VITAL SIGNS

Introduction

Assessing vital signs or cardinal sign is a routine medical procedure. And somehow determines the internal functions of the body

Vital signs composes of the following:

- ✓Body temperature
- ✓Pulse
- ✓Respiration and
- ✓ Blood pressure

Definition

- ✓Vital sign are otherwise called cardinal signs.
- ✓These are the indicator of health status, as these indicate the effectiveness of circulatory, respiratory, neural, & endocrine body functions.

Purposes of assessing a client

- ✓To determine change in client status.
- ✓ To recognize variation from normal and its significance.
- ✓ To help physician to prescribe right treatment.
- ✓ To identify specific life threatening condition.
- ✓ To detect changes in client health status. To help in diagnosis of disease, the result of treatment and medication.

When to take vital signs

- ✓Upon admission.
- ✓ On a routine basis.
- ✓ Before and after invasive procedure.
- ✓ Before and after administration of medication.
- ✓ Any detoraition of patient’s general condition.
- ✓ Before and after nursing intervention that may influence vital sign.
- ✓ Prior to medical emergency call MET team.

Vital signs equipment

- ✓Oral/ axilla / rectal thermometer
- ✓Stethoscope
- ✓ Sphygmomanometer with appropriate cuff size
- ✓Watch with a second hand
- ✓Spirit swab or cotton

- ✓Sponge towel
- ✓Paper bag for discard dry waste
- ✓ Documentation form
- ✓TRAY
- ✓Trolley with upper and lower trolley

Body temperature

- ✓It is a balance between the internal and external environment of the body
- ✓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

Two types of Body temperature

CORE Temperature- it is the temperature of the deep tissues of the body, such as the cranium, thorax, abdominal cavity and pelvic cavity.

It remains relatively constant (37 °C/ 98 °F)

An accurate measurement is usually done using a pulmonary catheter.

- ✓SURFACE temperature- is the temperature of the skin, the subcutaneous tissues and fat
- ✓It constantly rises and falls in relation to the environment
- ✓It varies from 20 °C (68 °F) to 40 °C (104 °F)

Sites commonly used in taking Body temperature

- ✓ Oral- most common
- ✓ Axilla –mostly used in infants and children
- ✓ Rectal- second choice
- ✓ Tympanic membrane- most favorable site

Alteration in Body temperature

- ✓Pyrexia, hyperpyrexia or fever- increase body temperature
- ✓febrile with fever
- ✓Afebrile without fever
- ✓Types of fever
- ✓ Intermittent-alternate body temperature (time)

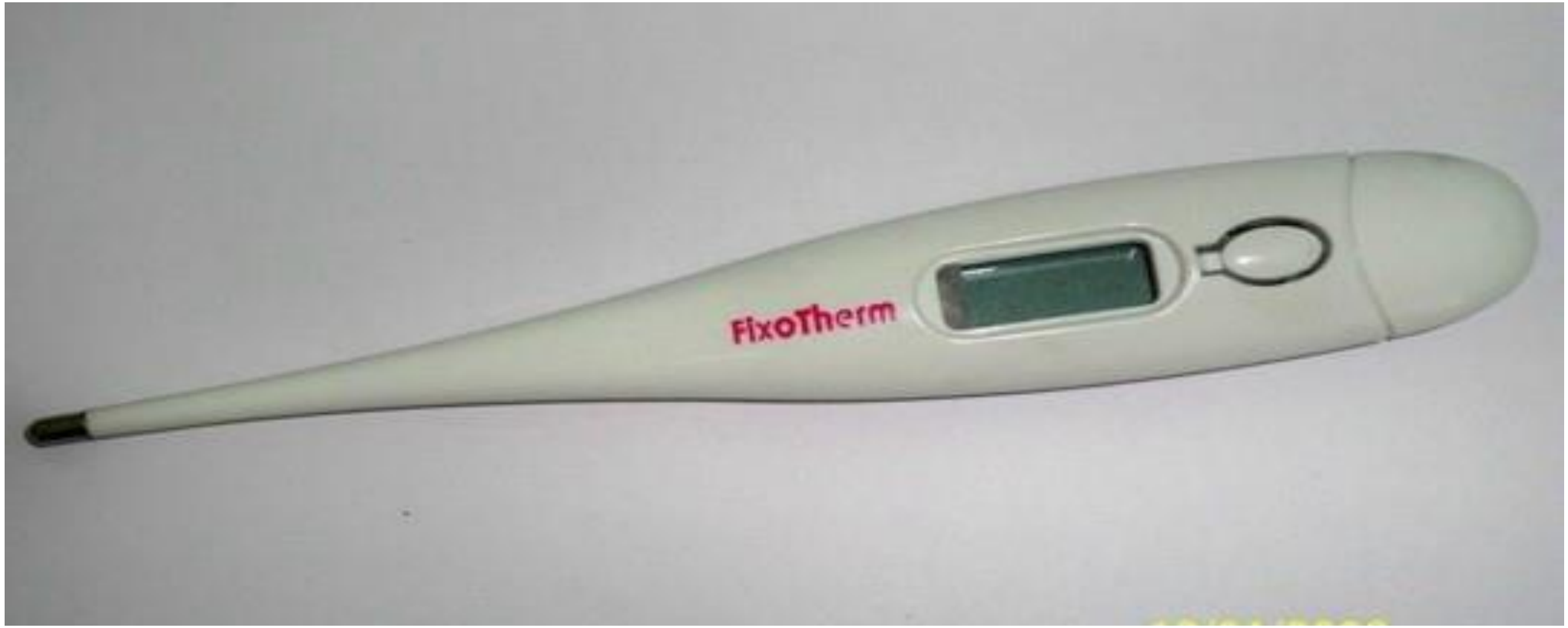
- ✓Remittent- wide range of temperature fluctuation
- ✓Relapsing- short febrile periods few days then normal
- ✓Constant- continuous
- ✓Hypothermia- decrease in core temperature below the low limit of normal

Types of Thermometer

- ✓Mercury in glass Oral thermometer have a long, slender tips Rectal thermometer have a short, rounded tips
- ✓ Electronic thermometer Digital thermometer
- ✓Chemical thermometer
- ✓Temperature sensitive strip
- ✓ Infrared thermometer Tympanic thermometer

Oral thermometer (Glass)

Digital Thermometer



Taking axillary Temperature

Digital thermometer is commonly used in infants and children, insert it at the axillary region

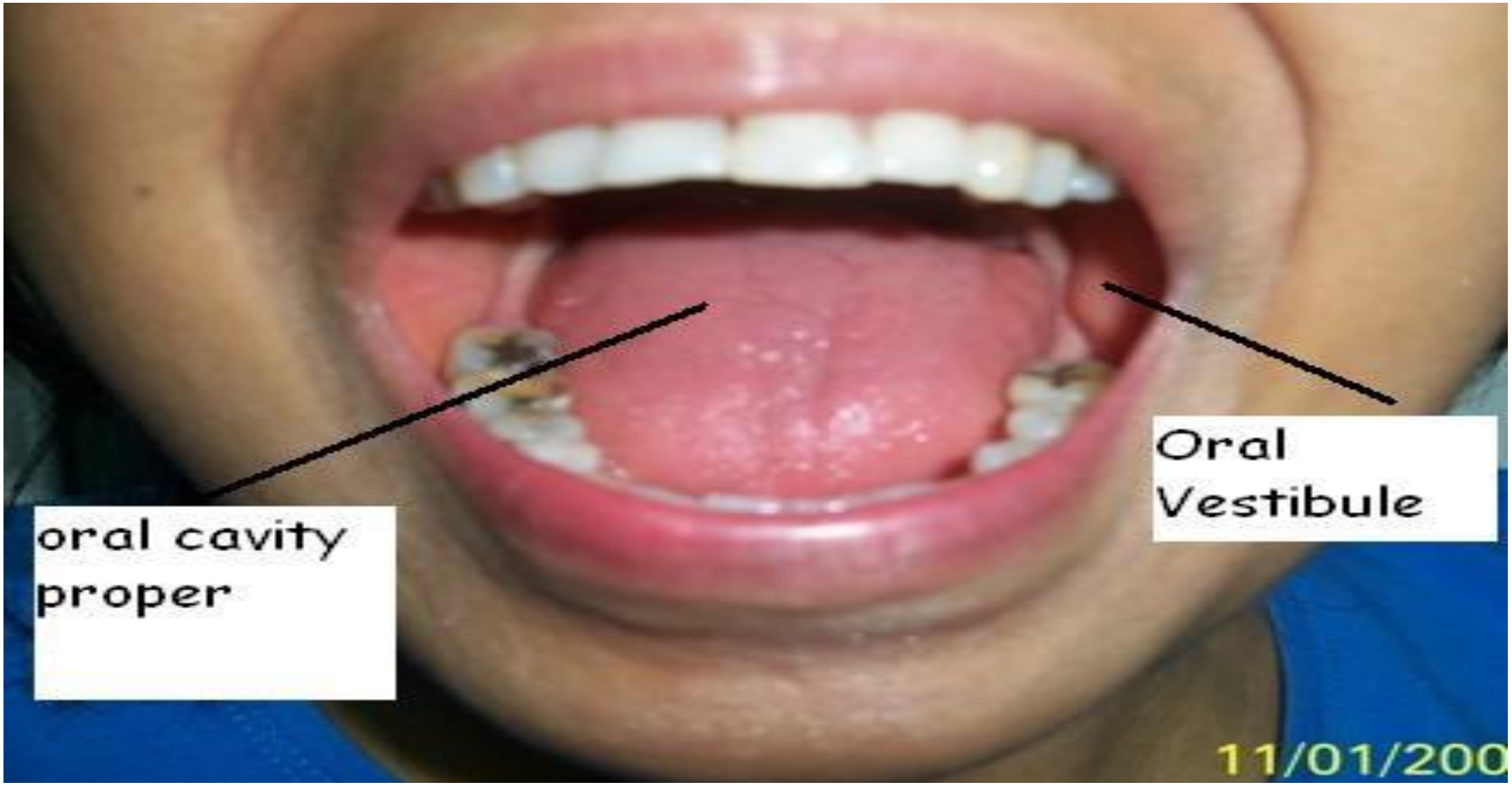
Closed the arm and wait for timer to bustle

- *Remember when taking BT in infants and children make sure that the patient is not in distress mood because any change in the activity will directly affect the BT reading.*

Taking Oral temperature

The Oral Cavity

Parts: Oral Vestibule and Oral Cavity Proper


oral cavity proper
Oral Vestibule
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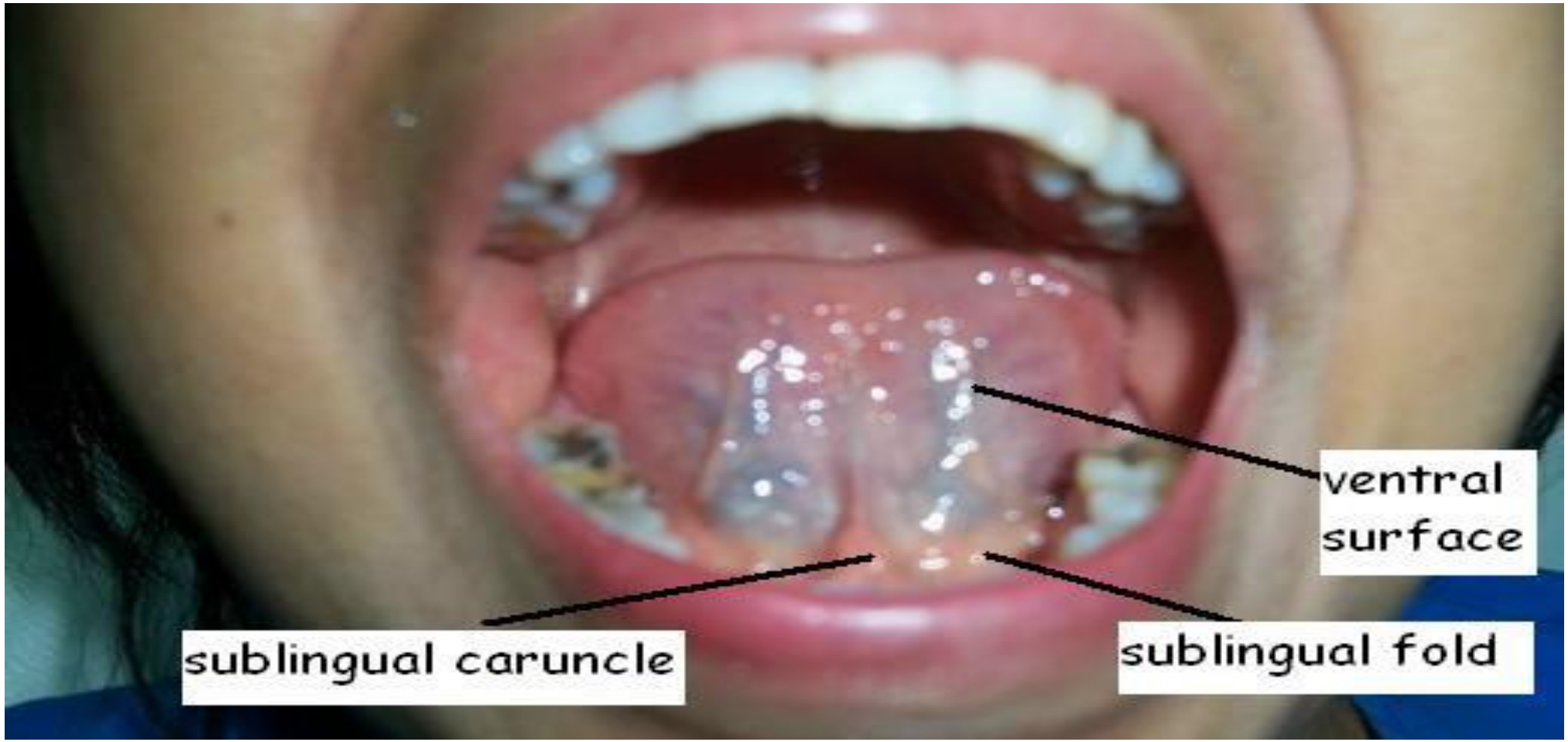
Floor of the mouth


ventral surface
sublingual caruncle
sublingual fold

Insert the tip at the sublingual fossa

Positioned the thermometer

Let stay for 1 to 2 minutes, tell the patient to close the mouth

Temperature conversion

°C = (Fahrenheit – 32) x 5/9 Convert 100 °F

°F = (Celsius x 9/5) + 32 Convert 40 °C

Normal/ Average temperature is between 36-37.9 °C or 96.8 – 100.3 °F

Pulse Rate

- ✓Is a wave of blood created by contraction of left ventricle of the heart
- ✓ Generally, the pulse wave represents the stroke volume output and the compliance of arteries.
- ✓**Stroke volume output** is the amount of blood that enters the arteries with each ventricular contraction.
- ✓**Compliance** its the ability of the arteries to contract and expand.

- ✓When adult is resting, the heart pumps 4 to 6 liters of blood per minute.
- ✓This volume is called cardiac output, The cardiac output (CO) is the result of the stroke volume (SV) times the heart rate (HR) per minute CO= SV x HR Note: in healthy person the pulse reflects the heartbeat

- ✓**Peripheral pulse-** is a pulse located in the periphery of the body.
- ✓**Apical pulse-** is a central pulse located at the apex of the heart.

Pulse site

1. Temporal- it is where the temporal artery located, between the upper, lateral part of the eye and upper medial part of the ear

2. Carotid- at the side of the neck, at the carotid triangle. Located between the Anterior/front of SCM and below the angle of the mandible

3. Apical- at the apex of the heart. **In adult** this is located on the left side of the chest, no more than 8 cm (3 in) to the left sternum under the

Carotid pulse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- ✓ **Brachial-** at the anterior part of the arm in children and at the
- ✓antecubital space (elbow crease) in adult.
- ✓ **Radial –** located at the wrist (anterior part), along with the thumb. It is where the radial artery is located
- ✓**Femoral** – at the inguinal ligament, the femoral artery is located.

Radial pulse

Brachial pulse

- ✓**Popliteal-** at the popliteal region, located at the back of the knee
- ✓**Posterior Tibial -** at the medial aspect of the ankle, it is where the posterior tibial artery is located
- ✓**Dorsalis pedis -** where the dorsalis pedis artery passes over the bones of the foot, at the space between the big toe and the 2nd toe.

Posterior tibial

Dorsalis pedis Pulse

Pulse site & Reasons for Use

- ✓Radial Readily accessible & routinely used
- ✓Temporal Used when radial pulse is not accessible
- ✓Carotid Used for infants, in cases of cardiac arrest and to determine the circulation to the brain
- ✓Brachial Used to measure blood pressure, used for cardiac arrest for infants

- Apical Routinely used in infants and children up to 3 years of age, Used to determine the discrepancies with radial pulse, and Used in conjunction with some medication
- Femoral Used in cases of cardiac arrest, for infants and children, determine circulation in the leg

- ✓Popliteal Used to determine the circulation in the lower leg and leg blood pressure
- ✓Posterior tibial Used to determine the circulation in the foot
- ✓Pedal Used to determine circulation in the foot

Assessing the Pulse

- ✓A pulse is commonly assessed by palpation or auscultation.
- ✓3 middle fingers are used for palpating all pulse site, except for apical pulse.
- ✓Stethoscope is used in assessing apical pulse and fetal heart tones.
- ✓Doppler ultrasound is used for pulses that is to difficult to assess.

- ✓The pulse is normally palpated by applying are moderate pressure with the three fingers of the hand.
- ✓The pads of the most distal aspect of the fingers are the most sensitive areas of detecting the pulse.


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When assessing the pulse, there is a need to take note of the following :

- ✓Rate
- ✓Rhythm
- ✓Volume
- ✓ Arterial wall elasticity
- ✓Presence or absence of bilateral equality.

Variations in Pulse Rate

- ✓Newborn to 1 month Average 130 Ranges between 80-180
- ✓Infant average 120 ranges 80-140
- ✓Below 2 years average 110 ranges 80- 130
- ✓6 years average 100 ranges btn 75- 120
- ✓10 years average 70 ranges 50-90
- ✓Adult average 80 ranges btn 60- 100
- ✓It is measured in Pulse rate/ Minute

Respiratory rate

- ✓ Is normally described in breaths per minute
- ✓Types:
- ✓Eupnea- Normal Breathing
- ✓Bradypnea- Abnormally slow
- ✓ Tachypnea or polypnea- Abnormally fast
- ✓Apnea- cessation of breathing

Respiratory depths

- ✓Is established by watching the movement of the chest.
- ✓ It is generally describe as normal, deep or shallow, **deep respiration** are those in which a large volume of air is inhaled and exhaled.
- ✓**Shallow respiration** involve the exchange of small volume of air

NOTE: in normal inspiration and expiration, an adult takes in about 500ml of air. This volume is called **Tidal volume**

Respiratory rhythm/ pattern

It refers to regularity of expiration and inspiration

- ✓Types
- ✓Regular
- ✓Irregular
- ✓Dyspnea- difficulty in breathing
- ✓Orthopnea- ability to breath in an upright position

Variations in Respiratory rate

- ✓Newborn Average 35/minute ranges between 30-80/minute
- ✓1 year average 30/minute ranges btn 20-40/minute
- ✓2 years average 25/minute ranges 20-30
- ✓8 years average 20/minute ranges btn 15-25
- ✓16 years averages 18/minute ranges 15-20
- ✓Adult average 16/minute ranges 12-20

BLOOD PRESSURE

Heart Sound

- ✓First Sound-occurs at the beginning of ventricular systole. It is caused by the closure of the tricuspid and mitral valves
- ✓Second Sound- marks the beginning of ventricular diastole and is caused by the closure of aortic and pulmonary valves.

Arterial blood Pressure

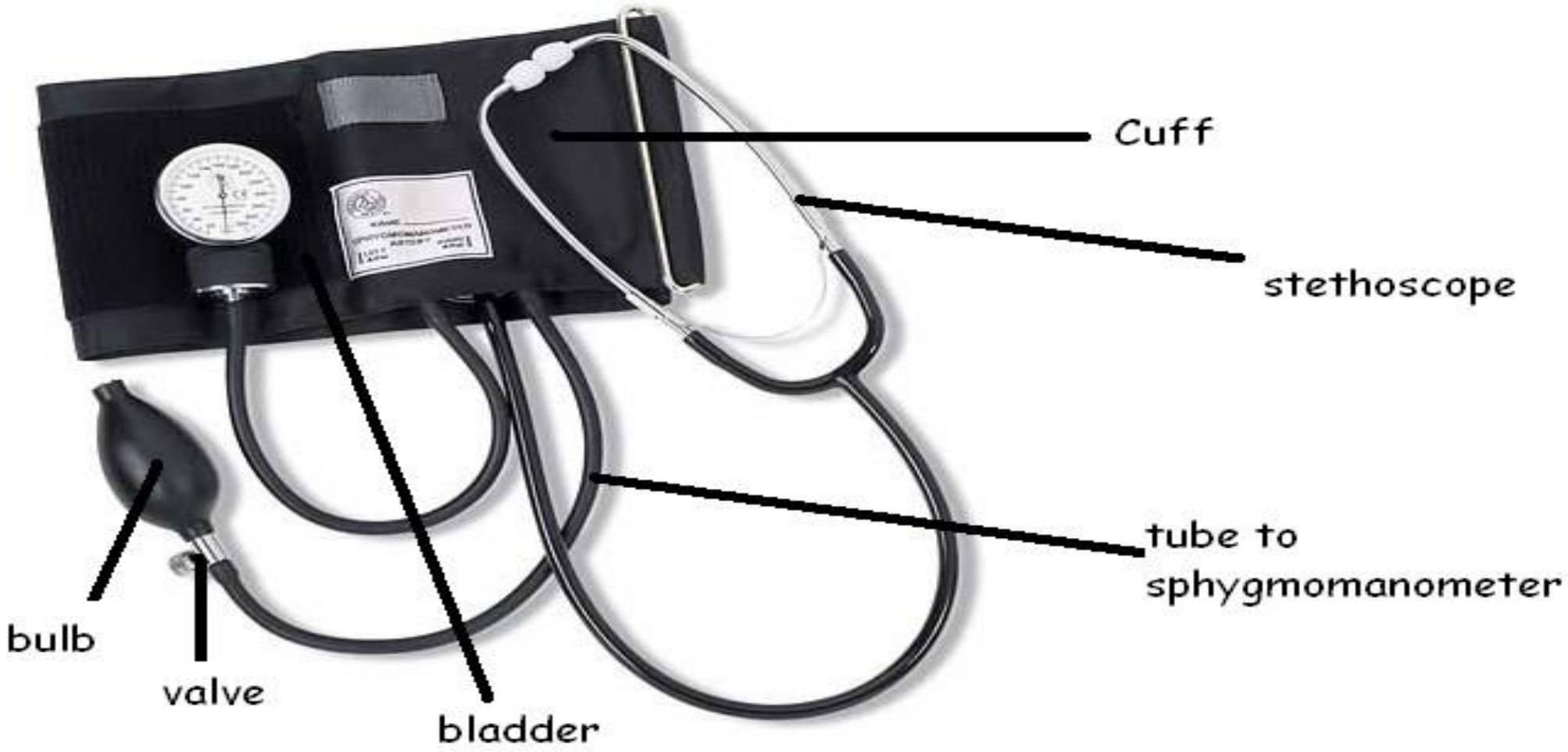
- ✓Is a measure of the pressure exerted by the blood as it flows through the arteries. Two blood pressure measurements
- ✓Systolic pressure- is the maximum pressure developed on the ejection of blood from the left ventricle into the arteries
- ✓Diastolic Pressure-is the lowest pressure and is a measure of the peripheral resistance.

In measuring the BP

- ✓By means of auscultation- the systolic pressure is taken at the point when beats becomes audible.
- ✓As the mercury continues to fall, the sound of the beats becomes louder, then gradually diminishes until a point is reached at which there is a sudden, marked diminution in intensity.
- ✓The average BP is about 120/80 at 20 years old and at the age of 60 is 160/90

Aneroid manometer with stethoscope

Part of the sphygmomanometer



Taking BP

- ✓It is measured with a blood pressure cuff, a sphygmomanometer and a stethoscope
- ✓The BP cuff has a bladder than can be inflated with air, it is covered with cloth and has two tubes attached to it (sometimes it’s three), one tube is connected to the rubber bulb.
- ✓To introduce air turn the valve clockwise and to release air turn it counterclockwise, the second tube to the sphygmomanometer and the third to stethoscope

Auscultatory method of obtaining BP

First the health care provider must determine the Korotkoff's sound- this is a series of sounds heard during BP assessment.

Phases of Korotkoff's sound

- ✓ Phase 1- The first faint clear tapping sound is heard. This sound gradually becomes strong and deep
- ✓ Phase 2- This is the period during deflation when the sounds have a swishing quality.

- ✓Phase 3- The period during which the sounds are forceful and powerful
- ✓ Phase 4- The time when the sounds begins to decrease in intensity, and has a less bounding force
- ✓Phase 5- The pressure level wherein the sound disappear.

Reading Blood Pressure

Reading Blood Pressure

- ✓The first sound heard is the systolic pressure and the last sound heard is the diastolic pressure

2 types of sphygmomanometer

- ✓Aneroid and mercury manometer
- ✓Aneroid is a calibrated dial with a needle that points to the calibrations while the other is a calibrated cylinder filled with mercury.
- ✓**Other types** Electric sphygmomanometer & Doppler stethoscope

Mercury manometer and cuff

Aneroid manometer and cuff

Variations BP cuff

- ✓If the bladder is too narrow, the obtained BP reading is erroneously elevated; if it is too wide the reading will be erroneously low The width should be 40% of the circumference or 20% wider than the diameter of the midpoint of the limb on which it is used
- ✓The length of the bladder should be sufficiently long almost to encircle the limb and to cover at least 2/3 of its circumference

Variations in BP by Age

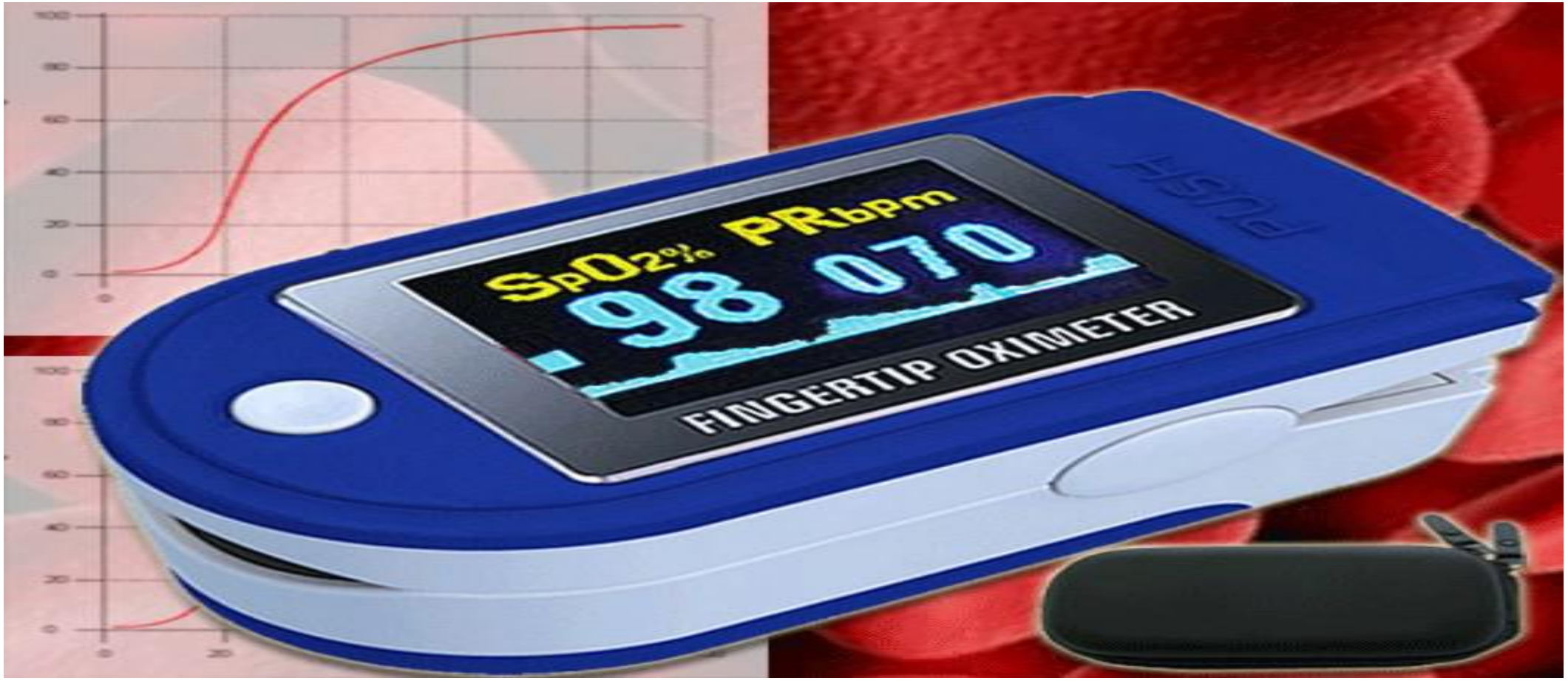
- ✓Newborn 73/55mmhg
- ✓I year 90/55mmhg
- ✓6 years 95/57mmhg
- ✓10 years 102/62mmhg
- ✓14 years 120/80
- ✓Adult 128/80mmhg

Assessment of oxygen saturation

Definition:

- ✓Oxygen saturation is the measurement of oxygen attached to the hemoglobin cell in the circulatory system. The normal spo2 is 90 to 100% .

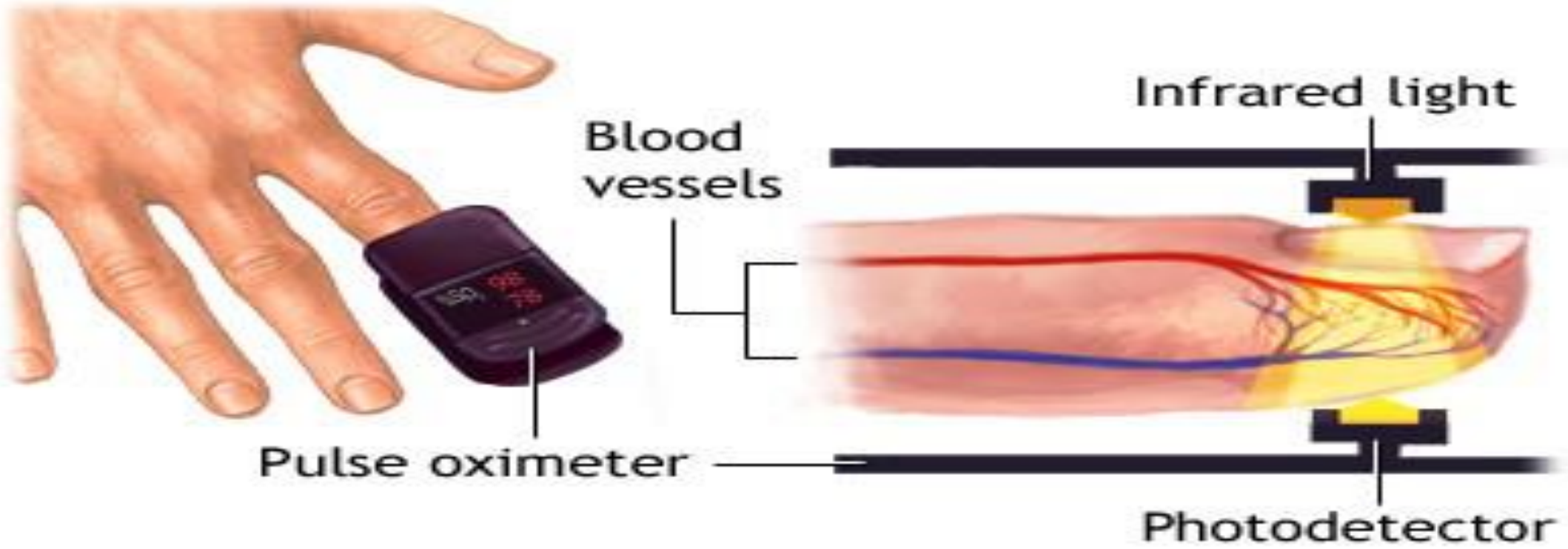
Pulseoxymeter




Rossmax
medical
12 : 30
LOW
%SpO2
High
Pulse
min.
M
SET
Palpus

Features of pulseoxymeter


98
64



A pulse oximeter estimates the amount of oxygen carried in the bloodstream using infrared technology across the skin

A.D.A.M.


Thank you!