chapter 8

Percutaneous Administration

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Objectives

1. Describe the topical forms of medications that are used on the skin.
2. Cite the equipment needed and the techniques used to apply each of the topical forms of medications to the skin.

Key Terms

creams (KRĒMZ) (p. 105)
lotions (LŌ-shŭnz) (p. 105)
aqueous (ey-kwee-uhs) (p. 105)
ointments (ŌYNT-mĕnts) (p. 105)
dressings (DRĔS-ĭngz) (p. 105)
seven RIGHTS (p. 106)

The routes of drug administration can be classified into three categories: enteral, parenteral, and percutaneous. The term *percutaneous administration* refers to the application of medications to the skin or mucous membranes for absorption. The absorption of topical medications can be influenced by the drug's concentration, how long the medication is in contact with the skin, the size of the affected area, the thickness of the skin, the hydration of the tissues, and the degree of skin disruption. Methods of percutaneous administration include the following: the topical application of ointments, creams, powders, or lotions to the skin; the instillation of solutions onto the mucous membranes of the mouth, eye, ear, nose, or vagina; and the inhalation of aerosolized liquids or gases for absorption through the lungs. The primary advantage of the percutaneous route is that the action of the drug, in general, is localized to the site of application, which reduces the incidence of systemic side effects. Unfortunately, the medications are sometimes messy and difficult to apply. In addition, they usually have a short duration of action and thus require more frequent reapplication.

ADMINISTRATION OF TOPICAL MEDICATIONS TO THE SKIN

DOSE FORMS

Creams

Creams are semisolid emulsions that contain medicinal agents for external application. The cream base is generally nongreasy, and it can be removed with water. Many over-the-counter creams are used as moisturizing agents.

Lotions

Lotions are **aqueous** (water-based) preparations that contain suspended materials. Lotions are commonly used as soothing agents to protect the skin and to relieve rashes and itching. Some lotions have a cleansing action, whereas others have an astringent or drawing effect. To prevent increased circulation and itching, lotions should be gently but firmly patted on the skin rather than rubbed into the skin. Shake all lotions thoroughly immediately before application, and use them sparingly to avoid waste.

Ointments

Ointments are semisolid preparations of medicinal substances in an oily base, such as lanolin or petrolatum. This type of preparation can be applied directly to the skin or mucous membrane, and it generally cannot be removed easily with water. The base helps to keep the medicinal substance in prolonged contact with the skin.

DRESSINGS

There are several types of **dressings** used to treat wounds, such as dry gauze sponges, nonadherent gauze dressings (e.g., Telfa), self-adhesive transparent films that act as a second skin (e.g., OpSite), and hydrocolloid dressings (e.g., DuoDERM). Hydrogel dressings are used on partial-thickness and full-thickness wounds and on skin that has been damaged by burns. There are also exudate absorbers such as calcium alginate dressings (e.g., AlgiDERM, Kaltostat, Sorbsan) manufactured from seaweed that can be used on infected wounds.

Wound care products and wound care have become a complex science. (Refer to fundamentals of nursing, medical-surgical nursing, and geriatric nursing textbooks for discussions of the principles of wound care.) Dressing recommendations for treating pressure ulcers are available from the Agency for Health Care Research and Quality, the Public Health Service, and the U.S. Department of Health and Human Services.

Clinical Goldmine

It is recognized that a major principle of wound healing is the need for a moist environment to propagate the epithelialization of the wound, which is further promoted by a diet that is high in protein, vitamin A, vitamin C, and zinc.

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 appropriate equipment.
2. Use the **seven RIGHTS** of medication preparation and administration (see p. 100) 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 give a thorough explanation of the procedure.

In addition, a nurse should perform a premedication assessment before applying any topical preparation. See individual drug monographs for more information.

ADMINISTRATION OF CREAMS, LOTIONS, AND OINTMENTS

Topical preparations can be used to do the following:

- Cleanse and débride a wound
- Rehydrate the skin
- Reduce inflammation
- Relieve localized signs and symptoms, such as itching and rash
- Provide a protective barrier
- Reduce a thickening of the skin, such as that involved with callus formation

EQUIPMENT

- Prescribed cream, lotion, or ointment
- 2 × 2-inch gauze sponges
- Cotton-tipped applicators
- Tongue blade
- Gloves
- Medication administration record (MAR) and medication profile

SITES

Skin surfaces affected by the disorder being treated.

TECHNIQUES

1. Follow the procedure protocol described previously.
2. Position the patient so that the surface where the topical materials are to be applied is exposed. Assess the current status of the patient's symptoms. Provide for patient comfort before starting therapy.
3. *Cleansing:* Follow the specific orders of the health care provider or clinical site policies for cleansing the site of application. After the area is exposed and cleansed, perform a wound assessment.
4. *Application:* Wear gloves during the application process. Many of the agents used may be absorbed through the skin of both the patient and the person who is applying the medication.
   - *Lotions:* Shake well until a uniform appearance of the suspension is obtained.
   - *Ointments or creams:* Use a tongue blade to remove the desired amount from a wide-mouthed container. Alternatively, squeeze the amount needed onto a tongue blade or cotton-tipped applicator from a tube-type container. Apply lotion firmly but gently by dabbing the surface. Apply ointments and creams with a gloved hand using firm but gentle strokes. Creams are to be gently rubbed into the area.
5. *Dressings:* Check specific orders regarding the type of dressing to be used. If a dressing is to be applied, spread the prescribed amount of ointment directly onto the dressing material with a tongue blade; the impregnated dressing material can then be applied to the affected skin surface. Secure the dressing in place.
6. *Wet dressings:* Always completely remove the previous dressing. Wring out wet dressings to prevent dripping, and apply the gauze in a single layer directly to the wound surface. For deeper wounds, pack the wound loosely with moist gauze sponges so that all surfaces are in contact with the moisture. Apply a layer of dry gauze sponges and an absorbent pad to the area. To secure a dressing that requires repeated changes, apply a binder, or use Montgomery's tapes.
7. Clean the area and the equipment used, and make sure that the patient is comfortable after the application procedure. (NOTE: Sterile supplies, gloves, and equipment are used for some wounds; however, clean rather than sterile items [e.g., gauze, gloves] may be used when applying most types of dressings [e.g., to a pressure ulcer]. Always check institutional policies and use clinical judgment.)
8. Perform hand hygiene.

PATIENT TEACHING

1. If appropriate, teach the patient to apply the medication and dressings.
2. Teach personal hygiene measures that are appropriate to the underlying cause of the skin condition (e.g., acne, contact dermatitis, infection).
3. When dressings are ordered, suggest the purchase of gauze and other necessary supplies.
4. Stress gentleness and moderation with regard to the amount of medication to be applied.

5. Emphasize that the patient must avoid touching or scratching the affected area.
6. Tell the patient to wash his or her hands before and after touching the affected area or applying the medication. Stress the prevention of the spread of infection, when present.

DOCUMENTATION

Provide the RIGHT DOCUMENTATION of the medication administered and the patient's response 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 treatment's therapeutic effectiveness (e.g., change in size of affected area, reduced drainage, decreased itching, lowered temperature with an infection).
3. On the patient's record, document any signs and symptoms of adverse drug effects, and provide a narrative description of the area being treated.
4. Develop a written record for the patient to use when charting progress for the evaluation of the effectiveness of the treatments being used. List the patient's symptoms (e.g., rash on the lower leg with redness and vesicles present, decubitus ulcer on the sacrum). List the data to be collected regarding the medication prescribed and its effectiveness (e.g., vesicles now crusted, weeping, or appear to be drying; redness in lower leg is lessening; measure the area of decubitus in cm and indicate if the wound is extending, remaining the same, or shrinking).
5. Perform and validate essential patient education regarding the drug therapy and other important aspects of intervention for the disease process that is affecting the patient.

PATCH TESTING FOR ALLERGENS

Objectives

3. Describe the procedure used and the purpose of performing patch testing.
4. Describe specific charting methods that are used with allergy testing.

Key Terms

patch testing (PĂCH) (p. 107)
allergens (ĂL-ĕr-jĕnz) (p. 107)

Patch testing is a method that is used to identify a patient's sensitivity to contact materials (e.g., soaps, pollens, dyes). The suspected **allergens** (antigens) are placed in direct contact with the skin surface and covered with nonsensitizing, nonabsorbent tape. Unless pronounced irritation appears, the patch is usually left in place for 48 hours and then removed. The site is left open to air for 15 minutes and then "read." A positive reaction is noted by the presence of redness and swelling, called a wheal, which indicates an allergy to the specific allergen. It may be necessary to read the areas after 3 days and again after 7 days to detect delayed reactions.

Intradermal tests may also be used to determine allergenicity to specific antigens. See Chapter 11 for more information about the intradermal administration of allergens.

Perform premedication assessments. See individual drug monographs.

EQUIPMENT

- Alcohol for cleansing the area
- Solutions of suspected antigens
- 1 × 1-inch gauze pads
- Droppers
- Mineral or olive oil
- Water
- Clippers
- Hypoallergenic tape
- Record for charting data about the substances applied and the patient's responses
- MAR, computer profile, or physician's order sheet

SITES

The back, arms, or thighs are commonly used. (DO NOT use the face or areas that are susceptible to friction from clothing.) Selected areas are spaced 2 to 3 inches apart. The type of allergen applied and the site of application are documented on the patient's chart (Figure 8-1). Hair is clipped from sites to ensure that the allergen is kept in close contact with the skin surface, thereby preventing a false-negative reaction.

TECHNIQUE

CAUTION: DO NOT begin any type of allergy testing unless emergency equipment is available in the immediate area in case of an anaphylactic response. Personnel should be familiar with the procedure to follow if an emergency does arise.

1. Check with the patient before starting the testing to ensure that no antihistamines or anti-inflammatory agents (e.g., aspirin, ibuprofen, diphenhydramine, corticosteroids) have been taken for 24 to 48 hours before the test. If the patient has taken an antihistamine or an anti-inflammatory agent, consult the health care provider before proceeding with the testing. Review the chart to ensure that the patient is not in an immunocompromised state as a result of disease or treatments such as chemotherapy or radiation therapy.

A

Reading Chart for Intradermal Testing

Patient Name:_____

Identification Number:_____

Physician Name:_____

DATE:	TIME:	AGENT	CONCENTRATION	DOSAGE	SITE NUMBER*	Reading Time in Hours or Minutes, 30 min or 24, 48, or 72 hr		

*Refer to diagram of sites, Figure 8-1, *A*

- Follow directions for the "reading" of the skin testing performed.
- Inspect sites in a good light.
- Record reaction in upper half of box using the following guidelines, e.g., 2+
  - \+ (1+) No wheal, 3 mm flare
  - ++ (2+) 2 to 3 mm wheal with flare
  - +++ (3+) 3 to 5 mm wheal with flare
  - ++++ (4+) >5 mm wheal
- Record measurement of induration (process of hardening) in mm in lower half of box, e.g., 5 mm

B

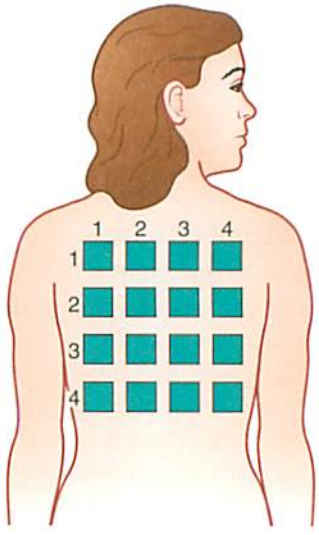

FIGURE 8-1 Patch test for contact dermatitis. **A,** Reading chart, patch testing. **B,** Patch testing sites.

2. Follow the procedure protocol described on p. 106.
3. Position the patient so that the surface on which the test materials are to be applied is horizontal. Provide for patient's comfort before beginning the testing.
4. Cleanse the selected area thoroughly with the use of an alcohol wipe. Use circular motions starting at the planned site of application and continuing outward to the periphery. Allow the area to air-dry.
5. Prepare the designated solutions with the use of aseptic technique.
6. Follow the specific directions of the employing health care agency regarding the application of liquid and solid forms of suspected allergens. A dropper is usually used to apply suspected liquid contact-type materials; solid materials are applied directly to the skin surface and then moistened with mineral or olive oil.
7. The following methods may be used:
   - After application, follow institutional policy for covering the test site.
   - Designated amounts of standardized-strength chemical solutions are arranged in metal receptacles that are backed with hypoallergenic adhesive. These solutions are then applied to the selected site. It is important to identify the contents of each receptacle correctly.
   - Patches that are impregnated with designated allergens are available for direct application to the prepared sites.
   - A patch test series kit is available that contains nonirritating concentrations of allergens that are packaged in syringes for dispersal. Although the kit contains 20 allergens, any number of them may be applied to individual patches or holding devices, which are then applied to the patient's skin.
8. Chart the times, agents, concentrations, and amounts applied. Make a diagram in the patient's chart, and number each location. Record which agent and concentration were placed at each site. Subsequent readings of each area are then performed and charted on this record.
9. Follow directions regarding the time of the reading of the skin testing being performed. The testing sites should be inspected in good light. Generally, a positive reaction (i.e., the development of a wheal) to a dilute strength of a suspected allergen is considered clinically significant. Measure the diameter of erythema in millimeters, and palpate and measure the size of any induration (i.e., the hardening of an area of the body that has reacted to inflammation). Record this information in the patient's chart. The control site should have no reaction, which should be noted. The following is a list of commonly used readings of reactions and appropriate symbols:

+ (1+)	No wheal, 3-mm flare
++ (2+)	2- to 3-mm wheal with flare
+++ (3+)	3- to 5-mm wheal with flare
++++ (4+)	>5-mm wheal

PATIENT TEACHING

1. Tell the patient the time, date, and place of the return visit for having the test sites read.
2. Tell the patient not to bathe or shower until the patches are read and removed. Explain the need to avoid activities that could cause excessive perspiration.
3. If the patient develops an area of severe burning or itching, lift the patch, and gently wash the area. Tell

the patient to report immediately the development of any breathing difficulty, severe hives, or rashes. The patient should be told to go to the nearest emergency department if he or she is unable to reach the health care provider who prescribed the skin tests.

DOCUMENTATION

Provide the RIGHT DOCUMENTATION of the allergen testing sites and the patient's responses to the allergens that were applied.

1. Chart the date, time, drug name, dose, and site of administration (see Figure 8-1).
2. Read each site at 24, 48, and 72 hours after application as directed by the health care provider or the policy of the health care agency. Additional readings may be required for up to 7 days after application.
3. Chart and report any signs and symptoms of adverse drug effects.
4. Perform and validate essential patient education regarding the testing and other essential aspects of intervention for the disease process that is affecting the individual.

ADMINISTRATION OF NITROGLYCERIN OINTMENT

Objectives

5. Identify the equipment needed, the sites and techniques used, and the patient education required when nitroglycerin ointment is prescribed.
6. Describe the specific documentation methods that are used to record the therapeutic effectiveness of nitroglycerin ointment therapy.

DOSE FORM

Nitroglycerin ointment (Nitro-Bid) provides relief of anginal pain for several hours longer than sublingual preparations. When properly applied, nitroglycerin ointment is particularly effective against nocturnal attacks of anginal pain. Specific instructions for nitroglycerin ointment are reviewed in this text, because it is the only ointment that is currently available for which dosage is critical to the success of use (see Chapter 25).

Perform premedication assessments. See individual drug monographs.

EQUIPMENT

- Gloves
- Nitroglycerin ointment
- Applicator paper
- Nonallergenic adhesive tape
- MAR and medication profile

SITES

Any area without hair may be used. Most people prefer the chest, flank, or upper arm area (Figure 8-2).

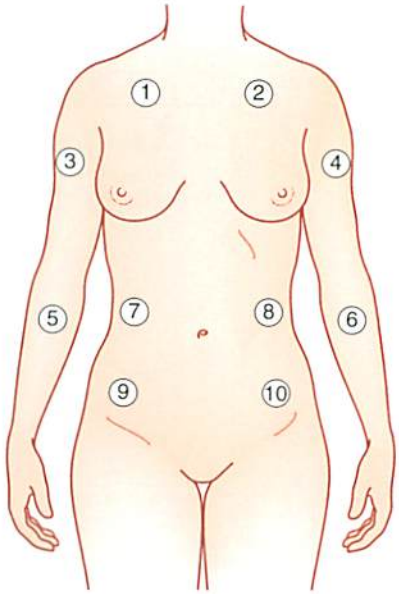

FIGURE 8-2 Sites for nitroglycerin application.

DO NOT shave an area to apply the ointment; shaving may cause skin irritation.

TECHNIQUES

1. Follow the procedure protocol described on p. 106.
2. Don gloves.
3. Position the patient so that the surface to which the topical materials are to be applied is exposed. Provide for the patient's comfort before starting therapy. NOTE: When reapplying ointment, first remove the plastic wrap and dose-measuring applicator paper from previous dose, and cleanse the area of remaining ointment on the skin surface. Select a new site for the application of the medication, and then proceed with steps 4 through 7.
4. Lay the dose-measuring applicator paper with the print side DOWN on the site (Figure 8-3, *A*). The ointment will smear the print.
5. Squeeze a ribbon of ointment of the proper length onto the applicator paper.
6. Place the measuring applicator on the skin surface at the site chosen on the rotation schedule, ointment side DOWN. Spread in a thin, uniform layer under the applicator. DO NOT RUB IN. Leave the paper in place. NOTE: Use of the applicator paper allows you to measure the prescribed dose and prevents absorption through the fingertips as you apply the medication (see Figure 8-3, *B*).
7. Cover the area where the paper is placed in accordance with institutional policy (this may include covering the paper with plastic wrap), and then tape the paper in place.
8. Remove gloves and dispose of them in accordance with institutional policy.
9. Perform hand hygiene.

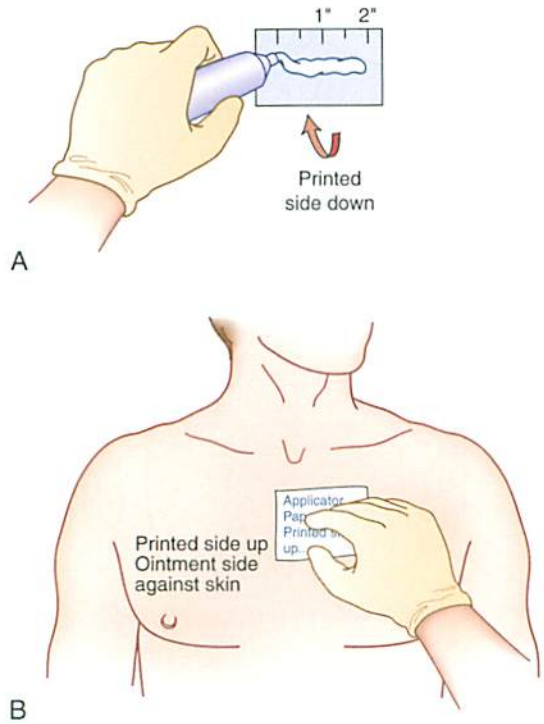

FIGURE 8-3 Administering nitroglycerin topical ointment. **A,** Lay the applicator paper print-side down, and measure the ribbon of ointment. **B,** Apply the applicator to the skin site, ointment-side down. Spread the ointment in a uniform layer under the applicator, and leave the paper in place.

Clinical Pitfall

Applying Nitroglycerin

To promote personal safety, the nurse should always wear gloves, whether applying nitroglycerin ointment paper or handling transdermal patches. When nitroglycerin transdermal patches are applied, chart the specific site of the application. Occasionally, patients may move the transdermal patch themselves because of convenience, skin irritation, or confusion. If the patch is not found at the original location at the scheduled time of removal, examine other areas of the body to find it; do not assume that the patch fell off or was removed. Tolerance and loss of antianginal response could develop if another patch is placed on the patient while the first patch is still on. Always dispose of used nitroglycerin paper or transdermal patches in a receptacle in which the patient, children, and pets will not have access. A substantial amount of nitroglycerin remains on the patch and can be toxic.

PATIENT TEACHING

1. Help the patient learn how to apply the ointment.
2. Tell the patient that the medication may discolor clothing. The use of clear plastic wrap protects clothing.
3. When the dosage is regulated properly, the ointment may be used every 3 to 4 hours and at bedtime. Remind the patient that there should be a drug-free period (usually 10 to 12 hours) every 24 hours as recommended by the health care provider.
4. Tell the patient to wash her or his hands after application to remove any nitroglycerin that came into contact with the fingers.
5. When terminating the use of this topical ointment, the dosage and frequency of application should be gradually reduced over a 4- to 6-week period. Tell the patient to contact the health care provider if adjustment is thought to be necessary. Encourage the patient not to discontinue the medication abruptly (see Chapter 25).

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, site, and route of administration.
2. Perform and record regular patient assessments for the evaluation of therapeutic effectiveness (e.g., blood pressure, pulse, output, degree and duration of pain relief on a scale of 0 to 10).
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 important aspects of intervention for the disease process that is affecting the individual.

ADMINISTRATION OF TRANSDERMAL DRUG DELIVERY SYSTEMS

Objective

7. Identify the equipment needed, the sites and techniques used, and the patient education required when transdermal medication systems are prescribed.

Key Term

transdermal patch (p. 110)

DOSE FORM

The **transdermal patch** provides for the controlled release of a prescribed medication (e.g., nitroglycerin, clonidine, estrogen, nicotine, scopolamine, fentanyl) through a semipermeable membrane for several hours to 3 weeks when applied to intact skin. The dose released depends on the surface area of the disk in contact with the skin surface and the individual drug. See specific monographs for the onset and duration of action of drugs that make use of this delivery system.

Perform premedication assessments. See individual drug monographs.

EQUIPMENT

- Gloves
- Transdermal patch
- Clipping equipment as appropriate for the site and the patient's skin condition
- MAR and medication profile

SITES

Any area without hair may be used. Most people prefer the chest, flank, or upper arm area. Develop a rotation schedule for use (see Figure 8-2 for an example of a nitroglycerin rotation schedule). See manufacturer's recommendations for location and frequency of application of patches other than nitroglycerin.

TECHNIQUES

1. Follow the procedure protocol described on p. 106.
2. Label the disk with the date, the time, and the nurse's initials. If the dosage of the medication is not printed on the patch applied, it is useful to include the dosage as part of the labeling process.
3. Don gloves.
4. Position the patient so that the surface on which the topical materials are to be applied is exposed. Provide for the patient's comfort. NOTE: When reapplying a transdermal disk or patch, remove the old disk or patch, and cleanse the skin thoroughly. Select a new site for application. It is especially important in the older adult or the confused patient to look for the old disk if it is not where the prior application is charted. The confused patient may have moved it elsewhere on the body or removed it. The old disk can be encased in the glove as the nurse removes it; this should then be disposed of in a receptacle on the medication cart rather than in the patient's room.
5. Apply the small adhesive topical disk. Figure 8-4 illustrates nitroglycerin being applied to one of the sites recommended by the rotation schedule. The frequency of application depends on the specific medication being applied via the transdermal disk and the duration of action of the prescribed medication. Nitroglycerin is applied once daily, whereas fentanyl is reapplied every 3 days; clonidine and Ortho Evra are reapplied once every 7 days. Hormone replacement therapies may be applied every 4 to 7 days.
6. Remove gloves and dispose of them in accordance with institutional policy.
7. Perform hand hygiene.

PATIENT TEACHING

1. Teach the patient how and when to apply the disks. NOTE: Certain products may be worn while showering; others should be replaced after bathing or showering. Refer to the patient education instructions for specific application directions. Scopolamine, which is used for motion sickness, must be applied at least 4 hours before travel; clonidine transdermal systems are applied once every 7 days. Ortho Evra is a contraceptive patch that is reapplied weekly for 3 weeks, with the fourth week being patch-free; a new patch and cycle of three patches starts the following week.
2. If a disk becomes partially dislodged, the recommendations for the product should be followed. A nitroglycerin disk is removed, and a new one is applied. Alternatively, clonidine transdermal patches come with a protective adhesive overlay to be applied over the patch to ensure skin contact with the transdermal system if the disk becomes loosened. See Chapter 41 for further information about the Ortho Evra patch.
3. Patients who are receiving nitroglycerin transdermally may require sublingual nitroglycerin for anginal attacks, especially while the dose is being adjusted. In general, nitroglycerin patches are worn for 10 to 14 hours; this is followed by a drug-free period of 10 to 12 hours so that the nitroglycerin will maintain its effectiveness.
4. Fentanyl (Duragesic) may take up to 12 hours after application to be effective for the management of stable, chronic pain. Therefore, it should be combined with a short-acting pain medication until a sufficient blood level of the fentanyl is achieved. Fentanyl patches are changed every 3 days. Breakthrough pain should be promptly reported to the health care provider. It may be necessary to increase

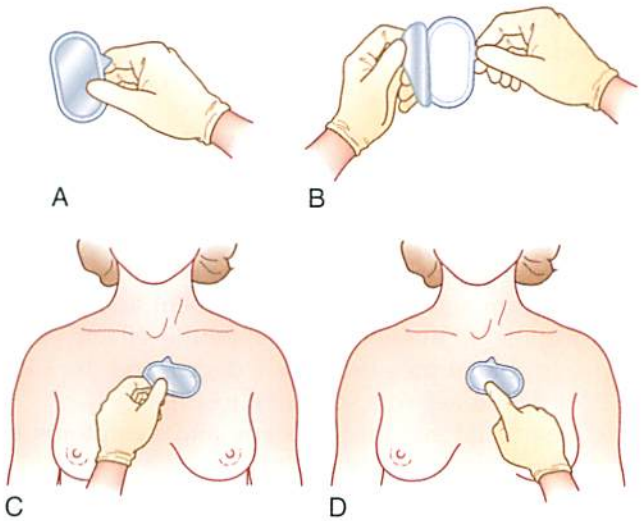

FIGURE 8-4 Applying a nitroglycerin topical patch. **A,** Carefully pick up the system lengthwise, with the tab up. **B,** Remove the clear plastic backing from the system at the tab. Do not touch the inside of the exposed system. **C,** Place the exposed adhesive side of the system on the chosen skin site. Press firmly with the palm of the hand. **D,** Circle the outside edge of the system with one or two fingers.

the dosage to achieve a satisfactory level of pain relief.

DOCUMENTATION

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

1. Chart the date, time, drug name, dosage, route of administration, and location of patch.
2. Perform and record regular patient assessments for the evaluation of therapeutic effectiveness (e.g., blood pressure, pulse, degree and duration of pain relief on a scale of 0 to 10).
3. Chart and report any signs and symptoms of adverse drug effects.
4. Perform and validate essential patient education regarding the drug therapy and other essential aspects of intervention for the disease process that is affecting the individual.

ADMINISTRATION OF TOPICAL POWDERS

Objective

8. Describe the dose form, the sites used, and the techniques used to administer medications in topical powder form.

DOSE FORM

Powders are finely ground particles of medication that are contained in a talc base. They generally produce a cooling, drying, or protective effect where applied.

Perform premedication assessments. See individual drug monographs.

EQUIPMENT

- Gloves
- Prescribed powder
- MAR and medication profile

SITE

Apply to the skin surface of the body as prescribed.

TECHNIQUE

1. Follow the procedure protocol described on p. 106.
2. Don gloves.
3. Position the patient so that the surface on which the topical materials are to be applied is exposed. Provide for the patient's comfort before starting therapy.
4. Wash and thoroughly dry the affected area before applying the powder.
5. Apply powder by gently shaking the container to distribute the powder evenly over the area. Gently smooth over the area for even coverage.
6. Remove gloves and dispose of them in accordance with institutional policy.
7. Perform hand hygiene.

PATIENT TEACHING

Tell the patient to cleanse the area of administration and then reapply the powder to the external surface as directed by the physician. The patient should avoid inhaling the powder during application.

DOCUMENTATION

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

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

ADMINISTRATION OF MEDICATIONS TO MUCOUS MEMBRANES

Objectives

9. Describe the dose forms, the sites and equipment used, and the techniques for the administration of medications to the mucous membranes.
10. Compare the techniques that are used to administer eardrops to patients who are less than 3 years with those that are used for patients who are more than 3 years old.
11. Describe the purpose, the precautions necessary, and the patient education required for those patients who require medications via inhalation.

Key Terms

buccal (BŬK-ăl) (p. 113)
ophthalmic (ŏf-THĂL-mĭk) (p. 113)
otic (Ō-tĭk) (p. 115)
aerosols (ĂR-ō-sŏlz) (p. 118)
metered-dose inhaler (MDI) (MĒ-tŭrd DŌS ĭn-HĀL-ŭr) (p. 119)
dry powder inhaler (DPI) (DRĪ PŎW-dŭr ĭn-HĀL-ŭr) (p. 119)

Drugs are well absorbed across mucosal surfaces, and therapeutic effects are easily obtained. However, mucous membranes are highly selective with regard to absorptive activity, and they differ in sensitivity. In general, aqueous solutions are quickly absorbed from mucous membranes, whereas oily liquids are not. Drugs in suppository form can be used for local or systemic effects on the mucous membranes of the vagina, the urethra, or the rectum. A drug may be inhaled and absorbed through the mucous membranes of the nose and lungs. It may be dissolved and absorbed

by the mucous membranes of the mouth or applied to the eyes or ears for local action. It may be painted, swabbed, or irrigated on a mucosal surface.

ADMINISTRATION OF SUBLINGUAL AND BUCCAL TABLETS

DOSE FORMS

Sublingual tablets are designed to be placed under the tongue for dissolution and absorption through the vast network of blood vessels in this area. Buccal tablets are designed to be held in the **buccal** cavity (i.e., between the cheek and the molar teeth) for absorption from the blood vessels of the cheek. The primary advantages of these routes of administration are the associated rapid absorption and onset of action: the drug passes directly into the systemic circulation, with no immediate pass through to the liver, where extensive metabolism usually takes place. As opposed to most other forms of administration to the mucous membranes, the action from these dose forms is usually systemic rather than localized to the mouth.

Perform premedication assessments. See individual drug monographs.

EQUIPMENT

- Prescribed medication (NOTE: The medications available to be administered by this route are forms of nitroglycerin. After the self-administration technique is taught, the patient should carry the medication or keep it readily available at the bedside for use as needed.)
- MAR and medication profile

SITE

Administer at the sublingual area (i.e., under the tongue; Figure 8-5, *A*) or the buccal pouch (i.e., between the molar teeth and the cheek; see Figure 8-5, *B*).

TECHNIQUE

See Chapter 7 for more information about the correct technique to use with either the medication card system or the unit-dose system.

1. Follow the procedure protocol described on p. 106.
2. Put on a glove, and place the medication under the patient's tongue (i.e., sublingual; see Figure 8-5, *A*) or between the patient's upper molar teeth and his or her cheek (i.e., buccal; see Figure 8-5, *B*). The tablet is meant to dissolve in these locations. Do not administer the medication with water. Encourage the patient to allow the drug to dissolve where placed and to hold saliva in the mouth until the tablet is dissolved.
3. Remove the glove and dispose of it in accordance with institutional policy.
4. Perform hand hygiene.

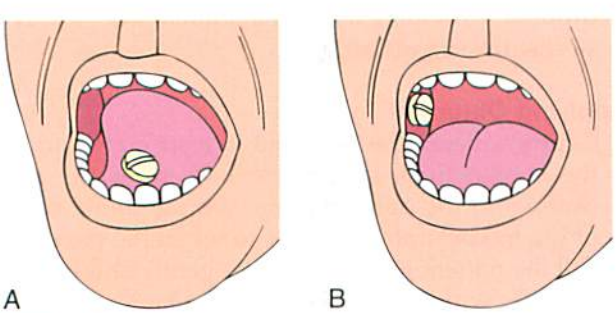

FIGURE 8-5 Placing medication in the mouth. **A,** Under the tongue (sublingual). **B,** In the buccal pouch.

PATIENT TEACHING

Explain the exact placement of the medication, the dosage, and the frequency of doses. The patient should be informed of adverse effects, where to carry the medication, how to store the medication, the medication's expiration date, and how to refill the prescription when needed.

DOCUMENTATION

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

1. Chart the date, time, drug name, dose, site, and route of administration.
2. Perform and record regular patient assessments for the evaluation of therapeutic effectiveness (e.g., blood pressure, pulse, degree and duration of pain relief, number of doses taken).
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.

NOTE: When the patient is self-administering a medication, the nurse is still responsible for all aspects of the charting and monitoring parameters to document the drug therapy and the response achieved.

ADMINISTRATION OF EYEDROPS AND OINTMENT

DOSE FORM

Medications for use in the eye are labeled *ophthalmic.* If a drug is not labeled as such, it should not be administered to the eye. Ocular solutions are sterile and easily administered, and they usually do not interfere with vision when they are instilled. Allow eye medication to warm to room temperature before administration.

Ocular ointments do cause alterations in visual acuity. However, they have a longer duration of action than solutions. Always use a separate bottle or tube of eye medication for each patient.

Perform premedication assessments. See individual drug monographs.

EQUIPMENT

- Gloves
- Eyedrops, ointment prescribed (check strength carefully)
- Dropper (use only the dropper supplied by the manufacturer)
- Tissues and sterile eye dressing (pad), as appropriate
- Normal saline solution, if needed, for cleaning off exudates
- MAR and medication profile

SITE

Eye(s)

TECHNIQUE

1. Follow the procedure protocol described on p. 106.
2. Assemble the ophthalmic medication.
3. Position the patient so that the back of his or her head is firmly supported on a pillow and so his or her face is directed toward the ceiling. With a child, restraints may be necessary if the child is too young to cooperate voluntarily. Always ensure patient safety.
4. Don gloves.
5. Inspect the affected eye to determine the current status. As appropriate, remove exudate from the eyelid and eyelashes with the use of sterile saline solution. A clean washcloth may be used, with a separate part of the cloth used for each eye. Start at the inner canthus, and wipe outward.
6. Expose the lower conjunctival sac by applying gentle traction to the lower lid at the bony rim of the orbit.
7. Approach the eye from below with the medication dropper or tube of ointment. (Never touch the eyedropper or ointment tip to the eye or the face.)
8. At the conclusion of either procedure, remove the gloves, and dispose of them in accordance with institutional policy.
9. Perform hand hygiene.

Instilling Drops

- Have the patient look upward over your head (Figure 8-6).
- Drop the specified number of drops into the conjunctival sac. Never drop the medication directly onto the eyeball.
- After instilling the drops, apply gentle pressure using a clean tissue to the inner canthus of the eyelid against the bone for approximately 1 to 2 minutes. This prevents the medication from entering the canal, where it would be absorbed in the vascular mucosa of the nose and produce systemic effects. It also ensures an adequate concentration of medication in the eye.
- When more than one type of eyedrop is ordered for the same eye, wait 1 to 5 minutes between the instillation of the different medications. Use only the dropper provided by the manufacturer. Apply a sterile dressing as ordered.

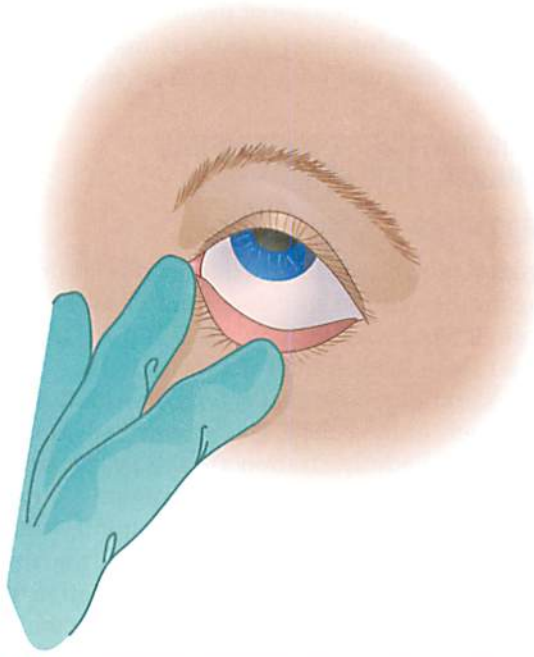

FIGURE 8-6 To administer ophthalmic drops, gently pull down the skin below the eye to expose the conjunctival sac. (From Kee, J. L., Hayes E. R., McCuistion, L. E. [2012]. Pharmacology: a nursing process approach [7th ed.]. St. Louis: Elsevier.)

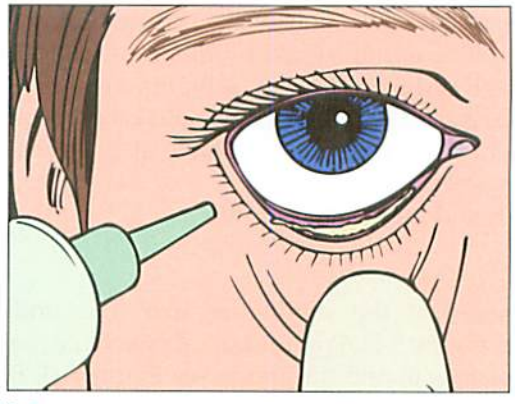

FIGURE 8-7 Administering ophthalmic ointment. To instill the ointment, gently pull the lower lid down as the patient looks upward. Squeeze the ophthalmic ointment into the lower sac. Avoid touching the tube to the eyelid.

Applying Ointment

- Gently squeeze the ointment in a strip fashion into the conjunctival sac (Figure 8-7), from the inner canthus to the outer canthus. Do not allow the tip of the medication dispenser to touch the patient.
- Tell the patient to close the eyes gently and to move the eyes with the lid shut, as if looking around the room, to spread the medication. Apply a sterile dressing as ordered.

PATIENT TEACHING

1. Teach the patient how to apply his or her own ophthalmic medication.
2. Tell the patient to wipe the eyes gently from the nose outward to prevent contamination between the eyes as well as the possible spread of infection and to use a separate tissue to wipe each eye.
3. Have the patient wash his or her hands often and avoid touching the eyes or the immediate surrounding areas, especially when an infection is present. Dispose of tissues in a manner that prevents the spread of infection.
4. Stress punctuality with regard to the administration of eye medications, especially when the medications are being used to treat infections or increased intraocular pressure.
5. Tell the patient to discard eye medications that have changed color or become cloudy or that contain particles. (If the patient's visual acuity is reduced, someone else should check the medications for clarity.)
6. The patient must not use over-the-counter eyewashes without first consulting the health care provider who is managing the eye disorder.
7. Emphasize the need for the careful follow-up examination of any eye disorder until the health care provider releases the patient from further care.

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, site, and route of administration.
2. Perform and record regular patient assessments for the evaluation of therapeutic effectiveness (e.g., redness, discomfort, visual acuity, changes in infection or inflammatory reaction, 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.

ADMINISTRATION OF EARDROPS

DOSE FORM

Eardrops are a solution that contains a medication that is used for the treatment of localized infection or inflammation of the ear. Medications for use in the ear are labeled *otic*. If a drug is not labeled as such, it should not be administered to the ear. Eardrops should be warmed to room temperature before use, and a separate bottle of eardrops should be used for each patient.

Perform premedication assessments. See individual drug monographs.

EQUIPMENT

- Gloves
- Otic solution prescribed
- Dropper provided by the manufacturer
- MAR and medication profile

SITE

Ear(s)

TECHNIQUES

1. Review the policy of the practice setting and follow guidelines regarding whether gloves are to be worn during the instillation of ear medications.
2. Follow the procedure protocol described on p. 106.
3. Position the patient so that the affected ear is directed upward.
4. Don gloves (in accordance with institutional policy).
5. Assess the ear canal for wax accumulation. If wax is present, obtain an order to irrigate the canal before instilling the eardrops.
6. Allow the medication to warm to room temperature, shake it well, and then draw it up into the dropper.
7. *Administration:* For children who are less than 3 years old, restrain the child, turn the child's head to the appropriate side, and then gently pull the lower earlobe *downward* and *back* (Figure 8-8, *A*) to straighten the external auditory canal. Instill the prescribed number of drops into the canal. Do not allow the dropper tip to touch any part of the ear. For children who are more than 3 years old and for adults, enlist cooperation or restrain as necessary. Turn the head to the appropriate side, and then gently pull the upper earlobe *upward* and *back* (see Figure 8-8, *B*) to straighten the external auditory canal. Instill the prescribed number of drops into the canal. Do not allow the dropper tip to touch any part of the ear.
8. Instruct the patient to remain on his or her side for a few minutes after instillation; insert a cotton plug *loosely*, if ordered.
9. Repeat the procedure if eardrops are ordered for both ears.
10. Remove gloves and dispose of them in accordance with institutional policy.
11. Perform hand hygiene.

Clinical Goldmine

Remember, for children who are less than 3 years old, pull the lower earlobe downward and back. For adults and children who are 3 years old and older, pull the upper earlobe up and back (see Figure 8-8).

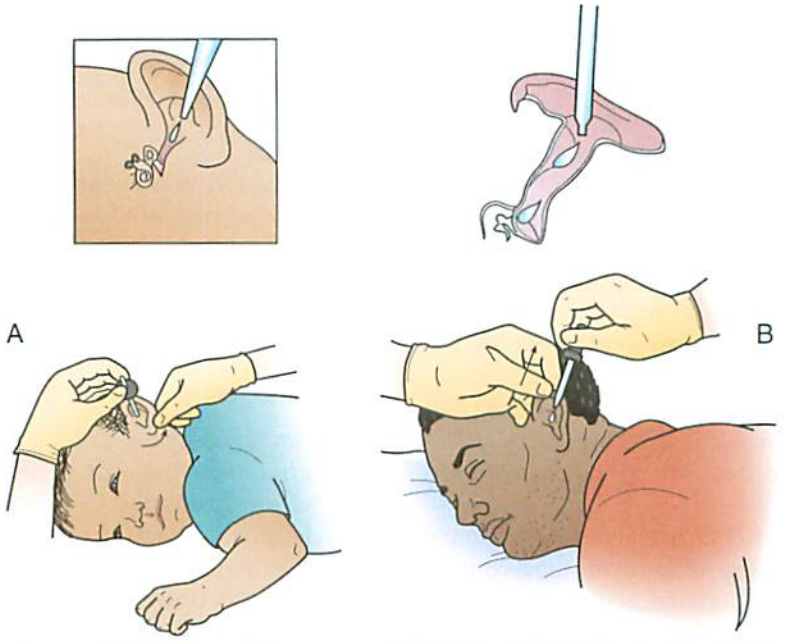

FIGURE 8-8 Administering eardrops. **A,** Pull the lower earlobe downward and back for children who are less than 3 years old. **B,** Pull the upper earlobe upward and back for patients who are more than 3 years old.

PATIENT TEACHING

1. Explain the importance of administering the medication as prescribed.
2. Teach the patient self-administration or teach the administration technique to another person, as appropriate.

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, site, and route of administration.
2. Perform and record regular patient assessments for the evaluation of therapeutic effectiveness (e.g., redness, pressure, degree and duration of pain relief, color and amount of drainage).
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 NOSE DROPS

Nasal solutions are used to treat temporary disorders that affect the nasal mucous membranes. Always use the dropper provided by the manufacturer, and give each patient a separate bottle of nose drops.

Perform premedication assessments. See individual drug monographs.

EQUIPMENT

- Gloves
- Nose drops prescribed
- Dropper supplied by the manufacturer
- Tissue to blow the nose
- Penlight
- MAR and medication profile

SITE

Nostril(s)

TECHNIQUE

1. Review institutional policy and follow the appropriate guidelines regarding whether gloves are to be used during the instillation of nose drops to prevent possible contact with body fluid secretions.
2. Follow the procedure protocol described on p. 106.
3. Explain the steps in the procedure to help the individual learn future self-administration.
4. Administer the medication (Figure 8-9).

For Adults and Older Children

- Instruct the patient to blow the nose gently unless this is contraindicated (e.g., nosebleeds, risk of increased intracranial pressure). Use a penlight to assess the nares.
- Have the patient lie down and hang the head backward over the edge of the bed or over a pillow placed under the shoulders.
- Draw the medication into the dropper. Hold the dropper just above the nostril, and instill the medication.

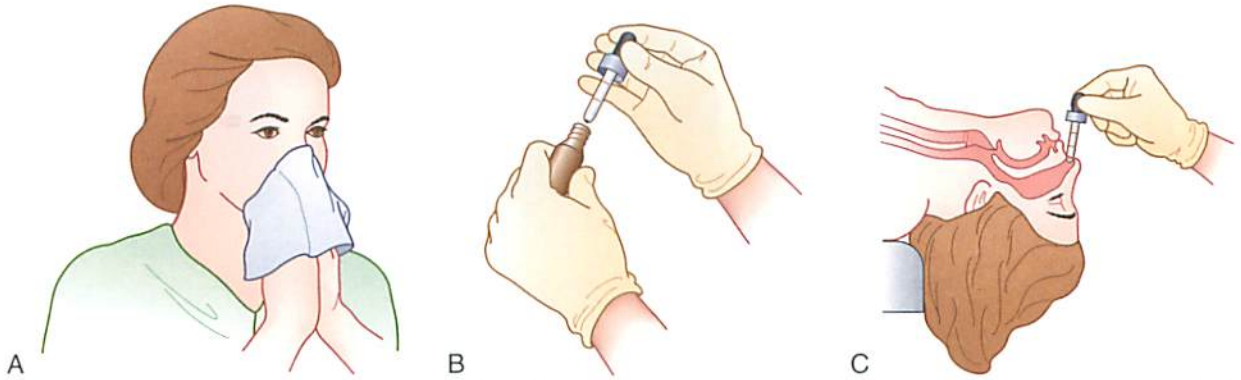

FIGURE 8-9 Administering nose drops. **A,** Have the patient gently blow the nose. **B,** Open the medication bottle, and draw the medication up to the calibration mark on the dropper. **C,** Instill the medication. Have the patient remain in this position for 2 to 3 minutes. Repeat in the other nostril, if necessary.

- After a brief time, have the patient turn the head to the other side, and repeat the administration process in the second nostril, if needed.
- Have the patient remain in this position for 2 to 3 minutes to allow the drops to remain in contact with the nasal mucosa.

For Infants and Young Children

- Position the infant or small child with the head over the edge of a bed or pillow, or use the "football" hold to immobilize the infant.
- Administer nose drops in the same manner as is used for an adult.
- For a child who is cooperative, offer praise. Provide appropriate comforting and personal contact for all children and infants.
- Have paper tissues available for use if it is absolutely necessary for the patient to blow his or her nose.

PATIENT TEACHING

Teach the patient about the self-administration of nose drops, if necessary. Tell the patient that the overuse of nose drops can cause a rebound effect, which causes symptoms to become worse. If symptoms have not resolved after a week of nasal drop therapy, then the health care provider should be consulted again.

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, site, and route of administration.
2. Perform and record regular patient assessments for the evaluation of the therapeutic effectiveness (e.g., nasal congestion, degree and duration of relief achieved, improvement in overall status), and reassess the condition of the nares periodically.
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 NASAL SPRAY

The mucous membranes of the nose absorb aqueous solutions very well. When applied as a spray, the small droplets of a solution that contains medication coat the membranes and are rapidly absorbed. The advantage of spray over drops is that there is less waste of medication, because some of the drops often run down the back of the patient's throat before absorption can take place. As with drops, each patient should have a personal container of spray.

Perform premedication assessments. See individual drug monographs.

EQUIPMENT

- Gloves
- Nasal spray prescribed
- Paper tissues to blow the nose
- Penlight
- MAR and medication profile

SITE

Nostril(s)

TECHNIQUES

1. Review institutional policy and follow the appropriate guidelines regarding whether gloves are to be used during the instillation of nasal sprays.
2. Follow the procedure protocol described on p. 106.
3. Don gloves (in accordance with institutional policy).

FIGURE 8-10 Administering nasal spray. **A,** Have the patient gently blow the nose. **B,** Block one nostril; shake the medication bottle. **C,** Insert the tip of the bottle into the patient's nostril, and squeeze a puff of spray while the patient inhales through the open nostril.

4. Instruct the patient to gently blow the nose (Figure 8-10, *A*), unless this is contraindicated (e.g., nosebleeds, risk of increased intracranial pressure).
5. Have the patient assume the upright sitting position. Use a penlight to inspect the nares.
6. Block one nostril (see Figure 8-10, *B*).
7. Shake the spray bottle while holding it upright.
8. Immediately after shaking the bottle, insert the tip into the nostril (see Figure 8-10, *C*). Ask the patient to inhale through the open nostril, and squeeze a puff of spray into the nostril at the same time.
9. Have paper tissues available for use if it is absolutely necessary for the patient to blow his or her nose.
10. Remove gloves and dispose of them in accordance with institutional policy.
11. Perform hand hygiene.

PATIENT TEACHING

Teach the patient the self-administration of nasal spray, if necessary. Tell the patient that the overuse of nasal spray can cause a rebound effect, which causes the symptoms to become worse. If symptoms have not resolved after a week of nasal spray therapy, then the health care provider should be consulted again.

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, site, and route of administration.
2. Perform and record regular patient assessments for the evaluation of therapeutic effectiveness (e.g., nasal congestion, degree and duration of relief achieved, improvement in overall status).
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 MEDICATIONS BY INHALATION

The respiratory mucosa may be medicated via the inhalation of sprays or aerosols. **Aerosols** use a flow of air or oxygen under pressure to disperse the drug throughout the respiratory tract. Oily preparations should not be applied to the respiratory mucosa, because the oil droplets may be carried to the lungs and cause lipid pneumonia. Although saliva as a body fluid has not been implicated in the transmission of the human immunodeficiency virus, institutional protocols should reflect current standards of universal precautions for all patients and health care personnel. Follow these procedures faithfully to prevent the transmission of this disease.

Perform premedication assessments. See specific drug monographs. Assess the patient's ability to manipulate the nebulizer.

EQUIPMENT

- Gloves
- Liquid aerosol or spray forms of medications
- MAR and medication profile

SITE

Respiratory tract

TECHNIQUES

1. Follow the procedure protocol described on p. 106.
2. Don gloves (in accordance with institutional policy).
3. Have the patient assume a sitting position. This allows for maximum lung expansion.
4. Prepare the medication according to the prescribed directions, and fill the nebulizer with diluent. (This

may be done before sitting the patient up if time is a factor for the patient's well-being.)
5. Activate the nebulizer with compressed oxygen or air until a fine mist is flowing; this will usually take up to 8 to 10 liters of oxygen or air.
6. Place nebulizer mask over patient's nose and mouth and ask patient to breath normally.
7. Allow enough time for all the medication in the nebulizer to be administered; this should take approximately 10 minutes.
8. Assess the patient while still sitting to determine effectiveness
9. Clean the equipment in accordance with the manufacturer's directions.
10. Remove gloves and dispose of them.
11. Perform hand hygiene.

PATIENT TEACHING

1. As appropriate to the circumstances, teach the patient, a family member, or a significant other how to operate the nebulizer that is to be used at home.
2. Explain the operation and cleansing of the equipment.
3. Before the patient is discharged, have the patient, a family member, or a significant other administer the treatment using the equipment and medications that have been prescribed for at-home use.
4. Stress the need to perform the procedure exactly as prescribed and to report any difficulties that are experienced after discharge for the health care provider's evaluation.

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, improvement or quality of breathing, cough and productivity, lung sounds, degree and duration of pain relief, ability to operate the nebulizer, activity and exercise restrictions).
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 MEDICATIONS BY ORAL INHALATION

DOSE FORMS

Bronchodilators and corticosteroids may be administered by inhalation through the mouth with the use of

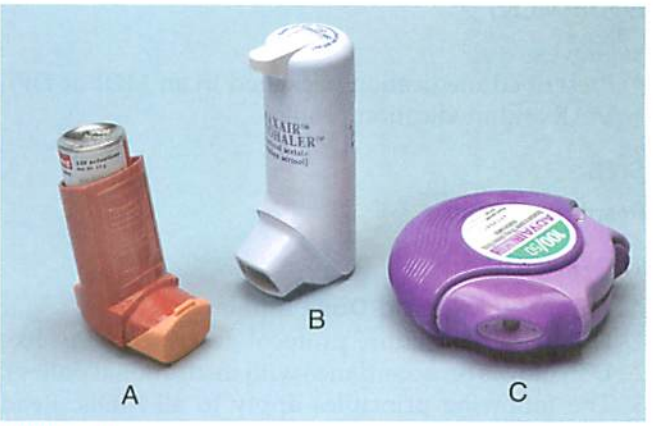

FIGURE 8-11 *A* and *B*, Metered-dose inhalers (MDIs). *C*, Dry powder inhaler (DPI).

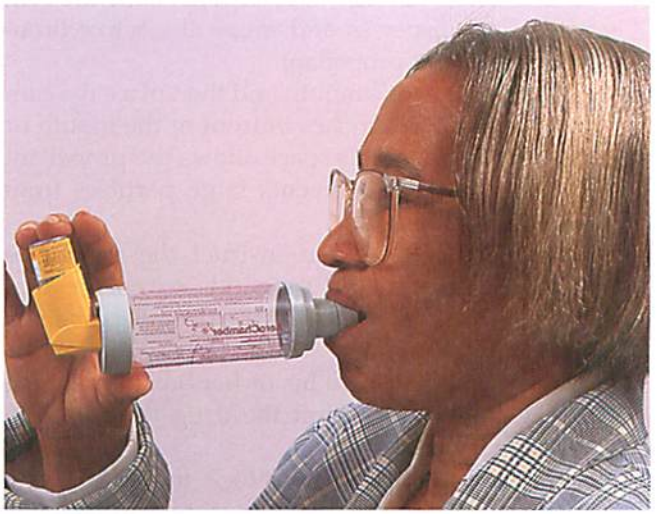

FIGURE 8-12 Metered-dose inhaler with an extender or spacer. (From Taussig, L. M., Landau, L. I., editors. [2008]. Pediatric respiratory medicine [2nd ed.]. St. Louis: Mosby.)

an aerosolized, pressurized **metered-dose inhaler (MDI)** or a **dry powder inhaler (DPI)** (Figure 8-11). The primary advantage of the inhalers is that the medication is applied directly to the site of action: the bronchial smooth muscle. Smaller doses are used, with rapid absorption and onset of action. The valve of the pressurized container (i.e., the MDI) or the dry powder pack of the DPI also helps to ensure that the same dose of medication is administered with each inhalation.

Approximately 25% of patients do not use MDIs properly and therefore do not receive the maximal benefit of the medication. Devices known as *extenders* or *spacers* (Figure 8-12) have been designed for patients who cannot coordinate the release of the medication with inhalation. The extender devices can be adapted to most pressurized canisters of MDIs. These devices trap the aerosolized medication in a chamber through which the patient inhales within a few seconds after releasing the medication into the chamber.

Perform premedication assessments. See individual drug monographs.

EQUIPMENT

- Gloves
- Prescribed medication packaged in an MDI or DPI
- MAR and medication profile

SITE

Respiratory tract

TECHNIQUE

Aerosolized Metered-Dose Inhaler

1. Follow the procedure protocol described on p. 106.
2. Don gloves (in accordance with institutional policy).
3. The following principles apply to all MDIs. Read and adapt these technique to the directions provided by the manufacturer for a specific inhaler and extender, if needed.
   - If the medication is a suspension, shake the canister. This disperses and mixes the active bronchodilator and propellant.
   - Open the patient's mouth and then place the canister outlet 2 to 4 inches in front of the mouth or use an extender. This space allows the propellant to evaporate and prevents large particles from settling in the mouth.
   - Activate the MDI, and instruct the patient to inhale deeply over 10 seconds to ensure that airways are open and that the drug is dispersed as deeply as possible.
   - Have the patient hold his or her breath and then exhale slowly to permit the drug to settle into pulmonary tissue.
   - If prescribed, repeat in 2 to 3 minutes. Using small doses with two or three inhalations enhances the deposition of the drug into the smaller peripheral airways for a longer therapeutic effect.
   - If the inhaled medication is a corticosteroid, have the patient rinse the mouth with water when administration is complete.
   - Cleanse the apparatus according to the manufacturer's recommendations; remove gloves and dispose of them in accordance with institutional policy.
   - Perform hand hygiene.

Dry Powder Inhaler

1. Follow the procedure protocol described on p. 106.
2. Don gloves (in accordance with institutional policy).
3. The following principles apply to all DPIs. Read and adapt these techniques to the directions provided by the manufacturer for a specific inhaler and extender, if needed.
   - Remove the cover, and check that the device and the mouthpiece are clean.
   - Make the medication available according to the manufacturer's instructions for each specific product. Keep the inhaler horizontal.
   - Have the patient breathe out, away from the device.
   - Place the mouthpiece gently into the patient's mouth, and have the patient close the lips around it.
   - Have the patient breathe in quickly, forcefully, and deeply until a full breath has been taken.
   - Remove the inhaler from the patient's mouth.
   - Have the patient hold the breath for about 10 seconds before breathing out.
   - Always check the number in the dose counter window to see how many doses remain.
   - If the patient drops the inhaler or breathes into it after the dose has been loaded, the dose may be lost. To ensure proper dosage, load another dose into the inhaler before using it.
   - Clean the device according to the manufacturer's instructions.
   - Remove gloves.
   - Perform hand hygiene.

Health Promotion

Refilling the Prescription

The patient should not wait until the canister is empty before having the prescription refilled. The last few doses in a canister are often subtherapeutic because of an imbalance in the remaining amounts of medication and propellant. Consult the manufacturer's information on how to determine whether the canister is almost empty. The commonly used float test is inaccurate for many aerosolized MDIs.

PATIENT TEACHING

Explain the procedure, and allow the patient to demonstrate the technique. Teaching aids for MDIs and DPIs without active ingredients are available from the pharmacy department to encourage patients to practice the technique before medication administration. In addition to technique, the patient should be informed about adverse effects, how to carry the medication, how to store it, and how to have it refilled when needed.

Have the patient perform the self-administration of the prescribed amount of ordered medication. Have the patient demonstrate the ability to read the canister counter to determine the amount of medication remaining in the container.

DOCUMENTATION

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

1. Chart the date, time, drug name, dose, site, and route of administration.
2. Perform and record regular patient assessments for the evaluation of therapeutic effectiveness (e.g., blood pressure, pulse, improvement of

quality of breathing, cough and productivity, degree and duration of pain relief, ability to operate the MDI, activity and exercise restrictions).
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 patient.

Perform premedication assessments. See individual drug monographs.

Life Span Considerations

Medicines Administered by Inhalation

When muscle coordination is not fully developed (e.g., in a younger child, or when dexterity has diminished in an older adult patient), it may be beneficial to use a spacer device (see Figure 8-12) for medicines that are administered by aerosol inhalation. When administering medicines by aerosol therapy to an older adult, make sure that the patient has the strength and dexterity to self-operate the equipment before discharge.

ADMINISTRATION OF VAGINAL MEDICATIONS

Objective

12. Identify the equipment needed, the site, and the specific techniques required to administer vaginal medications or douches.

Women with gynecologic disorders may require the administration of a medication intravaginally, usually for localized action. Vaginal medications may be creams, jellies, tablets, foams, suppositories, or irrigations (i.e., douches; see p. 122). The creams, jellies, tablets, and foams are inserted with the use of special applicators that are provided by the manufacturer; suppositories are usually inserted with a gloved index finger.

EQUIPMENT

- Prescribed medication
- Vaginal applicator
- Perineal pad
- Water-soluble lubricant (for suppository)
- Gloves
- Paper towels
- MAR and medication profile

SITE

Vagina

TECHNIQUES

1. Follow the procedure protocol described on p. 106.

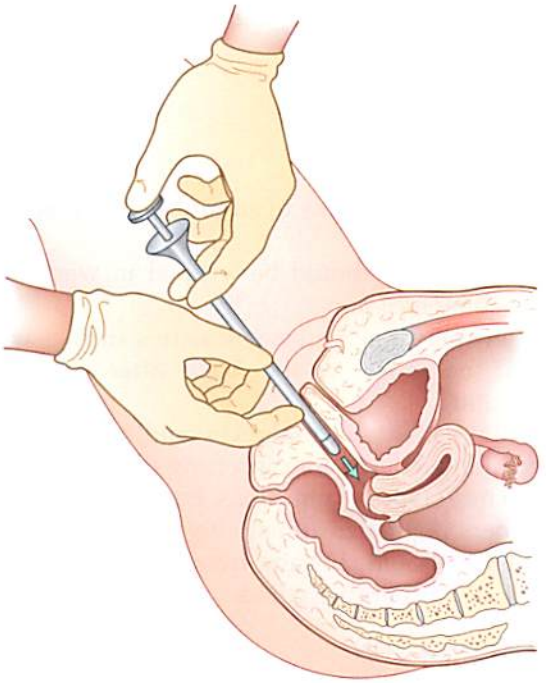

FIGURE 8-13 Applying vaginal medication. Gently insert the vaginal applicator as far as possible into the vagina, and then push the plunger to deposit the medication.

2. Have the patient void to ensure that the bladder is empty.
3. Don gloves.
4. Fill the applicator with the prescribed tablet, jelly, cream, or foam.
5. Place the patient in the lithotomy position, and elevate her hips with a pillow. Drape the patient to prevent unnecessary exposure.
6. *For creams, foams, and jellies,* use the gloved nondominant hand to spread the labia and expose the vagina. Assess the status of the presenting symptoms (e.g., color of discharge, volume, odor, level of discomfort). Lubricate the applicator. Gently insert the vaginal applicator as far as possible into the vagina, and push the plunger to deposit the medication (Figure 8-13). Remove the applicator, and wrap it in a paper towel for cleaning later. *For suppositories,* unwrap a vaginal suppository that has been warmed to room temperature, and lubricate it with a water-soluble lubricant. Lubricate the gloved index finger of the dominant hand. With the gloved nondominant hand, spread the labia to expose the vagina. Insert the suppository (rounded end first) as far into the vagina as possible with the dominant index finger.
7. Remove the glove by turning it inside out; place it on a paper towel for later disposal.
8. Apply a perineal pad to prevent drainage onto the patient's clothing or bed.
9. Instruct the patient to remain in a supine position with the hips elevated for 5 to 10 minutes

to allow for the melting and spreading of the medication.
10. Dispose of all waste.
11. Perform hand hygiene.

PATIENT TEACHING

1. Teach the patient how to administer the medication correctly.
2. The applicator should be washed in warm soapy water *after each use.*
3. Review personal hygiene measures such as wiping from the front to the back after voiding or defecating.
4. Tell the patient not to douche and to abstain from sexual intercourse after inserting the medication.
5. With most types of infections, both male and female partners require treatment. To prevent reinfection, patients should abstain from sexual intercourse until all partners are cured.

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 the 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.

ADMINISTRATION OF A VAGINAL DOUCHE

Douches (i.e., irrigants) are used to wash the vagina. This procedure is not necessary for normal female hygiene, but it may be required if a vaginal infection and discharge are present. It should also be noted that douching is not an effective method of birth control.

Perform premedication assessments. See individual drug monographs.

EQUIPMENT

- IV pole
- Gloves
- Water-soluble lubricant
- Douche bag with tubing and nozzle
- Douche solution
- MAR and medication profile

SITE

Vagina

TECHNIQUES

1. Follow the procedure protocol described on p. 106.
2. Ask the patient to void before the procedure.
3. If the nurse is teaching this procedure to a patient for home use, the patient would customarily recline in a bathtub. Depending on the patient's condition in the hospital, this too could occur. However, it may be necessary to place the patient on a bedpan and drape for privacy.
4. Hang the douche bag on an IV pole, about 12 inches above the vagina. Put on gloves. Apply water-soluble lubricant to a plastic vaginal tip.
5. Cleanse the vulva by allowing a small amount of solution to flow over the vulva and between the labia.
6. Gently insert the nozzle, directing the tip backward and downward 2 to 3 inches.
7. Hold the labia together to facilitate filling the vagina with solution. Rotate the nozzle periodically to help irrigate all parts of the vagina.
8. Intermittently release the labia, allowing the solution to flow out.
9. When all of the solution has been used, remove the nozzle. Have the patient sit up and lean forward to empty the vagina thoroughly.
10. Pat the external area dry.
11. Clean all equipment with warm soapy water *after every use;* rinse the equipment with clear water, and allow it to dry.
12. Thoroughly clean and disinfect the bathtub, if used. Remove gloves and dispose of them in accordance with institutional policy.
13. Perform hand hygiene.

PATIENT TEACHING

1. Teach the patient how to administer the douche correctly.
2. Explain that the bag and tubing should be washed in warm soapy water after each use so that they do not become a source of reinfection.
3. Review personal hygiene measures, such as wiping from the front to the back after voiding or defecating.
4. Explain that douching is not recommended during pregnancy.
5. With most types of infections, both male and female partners require treatment. To prevent reinfection, patients should abstain from sexual intercourse until all partners are cured.

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., 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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- 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-ĬN-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-RĬNJ) (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