Lecture 1

Growth measurement

Practical

By

Dr. Ghassan Abdul Ameer

Growth measurement

Growth measurement: it Measurement of physical growth in children to evaluation health status.

Growth measurements correlate directly to nutritional status and can indicate whether a child’s health and well-being are at risk

Growth measurement (Anthropometric)

- length
- Height
- weight
- head circumference
- chest circumference
- abdominal circumference
- Body mass index

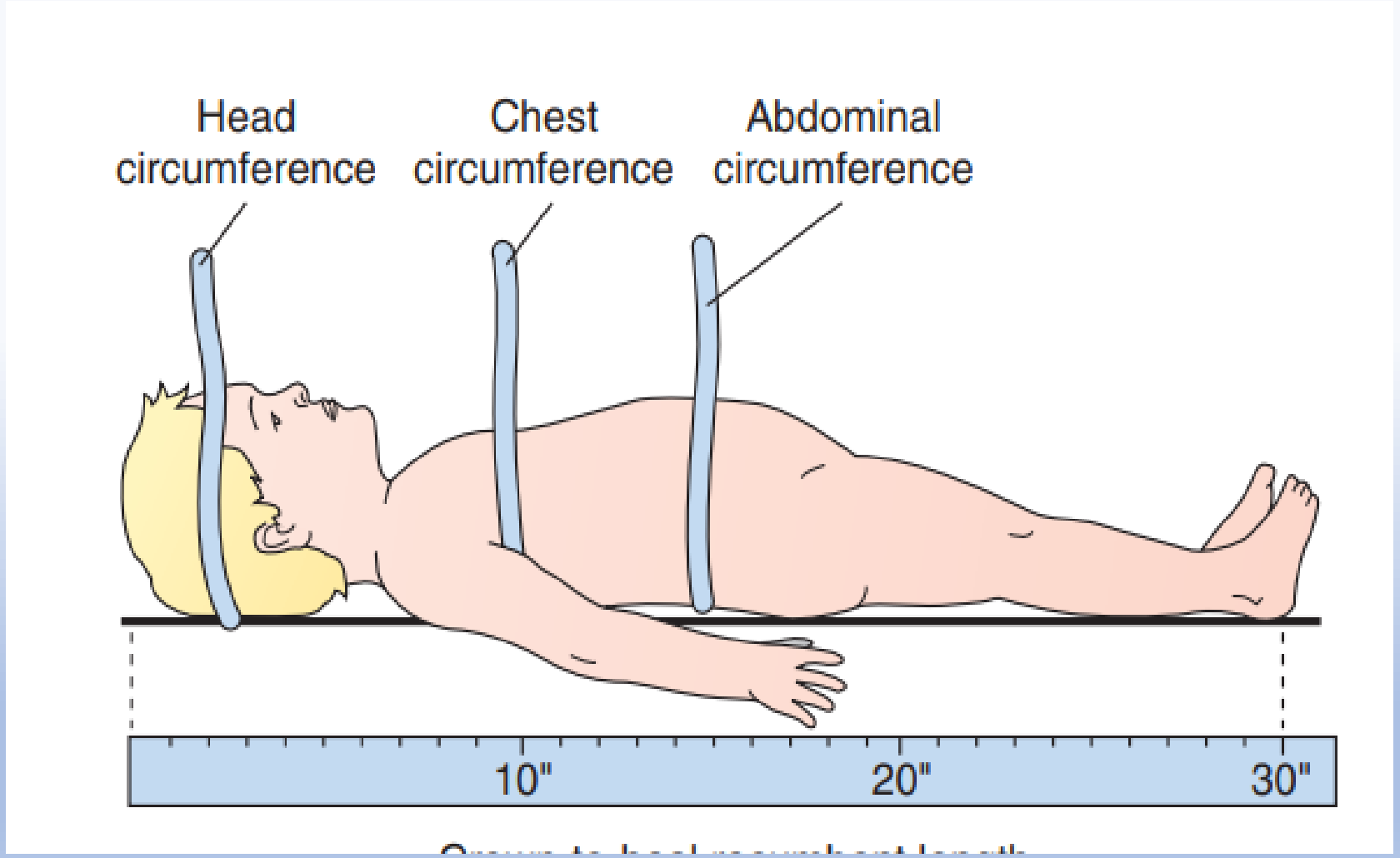
length

The term length refers to measurements taken when children are supine (also referred to as recumbent length). Until children are 24 months old,
measure length. Because of the normally flexed position during infancy recumbent, fully extend the body by

(1) holding the head in midline,

(2) grasping the knees together gently,

(3) pushing down on the knees until the legs are fully extended and flat against the table.


Head
circumference
Chest
circumference
Abdominal
circumference
10"
20"
30"

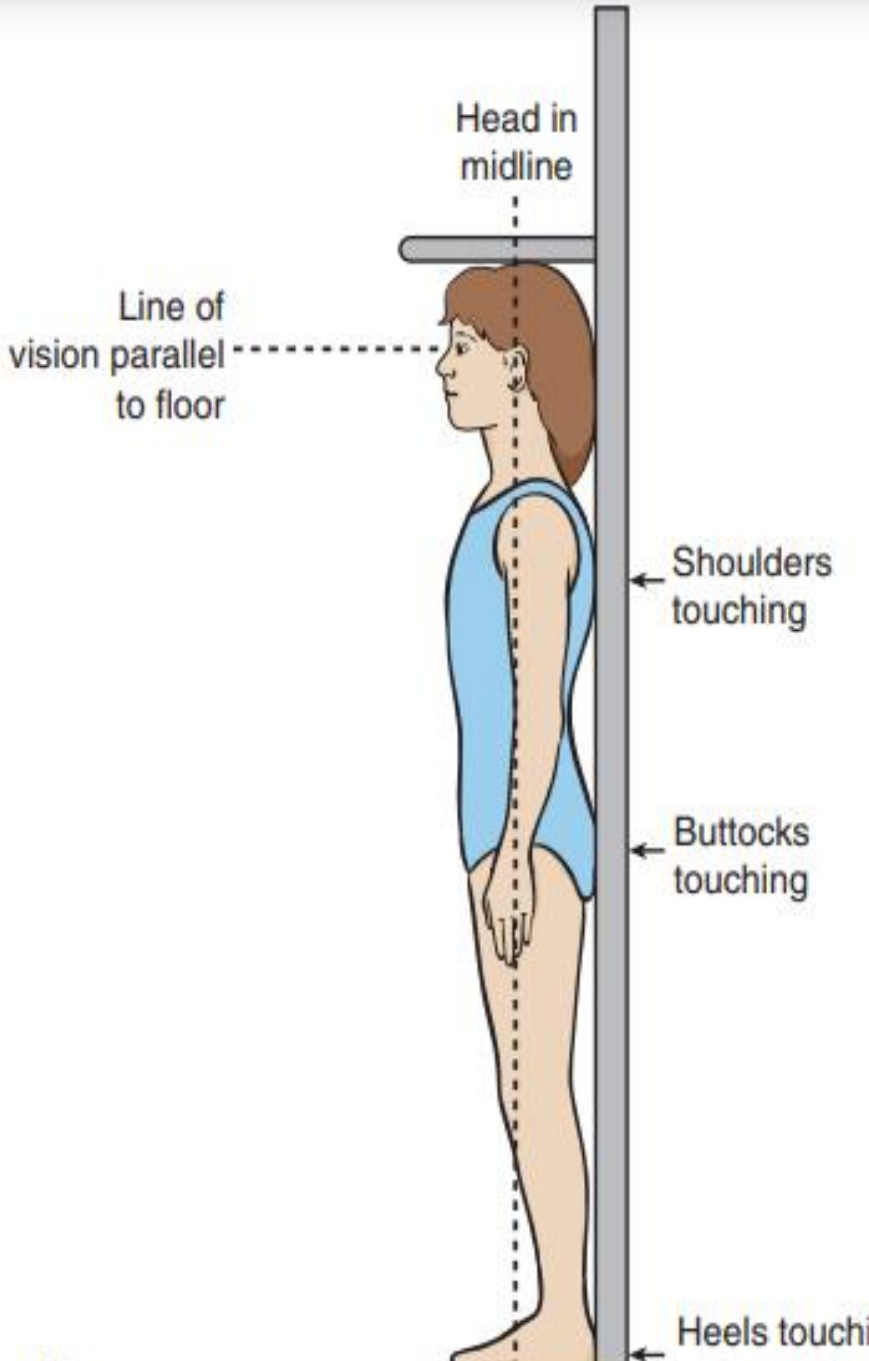
The average length of newborns is 48 to 53 cm (19–21 inches)

- Length increases about 3 cm /month during the 1st 3 months of age,
- then it increases 2 cm /month at age of 4-6 months,
- Then, at 7 – 12 months, it increases 1 ½ cm per month

Height

The term height (or stature) refers to the measurement taken when a child is standing upright. Measure height by having the child, with the

- shoes removed,
- stand as tall and straight as possible
- head in midline and the line of vision parallel to the floor.
- child’s back is to the wall or other vertical flat surface
- heels, buttocks, and back of the shoulders touching the wall


Head in midline
Line of vision parallel to floor
Shoulders touching
Buttocks touching
Heels touching

weight

- Measurement with taken when an appropriately sized bean balance scale .
- weight range at birth (2.5 kgm- 4kgm)
- low birth 2kgm ----under weight
- Over birth 4kgm ----over weight

weight

- should be measured soon after birth because weight loss occurs fairly rapidly. Normally, neonates lose about 10% of their birth weight by 3 to 4 days of age because of loss of extracellular fluid and meconium, as well as limited food intake, especially in breastfed infants. Birth weight is usually regained by the tenth to fourteenth day of life.

Measure Head Circumference

- Head circumference is generally measured on infants and children until the age of 3 years. Measure head circumference over the largest circumference of the head, namely the most prominent part on the back of the head (occiput) and just above the eyebrows

Head Circumference

- Normal measurement: 33 to 35 cm (13 to14 inches).

- In some cases of normal deliver head circumference (HC) reduce immediately after birth but it will be return to normal size after two to three days.

Head Circumference

- We should note the following changes in the head circumference:
- At birth HC may be equal or greater than Chest Circumference CC due to molding
- After 2 to 3 days HC is greater than CC by 2 to 3 cm. After six months HC is equal CC.
- After one year HC is less than CC

Abnormal Findings

- HC less than 32 cm is indicative of Microcephaly
- HC is 37cm and grater than CC is indicative of neurologic involvement such as Hydrocephalus

Fontanels, also known as soft spots, are spaces located at the areas where skull bones meet.

Anterior Fontanel – located at the junction of the two parieted bones and front bones. It is diamond shape about 3cm long and 2-3 cm wide.

It closes at 12 to 18 months of age

pulsations are visible at the anterior fontanel.

Posterior Fontanel – located at the conjunction of the parietal and occipital bones.

Measures about 0.5 to 1 cm in length.

Begins to close at 2 months of the age.

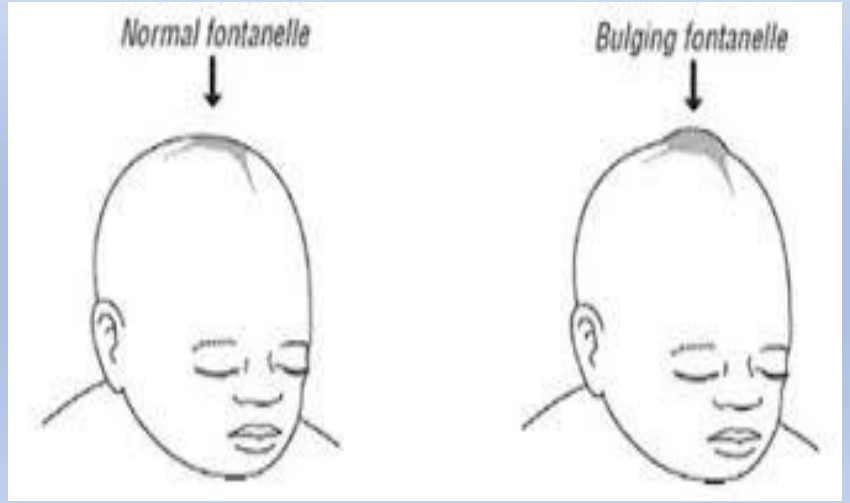
Fontanels are usually soft , flat and firm

Abnormal Findings

Bulging fontanel – indicate increased intracranial pressure.

Sunken fontanel – indicate as sign of dehydration.

Very large fontanel – may indicate hypothyroidism



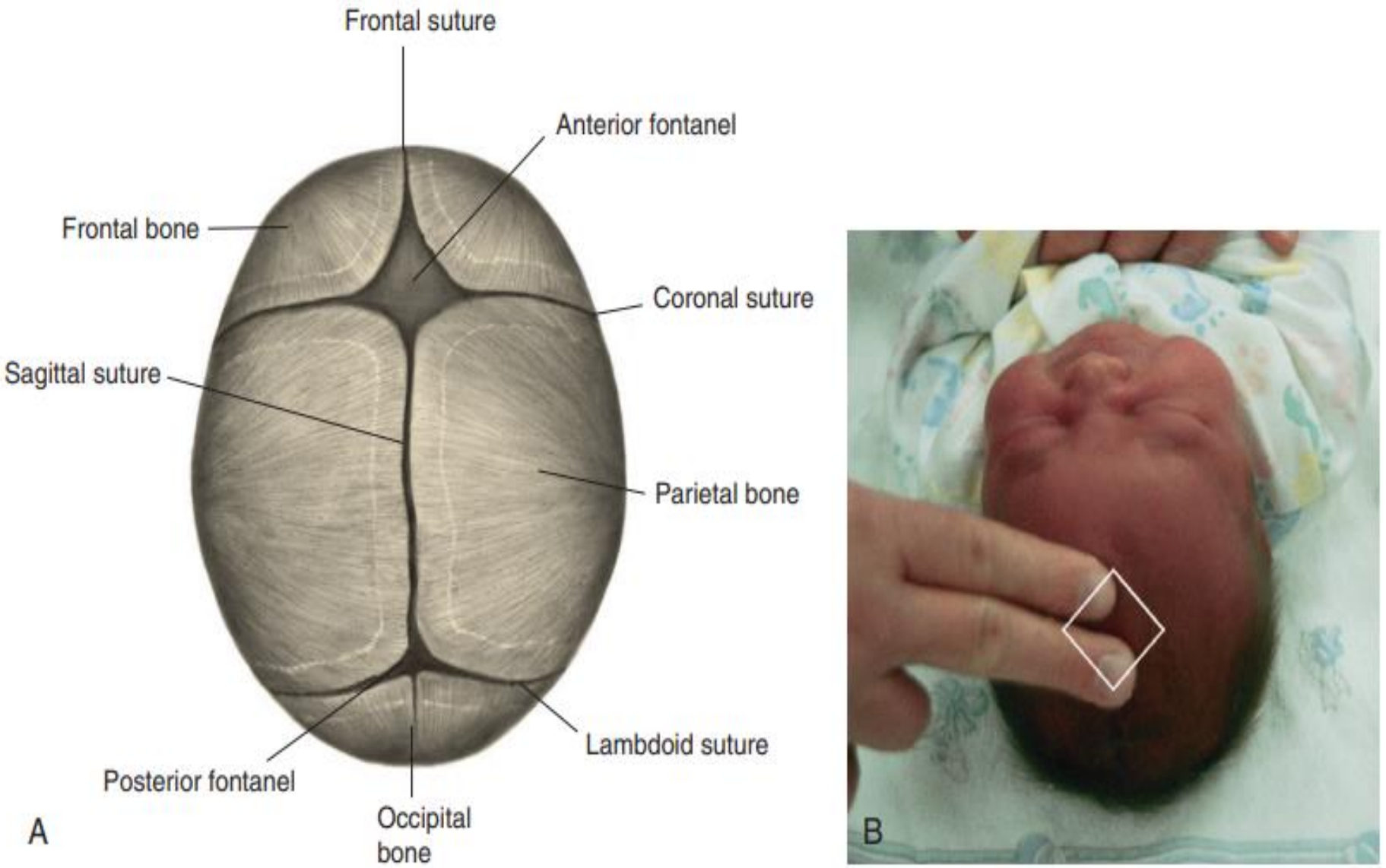


FIG 8-6 **A,** Location of sutures and fontanels. **B,** Palpating the anterior fontanel.

Chest Circumference

- Normal CC range from 30.5 to 33 cm (12 to 13 inches)

- The CC is measured at the level of the nipple using a tape measure

Abnormal Findings

- The CC less than 30 cm indicates prematurity.
- An enlarged heart may make the left side of the chest larger

Abdominal Circumference

Abdominal Circumference (AC) is approximately the same as chest circumference.

it is measured just above the level of the umbilicus

Abnormal Findings

- AC is not routinely measured unless there is a suspicion of abdominal distention due to obstruction in the gastrointestinal tract

body mass index (B.M index)

- Used for measured the growth of the body in health status of the child and development .
- Body mass index = weight for kg / height for meter square
- B.M index = wt. kg / Ht. M

Normal value of BMI for children

Table 1. Body mass index (BMI) threshold values

BMI (kg/m^2)	Weight Classification	Obesity Classification	Relative Risk of Disease
< 18.5	Underweight		
18.5 – 24.9	Normal		
25.0 – 29.9	Overweight		Increased
30.0 – 34.9	Obese	Obesity Class I	High
35.0 – 39.9	Obese	Obesity Class II	Very high
≥ 40.0	Extremely obese	Obesity Class III	Extremely high

TEMPERATURE

Average newborn temperature is 37.2 C

- Heat regulation is the important task in the newborn nursing care they are easy to loss body temperature due to immaturity of temperature regulating system, little amount of subcutaneous fatty tissue and large body surface.

Method of Temperature Assessment

The method of choice when obtaining the temperature of the children below 6 years old is the axillary because it is safer and

more accessible.

The nurse should put the thermometer in

the axilla for 5 minutes

RESPIRATORY RATE

Range from 30 to 60 breaths per minute

Respiratory rate (RR) shows down during the infancy period.

The nurse need to check the abdominal and the diaphragmatic area the chest and abdomen should rise at the same time during the infancy period

HEART RATE

Full term infants have heart rate that ranges from 120 to 150 bpm.

Heartbeat in newborn is often irregular.

Nurse need to take apical pulse and respiration while the child sleeping to obtain accurate result.

Pediatric Vital Signs – Normal Ranges

Infant	Toddler	School-Age	Adolescent
Heart Rate			
80-150	70-110	60-110	60-100
Respiratory Rate			
24-38	22-30	14-22	12-22
Systolic blood pressure			
65-100	90-105	90-120	110-125
Diastolic blood pressure			
45 - 65	55-70	60-75	65-85

HAVE A NICE DAY