9

Body Systems and Related Conditions

Bodies are organized into body systems. Each system in the body has a condition under which it works best. **Homeostasis** (*hoh-mee-oh-STAY-sis*) is the name for the condition in which all of the body's systems are balanced and are working together to maintain internal stability. To be in homeostasis, the body's **metabolism** (*me-TAB-uh-lism*), or physical and chemical processes, must be operating at a steady level. When disease or injury occur, the body's metabolism is disturbed, and homeostasis is lost.

Changes in metabolic (*me-tah-BOL-ic*) processes are called **signs** (objective information) **and symptoms** (subjective information). For instance, changes in body temperature could indicate that the body is fighting an infection. Noticing and reporting changes in clients is a very important part of a home health aide's job. The changes noted could indicate significant problems.

Each system in the body has its own unique structure and function. There are also normal, age-related changes for each body system. Knowing normal changes of aging will help HHAs better recognize any abnormal changes in clients. More information on normal changes of aging for each body system is in Chapter 11.

The body's systems can be organized in different ways. In this book the human body is divided into ten systems:

1. Integumentary (*in-teg-you-MEN-tar-ee*), or skin
2. Musculoskeletal (*mus-kyoo-lo-SKEL-e-tal*)
3. Nervous (*NERV-us*)
4. Circulatory (*SER-kyoo-la-tor-ee*)
5. Respiratory (*RES-spir-a-tor-ee*)
6. Urinary (*YOOR-i-nayr-ee*)
7. Gastrointestinal (*GAS-troh-in-TES-tuh-nul*)
8. Endocrine (*EN-doh-krin*)
9. Reproductive (*ree-pro-DUK-tiv*)
10. Immune (*i-MYOON*) and Lymphatic (*lim-FAT-ik*)

Body systems are made up of **organs**. An organ has a specific function. Organs are made up of **tissues**. Tissues are made up of groups of cells that perform a similar task. For example, in the circulatory system, the heart is one of the organs. It is made up of tissues and cells. **Cells** are the building blocks of the body. Living cells divide, grow, and die, renewing the tissues and organs of the body.

Diseases and conditions are either acute or chronic. An **acute illness** is one with severe symptoms; this type of illness is usually short-term. A **chronic illness** is a disease or condition that is long-term or long-lasting, even lasting over a lifetime. The symptoms are managed. Chronic conditions may have short periods of severity. The person may be hospitalized to stabilize the disease.

This chapter discusses the structure and function of each body system, as well as what is important to observe and report about each body system. Information about common conditions and diseases and related care is also included. However, confusion, dementia, and Alzheimer's disease—common conditions of the nervous system—will be discussed in Chapter 10. Chapter 11 contains information about the normal, age-related changes for each body system.

1. Describe the integumentary system and related conditions

The largest organ and system in the body is the skin, a natural protective covering, or **integument** (*in-TEG-you-ment*). Skin prevents injury to internal organs and protects the body against entry of bacteria. Skin also prevents the loss of too much water, which is essential to life. Skin is made up of layers of tissue. Within these layers are sweat glands, which secrete sweat to help cool the body when needed, and sebaceous glands, which secrete oil (sebum) to keep the skin lubricated. There are also hair follicles, many tiny blood vessels (capillaries), and tiny nerve endings (Fig. 9-1).

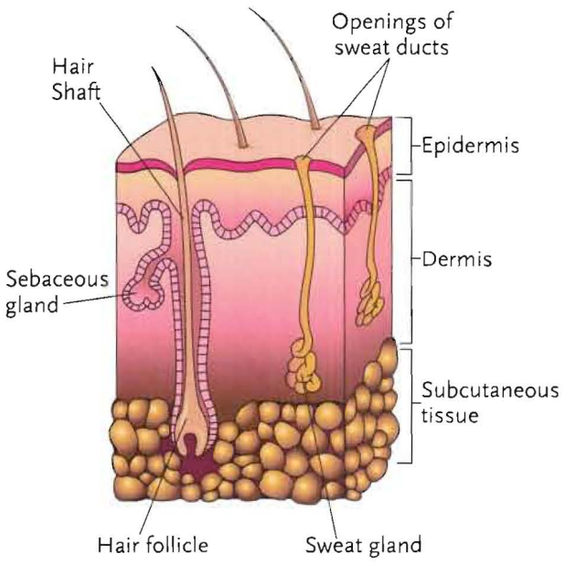

Fig. 9-1. *Cross-section showing details of the integumentary system.*

The skin is also a *sense organ* that feels heat, cold, pain, touch, and pressure. It then tells the brain what it is feeling. Body temperature is regulated in the skin. Blood vessels **dilate** (*DYE-late*), or widen, when the outside temperature is too high. This brings more blood to the body surface to cool it off. The same blood vessels **constrict**, or narrow, when the outside temperature is too cold. By restricting the amount of blood reaching the skin, the blood vessels help the body retain heat.

Observing and Reporting: Integumentary System

During daily care, a client's skin should be observed for changes that may indicate injury or disease. Observe and report these signs and symptoms:

- O/R Pale, white, reddened, or purple areas
- O/R Blisters or bruises
- O/R Complaints of tingling, warmth, or burning
- O/R Dry or flaking skin
- O/R Itching or scratching
- O/R Rash or any skin discoloration
- O/R Swelling
- O/R Cuts, boils, sores, wounds, or abrasions
- O/R Fluid or blood draining from the skin
- O/R Broken skin
- O/R Changes in moistness or dryness
- O/R Changes in an injury or wound (size, depth, drainage, color, or odor)
- O/R Redness or broken skin between toes or around toenails
- O/R Scalp or hair changes
- O/R Skin that appears different from normal or that has changed
- O/R In brown or black skin tones, look for changes in skin tone, skin temperature, and the feel of the tissue as compared to the skin nearby.

Pressure Injuries

Immobility reduces the amount of blood that circulates to the skin. Clients who have restricted mobility have an increased risk of skin deterioration at pressure points. **Pressure points** are areas of the body that bear much of the body's weight. Pressure points are mainly located at bony prominences. **Bony prominences** are areas of the body where the bone lies close to the skin. The skin here is at a much higher risk for skin breakdown. These areas include the elbows, shoulder blades, sacrum (tailbone), hips and knees (inner and outer parts), ankles, heels, toes, and the back of the head. Other areas at risk are the ears, the area under the breasts or scrotum, the area between the folds of the buttocks or abdomen, and skin between the legs (Fig. 9-2).

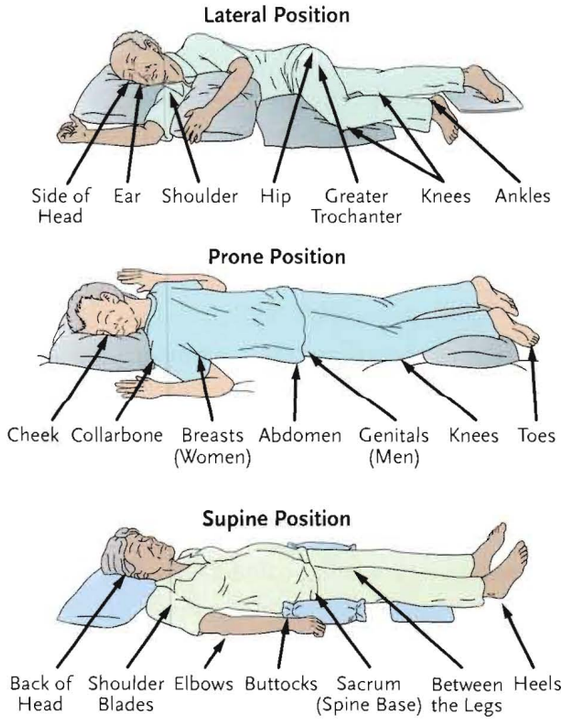

Fig. 9-2. *Areas at higher risk for skin breakdown.*

The pressure on these areas reduces circulation, decreasing the amount of oxygen the cells receive. Warmth and moisture also contribute to skin breakdown. Once the surface of the skin has broken down and is weakened, injuries can occur and may become infected, causing damage to the underlying tissue. When infection occurs, the healing process slows down. The injuries or wounds that result from skin deterioration and shearing are called **pressure injuries** (also called *pressure ulcers, pressure sores, decubitus* [*dee-KYOO-bi-tus*] *ulcers,* or *bed sores*). Shearing is rubbing or friction resulting from the skin moving one way and the bone underneath it remaining fixed or moving in the opposite direction.

If caught early, a break or tear in the skin can heal fairly quickly without other complications. However, if not caught early, a pressure injury can get bigger, deeper, and infected. Pressure injuries are painful and difficult to heal. They can lead to life-threatening infections. Prevention is very important and is the key to skin health. Pressure injuries are categorized by stages, which are as follows (Fig. 9-3):

- **Stage 1**: Skin is intact, but it may look red, and the redness is not relieved after removing pressure. Brown or black skin tones may not look red, but may appear to be a different color than the surrounding area. The area may be swollen, painful, firmer, softer, and warmer or cooler when compared to the area around it.
- **Stage 2**: There is partial-thickness skin loss involving the outer and/or inner layers of skin. The injury is pink or red and moist, and may also look like a blister.
- **Stage 3**: There is full-thickness skin loss in which fat is visible in the injury. Slough and/or eschar may be present. Slough is yellow, tan, gray, green, or brown tissue that is usually moist. Eschar is dead tissue that is hard or soft in texture and black, brown, or tan, and may be similar to a scab. The damage may extend down to, but not through, the tissue that covers muscle.
- **Stage 4**: There is full-thickness skin loss extending through all layers of the skin, tissue,

muscle, bone, and other structures, such as tendons. The injury will look like a deep crater, and slough and/or eschar may be visible.

- **Unstageable Pressure Injury**: There is full-thickness skin and tissue loss, but the extent of the damage cannot be determined because it is covered with slough or eschar. Once the slough and/or eschar is removed, the injury can then be staged (either Stage 3 or Stage 4).
- **Deep Tissue Pressure Injury**: The skin area is intact or nonintact and is deep red, purple, or maroon. The wound may appear as a blood-filled blister. The area may be painful and may be warmer or cooler than the surrounding tissue. Discoloration may be different in darker skin.

Fig. 9-3. *Pressure injury stages in photos as described by the National Pressure Ulcer Advisory Panel (NPUAP).*
(a) Photo of a Stage 1 pressure injury on the buttocks.
(b) Photo of a Stage 2 pressure injury on the buttocks.
(c) Photo of a Stage 3 pressure injury on the heel.
(d) Photo of a Stage 4 pressure injury on the foot. (PHOTOS COPYRIGHT © NATIONAL PRESSURE ULCER ADVISORY PANEL, NPUAP.ORG, USED WITH PERMISSION. ALL PHOTOGRAPHS ARE REPRINTED WITH PERMISSION OF THE COPYRIGHT HOLDER, GORDIAN MEDICAL, INC. DBA AMERICAN MEDICAL TECHNOLOGIES)

Observing and Reporting: Client's Skin

Observe and report these signs and symptoms:

- O/R Pale, white, reddened, gray, or purple skin
- O/R Blisters, bruises, or wounds on the skin
- O/R Differences in temperature of the skin when compared to the area around it
- O/R Complaints of tingling, warmth, or burning of the skin
- O/R Dry, cracked, or flaking skin
- O/R Itching or scratching
- O/R Rash or any skin discoloration
- O/R Swelling
- O/R Fluid or blood draining from skin
- O/R Broken skin anywhere on the body, including between the toes or around the toenails
- O/R Changes in existing injury, including size, depth, drainage, color, or odor

More information on care guidelines to promote healthy skin may be found in Chapter 16.

Wounds

A **wound** is a type of injury to the skin. Wounds are classified as either open or closed. An *open wound* has skin that is not intact. An open wound can be categorized in the following ways: incision, laceration, abrasion, or puncture wound. An incision is caused by a sharp-edged object, such as a knife or razor. An example of this type of open wound is a cut made during surgery with a surgical instrument. A laceration is an irregular wound caused by ripping or blunt trauma, such as tearing of skin during childbirth. An abrasion is a wound in which the top layer of skin is scraped or worn off, often by coming into moving contact with a rough surface. A puncture wound is a break in the skin caused by a sharp object such as a nail or a needle.

In a *closed wound*, the skin's surface has not been broken. Closed wounds can be contusions (bruises) or hematomas. A contusion is caused by blunt force trauma that damages tissue under the skin. A hematoma is caused by damage to a blood vessel that causes blood to collect under the skin.

Wounds are examined and cleaned with various liquids, such as tap water, sterile saline, or antiseptic solution. Bleeding may need to be stopped. Dressings, bandages, sutures, staples, or special strips or glue may need to be applied. Home health aides may assist with nonsterile dressing changes. Information on nonsterile dressings is included in Chapter 14. Information about sterile dressings is located in the Appendix at the back of the book.

Dermatitis

Dermatitis is a general term that refers to an **inflammation**, or swelling, of the skin. There are different types of dermatitis, including atopic dermatitis, also known as *eczema*, and stasis dermatitis. Dermatitis usually involves swollen, reddened, irritated, and itchy skin.

Stasis dermatitis is a skin condition that commonly affects the lower legs and ankles. The condition occurs due to a buildup of fluid under the skin. This buildup causes problems with circulation, and poor circulation results in skin that is fragile and poorly nourished. Stasis dermatitis can also lead to severe skin problems, such as open ulcers and wounds.

Early signs of stasis dermatitis include a rash; a scaly, red area; or itching. Other signs are swelling of the legs, ankles, or other areas; thin, tissue-like skin; darkening skin at ankles or legs; thickening skin at ankles or legs; signs of skin irritation; and leg pain. Home health aides should report any of these signs to their supervisor.

Ways to treat stasis dermatitis include surgery for varicose veins and medications, such as diuretics, to reduce fluid in the body. The client should wear stockings and shoes that fit properly and are not too tight. Elevating the feet may be ordered, and the legs should not be crossed. HHAs may need to apply elastic (antiembolic) stockings to help promote circulation and should be gentle when handling or cleaning the skin. The client may be on a low-sodium diet, and the care plan should be followed.

Sometimes stasis dermatitis can lead to a stasis ulcer. A stasis ulcer is an open wound resulting from inadequate oxygen and other nutrients to the tissues due to edema and decreased blood circulation. HHAs should always report any changes in the skin to avoid complications.

2. Describe the musculoskeletal system and related conditions

Muscles, bones, ligaments, tendons, and cartilage (*KAR-ti-lidj*) give the body shape and structure. They work together to move the body. The skeleton, or framework, of the human body has 206 bones (Fig. 9-4). In addition to allowing the body to move, **bones** also protect organs. For example, the skull protects the brain. Two bones meet at a **joint**. Some joints make movement possible in all directions. Other joints permit movement in one direction only. Muscles are connected to bone by tendons. **Muscles** provide movement of body parts to maintain posture and to produce body heat.

Fig. 9-4. *The skeleton is composed of 206 bones that aid movement and protect organs.*

Exercise is important for improving and maintaining physical and mental health. Inactivity and immobility can result in a loss of self-esteem, depression, pneumonia, urinary tract infections, constipation, blood clots, dulling of the senses, and muscle **atrophy** (*AT-roh-fee*) or **contractures** (*kon-TRAK-churz*). When atrophy occurs, the muscle wastes away, decreases in size, and becomes weak. When a contracture develops, the muscle or tendon shortens, becomes inflexible, and "freezes" in position. This causes permanent disability of the limb.

Range of motion (ROM) exercises can help prevent these conditions. With ROM exercises, the joints are extended and flexed in the measured degrees of a circle. Exercise increases circulation of blood, oxygen, and nutrients and improves muscle tone. Chapter 16 has information on ROM exercises.

Observing and Reporting: Musculoskeletal System

Observe and report these signs and symptoms:

- O/R Changes in ability to perform routine movements and activities
- O/R Any changes in a client's ability to perform ROM exercises
- O/R Pain during movement
- O/R Any new or increased swelling of joints
- O/R White, shiny, red, or warm areas over a joint
- O/R Bruising
- O/R Aches and pains reported

Arthritis

Arthritis (*ar-THRYE-tis*) is a general term that refers to inflammation, or swelling, of the joints. It causes stiffness, pain, and decreased mobility. Arthritis may be the result of aging, injury, or an autoimmune illness. An **autoimmune illness** causes the body's immune system to attack normal tissue in the body. Two common types of arthritis are osteoarthritis and rheumatoid arthritis.

Osteoarthritis (*AH-stee-oh-ar-thrye-tis*), also called *degenerative arthritis* or *degenerative joint disease (DJD)*, is a common type of arthritis that affects the elderly. It may occur with aging or as a result of joint injury. Hips and knees, which are weight-bearing joints, are usually affected. Joints in the fingers, thumbs, and spine can also be affected. Pain and stiffness seem to increase in cold, damp weather.

Rheumatoid arthritis (*ROOM-a-toyd ar-THRYE-tis*) can affect people of any age. Joints become red, swollen, and very painful. Deformities can result and may be severe and disabling (Fig. 9-5). Movement is eventually restricted. Fever, fatigue, and weight loss are also symptoms. Rheumatoid arthritis usually affects the smaller joints first, then progresses to larger ones. Other parts of the body that may be affected are the heart, lungs, eyes, kidneys, and skin. Rheumatoid arthritis is considered an autoimmune disease.

Fig. 9-5. *Rheumatoid arthritis.*

Arthritis is generally treated with the following:

- Anti-inflammatory medications such as aspirin or ibuprofen, as well as other medication
- Local applications of heat to reduce swelling and pain
- Range of motion exercises
- Regular exercise and/or activity routine
- Diet to reduce weight or maintain strength

Guidelines: Arthritis

- Watch for stomach irritation or heartburn caused by anti-inflammatory medications. Some clients cannot take these medications. Report signs of stomach irritation or heartburn to your supervisor immediately.
- Encourage activity. Gentle activity can help reduce the effects of arthritis. Follow the care plan instructions carefully. Use canes or other walking aids as needed.
- Adapt activities of daily living to allow independence. Many assistive devices are available to allow clients to bathe, dress, and feed themselves when they have arthritis (Fig. 9-6).

Fig. 9-6. *Special equipment, such as this plate, fork, and cup, can help a person with arthritis remain independent.* (PHOTOS COURTESY OF NORTH COAST MEDICAL, INC., WWW.NCMEDICAL.COM, 800-821-9319)

- Choose clothing that is easy to put on and fasten. Suggest handrails and safety bars for the bathroom.
- Promote person-centered care by treating each client as an individual. Arthritis is very common among elderly clients. Do not assume that each client has the same symptoms and needs the same care.
- Help maintain the client's self-esteem by encouraging self-care. Maintain a positive attitude. Listen to the client's feelings. You can help him remain independent as long as possible.

Osteoporosis

Osteoporosis (*os-tee-oh-poh-ROH-sis*) is a condition in which bones lose density, which causes them to become porous and brittle. Brittle bones can break easily. Osteoporosis is caused by any one (or a combination) of the following: a lack of calcium in the diet, the loss of estrogen, a lack of regular exercise or reduced mobility, or age. Osteoporosis is more common in women, especially after **menopause** (*MEN-oh-paws*) (the end of menstruation; occurs when a woman has not had a menstrual period for 12 months). Signs and symptoms of osteoporosis include low back pain, stooped posture, becoming shorter over time, and fractures. Osteoporosis is treated with medication, exercise, and supplements.

Muscular Dystrophy (MD)

Muscular dystrophy refers to a number of progressive diseases that cause a variety of physical disabilities due to muscle weakness. MD is an inherited disease; it causes a gradual wasting away of muscle, weakness, and deformity. The muscles of the hands are impaired, and there may be twitching of the hand and arm muscles. Legs may be weak and stiff. The person may be in a wheelchair. Most forms of MD are present at birth or become apparent during childhood. Many forms of MD are very slow to progress. Often people with MD can live to middle or even late adulthood. In the early stages of this disease, home health aides should help with activities of daily living or range of motion exercises. In the more advanced stages, assistance with skin care and positioning may be necessary as well.

Amyotrophic Lateral Sclerosis (ALS)

Amyotrophic (*a-me-o-TRO-fic*) **lateral sclerosis**, or **ALS**, often called *Lou Gehrig's disease*, is a progressive disease that causes muscle atrophy (weakening or wasting away) and eventually leads to death. A person may be diagnosed with ALS at any age. The average time a person lives

with this disease is between two and five years, though some people can live longer. Physical disabilities may begin with muscle weakness in the limbs or throat. Because ALS is progressive, disabilities get worse. Eventually, people who have this disease may have to breathe and be fed with the assistance of ventilators and tubes.

Guidelines: MD or ALS

- In the early stages of these diseases, assist with ADLs or range of motion exercises.
- Observe for any swallowing problems and report them to your supervisor.
- In the more advanced stages, assist with skin care and positioning and perform ADLs for the client.

Chapter 16 contains information about fractures, which are musculoskeletal system disorders.

3. Describe the nervous system and related conditions

The nervous system is the control and message center of the body. It controls and coordinates all body functions. The nervous system also senses and interprets information from outside the human body.

The neuron, or nerve cell, is the basic unit of the nervous system. Neurons send messages or sensations from the receptors in different parts of the body, through the spinal cord, and to the brain.

The nervous system has two main parts: the **central nervous system** (**CNS**) and the **peripheral** (*per-IF-er-al*) **nervous system** (**PNS**). The central nervous system is composed of the brain and spinal cord. The peripheral nervous system deals with the periphery, or outer part, of the body via the nerves that extend throughout the body (Fig. 9-7).

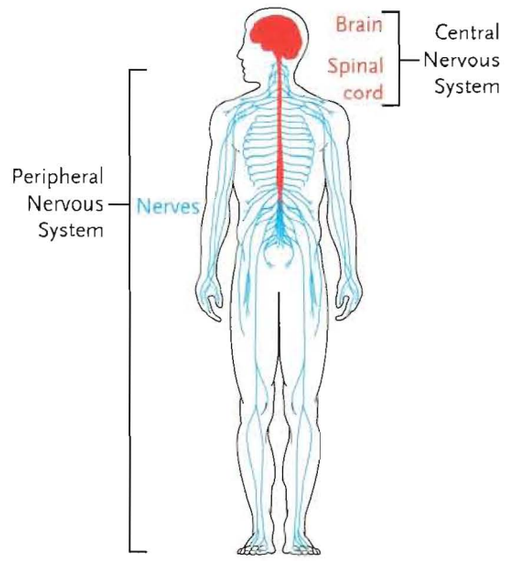

Fig. 9-7. *The nervous system includes the brain, spinal cord, and nerves throughout the body.*

Observing and Reporting: Nervous System

Observe and report these signs and symptoms:

- O/R Fatigue or pain with movement or exercise
- O/R Shaking or trembling
- O/R Inability to move one side of the body
- O/R Difficulty speaking or slurring of speech
- O/R Numbness or tingling
- O/R Disturbance or changes in vision or hearing
- O/R Dizziness or loss of balance
- O/R Changes in eating patterns and/or fluid intake
- O/R Difficulty swallowing
- O/R Bowel and bladder changes
- O/R Depression or mood changes
- O/R Memory loss or confusion
- O/R Violent behavior
- O/R Any unusual or unexplained change in behavior
- O/R Decreased ability to perform ADLs

CVA or Stroke

The medical term for a stroke is a **cerebrovascular accident** (**CVA**) (*se-ree-broh-VAS-kyoo-lar AK-si-dent*). CVA (sometimes called *brain attack*) occurs when the blood supply to a part of the brain is blocked or a blood vessel leaks or ruptures within the brain. An ischemic stroke is the most common type of stroke (Fig. 9-8). With this type of stroke, the blood supply is blocked. Without blood, part of the brain does not receive oxygen. Brain cells begin to die, and additional damage can occur due to leaking blood, clots, and swelling of the tissues. Swelling can also cause pressure on other areas of the brain.

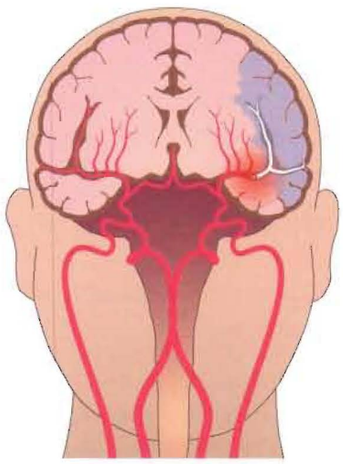

Fig. 9-8. *An ischemic stroke is caused when the blood supply to the brain is blocked.*

A quick response to a suspected stroke is critical. Tests and treatment need to be given within a short time of the stroke's onset (ideally within an hour). Early treatment may reduce the severity of the stroke.

A **transient ischemic attack** (**TIA**) (*TRAN-see-ent is-KEE-mik a-TAK*) is a warning sign of a CVA. It is the result of a temporary lack of blood supply to the brain. Symptoms may last up to 24 hours. They include difficulty speaking, weakness on one side of the body, temporary loss of vision, and numbness or tingling. These symptoms should not be ignored. An HHA should report any of these symptoms to the supervisor immediately. The following are also signs that a TIA or stroke is occurring:

- Facial numbness, weakness, or drooping, especially on one side
- Paralysis on one side of the body, called **hemiplegia** (*hem-i-PLEE-jee-a*)
- Arm numbness or weakness, especially on one side, called **hemiparesis** (*hem-i-pa-REE-sis*)
- Slurred speech or inability to speak, called **expressive aphasia** (*a-FAY-see-a*)
- Inability to understand spoken or written words, called **receptive aphasia**
- Use of inappropriate words
- Severe headache
- Blurred vision
- Ringing in the ears
- Redness in the face
- Noisy breathing
- Elevated blood pressure
- Slow pulse rate
- Nausea or vomiting
- Loss of bowel and bladder control
- Seizures
- Dizziness
- Loss of consciousness

In addition to the symptoms listed above, women may have these symptoms:

- Pain in the face, arms, and legs
- Hiccups
- Weakness
- Chest pain
- Shortness of breath
- Palpitations

F.A.S.T.

The acronym **F.A.S.T.** can be used as a way to remember the sudden signs that a stroke is occurring.

(F)ace: Is one side of the face drooping? Is it numb? Ask the person to smile. Is the smile uneven?

(A)rms: Is one arm numb or weak? Ask the person to raise both arms. Check to see if one arm drifts downward.

(S)peech: Is the person's speech slurred? Is the person unable to speak? Can the person be understood? Ask the person to repeat a simple sentence and see if the sentence is repeated correctly.

(T)ime: Time is of the utmost importance when responding to a stroke. If the person shows any of the symptoms listed above, report to the nurse immediately.

The website for the American Stroke Association (stroke.org) has more information.

Strokes occur on either the right or left side of the brain. Symptoms resulting from a stroke differ; they depend on which side of the brain is affected. Strokes that occur on the right side of the brain affect functioning on the left side of the body. Strokes that occur on the left side of the brain affect functioning on the right side of the body. The following problems can result from right-sided or left-sided damage from a stroke:

- Hemiplegia
- Hemiparesis
- One-sided neglect (tendency to ignore a weak or paralyzed side of the body)
- Loss of ability to tell where affected body parts are
- Expressive aphasia
- Receptive aphasia
- Inappropriate or unprovoked emotional responses, including laughing, crying, and anger, called **emotional lability**
- Loss of sensations, such as temperature or touch
- Loss of bowel or bladder control
- Cognitive impairments, such as poor judgment, memory loss, loss of problem-solving abilities, and confusion (an *impairment* is a partial or complete loss of function or ability)
- Difficulty swallowing, called **dysphagia**

Guidelines: CVA/Stroke

G Clients with paralysis, weakness, or loss of movement will usually receive physical or occupational therapy. Range of motion exercises will help strengthen muscles and keep joints mobile. Clients may also need to perform leg exercises to improve circulation. Safety is important when clients are exercising. Assist carefully with exercises as ordered.

G Never refer to the weaker side as the "bad side," or talk about the "bad" leg or arm. Use the term *weaker* or **involved** to refer to the side with paralysis.

G Clients with speech loss or communication problems may receive speech therapy. You may be asked to help. This includes helping clients recognize written words or spoken words. Speech-language pathologists will also evaluate a client's swallowing ability. They will decide if swallowing therapy or thickened liquids are needed.

G Experiencing confusion or memory loss is upsetting. People often cry for no apparent reason after suffering a stroke. Be patient and understanding. Your positive attitude will be important. Keeping a routine may help clients feel more secure.

G Encourage independence and self-esteem. Let the client do things for himself whenever possible, even if you could do a better or

faster job. Make tasks less difficult for the client to do. Acknowledge and praise clients' efforts to do things for themselves even when they are unsuccessful. Praise even the smallest successes to build confidence.

- Always check on the client's body alignment. Sometimes an arm or leg can be caught on something and the client is unaware.
- Pay special attention to skin care and observe for changes in the skin if a client is unable to move.
- If clients have a loss of touch or sensation, check for potentially harmful situations (for example, heat and sharp objects). If clients are unable to sense or move part of the body, check and change positioning often to prevent pressure injuries.
- Adapt procedures when caring for clients with one-sided paralysis or weakness. Carefully assist with shaving, grooming, and bathing.
- When assisting with transfers or walking, always use a transfer belt for safety. Stand on the weaker side. Support the weaker side. Lead with the stronger side (Fig. 9-9).

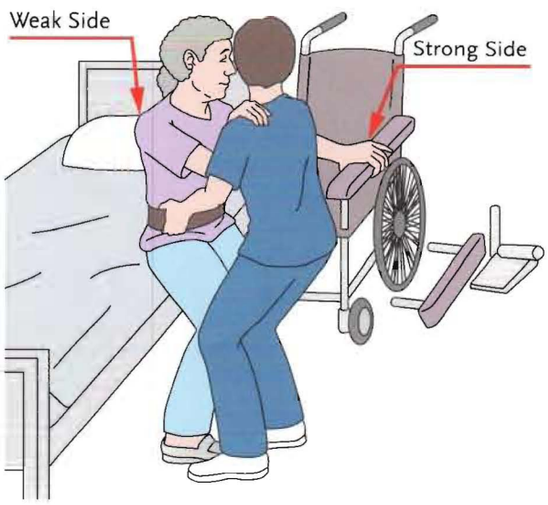

Fig. 9-9. *When helping a client transfer, support the weaker side while leading with the stronger side.*

When assisting with dressing, remember to

- Dress the weaker side first. Place the weaker arm or leg into the clothing first. This prevents unnecessary bending and stretching of the limb. Undress the stronger side first, then remove the weaker arm or leg from clothing to prevent the limb from being stretched and twisted.
- Use assistive equipment to help the client dress himself (see Chapters 13 and 16). Encourage self-care.

When assisting with eating, remember to

- Place food in the client's field of vision (Fig. 9-10). A nurse or doctor will determine a client's field of vision.

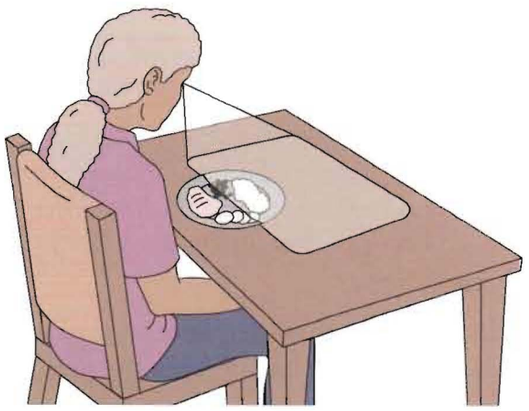

Fig. 9-10. *A client who has had a stroke may have a limited field of vision. Make sure the client can see what you place in front of her.*

- Use assistive devices such as silverware with built-up handle grips, plate guards, and drinking cups. (See Chapter 16.)
- Watch for signs of choking. Report any difficulty with swallowing. Soft foods may be ordered in the care plan if swallowing is difficult. Straws should not be used for someone with a swallowing problem.
- Always place food in the unaffected, or stronger, side of the mouth. Make sure food is swallowed before offering more bites.

When assisting with communication, remember to

- Keep questions and directions simple.
- Phrase questions so they can be answered with a "yes" or "no." For example, when helping a client with eating, ask, "Would you like to start with a drink of milk?"
- Agree on signals, such as shaking or nodding the head, or raising a hand or finger to indicate "yes" or "no."
- Give clients time to respond, and listen attentively.
- Use a pencil and paper if a client is able to write. A thick handle or tape wrapped around the pencil may help the client hold it more easily.
- Use verbal and nonverbal communication to express your positive attitude. Let the client know you have confidence in her abilities through smiles, touches, and gestures. Gestures and pointing can also help give information or allow the client to communicate with you.
- Use communication boards or special cards to make communication easier (Fig. 9-11).
- Keep a bell or other call signal within reach of clients. Clients can let you know when you are needed.
- Never talk about a client as if she were not there. Speak to all clients with respect.

When assisting with positioning, remember to

- Encourage the client to use and exercise her weaker side. Instruct her to use the strong arm or leg to assist with the range of motion exercises on the weak side. Rolling over onto the strong side first is recommended for changing positions. Remind recovering clients to place the strong foot under the involved ankle when crossing the legs in preparation for rolling over or moving the leg.

Fig. 9-11. *A sample communication board.*

- If the client is in a sitting position, place the elbow on an armrest to support the involved shoulder (Fig. 9-12).

Fig. 9-12. *Keep the involved shoulder supported while the client is sitting.*

- Ninety-degree flexion is a good position for the weak hip and knee. It is important to remember to position the involved side correctly. Often a person who has had a stroke cannot feel that one side of the body is weaker than the other.

Home health aides often help in the rehabilitation of a client who has suffered a stroke. People who have had a stroke may take a long time to recover. Therefore, it is important for HHAs to work with them in stages or steps that allow them to master simple goals first. An example is strengthening a weak arm. Doing this will help them gain confidence in their difficult fight to regain strength and ability.

Monitoring the home safety of clients who have had a stroke is essential. Clients who are unsteady, weak, or confused are at risk of falling. Clients with loss of sensation are at risk of burning themselves in the bathroom or at the stove. Here are some safety tips for the HHA to remember:

- Report any safety hazards, such as unnecessary clutter or throw rugs, to the supervisor.
- Unplug appliances such as toasters and coffee makers when not in use.
- Check the refrigerator and cabinets for spoiled food. A stroke may impair a person's sense of smell and taste.

Parkinson's Disease

Parkinson's disease is a progressive, incurable disease that causes a section of the brain to degenerate. Progressive means that the disease gets worse with time. Neurons in the brain that produce the substance called dopamine, a neurotransmitter, begin to break down and die. Parkinson's disease affects the muscles, causing them to become stiff, and movement may slow. In addition, it causes stooped posture and a shuffling gait, or walk. It can also cause pill-rolling. Pill-rolling is a circular movement of the tips of the thumb and the index finger when brought together, which looks like rolling a pill. Tremors or shaking make it very difficult for a person to perform ADLs such as eating and bathing. A person with Parkinson's may have a mask-like facial expression. Other symptoms are slurred speech and a monotone, softer voice. Medications are commonly used to treat this disease. Surgery may be an option for some people.

Guidelines: Parkinson's Disease

- Clients are at a high risk for falls. Visual and spatial impairments may occur, causing problems with bumping into doorways and navigating areas. Protect clients from any unsafe areas and conditions. Assist with ambulation as necessary.
- Help with ADLs as needed.
- Assist with range of motion exercises to prevent contractures and to help strengthen muscles.
- Observe for any swallowing problems and report them to your supervisor.
- Parkinson's disease may impair a person's sense of smell. Check for spoiled food.

- Encourage self-care. Be patient with self-care and communication.
- Depression and anxiety may accompany Parkinson's disease. Listen to clients when they want to talk. Offer relaxation techniques such as massage and listening to music. Report signs of depression to the supervisor. Chapter 18 has more information about depression and anxiety.

Multiple Sclerosis (MS)

Multiple sclerosis (**MS**) is a progressive disease that affects the central nervous system. When a person has MS, the **myelin** (*MYE-e-lin*) **sheath** that covers the nerves, spinal cord, and white matter of the brain breaks down over time. Without this covering, or sheath, nerves cannot send messages to and from the brain in a normal way.

MS progresses slowly and unpredictably. Clients who have this disease will have widely varying abilities. Symptoms will vary as well and may include blurred vision, tremors, poor balance, and difficulty walking. Weakness, numbness, tingling, incontinence, and behavior changes are also symptoms. MS can eventually cause blindness, contractures, and loss of function in the arms and legs (Fig. 9-13).

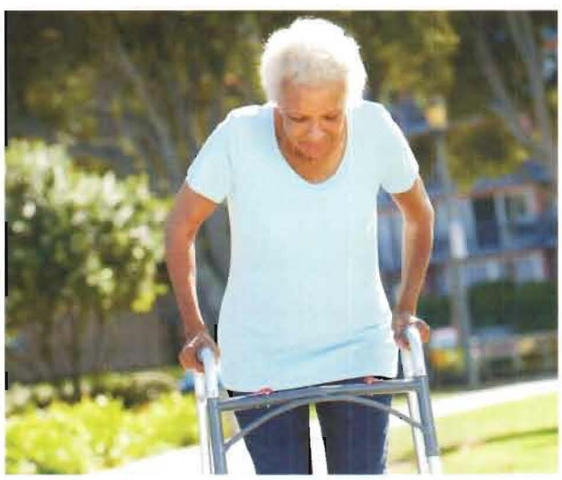

Fig. 9-13. *Multiple sclerosis is an unpredictable disease that causes varying symptoms and abilities. MS can cause a range of problems, including fatigue, poor balance, and trouble walking.*

Multiple sclerosis is often diagnosed in early adulthood. The exact cause is not known but it may be an autoimmune disease. There is no cure for this disease; it is mostly treated with medication. Some people who have MS use complementary treatments. Chapter 15 contains more information about complementary health practices.

Guidelines: Multiple Sclerosis

- Assist with ADLs as needed. Be patient with self-care and movement. Allow enough time for tasks. Offer rest periods as necessary.
- Give the client plenty of time to communicate. People with MS may have trouble forming their thoughts. Be patient. Do not rush them.
- Prevent falls, which may be due to a lack of coordination, fatigue, and vision problems.
- Stress can worsen the effects of MS. Be calm and listen to clients when they want to talk.
- Symptoms of MS can sometimes change daily; offer support and encouragement, and adapt care to the symptoms reported.
- Encourage a healthy diet with plenty of fluids.
- Give regular skin care to prevent pressure injuries.
- Assist with range of motion exercises to prevent contractures and to strengthen muscles.
- Assist with housekeeping duties as needed.

Head and Spinal Cord Injuries

Diving, sports injuries, falls, car and motorcycle accidents, industrial accidents, war, and criminal violence are common causes of head and spinal cord injuries. Problems from these injuries range from mild confusion or memory loss to coma, paralysis, and death.

There are different types of head injuries, including a bruise (contusion), bleeding in the

brain that collects and forms a clot (hematoma), a skull fracture, scalp wound, or concussion (a banging movement of the brain against the skull). The effects a person experiences from a head injury vary, depending on what caused the injury and how severe it is. Clients who have had a head injury may have the following problems: permanent brain damage, intellectual disabilities, personality changes, breathing problems, seizures, coma, memory loss, loss of consciousness, **paresis** (*pa-REE-sis*), and **paralysis** (*pa-RAL-a-sis*). Paresis is paralysis, or loss of muscle function, that affects only part of the body. Often, paresis refers to a weakness or loss of ability on one side of the body.

The effects of spinal cord injuries depend on the force of impact and the location of the injury. The higher the injury on the spinal cord, the greater the loss of function. People with head and spinal cord injuries may have **paraplegia**, or loss of function of the lower body and legs. These injuries may also cause **quadriplegia**, which is loss of function in the legs, trunk, and arms (Fig. 9-14).

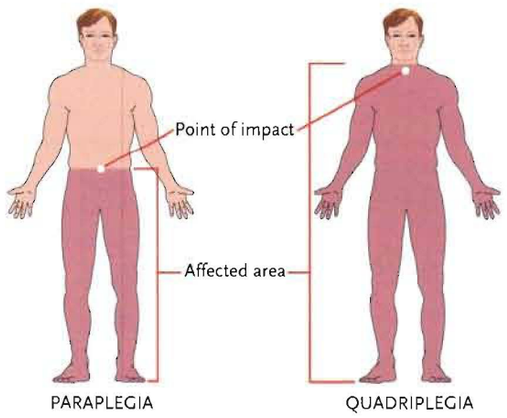

Fig. 9-14. *Loss of function depends on where the spine is injured.*

Rehabilitation is necessary for clients with spinal cord injuries. It will help them to maintain the muscle function that remains and to live as independently as possible. Clients will need emotional support as they adjust to their disability. Their specific needs will vary.

Guidelines: Head or Spinal Cord Injury

- Give emotional support, as well as physical assistance. Frustration and anger may surface as they attempt to deal with the reality of their lives. Try not to take it personally.
- Safety is very important. Be very careful that clients do not fall or burn themselves. Because clients who are paralyzed have no sensation, they are unable to feel a burn.
- Be patient with self-care. Allow as much independence as possible with ADLs.
- Give careful skin care. It is essential to prevent pressure injuries when mobility is limited.
- Assist clients to change positions at least every two hours to prevent pressure injuries. Be gentle when repositioning.
- Perform range of motion exercises exactly as ordered to prevent contractures and strengthen muscles.
- Immobility leads to constipation. Encourage plenty of fluids and a high-fiber diet if ordered in the care plan.
- Loss of ability to empty the bladder may lead to the need for a urinary catheter. Urinary tract infections are common. Encourage high intake of fluids. Give extra catheter care as needed.
- Lack of activity leads to poor circulation and fatigue. Offer rest periods as needed. Special stockings (elastic/antiembolic) to help increase circulation may be ordered.
- Difficulty coughing and shallow breathing can lead to pneumonia. Encourage deep breathing exercises as ordered.
- Male clients may have involuntary erections. Provide for privacy and be sensitive if this happens. Behaving professionally helps put clients at ease.
- Assist with bowel and bladder training as directed.

Amputation

Amputation is the surgical removal of some or all of a body part, usually an arm, hand, leg, or foot. Amputation may be the result of an injury or disease. After amputation, some people feel that the amputated limb is still there, or they feel pain in the part that has been amputated. **Phantom sensation** is the term used when a person feels that the body part is still there. The person may experience warmth, tingling, or itching in the area where the limb existed. **Phantom limb pain** occurs when the person feels pain in a limb (or extremity) that has been amputated. It may persist for a short time or for several years. The pain or sensation, which has various possible causes, including remaining damaged nerve endings, is real. It should not be ignored. Medication or physical therapy may be used to treat these conditions.

Guidelines: Amputation

- Clients who have had a body part amputated must make many physical, psychological, social, and occupational adjustments. Be supportive during the continuing process of adjustment. When a body part has been amputated, day-to-day activities may be limited. A client will need special care to help him adjust to these changes. When the condition is new, a physical and/or occupational therapist may work with the client.
- Assist clients in performing their ADLs.
- Assist with regular changes of position to prevent pressure injuries.
- Perform range of motion exercises as instructed. These exercises will help prevent contractures and other complications.
- Phantom limb pain is real pain and should be treated that way. Report complaints of pain to your supervisor.
- Follow the care plan for care of the prosthesis and the stump. See Chapter 13 for more information on prosthetics and related care.

The Nervous System: Sense Organs

The eyes, ears, nose, tongue, and skin are the body's major sense organs (Figs. 9-15 and 9-16). They are considered part of the nervous system because they contain receptors that receive impulses from the environment. They relay these impulses to the nerves.

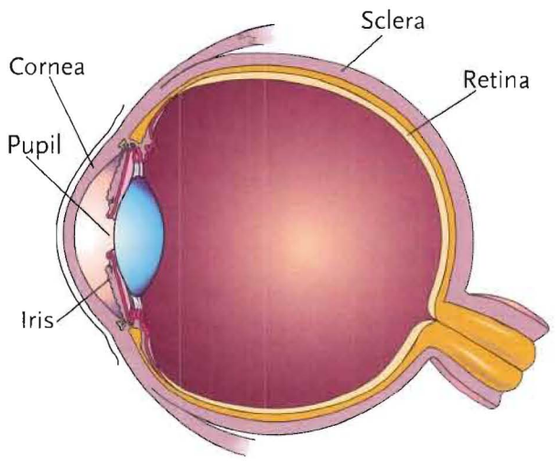

Fig. 9-15. The parts of the eye.

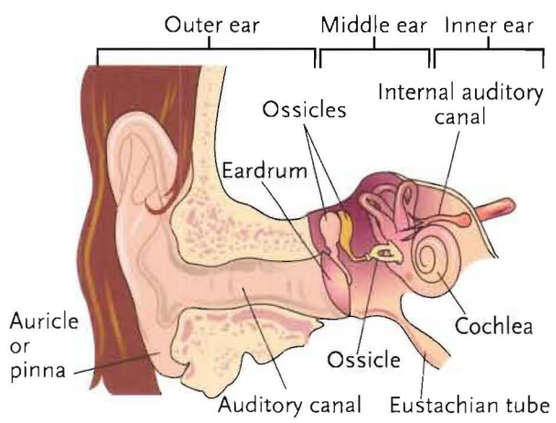

Fig. 9-16. The outer ear, middle ear, and inner ear are the three main divisions of the ear.

Observing and Reporting: Eyes and Ears

Observe and report these signs and symptoms:

- O/R Changes in vision or hearing
- O/R Signs of infection
- O/R Dizziness
- O/R Complaints of pain in the eyes or ears

Hearing Impairment

There are many different kinds of hearing loss. A person may be born with a hearing impairment or it may happen gradually. **Deafness** is partial or complete loss of hearing. It can occur as the result of heredity, disease, or injury. Some disorders affect a person's ability to hear. **Otitis media** (*oh-TYE-tis MEE-dee-a*) is an infection of the middle ear that can be caused by a variety of microorganisms. Bacteria grow inside the middle ear, which causes symptoms such as pain, pressure, fever, and a reduced ability to hear. Otitis media is treated with antibiotics.

In the elderly, aging commonly causes loss of hearing, as well as impaired vision, smell, and taste. If a person has a gradual hearing loss, he may not be conscious of it. Signs of hearing loss include the following:

- Speaking loudly
- Leaning forward when someone is speaking
- Cupping the ear to hear better
- Responding inappropriately
- Asking the speaker to repeat what has been said
- Speaking in a monotone
- Avoiding social gatherings or acting irritable in the presence of people who are having a conversation
- Suspecting others of talking about them or of deliberately speaking softly

People who have a hearing impairment may use a hearing aid, read lips, or use sign language. People with impaired hearing also closely observe the facial expressions and body language of others to add to their knowledge of what is being said.

Guidelines: Hearing Impairment

- G If the person has a hearing aid, make sure he is wearing it and that it is turned on. Chapter 13 contains more information about hearing aids.
- G Reduce or eliminate any background noise, such as televisions, radios, and loud speech. Close doors if needed.
- G Get the client's attention before speaking. Do not startle clients by approaching from behind. Walk in front of them or touch them lightly on the arm to let them know you are near.
- G Speak clearly, slowly, and in good lighting. Directly face the person (Fig. 9-17). The light should be on your face, not on the client's. Ask if he can hear what you are saying.

Fig. 9-17. *Speak face-to-face in good light.*

- G Do not shout or mouth the words in an exaggerated way.
- G Keep the pitch of your voice low.
- G Clients may read lips, so do not chew gum or eat while speaking. Keep your hands away from your face while talking.

- If the client hears better out of one ear, try to speak and stand on that side.
- Use short sentences and simple words. Avoid sudden topic changes.
- Repeat what you have said using different words when needed. Some people who are hearing impaired may want you to repeat exactly what was said because they missed only a few words.
- Use picture cards or a notepad as needed.
- Clients who are hearing impaired may hear less when they are tired or ill. This is true of everyone. Be patient and empathetic. Avoid long, tiring conversations.
- Some clients who are hearing impaired have speech problems and may be difficult to understand. Do not pretend you understand if you do not. Ask the client to repeat what was said. Observe the lips, facial expressions, and body language. Then tell the client what you think you heard. You can also request that the client write down words.
- Hearing decline can be a normal aspect of aging. Be understanding and supportive.

Vision Impairment

Vision impairment can affect people of all ages. It can exist at birth or develop gradually. It can occur in one eye or in both. It can also be the result of injury, illness, or aging.

Some vision impairment causes people to wear corrective lenses, such as contact lenses or eyeglasses. **Farsightedness** (hyperopia) is the ability to see objects in the distance better than objects nearby. It develops in most people as they age. **Nearsightedness** (myopia) is the ability to see things near but not far. It may occur in younger persons. Some people need to wear eyeglasses all the time. Others only need them to read or for activities that require seeing distant objects, such as driving. Surgery can also be performed to correct these eye problems.

People over the age of 40 are at risk for developing certain serious vision problems. These include cataracts, glaucoma, and blindness. When a **cataract** (*KAT-a-rakt*) develops, the lens of the eye, which is normally clear, becomes cloudy. This prevents light from entering the eye. Vision blurs and dims initially. Vision is eventually lost entirely. This disease process can occur in one or both eyes. It is corrected with surgery, in which a permanent lens implant is usually performed.

Glaucoma (*glaw-KOH-ma*) is a disease that is the leading cause of blindness in the United States. With glaucoma, the pressure in the eye (intraocular pressure) increases. This eventually damages the retina and the optic nerve. It causes loss of vision and blindness. Glaucoma can occur suddenly, causing severe pain, nausea, and vomiting. It can also occur gradually, with symptoms that include blurred vision, tunnel vision, and blue-green halos around lights. Glaucoma is treated with eye drops and other medications and sometimes surgery.

Guidelines: Vision Impairment

- Encourage the use of eyeglasses or contact lenses (contacts) if worn.
- If the client has eyeglasses, make sure they are clean. Clean glass lenses with water and soft tissue. Clean plastic lenses with cleaning fluid and/or a lens cloth. Eyeglasses should fit correctly and be in good condition (Fig. 9-18). Report to your supervisor if they are not in good condition or do not fit properly.

Fig. 9-18. *Eyeglasses must fit well, be clean, and be in good condition.*

- Contact lenses are made of many types of plastic. Some can be worn and disposed of daily; others are worn for longer periods. If the client is able, it is best to leave contact lens care to him.
- Identify yourself immediately when you enter the room. Do not touch the client until you have said your name. Let the client know when you are leaving the room.
- Provide adequate lighting at all times. Face the client when speaking.
- When you enter a new room with the client, orient him to where things are. Describe the things you see around you. Try not to use words such as "see," "look," or "watch."
- Always tell the client what you are doing while caring for him. Give specific directions, such as "on your right" or "in front of you."
- Use the face of an imaginary clock as a guide to explain the position of objects that are in front of the client (Fig. 9-19). For example, "There is a sofa at 7 o'clock."

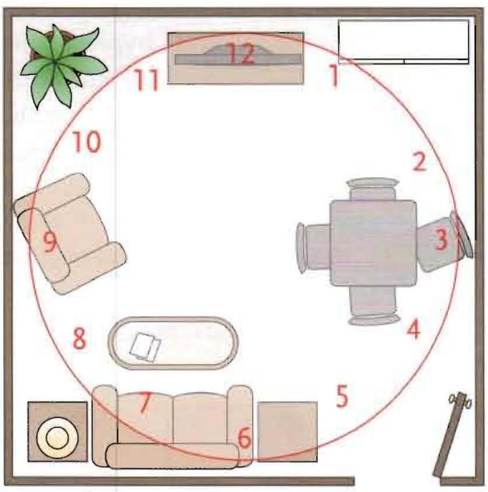

Fig. 9-19. *Use the face of an imaginary clock to explain the position of objects.*

- Do not move personal items, furniture, or other objects. Put everything back where you found it.
- Leave doors completely open or completely closed, never partly open.
- If the client needs guidance in getting around, walk slightly ahead. Let the client touch or grasp your arm lightly. This allows you to guide the person and warn him of steps, curbs, etc. Walk at the client's pace, not yours.
- Give assistance with cutting food and opening containers as needed.
- Use large clocks, clocks that chime, and radios to help keep track of time.
- Large-print books, audiobooks, digital books, and Braille books are available. Learning to read Braille, however, takes a long time and requires training.
- If the client has a guide dog, do not play with, distract, or feed it.
- Encourage the use of other senses, such as hearing, touch, and smell. Encourage the client to feel and touch things, such as furniture, clothing, or items in the room.

4. Describe the circulatory system and related conditions

The circulatory system is made up of the heart, blood vessels, and blood. The heart is the pump of the circulatory system. The heart pumps blood through the blood vessels to the cells.

The interior of the heart is divided into four chambers (Fig. 9-20). The two upper chambers are called the left atrium and right atrium. They receive blood. The two lower chambers, or **ventricles** (*VEN-tri-kuls*), pump blood. The blood carries food, oxygen, and other substances that cells need to function properly (Fig. 9-21).

The heart functions in two phases: the contracting phase, or **systole** (*SIS-toh-lee*), when the ventricles pump blood through the blood vessels,

and the resting phase, or **diastole** (*dye-AS-toh-lee*), when the chambers fill with blood. When a person's blood pressure is taken, the numbers measure these two phases (Chapter 14).

The circulatory system supplies food, oxygen, and hormones to cells. It supplies the body with infection-fighting blood cells and removes waste products from cells. The circulatory system also helps control body temperature.

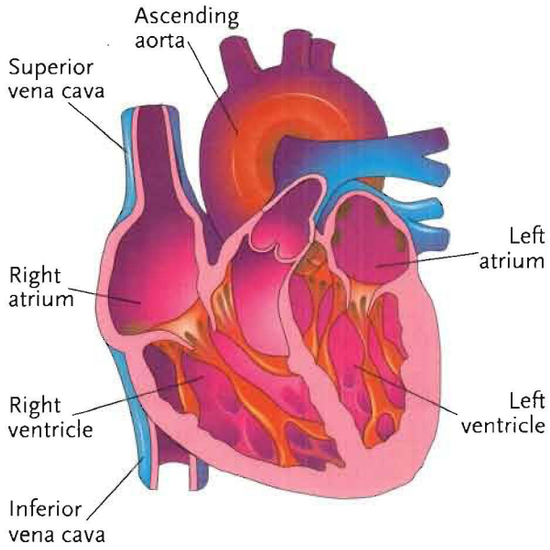

Fig. 9-20. *The four chambers of the heart connect to the body's largest blood vessels.*

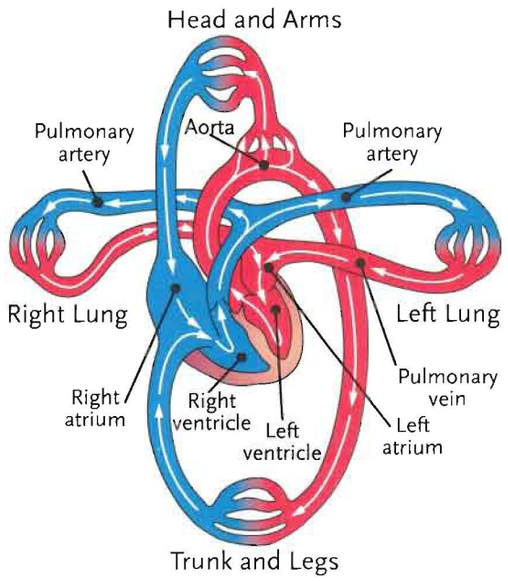

Fig. 9-21. *The flow of blood.*

Observing and Reporting: Circulatory System

Observe and report these signs and symptoms:

- O/R Changes in pulse rate
- O/R Weakness, fatigue
- O/R Loss of ability to perform ADLs
- O/R Swelling of ankles, feet, fingers, or hands (edema)
- O/R Pale or bluish hands, feet, or lips
- O/R Chest pain
- O/R Weight gain
- O/R Shortness of breath, changes in breathing patterns, inability to catch breath
- O/R Severe headache
- O/R Inactivity (which can lead to circulatory problems)

Hypertension (HTN) or High Blood Pressure

When systolic blood pressure consistently measures 130 mm Hg or higher or diastolic pressure regularly measures 80 mm Hg or higher, a person is diagnosed as having **hypertension** (**HTN**) (*high-per-TEN-shun*), or high blood pressure. (Systolic and diastolic readings do not both need to be high for a reading to be considered high.) The major cause of hypertension is **atherosclerosis** (*ath-er-oh-skle-ROH-sis*), or a hardening and narrowing of the blood vessels (Fig. 9-22). It can also result from kidney disease, tumors of the adrenal glands, pregnancy, and certain medications.

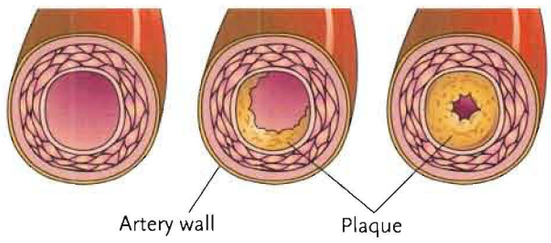

Fig. 9-22. *Arteries may harden or narrow because of a buildup of plaque. Hardened arteries cause high blood pressure.*

Hypertension can develop at any age. Signs and symptoms of hypertension are not always obvious, especially in the early stages. Often it is only discovered when a blood pressure measurement is taken by a healthcare provider. People with the disease may complain of headache, blurred vision, and dizziness.

Guidelines: Hypertension

- Because it can lead to serious conditions such as CVA, heart attack, kidney disease, or blindness, treatment to control high blood pressure is essential. Clients may take medication that lowers blood pressure. They may take **diuretics** (*dye-you-RET-iks*). Diuretics are medications that reduce fluid in the body. Offer trips to the bathroom or a bedpan often. Respond to requests for assistance promptly.
- Clients may have prescribed exercise programs and special diets, such as low-fat or low-sodium diets. Reducing the amount of sodium in the diet can help reduce extra fluid in the body. You will probably be required to measure blood pressure frequently. You can also help by encouraging clients to follow their diet and exercise programs.

Coronary Artery Disease (CAD)

Coronary artery disease occurs when the blood vessels in the coronary arteries narrow. This reduces the supply of blood to the heart muscle and deprives it of oxygen and nutrients. Over time, as fatty deposits block the arteries, the muscles that are supplied by the blood vessels die. CAD can lead to heart attack or stroke.

The heart muscle that is not getting enough oxygen causes chest pain, pressure, or discomfort, called **angina pectoris** (*an-JYE-na PEK-tor-is*). The heart needs more oxygen during exercise, stress, and excitement, as well as to digest a heavy meal. In CAD, narrow blood vessels prevent the extra blood with oxygen from getting to the heart (Fig. 9-23).

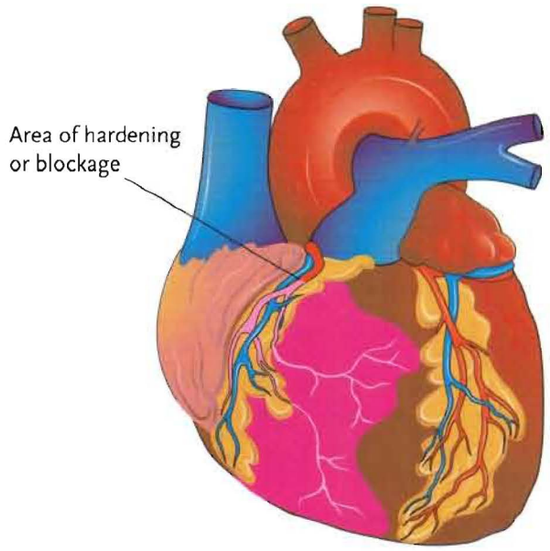

Fig. 9-23. *Angina pectoris is chest pain or pressure that results from the heart not getting enough oxygen.*

The pain of angina pectoris is usually described as pressure or tightness in the left side or the center of the chest, behind the sternum or breastbone. Some people have pain moving down the inside of the left arm or to the neck and left side of the jaw. A person suffering from angina pectoris may sweat or appear pale. The person may feel dizzy and have difficulty breathing.

Guidelines: Angina Pectoris

- Encourage clients to rest. Rest is extremely important. Rest reduces the heart's need for extra oxygen. It helps the blood flow return to normal, often within 3 to 15 minutes.
- Medication is also necessary to relax the walls of the coronary arteries. This allows them to open and get more blood to the heart. This medication, **nitroglycerin** (*nite-roh-GLIS-er-in*), is a small tablet that the client places under the tongue. There it dissolves and is rapidly absorbed. Clients who have angina pectoris may keep nitroglycerin

on hand to use as symptoms arise. Home health aides are not allowed to give medication. However, they may be allowed to assist clients with self-administration of medication. Chapter 15 has more information. Call your supervisor if a client needs help taking the medication. Nitroglycerin is also available as a patch. Do not remove the patch. Inform your supervisor immediately if the patch comes off. Nitroglycerin may also come in the form of a spray that the client sprays onto or under the tongue.

- G Clients may also be required to avoid heavy meals, overeating, intense exercise, and exposure to cold or hot and humid weather.

Myocardial Infarction (MI) or Heart Attack

When all or part of the blood flow to the heart muscle is blocked, oxygen and nutrients fail to reach the cells in that area (Fig. 9-24). Waste products are not removed and the muscle cells die. This is called a **myocardial infarction** (**MI**), or a heart attack. The area of dead tissue may be large or small, depending on the artery involved.

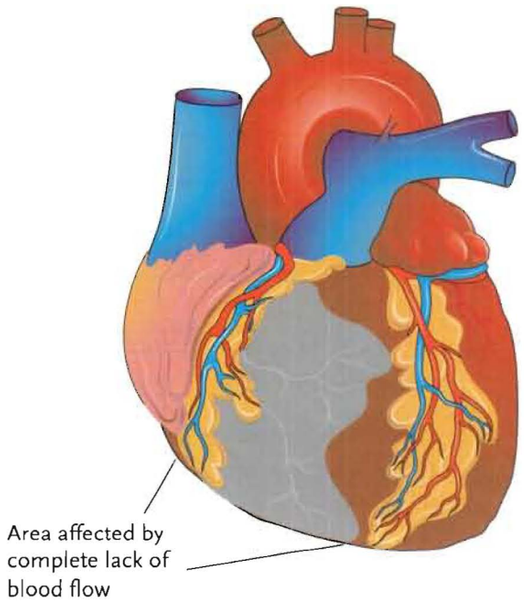

Fig. 9-24. *A heart attack occurs when all or part of the blood flow to the heart is blocked.*

Someone having a myocardial infarction must receive emergency treatment from medical personnel. This helps minimize damage and may prevent further illness or death. Chapter 7 contains information about warning signs of an MI.

Guidelines: Myocardial Infarction

- G After a myocardial infarction, cardiac rehabilitation is usually ordered. This ongoing program is comprehensive and consists of a variety of components, including the following:
  - A low-fat, low-sodium diet
  - A regular exercise program
  - Medications to regulate the heart rate and blood pressure, to lower cholesterol, and to lower triglycerides
  - Regular blood testing
  - Stopping smoking
  - Avoiding cold temperatures
  - A stress management program
  - Mental health care to help deal with depression and anxiety
- G Encourage clients to follow their special diets and to follow their exercise programs.
- G Be encouraging if clients have quit or are trying to quit smoking.
- G Reduce stress as much as possible. Listen when clients want to talk, and report signs of and complaints of stress to your supervisor.

Congestive Heart Failure (CHF)

Coronary artery disease, myocardial infarction, hypertension, and other disorders may all damage the heart. When the heart muscle has been severely damaged, the heart fails to pump effectively. When the left side of the heart is affected, blood backs up into the lungs. When the right side of the heart is affected, blood backs up into

the legs, feet, or abdomen. When one or both sides of the heart stop pumping blood effectively, it is called **congestive heart failure** (**CHF**).

Signs and symptoms of congestive heart failure include the following:

- Fatigue
- Rapid or irregular heartbeat
- Shortness of breath
- Dizziness
- Weakness
- Swelling of the feet and ankles (edema)
- Increased urination at night
- Weight gain

Guidelines: Congestive Heart Failure

- Although congestive heart failure is a serious illness, it can be treated and controlled. Medications can strengthen the heart muscle and improve its pumping.
- Assist the client as needed with getting to the toilet or commode. Because medications help eliminate excess fluids, the client will need more frequent trips to the bathroom. Keep a bedside commode nearby if the client is weak and has difficulty getting out of bed and walking to the bathroom.
- Encourage clients to follow special diet orders. A low-sodium diet and fluid restrictions may be recommended.
- A weakened heart pump may make it difficult for clients to walk, carry groceries, or climb stairs. Limited activity or bed rest may be prescribed. Allow for a period of rest after an activity.
- Measure intake of fluids and output of urine as directed (Chapter 14).
- Weigh clients as instructed. Clients may need to weigh daily at the same time to note weight gain from fluid retention.
- Apply elastic leg stockings as directed to reduce swelling in the feet and ankles.
- Assist with range of motion exercises as ordered. These exercises improve muscle tone when activity and exercise are limited (Fig. 9-25).

Fig. 9-25. *Range of motion exercises improve muscle tone.*

- Extra pillows may help clients who have trouble breathing. Keeping the head of the bed elevated may also help with breathing.
- Assist with personal care and ADLs as needed.
- A common side effect of medications for CHF is dizziness, which may result from a lack of potassium, although not all medications for CHF deplete potassium. High-potassium foods and drinks such as winter squash, baked sweet or regular potatoes, beans, raisins, apricots, prunes, bananas, prune juice, and orange juice can help. The care plan should mention the possible side effects of medication and signs or symptoms to report to your supervisor.

Peripheral Vascular Disease (PVD)

Peripheral vascular disease (**PVD**) is a disease in which the legs, feet, arms, or hands do not have enough blood circulation. This is due to fatty deposits in the blood vessels that harden over time. The legs, feet, arms, and hands feel cool or cold. Nail beds and/or feet become ashen

or blue. Swelling occurs in the hands and feet. Ulcers of the legs and feet may develop and can become infected. Pain may be very severe when walking, but it is usually relieved with rest. Risk factors for PVD include smoking, diabetes, high cholesterol, hypertension, inactivity, and obesity. Treatment includes quitting smoking, medications, exercise, and surgery.

5. Describe the respiratory system and related conditions

Respiration (*res-pir-AY-shun*), the body taking in oxygen and removing carbon dioxide, involves breathing in, **inspiration** (*in-spir-AY-shun*), and breathing out, **expiration** (*ex-pir-AY-shun*). The lungs accomplish this process (Fig. 9-26). The functions of the respiratory system are to bring oxygen into the body and to eliminate carbon dioxide produced as the body uses oxygen.

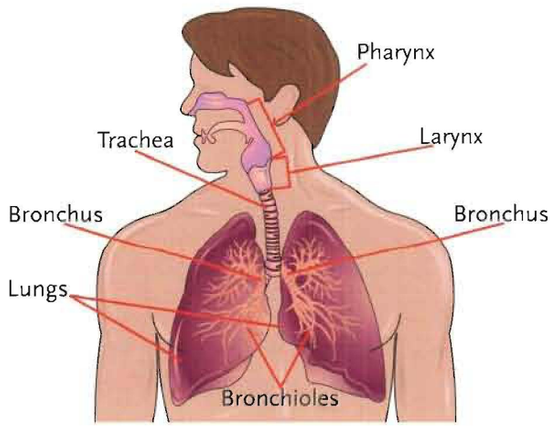

Fig. 9-26. *The respiratory process begins with inspiration through the nose or mouth. The air travels through the trachea and into the lungs via the bronchi, which then branch into bronchioles.*

Observing and Reporting: Respiratory System

Observe and report these signs and symptoms:

- O/R Change in respiratory rate
- O/R Shallow breathing or breathing through pursed lips
- O/R Coughing or wheezing
- O/R Nasal congestion or discharge
- O/R Sore throat, difficulty swallowing, or swollen tonsils
- O/R The need to sit after mild exertion
- O/R Pale, bluish, or gray color of the lips, arms, and/or legs
- O/R Pain in the chest area
- O/R Discolored **sputum**, mucus a person coughs up from the lungs (green, yellow, blood-tinged, or gray)

Chronic Obstructive Pulmonary Disease

Chronic obstructive pulmonary disease (**COPD**) is a chronic, progressive disease. This means a person may live for years with it but never be cured. COPD causes difficulty with breathing, especially with getting air out of the lungs. There are two chronic lung diseases that are grouped under COPD: chronic bronchitis and emphysema.

Bronchitis is an irritation and inflammation of the lining of the bronchi. Chronic bronchitis is a form of bronchitis that is usually caused by cigarette smoking. Symptoms include coughing that brings up sputum (phlegm) and mucus. Breathlessness and wheezing may be present. Treatment includes stopping smoking and possibly medications.

Emphysema is a chronic disease of the lungs that usually results from cigarette smoking. People with emphysema have trouble breathing. Other symptoms are coughing, breathlessness, and a rapid heartbeat. There is no cure for emphysema. Treatment includes managing symptoms and pain. Oxygen therapy, as well as medications, may be ordered. Quitting smoking is very important.

Over time, a person with either of these lung disorders becomes chronically ill and weakened. There is a high risk of acute lung infections, such as pneumonia. **Pneumonia** can be caused by a bacterial, viral, or fungal infection.

Acute inflammation occurs in lung tissue. The affected person develops a high fever, chills, cough, greenish or yellow sputum, chest pains, and rapid pulse. Treatment includes antibiotics, along with plenty of fluids. Recovery may take longer for older adults and persons with chronic illnesses.

When the lungs and brain do not get enough oxygen, all body systems are affected. Clients may have a constant fear of not being able to breathe. This can cause them to sit upright in an attempt to improve their ability to expand the lungs. These clients can have poor appetites. They usually do not get enough sleep. All of this can add to their feelings of weakness and poor health. They may feel they have lost control of their bodies, and particularly their breathing. They may fear suffocation.

Clients with COPD may experience the following symptoms:

- Chronic cough or wheeze
- Difficulty breathing, especially when inhaling and exhaling deeply
- Shortness of breath, especially during physical effort
- Pale, blue, or reddish-purple skin
- Confusion
- General state of weakness
- Difficulty completing meals due to shortness of breath
- Fear and anxiety

Guidelines: COPD

- G Colds or viruses can make COPD worse. Always observe and report signs and symptoms of colds or illness.
- G Help clients sit upright or lean forward. Offer pillows for support (Fig. 9-27).
- G Offer plenty of fluids and small, frequent meals.

Fig. 9-27. *It helps clients with COPD to sit upright and lean forward slightly.*

- G Encourage a well-balanced diet.
- G Keep oxygen supply available as ordered.
- G Medications that relax the air passages may be prescribed. These may be taken orally or inhaled directly into the lungs using sprays or inhalers. You may be assigned to observe the client taking his medication. More information about medication may be found in Chapter 15.
- G Being unable to breathe or fearing suffocation can be very frightening. Be calm and supportive.
- G Use proper infection prevention practices. Wash your hands often and encourage the client to do the same. Dispose of used tissues promptly.
- G Encourage as much client independence with ADLs as possible.
- G Remind clients to avoid situations where they may be exposed to infections, especially colds and the flu.
- G Encourage pursed-lip breathing. Pursed-lip breathing involves inhaling slowly through the nose and exhaling slowly through pursed lips (as if about to whistle).
- G Encourage clients to save energy for important tasks. Encourage clients to rest.

Report any of the following to your supervisor:

- Temperature over 101°F
- Changes in breathing patterns, including shortness of breath

- Changes in color or consistency of lung secretions
- Changes in mental state or personality
- Refusal to take medications as ordered
- Excessive weight loss
- Increasing dependence upon caregivers and family

Asthma

Asthma is a chronic, episodic disorder. It occurs when the respiratory system is hyperreactive (that is, it reacts quickly and strongly) to irritants, infection, cold air, or allergens such as pollen and dust. Exercise and stress can also worsen asthma. When the bronchi become irritated due to any one of these conditions, they constrict, making it difficult to breathe. As a response to irritation and inflammation, the mucous membrane produces thick mucus that further inhibits respiration. As a result, air is trapped in the lungs, producing coughing and wheezing.

Treatment for asthma includes medications that are given directly into the lungs using sprays or inhalers (Fig. 9-28). Clients with asthma should avoid triggers that bring on asthma attacks, such as allergens, smoke, strong odors, and strenuous exercise.

Fig. 9-28. *Two different types of asthma inhalers. Clients with asthma should be encouraged to carry their inhalers at all times.*

Upper Respiratory Infection (URI)

Upper respiratory infection (**URI**) is commonly called a cold. It is the result of a viral or bacterial infection of the nose, sinuses, and throat. Symptoms usually include nasal discharge, sneezing, sore throat, fever, and fatigue. For most people, a cold can be dealt with by the body's immune system and by rest and fluids. If the infection is bacterial, antibiotics may be prescribed. People who have upper respiratory conditions should not be exposed to cigarette smoke or other irritants. Clients may be more comfortable sitting up, rather than lying down.

Lung Cancer

Lung cancer is the growth of abnormal cells or tumors in the lungs. Symptoms of lung cancer include chronic cough, shortness of breath, and bloody sputum. More information about cancer is located later in the chapter.

Tuberculosis

Tuberculosis (**TB**) is a highly contagious lung disease. Symptoms include fatigue, loss of appetite, slight fever, prolonged coughing, and shortness of breath. Chapter 5 contains more information about tuberculosis.

6. Describe the urinary system and related conditions

The urinary system is composed of two kidneys, two ureters, one urinary bladder, a single urethra, and a meatus (Figs. 9-29 and 9-30). The urinary system has two important functions. Through urine, the urinary system eliminates waste products created by the cells. The urinary system also maintains the water balance in the body.

Observing and Reporting: Urinary System

Observe and report these signs and symptoms:

- Weight loss or gain
- Swelling in the upper or lower extremities
- Pain or burning during urination

- O/R Changes in urine, such as cloudiness, odor, or color
- O/R Changes in the frequency and amount of urination
- O/R Swelling in the abdominal/bladder area
- O/R Complaints that the bladder feels full or painful
- O/R Urinary incontinence/dribbling
- O/R Pain in the kidney or back/flank region
- O/R Inadequate fluid intake
- O/R Confusion

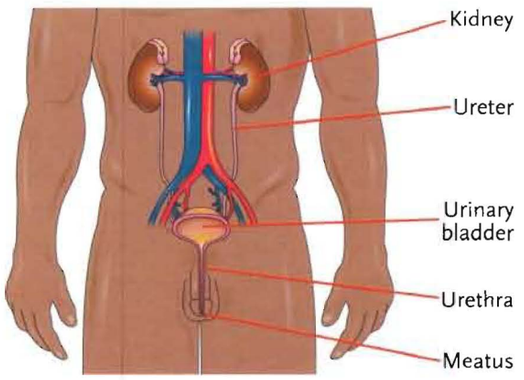

Fig. 9-29. *The urinary system consists of two kidneys and two ureters, the bladder, the urethra, and the meatus. This is an illustration of the male urinary system.*

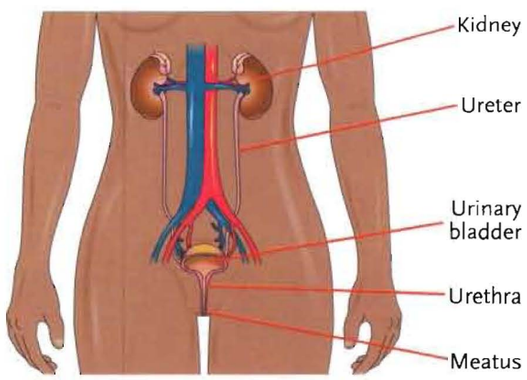

Fig. 9-30. *The female urethra is shorter than the male urethra. This is one reason why the female bladder is more likely to become infected by bacteria.*

Urinary Incontinence

When people cannot control the muscles of the bowels or bladder, they are said to be **incontinent**. **Urinary incontinence** is the inability to control the bladder, which leads to an involuntary loss of urine. Incontinence can occur in clients who are bedbound, ill, elderly, paralyzed, or who have circulatory or nervous system diseases or injuries. Incontinence is not a normal part of aging. Home health aides should always report incontinence. It may be a sign or symptom of an illness.

Guidelines: Urinary Incontinence

- G Offer a bedpan, urinal, commode, or trip to the bathroom often. Follow elimination schedules in the care plan.
- G Answer requests for help immediately.
- G Urinary incontinence is a major risk factor for pressure injuries. Document all episodes of incontinence carefully and accurately.
- G Cleanliness and careful skin care are important. Urine is very irritating to the skin. It should be washed off immediately and completely. Keep clients clean, dry, and free from odor. Observe the skin carefully when bathing and giving perineal care.
- G Change wet or soiled clothing immediately. Change bed linen any time it is wet or soiled. Use absorbent pads under bed linen for clients who are incontinent.
- G Some clients will wear disposable incontinence pads or briefs for adults. They help keep body wastes away from the skin. Assist clients as needed with changing wet briefs immediately. Do not refer to an incontinence brief or pad as a *diaper*. Clients are not infants, and using that term is disrespectful.
- G Encourage clients to drink plenty of fluids.
- G Clients who are incontinent need reassurance and understanding. Be professional and kind when dealing with incontinence. Doing so may help put clients at ease.

Urinary Tract Infection (UTI)

A **urinary tract infection** (**UTI**) is a bacterial infection of the urethra, bladder, ureter, or kidney. This results in pain or burning during urination and the frequent feeling of needing to urinate. The infection is commonly caused by *Escherichia coli* (*E. coli*), which is a type of bacteria usually found in the gastrointestinal tract. If it moves from the anus into the urethra and then the bladder, it can cause a urinary tract infection.

UTIs are more common in women. This is due, in part, to the female urethra being shorter (one to one and one-half inches) than the male urethra (seven to eight inches). In addition, because the female urethra is located directly in front of the vagina and the anus, it is closer to potential sources of bacteria. Bacteria can reach a woman's bladder more easily.

Wiping the perineal (*payr-i-NEE-al*) area from front to back after bladder and bowel elimination helps prevent UTIs. Drinking plenty of water and other fluids can also help prevent UTIs. Antibiotics are usually prescribed to treat UTIs.

Kidney Stones

Kidney stones, also called *renal calculi* (*KAL-kyoo-lye*), form when urine crystallizes in the kidneys. The stones can block the kidneys and ureters, causing severe pain. Kidney stones often have no single cause, but may be the result of lack of fluid intake, diet, infection, disorders, or certain genetic factors.

Kidney stones are treated with increased water intake, as well as pain relievers and other medications. Larger stones may need to be treated with surgery or a procedure that uses sound waves to break up the stones.

Chronic Renal Failure

Chronic renal failure (**CRF**), also called *chronic kidney failure*, occurs because the kidneys become unable to eliminate certain waste products from the body. This disease can develop as the result of chronic urinary tract infections, high blood pressure, inflammation of the kidneys (nephritis), or diabetes. Excessive salt in the diet can also cause damage to the kidneys. Over time, the disease becomes worse. Kidney **dialysis** (dye-AL-i-sis), an artificial means of removing the body's waste products, can improve and extend life for several years. Clients will be on fluid restrictions of different degrees. Chronic renal failure can progress to end-stage renal disease, which is fatal without kidney dialysis or a kidney transplant.

7. Describe the gastrointestinal system and related conditions

The gastrointestinal (GI) system, also called the digestive system, is made up of the gastrointestinal tract and the accessory digestive organs (Fig. 9-31). The gastrointestinal tract is a long passageway extending from the mouth to the anus, the opening of the rectum. Food passes from the mouth through the pharynx, esophagus, stomach, small intestine, large intestine, and out of the body as solid waste (*feces* or *stool*). The teeth, tongue, salivary glands, liver, gallbladder, and pancreas are the accessory organs to digestion. They help prepare the food so that it can be absorbed.

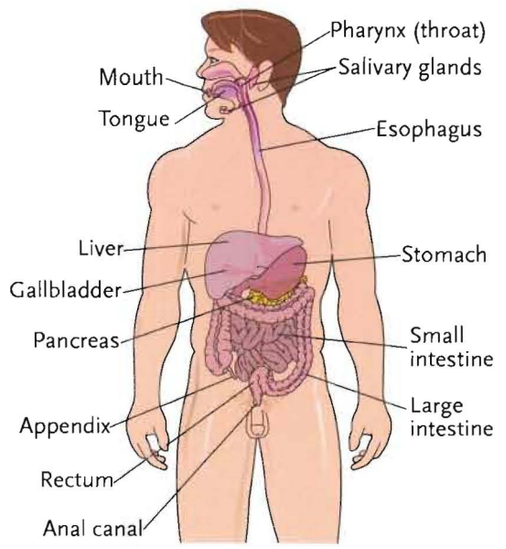

Fig. 9-31. *The GI system consists of all the organs needed to digest food and process waste.*

The gastrointestinal system has the following functions: digestion, absorption, and elimination. **Digestion** is the process of preparing food physically and chemically so that it can be absorbed into the cells. **Absorption** is the transfer of nutrients from the intestines to the cells. **Elimination** is the process of expelling wastes (made up of the waste products of food and fluids) that are not absorbed into the cells.

Observing and Reporting: Gastrointestinal System

Observe and report these signs and symptoms:

- O/R Difficulty swallowing or chewing (including denture problems, tooth pain, or mouth sores)
- O/R **Fecal incontinence** (inability to control bowels, leading to an involuntary passage of stool)
- O/R Weight gain or weight loss
- O/R Loss of appetite
- O/R Abdominal pain and cramping
- O/R Diarrhea
- O/R Nausea and vomiting (especially vomitus that looks like coffee grounds)
- O/R Constipation
- O/R Flatulence
- O/R Hiccups or belching
- O/R Bloody, black, or hard stools
- O/R Heartburn
- O/R Poor nutritional intake

Constipation

Constipation is the inability to eliminate stool (have a bowel movement), or the infrequent, difficult, and often painful elimination of a hard, dry stool. As a person ages, body waste moves more slowly through the intestines. This can cause more frequent constipation. Constipation can also result from decreased fluid intake, poor diet, inactivity, medications, certain diseases, or ignoring the urge to eliminate. Signs of constipation include abdominal swelling, gas, and irritability.

Treatment often includes increasing the amount of fiber eaten, increasing the activity level, and possibly medication. An enema or rectal suppository may be ordered to help with constipation. An enema is a specific amount of water, with or without an additive, that is introduced into the colon to stimulate the elimination of stool. A rectal suppository is a medication given rectally to cause a bowel movement. The Appendix at the back of this book contains more information about enemas.

Guidelines: Preventing Constipation

- G Clients may need to increase their fiber intake to help prevent constipation. A special diet that increases the intake of fiber and whole grains, such as whole grain cereals, bread, and raw fruits and vegetables, may be ordered (Fig. 9-32). Encourage clients to follow their diets.

Fig. 9-32. *Many raw fruits and vegetables are high in fiber and can help prevent constipation.*

- G Encourage clients to drink plenty of fluids. Offer different types of drinks that clients prefer.
- G Help clients follow ordered activity or exercise listed in the care plan.
- G Provide privacy for elimination.

Fecal Impaction

A fecal impaction is a hard stool that is stuck in the rectum and cannot be expelled. It results from unrelieved constipation. Symptoms include no stool for several days, oozing of liquid stool, cramping, abdominal swelling, and rectal pain. When an impaction occurs, a nurse or doctor will insert one or two gloved fingers into the rectum and break the mass into fragments so that it can be passed. Prevention of fecal impactions includes a high-fiber diet, plenty of fluids, an increase in activity level, and possibly medication. Early assessments of constipation may also help prevent impactions.

Hemorrhoids

Hemorrhoids are enlarged veins in the rectum. They may also be visible outside the anus. Constipation, obesity, pregnancy, chronic diarrhea, overuse of enemas or laxatives, and straining during bowel movements are common causes of hemorrhoids. Rectal itching, burning, pain, and bleeding during bowel elimination are signs and symptoms of hemorrhoids. Treatment includes adding more fiber into the diet and increasing fluid intake. Medications, compresses, and sitz baths are also used to treat hemorrhoids. Surgery may be necessary. Excessive cleaning and wiping of the area should be avoided. When cleaning the anal area, the home health aide should be very gentle to avoid causing pain and bleeding.

Diarrhea

Diarrhea is frequent elimination of liquid or semiliquid feces. Abdominal cramps, urgency, nausea, and vomiting can accompany diarrhea, depending on the cause. Bacterial and viral infections, microorganisms in food and water, irritating foods, and medications can cause diarrhea. Treatment of diarrhea usually involves medication, an increase in certain fluids, and a change of diet.

Gastroesophageal Reflux Disease

Gastroesophageal reflux disease, commonly referred to as **GERD**, is a chronic condition in which the liquid contents of the stomach back up into the esophagus. The liquid can inflame and damage the lining of the esophagus. It can cause bleeding or ulcers. In addition, scars from tissue damage can narrow the esophagus and make swallowing difficult.

Heartburn is the most common symptom of GERD. **Heartburn** is the result of a weakening of the **sphincter** (*SFINK-ter*) **muscle** that joins the esophagus and the stomach. When healthy, this muscle prevents the leaking of stomach acid and other contents back into the esophagus. Stomach acid causes a burning sensation, commonly called heartburn, in the esophagus. If heartburn occurs frequently and remains untreated, it can cause **ulceration** (*ul-ser-AY-shun*).

Heartburn and GERD must be reported to the supervisor. These conditions are usually treated with medications. Serving the evening meal three to four hours before bedtime may help. The client should not lie down until at least two to three hours after eating. Providing the client with extra pillows so the body is more upright during sleep can help. Serving the largest meal of the day at lunchtime, serving several meals of small portions throughout the day, and reducing fast foods, fatty foods, and spicy foods may also help. Stopping smoking, not drinking alcohol, and wearing loose-fitting clothing are often helpful as well.

Peptic Ulcers

Peptic ulcers are raw sores in the stomach. A dull or burning pain occurs one to three hours after eating, accompanied by belching or vomiting. Peptic ulcers can cause bleeding, and stool may appear black (tarry). Ulcers are caused by excessive acid secretion. Treatment includes antacids and other medications, as well as a change in diet. Clients with peptic ulcers should

avoid smoking and drinking too much alcohol and caffeine, which increase the production of gastric acid.

Ulcerative Colitis

Ulcerative colitis (*UL-ser-a-tiv koh-LYE-tis*) is a chronic inflammatory disease of the large intestine. Symptoms include cramping, diarrhea, pain occurring on one side of the lower abdomen, rectal bleeding, loss of appetite, and weight loss. Ulcerative colitis is a serious illness that can cause intestinal bleeding and death if left untreated.

Medications can relieve symptoms, but they cannot cure ulcerative colitis. Surgical treatment may include a **colostomy** (*koh-LOS-toh-mee*), which is the diversion of waste to an artificial opening (**stoma**) through the abdomen. Stool is diverted through the stoma instead of the anus. Chapter 14 contains more information about colostomy care.

Colorectal Cancer

Colorectal (*koh-loh-REK-tal*) **cancer**, also known as *colon cancer*, is cancer of the gastrointestinal tract. Signs and symptoms include changes in normal bowel patterns, cramps, abdominal pain, and rectal bleeding. Colorectal cancer must be treated with surgery. More information about cancer is located later in the chapter.

8. Describe the endocrine system and related conditions

The endocrine system is made up of glands in different areas of the body (Fig. 9-33). **Glands** are organs that produce and secrete chemicals called hormones. **Hormones** are chemical substances created by the body that control numerous body functions. Hormones are carried in the blood to the various organs.

The functions of the endocrine system are to maintain homeostasis through hormone secretion, influence growth and development, maintain blood sugar levels, and regulate levels of calcium and phosphate in the body. The endocrine system also regulates the body's ability to reproduce and determines how quickly cells burn food for energy.

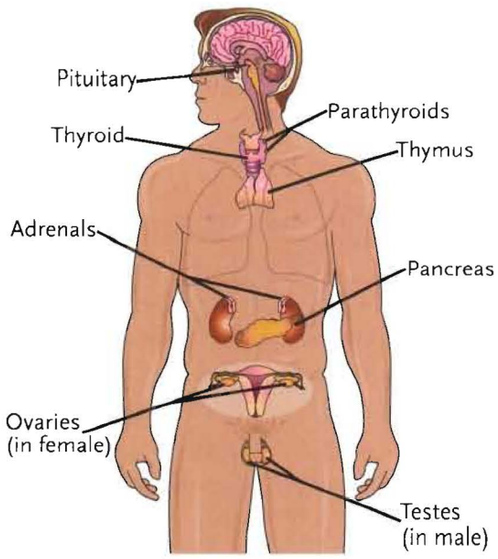

Fig. 9-33. *The endocrine system includes organs that produce hormones that regulate essential body processes.*

Observing and Reporting: Endocrine System

Observe and report these signs and symptoms:

- O/R Headache
- O/R Weakness
- O/R Blurred vision
- O/R Dizziness
- O/R Irritability
- O/R Sweating/excessive perspiration
- O/R Change in "normal" behavior
- O/R Confusion
- O/R Change in mobility
- O/R Change in sensation
- O/R Numbness or tingling in arms or legs
- O/R Weight gain or weight loss
- O/R Loss of appetite or increased appetite

- Increased thirst
- Frequent urination or any change in urine output
- Hunger
- Dry skin
- Skin breakdown
- Sweet or fruity breath
- Sluggishness or fatigue
- Hyperactivity

Diabetes

Diabetes mellitus, commonly called **diabetes** (*dye-a-BEE-tees*), occurs when the pancreas (*PAN-kree-as*) produces no insulin, too little insulin (*IN-su-lin*), or does not properly use insulin. **Insulin** is a hormone that works to move **glucose** (*GLOO-kohs*), or natural sugar, from the blood and into the cells for energy for the body. Without insulin to process glucose, these sugars collect in the blood and cannot get to cells. This causes problems with circulation and can damage vital organs.

Diabetes is common in people with a family history of the illness, in the elderly, and in people who are obese. Diabetes is a chronic disease that has two major types: type 1 and type 2.

Type 1 diabetes is usually diagnosed in children and young adults. In type 1 diabetes, the pancreas either produces no insulin or too little insulin. The condition will continue throughout a person's life. Type 1 diabetes is managed with daily injections of insulin or an insulin pump and a special diet. Regular blood glucose testing must be done.

Type 2 diabetes is the most common form of diabetes. In type 2 diabetes, either the body does not produce enough insulin or the body fails to properly use insulin. This is known as *insulin resistance*. Type 2 diabetes usually develops slowly. It is the milder form of diabetes. It typically develops after age 35; the risk of getting this type increases with age. However, the number of children with type 2 diabetes is growing rapidly. Type 2 diabetes often occurs in obese people or those with a family history of the disease. Type 2 diabetes can usually be controlled with diet and/or oral medications. Blood glucose levels should be tested regularly.

Other types of diabetes are prediabetes and gestational diabetes. **Prediabetes** is a condition in which blood glucose levels are above normal but are not high enough for a diagnosis of type 2 diabetes. Millions of people in the United States have prediabetes. Research indicates that some damage to the body, especially to the heart and circulatory system, may already be occurring during prediabetes. Prediabetes can be delayed or prevented with certain lifestyle changes, such as a change in diet, weight loss, and regular exercise.

Pregnant women who have never had diabetes before but who have high glucose levels during pregnancy are said to have **gestational diabetes**.

People with diabetes may have the following signs and symptoms:

- Excessive thirst
- Extreme hunger
- Frequent urination
- Unexplained weight loss
- Elevated blood sugar levels
- Glucose in the urine
- Sudden vision changes
- Tingling or numbness in hands or feet
- Feeling very tired much of the time
- Very dry skin
- Sores that are slow to heal
- More infections than usual

Diabetes can lead to further complications:

- Changes in the circulatory system can cause heart attack and stroke, reduced circulation, poor wound healing, and kidney and nerve damage.
- Damage to the eyes can cause vision loss and blindness.
- Poor circulation and impaired wound healing may result in leg and foot ulcers, infected wounds, and gangrene. Gangrene can lead to amputation.
- Insulin reaction and diabetic ketoacidosis can be serious complications of diabetes. Signs and symptoms of each are listed below.

Insulin Reaction and Diabetic Ketoacidosis

Insulin reaction and diabetic ketoacidosis are complications of diabetes that can be life-threatening. **Insulin reaction**, or **hypoglycemia** (*hye-poh-glye-SEE-mee-a*), can result from either too much insulin or too little food. It occurs when insulin is given and the person skips a meal or does not eat all the food required. Even when a regular amount of food is eaten, physical activity may rapidly metabolize the food so that too much insulin is in the body. Vomiting and diarrhea may also lead to insulin reaction in people who have diabetes.

The first signs of insulin reaction include feeling weak or different, nervousness, dizziness, and perspiration. These signal that the client needs food in a form that can be rapidly absorbed. A glass of milk, fruit juice, or water with sugar dissolved in it should be consumed right away. A glucose tablet is another quick source of sugar. The supervisor should be notified if a client has shown signs of insulin reaction. A fingerstick blood glucose test may need to be done right away. Other signs and symptoms include the following:

- Hunger
- Headache
- Rapid pulse
- Low blood pressure
- Cold, clammy skin
- Confusion
- Trembling
- Blurred vision
- Numbness of the lips and tongue
- Unconsciousness

Diabetic ketoacidosis (*KEE-to-a-si-DOH-sis*) (**DKA**) is caused by having too little insulin in the body. It can result from undiagnosed diabetes, infection, going without insulin or not taking enough insulin, eating too much, not getting enough exercise, or physical or emotional stress. The signs of the onset of diabetic ketoacidosis include increased hunger, thirst, or urination; abdominal pain; deep or labored breathing; and breath that smells sweet or fruity. The supervisor should be notified immediately if a client shows signs of diabetic ketoacidosis. The agency's policies and procedures regarding contacting emergency services should be followed. Other signs and symptoms of diabetic ketoacidosis include the following:

- Headache
- Weakness
- Rapid, weak pulse
- Low blood pressure
- Dry skin
- Flushed cheeks
- Drowsiness
- Nausea and vomiting
- Shortness of breath or air hunger (person gasping for air and being unable to catch his breath)
- Unconsciousness

Care Guidelines for Diabetes

Diabetes must be carefully controlled to prevent complications and severe illness. The care plan must be followed closely.

Guidelines: Diabetes

- Follow diet instructions exactly. The intake of carbohydrates, including breads, potatoes, grains, pasta, and sugars, must be regulated. Meals must be eaten at the same time each day. The client must eat everything that is served. If a client refuses to eat what is directed, or if you suspect that she is not following the diet when you leave, report this to your supervisor. More information on diet for a person with diabetes is provided later in this chapter.
- Encourage the client to follow her exercise program. Regular exercise is important. Exercise affects how quickly bodies use food, and it also helps improve circulation. Exercise may include walking or other active exercise (Fig. 9-34). It may also include passive range of motion exercises. Assist with exercise as necessary. Be positive. Try to make it fun. A walk can be a chore or it can be the highlight of the day.

Fig. 9-34. *Exercise programs are very important for clients with diabetes. They help to increase circulation and maintain a healthy weight.*

- Observe the client's management of insulin. Doses are calculated exactly. They should be administered at the same time each day. Home health aides are not permitted to inject insulin. However, you may be asked to bring the insulin and supplies to the client, to check the expiration date, to store the insulin (usually in the refrigerator), and/or to keep a record of where on the body the insulin was injected. Know when clients take insulin and when their meals should be served. There must be a balance between the insulin level and food intake.
- Perform blood tests as directed. A fingerstick blood glucose test is one type of blood test that may be used to check blood sugar. This is a simple test that is performed by quickly piercing the fingertip, then placing the blood on a chemically active disposable strip. The strip is inserted into a blood glucose meter, a special glucose monitoring machine (Fig. 9-35). The strip will indicate the result. Sometimes the care plan will specify a daily blood test for insulin levels. Not all states allow home health aides to do this. Know your state's rules. If allowed to assist with this procedure, your agency will train you how to do it. Always wear gloves when helping with glucose monitoring. Disinfect the blood glucose meter following manufacturer's instructions. A blood glucose meter should only be used by one person (not shared). Perform tests only as directed and allowed.

Fig. 9-35. *There are different types of equipment to measure glucose levels in the blood.*

G Proper foot care is vitally important for people with diabetes. Give foot care as directed. Because diabetes causes poor circulation, even a small sore on the leg or foot can grow into a large wound that may not heal. This can result in amputation. Careful foot care, including regular inspection, is very important (Fig. 9-36). The goals of diabetic foot care are to check for irritation or sores, to promote blood circulation, and to prevent infection.

Fig. 9-36. *Observe the legs and feet carefully. Poor circulation can increase the risk of infection and the loss of toes, feet, or legs to gangrene.*

G Encourage clients to wear comfortable, supportive, well-fitting shoes that do not hurt their feet. Shoes made of material that breathes, such as leather, cotton, or canvas, help prevent buildup of moisture. To avoid injuries to the feet, clients should not go barefoot. Socks made of natural fibers such as cotton or wool are best because they absorb sweat. Socks should not be too tight. Home health aides should never trim or clip a client's toenails. Only a nurse or doctor should do this.

Report any of the following to your supervisor:

- Any sign of skin breakdown, especially on the feet and toes
- Visual changes, especially blurred vision
- Change in appetite (client overeating or not eating enough) or increased thirst
- Fruity or sweet-smelling breath
- Weight changes
- Nausea or vomiting
- Changes in urine output, any signs of urinary tract infection, fruity or sweet-smelling urine
- Change in mobility
- Numbness or tingling in the arms or legs
- Nervousness or anxiety
- Dizziness or loss of coordination
- Irritability or confusion

Providing foot care for a client with diabetes

Equipment: basin of warm water, mild soap, 2 washcloths, 2 towels, bath mat, lotion, clean socks, shoes or slippers, gloves

1. Wash your hands.
2. Explain the procedure to the client. Speak clearly, slowly, and directly. Maintain face-to-face contact whenever possible.
3. Provide privacy for the client.
4. Fill the basin halfway with warm water. Test water temperature against the inside of your wrist. Ensure it is safe. Water temperature should be no higher than 105°F. Have client check water temperature. Adjust if necessary.
5. Place the basin on the bath mat or a bath towel (protective barrier) on the floor (if the client is sitting in a chair) or on a towel at the foot of the bed (if the client is in bed). Make sure basin is in a position that is comfortable for the client. Support the foot and ankle throughout the procedure.
6. Put on gloves.
7. Remove the client's socks and completely submerge the client's feet in the water. Soak the feet for 15 to 20 minutes.
8. Put soap on a wet washcloth. Remove one foot from the water. Wash the entire foot gently, including between the toes and around the nail beds.

9. Rinse the entire foot, including between the toes.
10. Using a clean, dry towel or washcloth, pat the foot dry gently, including between the toes.
11. Repeat steps 8 through 10 for the other foot.
12. Put lotion in one hand and warm it by rubbing your hands together.
13. Starting at the toes and working up to the ankles, gently rub lotion into the feet with circular strokes. Your goal is to increase circulation, so take several minutes on each foot. **Do not put lotion between the toes.** Remove excess lotion (if any) with a towel or washcloth. Make sure lotion has been absorbed and feet are completely dry.
14. Observe the feet, ankles, and legs for dry skin, irritation, blisters, redness, sores, corns, discoloration, or swelling.
15. Help the client put on clean socks and shoes or slippers.
16. Put used linens in the laundry. Pour water into the toilet and flush it. Clean and store the basin and supplies.
17. Remove and discard your gloves.
18. Wash your hands.
19. Document the procedure, including any abnormalities you observed on the feet or legs.

Meal Planning and Diabetes

People with diabetes must be very careful about what they eat. They must eat the right amount of the right type of food at the right time, and they must eat everything that is served. Calories and carbohydrates are carefully controlled, and protein and fats are also regulated. Foods that are high in sugar should be avoided, as they can cause problems with insulin balance.

The types and amounts of food are determined by nutritional and energy needs. A registered dietitian (RD) and the client will make up a **meal plan**, including snacks, that will include all of the right types and amounts of food for each day.

There are different methods of planning meals. The meal plan may use a carbohydrate-counting approach (often called *carb counting*). Carbohydrates raise the level of blood glucose. The amount of carbohydrates eaten, as well as the times they are eaten, must be regulated carefully. This helps keep blood glucose levels within a healthy range. The dietitian will determine the proper amount of carbohydrates for clients. Once the correct amount of grams of carbohydrates is determined, they need to be counted for each meal or snack. Nutrition labels need to be read, paying attention to serving size and carbohydrate content. Food portions may need to be measured.

Home health aides are not responsible for creating meal plans. A dietitian, along with the client, does this. However, if assigned to prepare food for the client, the HHA should follow the diet exactly. If the client is not following his diet, it should be reported to the supervisor. The ADA's website, diabetes.org, contains information about meal planning.

Hyperthryoidism (Overactive Thyroid Gland)

Hyperthyroidism (*high-per-THIGH-royd-ism*) is a condition in which the thyroid gland produces too much thyroid hormone. Body processes speed up and metabolism increases, causing weight loss, a rapid heartbeat, sweating, and nervousness. Hyperthyroidism is usually treated with medication. Occasionally, part of the thyroid is surgically removed.

Hypothryoidism (Underactive Thyroid Gland)

Hypothyroidism (*high-poh-THIGH-royd-ism*) is a condition in which the body lacks thyroid hormone. This causes body processes to slow down. It is an autoimmune disorder in which the body produces antibodies that attack the thyroid,

interfering with the production of thyroid hormone. Hypothryoidism is often caused by Hashimoto's thyroiditis. Symptoms of hypothyroidism include fatigue, weight gain, constipation, and intolerance to cold. Dry skin, hair loss, slow heart rate, and low blood pressure are other symptoms. Hypothyroidism is treated with thyroid hormone replacement therapy.

9. Describe the reproductive system and related conditions

The reproductive system is made up of the reproductive organs, which are different in men and women (Figs. 9-37 and 9-38). The reproductive system allows human beings to **reproduce**, or create new human life. Reproduction begins when a male's and female's sex cells (sperm and ovum) join. These sex cells are formed in the male and female sex glands. These sex glands are called the **gonads**.

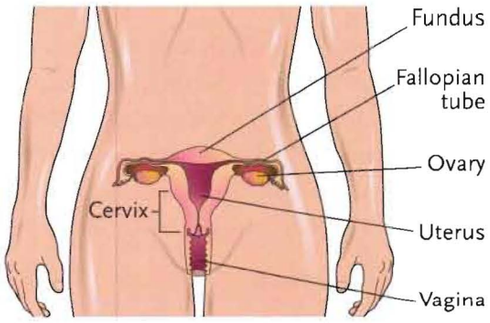

Fig. 9-37. The female reproductive system.

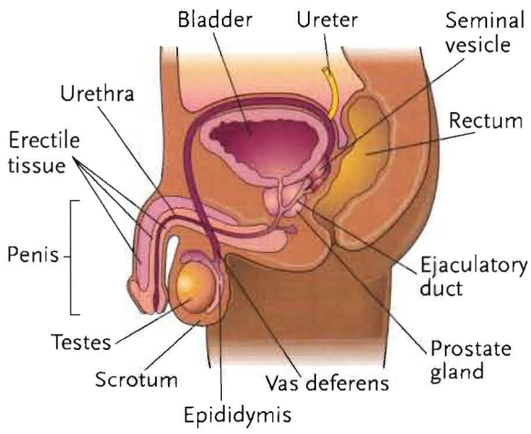

Fig. 9-38. The male reproductive system.

Observing and Reporting: Reproductive System

Observe and report these signs and symptoms:

- O/R Discomfort or difficulty with urination
- O/R Discharge from the penis or vagina
- O/R Swelling of the genitals
- O/R Blood in urine or stool
- O/R Breast changes, including size, shape, lumps, or discharge from the nipple
- O/R Sores on the genitals
- O/R Redness or rash on the genitals
- O/R Genital itching
- O/R Client reports erectile dysfunction (ED) (trouble getting or keeping an erection)
- O/R Client reports painful intercourse

Sexually Transmitted Infections

Sexually transmitted infections (STIs), or sexually transmitted diseases (STDs), are caused by sexual contact with an infected person. Sexually transmitted infections do not always have apparent signs and symptoms.

These infections are mostly transmitted through sexual contact, which includes sexual intercourse (vaginal and anal), contact of the mouth with the genitals or anus, and contact of the hands with the genital area. Some STIs can also be transmitted via needles during IV drug use, as well as during pregnancy or childbirth. The human immunodeficiency virus (HIV) and some kinds of hepatitis can be transmitted via needles, as well as through sexual contact. (HIV and AIDS are discussed in the next learning objective.)

Sexually transmitted infections cause a variety of signs and symptoms and health problems, which are detailed below. The transmission of some STIs can be reduced or stopped by using latex or polyurethane condoms.

Chlamydia infection is caused by organisms introduced into the mucous membranes of the reproductive tract. Chlamydia can cause serious infection, including pelvic inflammatory disease (PID) in women. PID can lead to infertility. Signs and symptoms of chlamydia infection include yellow or white discharge from the penis or vagina, burning during urination, swelling of the testes, painful intercourse, and abdominal and low back pain. Chlamydia is treated with antibiotics.

Syphilis is caused by bacteria. It can be treated effectively in its early stages, but if left untreated it can cause brain damage, mental health disorders, and even death. Babies born to mothers infected with syphilis may be born blind or with other serious birth defects. Syphilis is easier to detect in men than in women, due to open sores called **chancres** (*SHAYN-kers*) that develop on the penis soon after infection. In women, these sores may form inside the vagina.

The chancres are painless and can go unnoticed. If untreated, the infection progresses to rashes, headache, fever, weight loss, and muscle aches. Then, over time, if the infection is still not treated with penicillin or other antibiotics, it spreads to the heart, brain, and other vital organs. Untreated syphilis will eventually be fatal. The sooner the disease is treated, the better the person's chances of preventing long-term damage and avoiding infection of others.

Gonorrhea is caused by bacteria. Like syphilis, it is easier to detect in men than in women because many women with gonorrhea show no early symptoms. Men infected with gonorrhea will typically have a white, yellow, or green discharge from the penis. Painful or swollen testes and burning during urination are other common symptoms in men. Symptoms in women include cloudy vaginal discharge, along with vaginal bleeding between periods. Rectal itching, soreness, bleeding, or painful elimination of stool can occur in both men and women. If untreated, gonorrhea can cause blindness, joint infection, sterility, and pelvic inflammatory disease. Gonorrhea is treated with antibiotics.

Genital herpes, unlike the STIs discussed previously, is caused by a virus—herpes simplex type 1 (HSV-1) or type 2 (HSV-2). HSV-2 is generally the cause of genital herpes. Genital herpes cannot be treated with antibiotics, nor can it be cured. However, one type of medication makes it less likely that it will be transmitted to others. Once infected with genital herpes, a person may suffer repeated outbreaks of the disease for the rest of his life. A herpes outbreak includes burning, painful, red sores on the genitals that may take weeks to heal. The sores are infectious, but a person with genital herpes can spread the infection even when sores are not present.

Some people infected with genital herpes never experience repeated outbreaks. The later episodes may not be as painful as the initial outbreak. Treatment with antiviral medication can help people stay symptom-free for longer periods of time. The medication can also help lessen the duration and intensity of the episodes. Babies born to women infected with genital herpes can be infected during birth. Pregnant women experiencing an outbreak are usually delivered by Cesarean (*se-SAYR-ee-an*) section, or C-section.

Genital HPV infection is a sexually transmitted infection caused by human papillomavirus (HPV). HPV is a different virus than HIV and HSV (herpes). Genital HPV infection is spread primarily through genital contact and can infect the genital area of both men and women. This includes the penis, vulva, lining of the vagina, cervix, rectum, or anus. Many people have no signs or symptoms of HPV. Some HPV infections cause women to have an abnormal pap test. Genital warts may appear. They may also lead to the development of cervical cancer. Treatment to remove warts is done in a doctor's office or through the use of medication. There is no cure for HPV. However, an HPV vaccine, licensed by the Food and Drug Administration (FDA), is available and recommended for males

and females from age 9 to 26. It may help prevent genital warts and anal, vaginal, and vulvar cancers in women, and genital warts and anal cancer in men.

Vaginitis

Vaginitis, an inflammation of the vagina, may be caused by bacteria, protozoa (one-celled animals), or a fungus (yeast). Bacterial vaginosis occurs when there is an overgrowth of normal bacteria inside the vagina. Yeast infections are caused by an overproduction of a fungus called *Candida albicans*. Vaginitis may also be the result of hormonal changes after menopause. Women who have vaginitis have a white vaginal discharge, accompanied by itching and burning. Treatment of vaginitis includes oral medications, as well as vaginal creams or suppositories.

Benign Prostatic Hypertrophy (BPH)

Benign prostatic hypertrophy (**BPH**) (*be-NINE pros-TAT-ik HIGH-per-troh-fee*) is a disorder that is common in men over the age of 60. The prostate becomes enlarged and causes pressure on the urethra. This pressure leads to frequent urination, dribbling of urine, and difficulty starting the flow of urine. Urinary retention (urine remaining in the bladder) may also occur, causing urinary tract infection. Urine can also back up into the ureters and kidneys, causing damage to these organs. The cause of benign prostatic hypertrophy is unknown. Medications or surgery are used to treat this disorder. A test is also available to screen for cancer of the prostate. As men age, they are at increased risk for prostate cancer. Prostate cancer is usually slow-growing and responsive to treatment if detected early.

10. Describe the immune and lymphatic systems and related conditions

The immune system protects the body from disease-causing bacteria, viruses, and microorganisms in two ways. **Nonspecific immunity** protects the body from disease in general. **Specific immunity** protects against a particular disease that is invading the body at a given time.

The lymphatic (*lim-FAT-ik*) system removes excess fluids and waste products from body tissues and also helps the immune system fight infection. Closely related to both the immune and the circulatory systems, the lymphatic system consists of lymph vessels and lymph capillaries in which a fluid called **lymph** circulates (Fig. 9-39). Lymph is a clear, yellowish fluid that carries disease-fighting cells called **lymphocytes** (*LIM-foh-sytes*).

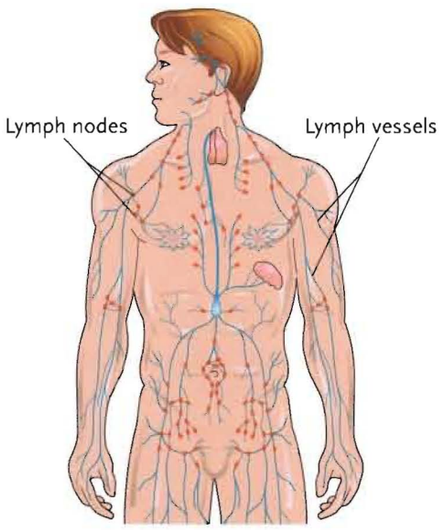

Fig. 9-39. *Lymph nodes work to fight infection and are located throughout the body.*

Unlike the circulatory system, in which the heart functions as a pump to move the blood, the lymph system has no pump. Lymph fluid is circulated by muscle activity, massage, and breathing.

Observing and Reporting: Immune and Lymphatic Systems

Observe and report these signs and symptoms:

- O/R Recurring infections (such as pneumonia, diarrhea, and fevers)
- O/R Swelling of the lymph nodes
- O/R Increased fatigue

Acquired Immunodeficiency Syndrome (AIDS)

Acquired immunodeficiency (*im-YOUN-oh de-FISH-en-see*) **syndrome** (**AIDS**) is a disease caused by the **human immunodeficiency virus** (**HIV**). HIV attacks the body's immune system and gradually weakens and disables it. AIDS is caused by acquiring HIV through blood or body fluids from an infected person. AIDS is the final stage of HIV infection in which infections, tumors, and central nervous system symptoms appear due to a weakened immune system that is unable to fight infection. It can take years for HIV to develop into AIDS. However, not everyone who has HIV will get AIDS.

HIV is a sexually transmitted disease. It can also be spread through the blood by sharing needles from an infected person. More information on high-risk behaviors for contracting HIV, avoiding HIV, and transmission of HIV is in Chapter 5.

In general, HIV affects the body in stages. The first stage involves symptoms similar to flu, with fever, muscle aches, cough, fatigue, and swollen lymph glands. These are signs and symptoms of the body's immune system fighting the infection. As the infection worsens, the immune system overreacts and attacks not only the virus, but also normal tissue.

When the virus weakens the immune system in later stages, a group of problems may appear. These include opportunistic infections, tumors, and central nervous system symptoms that would not occur if the immune system were healthy. This stage of the disease is known as AIDS. The diagnosis of AIDS is made when a person's CD4+ lymphocyte (a type of white blood cell) count falls to 200 or below.

In the late stages of AIDS, damage to the central nervous system may cause memory loss, poor coordination, paralysis, and confusion. These symptoms together are known as **AIDS dementia complex**.

The following are the signs and symptoms of HIV infection and AIDS:

- Flu-like symptoms, including fever, cough, weakness, and severe or constant fatigue
- Appetite loss
- Weight loss
- Night sweats
- Swollen lymph nodes in the neck, underarms, or groin
- Severe diarrhea
- Dry cough
- Skin rashes
- Painful white spots in the mouth or on the tongue
- Cold sores or fever blisters on the lips and flat, white ulcers in the mouth
- Cauliflower-like warts on the skin and in the mouth
- Inflamed and bleeding gums
- Bruising that does not go away
- Susceptibility to infection, particularly pneumonia, but also to tuberculosis, herpes, bacterial infections, and hepatitis
- **Kaposi's sarcoma**, a rare form of skin cancer that appears as purple, red, or brown skin lesions
- ***Pneumocystis jirovecii* pneumonia** (*new-moh-SIS-tis yee-row-VET-zee new-MOH-nee-a*), a lung infection
- AIDS dementia complex

Opportunistic infections, such as pneumonia, tuberculosis, and hepatitis, invade the body because the immune system is weak and cannot defend itself. These illnesses complicate AIDS. They further weaken the immune system. It is difficult to treat these infections because generally, over time, a person with AIDS develops resistance to some antibiotics. These infections can cause death in people with AIDS.

There is no cure for this disease, and there is no vaccine to prevent the disease. People who are infected with HIV are treated with drugs that slow the progress of the disease. Without medication, however, a weakened resistance to infections may lead to AIDS and eventually to death.

Many people are living longer with HIV by taking combinations of medications every day. A treatment called antiretroviral therapy (ART) has been shown to control the HIV virus. Three or more medications are used for this therapy. Medicines must be taken at precise times. They have many unpleasant side effects: gastrointestinal symptoms like nausea, vomiting, and diarrhea, as well as fever and skin rashes. For some people, the medications are less effective than for others. Other aspects of HIV treatment include relief of symptoms and prevention and treatment of infection.

Guidelines: HIV and AIDS

- Follow Standard Precautions. Follow Transmission-Based Precautions in addition to Standard Precautions if ordered.
- People with poor immune system function are more sensitive to infections. Wash your hands often and keep everything clean.
- Involuntary weight loss occurs in almost all people who develop AIDS. High-protein, high-calorie, and high-nutrient meals can help maintain a healthy weight.
- Some people with HIV/AIDS lose their appetites and have difficulty eating. These clients should be encouraged to relax before meals and to eat in a pleasant setting. Serve familiar and favorite foods. Report appetite loss or difficulty eating to your supervisor. If appetite loss continues to be a problem, the doctor may prescribe an appetite stimulant.
- It is extremely important to carefully follow guidelines for safe food preparation and storage when working with a client who has HIV or AIDS. Foodborne illnesses caused by improperly cooking or storing food can cause death for someone with HIV or AIDS. (See Chapter 23 for safe food handling practices.) Wash your hands frequently. Keep everything clean, especially countertops, cutting boards, and knives after they have been used to cut meat. Thaw food in the refrigerator, and wash and cook foods thoroughly. When storing food, keep cold foods cold and hot foods hot. Use small containers that seal tightly. Check expiration dates, and remember, "When in doubt, throw it out."
- Clients who have infections of the mouth and esophagus may require food that is low in acid and neither cold nor hot. Spicy seasonings should be removed. Soft or pureed foods may be easier to swallow. Drinking liquid meals and fortified drinks, such as milkshakes, may ease the pain of chewing. Warm rinses may help painful sores of the mouth. Careful mouth care is essential.
- A person who has nausea or vomiting should eat small, frequent meals and should eat slowly. The person should avoid high-fat and spicy foods, and eat a soft, bland diet. This includes mashed potatoes, noodles, rice, crackers, pretzels, toast, gelatin, and clear soups. Cool foods that have little odor are usually easier to eat than hot foods. When nausea and vomiting persist, liquids and salty foods should be encouraged, including clear soups, clear juices, ginger ale, electrolyte supplements, saltines, and pretzels. Clients should drink fluids in between meals. Care must be taken to maintain proper intake of fluids to balance lost fluids.
- Clients who have mild diarrhea may have frequent small meals that are low in fat, fiber, and dairy products. High-fiber foods include seeds, nuts, wheat bran, whole grain bread, and the skins of fruits and vegetables. Fats,

milk, cheese, ice cream, beans, cabbage, and spicy foods may need to be avoided. The client's doctor may order a BRAT (bananas, rice, applesauce, and toast) diet. This diet is helpful for short-term use.

- Diarrhea rapidly depletes the body of fluids. Fluid replacement is necessary. Good rehydration fluids include water, juice, caffeine-free soda, and broth. Caffeinated drinks should be avoided.
- **Neuropathy** (*noor-AH-path-ee*), or numbness, tingling, and pain in the feet and legs, is usually treated with pain medications. Wearing loose, soft slippers may be helpful. If blankets and sheets cause pain, a bed cradle can keep sheets and blankets from resting on the legs and feet (Chapter 12).
- Give emotional support, as well as physical care. Clients with HIV/AIDS may suffer from anxiety and depression. In addition, they are often judged by family, friends, and society. Some people avoid a person with AIDS due to intolerance, bias, or prejudice. Some people blame them for their illness. People with HIV/AIDS may experience tremendous stress. They may feel uncertainty about their illness, health care, and finances. They may also have lost friends who have died from AIDS. Listen closely to clients to understand their individual needs and concerns. This is part of providing person-centered care. Treat them with respect, and help provide needed emotional support.

  Clients with HIV/AIDS need support from others. This support may come from family, friends, religious and community groups, and support groups, as well as the care team. Report to your supervisor if you feel that clients need more resources and services.
- Withdrawal, apathy, avoidance of tasks, and mental slowness are early symptoms of HIV infection. Medications may also cause side effects of this type. AIDS dementia complex may develop, causing further mental symptoms. There may also be muscle weakness and loss of muscle control, making falls a risk. Clients in this stage of the disease will need a safe environment and close supervision in their ADLs.

Cancer

Cancer is a general term used to describe a disease in which abnormal cells grow in an uncontrolled way. Cancer usually occurs in the form of a tumor or tumors growing on or within the body. A **tumor** (*TOO-mer*) is a cluster of abnormally growing cells. **Benign** (*bee-NINE*) **tumors** are considered noncancerous. They usually grow slowly in local areas. **Malignant** (*ma-LIG-nant*) **tumors** are cancerous. They can grow rapidly and invade surrounding tissues.

Cancer invades local tissue and can spread to other parts of the body. When cancer spreads from the site where it first appeared (metastasizes), it can affect other body systems. In general, treatment is more difficult and cancer is more deadly after this has occurred. Cancer often appears first in the breast, colon, rectum, uterus, prostate, lungs, or skin. There is no known cure for cancer. However, some treatments are effective. They are discussed later in the chapter.

Known causes of cancer include the following (Fig. 9-40):

- Genetic factors
- Tobacco use
- Alcohol use
- Poor diet/obesity
- Lack of physical activity
- Certain infections
- Environmental exposure, such as radiation
- Sun exposure

Fig. 9-40. *Poor diet, obesity, and prolonged sun exposure are some of the causes of cancer.*

Signs of Cancer

When diagnosed and treated early, cancer can often be controlled. The American Cancer Society (cancer.org) has identified some warning signs of cancer:

- Unexplained weight loss
- Fever
- Fatigue
- Pain
- Skin changes, such as change in skin color (e.g., reddened skin)
- Change in bowel or bladder function
- Sores that do not heal
- Unusual bleeding or discharge
- Thickening or lump in the breast, testicle, or other parts of the body
- Indigestion or difficulty swallowing
- New mole or change in the appearance of an existing mole, wart, or spot
- Nagging cough or hoarseness

Common Treatments for Cancer

People with cancer can often live longer and sometimes recover when treated using the following methods. These treatments are most effective when tumors are discovered early. Often these treatments are combined.

Surgery is the front line of defense for most forms of cancer. It is the key treatment for malignant tumors of the skin, breast, bladder, colon, rectum, stomach, and muscle. Surgeons attempt to remove as much of the tumor as possible to prevent cancer from spreading.

Chemotherapy refers to medications given, usually intravenously, to fight cancer. Certain drugs destroy cancer cells and limit the rate of cell growth. However, many of these drugs are toxic to the body. They destroy healthy cells as well as cancer cells. Chemotherapy can have severe side effects, including nausea, vomiting, mouth sores, diarrhea, temporary hair loss, fatigue, weakness, anxiety, depression, and decreased resistance to infection.

Radiation therapy (radiotherapy) directs radiation to a limited area to kill cancer cells. However, normal or healthy cells in the radiation's path are also destroyed. By controlling cell growth, radiation can reduce pain. Radiation can cause the same side effects as chemotherapy, including an increased risk of infection. The skin on the area exposed to radiation may become sore, irritated, and sometimes burned.

Targeted therapy is a specific type of chemotherapy. Traditional chemotherapy typically destroys healthy cells as well as cancer cells. Scientists have developed targeted chemotherapy drugs using the differences between cancer cells and normal cells. These drugs can attack cancer cells and the cells that help cancer grow. Side effects of these drugs can be similar to those associated with other chemotherapy drugs, and can also include high blood pressure, rashes or other skin changes, bleeding and clotting problems, and more.

Immunotherapy is a general term for treatment that uses a person's own immune system to fight disease. Immunotherapy can be helpful in treating some forms of cancer. It can work by making the immune system work harder to fight the cancer or by adding something to the

immune system, like man-made proteins, to change how it works. Immunotherapy for cancer includes cancer vaccines, which make the immune system attack specific types of cancer cells. These may be used to help treat cancer or to stop cancer from coming back after other treatments. Different immunotherapy drugs have different side effects, but in general they have fewer side effects than chemotherapy drugs.

Hormone therapy is used to treat cancers that use hormones to grow, like breast and prostate cancers. Hormone therapy blocks the body's ability to produce certain hormones or changes how hormones behave. This type of therapy is usually used along with other types of treatment for cancer. Side effects include hot flashes, nausea, diarrhea, and fatigue.

Care Guidelines for Cancer

Coping with cancer can be a tremendous challenge. Home health aides should follow these guidelines when working with clients who have cancer:

Guidelines: Cancer

- Each case is different. Cancer is a general term and refers to many individual situations. Clients may live many years or only several months. Treatment affects each person differently. Do not make assumptions about a client's condition.
- Clients may want to talk or may avoid talking. Respect each client's needs. Listen if a client wants to share feelings or experiences with you. However, never push a client to talk. Be honest. Never tell a client, "Everything will be okay." Be sensitive. Remember that cancer is a disease, and its cause is unknown. Maintain a positive attitude and focus on concrete details. For example, comment if a client seems stronger, or mention that the sun is shining outside.
- Proper nutrition is very important for clients with cancer. Follow the care plan instructions and your assignments carefully. Clients frequently have poor appetites. Encourage a variety of food and small portions. Serve favorite foods that are high in nutrition. Liquid nutritional supplements may be used in addition to, not in place of, meals. If nausea or swallowing is a problem, foods such as soups, gelatin, or starches may appeal to the client. Use plastic utensils for a client receiving chemotherapy. It makes food taste better. Metal utensils cause a bitter taste.
- Cancer can cause severe pain, especially in the late stages. It can affect the ability to sleep, eat, and move. Be alert for signs of pain. Assist with comfort measures, including repositioning and providing distractions such as conversation, music, or reading materials (Fig. 9-41). Observe the client's use of pain medication. The client may be using a patient-controlled analgesia (PCA) pump for pain relief. This pump allows the person to press a button that releases pain medication. Report to the supervisor if pain seems to be uncontrolled.

Fig. 9-41. *Give clients with cancer as much emotional support as possible. Distractions such as conversation can help a person deal with pain.*

- Offer back rubs to provide comfort and increase circulation. For clients who spend many hours in bed, special pads or other positioning devices may make them more comfortable. Moving to a chair for some

period of time may improve comfort as well. Clients who are very weak or immobile need to be repositioned at least every two hours.

- Check the skin often to help prevent pressure injuries. Keep the skin clean and dry. Use lotion regularly on dry or delicate skin. Do not apply lotion to areas receiving radiation therapy. Do not remove markings that are used in radiation therapy. Follow any special skin care orders (for example, no hot or cold packs; no soap, lotion, or cosmetics; or no tight stockings).
- Help clients brush teeth regularly. Chemotherapy medications, nausea, vomiting, or mouth infections may cause pain and a bad taste in the mouth. You can help ease discomfort by using a soft-bristled toothbrush, rinsing with baking soda and water, or using a prescribed rinse. Do not use a commercial mouthwash. Alcohol in mouthwash can further irritate a client's mouth. For clients with mouth sores, using oral swabs rather than toothbrushes may be preferable. The swabs can be dipped in a rinse and gently wiped across the gums. Mouth sores can make mouth care very painful; be very gentle when giving care.
- People with cancer may have a poor self-image because they are weak and their appearance has changed. For example, hair loss is a common side effect of chemotherapy. Assist with grooming if desired. Your concern and interest can help improve the client's self-image.
- If visitors help cheer your client, encourage them and do not intrude. If some times of the day are better than others, suggest them to the client's friends or family. It may help a person with cancer to think of something besides cancer and treatment for a while. Pursue other topics and get to know your clients' interests. As always, report any signs of depression immediately (see Chapter 18).
- Caring for a person with cancer at home can be very difficult for family members. Be alert to needs that are not being met or stresses created by the illness. Report observations. A list of community resources for additional help may be found in Chapter 3.

Report any of the following to your supervisor:

- Increased weakness or fatigue
- Weight loss
- Nausea, vomiting, or diarrhea
- Changes in appetite
- Fainting
- Shortness of breath
- Signs of depression
- Confusion
- Blood in stool or urine
- Change in mental status
- Changes in skin
- New lumps, sores, or rashes
- Increase in pain or unrelieved pain
- Blood in the mouth

Care after a Mastectomy

A *mastectomy* is the surgical removal of all or part of the breast and sometimes other surrounding tissue. This operation is usually performed because of a tumor.

After a mastectomy, the care plan may include arm exercises for the side of the body on which the surgery was performed. The goal of arm exercises is to strengthen the arm and chest muscles and reduce swelling in the arm and underarm. Exercises may include raising the arm, opening and closing the hand, and bending and straightening the elbow. The client should wear loose, comfortable clothing while doing arm exercises.

The care plan's instructions may include keeping the arm on the affected side raised on pillows to decrease swelling. The client may use a sling to keep the arm elevated. In addition, deep breathing exercises may be ordered. Blood pressure should not be measured on the arm on the affected side.

Chapter Review

1. What is homeostasis?
2. What is an acute illness? What is a chronic illness?
3. What are three functions of the skin, or integument?
4. Why is preventing pressure injuries extremely important?
5. How many bones make up the skeleton of the human body?
6. What type of exercises can help prevent contractures and muscle atrophy?
7. What are two functions of the nervous system?
8. When helping a client who has had a stroke with transfers or walking, on which side should an HHA stand—the weaker or stronger?
9. Why may people with Parkinson's disease have trouble eating and bathing themselves?
10. When a person has multiple sclerosis, what covering breaks down over time?
11. What is paraplegia? What is quadriplegia?
12. When a client has a hearing impairment, on whose face should the light be shining while communicating—the client's or the home health aide's?
13. How can a home health aide explain the position of objects in front of a client who has a visual impairment?
14. What is phantom limb pain? What is phantom sensation?
15. What are four functions of the circulatory system?
16. What consistent blood pressure measurement is classified as hypertension?
17. What is the medical term for chest pain, pressure, or discomfort?
18. What does respiration mean? What are the two parts involved in respiration?
19. What position might a client with COPD prefer to be in?
20. What are two functions of the urinary system?
21. How should clients wipe after elimination in order to prevent infection?
22. Define the following terms related to the gastrointestinal system: digestion, absorption, and elimination.
23. What may need to be increased in a client's diet if she is prone to constipation?
24. What are glands?
25. Why is proper foot care especially important for a client with diabetes?
26. What is the function of the reproductive system?
27. What is a sexually transmitted infection?
28. What is nonspecific immunity? What is specific immunity?
29. What is the function of the lymphatic system?
30. How is HIV spread?
31. Which stage of HIV infection is classified as AIDS?
32. What are common side effects of chemotherapy and radiation?