

GROWTH CHARTS & ANTHROPOMETRIC ASSESSMENT

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Anthropometric assessment of infants

- Infant: a child from birth to one year of age is termed as an infant.
- Anthropometry: It is the scientific study of measurement and proportions of human body.

Anthropometric assessment of infants

- Weight
- Length
- Head circumference
- Chest circumference
- Mid arm circumference

Why is anthropometry important?

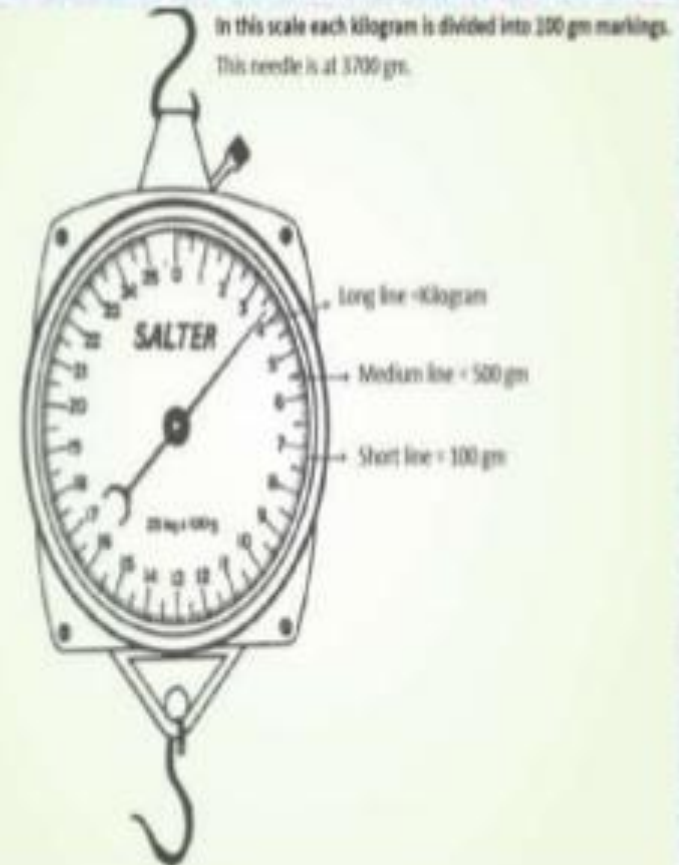
- Growth monitoring
- Nutritional assessment

Weight

- Beam or electronic balance



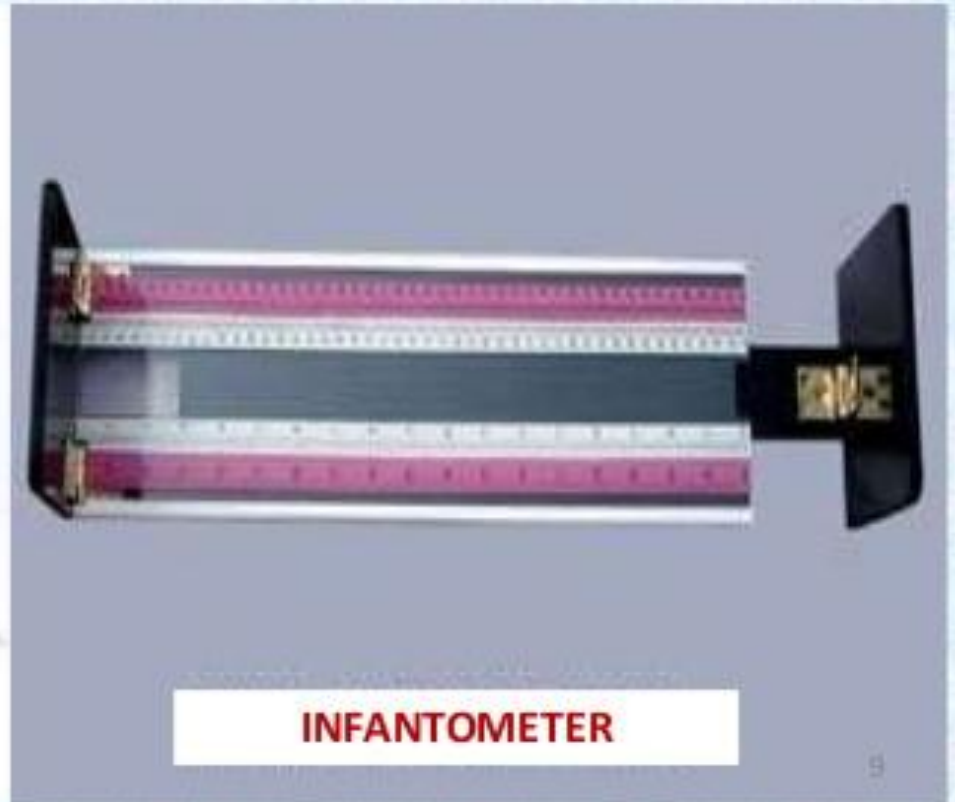
Salter's spring scale



Weight

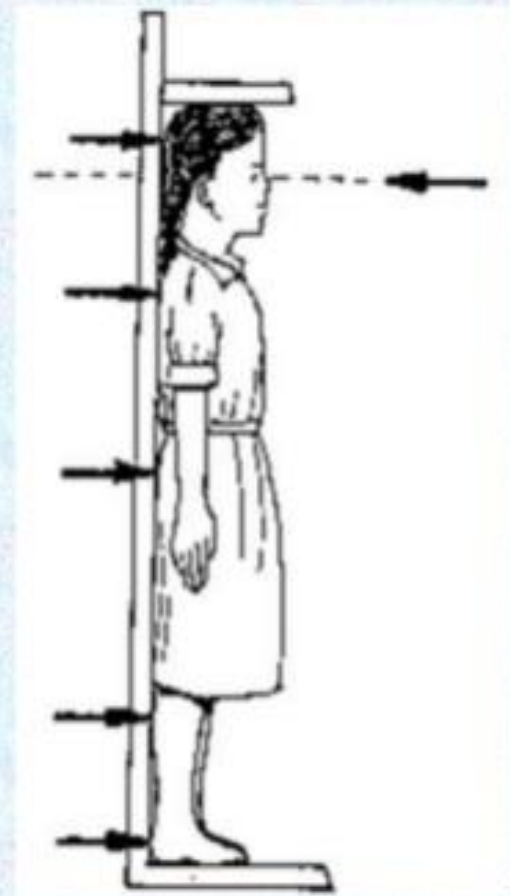
- Avg. birth weight-2.5-4 kg
- 25 gm/day till 3rd month
- 400 gm/month till 1 year.
- Weight doubles by 5 months
- Triples by the age of 1 year.

Length



Height

- Stadiometer or simply against the wall



Length/height

- Avg. height at birth is 50-55 cm
- At 1 year of age -75 cm
- The gain in length is 25 cm

Head circumference



Head circumference

- Non stretchable measuring tape
- Maximum circumference of head from the occipital protuberance to the supraorbital ridges on the forehead is measured.
- Reflects growth of brain.

Head circumference

- At birth-33-35 cm
- Increases by 2 cm/month for first 3 months
- 1 cm/month for next 3 months
- 0.5 cm/month for next 6 months
- Increases by 12 cm in infancy.

Chest circumference

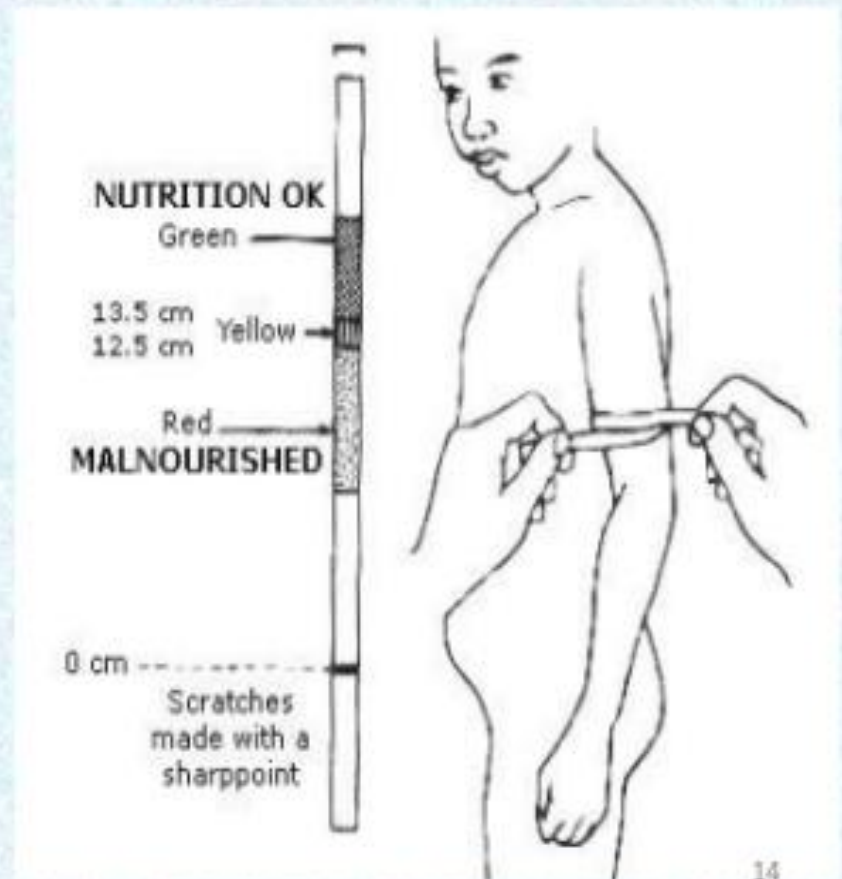
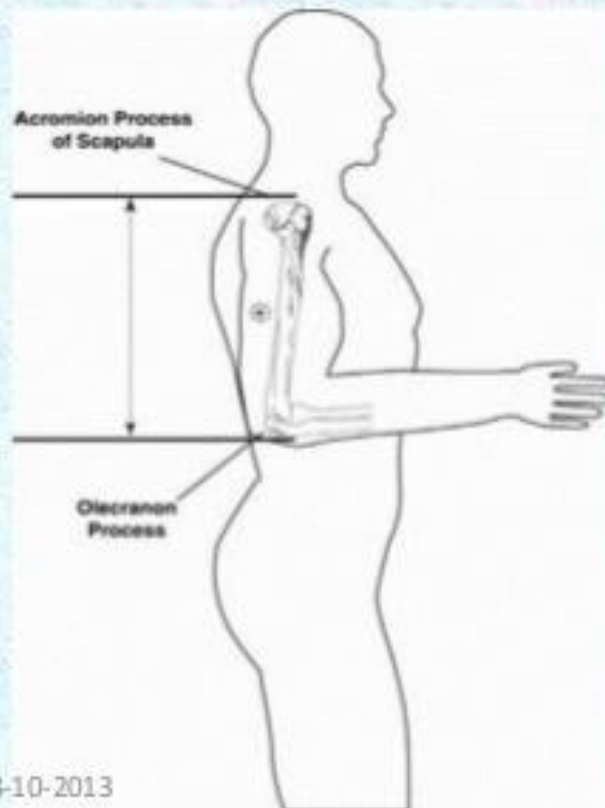


Chest circumference

- Non stretchable measuring tape
- At the level of the nipples midway between inspiration and expiration.
- At birth-2 cm less than Head circumference.
- Becomes equal at 1 year of age.
- Thereafter it exceeds the Head circumference.

Mid-arm circumference

- Mid-point between acromion process and olecranon process



Mid arm circumference

- Used to diagnose malnutrition in children.
- Normally it is > 12.5 cm
- Value < 11.5 cm is suggestive of severe acute malnutrition.

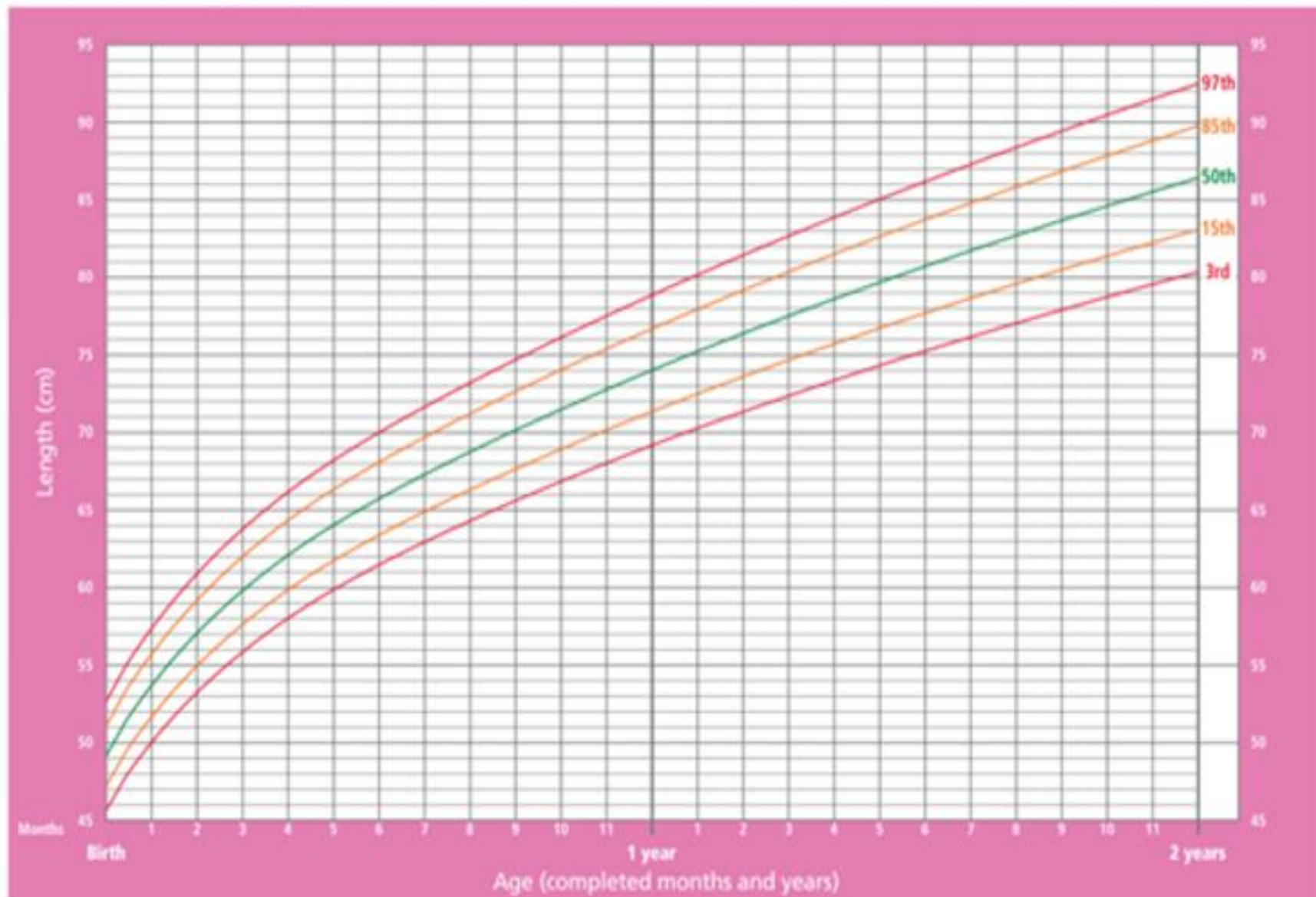
Interpretation of Growth charts

- **Growth:** A net increase in the size or mass of tissues.
- It is continues and orderly process which starts from conception and continues till adulthood.

- **Growth chart:** It is a tool used to graphically record anthropometric measurements in children over a period of time.
- Used to **monitor growth** and **nutritional status** of child.

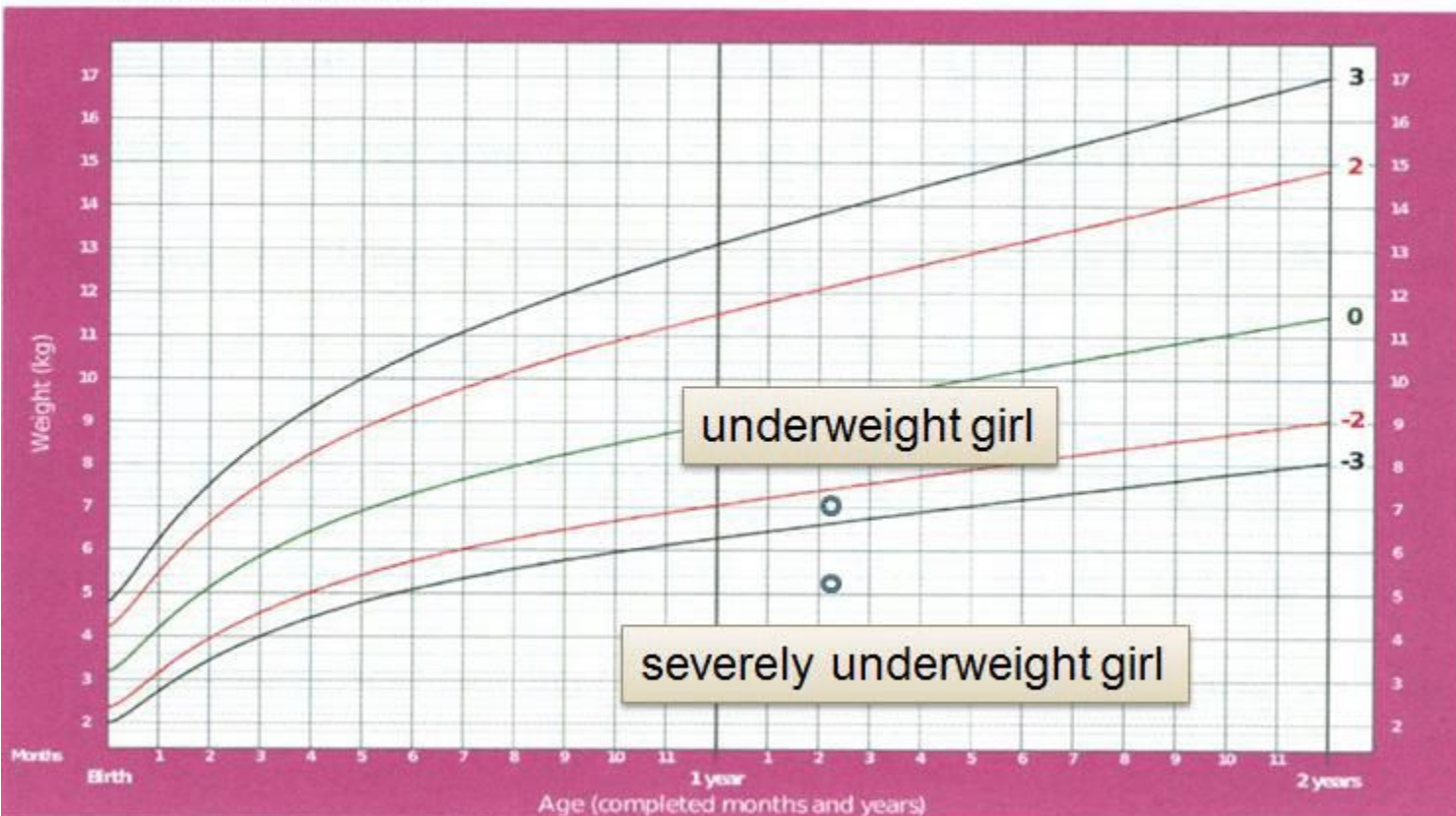
Length-for-age GIRLS

Birth to 2 years (percentiles)



Weight-for-age GIRLS

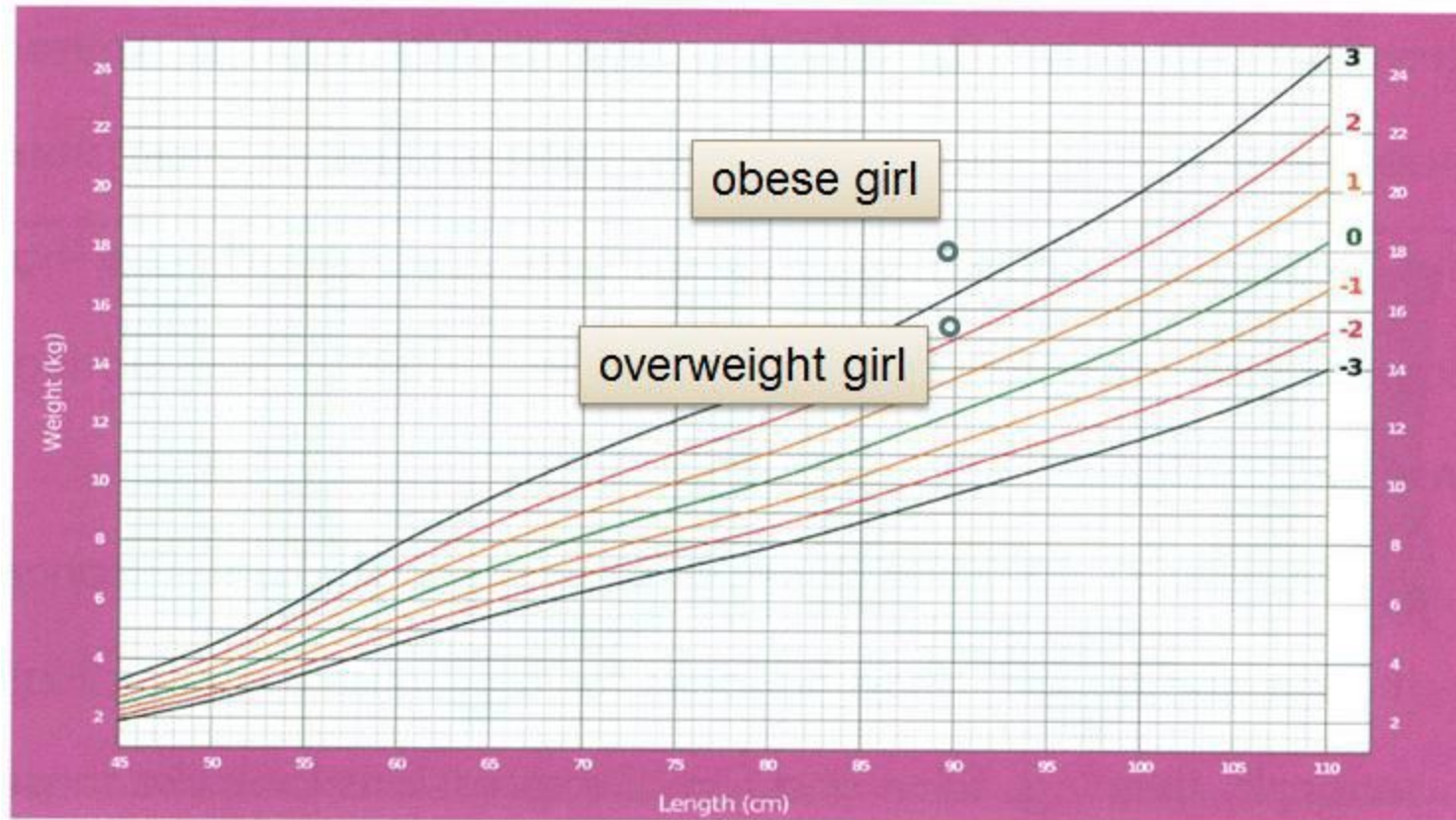
Birth to 2 years (z-scores)



WHO Child Growth Standards

Weight-for-length GIRLS

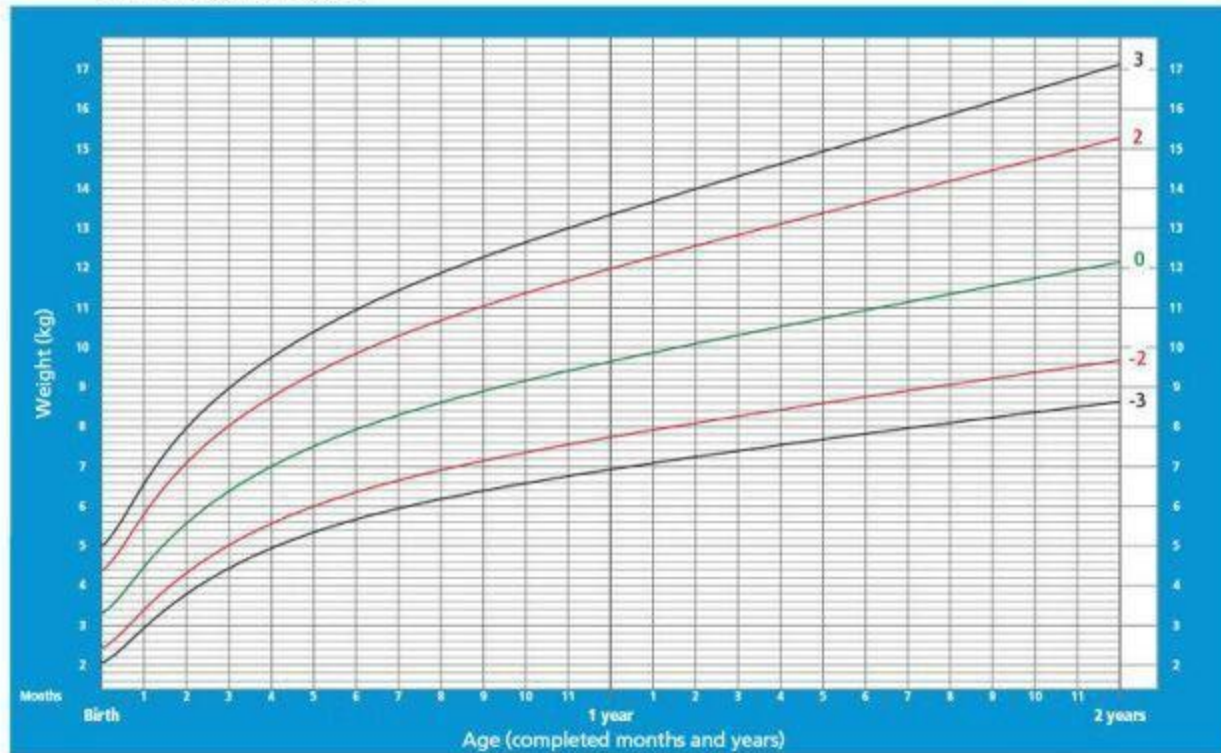
Birth to 2 years (z-scores)



WHO Child Growth Standards

Weight-for-age BOYS

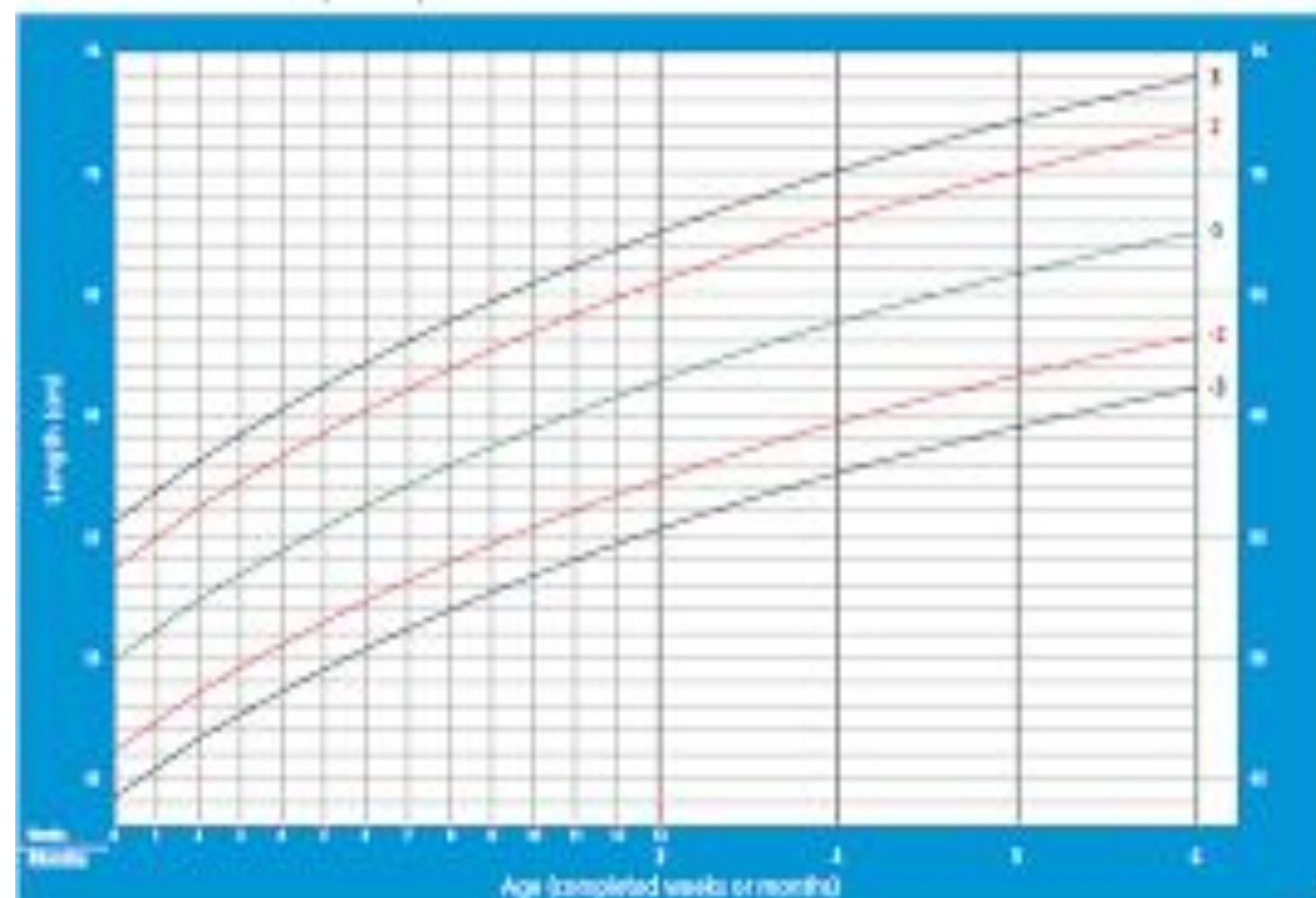
Birth to 2 years (z-scores)



WHO Child Growth Standards

Length-for-age BOYS

Birth to 6 months (z-scores)



WHO Child Growth Standards

- **Percentile curves-** frequency distribution curves
- Standard growth chart has 7 percentile lines-
- 3rd, 10th, 25th, 50th, 75th, 90th, 97th, percentiles.
- **Normal range-values** between 3rd and 97th percentile curves.

Z score	Exact percentile	Rounded percentile
0	50	50
-1	15.9	15
-2	2.3	3
-3	0.1	1
1	84.1	85
2	97.7	97
3	99.9	99

- Growth monitoring is done in all children during vaccination visits i.e. at the age of 1.5 months, 2.5 months, 3.5 months, 6 months and 9 months of age.

Interpretation of different indicators

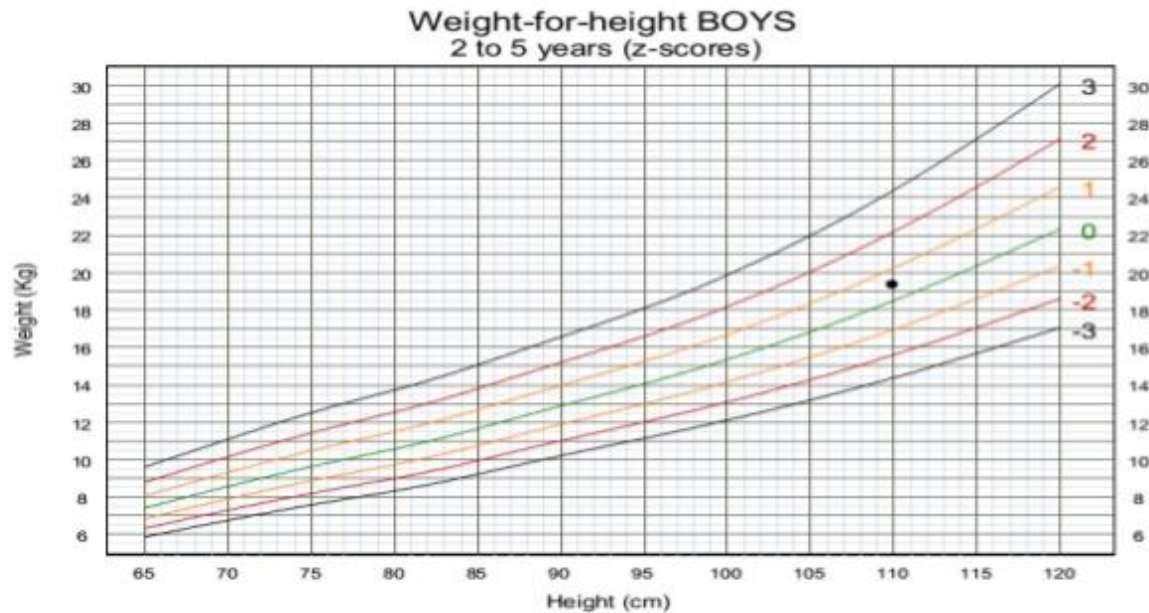
Indicator	Acute Malnutrition	Chronic Malnutrition
Wt-for-age		
Ht-for-Age	Normal	
Wt-for-Ht		Normal

Various indices and cut-off points for defining malnutrition

Indices	Indicators for malnutrition	Cut-off points for defining malnutrition		
		Percentile of ref- erence median	% of refer- ence median	Z or SD from ref- erence median #
Wt-for-ht	Wasting	< 3rd	< 80%	< - 2
Ht-for-age	Stunting	< 3rd	< 90%	< - 2
Wt-for-age	Underweight	< 3rd	< 80%	< -2

“Moderate” malnutrition classified as the percent falling between – 2 to – 3 SD and
“severe” as the percent falls below – 3 SD from the reference median

Example 1



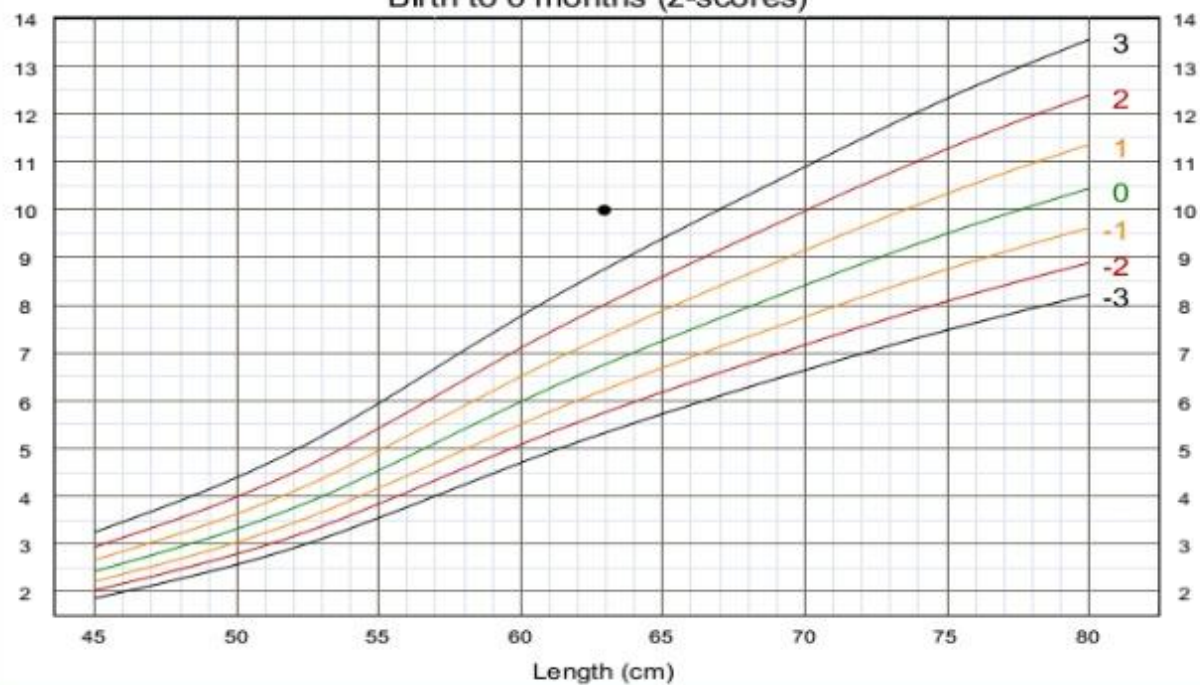
Interpretation – A boy Aged 3 years and 11 months. He weighs 19.5 kg and is 109.6 cm tall. His weight-for-age is above the 1 z-score line, and his height-for-age is above the 1 z-score line. His weight-for-height, shown on the chart, is in the normal range.

Normal weight boy
3 years, 11 months
109.6 cm, 19.5 kg



Example 2

Weight-for-length BOYS
Birth to 6 months (z-scores)



**Obese boy
3 1/2 months,
63 cm, 10 kg**

