

# Growth measurements



# contents

- Weight
- Length and height
- Head and chest circumferences
- Skinfold thickness
- Physiologic measurements(vital signs)



Weight



# Objectives:

**1-to evaluate the child health status .**

**2-to detect any marked loss or gain in weight**

**3- to provide a basic idea for determining the infant status and medication dosage**



# Equipment

- 1-an infant weighting scale or foot scale
- 2-Disposable sterile drape.



# Measuring Weight

Babies should be weighed without any clothes or nappy

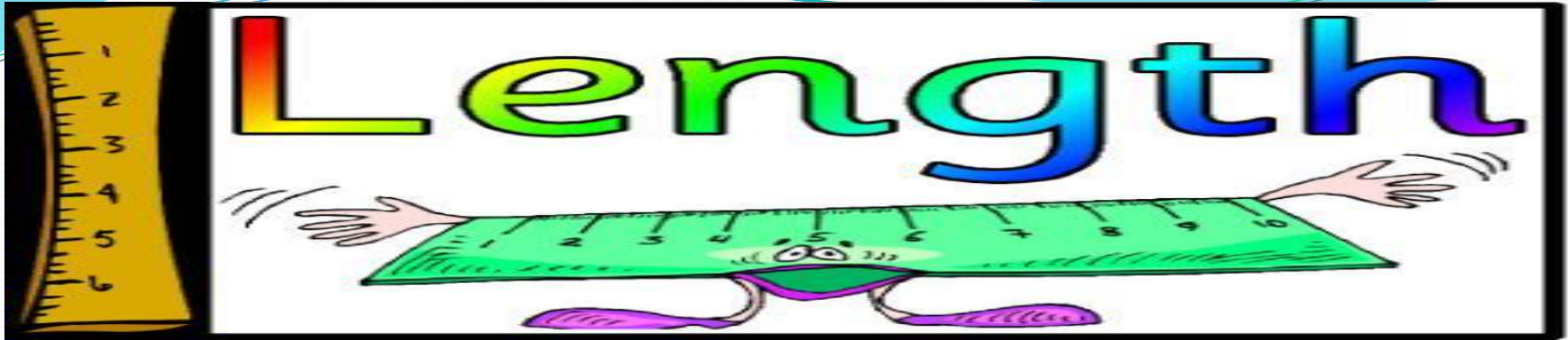
Children older than two years can be weighed in vest and pants, but no shoes, footwear, and dolls or teddies in hand

Only grade 3 clinical electronic scales in metric setting should be used -green sticker with background letter M (which means approved for medical use). Scales should be calibrated and maintained annually.



Class III  
Clinical  
Electronic  
Scales





*The term length refer to taking measurement when the children are supine (also referred to recumbent length) untie the children are 24month old.*

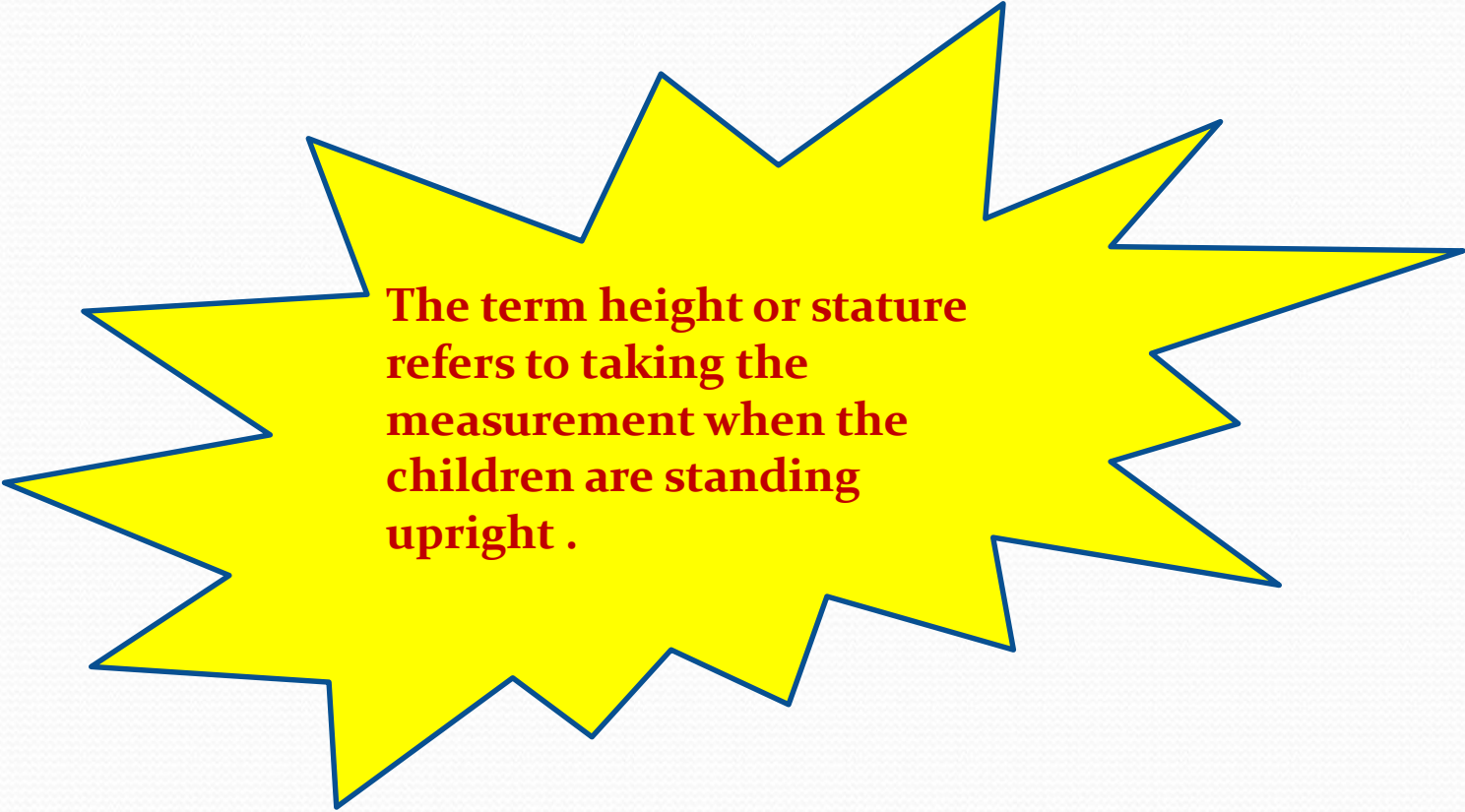
# Procedure

- *1-put infant on recumbent position*
- *2-hold head in mid line*
- *3-grasp knee and push gently toward table to fully extended leg .*
- *4-measure form vertex head to heels of feet (toes pointing upward )*
- *5- read and record .*



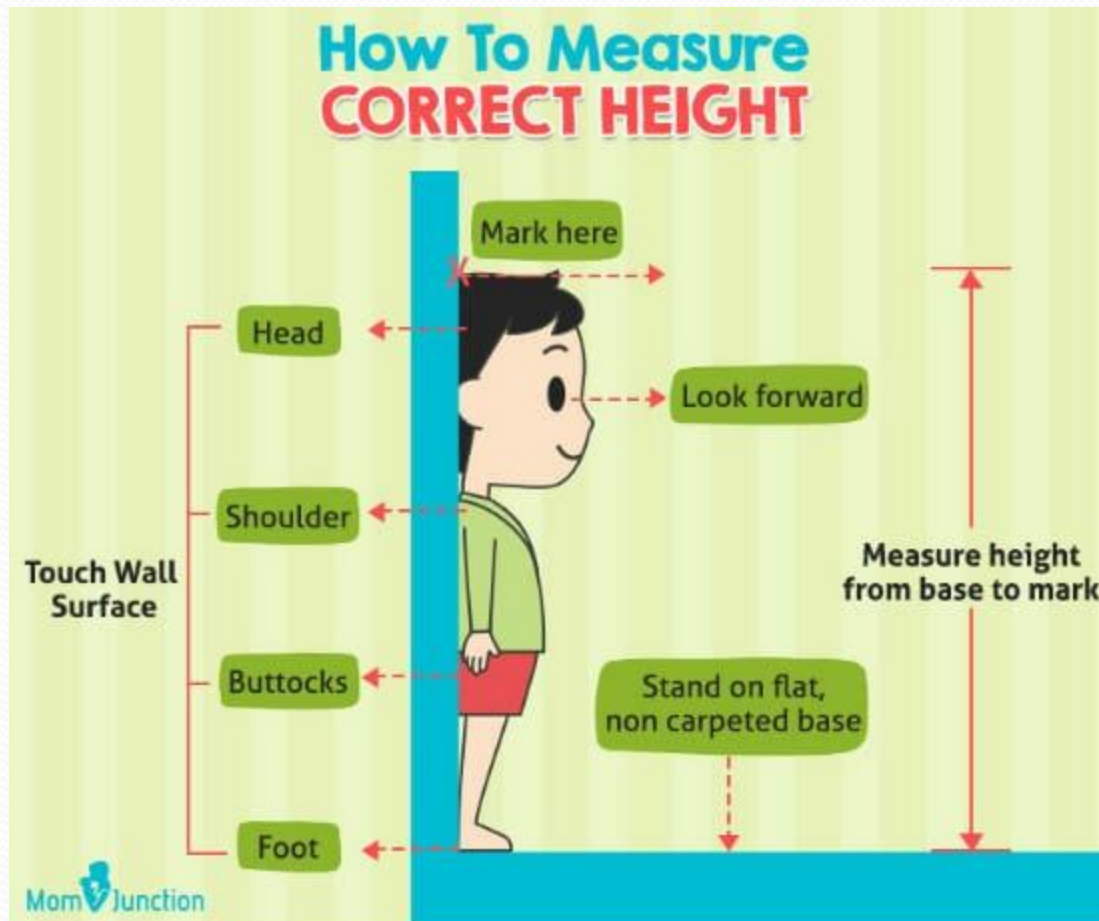


# Height



**The term height or stature refers to taking the measurement when the children are standing upright .**

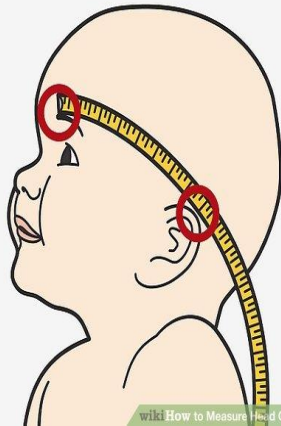
# Procedure



# Measuring Head Circumference



Head circumference should be measured using a narrow non-stretchable plastic or disposable lasso tape. Clean tape with antiseptic wipes [or soapy water] between child use



Measurement should be taken at the maximum occipital-frontal circumference taking the largest of 3 consecutive measurements

wiki How to Measure Head Circumference

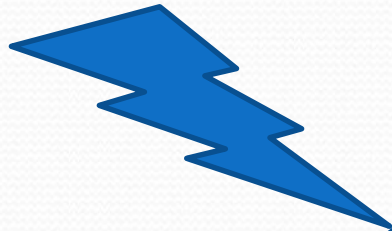
# Chest circumference

## Chest circumference

- Measure chest circumference with paper or steel tape around chest at nipple line and under tips of scapulas at back



**NB**



- 1-at birth normal head circumference is about 33to35cm
- 2-normal chest circumference at birth is about30.5to33cm
- 3-head and chest circumference equalize during the first year after birth
- 4-after age 2years chest circumference increase substantially more than head circumference.



# Skinfold thickness

## Definition

Skinfold thickness is a quick and easy method of measuring subcutaneous fat , that allows for estimation of an individuals body fat

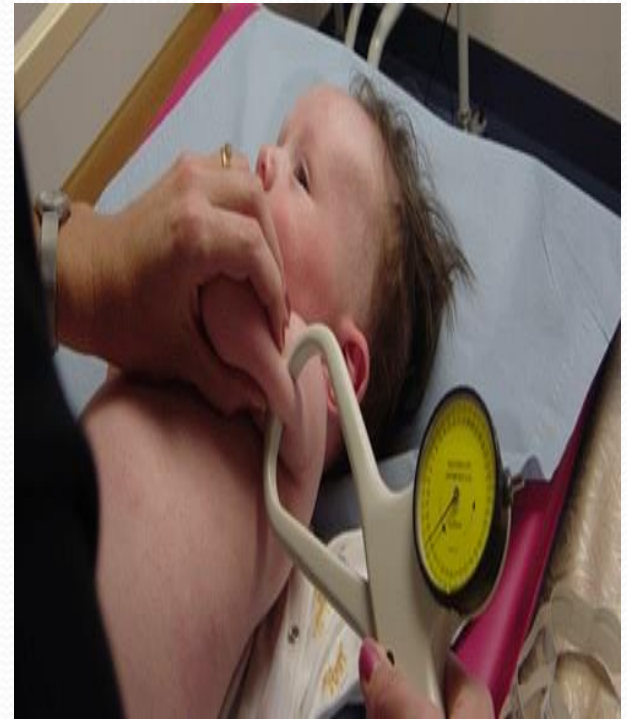
# Common site



1. Supra iliac
2. Abdomen
3. Upper thigh

# Skinfold thickness

- Skinfold thickness is a quick and easy method of measuring subcutaneous fat that allows for the estimation of an individual's body fat.
- The most common sites for measuring the skinfold thickness are: the triceps (most practical for routine clinical use), subscapula, supra iliac, abdomen & upper thigh





# Skinfold thickness

- \*Let the child's right arm flexed 90 degree at elbow.
- \*Mark mid-point between acromion & decranon on posterior aspect of arm.
- \*Let the child's arm hanging freely, pinch the skin between two fingers 1cm above mid-point.
- \*Gently pull fold away from underlying muscle & continue to hold until measurement is completed.
- \*Place caliper jams over skin fold at mid-point mark.
- \*Estimate reading to 1.0mm for 2-3 seconds after applying pressure.
- \* Take measurement until duplicates agree within 1mm.

# Physiologic measurements(vital signs)



# contents

1. *Body temperature.*
2. *Pulse.*
3. *Respiration .*
4. *Blood pressure*



# BODY TEMPERATURE

Balance between heat produced and heat lost by the body



# Types of thermometers

**3-types of thermometers**

```
graph TD; A[3-types of thermometers] --> B[Glass thermometer]; A --> C[Infrared tympanic ear thermometer]; A --> D[Electronic thermometer]; B --> E[Mercury expands in Response to heat]; C --> F[Sensor probe shape like otoscope]; D --> G[Heat sensitive probe Reads in seconds];
```

**Glass thermometer**

**Mercury expands in  
Response to heat**

**Infrared tympanic  
ear thermometer**

**Sensor probe shape  
like otoscope**

**Electronic thermometer**

**Heat sensitive probe  
Reads in seconds**

# Glass thermometer



## Infrared tympanic ear thermometer



# Electronic thermometer





# Sites and procedure

## 1. Oral

- #. **Posterior sublingual pocket under tongue (close to carotid artery).**
- #. **No hot or cold drinks or smoking 20 mins. prior to temp. must be awake & alert.**
- #. **Leave to place for 3 minutes.**
- #. **Not used for small children because they bite down.**



Continue(sites & procedure).....

## 2. Axillary

- #. **Bulb in center of axilla.**
- #. **Lower arm position across.**
- #. **Non invasive good for children.**
- #. **Leave in 5-10 minutes.**
- #. **Measures 0.5°C lower than oral temperature.**
- #. **Less accurate because less blood vessels nearby.**



Continue(sites & procedure).....

### 3. Rectal

- #. Side lying with upper leg flexed insert lubricated bulb.  
(half inch for infant)
- #. When unsafe or inaccurate by mouth rectal site is used.
- #. Leave in place for 2-3 minutes.
- #. Measures 0.5°C higher than oral.



A rectal temperature can be taken in either of these positions.

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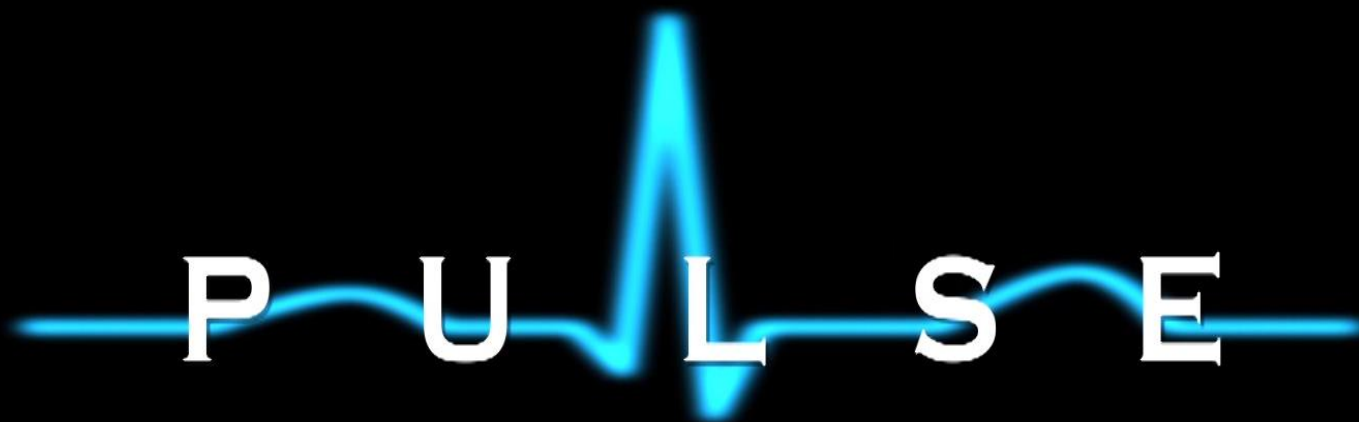
#### **4. Ear**

- #. Rapid measurement is done within 2-3 seconds.**
- #. It's easy to assess.**
- #. Close to hypothalamus sensitive to core temp. changes.**
- #. In adults: pull pinna up & back.**
- #. In children: pull down and back.**
- #. Otitis media can distort reading.**

- Keep clinical thermometer at eye level.



PULSE

A glowing blue pulse line graphic that passes through the letters of the word 'PULSE'. The line is horizontal and has a central, sharp peak that rises above the letter 'L' and a corresponding sharp dip that falls below it. The line is composed of several segments, with the central peak and dip being the most prominent. The letters 'P', 'U', 'L', 'S', and 'E' are white and positioned along the horizontal line, with the pulse line passing through them.

# Pulse Rate:

- Pulse rate means heart beats per minute.
- Pulse is never measured using thumb because thumb has a small artery which leads to false measurement.
- Usually, it is done using first 2 fingers of hands placing thumb down the hand for better grip and palpation.

# PULSE

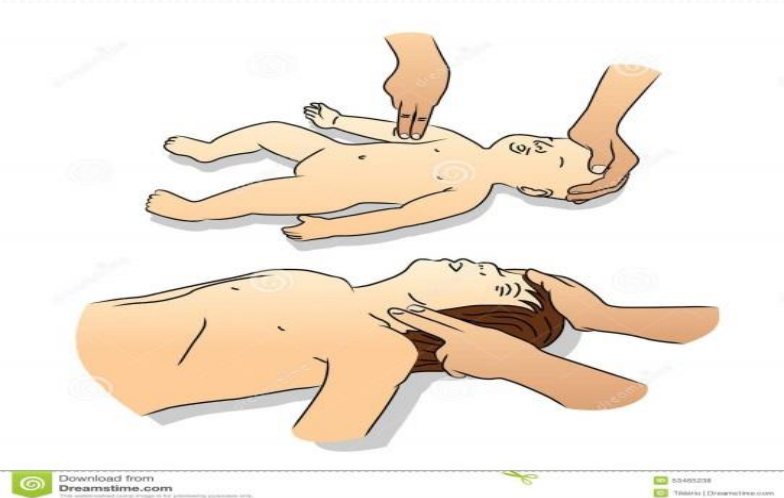
*Measuring techniques / places of assessing:*

❖ *PALPATION:*

- a. carotids
- a. brachialis, radials
- a. femoral , popliteal etc.

❖ *AUSCULTATION:*

- *Apical pulse by stethoscope.*





# ❖ Equipment



# A-apical pulse

## Heart Rate

- Apical rate
- Listen for 1 full minute
- Note
  - Rate, rhythm, intensity
  - Location of pulse
  - Presence of abnormal sounds



## B-Radial pulse

*1-place the child in a resting position*

*2-place the first three or two finger over the radial artery at the wrist*

*3-count pulse for one full minute*



## N.B:

1-Apical pulse is measured for children less than 3years of age .

2-radial pulse is measured for children over 3years of age .

3- pulse is measured as apical ,femoral ,radial ,temporal ,brachial....etc.

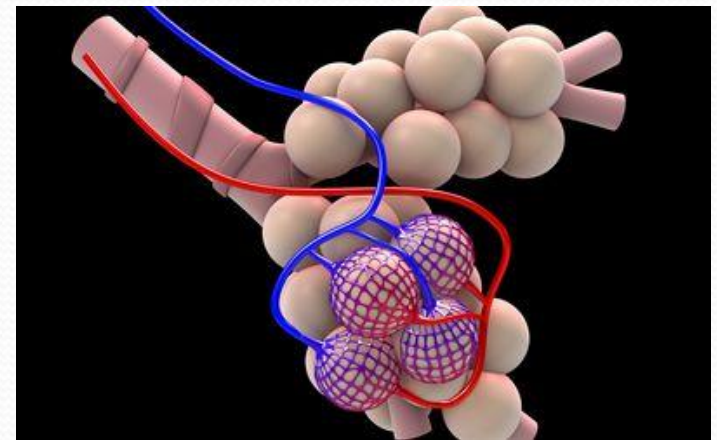
4-pulse should not be measured after crying ,bathing ,or feeding .



RESPIRTATION RATE

# Procedure

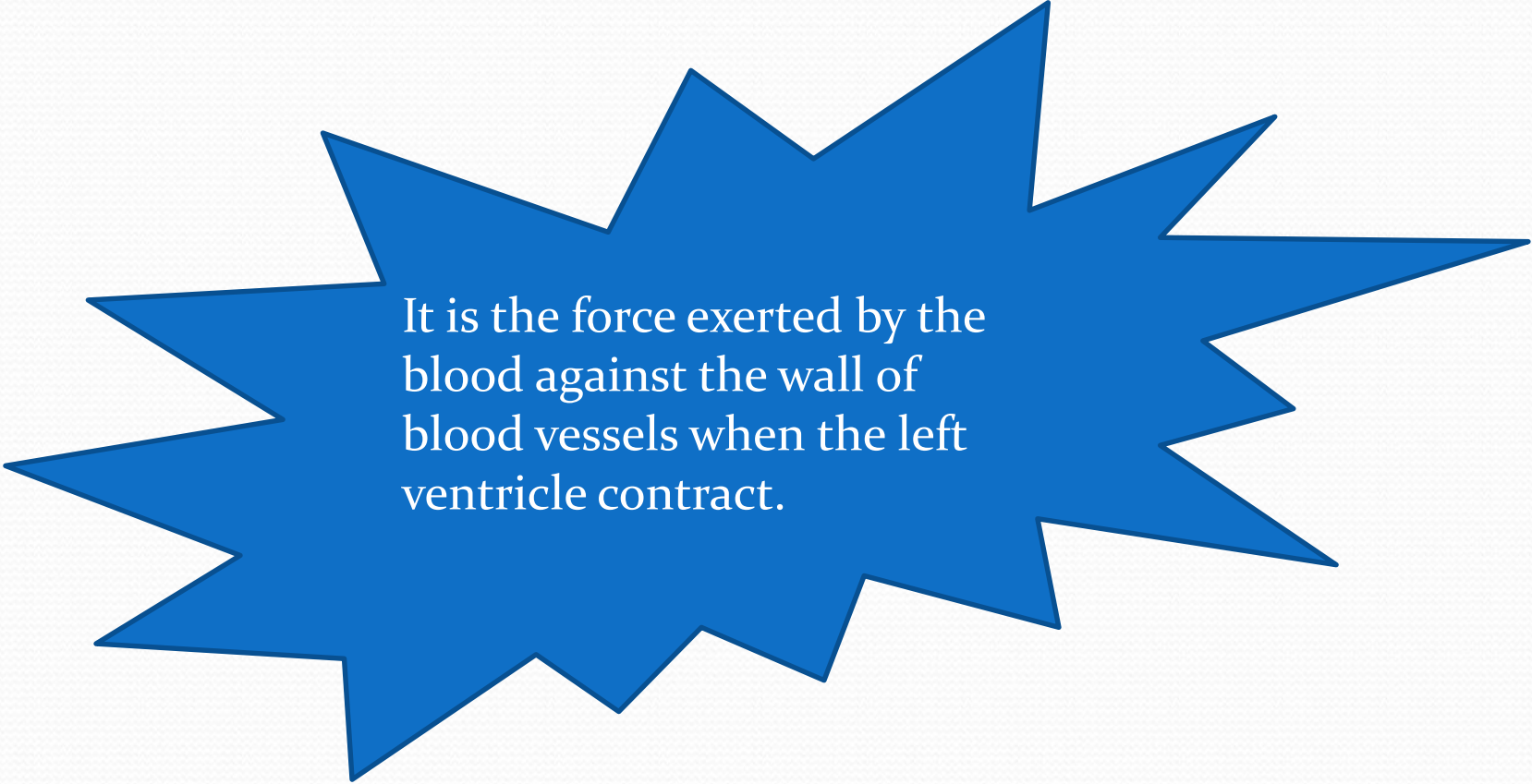
- *1-observe abdominal movement in infant , young children ,observe thoracic movement in older children .*
- *2-count respiration for one full minute*
- *3-report any abnormality*





# **BLOOD PRESSURE**

# Definition



It is the force exerted by the blood against the wall of blood vessels when the left ventricle contract.



# equipment



# Procedure

- 1-expose the upper arm .
- 2-apply cuff evenly over the upper arm with lower edge about 1.5cm above the antecubital.
- 3-position the sphygmomanometer on the level surface at approximately the level of the heart .
- 4-palpate the radial pulse and inflate the cuff until the palpating pulse is lost then pump for addition 20mmhg
- 5-position the bell of the stethoscope over the area where the brachial pulse is felt .
- 6-deflate the cuff slowly and listen to the sound .
- 7-notice the mercury l level where the sound is audible (systolic )and change to muffled or very sound (diastolic)
- 8-deflate the cuff, remove it
- 9- record the reading and report for any change .



*Table of normal range of vital signs according to the common age group*

<b>Age</b>	<b>Pulse</b>	<b>respiration</b>	<b>BL.P</b>
<b>Newborn</b>	120-160	30-60	Systolic50-70
<b>Infant</b>	110-160	25-40	Systolic70-95
<b>Toddler</b>	95-140	20-30	Systolic80-100
<b>Children</b>	80-120	20-25	Systolic80-100
<b>Older child(6-12y)</b>	60-80	15-20	Systolic90-120



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