

# Chapter 25

## Measurements

# Lesson 25.1

- Define the key terms and key abbreviations in this chapter.
- Explain why vital signs are measured.
- List the factors affecting vital signs.
- Identify the normal ranges for each temperature site.
- Explain when to use each temperature site.
- Explain how to use thermometers.

# Vital Signs

- Vital signs reflect three body processes:
  - Regulation of body temperature
  - Breathing
  - Heart function
- A person's vital signs:
  - Vary within certain limits
  - Are affected by many factors
  - Show even minor changes in the person's condition
  - Tell about responses to treatment
  - Often signal life-threatening events

# Accuracy

- Accuracy is essential when you measure, record, and report vital signs.
  - If unsure of your measurements, promptly ask the nurse to take them again.
- Unless otherwise ordered, take vital signs with the person at rest lying or sitting.
- Report the following at once:
  - Any vital sign that is changed from a prior measurement.
  - Vital signs above or below the normal range.

# Body Temperature

- Body temperature is the amount of heat in the body.
  - It is a balance between the amount of heat produced and the amount lost by the body.
  - Thermometers are used to measure temperature.
    - Fahrenheit (F) and centigrade or Celsius (C) scales are used.
  - Temperature sites are the:
    - Mouth
    - Rectum
    - Axilla (underarm)
    - Tympanic membrane (ear)
    - Temporal artery (forehead)
  - Each temperature site has a normal range.

# Thermometers

- These types of thermometers are used:
  - Glass thermometers
    - Used for oral, rectal, and axillary temperatures
  - Electronic thermometers
    - Some have oral and rectal probes with disposable covers.
    - Tympanic membrane thermometers measure temperature at the tympanic membrane in the ear.
    - Temporal artery thermometers measure temperature at the temporal artery in the forehead.

# Lesson 25.2

- Identify the pulse sites.
- Describe a normal pulse and normal respirations.
- Describe the practices for measuring blood pressure.
- Know the normal vital signs.
- Describe the 4 types of pain.

# Lesson 25.2 (Cont.)

- Explain why pain is personal.
- List the signs and symptoms of pain.
- Explain how to prepare the person for weight and height measurements.
- Perform the procedures described in this chapter.
- Explain how to promote PRIDE in the person, the family, and yourself.



# Pulse

- The pulse is the beat of the heart felt at an artery as a wave of blood passes through the artery.
  - A pulse is felt every time the heartbeats.
  - Pulse sites
    - The temporal, carotid, brachial, radial, femoral, popliteal, posterior tibial, and dorsalis pedis (pedal) pulses are on each side of the body.
    - The radial pulse is used most often.
    - The apical pulse is felt over the heart.
  - The apical pulse is taken with a stethoscope.
    - A stethoscope is an instrument used to listen to the sounds produced by the heart, lungs, and other body organs.

# Using a Stethoscope

- To use a stethoscope:
  - Wipe the ear-pieces and diaphragm with antiseptic wipes before and after use.
  - Place the ear-piece tips in your ears.
    - The bend of the tips points forward.
    - Ear-pieces should fit snugly.
  - Tap the diaphragm gently.
    - If you do not hear the tapping, turn the chest piece at the tubing. Gently tap the diaphragm again.
    - Check with the nurse if you still do not hear the tapping.
  - Place the diaphragm over the artery. Hold it in place.
  - Prevent noise. Do not let anything touch the tubing.

# Pulse Rate

- The pulse rate is the number of heartbeats or pulses felt in 1 minute.
  - The adult pulse rate is between 60 and 100 beats per minute.
  - Report a rate of less than 60 or more than 100 to the nurse at once.
- The rhythm of the pulse should be regular.
  - Pulses are felt in a pattern.
  - The same time interval occurs between beats.
- Force relates to pulse strength.
  - A forceful pulse is described as strong, full, or bounding.
  - Hard-to-feel pulses are described as weak, thready, or feeble.

# Pulse Sites

- The radial pulse is used for routine vital signs.
  - Place the first 2 or 3 fingertips of one hand against the radial artery.
  - Count the pulse for 30 seconds and multiply the number by 2.
  - If the pulse is irregular, count it for 1 minute.
- The apical pulse is on the left side of the chest slightly below the nipple.
  - It is taken with a stethoscope.
  - Count the apical pulse for 1 minute.
  - Count each *lub-dub* as one beat.

# Respirations

- Respiration means breathing air into (inhalation) and out of (exhalation) the lungs.
  - Each respiration involves 1 inhalation and 1 exhalation.
  - Respirations are normally quiet, effortless, and regular. Both sides of the chest rise and fall equally.
  - The healthy adult has 12 to 20 respirations per minute.
  - The person should not know that you are counting respirations.
    - Count respirations right after taking a pulse.
    - Count them for 30 seconds and multiply the number by 2.
    - If an abnormal pattern is noted, count respirations for 1 minute.

# Blood Pressure

- Blood pressure is the amount of force exerted against the walls of an artery by the blood.
  - Systole is the period of heart muscle contraction.
  - Diastole is the period of heart muscle relaxation.
  - The systolic pressure is the pressure in the arteries when the heart contracts.
  - The diastolic pressure is the pressure in the arteries when the heart is at rest.
  - Blood pressure is measured in millimeters (mm) of mercury (Hg).
  - The systolic pressure is recorded over the diastolic pressure.

# BP Normal Ranges

- Blood pressure has normal ranges:
  - Systolic pressure—Less than 120 mm Hg
  - Diastolic pressure—Less than 80 mm Hg
- Treatment is indicated for:
  - Hypertension (blood pressure measurements that remain above the normal range)
  - Hypotension (when the systolic pressure and the diastolic pressure are below the normal range)
- A stethoscope and a sphygmomanometer are used to measure blood pressure.
- Blood pressure is normally measured in the brachial artery.

# Pain

- Pain means to ache, hurt, or be sore.
- Pain is a warning from the body.
- Pain is personal.
  - If a person complains of pain or discomfort, the person has pain or discomfort.
- There are different types of pain.
  - Acute pain is felt suddenly from injury, disease, trauma, or surgery.
  - Chronic pain lasts for a long time.
  - Radiating pain is felt at the site of tissue damage and in nearby areas.
  - Phantom pain is felt in a body part that is no longer there.



# Signs and Symptoms

- Promptly report any information you collect about pain.
- The nurse needs this information:
  - Location
  - Onset and duration
  - Intensity
  - Description
  - Factors causing pain (precipitating factors)
  - Factors affecting pain
  - Vital signs
  - Other signs and symptoms

# Weight and Height

- Weight and height are measured:
  - On admission to the agency
  - Daily, weekly, or monthly
- Standing, chair, bed, and lift scales are used.

# Weight and Height Guidelines

- When measuring weight and height, follow these guidelines:
  - The person only wears a gown or pajamas.
    - No footwear is worn.
  - The person voids before being weighed.
  - Weigh the person at the same time of day.
    - Before breakfast is the best time.
  - Use the same scale for daily, weekly, and monthly weights.
  - Balance the scale at zero (0) before weighing the person.