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**Birzeit University**

**Faculty of Pharmacy, Nursing & health professions**

**NURS 131**

**Fundamentals of Nursing and Health Promotion 1**

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**Reference**

Berman, A., Snyder, S.,  & Frandsen, G.(2016). *Kozier & Erbs Funamentals of Nursing : Concepts, Process, and Practice*. England : Pearson Education Limited.

Chapter 29 Vital Signs

Skill 29-1🡺 Assessing body temperature

**PURPOSE**

■ To establish baseline data for subsequent evaluation

■ To identify whether the core temperature is within normal range

■ To determine changes in the core temperature in response to specific therapies (e.g., antipyretic medication, immunosuppressive therapy, invasive procedure)

■ To monitor clients at risk for imbalanced body temperature (e.g., clients at risk for infection or diagnosis of infection; those who have been exposed to temperature extremes

**ASSESSMENT**

■ Clinical signs of fever

■ Clinical signs of hypothermia

■ Site and method most appropriate for measurement

■ Factors that may alter core body temperature

**PLANNING**

**Equipment**

■ Thermometer

■ Thermometer sheath or cover

■ Water-soluble lubricant for a rectal temperature

■ Clean gloves for a rectal temperature

■ Towel for axillary temperature

■ Tissues/wipes

**IMPLEMENTATION**

**Preparation**

Check that all equipment is functioning normally.

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| **Performance steps** | **Done or not** |
| 1. Prior to performing the procedure, introduce self and verify the client’s identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate. Discuss how the results will be used in planning further care or treatments. |  |
| 2. Perform hand hygiene and observe appropriate infection control procedures. Apply gloves if performing a rectal temperature. |  |
| 3. Provide for client privacy. |  |
| 4. Place the client in the appropriate position (e.g., lateral or Sims’ position for inserting a rectal thermometer). |  |
| 5. Place the thermometer.• Apply a protective sheath or probe cover if appropriate.• Lubricate a rectal thermometer.**Thermometer Placement :****Oral :** Place the bulb on either side of the frenulum**Rectal :** Apply clean gloves. Instruct the client to take a slow deep breathduring insertion. Never force the thermometer if resistance is felt.Insert 3.5 cm (1.5 in.) in adults.**Axillary:** Pat the axilla dry if very moist. The bulb is placed in the center of the axilla.**Tympanic:** Pull the pinna slightly upward and backward for anadult. Point the probe slightly anteriorly, toward the eardrum.Insert the probe slowly using a circular motion until snug.**Temporal artery :** Brush hair aside if covering the temporal artery area. With the probe flush on the center of the forehead, depress the red button; keep depressed. Slowly slide the probe midline across the forehead to the hairline, not down the side of the face. Lift the probe from the forehead and touch on the neck just behind the earlobe. Release the button. |  |
| 6. Wait the appropriate amount of time. Electronic and tympanic thermometers will indicate that the reading is complete through a light or tone. Check package instructions for length of time to wait prior to readingchemical dot or tape thermometers. |  |
| 7. Remove the thermometer and discard the cover or wipe with a tissue if necessary. If gloves were applied, remove and discard them. Perform hand hygiene. |  |
| 8. Read the temperature and record it on your worksheet. If the temperature is obviously too high, too low, or inconsistent with the client’s condition, recheck it with a thermometer known to be functioning properly. |  |
| 9.Wash the thermometer if necessary and return it to the storage location. |  |
| 10. Document the temperature in the client record. A rectal temperature may be recorded with an “R” next to the value or with the mark on a graphic sheet circled. An axillary temperature may be recorded with “AX” or marked on a graphic sheet with an X. |  |

Skill 29-2🡺 Assessing peripheral pulse

**PURPOSES**

■ To establish baseline data for subsequent evaluation

■ To identify whether the pulse rate is within normal range

■ To determine the pulse volume and whether the pulse rhythm is regular

■ To determine the equality of corresponding peripheral pulses on each side of the body

■ To monitor and assess changes in the client’s health status

■ To monitor clients at risk for pulse alterations (e.g., those with a history of heart disease or experiencing cardiac arrhythmias, hemorrhage, acute pain, infusion of large volumes of fluids, or fever)

■ To evaluate blood perfusion to the extremities

**ASSESSMENT**

■ Clinical signs of cardiovascular alterations such as dyspnea (difficult respirations), fatigue, pallor, cyanosis (bluish discoloration of skin and mucous membranes), palpitations, syncope (fainting), or impaired peripheral tissue perfusion (as evidenced by skin discoloration and cool temperature)

■ Factors that may alter pulse rate (e.g., emotional status and activity level)

■ Which site is most appropriate for assessment based on the purpose

**PLANNING**

**Equipment**

■ Watch with a second hand or indicator

■ If using a DUS: transducer probe, stethoscope headset, transmission gel, and tissues/wipes

**IMPLEMENTATION**

**Preparation**

If using a DUS, check that the equipment is functioning normally.

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| **Performance steps** | **Done or not** |
| 1. Prior to performing the procedure, introduce self and verify the client’s identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate. Discuss how the results will be used in planning further care or treatments. |  |
| 2. Perform hand hygiene and observe appropriate infection control procedures. |  |
| 3. Provide for client privacy. |  |
| 4. Select the pulse point. Normally, the radial pulse is taken, unless it cannot be exposed or circulation to another body area is to be assessed. |  |
| 5. Assist the client to a comfortable resting position. When the radial pulse is assessed, with the palm facing downward, the client’s arm can rest alongside the body or the forearm can rest at a 90-degree angle across the chest. For the client who can sit, the forearm can rest across the thigh, with the palm of the hand facing downward or inward. |  |
| 6. Palpate and count the pulse. Place two or three middle fingertips lightly and squarely over the pulse point. *Rationale:* Using the thumb is contraindicated because the nurse’s thumb has a pulse that could be mistaken for the client’s pulse. Count for 15 seconds and multiply by 4. Record the pulse in beats per minute on your worksheet. If taking a client’s pulse for the first time, when obtaining baseline data, or if the pulse is irregular, count for a full minute. If an irregular pulse is found, also take the apical pulse. |  |
| 7. Assess the pulse rhythm and volume.• Assess the pulse rhythm by noting the pattern of the intervals between the beats. A normal pulse has equal time periods between beats. If this is an initial assessment, assess for 1 minute.• Assess the pulse volume. A normal pulse can be felt with moderate pressure, and the pressure is equal with each beat. A forceful pulse volume is full; an easily obliterated pulse is weak. Record the rhythm and volume on your worksheet. |  |
| 8. Document the pulse rate, rhythm, and volume and your actions in the client record. Also record in the nurse’s notes pertinent related data such as variation in pulse rate compared to normal for the client and abnormal skin color and skin temperature. |  |

Skill 29-3🡺 Assessing an apical pulse

**PURPOSES**

■ To obtain the heart rate of an adult with an irregular peripheral pulse

■ To establish baseline data for subsequent evaluation

■ To determine whether the cardiac rate is within normal range and the rhythm is regular

■ To monitor clients with cardiac, pulmonary, or renal disease and those receiving medications to improve heart action

**ASSESSMENT**

**Assess**

■ Clinical signs of cardiovascular alterations such as dyspnea (difficult respirations), fatigue/weakness, pallor, cyanosis (bluish discoloration of skin and mucous membranes), palpitations, syncope (fainting), or impaired peripheral tissue

perfusion as evidenced by skin discoloration and cool temperature

■ Factors that may alter pulse rate (e.g., emotional status, activity level, and medications that affect heart rate such as digoxin, beta-blockers, or calcium channel blockers)

**PLANNING**

**Equipment**

■ Watch with a second hand or indicator

■ Stethoscope

■ Antiseptic wipes

■ If using a DUS: the transducer probe, the stethoscope headset, transmission gel, and tissues/wipes

**IMPLEMENTATION**

**Preparation**

If using a DUS, check that the equipment is functioning normally.

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| **Performance steps** | **Done or not** |
| 1. Prior to performing the procedure, introduce self and verify the client’s identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate. Discuss how the results will be used in planning further care or treatments. |  |
| 2. Perform hand hygiene and observe appropriate infection control procedures. |  |
| 3. Provide for client privacy. |  |
| 4. Position the client appropriately in a comfortable supine position or in a sitting position. Expose the area of the chest over the apex of the heart. |  |
| 5. Locate the apical impulse. This is the point over the apex of the heart where the apical pulse can be most clearly heard.• Palpate the angle of Louis (the angle between the manubrium, the top of the sternum, and the body of the sternum). It is palpated just below the suprasternal notch and is felt as a prominence .• Slide your index finger just to the left of the sternum, and palpate the second intercostal space. • Place your middle or next finger in the third intercostal space, and continue palpating downward until you locate the fifth intercostal space. • Move your index finger laterally along the fifth intercostal space toward the mid clavicle line ( MCL). Normally, the apical impulse is palpable at or just medial to the MCL |  |
| 6. Auscultate and count heartbeats.• Use antiseptic wipes to clean the earpieces and diaphragm of the stethoscope. *Rationale:* The diaphragm needs to be cleaned and disinfected if soiled with body substances. Both earpieces and diaphragms have been shown to harbor pathogenic bacteria• Warm the diaphragm of the stethoscope by holding it in the palm of the hand for a moment. *Rationale:* The metal of the diaphragm is usually cold and can startle the client when placed immediately on the chest.• Insert the earpieces of the stethoscope into your ears in the direction of the ear canals, or slightly forward. *Rationale:* This position facilitates hearing.• Tap your finger lightly on the diaphragm. *Rationale:* This is to be sure it is the active side of the head. If necessary, rotate the head to select the diaphragm side.• Place the diaphragm of the stethoscope over the apical impulse and listen for the normal S1 and S2 heart sounds, which are heard as “lub-dub.” *Rationale:* The heartbeat is normally loudest over the apex of the heart. Each lub-dub is counted as one heartbeat. *Rationale:* The two heart sounds are produced by closure of the heart valves. The S1 heart sound (lub) occurs when the atrioventricular valves close after the ventricles have been sufficiently filled. The S2 heartsound (dub) occurs when the semilunar valves close after the ventricles empty.• If you have difficulty hearing the apical pulse, ask the supine client to roll onto his or her left side or the sitting client to lean slightly forward. *Rationale:* This positioning moves the apex of the heart closer to the chest wall.• If the rhythm is regular, count the heartbeats for 30 seconds and multiply by 2. If the rhythm is irregular or for giving certain medications such as digoxin, count the beats for 60 seconds. *Rationale:* A 60-secondcount provides a more accurate assessment of an irregular pulse than a 30-second count. |  |
| 7. Assess the rhythm and the strength of the heartbeat.• Assess the rhythm of the heartbeat by noting the pattern of intervals between the beats. A normal pulse has equal time periods between beats.• Assess the strength (volume) of the heartbeat. Normally, the heartbeats are equal in strength and can be described as strong or weak. |  |
| 8. Document the pulse rate and rhythm, and nursing actions in the client record. Also record pertinent related data such as variation in pulse rate compared to normal for the client and abnormal skin color and skin temperature. |  |

Skill 29-4🡺 Assessing an apical-radial pulse (Pulse deficit)

**PURPOSE**

■ To determine adequacy of peripheral circulation or presence of pulse deficit

**ASSESSMENT**

**Assess**

■ Clinical signs of hypovolemic shock (hypotension, pallor, cyanosis, and cold, clammy skin)

**PLANNING**

**Equipment**

■ Watch with a second hand or indicator

■ Stethoscope

■ Antiseptic wipes

**IMPLEMENTATION**

**Preparation**

If using the two-nurse technique, ensure that the other nurse is available at this time.

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| **Performance steps** | **Done or not** |
| 1. Prior to performing the procedure, introduce self and verify the client’s identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate. Discuss how the results will be used in planning further care or treatments. |  |
| 2. Perform hand hygiene and observe appropriate infection control procedures. |  |
| 3. Provide for client privacy. |  |
| 4. Position the client appropriately. Assist the client to a comfortable supine or sitting position. Expose the area of the chest over the apex of the heart. If previous measurements were taken, determine what position the client assumed, and use the same position. *Rationale:* This ensures an accurate comparative measurement. |  |
| 5. Locate the apical and radial pulse sites. In the two-nurse technique, one nurse locates the apical impulse by palpation or with the stethoscope while the other nurse palpates the radial pulse site . |  |
| 6. Count the apical and radial pulse rates.**Two-Nurse Technique**• Place the watch where both nurses can see it. The nurse who is taking the radial pulse may hold the watch.• Decide on a time to begin counting. A time when the second hand is on 12, 3, 6, or 9 or an even number on digital clocks is usually selected. The nurse taking the radial pulse says “Start.” *Rationale:* This ensures thatsimultaneous counts are taken.• Each nurse counts the pulse rate for 60 seconds. Both nurses end the count when the nurse taking the radial pulse says, “Stop.” *Rationale:* A full 60-second count is necessary for accurate assessment of any discrepancies between the two pulse sites.• The nurse who assesses the apical rate also assesses the apical pulse rhythm and volume (i.e., whether the heartbeat is strong or weak). If the pulse is irregular, note whether the irregular beats come at random or atpredictable times.• The nurse assessing the radial pulse rate also assesses the radial pulse rhythm and volume. **One-Nurse Technique Within a few minutes:**• Assess the apical pulse for 60 seconds, and• Assess the radial pulse for 60 seconds. |  |
| 7. Document the apical and radial (AR) pulse rates, rhythm, volume, and any pulse deficit in the client record. Also record related data such as variation in pulse rate compared to normal for the client and other pertinent observations, such as pallor, cyanosis, or dyspnea. |  |

Skill 29-5🡺 Assessing respiration

**PURPOSES**

■ To acquire baseline data against which future measurements can be compared

■ To monitor abnormal respirations and respiratory patterns and identify changes

■ To monitor respirations before or following the administration of a general anesthetic or any medication that influences respirations

■ To monitor clients at risk for respiratory alterations (e.g., those with fever, pain, acute anxiety, chronic obstructive pulmonary disease, asthma, respiratory infection, pulmonary edema or emboli, chest trauma or constriction, brainstem injury)

**ASSESSMENT**

**Assess**

■ Skin and mucous membrane color (e.g., cyanosis or pallor)

■ Position assumed for breathing (e.g., use of orthopneic position)

■ Signs of cerebral anoxia (e.g., irritability, restlessness, drowsiness, or loss of consciousness)

■ Chest movements (e.g., retractions between the ribs or above or below the sternum)

■ Activity tolerance

■ Chest pain

■ Dyspnea

■ Medications affecting respiratory rate

**PLANNING**

**Equipment**

■ Watch with a second hand or indicator

**IMPLEMENTATION**

**Preparation**

For a routine assessment of respirations, determine the client’s activity schedule and choose a suitable time to monitor the respirations. A client who has been exercising will need to rest for a few minutes to permit the accelerated respiratory rate to return to normal.

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| **Performance steps** | **Done or not** |
| 1. Prior to performing the procedure, introduce self and verify the client’s identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate. Discuss how theresults will be used in planning further care or treatments. |  |
| 2. Perform hand hygiene and observe appropriate infection control procedures. |  |
| 3. Provide for client privacy. |  |
| 4. Observe or palpate and count the respiratory rate.• The client’s awareness that the nurse is counting the respiratory rate could cause the client to purposefully alter the respiratory pattern. If you anticipate this, place a hand against the client’s chest to feel thechest movements with breathing, or place the client’s arm across the chest and observe the chest movements while supposedly taking the radial pulse.• Count the respiratory rate for 30 seconds if the respirations are regular. Count for 60 seconds if they are irregular. An inhalation and an exhalation count as one respiration. |  |
| 5. Observe the depth, rhythm, and character of respirations.• Observe the respirations for depth by watching the movement of the chest. *Rationale:* During deep respirations, a large volume of air is exchanged; during shallow respirations, a small volume is exchanged.• Observe the respirations for regular or irregular rhythm. *Rationale:* Normally, respirations are evenly spaced.• Observe the character of respirations, the sound they produce and the effort they require. *Rationale:* Normally, respirations are silent and effortless. |  |
| 6. Document the respiratory rate, depth, rhythm, and character on the appropriate record. |  |

Skill 29-6🡺 Assessing blood pressure

**PURPOSE**

■ To obtain a baseline measure of arterial blood pressure for subsequent evaluation

■ To determine the client’s hemodynamic status (e.g., cardiac output: stroke volume of the heart and blood vessel resistance)

■ To identify and monitor changes in blood pressure resulting from a disease process or medical therapy (e.g., presence or history of cardiovascular disease, renal disease,

circulatory shock, or acute pain; rapid infusion of fluids or blood products)

**ASSESSMENT**

**Assess**

■ Signs and symptoms of hypertension (e.g., headache, ringing in the ears, flushing of face, nosebleeds, fatigue)

■ Signs and symptoms of hypotension (e.g., tachycardia, dizziness, mental confusion, restlessness, cool and clammy skin, pale or cyanotic skin)

■ Factors affecting blood pressure (e.g., activity, emotional stress, pain, and time the client last smoked or ingested caffeine)

■ Some blood pressure cuffs contain latex. Assess the client for latex allergy and obtain a latex-free cuff if indicated.

**PLANNING**

**Equipment**

■ Stethoscope or DUS

■ Blood pressure cuff of the appropriate size

■ Sphygmomanometer

**IMPLEMENTATION**

**Preparation**

1. Ensure that the equipment is intact and functioning properly. Check for leaks in the tubing between the cuff and the sphygmomanometer.

2. Make sure that the client has not smoked or ingested caffeine within 30 minutes prior to measurement. *Rationale:* Smoking constricts blood vessels, and

caffeine increases the pulse rate. Both of these cause a temporary increase in blood pressure.

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| **Performance steps** | **Done or not** |
| 1. Prior to performing the procedure, introduce self and verify the client’s identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate. Discuss how the results will be used in planning further care or treatments. |  |
| 2. Perform hand hygiene and observe appropriate infection control procedures. |  |
| 3. Provide for client privacy. |  |
| 4. Position the client appropriately.• The adult client should be sitting unless otherwise specified. Both feet should be flat on the floor. *Rationale:* Legs crossed at the knee result in elevated systolic and diastolic blood pressures .• The elbow should be slightly flexed with the palm of the hand facing up and the arm supported at heart level . Readings in any other position should be specified. The blood pressure is normally similar in sitting, standing, and lying positions, but it can vary significantly by position in certain persons. *Rationale:* The blood pressure increases when the arm is below heart level and decreases when the arm is above heart level.• Expose the upper arm. |  |
| 5. Wrap the deflated cuff evenly around the upper arm. Locate center of the bladder directly over the artery. *Rationale:* The bladder inside the cuff must be directly over the artery to be compressed if the reading is to be accurate.• For an adult, place the lower border of the cuff approximately 2.5 cm (1 in.) above the antecubital space. |  |
| 6. If this is the client’s initial examination, perform a preliminary palpatory determination of systolic pressure. *Rationale:* The initial estimate tells the nurse the maximal pressure to which the sphygmomanometer needs to be elevated in subsequent determinations. It also preventsunderestimation of the systolic pressure or overestimation of the diastolic pressure should an auscultatory gap occur.• Palpate the brachial artery with the fingertips.• Close the valve on the bulb.• Pump up the cuff until you no longer feel the brachial pulse. At that pressure the blood cannot flow through the artery. Note the pressure on thesphygmomanometer at which pulse is no longer felt. *Rationale:* This gives an estimate of the systolic pressure.• Release the pressure completely in the cuff, and wait 1 to 2 minutes before making further measurements. *Rationale:* A waiting period gives the blood trapped in the veins time to be released. Otherwise, false highsystolic readings will occur. |  |
| 7. Position the stethoscope appropriately.• Cleanse the earpieces with antiseptic wipe.• Insert the ear attachments of the stethoscope in your ears so that they tilt slightly forward. *Rationale:* Sounds are heard more clearly when the ear attachments follow the direction of the ear canal.• Ensure that the stethoscope hangs freely from the ears to the diaphragm. *Rationale:* If the stethoscope tubing rubs against an object, the noise can block the sounds of the blood within the artery.• Place the bell side of the amplifier of the stethoscope over the brachial pulse site. *Rationale:* Because the blood pressure is a low-frequency sound, it is best heard with the bell-shaped diaphragm.• Place the stethoscope directly on the skin, not on clothing over the site. *Rationale:* This is to avoid noise made from rubbing the amplifier against cloth.• Hold the diaphragm with the thumb and index finger. |  |
| 8. Auscultate the client’s blood pressure.• Pump up the cuff until the sphygmomanometer reads 30 mmHg above the point where the brachial pulse disappeared.• Release the valve on the cuff carefully so that the pressure decreases at the rate of 2 to 3 mmHg per second. *Rationale:* If the rate is faster or slower, an error in measurement may occur.• As the pressure falls, identify the manometer reading at Korotkoff phases 1, 4, and 5. *Rationale:* There is no clinical significance to phases 2 and 3.• Deflate the cuff rapidly and completely.• Wait 1 to 2 minutes before making further determinations. *Rationale:* This permits blood trapped in the veins to be released.• Repeat the above steps to confirm the accuracy of the reading, especially if it falls outside the normal range (although this may not be routine procedure for hospitalized or well clients). If there is greater than5 mmHg difference between the two readings, additional measurements may be taken and the results averaged. |  |
| 9. If this is the client’s initial examination, repeat the procedure on the client’s other arm. There should be a difference of no more than 10 mmHg between the arms. The arm found to have the higher pressure should be used for subsequent examinations. **Variation: Obtaining a Blood Pressure by the Palpation Method:** If it is not possible to use a stethoscope to obtain the blood pressure or if the Korotkoff sounds cannot be heard, palpate the radial or brachial pulse site as the cuff pressure is released. The manometer reading at the point where the pulse reappears is an estimate of systolic value. **Variation: Taking a Thigh Blood Pressure:**■ Help the client to assume a prone position. If the client cannot assume this position, measure the blood pressure while the client is in a supine position with the knee slightly flexed. Slight flexing of the knee will facilitate placing the stethoscope on the popliteal space.■ Expose the thigh, taking care not to expose the client unduly.■ Locate the popliteal artery .■ Wrap the cuff evenly around the midthigh with the compression bladder over the posterior aspect of the thigh and the bottom edge above the knee. *Rationale:* The bladder must be directly over the posterior popliteal arteryif the reading is to be accurate.■ If this is the client’s initial examination, perform a preliminary palpatory determination of systolic pressure by palpating the popliteal artery. Measuring blood pressure in the client’s thigh.■ Report any significant change in the client’s blood pressure. Also report these findings:• Systolic blood pressure (of an adult) above 140 mmHg• Diastolic blood pressure (of an adult) above 90 mmHg• Systolic blood pressure (of an adult) below 100 mmHg■ Relate blood pressure to other vital signs, to baseline data, and to health status If the findings are significantly different from previous values without obvious reasons , consider possible causes .■ In adults, the systolic pressure in the popliteal artery is usually 20 to 30 mmHg higher than that in the brachial artery; the diastolic pressure is usually the same. **Variation: Using an Electronic Indirect Blood Pressure Monitoring Device:** ■ Place the blood pressure cuff on the extremity according to the manufacturer’s guidelines.■ Turn on the blood pressure switch.■ If appropriate, set the device for the desired number of minutes between blood pressure determinations.■ When the device has determined the blood pressure reading, note the digital results. |  |
| 10. Remove the cuff from the client’s arm. |  |
| 11. Wipe the cuff with an approved disinfectant. *Rationale:* Cuffs can become significantly contaminated. Many institutions use disposable blood pressure cuffs. The client uses it for the length of stay and then it is discarded. *Rationale:* This decreases the risk of spreading infectionby sharing cuffs. |  |
| 12. Document and report pertinent assessment data according to agency policy. Record two pressures in the form “130/80” where “130” is the systolic (phase 1) and “80” is the diastolic (phase 5) pressure. Record three pressures in the form “130/90/0,” where “130” is the systolic, “90” is the first diastolic (phase 4), and sounds are audible even after the cuff is completely deflated. Use the abbreviations RA or RL for right arm or right leg and LA or LL for left arm or left leg. Record a difference of greater than 10 mmHg between the two arms or legs. |  |

Skill 29-7🡺 Measuring oxygen saturation

**PURPOSES**

■ To estimate the arterial blood oxygen saturation

■ To detect the presence of hypoxemia before visible signs Develop

**ASSESSMENT**

**Assess**

■ The best location for a pulse oximeter sensor based on the client’s age and physical condition. Unless contraindicated, the finger is usually selected for adults.

■ The client’s overall condition including risk factors for development of hypoxemia (e.g., respiratory or cardiac disease) and hemoglobin level

■ Vital signs, skin color and temperature, nail bed color, and tissue perfusion of extremities as baseline data

■ Adhesive allergy

**PLANNING**

 **Equipment**

■ Nail polish remover as needed

■ Alcohol wipe

■ Sheet or towel

■ Pulse oximeter

**IMPLEMENTATION**

**Preparation**

Check that the oximeter equipment is functioning normally.

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| **Performance steps** | **Done or not** |
| 1. Prior to performing the procedure, introduce self and verify the client’s identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate. Discuss how theresults will be used in planning further care or treatments. |  |
| 2. Perform hand hygiene and observe appropriate infection control procedures. |  |
| 3. Provide for client privacy. |  |
| 4. Choose a sensor appropriate for the client’s weight, size, and desired location. Because weight limits of sensors overlap, a pediatric sensor could be used for a small adult.• If the client is allergic to adhesive, use a clip or sensor without adhesive. If using an extremity, assess the proximal pulse and capillary refill at the point closest to the site.• If the client has low tissue perfusion due to peripheral vascular disease or therapy using vasoconstrictive medications, use a nasal sensor or a reflectance sensor on the forehead. Avoid using lower extremities that have a compromised circulation and extremities that are used for infusions or other invasive monitoring. |  |
| 5. Prepare the site.• Clean the site with an alcohol wipe before applying the sensor.• It may be necessary to remove a female client’s dark nail polish. *Rationale:* Nail polish may interfere with accurate measurements . Alternatively, position the sensor on the side of the finger rather than perpendicular to the nail bed. |  |
| 6. Apply the sensor, and connect it to the pulse oximeter.• Make sure the LED and photodetector are accurately aligned, that is, opposite each other on either side of the finger, toe, nose, or earlobe. Many sensors have markings to facilitate correct alignment of the LEDsand photodetector.• Attach the sensor cable to the connection outlet on the oximeter. Turn on the machine according to the manufacturer’s directions. Appropriate connection will be confirmed by an audible beep indicating each arterial pulsation. Some devices have a wheel that can be turned clockwise to increase the pulse volume and counterclockwise to decrease it.• Ensure that the bar of light or waveform on the face of the oximeter fluctuates with each pulsation. |  |
| 7. Set and turn on the alarm when using continuous monitoring.• Check the preset alarm limits for high and low oxygen saturation and high and low pulse rates. Change these alarm limits according to the manufacturer’s directions as indicated. Ensure that the audio and visual alarms are on before you leave the client. A tone will be heard and a number will blink on the faceplate. |  |
| 8. Ensure client safety.• Inspect and/or move or change the location of an adhesive toe or finger sensor every 4 hours and a spring-tension sensor every 2 hours.• Inspect the sensor site tissues for irritation from adhesive sensors. |  |
| 9. Ensure the accuracy of measurement.• Minimize motion artifacts by using an adhesive sensor, or immobilize the client’s monitoring site. *Rationale:* Movement of the client’s finger or toe may be misinterpreted by the oximeter as arterial pulsations.• If indicated, cover the sensor with a sheet or towel to block large amounts of light from external sources (e.g., sunlight, procedure lamps, or bilirubin lights in the nursery). *Rationale:* Bright room light may besensed by the photodetector and alter the SpO2 value.• Compare the pulse rate indicated by the oximeter to the radial pulse periodically. *Rationale:* A large discrepancy between the two values may indicate oximeter malfunction. |  |
| 10. Document the oxygen saturation on the appropriaterecord at designated intervals. |  |