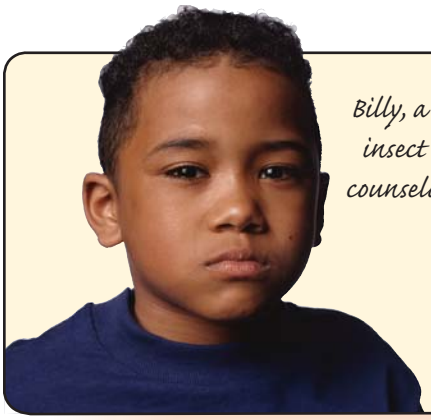
CHAPTER 25

Health Assessment



Billy Collins

Billy, a 9-year-old boy with a history of allergies, including an allergy to insect stings, is spending a week at summer camp. He reports to the camp counselor that he was just stung by a bee.

Tammy Browning

Tammy, who is expecting her first child, has been on the antepartum unit for 1 week, and is about to be moved to the delivery room. She and her partner, both in their late 20s or early 30s, have a history of substance abuse, primarily alcohol and marijuana. A urine specimen is to be collected for routine evaluation and a drug screen. Tammy is unaware that drug testing will be done.

Ramona Lewis

Ramona, a 19-year-old college student, comes to the emergency department. She is upset and crying and reports that she was date-raped.

Focusing on Blended Skills

The types of blended skills you'll need to respond to the case scenarios include:

Cognitive Skills

- Knowledge of how to conduct and document a health assessment in a systematic manner, identifying normal and abnormal findings
- Ability to integrate knowledge of subjective and objective data into a health assessment
- Knowledge of how to individualize the basic health assessment to specific populations (a school-aged child with a bee sting, a young adult rape victim, and a pregnant woman with a history of drug abuse)
- Knowledge of the typical assessment findings associated with an allergic reaction, rape, and substance abuse

Technical Skills

- Ability to use the equipment and techniques necessary to assess health status
- Ability to position the patient correctly for each body system assessment
- Ability to adapt equipment and techniques for patients of different developmental stages
- Ability to document assessment findings accurately

Interpersonal Skills

- Strong people skills to develop a trusting nurse–patient relationship
- Ability to communicate and interact effectively with patients and their significant others, especially during times of stress, such as a child with a bee sting, a woman who was raped, and a pregnant woman with a history of substance abuse
- Demonstration of self-confidence in own abilities and the willingness to get help when needed
- Ability to identify and respond to the needs of patients experiencing stress, such as a child with an allergic reaction and a young rape victim
- Ability to demonstrate respect for a patient's human dignity during a health assessment

Ethical and Legal Skills

- Knowledge of ethical and legal principles underlying patient care
- Commitment to safe, quality care, including ability to report problematic situations immediately
- A strong sense of responsibility and accountability
- Ability to participate as a trusted and effective patient advocate, including advocating for the pregnant patient and her fetus, a child, and a rape victim
- Ability to document health assessment findings according to agency policy
- Knowledge of special regulations and legislation detailing nursing responsibilities when assessing pregnancy, providing first aid in camp situations, and caring for a rape victim

Learning Objectives

After completing the chapter, you will be able to accomplish the following:

1. Explain the purposes and types of health assessment.
2. Follow guidelines for conducting a health history.
3. Prepare the patient and the environment for a health assessment.
4. Identify the equipment and positions used during a physical assessment.
5. Use the techniques of inspection, palpation, percussion, and auscultation during a physical assessment.
6. Conduct a physical assessment in a systematic manner.
7. Document significant health assessment findings in a concise, descriptive manner.
8. Describe nursing responsibilities before, during, and after diagnostic procedures.

Key Terms

adventitious breath sounds
auscultation
bronchial sounds
bronchovesicular sounds
bruits
comprehensive assessment
cyanosis
ecchymosis
edema
emergency assessment
erythema
focused assessment
inspection
jaundice
ongoing partial assessment
pallor
palpation
percussion
petechiae
precordium
turgor
vesicular breath sounds

Health assessment involves collecting, validating, and analyzing data about the patient's health. It includes gathering both subjective and objective data. Subjective data (signs) is information that is experienced or known only by the patient, such as pain, and is gathered during the health history. Objective data (symptoms) is information that is directly observed or is elicited through examination techniques. Health assessments are a part of nursing care for patients across the life span and may be conducted in any setting. (See the accompanying Reflective Practice box for an example.)

Reflective Practice

Challenge to Ethical and Legal Skills

I have always been interested in labor and delivery, so I was very excited to have the opportunity to follow a nurse in labor and delivery and assist and witness the beginning of life. I had no idea that the whole process could be so complicated.

It was here that I met Tammy Browning, who was expecting her first child. She and her partner were an interracial couple, in their late 20s or early 30s. They had been on the antepartum unit for approximately 1 week, and she was going to be moved to the delivery room shortly. Before entering the room, the nurse gave me a brief rundown of what we were expected to do throughout the morning.

On entering the patient's room for the first time, I was shocked at what I saw. The room was dark and extremely cluttered with food, candy wrappers, and trash overflowing onto the floor. The patient's partner had been sleeping in the room and both of their belongings were all over the place. I could not believe it! When we left the room, the nurse told me that both the patient and her partner had a history of drug use, mainly alcohol and marijuana. We had to get a urine sample from her to do a dipstick test. The specimen was also going to be used for a drug screen, but the patient was not going to be told about this. I was shocked and confused by this action. I thought that we had to tell the patient everything we were going to do—right?

Thinking Outside the Box: Possible Courses of Action

- Go along with what the nurse decided to do, and when we got out of the patient's room, ask why she decided to take this course of action.
- Inform myself of the legality of taking this route of action.
- Inform my instructor and head nurse about the case, asking if this was a usual occurrence and requesting that they tell or educate me on what basis they were allowed to do this.

Evaluating a Good Outcome: How Do I Define Success?

- Safety of patient and neonate is ensured.
- Patient and baby benefit from the decided-on course of action.
- No breach of duty or harm is done.
- Patient receives proper care and treatment regardless of her past drug use and results of the drug tests.
- Respect for patient is maintained.

Personal Learning: Here's to the Future!

I really had no idea what to do. Because I did not feel legally competent to challenge the nurse and suggest a different course of action, I followed her and went along with her story. Afterward I asked her if we were allowed to do this. Her answer was that she was doing it because the patient had a history of drug use and she suspected that she had been smoking marijuana throughout her stay. The test was not going to harm the baby or the mother; if anything, the test was going to be beneficial in providing the most adequate care for her and her baby. It was also going to assist in preparing for any complications that may arise during the delivery.

When she gave me this explanation, I figured that her reasons were valid and it was all right to do this since no one was going to get hurt and it would be beneficial. However, I was left with the thought that we were violating the patient's privacy. I also spoke with my clinical instructor about the situation. Through this experience, I realized that I need to educate myself more on the legal aspects of nursing. I had never paid much attention to the fact that I am exposed to many legal situations every day as a healthcare provider. Therefore, I must be prepared to confront them. I think that it is vital to be skilled as well as to be competent medically and legally. By having this knowledge, many difficult situations may be avoided and/or resolved. With this knowledge I will also be a better advocate for my patients.

Reflection

How would you respond in a similar situation? Why? What does this tell you about yourself and about the adequacy of your skills for professional practice? What do you think might have happened if the patient were told about the drug testing? Do you feel that the nurse's action of not telling the patient was based on appropriate ethical and legal principles? Why or why not? If so, what ethical and legal principles formed the basis for the action? If not, what ethical and legal principles were violated? Can you think of other ways to respond? What other skills (cognitive, interpersonal, technical, ethical/legal) would you need to respond well in this situation? Do you agree with the criteria to evaluate a successful outcome? Did the nursing student meet the criteria? Explain your answer.

Stephanie Cuellar, Georgetown University

PRINCIPLES OF HEALTH ASSESSMENT

Purpose of Health Assessment

The purpose of a health assessment is to collect subjective and objective data about a patient to determine his or her overall level of physical, psychological, sociocultural, developmental, and spiritual health. A nursing assessment differs from other types of healthcare assessments (for example, one performed by a physician) in that it is a holistic collection of information about factors that affect or are affected by one's level of health. Health assessment is an integral component of nursing care and is the foundation of the nursing process. The information from the health assessment is used to formulate nursing diagnoses that require nursing care. Assessments are used to plan, implement, and evaluate teaching and care to promote an optimal level of health through interventions to prevent illness, restore health, and facilitate coping with disabilities or death. The information is also used to identify health problems that require interdisciplinary care or immediate referral to other healthcare providers. This chapter provides information necessary to identify risks for alterations in health, perform the skills of physical examination, and identify normal age-related variations in physical structures and functions. Additional information about assessment is found in Chapter 12.

Types of Assessment

The scope and type of assessment conducted vary based on the setting, the healthcare needs of the patient, and the acuity of the health problem. A health assessment may be comprehensive, ongoing partial, focused, or emergency. A **comprehensive assessment** with a health history and complete physical examination is usually conducted when a patient first enters a healthcare setting, with information providing a baseline for comparing later assessment. An **ongoing partial assessment** is one that is conducted at regular intervals (eg, at the beginning of each home health visit or each hospital shift) during care of the patient. This type of assessment concentrates on identified health problems to monitor positive or negative changes and evaluate the effectiveness of interventions. A **focused assessment** is conducted to assess a specific problem. For example, if a woman is having abdominal pain, the nurse asks questions about urinary problems, bowel problems, allergies, and menstrual history during the health history and then assesses vital signs and abdominal structures during the physical assessment. An **emergency assessment** is a type of rapid focused assessment conducted to determine potentially fatal situations. For example, assessing the airway, breathing, and circulation before beginning cardiopulmonary resuscitation is part of an emergency assessment.

Consider Billy Collins, the 9-year-old who was stung by a bee. In this situation, the nurse would conduct an emergency assessment to determine the immediate effects of the bee sting, assessing for indications of an allergic reaction. Once this emergency assessment is completed, the nurse would perform a focused assessment to address the boy's history of allergies.

HEALTH ASSESSMENT PREPARATION

Preparing the Patient

Consider and remain sensitive to the patient's physiologic needs (eg, pain or decreased stamina because of age or illness) and psychological needs (eg, anxiety related to examination). Explain that the first part of the assessment will involve questions about the patient's health concerns, health habits, and lifestyle (Fig. 25-1). After the health history is completed, body structures will be examined. Tell the patient that the assessments should not be painful. The patient may be anxious for various reasons. Explaining the assessment in general terms can help decrease the patient's embarrassment, fear of possible abnormal physical findings, or fear of "failing" a test. Be sure to then explain each assessment in greater detail as it is performed. Explain that drapes (covers) will be used during the examination, and only the area being assessed will be exposed. Answer the patient's questions directly and honestly.

Think back to Ramona Lewis, the college student who reported that she was a victim of date rape. The nurse would need to incorporate knowledge of the emotional and physical effects of rape when communicating with Ms. Lewis. In addition, the patient's anxiety is likely to be high; thus, using empathy and establishing a trusting nurse–patient relationship are key.

Direct the patient to a private dressing area or to a comfortable area in the home and ask the patient to change into a gown. If necessary, assist the patient with undressing. Ask the patient to empty the bladder before the examination so that he or she will be more comfortable during the assessment and assessment of the abdomen will be easier.

Preparing the Environment

The environment needs to be prepared before the health assessment is conducted. Clinics, offices, and hospitals may have a special examination room that provides a quiet, private

Figure 25-1. A brief explanation of the examination before beginning and just before each stage alleviates patient fear and anxiety. *(Photo © B. Proud.)*

space for assessment. If such a room is available, the examination table is prepared, a gown and drape for the patient are provided, and instruments and special supplies needed for the assessment are gathered. If the area is open to others, an enclosure with a curtain or screen is essential. The room should be warm enough to prevent chilling, and the area or room should be adequately lighted, either by sunlight or overhead lighting.

Maintaining Cultural Sensitivity

Each person is a unique individual. The patient's culture does not affect how a health assessment is conducted, but it is an integral component of the interactions between the nurse and the patient. Nurses should know risk factors for alterations in health that are based on racial inheritance, as well as normal variations that occur within races. Nurses must consider their patients within the context of family, culture, and community (Weber & Kelley, 2007). Chapter 3 provides information about cultural diversity and the importance of providing culturally sensitive nursing care.

THE HEALTH HISTORY

A health history is a collection of subjective data that provides a detailed profile of the patient's health status. Nurses use therapeutic communication skills and interviewing techniques during the health history to establish an effective nurse–patient relationship and to gather data to identify actual and potential health problems as well as sources of strength. Effective interviewing skills are described in Chapters 12 and 21.

Recall Tammy Browning, the pregnant woman with a history of substance abuse. Therapeutic communication skills would be key to establishing a trusting nurse–patient relationship, which is essential for gathering data about the patient's recent drug use.

Information is collected during an interview with the patient, who is the primary source of data. Components of the health history, with examples of questions to ask, are outlined in Box 25-1. Nurses should be sensitive to cultural differences that influence how both verbal and nonverbal communications are interpreted.

BOX 25-1 Components of a Health History

Biographical Data

Biographical information is often collected during admission to a healthcare facility or agency and documented on a specific form; it helps to identify the patient. Biographical data include:

- Name
- Address
- Gender
- Marital status
- Occupation
- Religious preference
- Healthcare financing
- Primary healthcare provider

Reason for Seeking Health Care

The patient's reason for seeking care helps to focus the rest of the assessment. Present an open-ended question, such as, "Tell me why you are here today." **Be sure to document in the patient's own words.** For example, if Nina Dunning comes into the clinic and states, "I am having trouble sleeping. At night, I can't seem to stop my thoughts. All I do is worry."

Incorrect documentation: Patient complains of insomnia and anxiety.

Correct documentation: "I am having trouble sleeping. At night, I can't seem to stop my thoughts. All I do is worry."

History of Present Health Concern

When taking the patient's history of present health concern, be sure to explore the symptoms thoroughly. Sample questions include:

- "When did you first begin having this problem?" "Did it happen suddenly or slowly?"
- "Show me exactly where you are having this problem."
- "What other symptoms have you had with this problem?"
- "How have you treated this problem?"

Medical History

A patient's medical history may provide insight to causes of current symptoms. It also alerts the nurse to certain risk factors. Medical history includes past illnesses, chronic health problems and treatment, and previous surgeries or hospitalizations. Sample questions include:

- "Tell me about the childhood illnesses, such as measles or mumps, that you had."
- "What are you allergic to?"
- "Describe any accidents, injuries, and surgeries you have had."
- "What prescribed or over-the-counter medications do you use? Do you take any herbal or dietary supplements?"

Family History

Certain disorders have genetic links. For example, a family history of cancer is a risk factor for cancer. Sample family history questions include:

- "How old are the members of your family?"
- "If any members of your family are not living, what caused their death?"
- "Is there any history of this health problem you have in other family members?"
- "Do any family members have chronic illnesses?"

Lifestyle

A patient's lifestyle contributes to his or her overall health and well-being. For example, smoking is related to many health problems. Sample lifestyle questions include:

- "Do you smoke, drink, or use drugs? If so, for how long and how much?"
- "Describe the foods you eat during a typical day."
- "Tell me about how well you sleep."
- "How much exercise do you get each day?"
- "Who in your family or community is available to help you with health problems if you need it?"

BOX 25-2 Risk Factors for Cancer: American Cancer Society CAUTION Model

Change in bowel or bladder habits
A sore that does not heal
Unusual bleeding or discharge
Thickening or lump in the breast or elsewhere
Indigestion or difficulty in swallowing
Obvious change in wart or mole
Nagging cough or hoarseness

From the American Cancer Society.

The health history helps the nurse identify risk factors for alterations in health. Risk factors often relate specifically to the body system being assessed. Therefore, in this chapter, questions to ask regarding risk factors for altered health are provided in the health history section of each body system. In addition, be sure to screen clients for the risk factors for and warning signs of cancer (Box 25-2).

PHYSICAL ASSESSMENT

A physical assessment is the systematic collection of objective information. The physical assessment is usually conducted in a head-to-toe sequence or a system sequence but can be adapted to meet the needs of the patient. It is often necessary to modify the sequence, positions, and specific assessments based on the patient's age, energy level, and physical state, as well as time constraints. Even when modified, the health assessment should be conducted in an organized and knowledgeable manner.

Consider Billy Collins, the 9-year-old who was stung by a bee. The nurse would modify the health assessment by focusing on the immediate problem at hand: the bee sting and possible allergic reaction.

Conducting an accurate health assessment takes time and practice. Components of a comprehensive physical assessment are provided in Table 25-1.

Equipment

The equipment used in a physical assessment should be readily accessible, clean or sterile, in proper working order, and organized for the correct sequence of use (Fig. 25-2). Equipment that will touch the patient should be warmed (by the examiner's hands or warm water) before use. Although not all the instruments described below will be needed in every assessment, they are commonly used in a total assessment. Some equipment, such as a tongue blade and penlight, may be used in the physical assessment but are not included in this discussion. Beginning students will not conduct all elements of a complete physical assessment, but the instruments and techniques are discussed here so they can understand what is being done by more advanced practitioners.

Stethoscope

The stethoscope is illustrated and described in Chapter 24. During health assessment, the stethoscope is used to listen to sounds of the heart, lungs, abdomen, and cardiovascular system. The bell and diaphragm are illustrated in Figure 25-3. The bell of the stethoscope is pressed lightly against the body part to listen to low-pitched sounds, such as abnormal cardiovascular sounds. The diaphragm of the stethoscope is pressed firmly against the body part to listen to high-pitched sounds, such as normal heart sounds, breath sounds, and bowel sounds. When using the stethoscope, expose the body part to be auscultated and try to minimize environmental noises.

Ophthalmoscope

An ophthalmoscope is a lighted instrument used to visualize the interior structures of the eye. It consists of two parts: a body that contains the light source and a detachable head that contains lenses that magnify the internal eye structures. The head is secured in the body. The dial on the head, when depressed and turned, turns on the illumination. Several lenses are arranged on a wheel that controls the focus on structures in the eye. Each lens is labeled with a positive (black) or negative (red) number, with units of strength called diopters. Red numbers are used for near-sighted (myopic) patients, black numbers for far-sighted (hyperopic) patients. The zero lens is used when either the examiner or the patient has refractive errors.

Otoscope

An otoscope is a lighted instrument used to examine the external ear canal and the tympanic membrane. An attached speculum directs the light in a narrow beam to improve visualization of ear structures. The specula come in various sizes; use the largest speculum that will extend into the patient's ear canal.

Snellen Chart

The Snellen chart, used as a screening test for distant vision, consists of characters in 11 lines of different-sized type; the line of largest characters is at the top of the chart and the line of smallest characters is at the bottom. Scores ranging from 20/10 (the smallest line of characters) to 20/200 (the largest line of characters) are shown in the left-hand column, and distances are in the right-hand column next to the numbers.

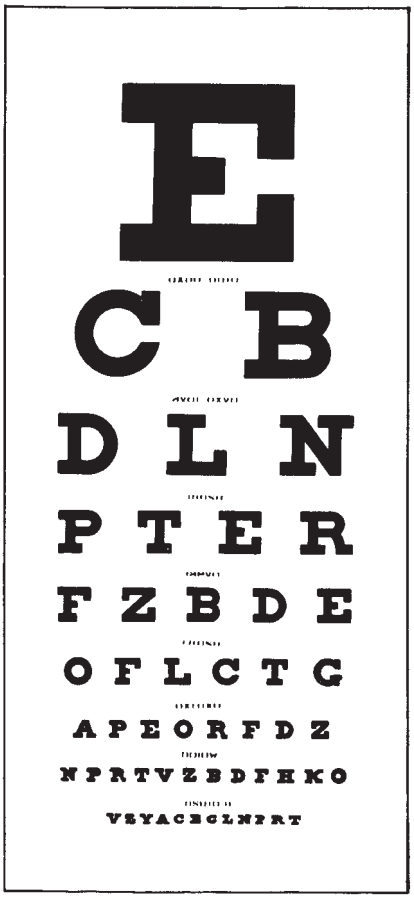
Nasal Speculum

A nasal speculum is used to visualize the lower and middle turbinates of the nose. A penlight or flashlight is used for illumination. The blades of the speculum are inserted about ½″ (1 cm) into each nostril and opened so that they do not press on the septum. Alternatively, the otoscope can be used to visualize the internal nares. The light is provided by the scope, and the shortest, widest speculum that will fit into the nostril is used.

Ophthalmoscope and otoscope set

Ophthalmoscope

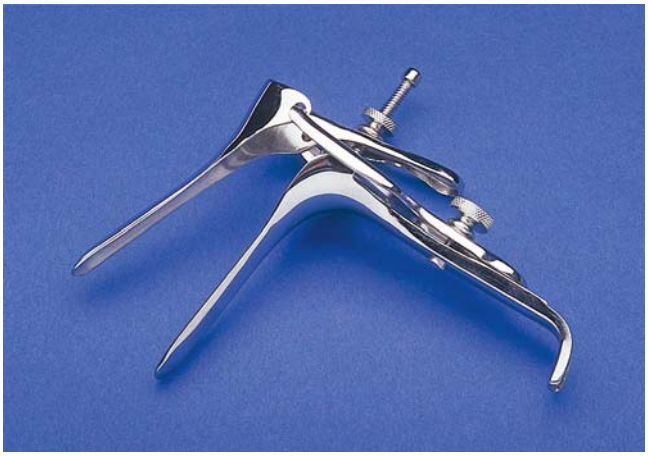
Otoscope



Snellen chart

Percussion hammer

Tuning forks



Vaginal speculum

Figure 25-2. Instruments used in the physical assessment. *(Photos © Ken Kasper.)*

Vaginal Speculum

A vaginal speculum is a two-bladed instrument used to examine the vaginal canal and cervix. The speculum is inserted into the vagina and the speculum blades are opened, allowing visualization and assessment of the vagina and cervix. The speculum must be warmed and lubricated with warm water or a water-soluble agent before insertion.

Remember Ramona Lewis, the college student who reported that she was a victim of date rape. A vaginal examination would be crucial for collecting data to confirm the rape. Warming and lubricating the speculum would be very important to provide patient comfort during this extremely upsetting time.

Figure 25-3. Stethoscope bell and diaphragm. Use the **bell** of the stethoscope to detect low-pitched sounds. The bell should be at least 1 inch wide. Hold the bell lightly against the body part being auscultated. Use the **diaphragm** of the stethoscope to detect high-pitched sounds. The diaphragm should be at least 1.5 inches wide for adults and smaller for children. Hold the diaphragm firmly against the body part being auscultated.

Tuning Fork

A tuning fork is a two-pronged metal instrument used to test auditory function and vibratory perception. The fork is activated to vibrate by gently tapping its prongs against the palm of the hand. Once vibrating, hold the fork at the base to avoid diminishing the vibration of the prongs.

Percussion Hammer

A percussion hammer (also called a reflex hammer) is an instrument with a rubber head used to test deep tendon reflexes. The hammer is held between the thumb and index finger to direct a brisk tap on the selected body area. The quick, firm tap is made with a rapid downward and backward wrist action. The pointed end of the hammer is used for smaller areas.

Positioning

A variety of positions are used during a physical assessment. During positioning, it is important to consider the patient's age, health status, mobility, physical condition, energy level, and privacy. Positioning patients who are weak or have physical limitations may require assistance. Uncomfortable or embarrassing positions should not be maintained for long periods. The assessment should be organized so that several body systems can be assessed with the patient in one position, thus minimizing unneeded and possibly tiring movements. Positions that may be used during a physical assessment are illustrated and described in Box 25-3.

Draping

Draping prevents unnecessary exposure, provides privacy, and keeps the patient warm during the physical assessment. Drapes may be paper, cloth, or bed linens. When conducting an assessment, expose only the body parts being assessed to maintain the patient's modesty and comfort.

Techniques of Physical Assessment

The four primary assessment techniques are:

- Inspection
- Palpation
- Percussion
- Auscultation

These assessments are primarily used in the sequence listed; variations are noted in the discussion of specific body areas later in the chapter. Bilateral body parts are always compared; for example, the assessment findings of one leg are compared with those of the other leg. Bilateral body parts are normally symmetric; that is, they have the same size and shape as well as the same characteristics, such as movement or pulses.

Inspection

Inspection is the process of performing deliberate, purposeful observations in a systematic manner. The nurse observes visually but also uses hearing and smell to gather data throughout the assessment. Inspection begins with the initial patient contact and continues through the entire assessment. Adequate natural or artificial lighting is essential for distinguishing the color, texture, and moisture of body surfaces. A quiet environment allows sounds to be heard.

Inspect each area of the body for size, color, shape, position, and symmetry, noting normal findings and any deviations from normal. Inspection may be combined with the palpation phase of the assessment, with inspection preceding palpation.

Palpation

Palpation is an assessment technique that uses the sense of touch. The hands and fingers are sensitive tools and can assess temperature, turgor, texture, moisture, vibrations, and shape. Certain parts of the hand are more effective at assessing different things (Fig. 25-4). The dorsum (back) surfaces of the hand and fingers are used for gross measure of temperature. The palmar (front) surfaces of the fingers and finger pads are used to assess texture, shape, fluid, size, consistency, and pulsation. Vibration is palpated best with the palm of the hand.

The nurse's hands should be warm and the fingernails short. Any area of tenderness is palpated last. Light, moderate, or deep palpation may be used, the depth being controlled by the amount of pressure applied. For light palpation, apply light pressure with the fingers together depressing the skin and underlying structures less than 1 cm (0.5″) (see Fig. 25-5A). Moderate palpation is conducted by depressing the skin surface 1 to 2 cm (0.5″ to 0.75″). For deep palpation, press inward about 2 cm (1″) (see Fig. 25-5B). Deep palpation, which carries a risk of internal injury, should be used cautiously and only after considerable practice.

Applying intermittent pressure to a specific area allows assessment of surface characteristics and underlying struc-

TABLE 25-1 Summary of a Comprehensive Physical Assessment

Component	Equipment (as needed)	Assessment Parameters
General survey	• Scales • Sphygmomanometer • Stethoscope	• Observe general appearance, hygiene, posture, gait, thought processes, speech patterns. • Evaluate height and weight. • Take vital signs.
Integument	• Gloves	• Skin: Inspect for color and lesions; palpate for temperature, texture, and moisture. • Hair: Inspect for texture, loss, unusual growth, and infestations. • Nails: Inspect for color and condition.
Head and neck	• Gloves • Snellen chart • Ophthalmoscope • Otoscope • Tongue depressor	• Skull and face: Inspect for shape and symmetry. • Neck: Palpate trachea and thyroid gland. • Lymph nodes: Palpate for size, shape, consistency, and tenderness. • Eyes: Test visual acuity, extraocular movements, and peripheral vision; inspect for discharge, alignment, and internal structures. • Ears: Test hearing acuity; inspect position, external ear, tympanic membrane, and for cerumen. • Nose, mouth, throat: Inspect for color, consistency, condition of teeth, exudate, condition of tonsils; palpate for tenderness.
Thorax and lungs	• Gloves • Stethoscope • Tape measure	• Thorax: Inspect posture and respiratory rate; palpate for crepitus and expansion; percuss for tones; auscultate breath sounds. • Breasts: Inspect size, shape, symmetry, color, areolas, nipple (discharge), retraction, dimpling; palpate for masses or tenderness. • Axillary lymph nodes: Palpate for size, shape, consistency, and tenderness.
Cardiovascular	• Stethoscope • Watch with a second hand	• Carotid arteries: Auscultate for bruit; palpate pulse strength. • Jugular vein: Inspect for pulsations and distention. • Precordium: Inspect for pulsations; palpate apical impulse, pulsations, and heart rate and rhythm; auscultate heart sounds and murmurs.
Peripheral vascular	• Stethoscope • Doppler (if needed)	• Peripheral pulses: Palpate for symmetry, character, strength, rate, patency • Arms and legs: Inspect for color, hair pattern, veins, lesions, and edema; palpate for temperature.
Abdomen	• Stethoscope	• Abdomen: Inspect for size, shape, contour, lesions, distention, and hernia; percuss for tones; palpate for tenderness. • Bowel sounds: Auscultate for intensity, frequency, and pitch. • Liver: Percuss and palpate for location and consistency/size; palpate for tenderness. • Aorta: bruits, pulsation **Remember: Sequence of techniques is different for the abdomen: inspection, auscultation, percussion, then palpation.**
Male genitalia	• Gloves	• Penis: Inspect for inflammation, infestations, rashes, lesions, masses, and discharge. Palpate for masses. • Scrotum and testes: Inspect for inflammation, edema, and lesions; palpate for masses.
Female genitalia	• Gloves • Speculum • Lubricant • Applicators • Culture tubes • Pap test supplies	• External genitalia: Inspect for inflammation, infestations, rashes, lesions, masses, discharge (color, odor, amount), swelling, and bulging out of vagina. • Uterus: Palpate for size, position, shape, and consistency. • Ovaries: Palpate for size, shape, mobility, and tenderness.

(continued)

TABLE 25-1 Summary of a Comprehensive Physical Assessment *(continued)*

Component	Equipment (as needed)	Assessment Parameters
Anus, rectum, prostate	• Gloves • Lubricant • Occult blood test	• Anus: Inspect and palpate for hemorrhoids, lumps, ulcers, fissures. • Stool: Inspect for color; test for occult blood. • Prostate: Palpate for size, shape, consistency, and tenderness.
Musculoskeletal	None	• Gait: Inspect gait and posture. • Joints and muscles: Inspect for size, symmetry, color, and edema; palpate for nodules, crepitus, and strength. • Joints: Test range of motion.
Neurologic	• Reflex hammer • Sharp/dull objects • Aromatic scents	• Mental status: Assess level of awareness; level of consciousness; dress, grooming, hygiene; speech; thought processes; and memory and abstract reasoning. • Cranial nerves: Test ability to smell, see, clench teeth, move eyes, have facial expressions, hear, taste, feel touch, swallow, shrug shoulders against resistance, and protrude tongue. • Fine motor movement: Test ability to repeatedly touch nose with hand, pat knees with palms and backs of hands, and run heel down opposite shin. • Sensory: Test ability to distinguish between sharp and dull touch. • Reflexes: Assess degree of response.

Not all assessments on this table are discussed in the narrative. Please consult an assessment textbook for additional information.

tures. Two hands are used for bimanual palpation (eg, palpating breast tissue); one hand applies pressure and the other hand feels the tissue or structure. Characteristics of masses, as determined by palpation, are described in Table 25-2.

Percussion

Percussion is the act of striking one object against another to produce sound. The sound waves produced by the striking action over body tissues are known as percussion tones. Percussion is used to assess the location, shape, size, and density of tissues.

Both hands are used to produce sound waves. The nondominant hand is placed directly on the area to be percussed, with the fingers slightly separated and the middle finger placed firmly on the body surface (Fig. 25-6A). The other hand (dominant hand) provides the striking force, initiated by a sharp downward wrist movement with the forearm stationary and the wrist relaxed. The tip of the middle finger of the dominant hand strikes the middle finger of the opposing hand (see Fig. 25-6B). This action produces a vibration that allows discrimination among five different tones, described in Table 25-3.

Auscultation

Auscultation is the act of listening with a stethoscope to sounds produced within the body. Auscultation is performed by placing the stethoscope diaphragm or bell against the body part being assessed. When auscultating, the nurse should expose the part listened to, use the proper part of the bell for specific sounds, and (if possible) listen in a quiet environment.

Four characteristics of sound are assessed by auscultation: (1) pitch (ranging from high to low); (2) loudness (ranging from soft to loud); (3) quality (eg, gurgling or swishing); and (4) duration (short, medium, or long).

GUIDELINES FOR PERFORMING HEALTH ASSESSMENT

Although there are various organizing structures for conducting a physical assessment, one often used proceeds from head to toe. Although each body system is discussed individually here, in reality nurses usually combine several systems (eg, while assessing the head and neck they also assess the cranial nerves, which is part of the neurological system). The accompanying head-to-toe assessment video demonstrates proper technique.

General Survey

The general survey is the first component of the physical assessment. Information from the general survey provides clues to the overall health of the patient. It includes observing the patient's overall appearance and behavior, taking vital signs, and measuring height and weight.

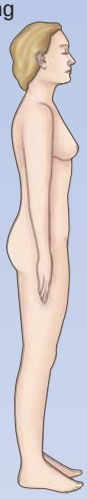
Appearance and Behavior

Information about the patient's appearance and behavior is usually gathered when taking the health history. Assessing

BOX 25-3 Positions Used in Physical Assessment

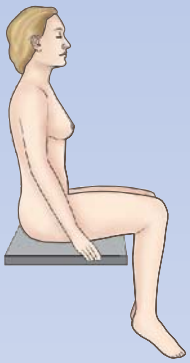
Standing
The patient stands erect. This position should not be used for patients who are weak, dizzy, or prone to fall. It is used to assess posture, balance, and gait (while walking upright).

Standing



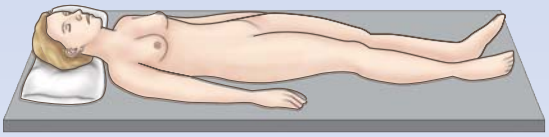
Sitting
The patient may sit in a chair or on the side of the bed or examining table, or remain in bed with the head elevated. It allows visualization of the upper body, facilitates full lung expansion, and is used to assess vital signs and the head, neck, anterior and posterior thorax, lungs, heart, breasts, and upper extremities.

Sitting



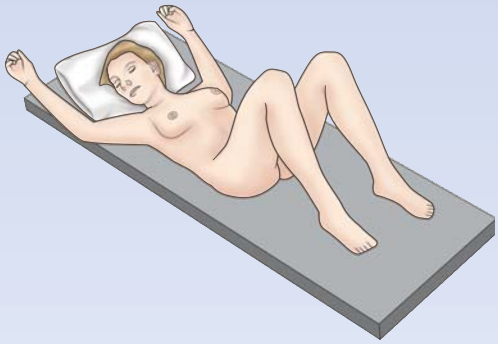
Supine
The patient lies flat on the back with legs extended and knees slightly flexed. It facilitates abdominal muscle relaxation and is used to assess vital signs and the head, neck, anterior thorax, lungs, heart, breasts, abdomen, extremities, and peripheral pulses.

Supine



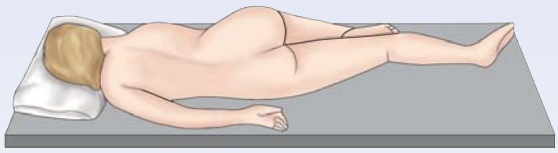
Dorsal Recumbent
The patient lies on the back with legs separated, knees flexed, and soles of the feet on the bed. It should not be used for abdominal assessment because it causes contraction of the abdominal muscles. It is used to assess the head, neck, anterior thorax, lungs, heart, breasts, extremities, and peripheral pulses.

Dorsal recumbent



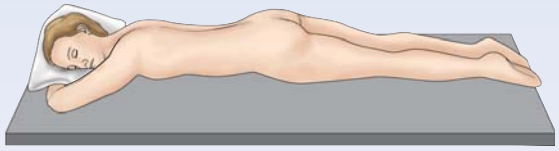
Sims Position
The patient lies on either side with the lower arm below the body and the upper arm flexed at the shoulder and elbow. Both knees are flexed, with the upper leg more acutely flexed. It is used to assess the rectum or vagina.

Sims



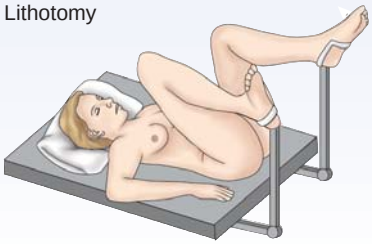
Prone
The patient lies flat on the abdomen with the head turned to one side. It is used to assess the hip joint and the posterior thorax.

Prone



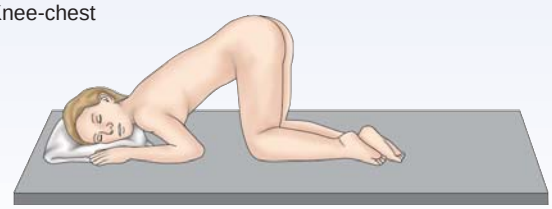
Lithotomy
The patient is in the dorsal recumbent position with the buttocks at the edge of the examining table and the heels in stirrups. It is used to assess female genitalia and rectum.

Lithotomy



Knee-chest
The patient kneels, with the body at a 90-degree angle to the hips, back straight, arms above the head. It is used to assess the anus and rectum.

Knee-chest



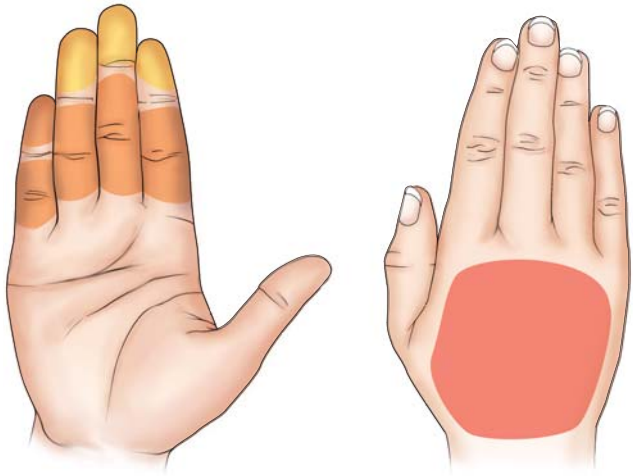


Figure 25-4. (*Left*) Palmar surfaces of the examiner's fingertips and finger pads are used for discriminatory sensation, such as texture, vibration, presence of fluid, or size and consistency of a mass. (*Right*) The dorsum, or back of the hand, is used to assess surface temperature.

TABLE 25-2 Characteristics of Masses Determined by Palpation

Quality	Characteristics to Determine
Shape	Round Ovoid Tubular Irregular
Size	Measured in centimeters
Consistency	Firm Edematous Spongy Cystic
Surface	Smooth Nodular Granular
Mobility	Fixed or nonmobile Mobile
Tenderness	Amount of tenderness to touch
Pulsatile	Pulsation can or cannot be felt in the mass

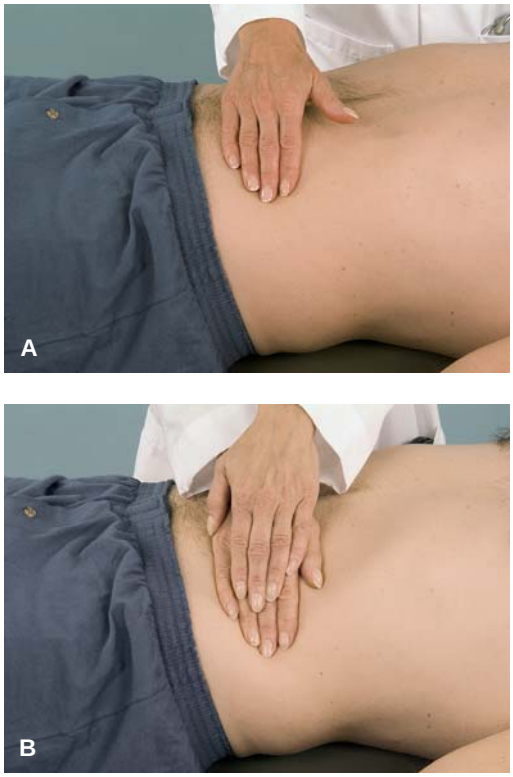


Figure 25-5. Degrees of palpation. (**A**) In light palpation, light pressure is applied by placing the fingers together and depressing the skin and underlying structures about ½ inch (1 cm). (**B**) Deep palpation is used with caution. The skin and underlying structures are depressed about 1 inch (2 cm). *(Photos by B. Proud.)*

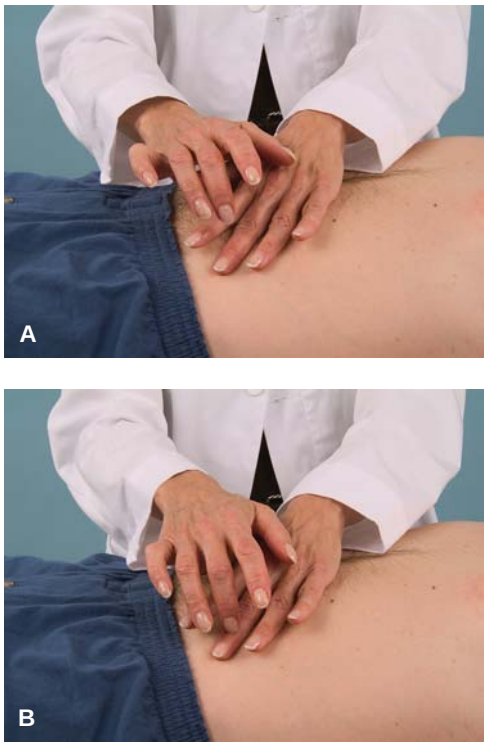


Figure 25-6. Percussion is used to access the location, shape, size, and density of tissues. (**A**) The nondominant had is placed directly on the area to be percussed, and the middle finger is placed firmly on the body surface. (**B**) The tip of the middle finger of the dominant hand strikes the joint of the middle finger of the opposite hand. *(Photos by B. Proud.)*

TABLE 25-3 Percussion Tones

Tone	Relative Intensity	Sample Location
Flat	Soft	Thigh
Dull	Medium	Liver
Resonance	Loud	Normal lung
Hyperresonance	Very loud	Emphysematous lung
Tympany	Loud	Gastric air bubble or puffed-out cheek

appearance provides information about various aspects of the patient's health. Inspect the patient's body build, posture, and gait. Note proportion of height to weight, providing insight into nutritional status. Note whether the patient has erect or slumped posture. Note coordination of movements and pattern of gait. Uncoordinated or spontaneous movements may suggest neurologic problems.

Observe hygiene and grooming (cleanliness, body odors). Note any deficits. These may indicate other problems. For example, patients with inappropriate dress (eg, wrong for the season) or worn or dirty clothing may have depression or inadequate financial resources.

Note signs of illness, such as changes in posture, skin color, and respirations; nonverbal communication of pain or distress; and short attention span.

Assess affect, attitude, and mood. Speech, facial expressions, ability to relax, eye contact, and behavior all provide clues to mood and mental health. If you suspect depression, anxiety, or other mental health disorders, use appropriate screening tools and refer as necessary. Box 25-4 presents the Geriatric Depression Scale, a useful tool in screening older adults for depression. The questionnaire is given to patients to complete.

Assess cognitive processes (speech content and patterns, orientation, and appropriate verbal responses). As cognitive processes are controlled by the neurological system, these are discussed further under that section.

Think back to Tammy Browning, the pregnant woman with a history of substance abuse. The nurse would perform a general survey of the patient to determine any findings suggestive of recent substance use.

Vital Signs

Vital signs are measured to establish a baseline for the database and to detect actual or potential health problems. Vital signs are discussed in detail in Chapter 24.

Height and Weight

The ratio of height and weight is an assessment of overall health, hydration status, and nutrition. Height and weight should be measured using accurate scales and measuring devices. The patient should remove shoes and heavy clothing if the measurements are taken before undressing. If the patient cannot stand erect, weight can be obtained using chair scales or bed scales. The patient's actual height and weight can be compared with recommended average weights on a standardized chart as a general guideline for assessing nutritional status and health (see the Guidelines for Nursing Care 25-1). Table 25-4 provides a height and weight table for use as a standard reference.

Children to 2 years of age should have their height measured in the recumbent position with the legs fully extended. Infants should be weighed without any clothing, and children should be weighed in their underwear.

Assessing the Integument

Integumentary assessment includes the skin, nails, hair, and scalp. Assessing the integumentary structures provides information about the patient's overall health status, as well as clues to local or systemic health problems. It also provides data about self-care activities to maintain health, hygiene, and nutrition. Assessing for skin cancer is essential and provides the base for teaching skin cancer prevention.

Health History

Identify risk factors for altered health during the health history by asking about the following:

- History of rashes, lesions, change in color, or itching
- History of bruising or bleeding in the skin
- History of allergies to medications, plants, foods, or other substances
- Exposure to the sun and sunburn history
- Presence of lesions (wounds, bruises, abrasions, or burns)
- Change in the color, size, or shape of a mole
- Recent chemotherapy or radiation therapy
- Exposure to chemicals that may be harmful to the skin, hair, or nails
- Degree of mobility
- Types of food eaten and liquids consumed each day

Physical Assessment

The skin, hair, and nails are assessed by inspection and palpation. Ask the patient to remove all clothing and put on an examination gown (if appropriate). The patient remains in the sitting position for most of the examination but will need to stand or lie on the side when the posterior part of the body is examined. Protect the patient's privacy by exposing only the body part being examined. If the patient has lesions, wear gloves during palpation.

Skin

The skin is a general indicator of the patient's health status and provides information that might indicate an underlying disease.

BOX 25-4 Geriatric Depression Scale (GDS)

Instructions: Circle the answer that best describes how you felt over the past week.

1. Are you basically satisfied with your life?	yes	no
2. Have you dropped many of your activities and interests?	yes	no
3. Do you feel that your life is empty?	yes	no
4. Do you often get bored?	yes	no
5. Are you in good spirits most of the time?	yes	no
6. Are you afraid that something bad is going to happen to you?	yes	no
7. Do you feel happy most of the time?	yes	no
8. Do you often feel helpless?	yes	no
9. Do you prefer to stay at home, rather than going out and doing things?	yes	no
10. Do you feel that you have more problems with memory than most?	yes	no
11. Do you think it is wonderful to be alive now?	yes	no
12. Do you feel worthless the way you are now?	yes	no
13. Do you feel full of energy?	yes	no
14. Do you feel that your situation is hopeless?	yes	no
15. Do you think that most people are better off than you are?	yes	no
Total Score	_____	

Scoring Instructions

Instructions: Score one point for each bolded answer. A score of 5 or more suggests depression.

1. Are you basically satisfied with your life?	yes	no
2. Have you dropped many of your activities and interests?	yes	no
3. Do you feel that your life is empty?	yes	no
4. Do you often get bored?	yes	no
5. Are you in good spirits most of the time?	yes	no
6. Are you afraid that something bad is going to happen to you?	yes	no
7. Do you feel happy most of the time?	yes	no
8. Do you often feel helpless?	yes	no
9. Do you prefer to stay at home, rather than going out and doing things?	yes	no
10. Do you feel that you have more problems with memory than most?	yes	no
11. Do you think it is wonderful to be alive now?	yes	no
12. Do you feel worthless the way you are now?	yes	no
13. Do you feel full of energy?	yes	no
14. Do you feel that your situation is hopeless?	yes	no
15. Do you think that most people are better off than you are?	yes	no
A score of ≥ 5 suggests depression ***Total Score***	_____	

Ref. Yesavage: The use of Rating Depression Series in the Elderly, in Poon (ed.): Clinical Memory Assessment of Older Adults, American Psychological Association, 1986.

The assessment begins with an overall inspection of the skin's condition. Specific areas of the skin can be assessed during other body system assessments (eg, you may assess the skin on the abdomen while performing other abdominal assessments). Adequate lighting is essential for accurate assessments. Inspect the skin for color, vascularity, and lesions (Fig. 25-7) and palpate for temperature, moisture, turgor, and texture.

Inspecting Skin Color

Skin color varies among races and among individuals, ranging from a pinkish white to various shades of brown. Skin areas that are normally exposed, such as the face and hands, may have a somewhat different color from areas that are usually covered by clothing, but otherwise skin color is relatively constant. Special care must be taken to detect color changes in dark-skinned patients, such as African Americans, Hispanics, Native Americans, people of Mediterranean descent, and whites who are deeply suntanned. Some body areas of dark-skinned people, such as the palms of the hands and the soles of the feet, normally have less pigmentation than other body areas.

Changes in skin color include erythema, cyanosis, jaundice, and pallor (Table 25-5). These color changes are often easier to assess in light-skinned people. **Erythema** (redness of the skin) is more often seen in the face and the neck. It is associated with sunburn, inflammation, fever, trauma, and allergic reactions.

Think back to Billy Collins, the child who was stung by a bee. The nurse would use inspection skills to observe for erythema in the area of the sting.

Cyanosis is a bluish or grayish discoloration of the skin in response to inadequate oxygenation. Cyanosis is assessed as a blue tinge in patients with white skin and as dullness in

Guidelines for Nursing Care 25-1

Obtaining Height and Weight With an Upright Balance Scale

Obtaining Height

- Ask the patient to remove shoes.
- Raise L-shaped sliding arm on the measuring device attached to the scale somewhat higher than the patient's approximate height.
- Ask the patient to step on the platform of the scale and stand erect with the back to the measuring device and the heels together.
- Lower the L-shaped sliding arm until it rests on top of the patient's head.
- Read the height in inches and record.
- Ask the patient to step down from the platform.

Obtaining Weight

- Balance the scale on zero.
- Ask the patient to remove shoes (and coat, if appropriate) and step onto the platform.
- Move the sliding indicator to the left until the scale balances.
- Read the weight in pounds and record.
- Ask the patient to step down from the platform.
- Return the scale weight indicator to zero.
- Considerations: Daily weights should be obtained at the same time each day (usually early morning), with the patient wearing the same clothing, and using the same scale.

© B. Proud.

patients with dark skin. **Jaundice** is a yellow color of the skin resulting from liver and gallbladder disease, some types of anemia, and hemolysis. It usually develops first in the sclera of the eyes and then in the skin and mucous membranes. Jaundice in dark-skinned people is more difficult to observe on the trunk of the body, but the sclera, oral mucous membranes, palms, and soles appear yellow to yellow-orange. **Pallor,** or paleness of the skin, often results from an inadequate amount of circulating blood or hemoglobin, causing inadequate oxygenation of the body tissues. Depending on severity, pallor may be visible over the entire skin surface or only in the lips, nailbeds, mucous membranes, and conjunctiva. Pallor in dark-skinned people is seen as an ashen gray or yellow tinge.

Inspecting Skin Vascularity

Inspect the skin for vascularity, bleeding, or bruising; these signs might relate to a cardiovascular, hematologic, or liver dysfunction. **Ecchymosis** is a collection of blood in the subcutaneous tissues, causing purplish discoloration. **Petechiae** are small hemorrhagic spots caused by capillary bleeding. If they are present, assess their location, color, and size.

Remember Ramona Lewis, the college student reporting a rape. The nurse would inspect the patient for signs and symptoms of trauma, including any bruising or petechiae. These findings would be important objective data to help substantiate the rape.

Inspecting Skin Lesions

Inspect the skin for lesions, which are areas of diseased or injured tissue. Note bruises, scratches, cuts, insect bites, and wounds. Lesions are categorized as primary, which may arise from previously normal skin, and secondary, which result from changes in primary lesions (Tables 25-6 and 25-7). Assess wounds (breaks in the continuity of the skin) for size, shape, depth, location, and presence of drainage or odor. (Wounds are discussed in Chap. 38.) Scars are healed wounds. Describe

TABLE 25-4 Height and Weight Table

Weight (lb) Men*				Weight (lb) Women†			
Height	Small Frame	Medium Frame	Large Frame	Height	Small Frame	Medium Frame	Large Frame
5′ 2″	128–134	131–141	138–150	4′ 10″	102–111	109–121	118–131
5′ 3″	130–136	133–143	140–153	4′ 11″	103–113	111–123	120–134
5′ 4″	132–138	135–145	142–156	5′ 0″	104–115	113–126	122–137
5′ 5″	134–140	137–148	144–160	5′ 1″	106–118	115–129	125–140
5′ 6″	136–142	139–151	146–164	5′ 2″	108–121	118–132	128–143
5′ 7″	138–145	142–154	149–168	5′ 3″	111–124	121–135	131–147
5′ 8″	140–148	145–157	152–172	5′ 4″	114–127	124–138	134–151
5′ 9″	142–151	148–160	155–176	5′ 5″	117–130	127–141	137–155
5′ 10″	144–154	151–163	158–180	5′ 6″	120–133	130–144	140–159
5′ 11″	146–157	154–166	161–184	5′ 7″	123–136	133–147	143–163
6′ 0″	149–160	157–170	164–188	5′ 8″	126–139	136–150	146–167
6′ 1″	152–164	160–174	168–192	5′ 9″	129–142	139–153	149–170
6′ 2″	155–168	164–178	172–197	5′ 10″	132–145	142–156	152–173
6′ 3″	158–172	167–182	176–202	5′ 11″	135–148	145–159	155–176
6′ 4″	162–176	171–187	181–207	6′ 0″	138–151	148–162	158–179

* Weights at ages 25 to 59 yr are based on lowest mortality. Weights in pounds are according to frame (in indoor clothing weighing 5 lb, shoes with 1-inch heels).
† Weights at ages 25 to 59 yr are based on lowest mortality. Weights in pounds are according to frame (in indoor clothing weighing 3 lb, shoes with 1-inch heels).

rashes (skin eruptions) in terms of their type, size, elevation, coloring, and presence of drainage or itching. Document the exact body surface areas involved.

Palpating Skin Temperature, Texture, Moisture, and Turgor

The skin is normally warm and dry. An increase in skin temperature and moisture can indicate an elevated body temperature. The texture of the skin may vary from smooth and soft to rough and dry. In the dehydrated patient, the texture is dry, loose and wrinkled and the mucous membranes are cracked and dry. An excessive amount of perspiration, such as when the entire skin is moist, is called diaphoresis.

Figure 25-7. The skin is inspected for color, vascularity, and lesions. *(Photo © B. Proud.)*

Turgor is the fullness or elasticity of the skin and is usually assessed on the sternum or under the clavicle. Normal turgor results in elasticity of the skin; it can be picked up in a fold and returns to its shape when released. When the patient is dehydrated, the skin's elasticity is decreased, and the skin fold returns to normal slowly; however, this may be a normal finding in older patients (Fig. 25-8).

Difficulty in lifting a skin fold may indicate **edema** (excess fluid in the tissues). Edema is characterized by swelling, with taut and shiny skin over the edematous area. If the area of edema is palpated with the fingers, an indentation may remain after the pressure is released; this is called pitting edema. Edema may be graded as 0 (none), +1 (trace, 2 mm), +2 (moderate, 4 mm), +3 (deep, 6 mm), or +4 (very deep, 8 mm). Edema may be the result of overhydration, heart failure, kidney failure, trauma, or peripheral vascular disease.

Nails

The nails are inspected for shape, angle, texture, and color. The nails should be somewhat convex and should follow the natural curve of the finger. The angle between the nail and its base in the finger should be about 160 degrees. The nails should be smooth, and the nail base, when palpated, should be firm and nontender. Abnormal findings include indentations

TABLE 25-5 Skin Color Assessment

Color Variations	Assessment Areas	Possible Causes
Redness (erythema; flushing)	Facial area, localized area of skin on the body	Blushing, alcohol intake, fever, injury trauma, infection
Bluish (cyanosis)	Exposed areas, particularly the ears, lips, inside of the mouth, hands and feet, nailbeds	Cold environment, cardiac or respiratory disease (decreased oxygenation)
Yellowish (jaundice)	Overall skin areas, mucous membranes, and sclera	Liver disease (increase in bilirubin levels)
Paleness (pallor)	Exposed areas, particularly the face and lips, conjunctivae, and mucous membranes	Anemia (decreased hemoglobin) Shock (decreased blood volume)
Vitiligo (whitish patchy areas on the skin)	Overall skin areas, lips, nailbeds, conjunctivae	Depigmentation (congenital or autoimmune conditions)
Tanned or brown	Sun-exposed areas	Overexposure (increased melanin production), pregnancy (brown spots)

called Beau's lines (from acute illness); infection; painless separation of the nail plate from the nailbed (onycholysis) from infection or trauma; increased brittleness or thickness and angulation (from anemia or iron deficiency anemia); and clubbing (from long-term lack of oxygenation). Figure 25-9 illustrates nail abnormalities.

Hair and Scalp

The hair is normally resilient, evenly distributed, and neither excessively dry nor oily. Hair is found on all body surfaces except the palms of the hands, the soles of the feet, and parts of the genitalia. Assess the hair for color, texture, and distribution. Abnormal findings include unusual balding (alopecia) and excessive amounts of hair on the face and body (hirsutism). Hair loss may be the result of chemotherapy, radiation therapy, infection, hormone disorders, or inadequate nutrition. Decreased oxygenation of peripheral tissues, especially of the lower extremities, may cause loss of hair. Excessive hair growth may occur in persons with hormone disorders.

Separate the hair to inspect the scalp for color, dryness, scaliness, lumps, lesions, or lice. Nits, which are the white eggs of lice, can be differentiated from dandruff or lint because they are attached to the hair shaft. If any lumps or masses are palpated, note their location, size, tenderness, and mobility.

Figure 25-8. To assess skin turgor, a small fold of skin is picked up and then released to return to its normal shape. Difficulty in lifting a skin fold may indicate presence of edema. *(Photo © B. Proud.)*

Normal Age-Related Variations

Infant/Child

Common skin variations in newborns and children include:

- Jaundice and milia (whiteheads) in newborns
- Fine downy hair (lanugo) for the first 2 weeks of life
- Smooth, thin skin at birth
- Pubic hair development at the onset of puberty

Older Adult

Common skin variations in the older adult include:

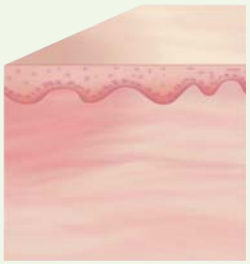
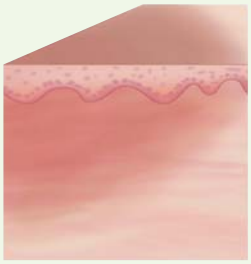
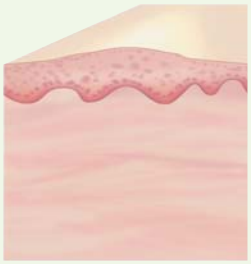
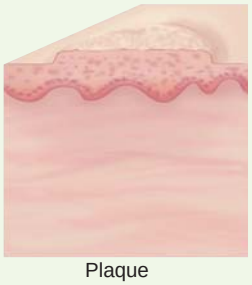
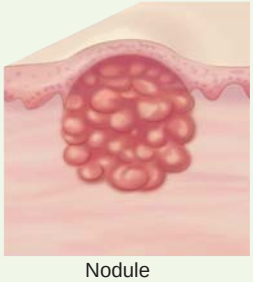
- Wrinkles, dryness, scaling, decreased turgor
- Raised dark areas (senile keratosis)
- Flat brown age spots (senile lentigines)
- Small round red spots (cherry angioma)
- Fine, brittle gray or white hair
- Hair loss
- Coarse facial hair in women, decreased body hair in men and women
- Thick, yellow toenails

Assessing the Head and Neck

Assessment of the head and neck includes the skull, face, eyes, ears, nose and sinuses, mouth and pharynx, trachea, thyroid gland, and lymph nodes. During the health history, note any health problems manifested by subjective report, such as headaches or dizziness. If the patient smokes, a discussion of ways to stop smoking should be included in the plan of care. Physical examination of the structures of the head and neck provides data about the shape and structure of cranial

(text continues on page 616)

TABLE 25-6 Primary Skin Lesions

Lesion Name	Description	Example	Illustration
Circumscribed, Flat, Nonpalpable Change in Skin Color			
Macule	Lesion ≤1 cm	Petechiae, freckle	 Macule
Patch	Lesion >1 cm	Vitiligo	 Patch
Palpable, Elevated Solid Masses			
Papule	Mass ≤0.5 cm	Mole	 Papule
Plaque	Mass >0.5 cm	Coalesced papules	 Plaque
Nodule	Mass 0.5–2 cm; firmer than a papule	Nevus (wart)	 Nodule

(continued)

TABLE 25-6 Primary Skin Lesions *(continued)*

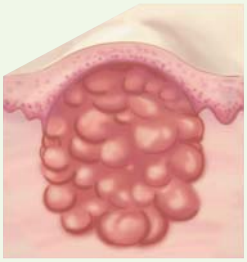
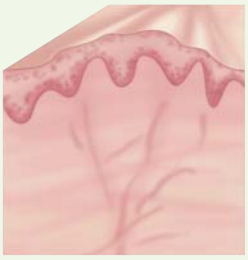
Lesion Name	Description	Example	Illustration
Tumor	Mass >2 cm	Lipoma	 Tumor
Wheal	Irregular, superficial area of localized skin edema	Hives, mosquito bite	 Wheal
Circumscribed, Superficial Skin Elevations Formed by Free Fluid in a Cavity Within the Skin Layers			
Vesicle	Filled with serous fluid, ≤0.5 cm	Herpes simplex	 Vesicle
Bulla	Filled with serous fluid, >0.5 cm	2nd-degree burn	 Bulla
Pustule	Filled with pus	Acne, impetigo	 Pustule

TABLE 25-7 Secondary and Miscellaneous Skin Lesions

Lesion Name	Description	Example
Secondary Lesions		
Loss of Skin Surface		
Erosion	Loss of superficial epidermis, moist, nonbleeding surface	Moist area after rupture of a vesicle, as in chickenpox
Ulcer	Loss of epidermis and dermis, may bleed and scar	Stasis ulcer
Fissure	Deep linear crack, extends into dermis	Athlete's foot
Material on the Skin Surface		
Crust	Dried residue of serum, pus, or blood	Impetigo
Scale	Thin flake of exfoliated dermis	Dandruff, dry skin
Miscellaneous Lesions		
Lichenification	Thickened and roughened epidermis, with increased visibility of skin furrows	Atrophic dermatitis
Atrophy	Thinning of the skin, loss of skin furrows, shiny appearance	Peripheral vascular disease
Excoriation	Scratch of the epidermis	
Scar	Fibrous tissue replaces tissue in the dermis or subcutaneous layer	
Keloid	Hypertrophied scar	
Other Common Skin Lesions, Not Technically Primary or Secondary		
Comedo	Plugged opening of a sebaceous gland, a hallmark of acne	Common blackhead
Telangiectasia	Small, dilated, red or bluish surface vessels; may be part of a basal cell carcinoma or skin injury from radiation	
Nevus	Flat to slightly elevated, round, evenly pigmented	Common mole

bones, function of special senses (sight, hearing, taste, and smell), nasal and oral structures, the size and consistency of the thyroid gland, and any swelling or pain in the lymph nodes in the neck.

Health History

Identify risk factors for altered health during the health history by asking about the following:

- Changes with aging in vision or hearing
- History of use of corrective lenses or hearing aids
- Loss of an eye (use of artificial eye)
- History of allergies
- History of disturbances in vision or hearing
- History of chronic illnesses, such as hypertension, diabetes mellitus, or thyroid disease
- Exposure to harmful substances or loud noises
- Exposure to ultraviolet light
- History of smoking, chewing tobacco, or cocaine use
- History of eye or ear infections
- History of head trauma
- History of persistent hoarseness
- Oral and dental care practices

Physical Assessment

Assess the structures of the head and neck with the patient seated.

Skull

Inspect and palpate the skull for size and shape. The parts of the head and face should be in proportion to each other and symmetric. Although the shape of the normal skull varies considerably, generally the shape is gently curved with prominences at the frontal and parietal bones. Abnormal findings include lack of symmetry or unusual size or contour of the skull (either may be the result of trauma or diseases affecting the growth of bone) and tenderness. If the skull of a child or an adult appears disproportionately large or small, measure the circumference. Measuring head circumference is a normal part of infant assessment to the age of 2 years and should be conducted at each visit.

Face

Inspect the face for color, symmetry, and distribution of facial hair. Edema of the face, especially around the eye (periorbital edema), and involuntary facial movements (eg, tics, fasciculations, and tremors) are abnormal findings. If abnormalities are noted, document their location, amount, and timing.

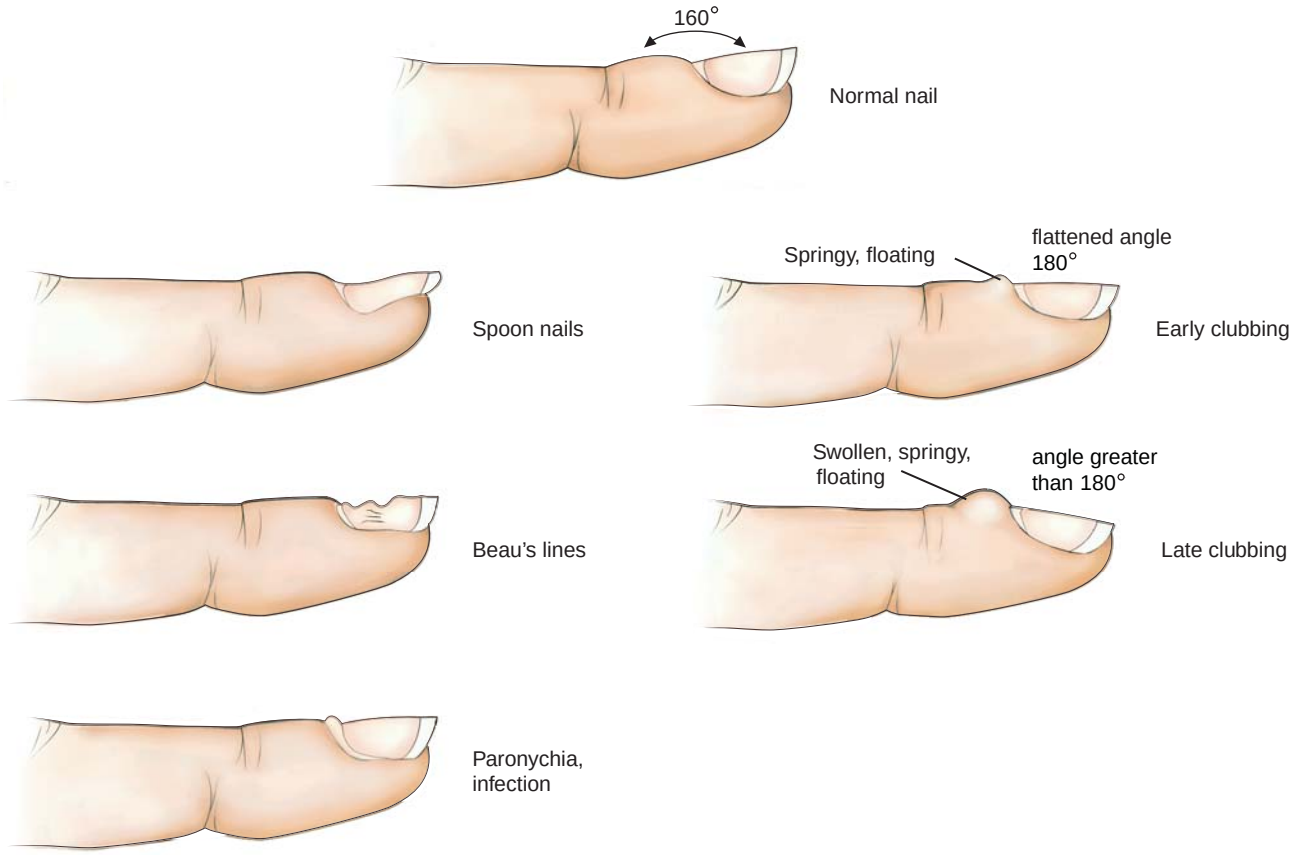


Figure 25-9. Examples of nail abnormalities.

Eyes

Assess the structures and functions of the eyes using a penlight, an ophthalmoscope, and an eye chart. The eyes are assessed primarily by inspection. Assessments of the eye include external and internal eye structures, visual acuity, extraocular movements, and peripheral vision. Figure 25-10 illustrates structures of the eye.

Inspecting External Eye Structures

Inspect the eyes, eyebrows, eyelids, eyelashes, lacrimal glands, pupils, and iris for position and alignment (Fig. 25-11). Inspect the eyes for symmetry and parallel alignment. Asymmetry of position and alignment may be caused by muscle weakness or a congenital abnormality. The eyebrows should have equal distribution, and the eyelashes should curl outward. Inspect the eyelids for color, edema, and equal coverage of the eyeball. Abnormal findings include drooping of the upper lids (ptosis), which may be attributable to damage to the oculomotor nerve, myasthenia gravis, or a congenital disorder; inward turning of the lower lid (entropion); outward turning of the lower lid (ectropion); and redness or drainage (from infection of the lid margins, conjunctivae, or hair follicles). Inspect and palpate the lacrimal glands for edema and pain.

The pupils are normally black, equal in size, round, and smooth. The pupils may be pale and cloudy if the patient has cataracts (loss of opacity of the lens). Injury to the eye, glaucoma, and certain medications may cause the pupil to dilate (mydriasis); certain drugs can cause constriction (miosis); and unequal pupils may result from central nervous system injury or illness.

Assess the pupils for their reaction to light and accommodation and for convergence (see Guidelines for Nursing Care 25-2). Decreased or absent pupillary response indicates blindness or serious brain damage. Inability of the eyes to accommodate or converge is abnormal.

Inspecting Internal Eye Structures

The internal eye is examined with the ophthalmoscope (Fig. 25-12) to assess the fundus, including the retina, optic nerve disc, macula, fovea centralis, and retinal vessels. Using the ophthalmoscope takes practice; guidelines for assessing the internal eye are listed in the Guidelines for Nursing Care 25-3. Normal findings are a uniform red reflex; a clear, yellow optic nerve disc; a reddish retina; and light-red arteries and dark-red veins, the veins being about 1.5 times as large as the arteries (Fig. 25-13).

Abnormal findings include cloudiness of the lens (from cataracts), changes in the size and shape of blood vessels (from hypertension or arteriosclerosis), and changes in color and surface characteristics (from such health problems as diabetes mellitus, hypertension, trauma, inflammation, or a detached retina).

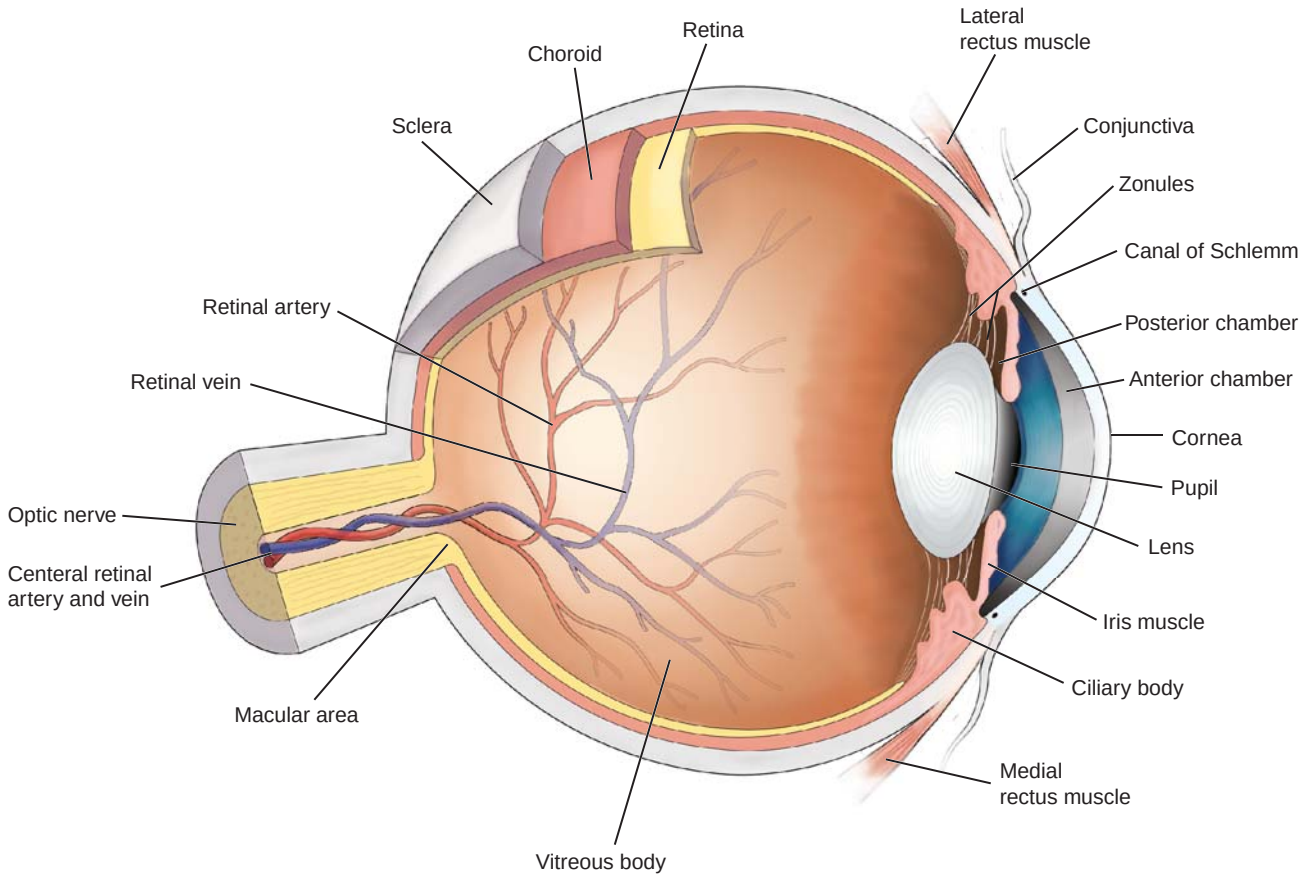


Figure 25-10. A cross-section of the eye.

Assessing Visual Acuity, Extraocular Movements, and Peripheral Vision

Assess visual acuity by placing the patient 20 feet from the Snellen chart and testing each eye. Ask the patient to read the smallest possible line of letters, first with both eyes and then with one eye at a time. Note whether the patient's vision is being tested with or without corrective lenses. Visual acuity is measured by standardized numbers listed on the side of the chart. The numerator is 20, representing the distance from which a person with normal vision (recorded as 20/20) can read the letters. The larger the denominator, the poorer the vision. Visual acuity is recorded as the smallest line of letters that can be read accurately with no more than two inaccurate readings (such as "20/30–2 with glasses").

Test extraocular movements by assessing the cardinal fields of vision for coordination and alignment. Normally both eyes move together, are coordinated, and are parallel (see Guidelines for Nursing Care 25-4). Tests for peripheral vision (or visual fields) are used to assess retinal function and optic nerve function. Full peripheral vision is normal (see Guidelines for Nursing Care 25-4).

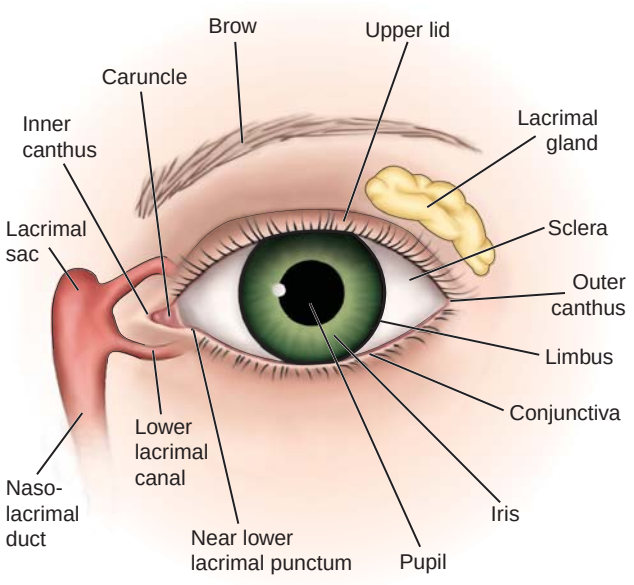


Figure 25-11. The eye and surrounding structures.

Ears

Assess the external ear, the middle ear, and the inner ear (Fig. 25-14). The patient remains seated while the nurse assesses the structure of the ears by inspection and palpation. An otoscope with the correct size of ear speculum may be used to inspect the ear canal; a tuning fork and ticking watch are used to assess hearing acuity.

Inspecting the External Ear

Inspect the external ear (Fig. 25-15) for shape, size, and lesions. The external surfaces of the ear should be smooth, and the shape and size of the ears should be symmetric and pro-

Guidelines for Nursing Care 25-2

Measuring Pupillary Reaction, Accommodation, and Convergence

Pupillary Reaction

- Ask the patient to look straight ahead.
- Bring the penlight from the side of the patient's face and briefly shine the light on the pupil (Figure A).
- Observe the pupil's reaction; it normally rapidly constricts (direct response) (Figure B).
- Repeat the procedure and observe the other eye; it too normally will constrict (consensual reflex).
- Repeat the procedure with the other eye.

Figure A. Assessing pupillary reaction.

Figure B. Pupillary gauge measures pupils (dilation or constriction) in millimeters (mm).

Accommodation

- Hold the forefinger, a pencil, or other straight object about 10 to 15 cm (4″ to 6″) from the bridge of the patient's nose (Figure C).
- Ask the patient to first look at the object, then at a distant object, then back to the object being held. The pupil normally constricts when looking at a near object and dilates when looking at a distant object.

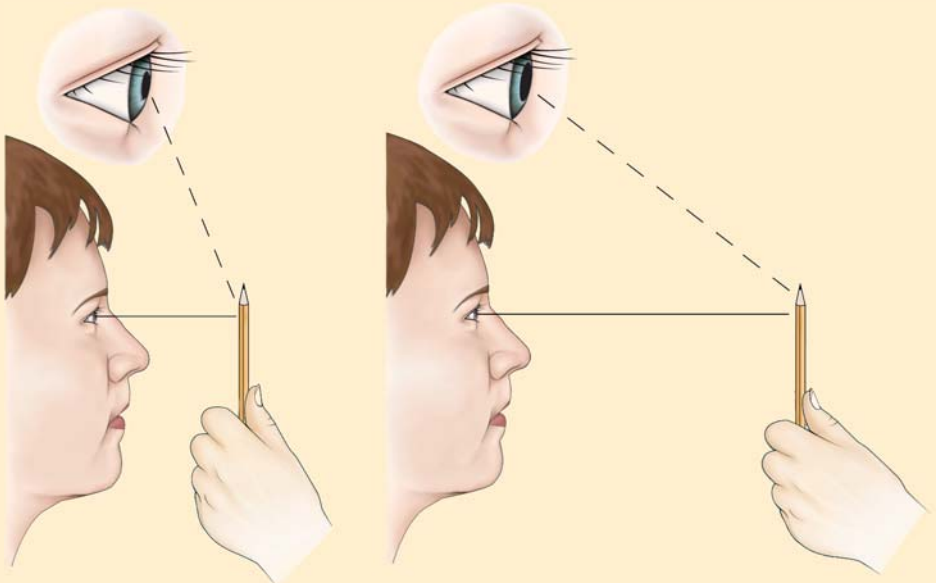


Figure C. Assessing accommodation.

(continued)

Guidelines for Nursing Care 25-2

Measuring Pupillary Reaction, Accommodation, and Convergence *(continued)*

Convergence

- Hold your finger about 6″ to 8″ from the bridge of the patient's nose.
- Move your finger toward the patient's nose to assess convergence (Figure D). The patient's eyes should normally converge (assume a cross-eyed appearance).

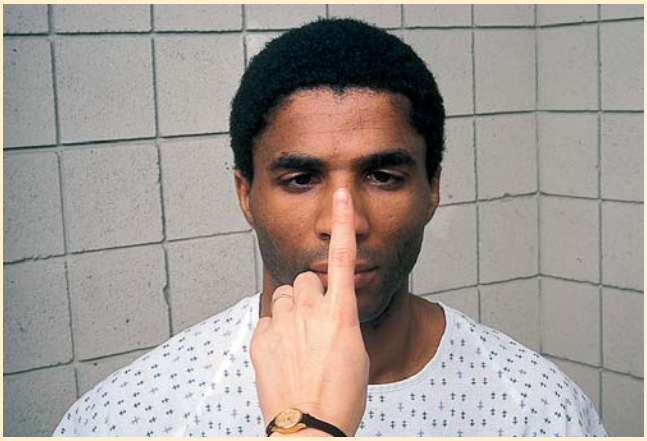


Figure D. Assessing convergence.

portional to the head. Abnormal findings of the external ear include unequal height and size, uneven color, and lesions.

Palpating the External Ear

Palpate the external ear gently for pain, edema, or presence of lesions. Pain when manipulating the pinna is a symptom of an infection of the external ear.

Inspecting the Ear Canal and Tympanic Membrane

The otoscope is used to examine the ear canal and the tympanic membrane with the patient sitting. Attach the largest speculum that will fit comfortably into the patient's ear to the otoscope. Insert the otoscope speculum as the patient's head is slightly tilted away from the examiner. To achieve better visualization, straighten the ear canal of the adult by gently pulling the pinna up and back. In children younger than 3 years of age, straighten the ear canal by pulling the pinna down and back.

Figure 25-12. Examination of the internal structures of the eye, using an ophthalmoscope. *(Photo by B. Proud)*

The ear canal should be smooth and pinkish. Examine for wax, discharge, and foreign bodies. The tympanic membrane should be intact, translucent, shiny, and gray (Fig. 25-16). There should be no redness or discharge.

Abnormal findings include redness of the canal (from inflammation or infection), mastoid tenderness (from infection), a red and swollen eardrum (symptoms of an infection in the middle ear), a perforated eardrum (from an infection causing rupture or trauma), wax plugs in the ear canal (from an accumulation of cerumen), and drainage (from an infection or foreign body in the ear canal).

Assessing Hearing and Sound Conduction

Assess hearing one ear at a time by determining whether the patient can hear a whispered voice or a ticking watch from a distance of 1 to 2 feet. Assess hearing acuity out of the patient's line of vision (to prevent lip-reading), with the opposite ear covered.

Tuning fork tests help assess the type of hearing loss. Hearing loss may be conductive (the result of a problem with the transmission of sound waves through the outer and middle ear); sensorineural (from inner ear damage); or mixed, a combination of both. Assess the patient for both bone conduction

Guidelines for Nursing Care 25-3

Assessing the Internal Eye

- Assemble the ophthalmoscope. Begin with the light setting at the large white light and the lens wheel at 0 setting.
- Darken the room and have the patient remove glasses. Allow time for the patient's pupils to dilate. The patient should be sitting.
- Sit facing the patient and ask him or her to look straight ahead during the examination.
- Keep both eyes open while looking through the ophthalmoscope viewer.
- Use your right hand and eye to examine the patient's right eye, and your left hand and eye for the patient's left eye.
- Shine the light on the pupil and observe the round red or orange glow (the red reflex).
- Focusing on the red reflex, slowly move the ophthalmoscope toward the patient's eye.
- Rotate the lens wheel until internal eye structures are sharp and clear.
- Follow blood vessels toward the midline to locate the optic disc; note color, size, shape, margins, and central area (physiologic cup).
- Follow blood vessels outward to each of the four quadrants, assessing color, size, and pattern.
- Ask the patient to look up, down, and from side to side, assessing the characteristics of the retina.
- Locate the macula by first locating the optic disc and then looking toward the patient's temple for a small circular structure near the disc; note color, characteristics, and area of reflected light (fovea centralis).

of sound and air conduction of sound with the Weber's test and the Rinne test. Guidelines for Nursing Care 25-5 discusses how to assess hearing with a tuning fork.

Normally, in the Weber's test, the sound is heard in both ears or is localized at the center of the head. Patients with conductive hearing loss hear the sound better in the affected ear because bone (in this case, the ossicles) transmits the sound directly to the ear. If the sound is heard better in the ear without a problem, it indicates damage to the inner ear or a nerve disorder.

Normally, in the Rinne test, air-conducted hearing is greater than bone-conducted hearing (documented as AC > BC). If the hearing loss is conductive, bone conduction will be the same or greater than air conduction.

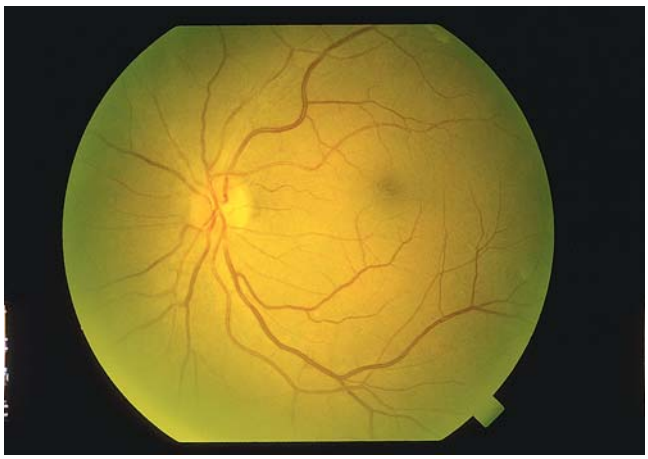


Figure 25-13. The normal fundus as seen through an ophthalmoscope.

Nose and Sinuses

Assess the nose by examining the external nose, the nares, and the turbinates (Fig. 25-17). The maxillary sinuses are located in the maxillary bone, the frontal sinuses in the frontal bone (Fig. 25-18). The nose is assessed by inspection and the sinuses by inspection and palpation. The patient sits with the head slightly tilted back.

Inspecting the Nose

Test the nose for patency by occluding one nostril at a time and asking the patient to inhale and exhale through the nose. Inspect each nostril using an otoscope with a short, wide tip or using a nasal speculum and penlight (Fig. 25-19). Examine the mucous membranes for color and the presence of lesions, exudate, or growths. Inspect the nasal septum for intactness and deviation. It is not necessary to use a nasal speculum with a child; push the tip of the nose upward with your thumb and shine a light into the nares. Normally, the nasal mucosa is moist and redder than the oral mucosa.

Abnormal findings are swelling of the mucosa, bleeding or discharge (indicating allergies with inflammation or infection), perforation or deviation of the nasal septum (cocaine use may cause perforation; a deviated septum may be congenital or from trauma), and polyps (often seen with chronic allergies).

Palpating the Sinuses

Palpate the frontal and maxillary sinuses for pain and edema. The frontal sinuses are palpated by gently pressing upward on the bony prominences located above each eye. The maxillary sinuses are palpated by gentle pressure on the bony

Guidelines for Nursing Care 25-4

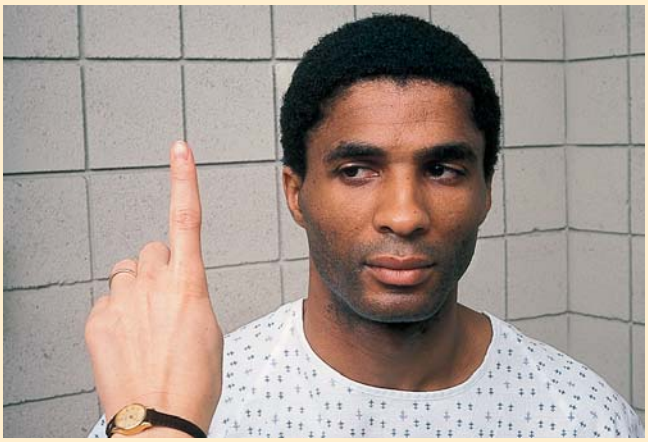
Assessing Extraocular Movements and Peripheral Vision

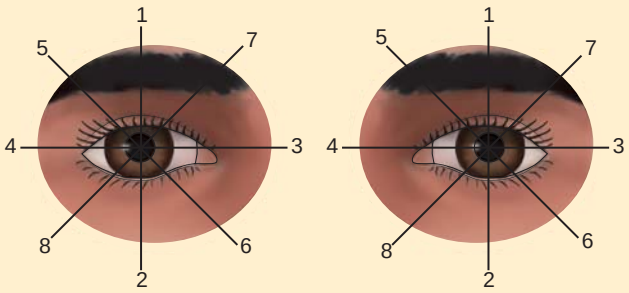
Extraocular Movements

- Ask the patient to sit or stand about 2 feet away, facing you sitting or standing at eye level with the patient.
- Ask the patient to hold the head still and follow the movement of your forefinger or a penlight with the eyes.
- Keeping your finger or light about 1 foot from the patient's face, move it slowly through the cardinal positions: up and down, left and right, diagonally up and down to the left, diagonally up and down to the right (see Figure).

Peripheral Vision

- Have the patient stand or sit about 2 feet away, facing you at eye level.
- Ask the patient to cover one eye with a hand or an index card.
- Ask the patient to look directly at your nose and fix his or her eyes on that spot.
- Cover your own eye opposite the patient's closed eye.
- Hold one arm outstretched to one side (right or left) equidistant from you and the patient, and move your fingers into the visual fields from various peripheral points.
- Ask the patient to tell you when the fingers are first seen (both you and the patient should see the fingers at the same time).
- Repeat the procedure for the other eye.





Testing extraocular movement of the eye.

prominences of the upper cheek (Fig. 25-20). Normally, the sinuses are not painful when palpated. Pain may be a finding if the sinuses are infected or obstructed.

Mouth and Pharynx

The mouth and pharynx include the lips, tongue, teeth, gums, hard and soft palate, salivary gland, tonsillar pillars, and tonsils (Fig. 25-21).

Inspecting the Mouth and Pharynx

Equipment used to assess the mouth, pharynx, and neck includes a penlight, a tongue blade, a 4″ × 4″ gauze sponge, and gloves. Assess the mouth and pharynx by inspecting the lips, gums and teeth, tongue, and hard and soft palates. Use palpation if any abnormalities are noted during inspection. Have the patient sit with the head tilted backward and the mouth opened wide. Wear gloves when assessing a patient's mouth and use 4″ × 4″ gauze to hold the tongue for palpation.

The lips should be pink, moist, and smooth. The tongue and mucous membranes are normally pink, moist, and free of swelling or lesions. If the patient wears dentures, they are removed for the inspection of the gums and roof of the mouth. The gums should be pink and smooth. With the patient's tongue relaxed on the floor of the mouth, examine the mucous membrane of the oropharynx while depressing the base of the tongue with a tongue depressor. The uvula is normally centered and freely movable. The tonsils, if present, are small, pink, and symmetric in size. The teeth should be regular and free of cavities or have dental restoration.

Abnormal findings are pallor, cyanosis, or redness and swelling of the mucous membranes; lesions of the mucosa and lips; swollen, red tonsils (indicating infection); swollen, red, and bleeding gums (from nutritional deficits, inflammation or infection, poorly fitted dentures, or poor oral hygiene); poorly aligned, missing, or carious teeth; a white coating on the tongue (from poor oral hygiene, irritation, or smoking); a fissured tongue (from dehydration); a bright-red tongue (seen

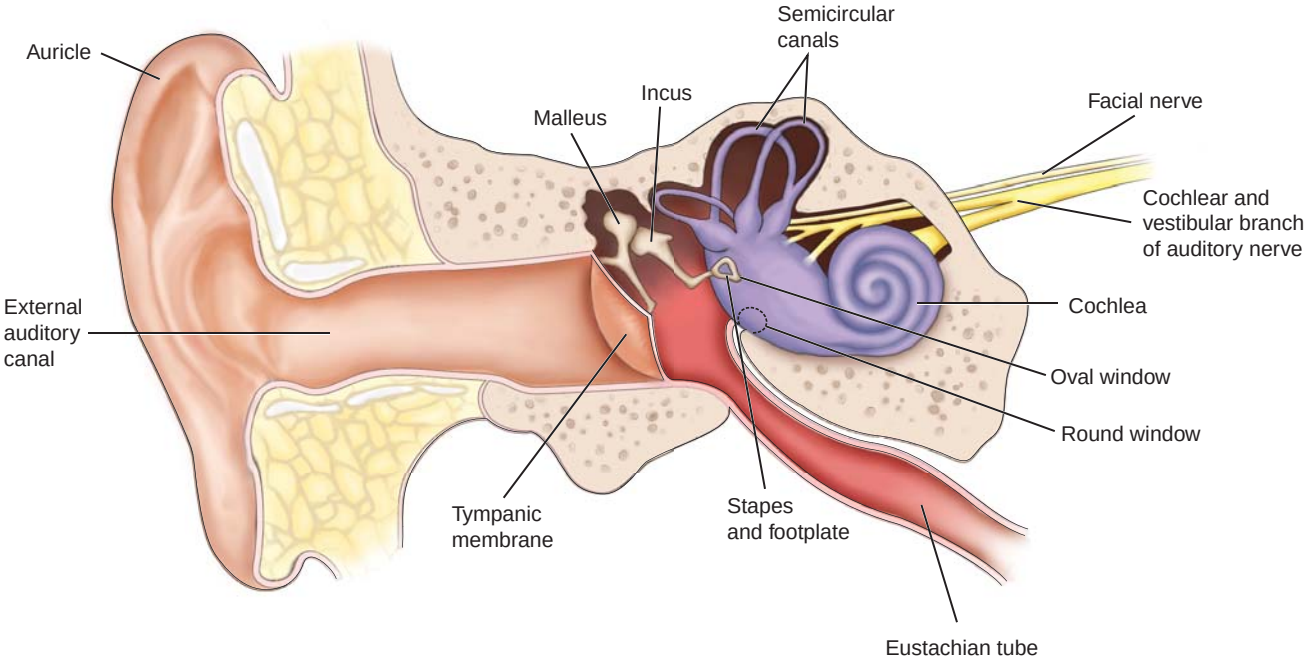


Figure 25-14. Internal structures of the ear.

in deficiencies of iron, vitamin B_{12}, or niacin); or a black, hairy tongue (from antibiotic use).

Neck

Inspecting the Neck

Assess the neck (Fig. 25-22) with the patient sitting. The neck should be hyperextended slightly. Assess the neck for range of motion and venous distention. Ask the patient to tilt the head backward, forward, and side to side to assess range of motion. The neck should be symmetric, with full range of motion. No neck vein distention (indicating heart problems) should be visible.

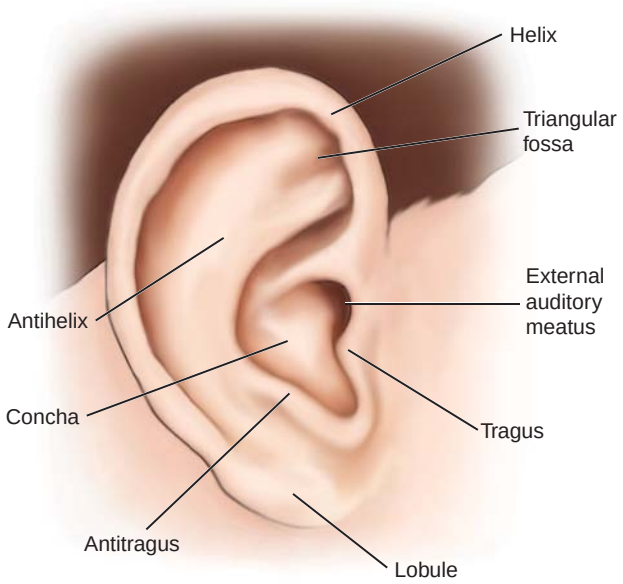


Figure 25-15. External structures of the ear.

Palpating the Trachea and Lymph Nodes

The trachea, normally midline at the suprasternal notch, is palpated for alignment and position. An unequal space between the trachea and the sternocleidomastoid muscle on each side is an abnormal finding indicating tracheal displacement.

Palpate the lymph nodes (Fig. 25-23) with the pads of the fingers for enlargement, tenderness, and mobility. The nodes are generally not palpable; if palpable, they should be small, mobile, smooth, and nontender. If palpable, assess location, size, consistency, mobility, and tenderness. Enlarged lymph

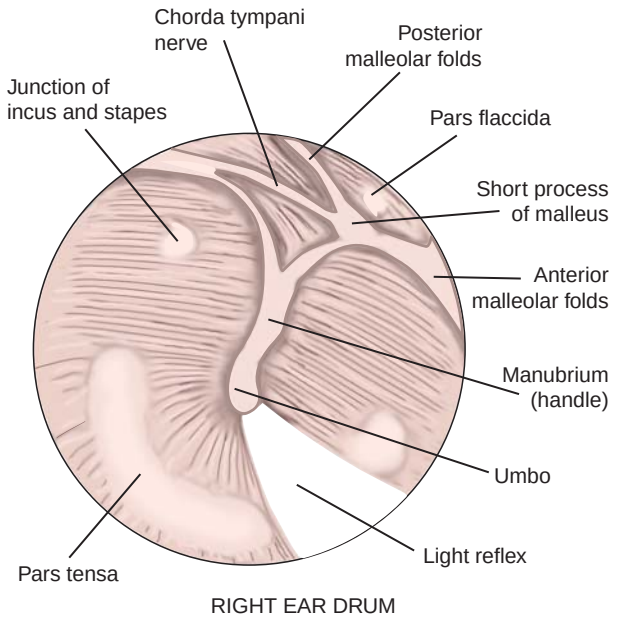


Figure 25-16. Normal tympanic membrane, as seen through an otoscope.

Guidelines for Nursing Care 25-5

Using a Tuning Fork to Assess Hearing

Weber's Test for Bone Conduction of Sound

- Hold the tuning fork at its base and strike it against your other palm so that the fork vibrates.
- Place the base of the tuning fork on the center of the top of the patient's head.
- Ask the patient where the sound is heard best.

Rinne's Test to Compare Air Conduction With Bone Conduction of Sound

- Strike the tuning fork as for Weber's test.
- Hold the base of the tuning fork against the mastoid process of the patient and ask the patient to tell you when the sound can no longer be heard.
- Immediately place the still-vibrating tuning fork close to the external ear canal and ask whether the patient can hear the sound; the normal ear will do so.
- Repeat the test with the other ear.

nodes (lymphadenopathy) may indicate infection, autoimmune disorders, or metastasis of cancer.

Palpating the Thyroid Gland

The thyroid gland is assessed by palpation, although it is normally not palpable in some patients. The patient is sitting, with the examiner using an anterior or posterior approach. Palpate for size, shape, symmetry, tenderness, and presence of any nodules (see Guidelines for Nursing Care 25-6). If palpable, the thyroid gland should feel soft but elastic. It should be nontender and should have no enlargement, masses, or nodules (which may indicate thyroid gland disease, infection of the thyroid, or cancer).

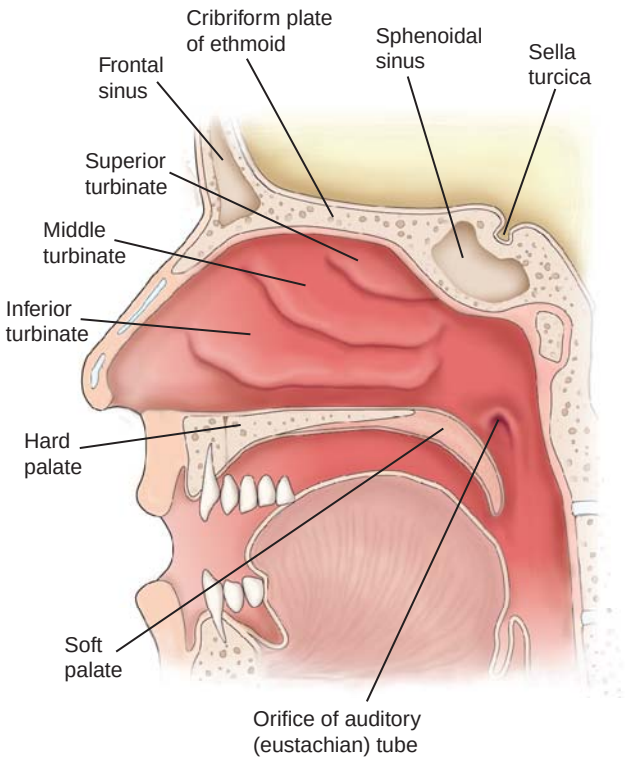


Figure 25-17. Cross-section of the nasal cavity.

Normal Age-Related Variations

Infant/Child

Common head and neck variations in newborns and children include:

- Closing of posterior fontanel at 8 weeks of age; soft anterior fontanel at about 18 months of age

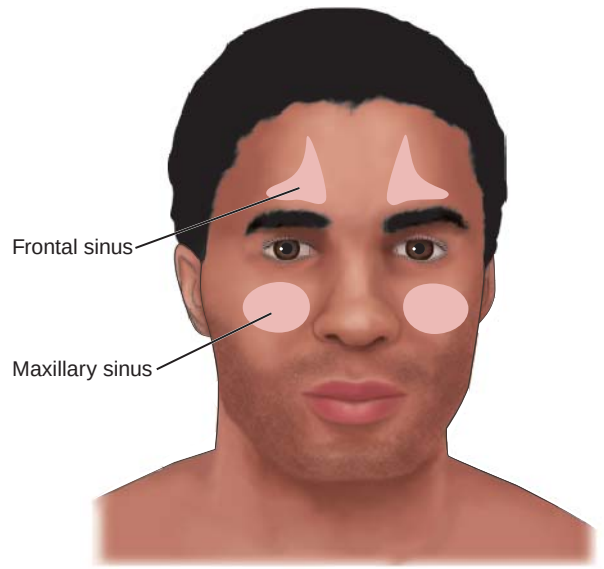


Figure 25-18. Location of the frontal and maxillary sinuses.

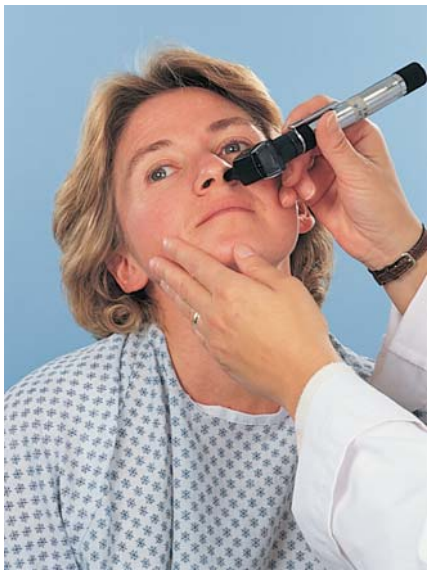


Figure 25-19. Examination of the nasal passages using an otoscope with a wide speculum. *(Photo © B. Proud.)*

- Gazing at and following bright objects by 1 month of age
- Focusing with both eyes by 6 months of age
- Pupils at the inner folds (pseudostrabismus)
- Startle reflex in newborns

Older Adult

Common head and neck variations in the older adult include:

- Impaired near vision (presbyopia)
- Decreased color vision and peripheral vision
- Decreased adaptation to light and dark
- A white ring around the cornea (arcus senilis)
- Entropion and ectropion
- Hearing loss (presbycusis)
- Impaired conductive hearing
- Elongated ear lobes
- Prominent ear landmarks
- Decreased neck range of motion
- Nodular thyroid gland
- Smaller, more easily palpated lymph glands

Assessing the Thorax and Lungs

The thorax (Fig. 25-24) comprises the lungs, rib cage, cartilage, and intercostal muscles. Data from the health history may elicit subjective data indicating a health problem, such as dyspnea or chest pain, as well as information about sleep patterns, cough, and sputum. A history of smoking indicates the need to include ways to stop smoking in the plan of care. Environmental exposure to certain inhalants (such as secondhand smoke, paint, air pollution, or asbestos fibers) in the home or workplace may increase the risk of respiratory diseases and cancer. Physical examination provides data about the bony structures of the thorax, respiratory effort, chest expansion, and breath sounds.

Health History

Identify risk factors for altered health during the health history by asking about the following:

- History of trauma to the ribs or lung surgery
- Number of pillows used when sleeping
- History of chest pain with deep breathing
- History of persistent cough with or without producing sputum
- History of allergies
- Environmental exposure to chemicals, asbestos, or smoke
- History of smoking
- History of lung disease in family members or self
- History of frequent or chronic respiratory infections

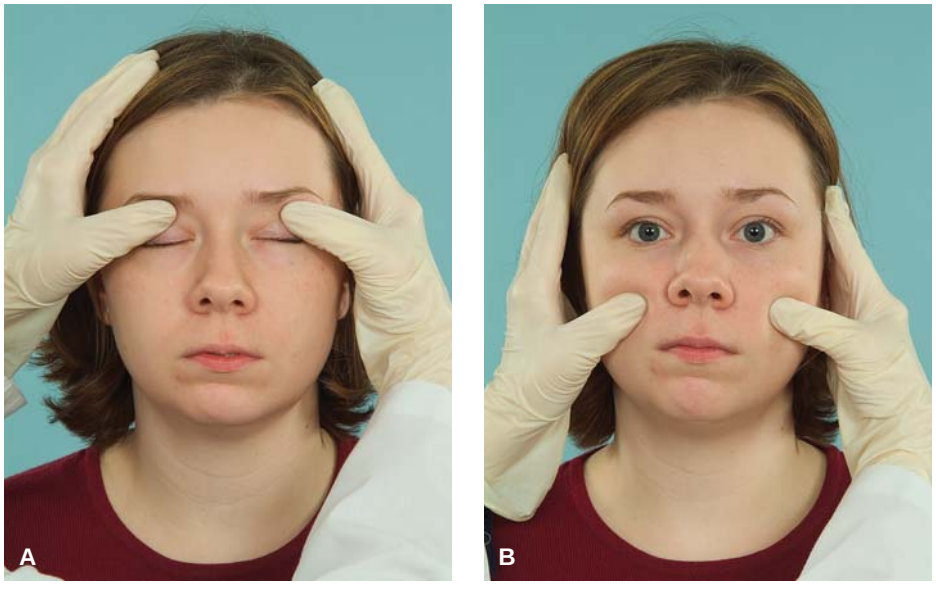


Figure 25-20. (**A**) The frontal sinuses are palpated by gently pressing upward on the bony prominences above each eye. (**B**) The maxillary sinuses are palpated by applying gentle pressure on the bony prominences of the upper cheek. *(Photos by B. Proud.)*

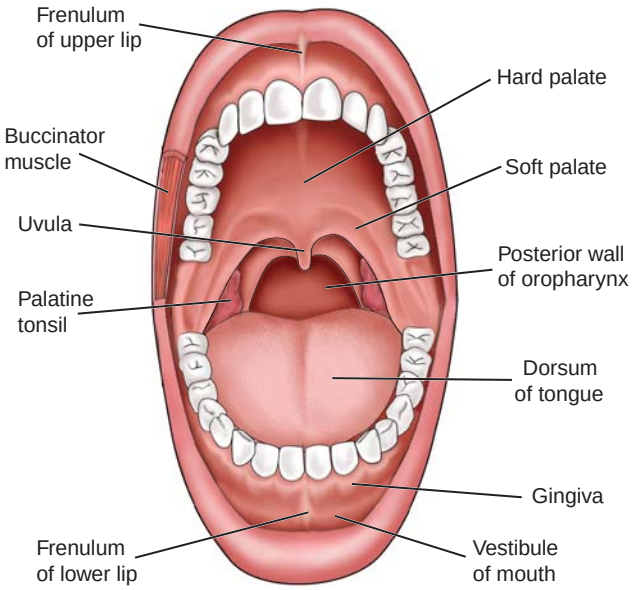


Figure 25-21. Structures of the mouth.

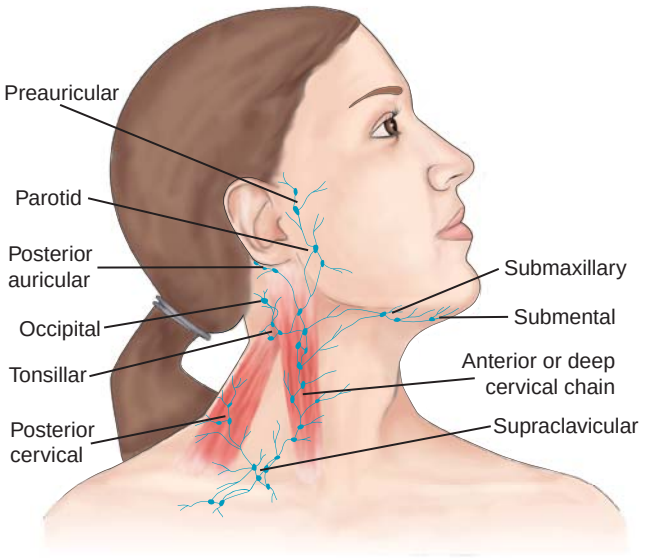


Figure 25-23. Location of the lymph nodes of the neck.

Physical Assessment

Physical assessment of the thorax and lungs requires a stethoscope and a tape measure. The environment should be warm and adequately lit. The techniques for this assessment include inspection, palpation, percussion, and auscultation. The patient sits during the assessment.

Inspecting the Thorax

Begin inspection by observing the patient's chest for color, shape or contour, breathing patterns, and muscle development. The color should be even and consistent with the color of the patient's face. The shape or contour should have a downward equal slope at the rib cage. The chest should be symmetric, with the transverse diameter greater than the anteroposterior diameter. An increased anteroposterior diameter, as seen in chronic lung diseases, is described as barrel-chest (Fig. 25-25). Respirations should be smooth and even, ranging from 12 to 20 breaths/min.

Abnormal findings include an increase in chest size and contour, abnormal breathing patterns with use of accessory muscles (symptoms of respiratory disease, such as chronic obstructive pulmonary disease or asthma), unequal chest expansion (may occur in chest trauma or pneumonia), and abnormal respirations.

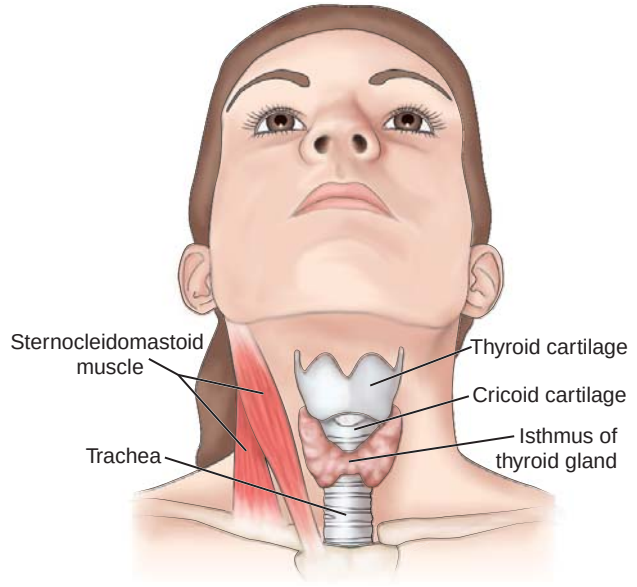


Figure 25-22. Structures of the neck.

Palpating the Thorax

Palpation is used to detect areas of sensitivity, chest expansion during respirations, and vibrations (fremitus). Use the palmar surface of the hands to palpate the anterior and posterior thoracic landmarks (Fig. 25-26) in a sequential pattern for temperature, moisture, muscular development, and any tenderness or masses. The skin should be warm and dry, with muscular development symmetric, and there should be no tenderness or masses. Abnormal findings may be cool or excessively dry or moist skin, muscle asymmetry, tenderness, and masses.

The same sequence is used to test for tactile (vocal) fremitus, comparing bilateral sides (Fig. 25-27). Fremitus is a symmetric vibration of the chest wall that occurs with speaking. Normally, equal bilateral mild vibrations are palpable, and are louder in the upper region of the lungs. To assess fremitus, use the ball of the hand to palpate over the posterior thorax and ask the patient to repeat "ninety-nine" at each area. Unequal fremitus may increase from consolidation of lung tissue or trapped air in chronic obstructive pulmonary disease or decrease with pneumothorax (air in the lungs).

Chest expansion is determined by placing the hands over the posterior chest wall, with the fingers at the level of T9 or T10. Ask the patient to take a deep breath, and observe

Guidelines for Nursing Care 25-6

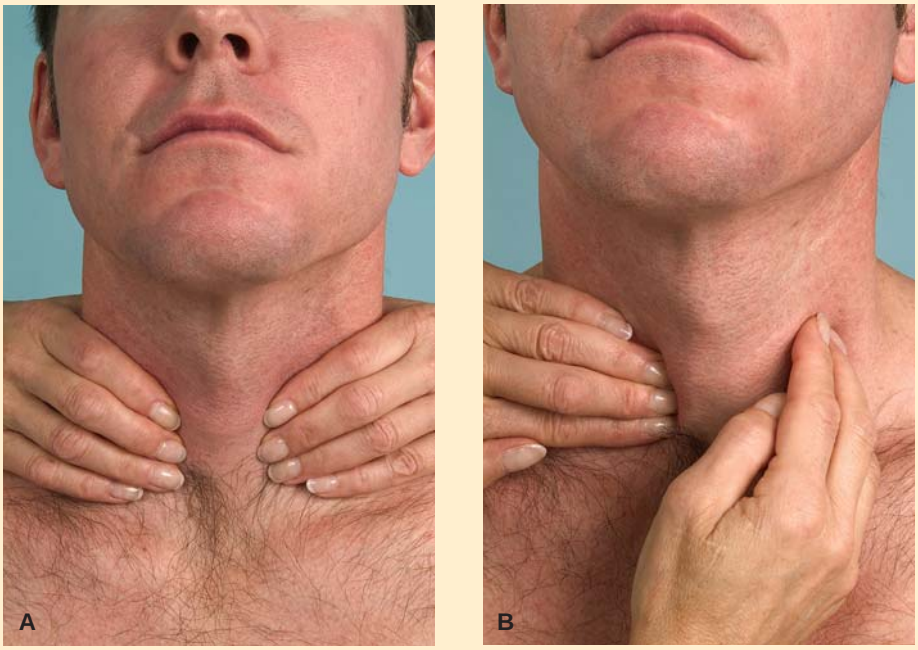
Palpating the Thyroid Gland

Posterior Approach

- Standing behind the patient, place your hands around the patient's neck, with the fingertips over the lower half of the neck and trachea (see Figure A).
- Ask the patient to swallow, and feel for enlargement of the gland as it rises.
- Palpate each lobe of the thyroid by having the patient turn the head slightly toward the side to be examined; then gently displace the trachea with one hand.
- Ask the patient to swallow, and palpate the thyroid with the other hand.
- Repeat for the other side.

Anterior Approach

- Standing facing the patient, place the fingers of your left hand around the sternomastoid muscle (See Figure B).
- Ask the patient to swallow, and palpate for enlargement.
- Repeat for the other side.



Palpating the thyroid (**A**) using a posterior approach. (**B**) Using an anterior approach. *(Photos by B. Proud.)*

the movement of your thumbs. The thorax should expand symmetrically (Fig. 25-28).

Percussing the Thorax

Although not used frequently in assessing the lungs, percussion may be used to determine lung position and size and to detect the presence of air, liquids, or solids within the lungs. The shoulder area and anterior and posterior thorax are percussed in a systematic pattern (see Fig. 25-26). Note the intensity, pitch, duration, and quality of sounds produced. When a normal air-filled lung is percussed, the sound is hollow, loud, low in pitch, and of long duration. This percussion tone is known as resonance. A flat tone is heard over bony or well-developed muscle tissue. Abnormal percussion sounds are hyperresonance, heard over emphysematous lung tissue, and dullness, heard over fluid or a solid mass.

Auscultating Breath Sounds

Auscultation is used to detect airflow within the respiratory tract. The seated patient is asked to breathe slowly and deeply through the mouth. Place the warmed diaphragm of the stethoscope over the thoracic landmarks and auscultate breath sounds

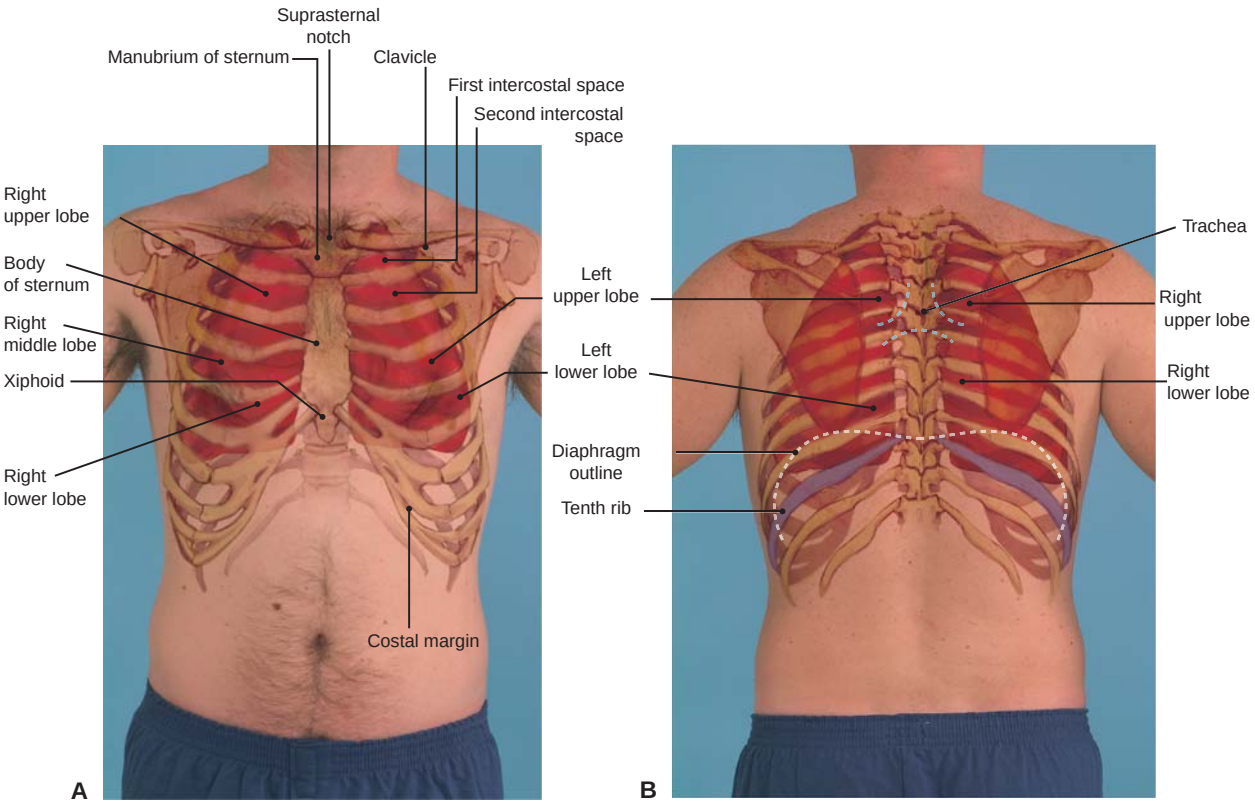


Figure 25-24. Thoracic landmarks (**A**) Anterior. (**B**) Posterior.

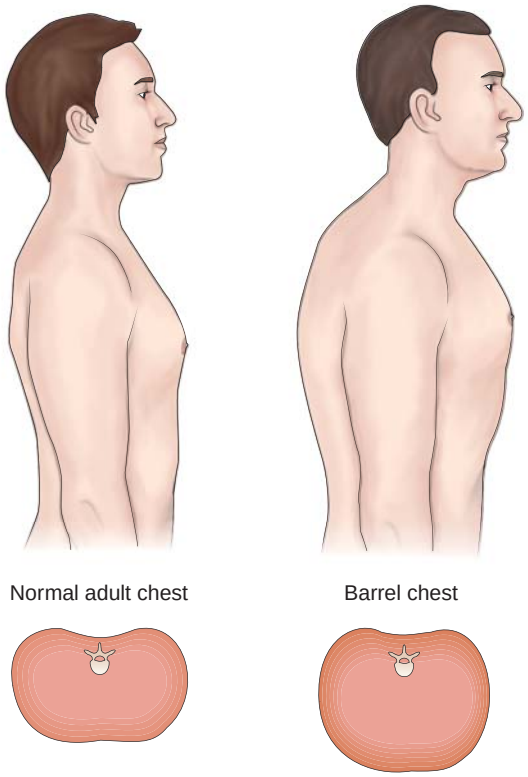


Figure 25-25. Profile and anteroposterior diameter of normal adult chest and barrel chest.

in the same sequential pattern as used for palpation and percussion (see Fig. 25-26). Normally, breath sounds result from the free movement of air into and out of all parts of the bronchial tree. Listen for the duration, pitch, and intensity of the sounds.

Ordinarily, breath sounds are not audible without auscultation. Normal breath sounds (Table 25-8) vary over different parts of the lungs. **Bronchial sounds** heard over the trachea are high-pitched, harsh sounds, with expiration being longer than inspiration. **Bronchovesicular sounds** are heard over the mainstem bronchus and are moderate "blowing" sounds, with inspiration equal to expiration. **Vesicular breath sounds** are soft, low-pitched sounds, heard best over the base of the lungs during inspiration, which is longer than expiration. **Adventitious breath sounds** are not normally heard in the lungs but, if present, may be auscultated along with normal breath sounds (Table 25-9). Stertorous breathing is a general term used to refer to noisy, strenuous respirations. Stridor is a harsh, high-pitched sound heard on inspiration when there is a narrowing of the upper airway, such as the larynx or trachea. Infants or young children with croup often manifest stridor when breathing. Crackles are fine to course crackling sounds made as air moves through wet secretions; they are most often heard on inspiration. Crackles are described as "fine" when they are made by air passing through moisture in small air passages and alveoli and as "coarse" when they are made by air passing through moisture in the bronchioles, bronchi, and trachea. Coarse crackles can also be documented as rhonchi. Wheezes are continuous sounds that originate in

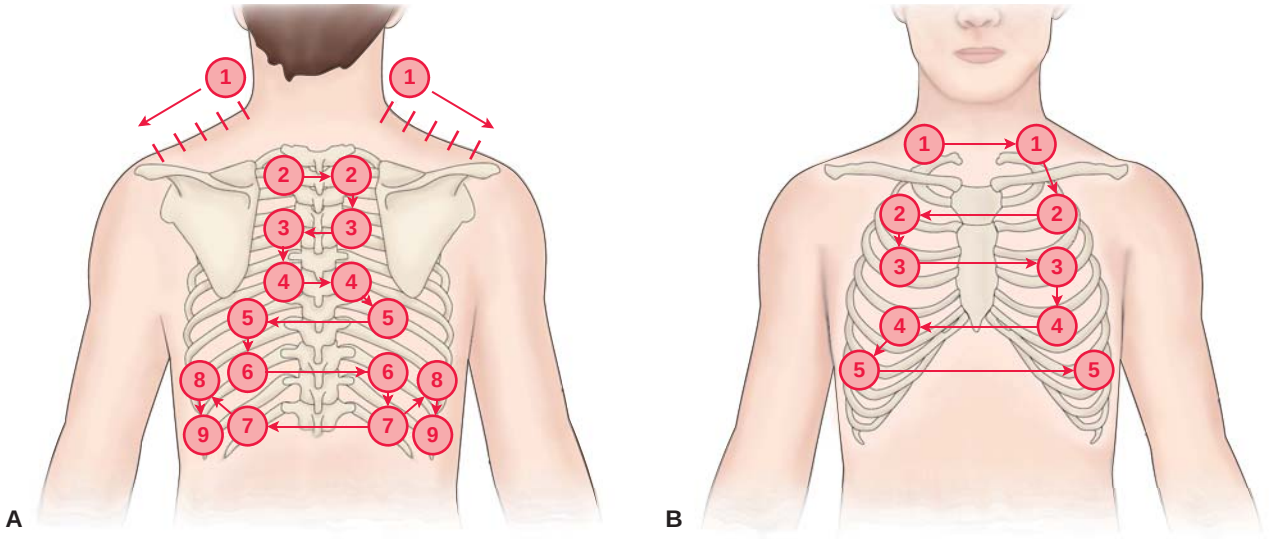


Figure 25-26. Posterior (**A**) and anterior (**B**) chest—landmarks and systematic sequence of assessment. The pattern is used for palpation, percussion, and auscultation of the chest.

small air passages that are narrowed by secretions, swelling, or tumors. They may be inspiratory or expiratory and are high-pitched sounds. A pleural friction rub is a grating sound caused by an inflamed pleura rubbing against the chest wall.

Think back to Billy Collins, the 9-year-old who was stung by a bee. Incorporating knowledge of the signs and symptoms of an allergic reaction, the nurse would inspect Billy's chest for accessory muscle use and auscultate his lungs, noting any evidence of wheezing, which is commonly noted with allergic reactions.

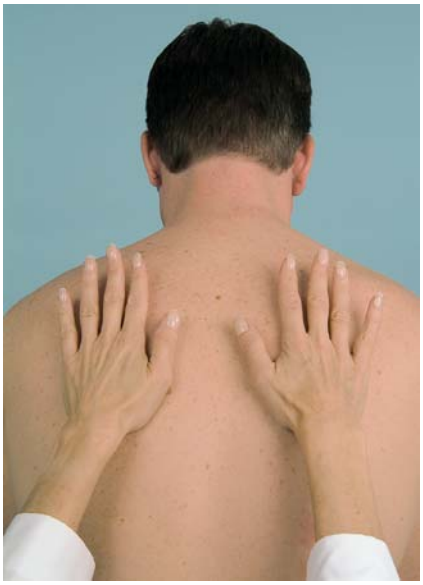


Figure 25-27. Palpation of the posterior thorax for vocal or tactile fremitus. The examiner uses the palms of the hands to detect vibrations transmitted through the lungs to the chest wall.

Although stertorous respirations, stridor, and wheezes can be heard without amplification, crackles and pleural friction rubs are usually heard only by auscultation with a stethoscope. If a productive cough occurs during assessment of the thorax and lungs, the sputum should be assessed for color, consistency, and amount.

Normal Age-Related Variations

Infant/Child

Common thorax and lung variations in newborns and children include:

- Louder breath sounds on auscultation
- More rapid respiratory rate (until 8 to 10 years of age)
- Use of abdominal muscles during respiration

Older Adult

Common thorax and lung variations in older adults include:

- Increased anteroposterior chest diameter
- Increase in the dorsal spinal curve (kyphosis)
- Decreased thoracic expansion
- Use of accessory muscles to exhale

Assessing the Cardiovascular and Peripheral Vascular Systems

Cardiovascular and peripheral vascular assessment includes the heart and the extremities. Questions in the health history can identify subjective data such as leg pain, chest pain, or dyspnea on exertion. Data can also be used to identify activities of daily living and health behaviors that increase the risk of cardiovascular disease, including smoking; lack of exercise; and a diet high in calories, fats, and salt. If these risks

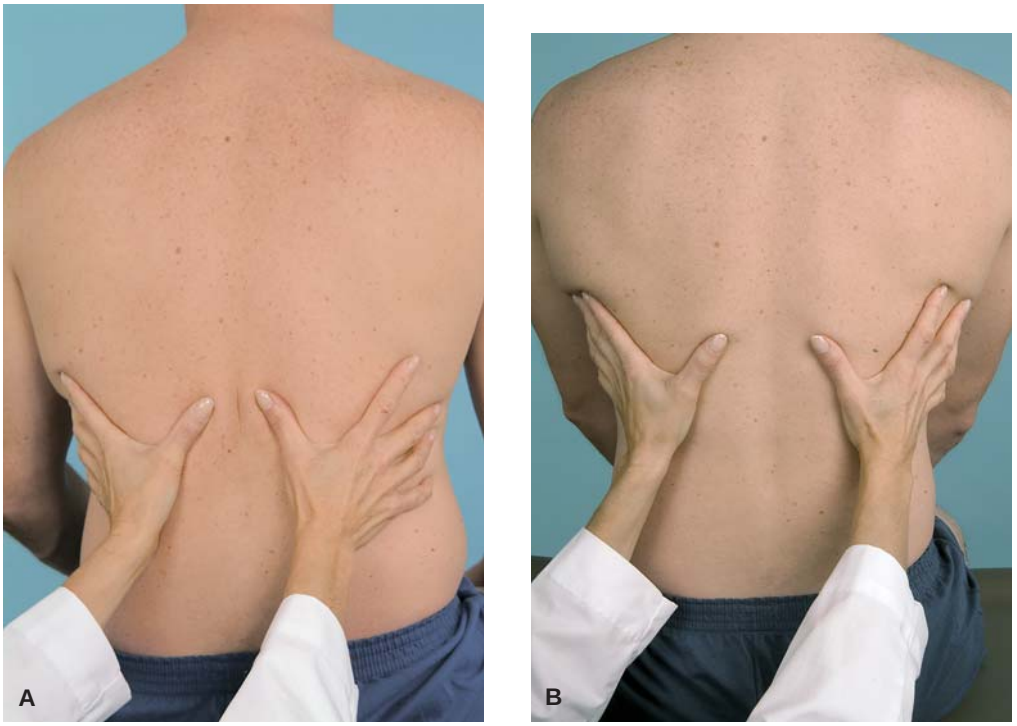


Figure 25-28. Palpating the posterior thorax excursion. The examiner's hands are placed symmetrically on the patient's back (**A**). As the patient inhales, the examiner's hands should move apart symmetrically (**B**). *(Photos by B. Proud.)*

are identified, the plan of care should include referral for additional diagnostic testing and teaching about health promotion activities. The physical examination is used to identify signs and symptoms of peripheral vascular disease and heart disease.

Health History

Identify risk factors for altered health during the health history by asking about the following:

- History of chest pain, palpitations, or dizziness
- Swelling in the ankles and feet
- Number of pillows used to sleep
- Type and amount of medications taken daily
- History of heart defect, rheumatic fever, or chest or heart surgery
- Family history of hypertension (high blood pressure), myocardial infarction (heart attack), coronary artery disease, high blood cholesterol levels, or diabetes mellitus
- History of smoking
- History of alcohol use
- Type and amount of exercise
- Usual foods eaten each day
- Changes in color or temperature of the extremities
- History of pain in the legs when sleeping or pain that is worsened by walking
- History of blood clots or sores on the legs that do not heal

Physical Assessment

Peripheral vascular assessment includes measuring the blood pressure and assessing peripheral pulses and perfusion. Assessments are done by inspection and palpation, with the patient sitting or supine. Peripheral vascular assessments may be combined with assessment of other body areas.

The techniques used for cardiovascular assessment include inspection, palpation, and auscultation. A stethoscope with a bell and diaphragm and a sphygmomanometer are used. The patient may be in a sitting position or in a supine position with the head raised about 30 degrees. Adequate lighting is essential for inspection of color and pulsations. A quiet environment is necessary for accurate auscultation of heart sounds. The nurse is usually positioned at the right side of the patient. Refer to Figure 25-29 for a view of the heart, including the heart valves responsible for heart sounds.

Neck and Precordium

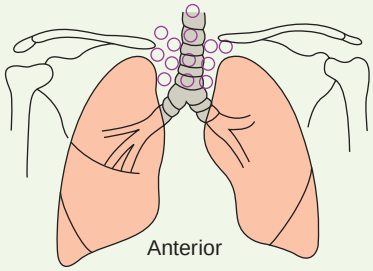
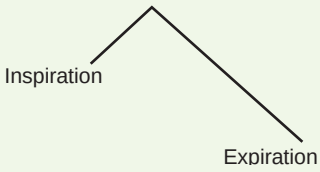
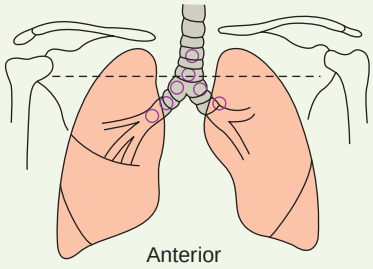
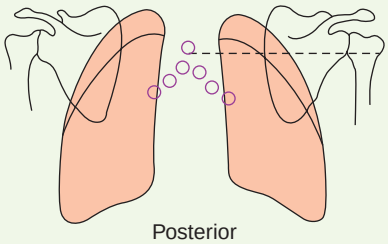
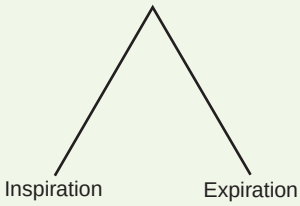
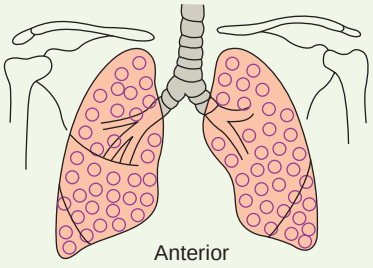
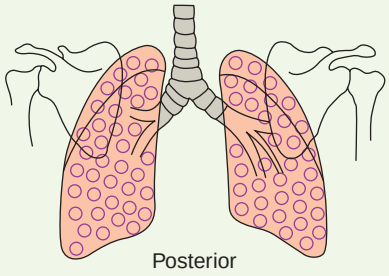
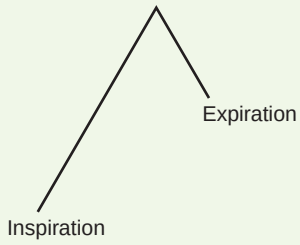
Inspecting the Neck and Precordium

Observe the neck and **precordium** (the aortic, pulmonic, tricuspid, and apical areas, and Erb's point; Fig. 25-30) for visible pulsations. There are usually no visible pulsations, except the apical impulse, located at about the fourth or fifth intercostal space at the left midclavicular line. Inspect the epigastric area at the tip of the sternum for pulsation of the abdominal aorta. Findings of neck vein distention (indicating heart disease) or visible pulsations in precordial areas other than the apical impulse (which may result from abnormalities of the ventricle) are considered abnormal.

Palpating the Precordium

Using the palmar surface with the four fingers held together, palpate the precordium gently for pulsations (Fig. 25-31). Remember that hands should be warm. Palpation proceeds in a systematic manner, with assessment of specific cardiac

TABLE 25-8 Normal Breath Sounds

Type, Description, and Location	Ratio of Inspiration to Expiration
Bronchial or Tubular	
 Blowing, hollow sounds; auscultated over the trachea	 Expiration is longer, lower, and higher-pitched than inspiration
Bronchovesicular	
  Medium-pitched, medium intensity, blowing sounds; auscultated over the first and second interspaces anteriorly and the scapula posteriorly	 Inspiration and expiration have similar pitch and duration
Vesicular	
  Soft, low-pitched sounds; auscultated over the lung periphery	 Inspiration is longer, louder, and higher-pitched than expiration

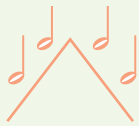
landmarks—the aortic, pulmonic, tricuspid, and mitral areas and Erb's point. Palpate the apical impulse in the mitral area. Note size, duration, force, and location in relationship to the midclavicular line. Identify any precordial thrills, which are fine, palpable, rushing vibrations over the right or left second intercostal space, and any lifts or heaves, which involve a rise along the border of the sternum with each heartbeat. Normal findings include no pulsation palpable over the aortic and pulmonic areas, with a palpable apical impulse.

Auscultating Heart Sounds

Auscultation is used to determine the heart sounds caused by closure of the heart valves. Use systematic auscultation, beginning at the aortic area, moving to the pulmonic area, then to Erb's point, then to the tricuspid area, and finally to the mitral area (Fig. 25-30). Ask the patient to breathe normally. The stethoscope diaphragm is first used to listen to high-pitched sounds, followed by use of the bell to listen to low-pitched sounds. Focus on the overall rate and rhythm of the heart and the normal heart sounds (Box 25-5).

Consider Tammy Browning, the pregnant woman described in the Reflective Practice display. In addition to completing a health assessment for Tammy, the nurse would need to auscultate fetal heart sounds to assess fetal status.

TABLE 25-9 Abnormal Breath Sounds

Type and Characteristics	Illustration
Wheeze (Sibilant) • Musical or squeaking • High-pitched, continuous sounds • Auscultated during inspiration and expiration • Occurs in small air passages	
Wheeze (Sonorous) • Sonorous or course • Low-pitched, continuous sounds • Auscultated during inspiration and expiration • Coughing may clear the sound	
Crackles • Bubbling, crackling, popping • Low- to high-pitched, discontinuous sounds • Auscultated during inspiration • Occurs in small air passages, alveoli, bronchioles, bronchi, and trachea	
Friction Rub • Rubbing or grating • Loudest over lower lateral anterior surface • Auscultated during inspiration and expiration	

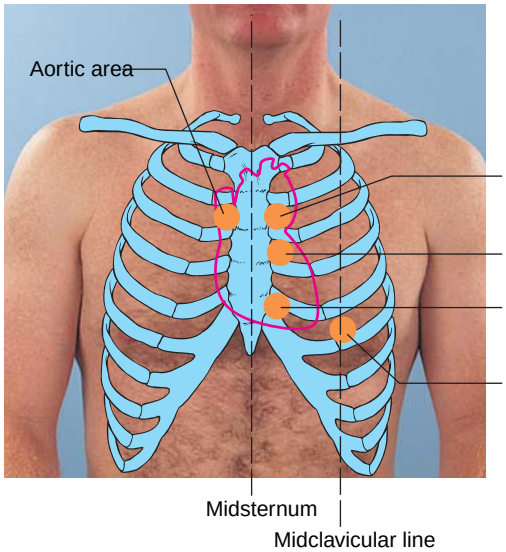


Figure 25-30. Traditional cardiac landmarks and areas for auscultation.

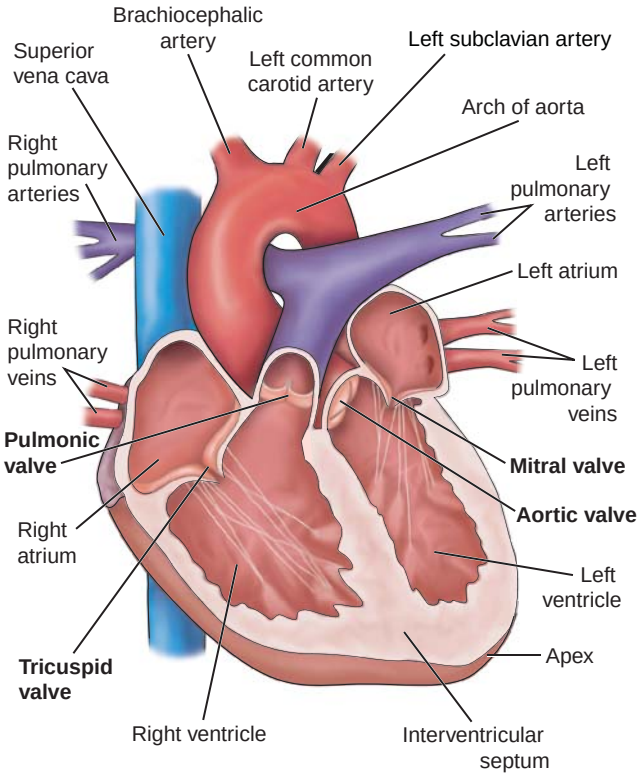


Figure 25-29. View of the interior of the heart showing the atrioventricular and semilunar valves responsible for normal heart sounds.

Peripheral Vascular System

Inspecting the Extremities

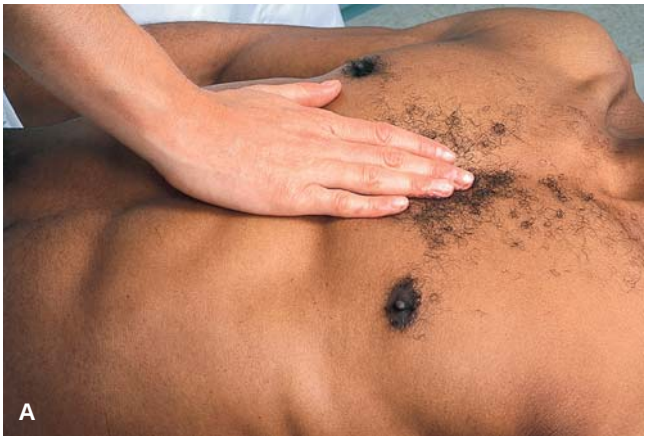
Inspect the skin of the extremities for color, temperature, continuity, lesions (as described previously for assessment of the integument), venous patterns, and edema. There are normally no venous patterns, varicosities, rashes, ulcers, or edema on the lower extremities. The skin of the patient with peripheral vascular disease (resulting in decreased blood flow and oxygenation of tissues) is typically pale and cool, shiny with brown discolorations, and hairless; and the toenails are thickened.

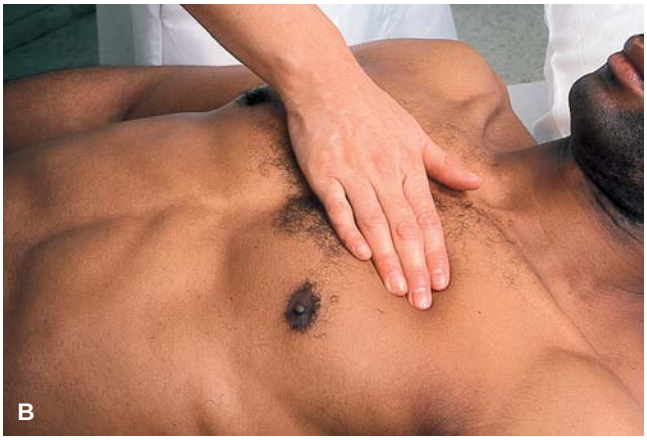
Phlebitis (inflammation of a vein) of the lower extremity is indicated by pain, redness, and swelling of the affected calf or thigh.

Palpating Peripheral Pulses

Use the pads of the index and middle fingers to palpate peripheral pulses for amplitude and symmetry. Palpate, one at a time and with caution, the carotid brachial, radial, femoral, popliteal, dorsalis pedis, and posterior tibial pulses (see Fig. 24-3 in Chap. 24). These should be strong and equal bilaterally. The amplitude of the pulses may be documented as 0 (absent), 1+ (weak), 2+ (normal), 3+ (increased), or 4+ (bounding).

Abnormal findings include an absent, weak, thready pulse (which may indicate a decreased cardiac output), a forceful or bounding pulse (seen in hypertension and circulatory overload), and an asymmetric pulse (related to impaired circulation). Other specific assessments to determine arterial





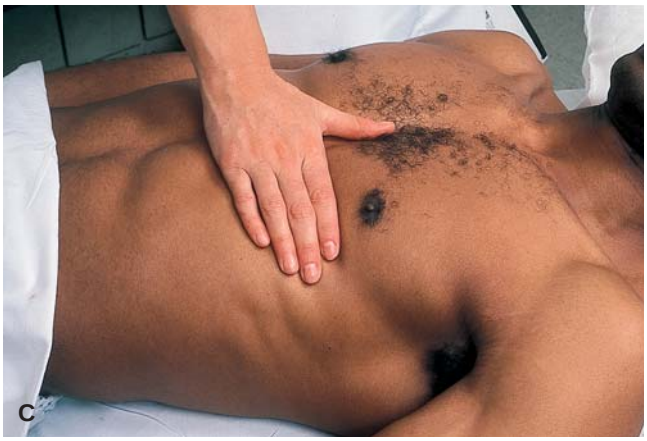


Figure 25-31. Palpating areas of the precordium: (**A**) aortic area, (**B**) pulmonic area, and (**C**) apical (mitral) and tricuspid area. *(Photos © Ken Kasper.)*

blood flow include Allen's test, Buerger's test, and capillary refill (see Guidelines for Nursing Care 25-7).

Normal Age-Related Variations

Infant/Child

Common cardiovascular and peripheral vascular variations in newborns and children include:

- Visible pulsation if the chest wall is thin
- Sinus dysrhythmia (the rate increases with inspiration and decreases with expiration)
- Presence of S_3 (in about one third of all children)
- More rapid heart rate (until about 8 years of age)

Older Adult

Common cardiovascular and peripheral vascular variations in older adults include:

- Difficult-to-palpate apical pulse
- Difficult-to-palpate distal arteries
- Dilated proximal arteries
- More prominent and tortuous blood vessels; varicosities common
- Increased systolic and diastolic blood pressure
- Widening pulse pressure

Assessing the Breasts and Axillae

Although the assessments and disorders described here focus on the female breast, men also are at risk for breast disease. Each breast has a lymphatic network that drains into the underlying axilla (Fig. 25-32). The health history elicits risk factors for cancer of the breast, especially in females. Physical assessment of the breasts and axilla are primarily conducted to identify any lumps in the breasts and/or enlargement or pain in axillary lymph nodes; if assessed, the patient should have further diagnostic tests.

Health History

Identify risk factors for altered health during the health history by asking about the following:

- History of pain in one or both breasts, including relationship to menstrual period
- History of lumps or swelling, redness, change in size, or dimpling in the breasts
- History of discharge from the breast
- Family history of ovarian or breast cancer
- History of breast disease, biopsy, or surgery
- Menstrual and pregnancy history
- Use of hormones, oral contraceptives, or antidepressants
- Exposure to radiation, benzene, or asbestos
- Usual dietary intake and alcohol consumption
- Knowledge and practice of breast self-examination (see Chap. 35)
- Most recent clinical breast examination and mammogram

Physical Assessment

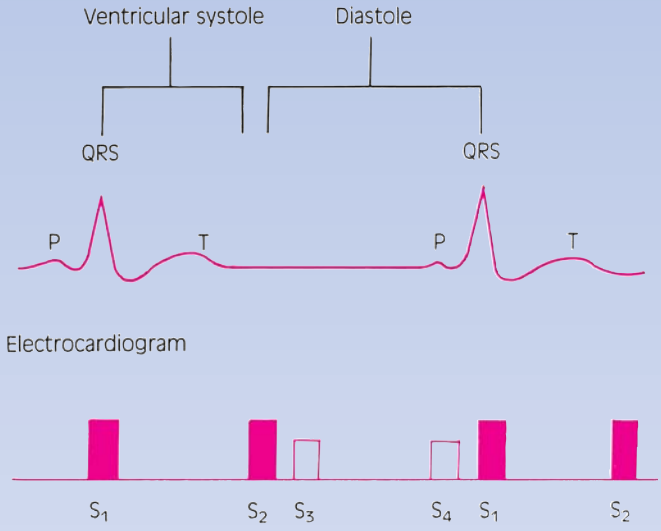
The breasts and axilla are assessed in both men and women by inspection and palpation. The patient is in the sitting or supine position. When sitting, the patient should sit erect, with arms at sides or raised overhead. When supine, the patient's hand on the side being examined is placed under the head.

BOX 25-5 Heart and Cardiovascular Sounds

Normal Heart Sounds

During auscultation, the first heart sound, called S_1, is heard as the "lub" of "lub-dub." This sound occurs when the mitral and tricuspid valves close and corresponds to the onset of ventricular contraction (see figure). The sound, low-pitched and dull, is heard best at the apical area. The second heart sound, S_2, occurs at the termination of systole and corresponds to the onset of ventricular diastole. The "dub" of "lub-dub," it represents the closure of the aortic and pulmonic valves. The sound of S_2 is higher pitched and shorter than S_1. The two sounds occur within 1 second or less, depending on the heart rate.

Normal findings include S_1 that is louder at the tricuspid and apical areas, with S_2 louder at the aortic and pulmonic areas.



Heart sounds in relation to the cardiac cycle and an electrocardiogram.

Abnormal Heart Sounds

Abnormal findings include extra heart sounds at any of the cardiac landmarks and abnormal rate or rhythm. Extra heart sounds are often heard when the patient has anemia or heart disease. A wide variety of conditions may alter the normal heart rate or rhythm, including serious infections, diseases of the heart muscle or conducting system, dehydration or overhydration, endocrine disorders, respiratory disorders, and head trauma. Extra heart sounds may be S_3, S_4, murmurs, or bruits.

S_3 and S_4

S_3, known as the third heart sound, is often represented by a "lub-dub-dee" pattern ("dee" being S_3); this sound is best heard with the stethoscope bell at the mitral area, with the patient lying on the left side. S_3 is considered normal in children and young adults and abnormal in middle-aged and older adults.

S_4 is the fourth heart sound, represented by "dee-lub-dub." S_4 is considered normal in older adults but abnormal in children and adults.

Murmurs

Heart murmurs are extra heart sounds caused by some disruption of blood flow through the heart. The characteristics of a murmur depend on the adequacy of valve function, rate of blood flow, and size of the valve opening. Grading of heart murmurs:

Grade	Description
I	A murmur so faint that it can be heard only with great effort
II	A faint murmur but one that can be easily detected
III	A moderately loud murmur
IV	A very loud murmur that is usually associated with a thrill sound
V	An extremely loud murmur
VI	An exceptionally loud murmur that can be heard while the stethoscope is lifted off the skin

Bruits

Bruits, which are abnormal sounds, are "swooshing" sounds similar to murmurs and are heard over major blood vessels. The sound indicates a partially blocked artery, causing blood to swirl, rather than flow normally. Bruits are most commonly heard over the carotid arteries, the abdominal aorta, and the femoral arteries.

Guidelines for Nursing Care 25-7

Assessing Peripheral Circulation

Allen's Test

- Ask the patient to rest his or her hand on the examining table with the palm up and to make a fist.
- Use your thumbs to occlude the radial and ulnar arteries and ask the patient to open his or her hand (the palm will be pale).
- Release your thumb pressure and observe the return of color to the palm (this should normally take 3 to 5 seconds).

Buerger's Test

- Ask the patient to assume a supine position and then raise one arm or one leg about 1 foot (30 cm) above the level of his or her heart.
- Ask the patient to briskly move the leg or arm up and down for 1 minute, then to sit up and dangle the arm or leg downward.
- Observe the time it takes for the original color of the patient's skin to return and for the veins to fill. Normally, color returns in 10 seconds, and veins fill in 15 seconds.

Capillary Refill

- Using your thumb and forefinger, squeeze the patient's fingernail or toenail until it appears white.
- Release the pressure and observe the time it takes for normal color to return. Normally, color returns immediately.
- Assess capillary refill in children by pressing the skin lightly over the forehead or top of the hand. Release the pressure; observe the time for return of color.

Inspecting the Breasts

Inspect the breasts for size, shape, symmetry, color, texture, and skin lesions. The breasts should be relatively symmetric, although variations are normal. The size varies among individuals. The shape of the breasts is round and smooth, and there should be no skin depressions (retraction) or puckering (dimpling). The color should be consistent with the rest of the skin, and the texture of the skin should be soft.

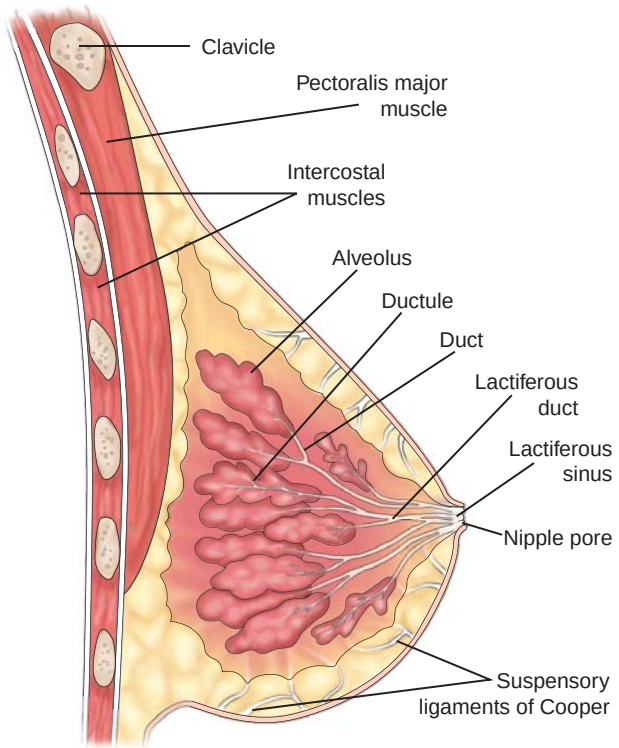


Figure 25-32. Lateral view of the female breast.

Inspect the areola and nipples for size and shape and the nipples for discharge, crusting, and inversion. The areolar and nipple areas should be equal in size, round or oval, with a smooth surface. Montgomery's tubercles (sebaceous glands on the areolae of the breasts) are a normal component of the areola. The nipples are normally everted. Discharge from the nipples is an abnormal finding except in pregnancy (leaking is normal during pregnancy and breastfeeding). Other abnormal findings include the dimpling, lesions, and asymmetry.

Palpating the Breasts and Axillae

Palpate the breast to detect any abnormal lumps. Palpate the nipple and areola and gently compress the nipple between the thumb and forefinger to assess for discharge. The breast is assessed in four quadrants: the upper outer quadrant, the lower outer quadrant, the upper inner quadrant, and the lower inner quadrant (Fig. 25-33). Guidelines for Nursing Care 25-8 provides instructions for palpation. The breast tissue should be smooth and firm, with a granular consistency. If a mass is detected, carefully assess its location, size, shape, consistency, and tenderness. The breasts are normally tender during the week before menstruation.

An increase in the nodularity and tenderness of the breasts may be associated with the menstrual period or may indicate fibrocystic disease. Discharge, lumps, lesions, dimpling, asymmetry, and palpable lymph nodes may be indicative of breast cancer. Palpate the axillary areas for lymph

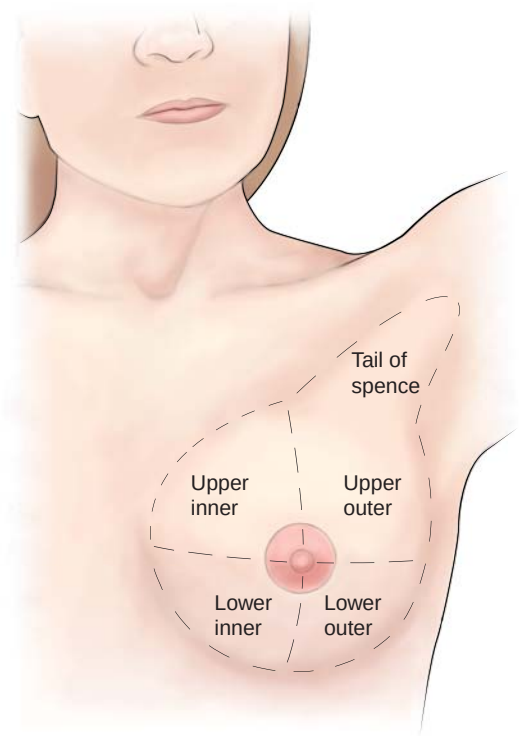


Figure 25-33. Location of assessment findings of the breast are identified by quadrant.

nodes (Fig. 25-34), which normally are nonpalpable and nontender. If any nodes are palpable, assess their location, size, shape, consistency, tenderness, and mobility. Palpable lymph nodes are an abnormal finding.

Normal Age-Related Variations

Infant/Child

Common breast and axillae variations in newborns and children include:

- Breast enlargement and a white discharge from the nipples (up to 2 weeks of age)
- Female breast growth beginning at 10 or 11 years of age
- Temporary enlargement of one or both breasts (gynecomastia) in pubescent boys

Older Adult

Common breast and axillae variations in older adults include:

- Granular, pendulous breasts in women

Assessing the Abdomen

The abdominal cavity (Fig. 25-35) contains the stomach, the small intestine, the large intestine, the liver, the gallbladder, the pancreas, the spleen, the kidneys, and the urinary bladder. Not all of these organs can be assessed. Although the liver is not normally palpable, the technique for assessing it is included because abnormal findings are important. The spleen is rarely palpable and assessment requires deep palpation (requiring more advanced skills), so it is not included in this discussion. The abdominal cavity also contains the female reproductive organs, discussed in the following section. Health history questions are used to identify subjective data, including abdominal pain and nausea; and to collect data about the patient's elimination patterns, fluid and nutritional intake, and lifestyle. Physical examination is conducted to further assess problems with pain and to identify any abdominal masses. Abdominal assessments are also used to assess the return of bowel sounds (for example, after surgery) and retention of urine in the urinary bladder.

Health History

Identify risk factors for altered health during the health history by asking about the following:

- History of abdominal pain
- History of indigestion, nausea or vomiting, constipation or diarrhea
- History of food allergies or lactose intolerance
- Appetite and usual food and fluid intake
- Usual bowel and bladder elimination patterns
- History of gastrointestinal disorders, such as peptic ulcer disease, bowel disease, gallbladder disease, liver disease, or appendicitis
- History of urinary tract disorders, such as infections, kidney stones, or kidney disease
- History of abdominal surgery or trauma
- Type and amount of prescribed and over-the-counter medications used
- Amount and type of alcohol ingestion
- For women, menstrual history

Physical Assessment

A warm stethoscope, adequate lighting, and warm hands with short fingernails are needed to assess the abdomen. The patient lies supine with the head slightly elevated and arms at the sides. Small pillows may be placed under the head and knees. The patient should have an empty bladder. Make sure that the patient is warm and comfortable. These measures, as well as the position, help prevent contraction of the abdominal muscles, which makes palpation difficult.

To locate organs more easily and to make documentation more specific, the abdomen can be divided into four quadrants: right upper, right lower, left upper, and left lower (Fig. 25-36). The sequence of techniques used to assess the abdomen is inspection, auscultation, percussion, and palpation. Percussion and palpation stimulate bowel sounds and thus are done after auscultation of the abdomen. Ask the patient to breathe slowly and deeply through the mouth during the examination to promote relaxation. Ask the patient to identify painful areas of the

Guidelines for Nursing Care 25-8

Palpating the Breasts

Palpate each quadrant of each breast in a systematic method, either the circular, wedge, or vertical strip technique. The patient should be supine with a small pillow or towel beneath her back.

Circular

- Start at the tail of Spence and move in increasing smaller circles (Figure A).
- Use the pads of the first three fingers to gently compress the breast tissue against the chest wall.

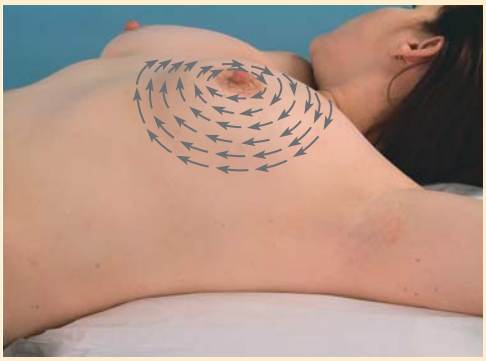


Figure A. Circular technique.

Wedge

- Work in a clockwise direction and palpate from the periphery toward the areola (Figure B).
- Use the pads of the first three fingers to gently compress the breast tissue against the chest wall.

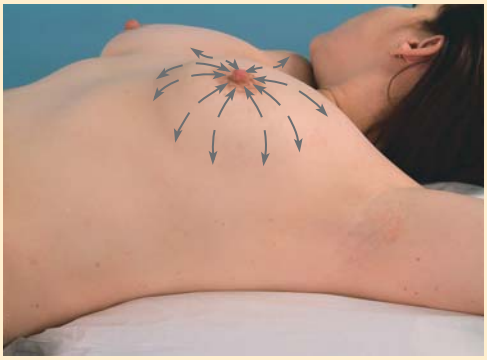


Figure B. Wedge technique.

Vertical Strip

- Start at the outer edge of the breast and palpate up and down the breast (Figure C).
- Use the pads of the first three fingers to gently compress the breast tissue against the chest wall.

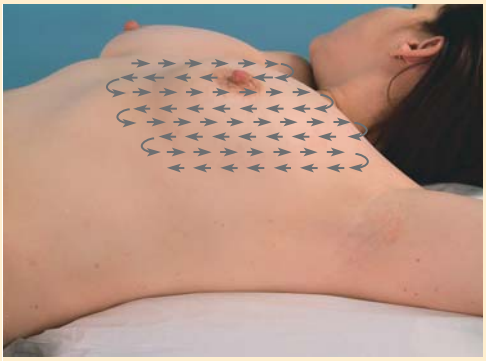


Figure C. Vertical strip technique.

abdomen and explain you will assess these at the end of the examination.

Inspecting the Abdomen

Sit at the side of the patient: a tangential view enhances shadows and contours. Inspect skin color and surface characteristics, including the umbilicus, contour, symmetry, peristalsis, pulsations, and masses. The skin color may be slightly lighter than exposed areas. Fine white or silver lines (striae) may be visible, often the result of skin stretching from weight gain or pregnancy. The umbilicus should be centrally located and may be flat, rounded, or concave. The abdomen should be evenly rounded or symmetric, without visible peristalsis. In thin people, an upper midline pulsation may normally be visible. Abnormal findings include swelling of the abdomen (indicating fluid retention called ascites) and abdominal masses or unusual pulsations.

Auscultating Bowel Sounds and Vascular Sounds

Auscultation is used to assess bowel sounds and vascular sounds. Auscultation is performed in a systematic manner, using the four quadrants as a guide. The stethoscope is warmed, and the flat diaphragm is placed lightly on the abdomen in one of the selected quadrants. Listen carefully for bowel sounds, and note their frequency and character. They are heard as clicks and gurgles and usually occur every 5 to 20 seconds.

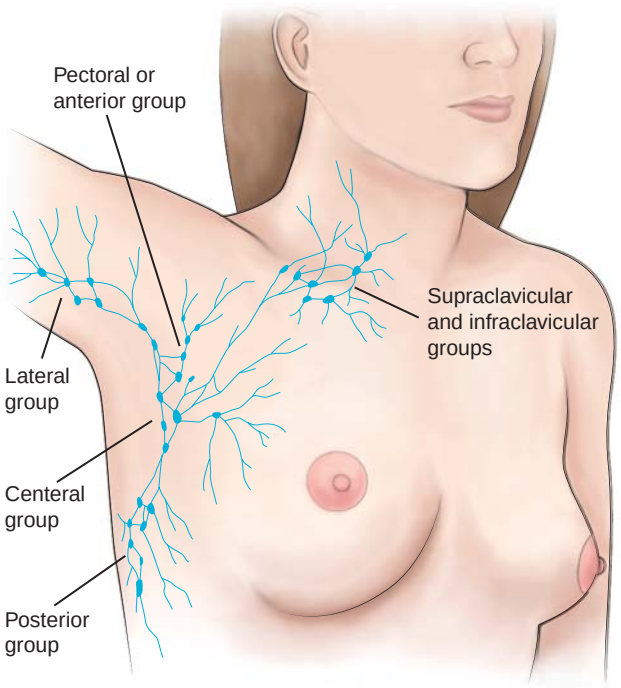


Figure 25-34. Location of the cervical, axillary, and mammary lymph nodes.

Move the stethoscope in a clockwise manner, assessing all four quadrants systematically. Using the bell of the stethoscope, auscultate over the aorta, renal arteries, and iliac arteries for bruits.

Abnormal findings include increased bowel sounds (often heard with diarrhea or in early bowel obstruction), decreased bowel sounds (heard after abdominal surgery or late bowel obstruction), or absent bowel sounds (indicating peritonitis or paralytic ileus). Bowel sounds of high-pitched tinkling or rushes of high-pitched sounds indicate a bowel obstruction. A bruit may be heard if an aneurysm or stenosis is present in an abdominal artery. Report changes in or absence of bowel sounds.

Percussing the Abdomen

Percussion is useful in assessing a full bladder or changes in abdominal contents. All four quadrants are percussed in a systematic, clockwise manner to identify fluid, masses, or air. Note the distribution of sounds. Normal sounds are tympany over the abdomen and dullness over the liver and a full bladder. The dominant percussion note in abdominal assessment is tympany. Abnormal findings include decreased tympany and increased dullness, possibly caused by fluid or a mass.

Palpating the Abdomen

Use the pads of the fingers to palpate with a light, gentle, dipping motion. Watch the patient's face for nonverbal signs of pain during palpation. Palpate each quadrant in a systematic manner, noting muscular resistance, tenderness, enlargement of the organs, or masses. If the patient complains of abdominal pain, palpate the area of pain last. The abdomen should normally be soft, relaxed, and free of tenderness. Abnormal findings include involuntary rigidity, spasm, and pain (which may indicate trauma, peritonitis, infection, tumors, or enlarged or diseased abdominal organs).

Palpating the Liver

The liver is not usually palpable, but it is assessed for abnormalities. The lower edge of the liver may be palpated using light palpation or a hooking technique. To palpate bimanu-

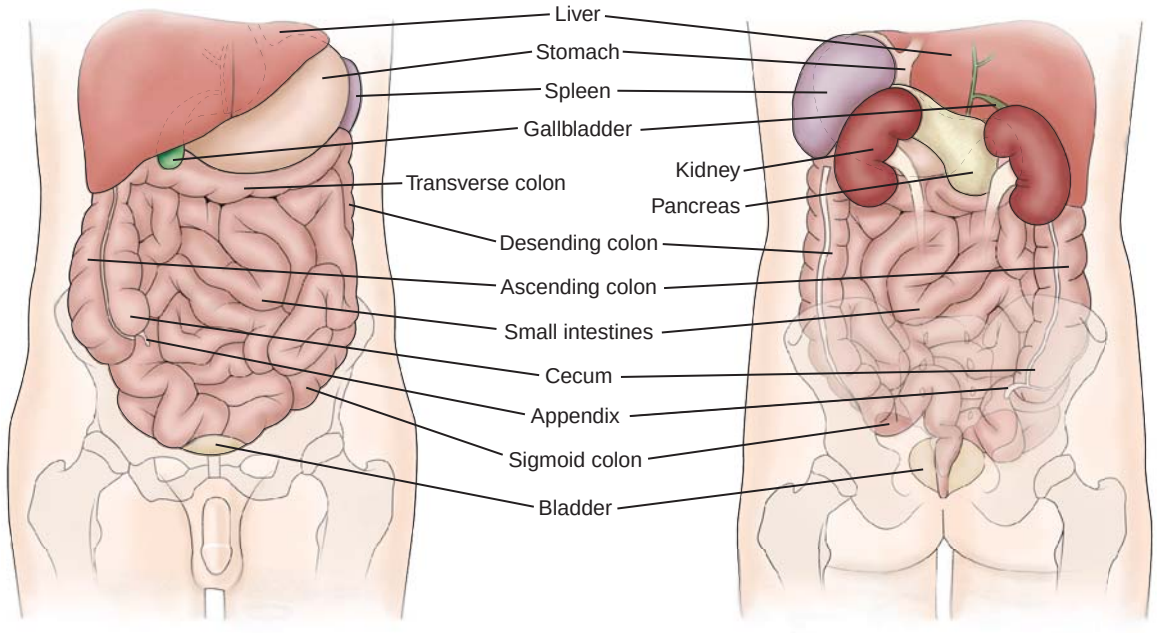


Figure 25-35. Organs of the abdominal cavity.

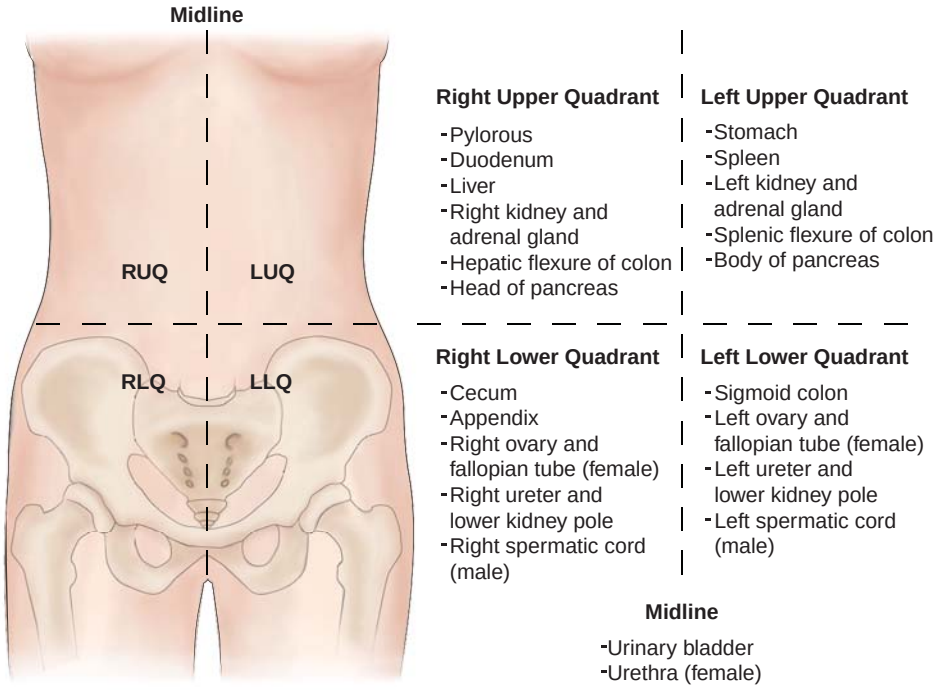


Figure 25-36. Diagram of abdominal quadrants and outline of underlying organs.

ally, stand at the patient's right side and place your left hand under the patient's back at the level of the 11th to 12th ribs. With your fingertips pointing toward the patient's head, ask the patient to inhale and press up and in with your fingertips. To palpate by hooking, stand on the patient's right side and hook (curl) the fingers of both hands over the edge of the right costal margin. Ask the patient to take a deep breath and gently pull up and in with your finger tips. The normal liver edge should feel firm and smooth, and may normally be mildly tender. Abnormal findings include a hard and firm liver edge (found in cancer of the liver), nodularity (found with tumor, metastatic cancer, and cirrhosis of the liver), and pain (from vascular engorgement as in congestive heart failure, hepatitis, or abscess). If the liver border is more than 1 to 3 cm below the costal margin it is considered enlarged; enlargement may result from hepatitis, liver tumors, cirrhosis, and vascular engorgement.

Normal Age-Related Variations

Infant/Child

Common abdominal variations in newborns and children include:

- Umbilical cord in newborns; dries and falls off within the first few weeks of life
- A "pot-belly" (under 5 years of age)
- Visible peristaltic waves
- Easily palpated liver and spleen

Older Adult

Common abdominal variations in older adults include:

- Decreased bowel sounds
- Decreased abdominal tone
- Liver border palpated more easily

Assessing Female Genitalia

The external female genitalia consist of the mons pubis, labia majora and minora, clitoris, vestibular glands, vaginal vestibule, vaginal orifice, and urethral opening (Fig. 25-37). Information collected during the health history is especially helpful in identifying risk factors for cancer and health-related behaviors that may lead to sexually transmitted infections. Although the external genitalia may be examined, the internal pelvic examination is a skill most often performed by

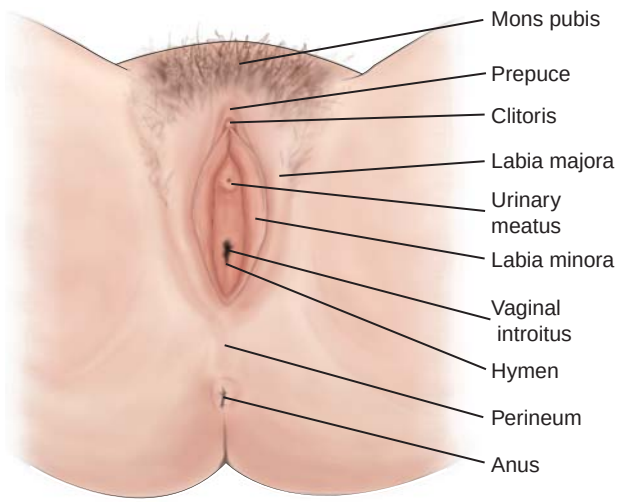


Figure 25-37. External female genitalia.

a physician or a nurse with advanced education and skills. The female genitalia are assessed for lesions, discharge, masses, and enlargement of internal organs. The rectum and anus may be assessed during part of this examination if a total health assessment is being performed. Information about rectal examination is given separately.

Health History

Identify risk factors for altered female health during the health history by asking about the following:

- Menstrual history (age of first and last period, length of flow, type of flow, pain)
- Sexual history (age at which sexual activity began, number of partners)
- Number of pregnancies and live births
- History of sexually transmitted infection
- Use of contraceptives
- Frequency of pelvic examinations and Pap smears
- History of vaginal discharge, itching, or pain on urination
- History of smoking
- Family history of reproductive or genital cancer

Recall Ramona Lewis, the college student who reported that she was raped. As part of the focused assessment, the nurse would need to obtain a reproductive health history to provide a baseline for the patient's plan of care.

Physical Assessment

The genitalia are assessed by inspection and palpation. A description of an internal pelvic assessment of women is included in this chapter, although individual health agency policies vary on whether this is included as part of the health assessment. This is an advanced assessment technique, but nurses often assist in performing vaginal examinations and need to be familiar with the procedure. In many instances, male healthcare providers will ask that a female be present in the room as a chaperone during the examination. Women from some cultures (Islam, for example) may agree to a physical examination of the genitalia only by a female nurse or female physician. Equipment required includes a vaginal speculum (for the female examination), a good light source, and disposable gloves.

Inspecting and Palpating the External Genitalia

The bladder should be emptied before the examination. The woman is placed in the lithotomy position on the examination table, with the legs in stirrups, and draped so that only the genitalia are exposed. Explain the procedure to her and help her to relax as it is performed. Gloves are worn during this assessment.

The external genitalia are inspected first. Inspect the external genitalia for color, size of the labia majora and vaginal opening, lesions, and discharge. The vulva normally has more pigmentation than other skin areas, and the mucous membranes are dark pink and moist. The skin and mucosa should be smooth, without lesions or swelling. The labia should be symmetric without lesions or swelling. Lesions may be the result of infections (such as herpes or syphilis). There may be a small amount of clear or whitish vaginal discharge (this is normal). The vaginal orifice varies in size, depending on the woman's age, sexual history, and having vaginal delivery. In children, loss of hymenal tissue between the 3 o'clock and 9 o'clock position indicates trauma (from digits, penis, or foreign objects). Palpate the labia for masses and the Bartholin's glands for swelling, pain, and discharge.

Inspecting Internal Genitalia

A speculum is used to examine the internal genitalia. Guidelines for Nursing Care 25-9 lists the sequence of an internal vaginal examination.

Think back to Ramona Lewis, the college student who arrived at the emergency department reporting that she was a victim of date rape. Examination of her external and internal genitalia is required to collect evidence indicating rape. The nurse would need to keep in mind the agency's policy and local and state legal requirements related to collection of rape evidence.

Abnormal findings include redness, swelling of glands, discharge, lesions, and pain, which may indicate infection, an abscess, a polyp, or cancer. For related assessments of sexually transmitted diseases and the urinary tract, see Chapters 35 and 43.

Normal Age-Related Variations

Infant/Child

Common genitalia variations in newborns and children include:

- Enlarged labia and clitoris at birth
- Public hair and breast development occur at puberty and follow a regular sequence of development
- Menstruation begins about 2.5 years after puberty begins
- Irregular menstrual cycle for first 2 years

Older Adult

Common genitalia variations in older adults include:

- Decreased labia size
- Decreased public hair
- Decreased vaginal secretions
- Shortened vaginal vault

Assessing Male Genitalia

The male genitalia (Fig. 25-38) include the penis, testicles, epididymis, scrotum, prostate gland, and seminal vesicles.

Guidelines for Nursing Care 25-9

Vaginal Examination

- Explain the procedure to the patient.
- Warm the speculum under warm running water; if cytologic specimens are to be taken, the water serves as the lubricant; if no specimens are needed, a water-soluble lubricant may be used.
- Don gloves.
- Using two fingers placed just inside the vagina, press down gently on the posterior vaginal wall.
- Insert the speculum blades vertically into the vagina, the posterior portion pointed at a 45-degree angle. Ensure that no pubic hair is caught in the speculum.
- Turn the speculum so that the handle is down and the blades are in a horizontal position.
- Open the blades and close the screw that locks the blades open.
- Inspect the cervix and os for size, color, shape, lesions, and discharge.
- Obtain specimens if needed.
- Withdraw the blades slowly, observing the vaginal walls.
- When the speculum blades are clear of the cervix, release the screw so that the blades close, and withdraw the speculum from the vagina.
- Provide the patient with tissues to remove the lubricating jelly (if used).

Information from the health history is helpful in identifying self-care and lifestyle factors that increase the risk of illnesses such as testicular cancer or sexually transmitted infections. The physical examination is focused on detecting abnormal findings so that early diagnosis and treatment can be initiated.

Health History

Identify risk factors for altered male health during the health history by asking about the following:

- Frequency of digital rectal examinations
- Frequency of testicular self-examination
- Use of contraceptives
- Occupational exposure to chemicals (tire and rubber manufacturing, farming, mechanics)
- History of sexually transmitted infection
- History of discharge from the penis
- Difficulty with urination (hesitancy, frequency, voiding at night)
- History of incontinence
- History of erectile dysfunction

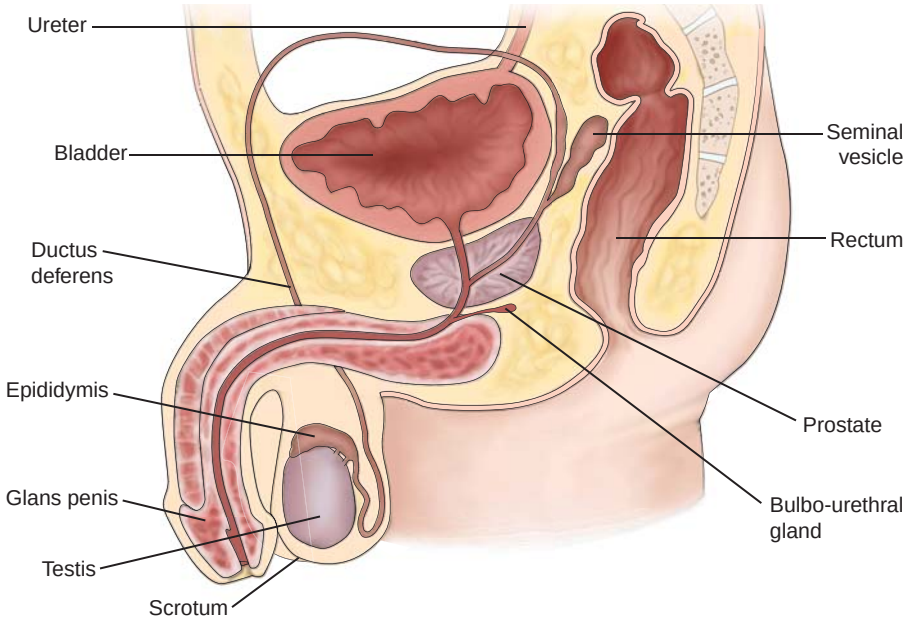


Figure 25-38. Organs of the male urogenital system.

Physical Assessment

Inspecting and Palpating the Genitalia

The patient may be standing or supine. Gloves are worn during this assessment. Inspect the external genitalia for size, placement, contour, appearance of the skin, redness, edema, and discharge. If the patient is uncircumcised, retract the foreskin for inspection of the glans penis. Assess the location of the urinary meatus. Inspect the scrotum for symmetry; it is not unusual for the left testicle to lie lower in the scrotal sac than the right testicle. The size, shape, and consistency of the scrotal contents (ie, testes) should be similar bilaterally. Normal findings include skin that is free of lesions, and a foreskin (if present) that is intact, uniform in color, and easily retracted. The urinary meatus is normally located in the center of the glans penis and is free of discharge. The scrotum and testes should be free of masses and nontender. Inspection of the inguinal area may be done at this time by asking the patient to bear down. Normally, the inguinal area is free of bulges. (Further assessment for inguinal hernia, inguinal lymph nodes, and femoral hernia are usually performed by a physician or nurse with advanced education and skills.)

Abnormal findings are lesions, redness, edema, pain, discharge, fluid-filled masses in the scrotum (symptoms of a hydrocele or varicocele), and displacement of the urinary meatus or difficulties with voiding. Edema, redness, discharge, or pain may indicate an infection. Voiding difficulties may result from scarring caused by infections or prostate enlargement. (See Chaps. 35 and 43 for additional discussion of sexually transmitted diseases and the male urinary tract.)

Normal Age-Related Variations

Infant/Child

Common genitalia variations in newborns and children include:

- Development of pubic hair and enlargement of the scrotum, testes, and penis occurs at puberty and follows a regular sequence to adult configuration.
- Spontaneous nocturnal emission of seminal fluid occurs at puberty.

Older Adult

Common genitalia variations in older adults include:

- Decreased penis size
- Decreased pubic hair
- Decreased size of testes

Assessing the Rectum and Anus

The rectum and anus are not assessed in all patients but this is a part of a total health assessment. Information from the health history provides information about normal patterns of bowel elimination and identifies risks for illness (such as colon cancer) and health behaviors (such as frequency of digital rectal examinations [DRE] or engaging in rectal sex). Both men and women should have regular DRE to assess for cancer. Physical examination provides information to support teaching about risk for colon cancer and the risks of sexually transmitted infections (including AIDS) associated with unprotected anal sex.

Health History

Identify risk factors for altered health during the health history by asking about the following:

- Bowel patterns, including any constipation, diarrhea, pain, or trouble controlling bowels
- History of blood or mucus in the stool
- Family history of polyps, colon or rectal cancer, or prostate cancer
- History of hemorrhoids

Physical Assessment

Techniques used to assess the rectum and anus include inspection and palpation. Necessary equipment includes lubricant and good lighting. Gloves are worn. The patient may be in the Sims, knee-chest, or lithotomy position or may be standing and leaning over the examination table.

Inspection is used to assess the anal area, which normally has increased pigmentation and some hair growth. Palpation is used to assess the rectum, using a well-lubricated, gloved index finger. Sphincter tone at the anus should be firm and the mucosal lining smooth. (Fecal specimens may be taken at this time, if necessary.) Abnormal findings include relaxed sphincter tone; skin cracks, nodules, or hemorrhoids at the anal sphincter; bleeding (which may indicate hemorrhoids or colorectal cancer); and hard or abnormally colored (such as clay-colored or dark-black) stools.

If a rectal assessment is conducted, the cervix in women may be felt as a small, round mass when palpating the anterior rectal wall. Abnormal findings include changes in consistency. The prostate gland in men can be assessed for size, shape, and consistency by palpation through the anterior rectal wall; the gland is normally smooth, firm, and about 1¾″ (4 cm) in size. Abnormal findings include enlargement or changes in consistency (which occur in benign prostatic enlargement or cancer).

Normal Age-Related Variations

Infant/Child

Note: Normally physical examination of the rectum and anus is not performed in young children or adolescents.

Older Adult

Common variations in older adults include:

- Anus is darker in color
- Hemorrhoids are often present

Assessing the Musculoskeletal System

The primary structures of the musculoskeletal system are the bones, muscles, cartilage, ligaments, tendons, and joints. The muscles, bones, and joints are assessed. Health history information is used to evaluate the patient's ability to carry out

activities of daily living and to collect subjective data, such as pain, stiffness, and ability to move. The patient's usual exercise patterns are helpful in teaching healthy behaviors. Physical examination provides information about posture, gait, bone size and structure, joint range of motion (ROM), and muscle strength. Normally, the joints are of equal bilateral size, shape and color; are free of swelling, pain, nodules, or crepitus (grating sounds on movement); and move through full ROM. Abnormal findings include deformity, crepitus, and limited ROM (indicating injury, inflammation and/or arthritis of the affected joints or bones, and muscle pain and/or weakness caused by injury or disease).

Health History

Identify risk factors for altered health during the health history by asking about the following:

- History of trauma, arthritis, or neurologic disorder
- History of pain or swelling in the joints
- History of pain in the muscles or joints
- Frequency and type of usual exercise
- Dietary intake of calcium
- History of smoking
- History of alcohol intake

Physical Assessment

The patient assumes a variety of positions, including standing, sitting, and supine. Assessments of the musculoskeletal system can be integrated into the assessment of other body systems.

Inspecting and Palpating the Muscles

Examine the muscles by inspection and palpation of muscle groups and by testing muscle tone and strength. Muscle groups are observed for bilateral symmetry and palpated for tenderness. Normally, they are symmetric and nontender. Evaluate muscle tone (the normal condition of a muscle at rest) by putting each joint and extremity through passive range of motion. Assess muscle strength. Guidelines 25-10 describes testing muscles.

Abnormal findings include atrophy (a decrease in size), tremors (involuntary movements), and flaccidity (without tone) of muscles. Other abnormal findings are loss of strength and tone, decreased range of motion, uncoordinated movements, swelling, and pain. Abnormal findings may indicate a musculoskeletal disease, trauma, or a neurologic disease.

Palpating the Bones

Palpate bones for normal contour and prominence as well as for bilateral symmetry. Abnormal findings include pain, enlargement, asymmetry, and changes in contour. Abnormal findings may indicate trauma, degenerative joint disease, musculoskeletal disease, or a neurologic disease.

Inspecting and Palpating the Joints

Each joint is put through its full range of motion to assess the degree of movement. Joint movements include flexion, extension, hyperextension, abduction, adduction, supination, and pronation. Normally, each joint has full range of motion, is nontender, and moves smoothly. Palpate joints for the abnormal findings of pain, swelling, nodules, and crepitation (a grating sound heard or felt on movement). See Chapter 39 for further discussion and illustration of joint mobility.

Inspecting Spinal Curves

With the patient standing, inspect the spine from the back and from the side. The lumbar curve may be flattened with a herniated disk. Kyphosis (an increased thoracic spinal curve) is more often seen in older adults. An exaggerated lumbar curve (lordosis) is often seen during pregnancy or in obesity. Scoliosis is a lateral curvature of the spine with increased convexity on the side that is curved. School nurses often first identify scoliosis during screenings, which are recommended for girls in grades 5 and 7 and for boys in grades 8 or 9. Findings indicating scoliosis are illustrated in Figure 25-39.

Normal Age-Related Variations

Infant/Child

Common musculoskeletal variations in newborns and children include:

- C-shaped curve of spine at birth; the anterior cervical curve develops at about 3 to 4 months of age, and the anterior lumbar curve develops between 12 and 18 months of age
- Lordosis (an exaggerated lumbar curve)
- Pronation of the feet in children between 12 and 30 months of age
- Genu varum (bowleg) for 1 year after learning to walk

Older Adult

Common musculoskeletal variations seen in older adults include:

- Loss of muscle mass and strength
- Decreased range of motion
- Kyphosis
- Decreased height
- Osteoarthritic changes in joints

Assessing the Neurologic System

Neurologic assessment includes cerebral function, cranial nerve function, cerebellar function, motor and sensory function, and reflexes. The health history is useful in obtaining information about activities of daily living and subjective data, such as dizziness, loss of sensation, headaches, and ability to see, hear, taste, and detect sensations. Physical examination is conducted to identify mental status and level of consciousness, cranial nerve function, muscle strength and coordination, and reflexes. Normally, the patient is alert and responsive, has full sensory function, and all muscle groups are bilaterally strong. Abnormal findings are discussed with specific parts of the examination that follow.

(text continues on page 646)

Guidelines for Nursing Care 25-10

Assessing the Muscles

Assess muscle strength by asking the patient to move against resistance. Bilateral equal resistance should be present Observe muscle contraction and determine muscle strength exerted. Muscle strength should be bilaterally equal, with a slight increase on the dominant side. Techniques for assessing the muscles include:

Shoulder Flexion

The patient flexes shoulder muscle against resistance of the examiner's hand (Figure A).

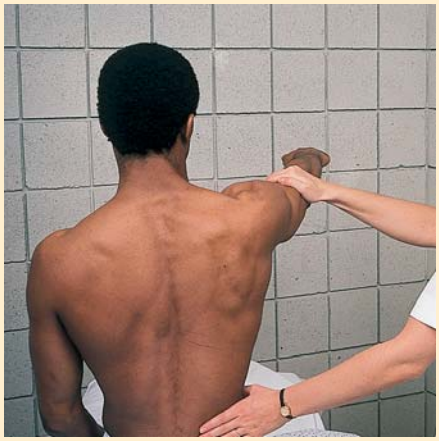


Figure A.

Elbow Extension and Flexion

- The patient first extends the elbow against resistance by the examiner (Figure B).
- Then he flexes the elbow against resistance (Figure C).

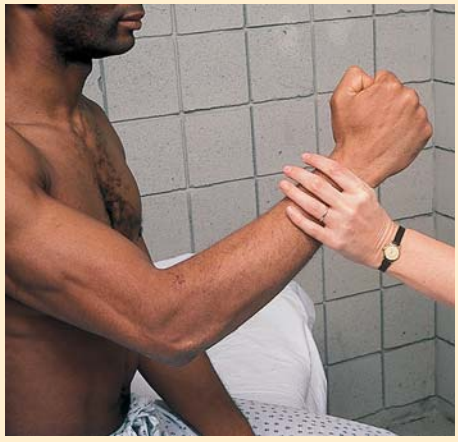


Figure B.

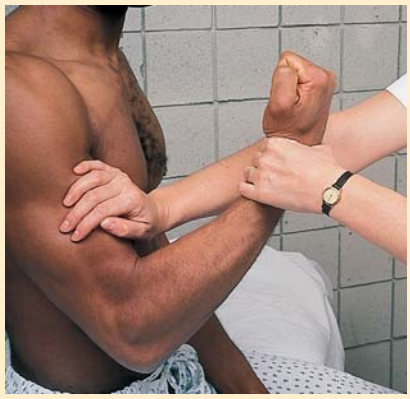


Figure C.

Wrist Extension

The patient makes a fist and resists examiner's attempts to pull down wrist (Figure D).

Figure D.

Grip

The patient squeezes the examiner's index and middle fingers (Figure E).

Figure E.

(continued)

Guidelines for Nursing Care 25-10

Assessing the Muscles *(continued)*

Hip Flexion

The patient attempts to raise his thigh against examiner's resistance (Figure F).

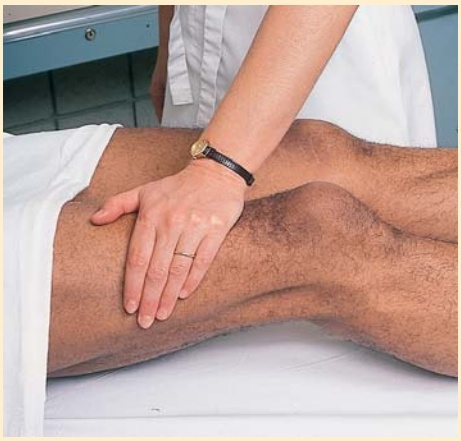


Figure F.

Knee Flexion and Extension

- With the patient's knee bent and foot on the examining table, the patient attempts to keep foot down while the examiner attempts to straighten the patient's leg to test flexion (Figure G).

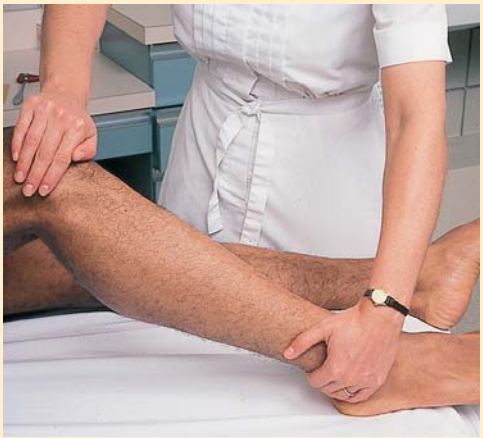


Figure G.

- To test extension, the examiner supports the patient's knee and the patient attempts to straighten his leg against resistance at the ankle (Figure H).

Photos by Ken Casper.

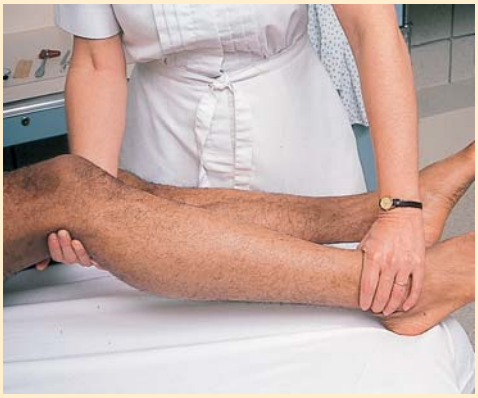


Figure H.

Ankle Plantar Flexion and Dorsiflexion

- The patient first pushes the balls of the feet against resistance of the examiner's hands (Figure I).
- Then, the patient attempts to pull against examiner's resistance (Figure J).

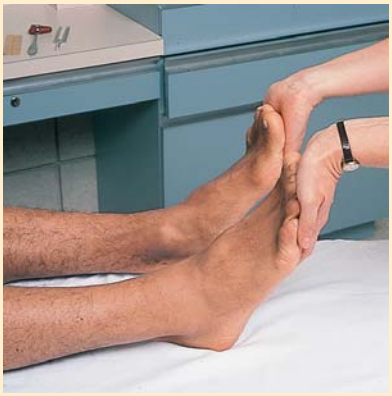


Figure I.

Figure J.

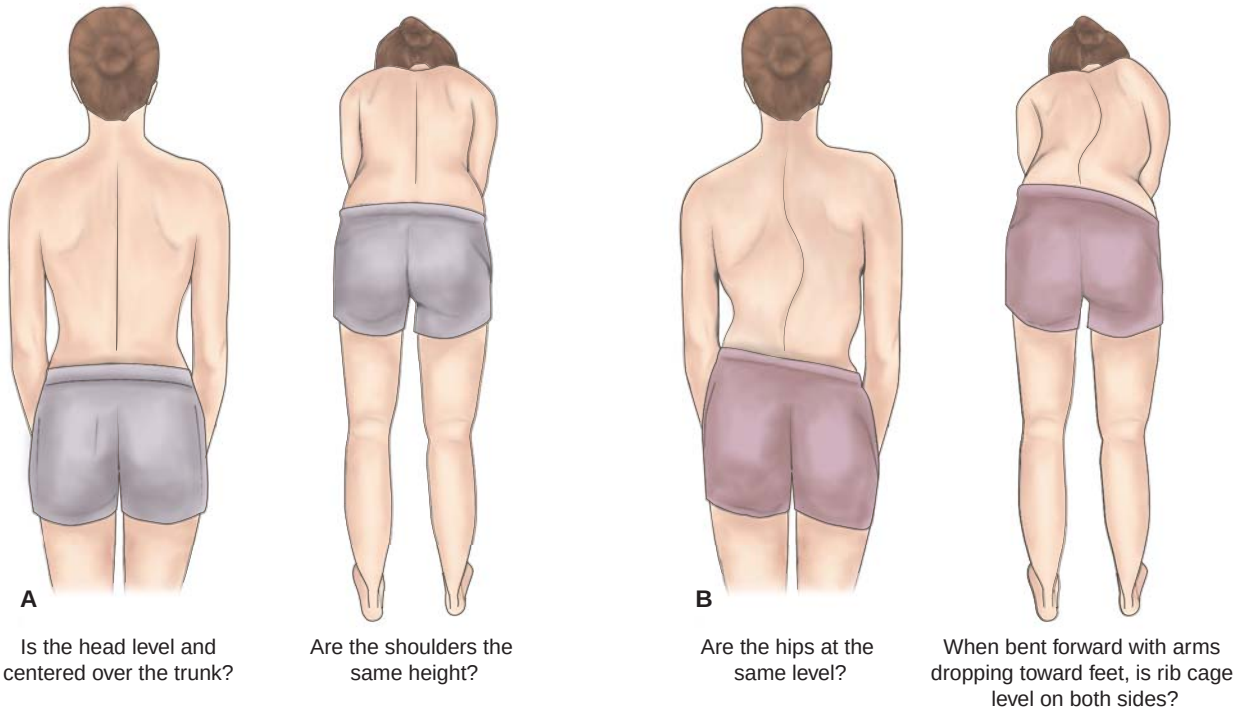


Figure 25-39. Screening for scoliosis. (**A**) Normal position and spinal curves. (**B**) Scoliosis indicators.

Health History

Identify risk factors for altered health during the health history by asking about the following:

- History of numbness, tingling, or tremors
- History of seizures
- History of headaches
- History of dizziness
- History of trauma to the head or spine
- History of infections of the brain
- History of stroke
- Changes in the ability to hear, see, taste, or smell
- Loss of ability to control bladder and bowel
- History of high blood pressure
- History of smoking
- History of chronic alcohol use
- History of diabetes mellitus or heart disease
- Use of prescription and over-the-counter medications
- Family history of high blood pressure, Alzheimer's disease, epilepsy, cancer, or Huntington's chorea
- Frequency of blood cholesterol tests and results
- Exposure to environmental hazards (eg, lead, insecticides)

Physical Assessment

Assess cerebral function by observing the patient's behavior throughout the health history interview and physical assessment. Assess the patient's mental status, memory, emotional status, cognitive abilities, and behavior. Evaluate cerebellar function by assessing fine motor skills, coordination, and balance. Assess the sensory system by having the patient identify various sensory stimuli, and evaluate the reflexes by contraction of specific muscles.

Equipment includes vials of aromatic substances (eg, peppermint and vanilla), a visual acuity chart, a penlight, a sharp object (eg, a large safety pin), cotton balls, vials of solution to test taste (eg, salt or sugar), a tuning fork, a tongue depressor, a reflex hammer, and familiar objects such as a key or coin. The patient should be sitting and the environment should be quiet.

Mental Status

Mental status assessment includes level of awareness, level of consciousness, behavior and appearance, memory, abstract reasoning, and language. On initial contact, begin to evaluate the patient's orientation to person, place, and time, as well as his or her cognitive abilities and affect (whether the patient knows who he or she is, where he or she is, and the day or month or year). Observe the patient's appearance, general behavior, ability to speak clearly, and responses to questions. Note any variation in responses.

The patient should have a clean, neat appearance with erect posture; should be oriented to person, place, and time; should have memory recall (both short-term and long-term memory); and should be able to demonstrate coherent and logical thought processes. Abnormal findings include poor hygiene, inappropriate dress, disorientation, absent memory recall, and incoherent or illogical thought processes. These abnormal findings may indicate a mental health disorder, mental retardation, organic brain disease, cerebrovascular disorder, alcohol or drug intoxication, or a tumor.

Think back to Tammy Browning, the pregnant woman with a history of substance abuse. The nurse would assess the patient's mental status for clues suggesting recent drug use, incorporating knowledge of abnormal findings into the assessment.

The following discussion of each of the mental status components includes sample questions or specific assessments to use during the assessment.

Assessing Level of Awareness

Evaluate orientation to time, place, and person to assess level of awareness. The following questions may be used:

- Time: What is today's date? What day of the week is it? What season of the year is this? What was the last holiday?
- Place: Where are you now? What is the name of this city? What state are we in?
- Person: What is your name? How old are you? Who came to visit you this morning?

Although exceptions may occur, individuals who have impaired awareness first lose time orientation, followed by place orientation, and then person orientation. Remember that it is often difficult to know the exact date when one is ill, in pain, or in unfamiliar surroundings.

Assessing Level of Consciousness

Consciousness is the degree of wakefulness or the ability of a person to be aroused. This is not the same as orientation; a patient may be conscious but not oriented. Level of consciousness is described as follows:

- Awake and alert: fully awake; oriented to person, place, and time; responds to all stimuli, including verbal commands
- Lethargic: appears drowsy or asleep most of the time but makes spontaneous movements; can be aroused by gentle shaking and saying patient's name
- Stuporous: unconscious most of the time; has no spontaneous movement; must be shaken or shouted at to arouse; can make verbal responses, but these are less likely to be appropriate; responds to painful stimuli with purposeful movements
- Comatose: cannot be aroused, even with use of painful stimuli; may have some reflex activity (such as gag reflex); if no reflexes present, is in a deep coma

The Glasgow Coma Scale (Table 25-10) is a standardized assessment tool that assesses level of consciousness. Three parameters are evaluated: eye opening, motor response, and verbal response. Scores are given in each category, and a total score is recorded, with higher scores indicating a more normal level of functioning. A score of 7 or less defines coma. This is a more accurate evaluation of mental status over time.

TABLE 25-10 Glasgow Coma Scale

Component	Response	Score
Eye opening	Spontaneous	4
	To verbal command	3
	To pain	2
	No response	1
Motor response	To verbal command	6
	To localized pain	5
	Flexes/withdraws	4
	Flexes abnormally	3
	Extends abnormally	2
	No response	1
Verbal response	Oriented/talks	5
	Disoriented/talks	4
	Inappropriate words	3
	Incomprehensible sounds	2
	No response	1

Assessing Memory

Assess memory by asking questions that call for answers demonstrating immediate recall and recall for past events. To assess immediate memory, ask the patient to repeat a series of numbers forward or backward (eg, 3, 6, 9). Start with three numbers and gradually increase the digits until the patient cannot respond correctly. Most adults can repeat a series of five to eight numbers forward and four to six digits backward. You might also ask, "What did you eat for breakfast this morning?" To assess past memory, ask, "When is your birthday?" or "When is your wedding anniversary?"

Assessing Abstract Reasoning

Ask the patient to explain a proverb such as "the early bird catches the worm." If intellectual ability is impaired, the patient usually gives a literal explanation or repeats the phrase. Be sure that the phrase is not culture specific.

Assessing Language

The cerebral cortex controls the ability to express self through writing, words, or gestures and to understand the spoken and written word. Injury to the cortex can cause aphasia, which is a disorder of language ability. Aphasia may be expressive (the individual understands written and spoken words but cannot write or speak to communicate effectively) or receptive (the individual cannot understand written or spoken words). These aphasias may also be combined. Some simple methods of assessing language capabilities include asking the patient to name items in the room (eg, bed, flowers, gown, pajamas), to follow simple commands (such as "Point to your head"), to read a short sentence aloud, or to match printed and spoken words with appropriate pictures.

Cranial Nerve Function

The function of the 12 cranial nerves is assessed primarily during the neurologic assessment, although parts of cranial nerve function are assessed with other body systems (eg, pupillary response during assessment of the face). The cranial nerves, with their function and assessment methods, are outlined in Table 25-11. Each nerve has a specific function and is evaluated individually.

TABLE 25-11 Summary of Cranial Nerves

Nerve (Number)	Type	Functions	Methods for Examining Nerve
Olfactory (I)	Sensory	Sense of smell	Test each nostril for smell reception and interpretation.
Optic (II)	Sensory	Sense of vision	Test vision for acuity and visual fields.
Oculomotor (III)	Motor	Pupil constriction Raise eyelids	Test pupillary reaction to light and ability to open and close eyelids.
Trochlear (IV)	Motor/ Proprioceptor	Downward inward eye movement	Test for downward and inward movement of the eye.
Trigeminal (V)	Motor	Jaw movements—chewing and mastication	Ask patient to open and clench jaws while you palpate the jaw muscles.
	Sensory	Sensation on the face and neck	Test face and neck for pain sensations, light touch, temperature.
Abducens (VI)	Motor	Lateral movement of the eyes	Test ocular movement in all directions.
Facial (VII)	Motor	Muscles of the face	Ask the patient to raise eyebrows, smile, show teeth, puff out cheeks.
	Sensory	Sense of taste on the anterior two thirds of the tongue	Test for the taste sensation with various agents.
Acoustic (VIII)	Sensory	Sense of hearing	Test hearing ability.
Glossopharyngeal (IX)	Motor	Pharyngeal movement and swallowing	Ask the patient to say "ah," and have patient yawn to observe upward movement of the soft palate; elicit gag response; note ability to swallow.
	Sensory	Sense of taste on the posterior one third of the tongue	Test for taste with various agents.
Vagus (X)	Motor/ Sensory	Swallowing and speaking	Ask the patient to swallow and speak; note hoarseness.
Accessory (XI)	Motor/ Sensory	Movement of shoulder muscles	Ask the patient to shrug shoulders against your resistance.
Hypoglossal (XII)	Motor	Movement of the tongue; strength of the tongue	Ask the patient to protrude tongue; ask patient to push tongue against cheek.

Motor and Sensory Function

Evaluate motor ability by assessing balance, gait, and coordination. Assess sensory function by testing sensory discrimination of pain, light touch, and vibrations.

Inspecting Balance and Gait

Evaluate balance and gait by having the patient walk across the room on the toes, on the heels, and heel to toe. Observe posture, balance, and arm and leg movements. The posture should be erect, with slight swaying in the standing position, and the gait even with simultaneous arm movements. Abnormal findings include loss of balance, shuffling, wide-based gait, and abnormal patterns of gait. These findings may indicate disorders of the motor, sensory, vestibular, and cerebellar systems.

Assessing Motor Function and Coordination

Evaluate motor function and coordination by having the patient rapidly touch each finger with the thumb, rapidly pat the hand on the thigh, and tap the foot on the floor (or against your hand, if the patient is supine). Repeat the sequence on the opposite limb. Normally, the movements are coordinated. If the patient is unable to perform these movements, it may indicate disease of the upper motor neurons or cerebellum.

Assessing Sensory Function

Test sensory perception by evaluating the patient's response to pain, light touch, and vibration. With the patient's eyes closed, use a sharp object and a soft object randomly to touch the upper and lower extremities to test sensation. The assessment proceeds from distal (hands, arms, feet, or legs) to proximal (the trunk). The patient should be able to distinguish between sharp (painful) and soft or dull touch. The same process is repeated by using the tuning fork to test for vibratory sensation and placing the fork on bony prominences. Abnormal findings include inability to perceive pain or light touch, inability to identify the location of touch, and absence of vibratory sensation.

Reflex Function

Evaluate the deep tendon reflexes to determine the functional ability of specific spinal segment levels. Use the reflex ham-

mer to elicit muscle contraction and reflexes. The patient may be either sitting or supine. Selected reflexes, with normal responses and methods of assessment, are illustrated in Table 25-12. They are usually graded on a scale of 0 to 4, as listed in Table 25-13. A grade of 2 is considered a normal or active response.

Normal Age-Related Variations

Infant/Child

Common neurologic variations for newborns and children include:

- Positive Babinski's reflex (normal in children between 12 and 24 months)
- Grasp reflex (present at birth)
- Motor control develops in head, neck, trunk, and extremities sequence

Older Adult

Common neurologic variations for older adults include:

- Slower thought processes and verbal responses
- Decreased sensory ability (hearing, sight, smell, taste, temperature, and pain)
- Slower coordination and voluntary movements
- Decreased reflex responses
- Appearance of confusion in unfamiliar surroundings
- Slower gait, with a wider base and flexed hips and knees
- Decreased deep tendon reflexes

DOCUMENTING THE DATA

After completing the nursing history and assessment, organize all assessment data to identify actual and potential health problems, make nursing diagnoses, plan appropriate care, and evaluate the patient's responses to treatment. A pattern is often established that begins during the history and is confirmed during the physical assessment. For example, a health history of a woman diagnosed with multiple sclerosis (a neurologic disorder) includes data about fatigue and increased weakness and muscle spasms in the legs. Physical examination findings include decreased muscle strength in the lower extremities. These data are used to support the nursing diagnosis of Activity Intolerance related to fatigue and lower extremity weakness. Document the data, with each system recorded individually. A documentation example is illustrated in Box 25-6.

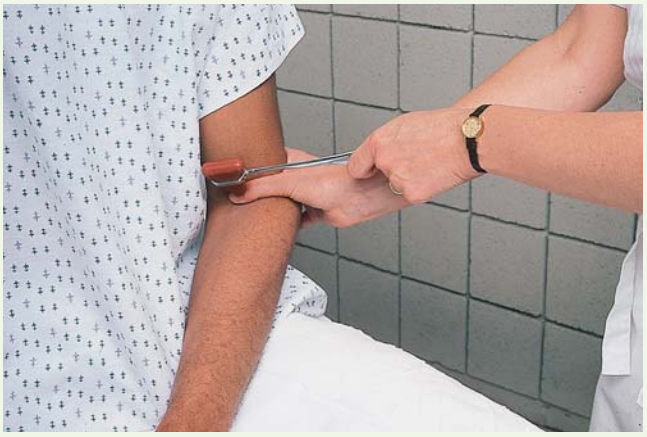
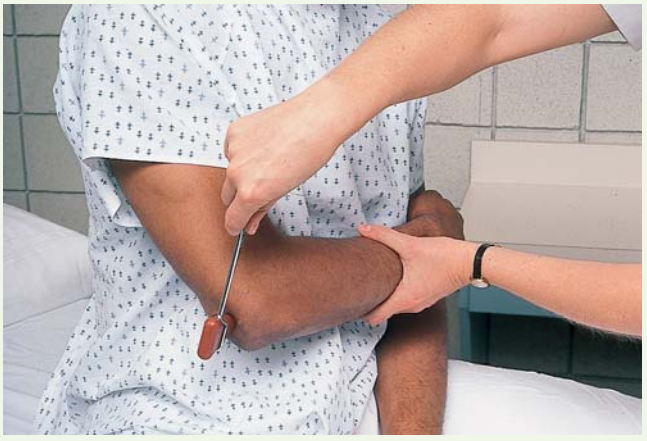
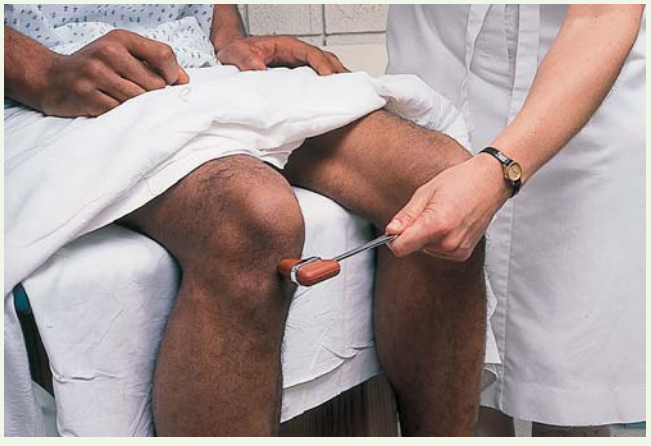
THE NURSE'S ROLE IN DIAGNOSTIC PROCEDURES

Nurses assist before, during, and after diagnostic tests. The nurse is also responsible for other activities associated with diagnostic tests, such as witnessing the patient's consent, scheduling the test, preparing the patient physically and emotionally for the test, providing care after the test, disposing of used equipment, and transporting specimens.

Think back to Tammy Browning, the pregnant woman with a history of substance abuse. A urine specimen was to be obtained for routine testing. In addition, the specimen was to be used for drug testing without the patient's knowledge. Typically a signed consent form is not necessary for urine specimens. However, the nurse would need to know the agency's policy and legal statutes of the area regarding consent for drug testing before obtaining the specimen.

Diagnostic tests provide crucial information about a patient's health, and their results become a part of the total health assessment. Nurse practitioners and physicians make decisions concerning which diagnostic tests to schedule when problems are noted during the health history or physical assessment or because of a problem stated by the patient. Table 25-14 presents an overview of different types of diagnostic procedures.

TABLE 25-12 Normal Responses of Commonly Tested Reflexes

How to Test Reflex	Normal Response
Biceps	
	The contraction of the biceps can be seen and felt. To test the biceps reflex, the elbow is slightly bent, and the palm faces downward. The examiner's thumb is placed on the biceps tendon at the bend in the elbow. The percussion hammer strikes the examiner's thumb.
Triceps	
	The contraction of the triceps can be seen as the elbow extends. To test the triceps reflex, the patient's elbow is sharply bent; the forearm is placed across the chest wall with the palm turned toward the body. The triceps tendon is struck with the percussion hammer just above the elbow.
Knee	
	The contraction of the quadriceps causes the knee to extend. To test the knee reflex, the patient is in the sitting position. The patellar tendon just below the patella is struck with the percussion hammer. If the patient is lying down, the reflex is tested while the examiner's hands are placed under the knees to bend them.

(continued)

TABLE 25-12 Normal Responses of Commonly Tested Reflexes *(continued)*

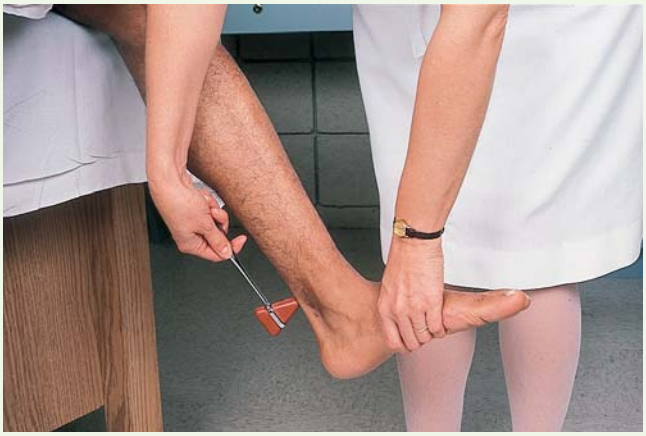
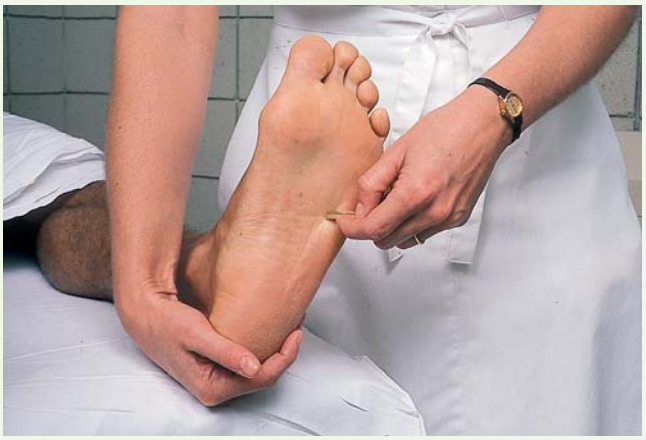
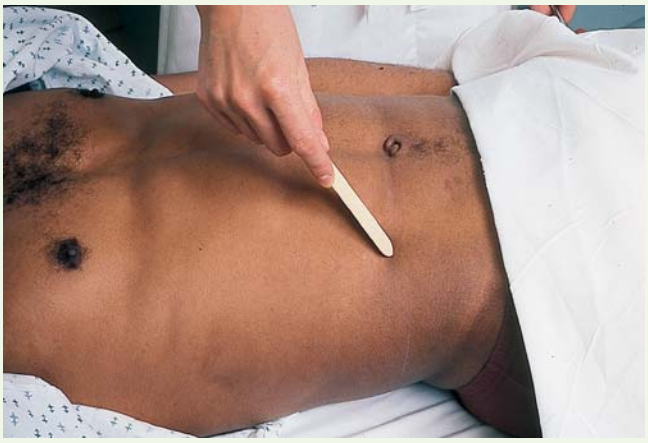
How to Test Reflex	Normal Response
Ankle	
	The foot jerks and moves downward. To test the ankle reflex, the leg is bent at the knee and the foot is supported in a walking position. The Achilles tendon is struck with the percussion hammer.
Babinski	
	The toes bend or curl. The lateral aspect of the sole of the foot is stroked with an object, such as a key or a thumbnail, from the heel to the ball of the foot.
Abdominal	
	The contraction of abdominal musculature can be seen. To test the abdominal reflex, with the patient lying on the back, each side of the abdomen is stroked from the sides toward the center with a tongue blade or key.

TABLE 25-13 Grading of Reflexes on a 0 to 4+ Scale

Grade	Description
4+	Very brisk, hyperactive; often indicative of disease; often associated with clonus (rhythmic oscillations between flexion and extension)
3+	Brisker than average; possibly but not necessarily indicative of disease
2+	Average; normal
1+	Somewhat diminished; low normal
0	No response

BOX 25-6 Documenting a Health Assessment

Mrs. D. comes to a local community outpatient agency for her intolerance of eating fatty foods. She says, "I just started having a lot of gas and was sick to my stomach after eating fried foods." The nurse in charge of the agency makes the following assessments.

Health History

Mrs. D. is a 52-year-old woman who lives with her 54-year-old husband on a farm in a rural midwestern area. She graduated from high school and is employed as a secretary for a local insurance agency. Mrs. D. is well-groomed, alert, and oriented. She occasionally takes over-the-counter medications for constipation and colds. She takes a prescription medication twice a day for "high blood pressure." She says she has about two mixed drinks a week and does not smoke. She has had five pregnancies, resulting in five living children.

Mrs. D. had her tonsils removed at 5 years of age, had an appendectomy at 22 years of age, and is allergic to penicillin (causes rash and difficulty breathing). She has had all her immunizations, but her last tetanus shot was 10 years ago. Her family history of illness is as follows:

Maternal grandfather, died of heart problems at 77 years of age
Maternal grandmother, died of diabetes complications at 69 years of age
Paternal grandfather, died of stroke at 82 years of age
Paternal grandmother, died of unknown causes at 56 years of age
Sister, 49 years of age, healthy
Brother, died at 22 years of age in a car accident

Physical Assessment

Vital signs: T = 98.8°F (orally), P = 82 beats/min, R = 16 breaths/min, BP = 150/88 mm Hg
Height/weight: 5 feet, 4 inches tall, 178 pounds

Integument: Skin warm and dry, normal turgor. Numerous freckles over face and arms. Old scar, RLQ (appendectomy). Nails convex and smooth. Hair dark brown, shiny, normal distribution.

Head and neck: Skull size and shape normal. Facial features symmetric. Can raise eyebrows, close eyes, smile, puff out cheeks. External eye structures symmetric. Sclera white, conjunctiva pink. Wears glasses to correct near-sightedness. Vision with glasses 20/30-2 on Snellen's chart. Pupils equal and react to light. Demonstrates accommodation, convergence, and peripheral vision. Lens clear. Hearing tested by use of a clock, which she heard clearly at 2 feet. External ears symmetric. Canals smooth and pink without excess cerumen. Tympanic membranes intact without redness or drainage. Right nostril clear, left nostril occluded with mucus. Left maxillary sinus slightly tender on palpation. Teeth in good repair with six fillings. Oral mucous membranes pink. Tonsils absent. Trachea midline, thyroid nonpalpable. No lymph nodes palpable.

Thorax/lungs/heart: Thorax symmetric with equal expansion. Respirations even and unlabored. Lung sounds clear. No visible pulsations noted in neck or precordium. S1 and S2 heard at pulmonic, aortic, tricuspid, and mitral areas. No extra heart sounds, murmurs, or bruits heard. Apical pulse 84 beats/min and regular.

Breasts and axilla: Skin pink. No dimpling or retraction noted. Areolae and nipples dark brown, no crusting or drainage. No masses palpated in breasts. Axillary lymph nodes are not palpable. To have mammogram at next visit.

Abdomen: Obese, rounded. Umbilicus midline. No pain on light palpation. Bowel sounds heard in all four quadrants. No bruits heard on auscultation.

Peripheral vascular: Pulses equal in both arms. Pulses equal in both legs. No edema present. Superficial varicose veins present on both lower extremities between ankle and knee. Toenails thick and yellow.

Genitalia: Will be assessed at next visit with pelvic and Papanicolaou's smear.

Rectum and anus: Inspected only. Small external hemorrhoids noted.

Musculoskeletal: Stands erect. Normal spinal curves. No joint deformities, tenderness, or crepitation. Full active range of motion in all joints. Muscle strength equal bilaterally, slightly stronger on the right (dominant side).

Neurologic: Alert and oriented to time, place, person. Facial expressions appropriate. Speech clear and appropriate. Demonstrates long-term and short-term memory. All cranial nerves tests were intact. Fine motor movements intact. Gait even. Perceives pain or light touch appropriately. All reflexes = 2.

TABLE 25-14 A Guide to Common Laboratory and Diagnostic Procedures

Procedure	Description	Examples
Aspiration procedures	Studies in which a needle or similar instrument is inserted into a body organ or cavity. Fluid or tissue is aspirated, prepared, labeled, and sent to the laboratory for examination.	Liver biopsy Lumbar puncture Paracentesis Thoracentesis
Electrical impulse procedures	Studies that use a machine with electrodes attached to the body to monitor electric activity. Electric impulses are recorded on a graph and displayed on paper or an oscilloscope screen.	Electrocardiogram (EKG) Electroencephalogram (EEG)
Endoscopic procedures	Studies that allow for direct visual examination of various body cavities and organs by means of a hollow, lighted tube called an endoscope. The tube may be flexible or rigid. May be used to obtain tissue specimens for biopsy or microscopic examination.	Bronchoscopy Colonoscopy Gastroscopy Sigmoidoscopy Laparoscopy
Laboratory procedures	Studies in which body fluids, secretions, or tissues are sent to the laboratory for analysis	Blood studies Urine studies Sputum studies Fecal studies Biopsies
Radiography procedures	Because of the ability of x-rays to penetrate human tissues, x-ray studies provide a picture of body structures that looks like a negative of a photograph.	Chest x-ray Dye-enhanced cardiac catheterization
Magnetic resonance imaging (MRI)	The computer-based procedure provides physiologic information and detailed views of fluid-filled soft tissues.	MRI of the brain, spine, extremities, joints, heart, pelvis, abdomen
Nuclear scanning	Studies that use the administration of a radionuclide and subsequent measurement of radiation from an organ to detect functional abnormalities	Brain scan Heart scan Lung scan Bone scan
Ultrasonography	Studies in which a harmless, high-frequency sound wave is emitted that penetrates the organ being studied. The sound waves bounce back to the sensor and are electronically converted into a picture of the organ or the contents of the organ.	Ultrasound of the pelvis, abdomen, heart, uterus

The Taylor Suite offers these additional resources to enhance learning and facilitate understanding of this chapter.

- thePoint online resource, http://thepoint.lww.com/Taylor6E
- Student CD-ROM included with the book
- Study Guide to Accompany Taylor's Fundamentals of Nursing

Developing Critical Thinking Skills

1. Describe how you would explain a cardiovascular assessment to the following patients:
   - A healthy 5-year-old
   - A college student who has never been ill
   - A 50-year-old man who has never had a physical assessment
   - An 85-year-old woman with heart problems
2. When you are conducting a health history, your patient gives you strange answers. Later, during the mental status assessment, she gives you the wrong answers for the date and place. She also cannot remember what medications she takes. How would you document this information? What would you do next?
3. When you make a home visit to conduct an initial health history and physical assessment, the patient refuses to let you do more than assess vital signs. What would you do?

Practicing for NCLEX

1. The internal structures of the eye can be visualized using which of the following instruments?
   a. Otoscope
   b. Ophthalmoscope
   c. Stethoscope
   d. Tuning fork
2. To make accurate assessments during inspection, the nurse must
   a. Compare bilateral body parts
   b. Have 20/20 vision

c. Focus on selected body systems
d. Use touch judiciously

3. Palpation is a physical assessment technique that uses the sense of:
   a. Intuition
   b. Vision
   c. Hearing
   d. Touch
4. When percussing over the stomach, the nurse notes a loud, drum-like sound. The term to document this percussion tone is:
   a. Dullness
   b. Flatness
   c. Tympany
   d. Resonance
5. The bell of the stethoscope is used to hear:
   a. Tympanic sounds
   b. Bowel sounds
   c. Lung sounds
   d. Heart sounds
6. Skin turgor may be assessed by which of the following techniques?
   a. Indenting with the fingertips
   b. Using special lighting
   c. Touching to detect moisture
   d. Lightly pinching a skin fold
7. Visual acuity may be assessed by using a Snellen chart. If a patient has acuity of 20/40 in both eyes, this means:
   a. The patient can see twice as well as normal
   b. The patient has double vision
   c. The patient has less than normal vision
   d. The patient has normal vision
8. When using an otoscope to assess the tympanic membrane of an adult, the ear canal is straightened by gently pulling the pinna:
   a. Up and back
   b. Down and forward
   c. Away from the examiner
   d. In any direction
9. When percussing the thorax and lungs, a dull sound indicates:
   a. An air-filled structure
   b. A bony structure
   c. Emphysematous tissue
   d. Fluid or a solid mass
10. When auscultating the thorax and lungs, coarse gurgling sounds are heard on expiration. These sounds can be broadly labeled as:
    a. Adventitious breath sounds
    b. Bronchovesicular breath sounds
    c. Vesicular breath sounds
    d. Bronchial sounds
11. Heart sounds are the result of:
    a. Blood flow through the heart
    b. Movement of blood into the heart from the aorta
    c. Closure of the heart valves
    d. Contraction of the cardiac muscle
12. When palpating the breast, the assessment should be conducted by which division of areas?
    a. Quadrants
    b. Halves
    c. Entire breast tissue
    d. Bilateral comparison
13. When assessing the abdomen, which assessment technique should be conducted after inspection?
    a. Percussion
    b. Palpation
    c. Auscultation
    d. Sequence does not matter
14. Which of the following assessments of mental status is *not* an assessment of orientation?
    a. Time
    b. Place
    c. Person
    d. Consciousness
15. As part of the assessment of the cranial nerves, the nurse asks the patient to raise the eyebrows, smile, and show the teeth. These actions provide information about which cranial nerve?
    a. Olfactory
    b. Optic
    c. Facial
    d. Vagus

Answers With Rationale

1. The correct answer is *b.* None of the other instruments can be used to visualize the internal eye.
2. The correct answer is *a.* A comparison of bilateral body parts is necessary for recognizing abnormal findings. Perfect vision is unnecessary; the nurse examines all body systems and uses touch during palpation.
3. The correct answer is *d.* Palpation is the technique that uses the sense of touch. The other answers are incorrect.
4. The correct answer is *c.* Tympany is a loud, drum-like sound, heard over an air-filled organ. Dullness has a thud-like quality. Flatness is a flat, high-pitched sound. Resonance is a hollow sound heard over lung tissue.
5. The correct answer is *d.* The bell of the stethoscope is used to hear low-pitched sounds, such as those produced by the heart and vascular system.
6. The correct answer is *d.* Skin turgor is assessed by lightly pinching a fold of skin and allowing it to return to its shape when released.
7. The correct answer is *c.* Normal vision is 20/20. A finding of 20/40 would mean that a patient has less than normal vision.
8. The correct answer is *a.* The ear canal of an adult is straightened by gently pulling the pinna of the ear up and back. In children younger than 3 years of age, the ear canal is straightened by pulling the pinna gently down and back.
9. The correct answer is *d.* A dull sound is heard when percussing over fluid or a solid mass.
10. The correct answer is *a.* Adventitious breath sounds are sounds not normally heard in the lungs. The other answers are normal breath sounds.
11. The correct answer is *c.* Heart sounds are the result of closure of the heart valves.
12. The correct answer is *a.* The breast is divided into four quadrants—outer upper quadrant, outer lower quadrant, inner upper quadrant, and inner lower quadrant. Each quadrant is systematically palpated in a clockwise direction.

13. The correct answer is *c.* When assessing the abdomen, the sequence is inspection, auscultation, percussion, and palpation. Auscultation follows inspection because percussion and palpation stimulate bowel sounds.
14. The correct answer is *d.* The other answers are assessments of orientation.
15. The correct answer is *c.* Motor function of the facial nerve (cranial nerve VII) is assessed by asking the patient to raise the eyebrow, smile, and show the teeth.

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