

Assessing Blood Pressure

Overview

- Establish a baseline measurement of arterial blood pressure for subsequent evaluation.
- Determine the patient's hemodynamic status (e.g., stroke volume of the heart and blood vessel resistance).
- Identify and monitor changes in blood pressure resulting from a disease process and medical therapy (e.g., presence or history of cardiovascular disease, renal disease, circulatory shock, or acute pain; rapid infusion of fluids or blood products).

Preparation

- Readings reflecting a 20-mm Hg change in blood pressure should be reported.
- Although a diastolic pressure can be obtained by palpation, frequent errors occur in obtaining results.
- If the patient has had a mastectomy or has a hemodialysis shunt or IV infusion, avoid taking blood pressure in the affected extremity.

Special Considerations

Pediatric Patients

- Newborns have a mean systolic pressure of about 75 mm Hg.
- The pressure rises with age, reaching a peak at the onset of puberty, and then tends to decline somewhat.
- One quick way to determine the normal systolic blood pressure of a child is to use the following formula:
Normal systolic BP = $80 + (2 \times \text{child's age in years})$.

Elderly Patients

- In older people, elasticity of the arteries is decreased—the arteries are more rigid and less yielding to the pressure of the blood.
- This produces an elevated systolic pressure.
- Because the walls no longer retract as flexibly with decreased pressure, the diastolic pressure is also higher.

Equipment

- Sphygmomanometer with cuff (size must be appropriate for patient)
- Stethoscope

Procedure

- Check to determine if patient smoked or had caffeine prior to blood pressure assessment. *This allows the nurse to assess blood pressure accurately and to identify significant changes.*
- Instruct patient to refrain from both prior to measurement.
- Determine the proper cuff size for the patient. The bladder should completely encircle the arm without overlapping. The cuff should be long enough to encircle the arm several times. *Proper cuff size is required for the correct amount of pressure to be applied over the artery.*
- Determine the best site for the cuff placement. *Application of pressure from an inflated cuff can temporarily impair blood flow and compromise patient's circulation.*
- Explain the purpose of the procedure to the patient. *This reduces anxiety.*
- Wash hands. *Reduces spread of microorganisms.*

- Assist the patient to a comfortable sitting position, with the upper arm slightly flexed, the forearm supported at heart level, and the palm turned up. *Placing the arm above the level of the heart produces false-low readings. This position facilitates cuff application.*
- Fully expose the patient's upper arm. *This ensures proper cuff placement.*
- Palpate the brachial artery (on the lower medial side of the biceps muscle) and position the cuff 1 in. (2.5 cm) above the pulsations. *The stethoscope will be placed over the artery without touching the cuff.*
- Center the arrows marked on the cuff over the brachial artery. *Inflating the bladder directly over the brachial artery ensures that proper pressure is applied during inflation of the cuff.*
- With the cuff fully deflated, wrap it evenly and snugly around the upper arm. *A loose-fitting cuff will cause a false elevation in the blood pressure measurement.*
- Keep manometer at eye level. The nurse should be no more than approximately 1 yard away. *This ensures accurate reading of the mercury level.*
- Palpate the brachial or radial artery while rapidly inflating the cuff. Inflate to a pressure 30 mm Hg above the point at which the pulse disappears. Slowly deflate the cuff, and notice when the pulse reappears. *This identifies the patient's approximate systolic pressure and determines the maximal inflation point for an accurate reading. It also prevents an auscultatory gap.*
- Place the stethoscope earpieces in the ears, and be sure that sounds are clear, not muffled. *Each earpiece should follow the angle of the ear canal to facilitate hearing.*
- Deflate the cuff, and wait 30 seconds. *Prevents venous congestion and false-high readings.*
- Relocate the brachial artery, and place the diaphragm of the stethoscope over it. *Ensures optimal reception of sound.*
- Close the valve of the pressure bulb by turning it clockwise until tight. *Prevents air leaking during inflation.*
- Inflate the cuff to 30 mm Hg above the patient's palpated systolic level. *This ensures an accurate pressure measurement.*
- Slowly open the valve and allow the mercury to fall at a rate of 2 to 3 mm Hg per second. *A decline in mercury that is too fast or too slow may lead to an inaccurate measurement.*
- Note the point on the manometer when the first clear sound is heard. *The first Korotkoff sound indicates the systolic pressure.*
- Continue to deflate the cuff gradually making note when the muffled or dampened sound appears, and the point on the manometer when the sound disappears in adults. (Note the pressure to the nearest 2 mm Hg.) *A fourth Korotkoff sound may be detected as a diastolic pressure in adults with hypertension.*
- Continue to deflate the cuff, noticing the point to the nearest 2 mm Hg when the sound disappears. *The fifth Korotkoff sound is recommended as the diastolic reading in an adult.*
- Deflate the cuff rapidly and remove from the patient's arm, unless the measurement needs to be repeated. *Continuous inflation causes arterial occlusion, which will result in numbness and tingling of the patient's arm.*
- If the procedure needs to be repeated, wait 30 seconds. *This prevents venous congestion and a false-high reading.*
- Fold the cuff and store it in its proper place. *Proper maintenance of the equipment contributes to the accuracy of the instrument.*
- Assist the patient to a comfortable position and cover upper arm. *Promotes comfort.*

- Record findings on the medical record or the flow sheet. *This documents the procedure and the patient's status.*

Blood Pressure Assessment by Palpation

- Explain the procedure to the patient *This decreases anxiety and promotes patient cooperation.*
- Wash hands. *Prevents transmission of microorganisms.*
- Locate the patient's brachial or radial pulse. *This locates the pulse that offers the best palpable volume for the procedure.*
- Place the cuff on the patient's arm. *This will position the cuff for inflation.*
- Palpate again for the pulse. When the pulse is felt, continue to palpate. *This relocates the pulse for the procedure.*
- Inflate the cuff until unable to palpate the pulse. *This occludes the arterial blood flow.*
- Inflate the cuff until the measurement gauge is 20 mm Hg past the point at which the pulse was lost on palpation. *This identifies the point of pulse return.*
- Slowly deflate the cuff at a rate of 2 to 3 mm Hg per second. *This prevents the nurse from missing the first palpable beat.*
- Note the reading on the measurement gauge when the pulse returns. Remove cuff from the patient's arm. *This identifies the systolic blood pressure reading.*

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