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Nursing

lecture: 4

Vital signs

The vital or cardinal signs : are important indicators of the body's response to physical, environmental, and psychological stressors.



Vital signs composes of the following:

- Body temperature
- Pulse
- Respiration
- Blood pressure
pain

Equipment

- Vital sign tray
- Stethoscope
- Sphygmomanometer
- Thermometer
- Second hand watch
- Red and blue pen
- Vital sign sheet
- Cotton swab
- Disposable gloves if available
- Kidney dish

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- **Body Temperature**

□ **Body temperature**

- It is a balance between the internal and external environment of the body, or
- It is the balance between the heat produced by the body and the heat lost from the body.
- It is measured in heat units, called *degrees*

Body temperature = heat produced - heat lost .

Control body temperature :

control by (hypothalamus) the anterior hypothalamus control heat loss and the posterior hypothalamus control heat production.



There are two types of body temperature

1. Core temperature: it is the temperature of the deep tissues of the body, such as the cranium, esophagus, rectum, pulmonary artery, thorax, abdominal cavity and pelvic cavity.

2. Skin or body surface temperature: is the temperature depending on blood flow to the skin and amount of heat lost to the external environment such as skin: orally, axilla.

The normally maintained within a range of 36.0C (97.0F) to 37.5C (99.5F).



Sites used in taking Body Temperature

- Oral
- Axilla
- Rectal
- Tympanic membrane





Thermometer: is an instrument used to measure body temperature

| | | |
|---|--|---|
| <p>Oral</p> <p>Posterior sublingual pocket – under tongue (close to carotid artery)</p> | <p>No hot or cold drinks or smoking 20 min prior to temp. Must be awake & alert.</p> <p>Not for small children (bite down)</p> | <p>Leave in place 3 min</p> |
| <p>Axillary</p> <p>Bulb in center of axilla</p> <p>Lower arm position across chest</p> | <p>Non invasive – good for children. Less accurate (no major bld vessels nearby)</p> | <p>Leave in place 5-10 min.</p> <p>Measures 0.5 C lower than oral temp.</p> |
| <p>Rectal</p> <p>Side lying with upper leg flexed, insert lubricated bulb (1-1 1/2 inch adult) (1/2 inch infant)</p> | <p>When unsafe or inaccurate by mouth (unconscious, disoriented or irrational)</p> <p>Side lying position – leg flexed</p> | <p>Leave in place 2-3 min.</p> <p>Measures 0.5 C higher than oral</p> |
| <p>Ear</p> <p>Close to hypothalamus – sensitive to core temp. changes</p> <p>Adult - Pull pinna up & back</p> <p>Child – pull pinna down & back</p> | <p>Rapid measurement</p> <p>Easy assessibility</p> <p>Cerumen impaction distorts reading</p> <p>Otitis media can distort reading</p> | <p>2-3 seconds</p> |

- **Febrile** – body temperature above patient's normal range.\
- **Afebrile** – normal body temperature
 - **Fever** – sign of inflammation or infection
 - **Hyperpyrexia** – extremely high temperature



Factors Affecting Body Temperature

1. Age
2. Diurnal variations
3. Exercise
4. Hormones
5. Stress
6. Environment



Clinical signs of fever

1. Onset cold and chill phase

- A. Increase heart rate .
- B. Increase respiratory rate and depth.
- C. Shivering due to increased skeletal muscle tension and contraction.
- D. Pale ,cold skin due to vasoconstriction.
- E. Cyanotic nail.
- F. Feeling cold .
- G. Sweating .
- H. Rise in body temperature.



2.Course (flush phase)

- A. Skin that feels warm and appears flushed due to vasodilatation .
- B. Increased pulse and respiration rates .
- C. Increased thirst .
- D. Mild to sever dehydration.
- E. Lose of appetite.
- F. Malaise and weakness.



Nursing intervention during chill phase.

1. Provide adequate nourishment to meet his body's needs because of the increased metabolic rate.
2. Provide additional O₂ because of the increased metabolic rate.(on need)



3. Provide extra warmth, ex. blankets when the client feels chilled. But remove blankets when he or she feels warm.
4. Provide additional fluids to the body due to increased metabolic rate.
5. Reduce physical activity to limit the body's increased need for O₂

Nursing interventions during to flush phase;

1. Remove excess blankets when the client feels warm.
2. Provide fluid e.g.3000 ML per 24 hr.
3. Provide oral hygiene to keep the mucous membrane moist .

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4. Provide dry clothing to increase heat loss .
 5. Reduce physical activity to limit heat production

pulse

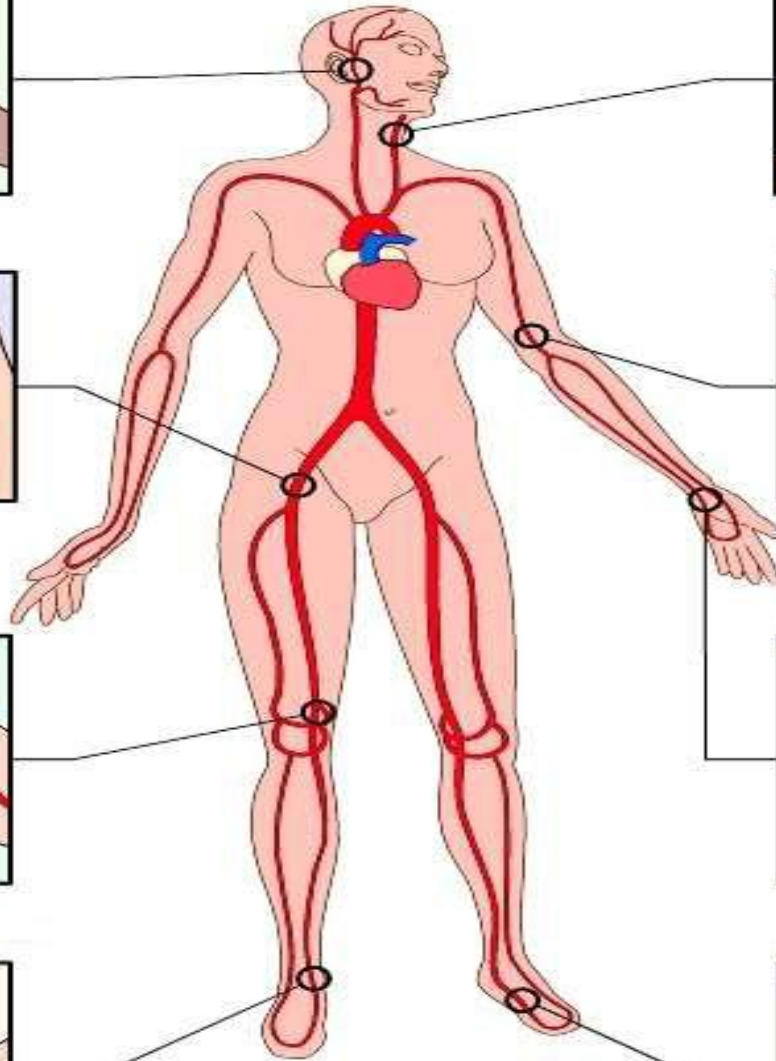
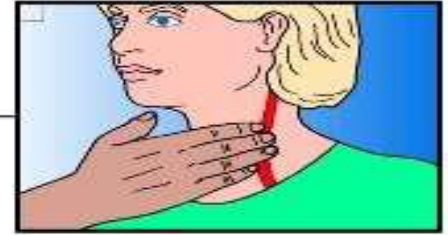
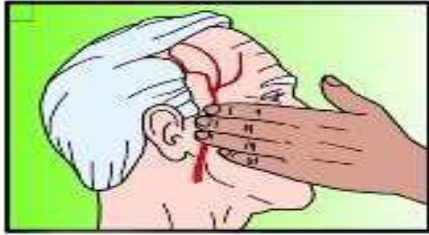
The regular expansion of an artery caused by the ejection of blood into the arterial system by the contractions of the heart.

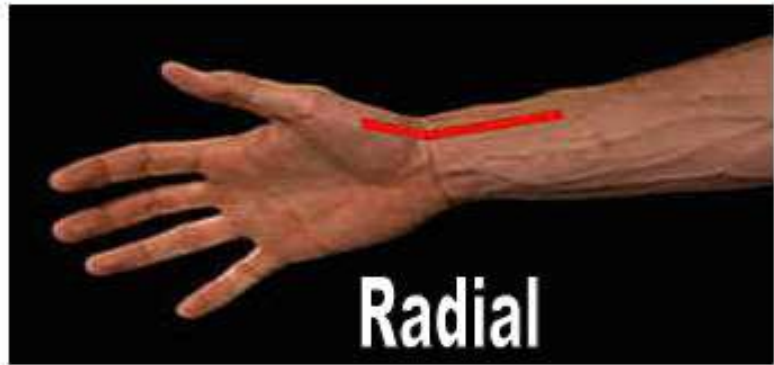
Pulse – number of times the heart beats in one minute

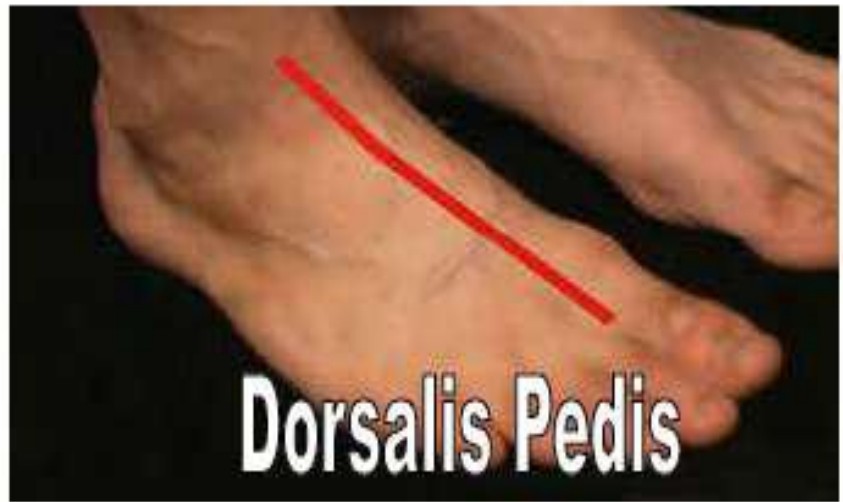
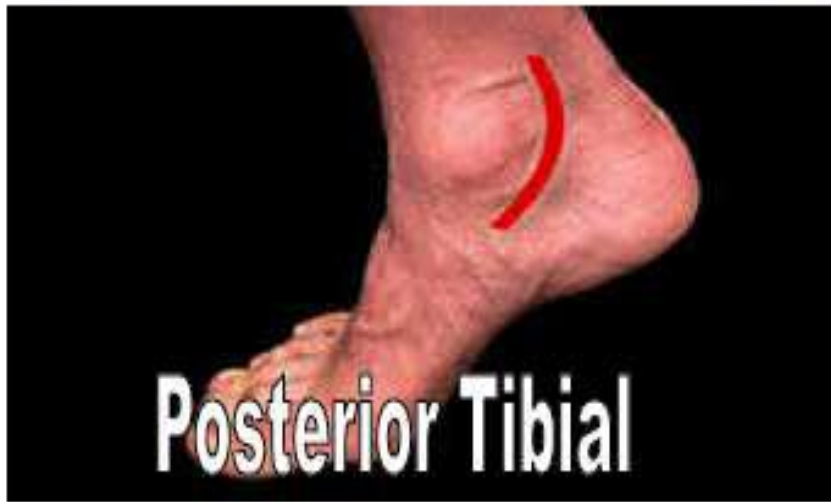
Sites of measurement the pulse



- Radial – thumb side of wrist
- Brachial – inner aspect of elbow
- Carotid – neck
- Temporal
- Apical – at the apex of the heart in an adult left chest below nipple (need stethoscope)
- Femoral – groin
- Popliteal – behind knee
- Posterior tibialis – behind inner ankle
- Dorsalis pedis – on top of foot









Factors affecting pulse rate :

1. Age :newborn (infants) 120-160 **beats/min.**
Adult 60- 100 beats/min.
2. Gender :the average males pulse is slightly lower than the females .
3. Exercise
4. Medication :some drugs increase pulse rate and others decrease it .
5. Hemorrhage .
- 6.Stress:increase the rate as well as the force of heart beat .



Factors that increase pulse

- Exercise
- Strong emotions – fear, anger, laughter, excitement
- Fever
- Pain
- Shock
- Hemorrhage

Factors that decrease pulse

- Sleep/rest
- Depression
- Drugs – digitalis, morphine
- Athletes in good physical condition may have a lower pulse, probably <60 beats/min. This is normal

Characteristic of the pulse :

- Rate – number of beats/min. normal 60-100 beats /min
- Rhythm – regularity of pulse
- Strength – force
 - Weak or thready
 - Bounding
 - Strong .



Two common abnormalities in pulse rate :

Tachycardia :above 100 beats/min.

Bradycardia is a slow rate below 60 beat/min in adult.

Respiration

Is the act of breathing ,it includes the intake of O_2 and the output of CO_2 .

Respiration: is the mechanism the body uses to exchange gases between the atmosphere and the blood of the cells.

A healthy adult breath **12-20 breath /min.**

Terminology :

- ❑ **Ventilation:** is movement of gases in and out of the lungs.
- ❑ **Hypoventilation :** Shallow irregular breathing.
- ❑ **Hyperventilation:** irregular increased depth and rate of breathing.
- ❑ **Inspiration (or inhalation):** is the intake of air to the lung.
- ❑ **Expiration (or exhalation)** is the discharge of breathing out the lung.
- ❑ **Eupnea:** normal respiratory rate.
- ❑ **Apnea:** the absence of respiration .
- ❑ **Dyspnea:** difficult of respiration

- ❑ **Anoxia:** lack of O₂ supply to the tissue.
- ❑ **Tachypnea:** Rapid shallow breathing is a rate above 20 breaths per minute, associated with increased activity or a disease process
- ❑ **Bradypnea:** slow breathing below 12 breath per minute with normal depth and rhythm , associated with sedation , anesthesia

Factors influencing of respiration :

1. **Medication:** increased or decreased
2. **Acute pain:** increased rate and depth of respiration.
3. **Anxiety:** increased rate and depth of respiration.
4. **Smoking:** increased rate and depth of respiration.
5. **Anemia:** increased rate and depth of respiration .



Characteristic of respiration :

1. **Respiratory rate:** adult 12-20 **breath / min.**
2. **Respiratory depth:** deep ,shallow ,normal.
3. **Respiratory rhythm:** regular ,irregular.
4. **Respiratory quality:** dys**p**nea ,wheezing .

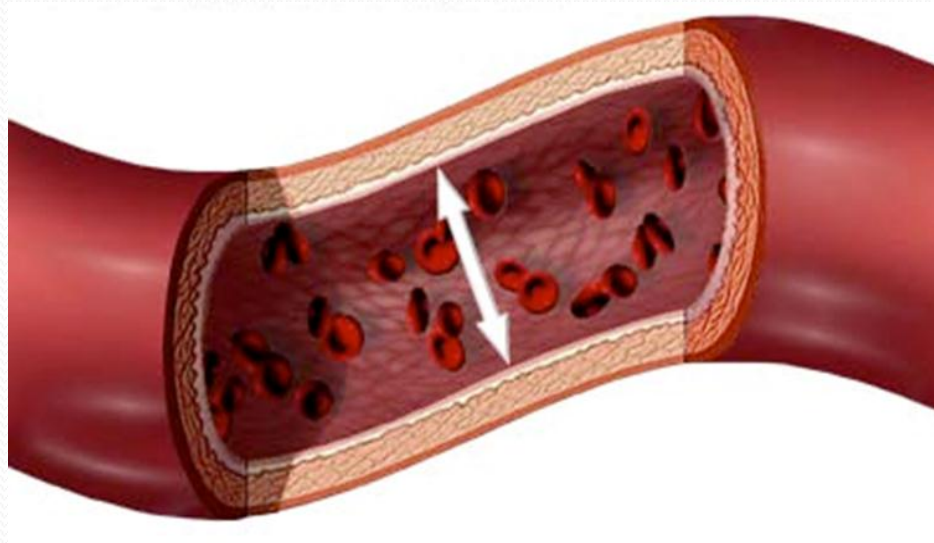


Blood Pressure

Blood pressure

Blood Pressure is a measurement of the force against the walls of the arteries as the heart pumps blood throughout the body

Blood pressure is measured in mmHg (millimeters of mercury)



There are two B.P measures .

1. **Systolic pressure** :is greatest pressure occur during constriction of left ventricles pumps blood into the aorta .

2. **Diastolic pressure** :lowest pressure occur during relaxation of ventricles .

- **systolic pressure** (ventricle contraction)
- **diastolic pressure** (ventricle at rest)

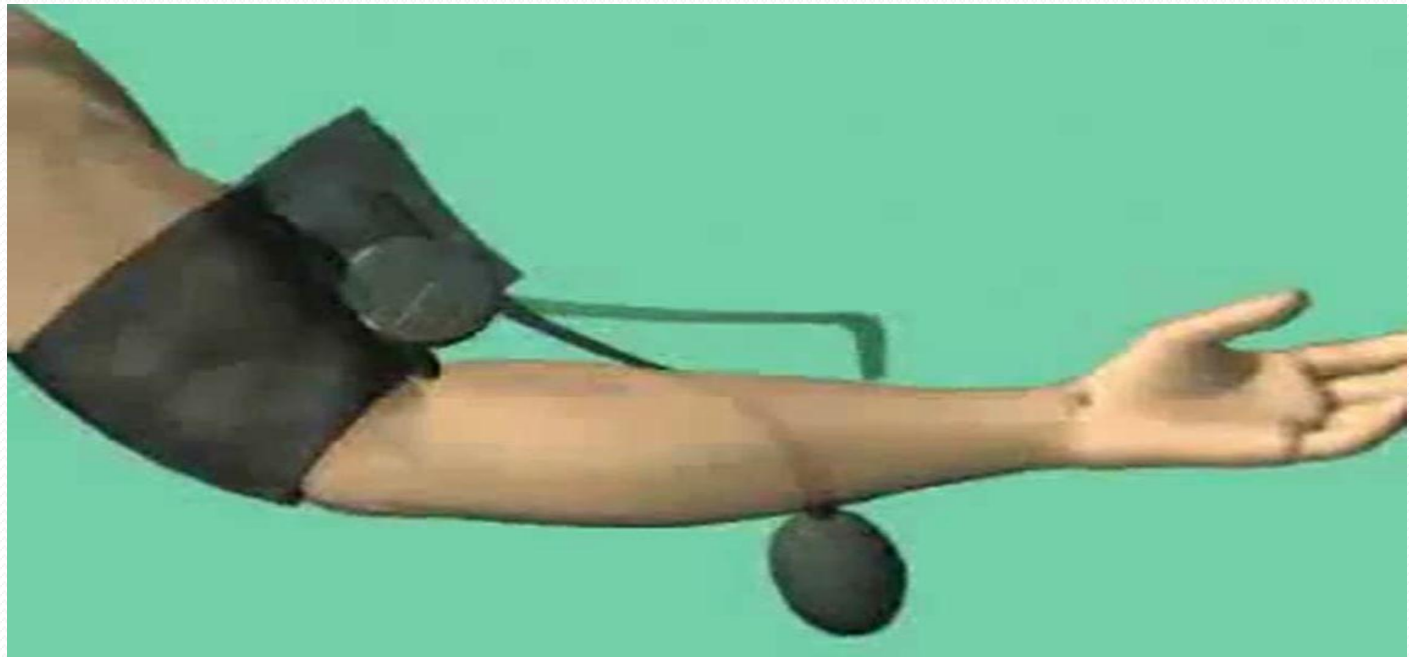


The normal range **systolic** (100-140 mmhg).

The normal range **diastolic** (60-90 mmhg).

Hypertension: is the continues elevated of arterial of B.P over 140/90 mmhg.

Hypotension: is abnormal lowering of blood pressure less than 90/60 mmhg.





Factors influencing blood pressure :

1.Age :newborn one month 85 /55

Middle adult 120/80,older adult 140/90

2.Stress ,anxiety ,fear ,pain and emotional stress which increased heart rate .

3.Medication.

4.Gender .



- Blood pressure should be measured after 5 minutes from the rest.
- No exertion, eating or smoking should take place for up to 30 minutes before measurement.



- **Pulse pressure:** difference between the diastolic and the systolic pressures.
- **Pulse pressure**= systolic pressures - diastolic .
- A normal pulse pressure is about 40 mmHg.
- elevated pulse pressure occurs in arteriosclerosis.
A low pulse pressure (e.g., less than 25 mmHg) occurs in conditions such as severe heart failure.
- **Pulse deficit** = apical pulse- peripheral pulse
- **Mean arterial pressure (MAP)**
- **MAP is 70 to 110 mmHg.**
- **MAP= SBP+ 2*(DBP)**

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- **Orthostatic hypotension:** is a blood pressure that decreases when the client sits or stands.

- **When assessing for orthostatic hypotension:**
 - Place the client in a supine position for 10 minutes.
 - Record the client's blood pressure.
 - Assist the client to slowly sit or stand. Support the client in case of faintness.
 - Immediately recheck the blood pressure in the same sites as previously.
 - Repeat the pulse and blood pressure after 3 minutes.
 - Record the results. A drop in blood pressure of 20 mmHg systolic or 10 mmHg diastolic indicates orthostatic hypotension.

**THANKS FOR
LISTENING**

