

# Vital Signs: Blood Pressure

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HS2

DH08



# Objectives

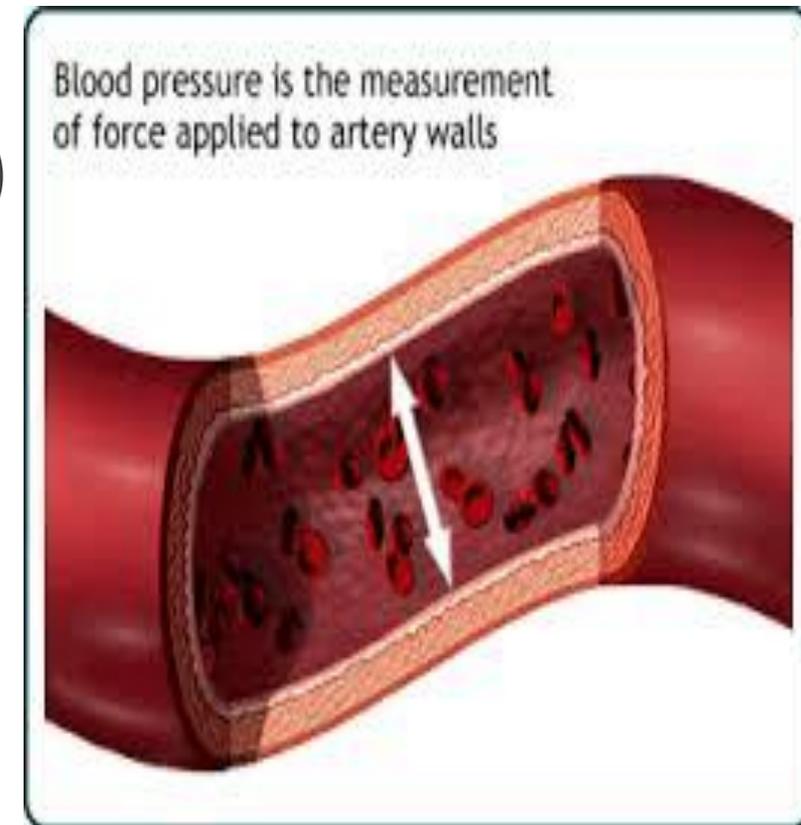
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Measure and record blood pressure to an accuracy of +/- 2mm of actual reading

# Blood Pressure

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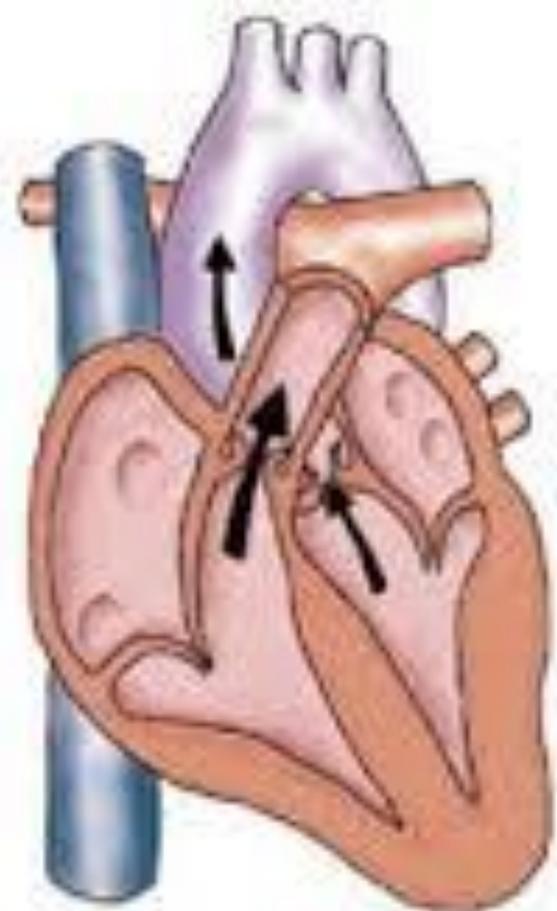
- Measure of pressure on the arterial walls as blood pulsates through them
- Read in millimeters (mm) of mercury (Hg)
- Measured with a sphygmomanometer
- Two pressures are measured
  1. systolic blood pressure (SBP)
  2. diastolic blood pressure (DBP)



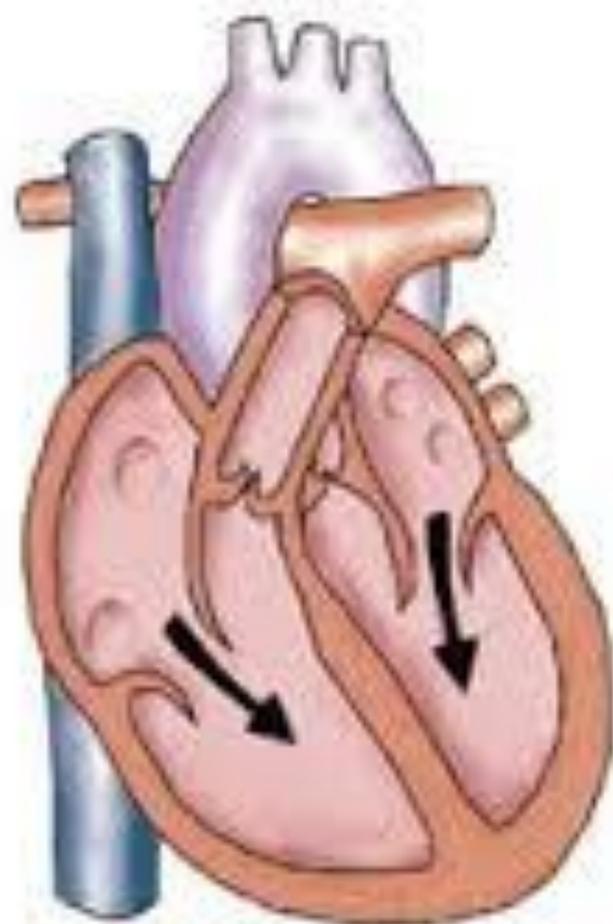
# Blood Pressure

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- **SBP**=the pressure exerted on the arteries when the LV is contracting and pushing blood into the arteries
- **DBP**=the constant pressure in the arterial walls when the LV relaxes between contractions
- BP is recorded as a fraction
- Systolic is the numerator (top)
- Diastolic is the denominator (bottom)



Systole



Diastole

# Blood Pressure Values

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	Systolic	Diastolic
➤ Normal	<120	<80
➤ Normal range	100-120	60-80
➤ Prehypertension	121-139	81-89
➤ Hypertension	>140	>90
➤ Hypotension	<90	<60



# Blood Pressure

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BP can be obtained from any pulse site over an artery

- ✓ **Brachial**=on upper arm; most common site for routine VS for adults and older children
- ✓ **Radial**=on lower arm; alternate site for infants or pts with very large upper arms
- ✓ **Popliteal**=on thigh; alternate site to arms in case of trauma, disease, or medical treatments
- ✓ **Dorsalis pedis and Posterior tibial**=on lower leg; common site for infants when using automatic BP cuff because infant's leg can be held still easier

# Blood Pressure

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## Precautions when taking BP:

- ✓ Do not take BP in the arm on the same side as a mastectomy site
- ✓ Do not take BP in same extremity that has an IV, AV graft, or injury such as a burn
- ✓ Do not use automatic BP machine if pt has a bleeding disorder-may be excess pressure when cuff inflates
- ✓ Wait 1-2 minutes between repeating a reading

# Sphygmomanometer

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- Instrument used to measure BP
- 3 types of sphygmomanometers:
  - 1. Mercury**=has long column of mercury; each mark represents 2mm Hg; most accurate; must read meniscus at eye level; mercury dangerous if broken



# Sphygmomanometer

- Instrument used to measure BP
- 3 types of sphygmomanometers:
  2. **Aneroid**=calibrated dial; each line represents 2mm Hg; needle must be on zero when cuff is deflated, if not it should not be used until recalibrated



# Sphygmomanometer

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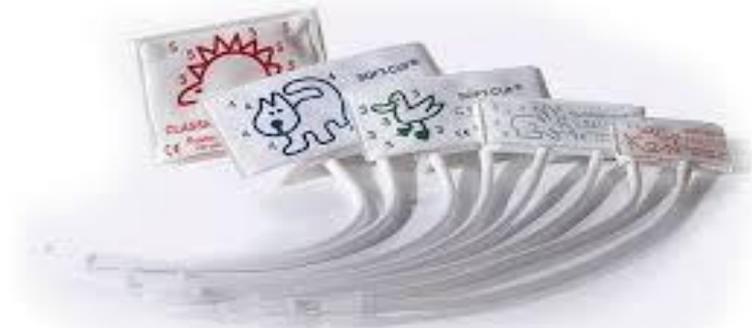
- Instrument used to measure BP
- 3 types of sphygmomanometers:
  3. **Electronic**=digital display; usually shows P also; no stethoscope needed



# Sphygmomanometer

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- Cuff must be the correct size for the pt
- Too small cuffs will give artificially high readings
- Too large cuffs will give artificially low readings



# BP Procedure

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- Stethoscope earpieces should be turned slightly toward your face
- Tap on diaphragm to make sure it is turned in the correct direction
- Hold the end piece just above the connection point to the tubing or place one finger firmly on the middle of the bell to reduce noise created by holding the end piece
- If possible, make sure pt has been sitting quietly for 5 minutes
- Maintain a calm attitude and reassure the pt because nervousness and anxiety or excitement can elevate their BP

# BP Procedure

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- Pt's arm should be relaxed and close to the level of their heart with palm up
- Raise the sleeve about 5 inches above the AC, if sleeve constricts the arm, remove the garment
- Wrap the deflated cuff around upper arm 1" above AC with pulse site in the middle of the cuff bladder
- Turn valve completely to the right until it stops, then slightly loosen it

# BP Procedure

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- Determine ***palpatory systolic pressure***: find the brachial (or radial) pulse and keep your fingers on it, inflate the cuff until the pulse disappears. Inflate the cuff 30mm Hg above this point. Slowly release the pressure while watching gauge. When the pulse is felt again, note the reading which is the palpatory systolic pressure
- Deflate cuff completely again and wait 1-2 minutes to allow blood flow to completely resume
- Palpate the brachial artery and then place diaphragm directly over it

# BP Procedure

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- Turn valve completely to the right until it stops, then slightly loosen it
- Inflate the cuff to 30mm Hg above the palpatory systolic pressure
- Open the bulb slowly to the left and allow the needle to fall slowly about 2-4mm Hg per second

# BP Procedure

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- Listen for the beginning sound=**systolic pressure**
- You may hear an abrupt change in the sound, if so note that reading
- Listen for the last sound=**diastolic pressure**
- If you still hear a sound, continue to the zero mark. You will record the reading of the 1<sup>st</sup> sound, the reading when the sound changed, and zero example: 124/78/0

# A Final Note About Vital Signs

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- When assessing VS, perform the least invasive first
- **Invasive**=invading someone's personal space, such as inserting a needle
- **Noninvasive**=actions that do not intrude, such as simple observation
- Starting with least invasive assessments gives the pt time to adjust and build a level of trust with you
- When **assessing** VS, use this order if possible: RR, P, T, BP
- If temp is going to be taken rectally, it should be done after BP
- When **documenting**, be sure to record them in this order: T, P, R, BP