

Vital signs

Definition :

Are an indicators or signs checked to monitor the basic functions of the body includes ;Body Temperature(**T.**) ,Pulse Rate(**PR.**), Respiration (**R.**),Blood Pressure(**BP.**), Oxygen Saturation(**PO2**) And recently some agency designed pain as a sixth vital to be assessed

when to assess vital signs :

- 1-When a person is admitted to a health care facility
- 2- Several times a day for hospitalized patients
- 3- pre and post-surgery
- 4- After some nursing procedures
- 5- before and after medications are given that affect the respiratory or circulatory system
- 6- Whenever the person complains of chest pain, shortness of breath, rapid heart rate, or not feeling well
- 7- With the person at rest in a lying or sitting position

1- BODY TEMPERATURE

Body temperature reflects the balance between the heat produced and the heat lost from the body, and is measured in heat units called degrees.

The body's temperature control center is the hypothalamus.

Terminology :

Hyperpyrexia: A very high fever such as 41C.

Pyrexia: a body temperature above the usual range (fever). Pyrexia , a very high fever , such as 41C temp.

Hypothermia: is a body temperature below the lower limit of normal

There are two kinds of body temperature:

Core temperature: is the temperature of the deep tissues of the body, such as the abdominal cavity , pelvic cavity, brain and heart , it remain constant 37°C

Surface temperature: is the temperature of the skin, the subcutaneous tissue, and fat. It, by contrast, rises and falls in response to the environment.

Body temperature is measured in one of four areas of the body:

1. Mouth – Oral
2. Rectum – Rectal
3. Axilla (Underarm) – Axillary
4. Ear – Tympanic
- 5- Temporal Site - Forehead

Factors Affecting Body's heat production:

- 1. Basal metabolic rate (BMR):** is the rate of energy utilization in the body to maintain essential activities such as breathing.
- 2. Muscle activity:** It including shivering, can greatly increase metabolic rate.
- 3. Thyroxin output:** Increased thyroxin output increases the rate of cellular metabolism throughout the body.
- 4. Epinephrine and sympathetic stimulation,** these immediately increase the rate of cellular metabolism in many body tissues.
- 5. Age:** Very young and very old are more sensitive to change in environmental temperature due to decreased thermoregulatory controls.
- 6. Gender:** women tend to have more function in body temperature than men the increase in progesterone secretion at ovulation increase body temperature.
- 7. Exercise:** Hard work or exercise can increase body temperature

COMMON TYPES OF FEVERS

1-Intermittent fever: a body temperature alternates at regular intervals between periods of fever and periods of normal temperatures. ex. malaria disease

2-Remittent fever: wide range of temperature fluctuations occurs over the hour -2 period, all of which are above normal. such as with cold or influenza

3-Relapsing fever : short febrile periods of a few days are interspersed with -3 periods of 1 or 2 days of normal temperature

4-Constant fever the body temp: the body temperature fluctuates minimally but always remains elevated

STAGES OF FEVER

1- ONSET (COLD OR CHILL PHASE)

- Increased heart rate
- Increased respiratory rate and depth
- Shivering and feeling cold
- Pallid, cold skin
- Cyanotic nail beds

2- COURSE (PLATEAU PHASE)

- Absence of chills
- Skin that feels warm
- Photosensitivity
- Increased pulse and respiratory rates
- Increased thirst
- Drowsiness, restlessness
- Herpetic lesions of the mouth
- Malaise, weakness, and aching muscles

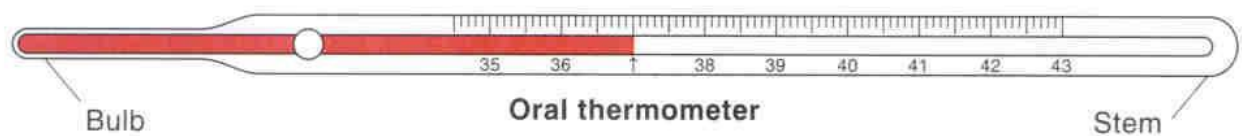
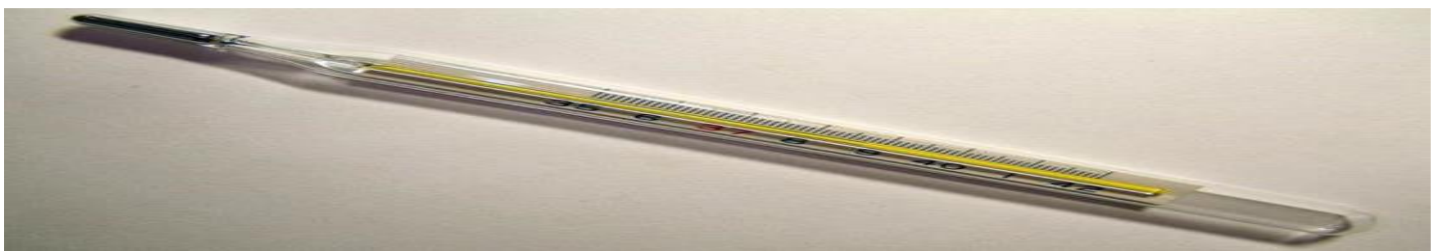
3- FEVER ABATEMENT/FLUSH PHASE)

- Skin that appears flushed and feels warm

- Sweating
- Decreased shivering
- Possible dehydration

Type of thermometer :

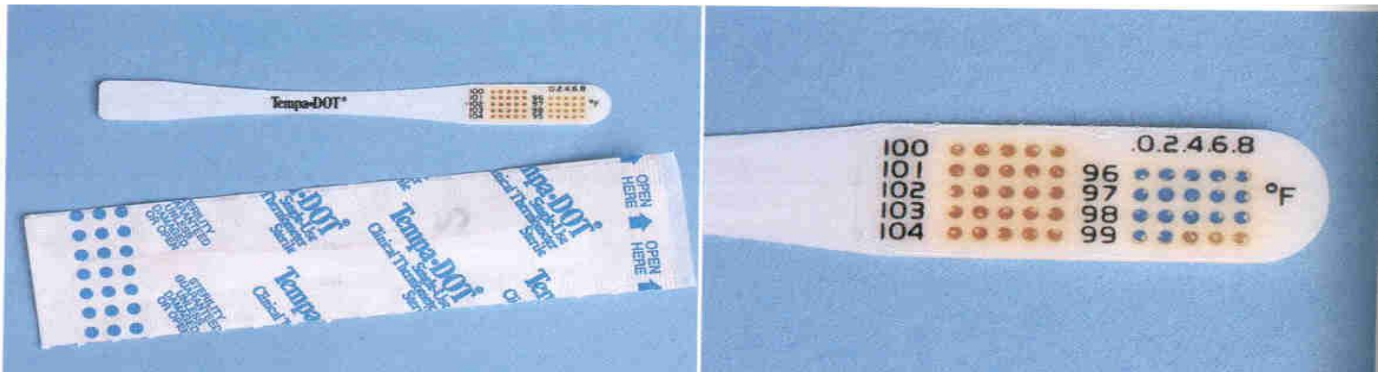
1-Glass thermometer : A small hollow glass tube that contains mercury or a mercury-free substance in a bulb at one end. When heated the mercury rises in the tube.



2-Digital thermometer

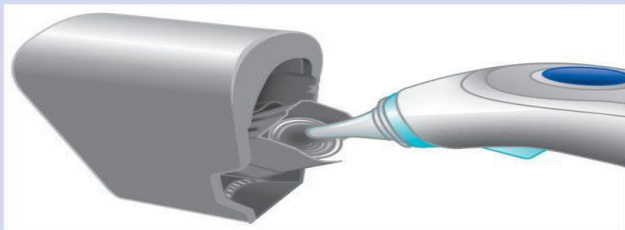


3-disposable oral Thermometer



4- Tympanic temperature

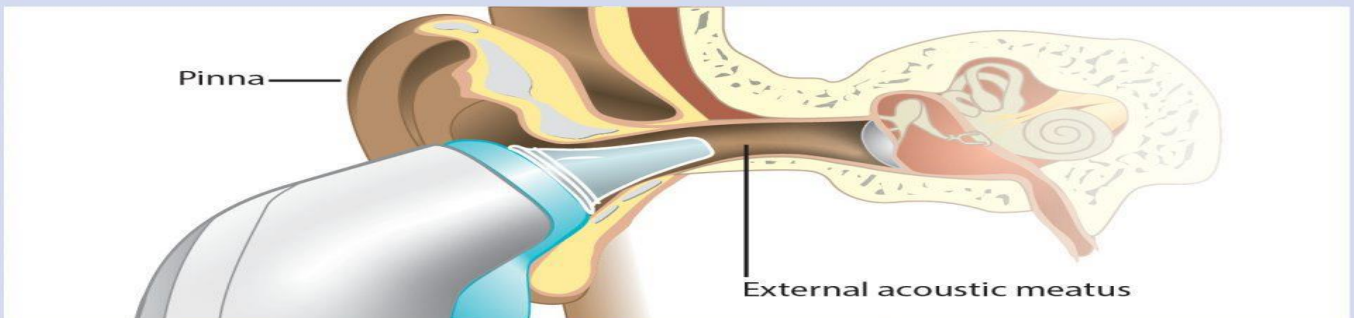
Fig 2. **Using an electronic tympanic thermometer**



2a. Attach the probe tip to the thermometer



2b. Gently pull the pinna of the ear upwards and backwards



2c. Insert the thermometer probe into the external acoustic meatus and ensure there is a snug fit

Procedure for taken temperature(Glass thermometer)

- o Rinse with cold water
- o Check the thermometer for breaks and chips
- o Shake down the thermometer so the mercury is below the lines and numbers
- o Place a disposable cover on the thermometer
- o Place the thermometer under the person's tongue
- o Leave the thermometer in place for 2 – 3 minutes
- o If the person has been eating, drinking, or smoking, wait 15 minutes before taking temperature

Do not take an oral temperature on:

1-An infant or young child (under age 6)

2- An unconscious patient

3- A patient that has had oral surgery or an injury to the face, neck, nose, or mouth.

4- A person receiving oxygen

5- A patient with a nasogastric tube in place

6- A patient who is confused or restless

7- A patient who is paralyzed on one side of the body

8- Has a history of seizures

9- A patient who breathes through the mouth

Taken A Rectal Temperature :

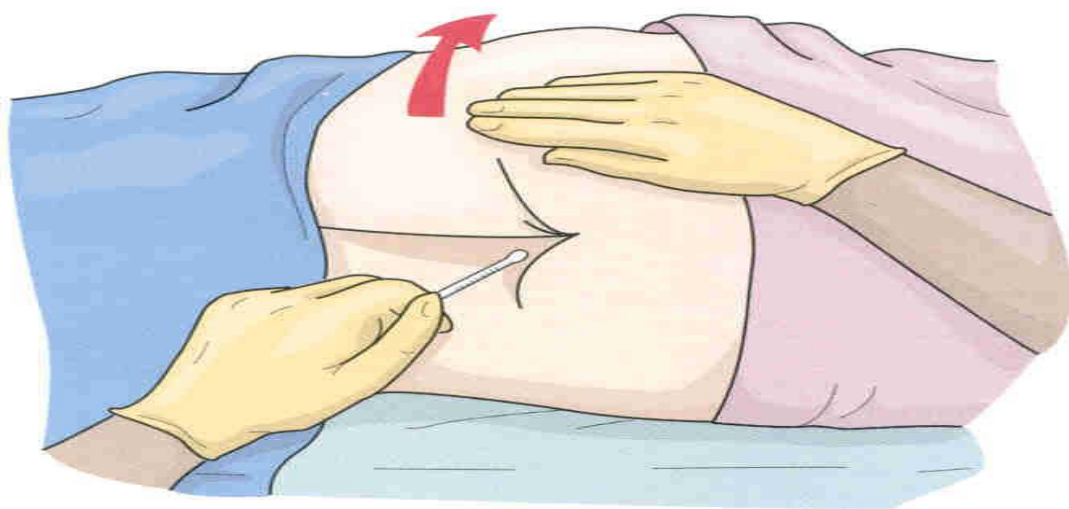
1-Lubricate the thermometer before inserting into the rectum

2- Place the person in a side-lying position

3- Insert the thermometer 1 inch into the rectum

4- Hold the thermometer in place for 2 minutes

5- Remove the disposable cover and read the thermometer



Do not take a rectal temperature on:

1-person who has had rectal surgery or rectal injury

2-If the person has diarrhea

3- If the person is confused or agitated

4- If the person has heart disease (stimulates the vagus nerve which slows the heart rate)

Taken an axillary temperature :

1- Make sure the underarm is clean and dry

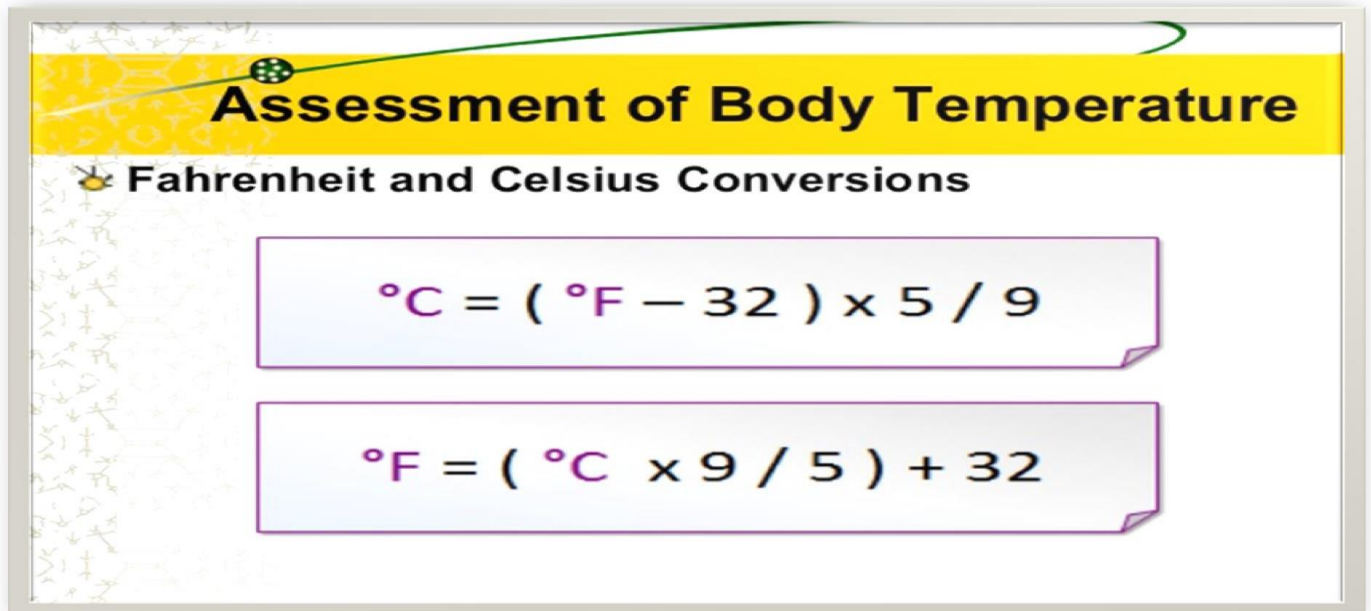
2- The arm is held close to the body

3- You need to hold the thermometer in place while the temperature is being taken

4- The thermometer is left in place for 10 minutes



Oral	Axillary	Rectal	Tympanic	Temporal
36.0°-37.6° C (96.8°- 99.68° F)	35.5°-37.0° C (95.9°- 98.6° F)	34.4°-37.8° C (93.92°- 100.04° F)	35.6°-37.4° C (96.08°- 99.32° F)	36.1°-37.3° C (96.98°- 99.14° F)



Assessment of Body Temperature

Fahrenheit and Celsius Conversions

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 5 / 9$$
$$^{\circ}\text{F} = (^{\circ}\text{C} \times 9 / 5) + 32$$

NURSING INTERVENTIONS FOR CLIENTS WITH FEVER

1. Monitor vital signs.
2. Assess skin color and temperature.
3. Monitor white blood cell count, hematocrit value, for indications of infection or dehydration.
4. Remove excess blankets when the client feels warm
5. Provide adequate nutrition and fluids (e.g., 2,500–3,000 mL/ day) to meet the increased metabolic demands and prevent dehydration.
6. Measure intake and output.
7. Reduce physical activity to limit heat production.
8. Administer antipyretics (drugs that reduce the level of fever)

2- PULSE

Pulse: is a wave of blood created by contraction of the left ventricle of the heart.

A normal pulse rate 60 – 100 beats per minute.

- Bradycardia is a heart rate less than 60 beats per minute in an adult.
- Tachycardia is a heart rate in excess of 100 beats per minute in an adult
- Pulse deficit: is the difference in the apical pulse and the radial pulse

Characteristics of Pulse:

1. Pulse rate: is an indirect measurement of cardiac output obtained by counting the number of apical or peripheral pulse waves over a pulse point

2. Pulse rhythm is the regularity of the heartbeat

-Regular (the beats are evenly spaced).

- Irregular (the beats are not evenly spaced).

- Dysrhythmia (arrhythmia) is an irregular rhythm

3. Pulse volume is a measurement of the strength of force exerted by the ejected blood against the arterial wall with each contraction

SCALE	DESCRIPTION
0	Absent pulse
1	Weak and thready pulse
2	Normal pulse
3	Bounding pulse

PULSE POINT ASSESSMENT

Pulse point

Anatomical location

Temporal :Where the temporal artery passes over the temporal bone of the head.

Carotid :At the side of the neck where the carotid artery

Apical: At the apex of the heart.

Brachial :At the inner aspect of the biceps muscle of the arm

Radial :Where the radial artery runs along the radial bone, on the thumb side of the inner aspect of the wrist.

Femoral :Where the femoral artery passes alongside the inguinal ligament.

Popliteal :Where the popliteal artery passes behind the knee.

Posterior tibial :On the medial surface of the ankle where the posterior tibial artery passes

Dorsalis pedis: Where the dorsalis pedis artery passes over the

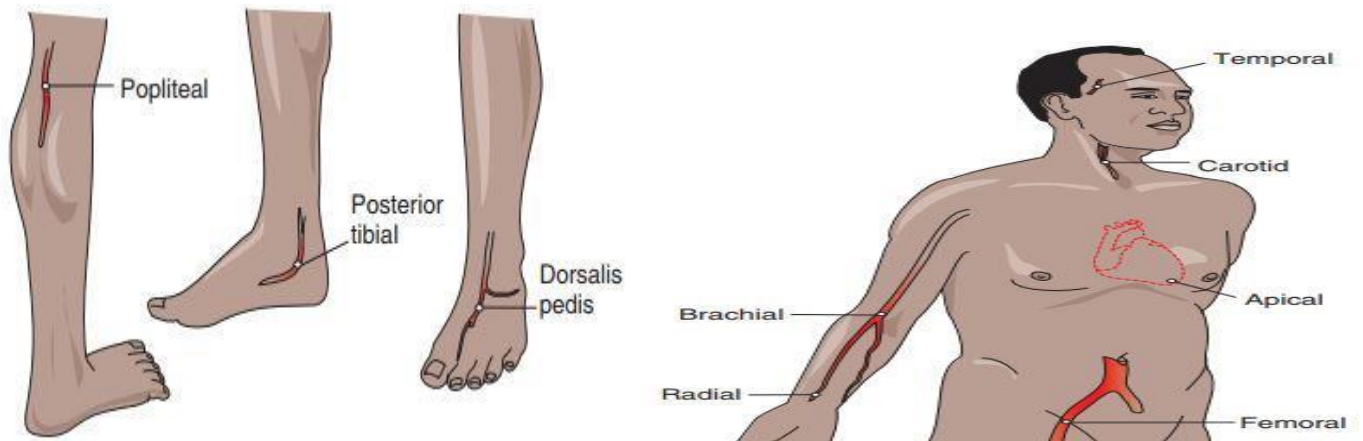
Quality of the pulse is assessed and may be noted on a point scale:

3+ - bounding – increase stroke volume

2+ - normal

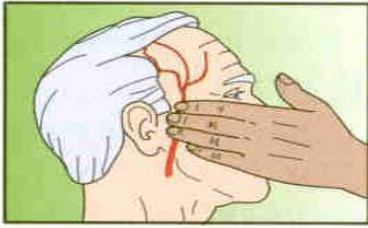
1+ - weak thready – decrease stroke volume

0 – absences

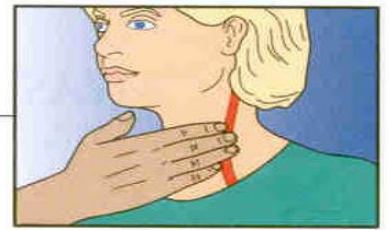


Pulse site

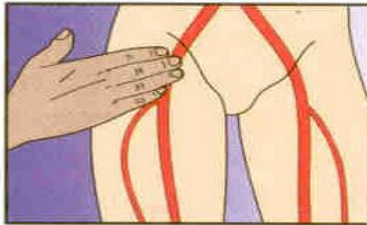
Temporal



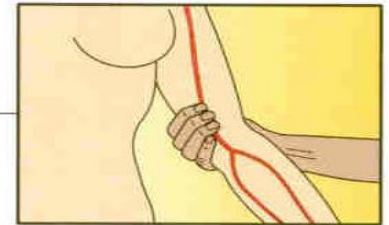
Carotid



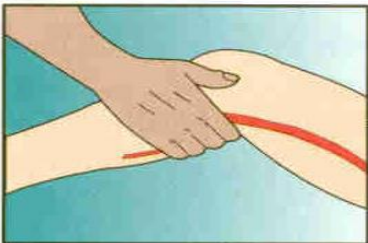
Femoral



Brachial



Popliteal



Radial



Posterior tibial



Dorsalis pedis



Procedure for taken pulse rate.

- 1- Can be taken without disturbing or exposing the person
- 2- Place the first two or three fingers of one hand against the radial artery
- 3- The radial artery is on the thumb side of the wrist
- 4- Do not use your thumb to take a person's pulse
- 5- Use gentle pressure
- 6- Count the pulse for 30 seconds and multiply by two



Factors Contribute to Increase Pulse Rate

1. Pain.
2. Fever.
3. Stress, exercise.
4. Bleeding.
5. Decrease in blood pressure.
6. Some medications as (Adrenaline, Aminophylline)

Factors May Slow the Pulse Rate

1. Rest.
2. Increasing age.
3. People with thin body size.

4. Some Medications.

5. Thyroid gland disturbances

3- RESPIRATION:

The chest rises during inspiration (breathing in) and falls during expiration (breathing out).

Movement of air in (inspiration) and out (expiration) of the lungs.

Normal range of respiratory rate for adult is 12 – 20 breaths per min

Terminology:

Tachypnea – respiratory rate over 20 (shallow)

Bradypnea – respiratory rate below 12 (regular)

Dyspnea – shortness of breath – difficulty in breathing

Apnea – cessation of breathing

Hyperventilation – fast and deep respirations

Hypoventilation – slow and shallow respirations

Eupnea: refers to easy respirations with anormal rate of breaths per minute.

Inspiration (inhalation)is the act of breathing in .

Expiration (exhalation)is the act of breathing out.

Assessment of respiration includes

1-Depth: by assessing the degree of movement in the chest wall; shallow, deep or normal.

2-Rhythm. Regular or irregular

3- Rate: observes a full inspiration & expiration when counting.

Control of Breathing Respiration is controlled by respiratory center in the medulla oblongata

FACTORS AFFECTING RESPIRATION

Pain, anxiety, exercise.

2. Medications.

3. Trauma.

4. Infection.

5. Respiratory and cardiovascular disease.

6. Alteration in fluids, electrolytes, acid – base balances.

4-Blood Pressure

Is the measurement of the amount of force the blood exerts against the artery walls

Bp is measured in mm (millimeters) of hg (mercury)

Normal measurment of BP. systolic /diastolic= 120/80

Average adult systolic range – 100 to 140

Average adult diastolic range – 60 to 90

Abnormal blood pressure:

Hypertension – measurements above the normal systolic or diastolic pressures

Hypotension – measurements below the normal systolic or diastolic pressures

Terminology :

o Systolic pressure(top) – the pressure exerted when the heart muscle is contracting of the ventricles

o Diastolic pressure(bottom) – the pressure exerted when the heart muscle(ventricles) are relaxing between beats

Pulse preesure :is the difference between the diastolic and the systolic .

is about 40mmHgpressure pulse a normal

Factors Affecting Blood Pressure

1. Age

2. Gender

3. Race

4. Exercise

5. Stress

6. Medications

7. Obesity

8. Medical conditions

Type of BP Cuff :

- The proper name for a blood pressure cuff is **sphygmomanometer**



Guidelines for measurement of blood pressure:

- 1-Do not take a blood pressure on an arm with an IV, a cast, or a dialysis shunt.
- 2-Do not take a blood pressure on the side that a person has had breast surgery on.
- 3- Measure blood pressure with the person sitting or lying.
- 4- Apply the cuff to the bare upper arm. Do not apply the cuff over clothing.
- 5- Make sure the cuff is snug.
- 6- Use a large cuff if necessary.
- 7- Make sure the room is quiet.
- 8- If you do not hear the blood pressure, wait 30 to 60 seconds and try again. If you still can not hear it or are unsure of your readings, have the nurse check your

PROCEDURE OF Measurement of blood pressure :

- 1.Clean the stethoscope earpieces and diaphragm with alcohol.
- will be placed. stethoscope2.Locate the brachial pulse. This is where the

3.Wrap the cuff above the elbow with the arrow pointing to the brachial artery. Fasten the cuff so it fits snugly.

4.Place the diaphragm of the stethoscope flat on the pulse site, holding it in place with the index and middle fingers of one hand.

5.Locate the radial pulse.

cuff by turning it to the right (clockwise). BP6.Close the valve on the

Hg7.Inflate the cuff until you can no longer feel the radial pulse. ,Then inflate the cuff 30 mm beyond this point.

8.Deflate the cuff slowly by opening the valve slightly and turning it counterclockwise (to the left) with your thumb and index finger. Allow the air to escape slowly while listening for a pulse sound.

9.Note the reading at which you hear the first clear, regular pulse sound. This number is the systolic pressure.

10.Continue listening until the sound disappears. This is the diastolic pressure. Note this reading.

11.Open the valve completely to deflate the cuff. Remove the cuff from the patient.





5-Oxygen Saturation:

The amount of oxygen in the blood, measured with a pulse oximeter.

a normal oxygen saturation level is between 95% and 100%.

Pulse oximeter: A small, clip-like device that is usually placed on a finger, earlobe, or toe.

Low (Hypoxemia): Levels below 95% symptoms such as: •

- 1-Shortness of breath.
- 2-Rapid breathing.
- 3-Fast or pounding heartbeat.
- 4-Confusion.

Factors that can affect readings

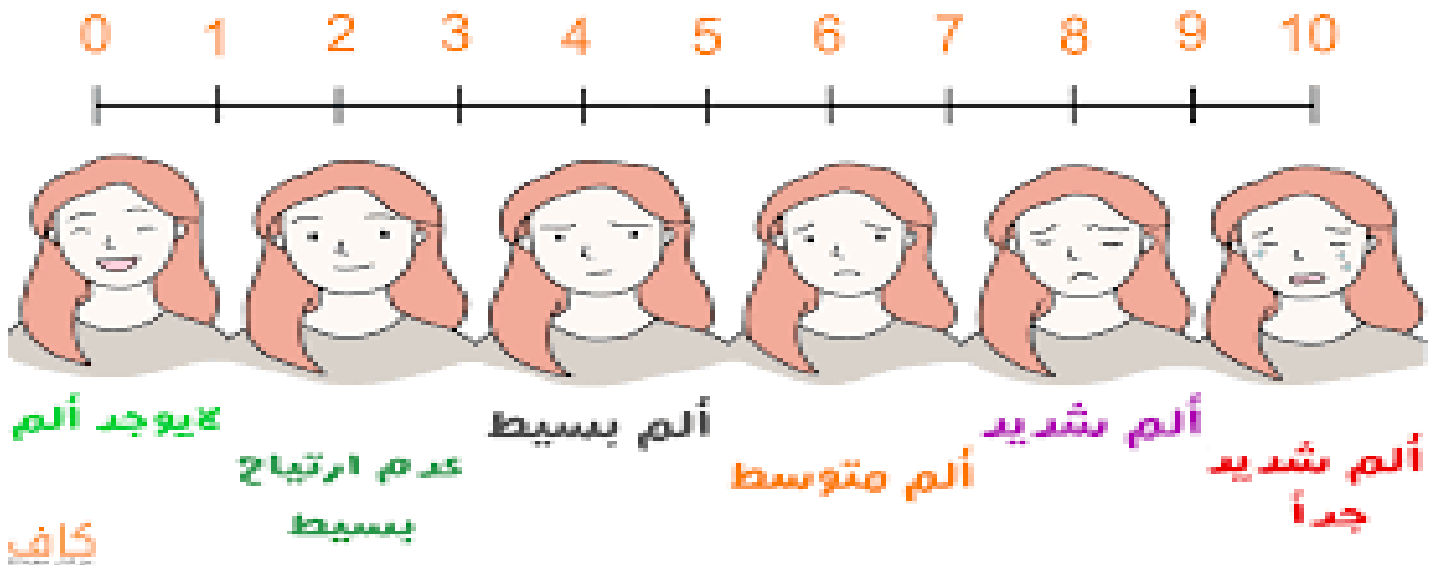
- 1-Poor blood flow (e.g., cold hands). •
- 2-Nail polish or artificial nails. •
- 3-Movement or dirty probes. •



6-Pain:

A subjective but critical indicator of physiological distress or a response to injury, sometimes referred to as the sixth vital sign.

pain is subject to an individual's interpretation. Pain scale assessment allows the medical team to comfort and meet the needs of the individual. The individual reads the scale and chooses a word to describe the intensity of their pain. After identifying the level of pain rating that is comfortable for the individual, the medical team will ensure the pain management is effective. Two ways to manage pain: Drug therapy and Non-drug techniques (Slow Rhythmic Breathing)



Wong-Baker FACES® Pain Rating Scale



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