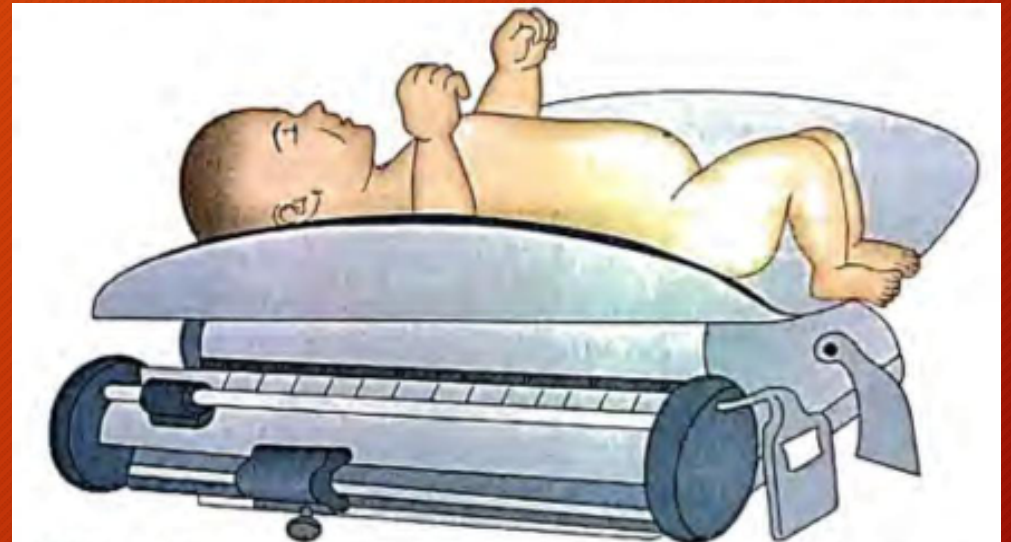


# GROWTH & NUTRITIONAL ASSESSMENT IN CHILDREN

ANTHROPOMETRIC INDICES & THEIR INTERPRETATION

# WEIGHT

- Nude (newborns), minimal light clothing, no footwear
- Recorded accurately on a lever or electronic weighing scale
- Placed in the middle of weighing pan
- Avg birth wt 3kg
- @3yrs-wt is about 5 times birth weight



**Fig. 2.4:** Beam scale for accurate measurement of weight. The child should be nude or in minimal clothing

# UNDERWEIGHT

## WEIGHT FOR AGE

$$=(x+9)/2 \quad (\text{upto } 1 \text{ yr})$$

$$=2x+8 \quad (1-5\text{yr})$$

$$=(7x-5)/2 \quad >5\text{yr}$$

- Low weight for age
- An underweight child could be wasted or stunted or both

Nutritional Status	Weight / Age
Normal	>80%
Grade I	70-80%
Grade II	60-70%
Grade III	50-60%
Total	

# LENGTH

## LENGTH

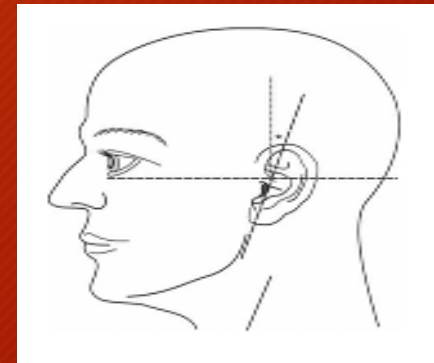
- For children < 2yr
- Supine on infantometer or rigid measuring table
- Fix the head, legs straightened, feet perpendicular to legs, toes pointing upward. Free footboard brought into firm contact with the feet
- 50 cm @ birth,



**Fig. 2.6:** Measurement of length on an infantometer. Note how the knees are gently straightened while the head and feet are aligned

# HEIGHT

- Upright, heels slightly separated, weight borne evenly on both feet.
- Stadiometer
- Head is so positioned that child looks directly forward with Frankfurt plane
- gains 6cm every year until 12 ,after that acc to puberty.



# STUNTING

- Low height for age
- indicates chronic undernutrition

$$\text{HEIGHT FOR AGE} = 6x + 77$$

	<u>N</u>	<u>Mild</u>	<u>Mod</u>	<u>Severe</u>
<u>Ht-for-Age%</u>	>95	90-95	80-90	<80
<u>Wt-for-Ht%</u>	>90	80-89	70-79	<70

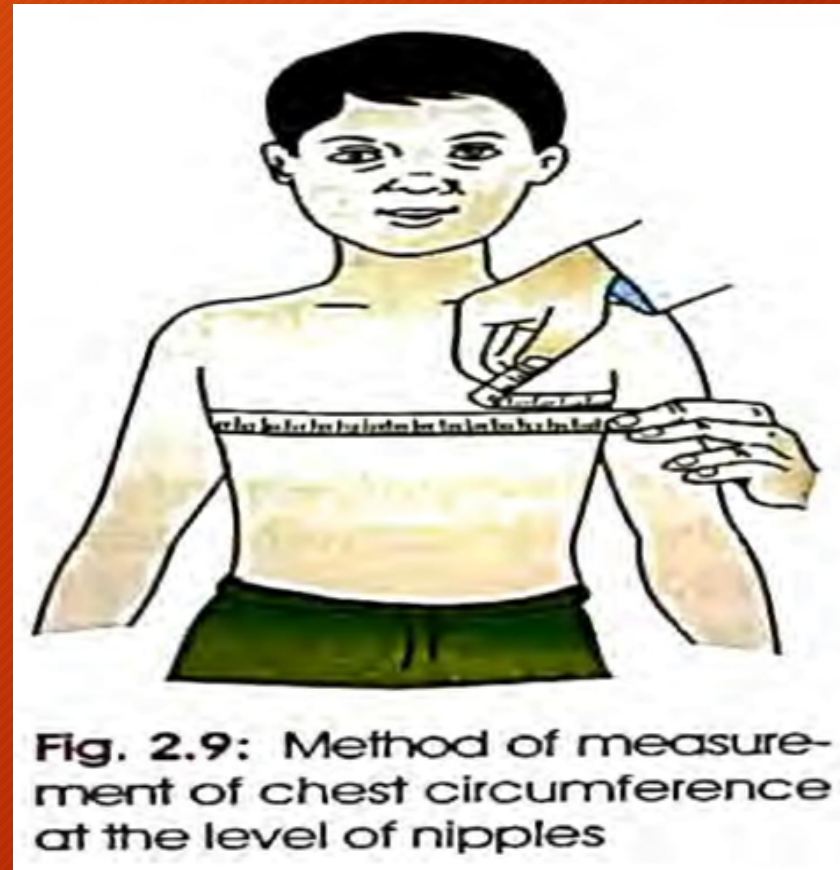
# HEAD CIRCUMFERENCE

- Maximum circumference of head from occipital protuberance to supraorbital ridges
- Nonstretchable tape



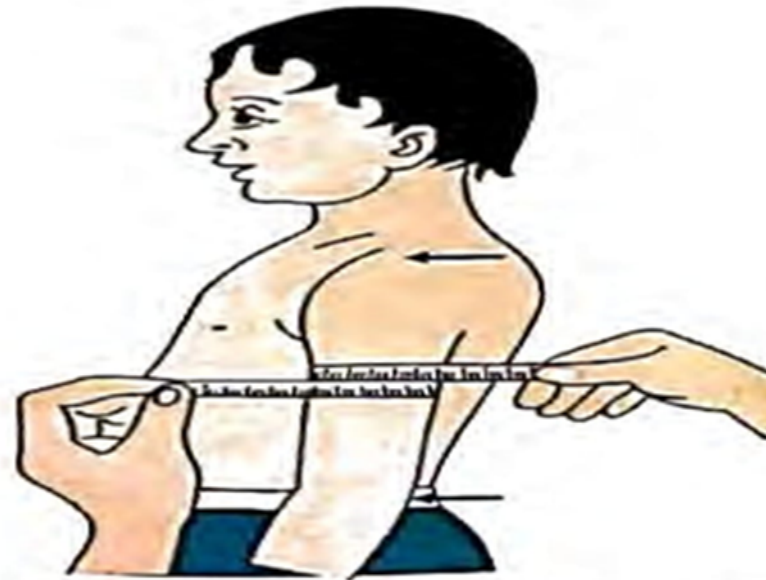
# CHEST CIRCUMFERENCE

- @level of nipples, midway btw inspiration and expiration
- $3\text{cm} <$  head circumference @birth
- equal @1
- After that ,chest>head



# MUAC

- Midway btw acromion & olecranon



**Fig. 2.10:** Measurement of mid-upper arm circumference. Note how the anatomical landmarks are first located (arrows) to accurately measure the circumference

**Table 2.3: Approximate anthropometric values by age**

<i>Age</i>	<i>Weight (kg)</i>	<i>Length or height (cm)</i>	<i>Head circumference (cm)</i>
Birth	3	50	34
6 months	6 (doubles)	65	43
1 year	9 (triples)	75	46
2 years	12 (quadruples)	90	48
3 years	15	95	49
4 years	16	100	50

# WASTING

- Low weight for height
- Thin appearance
- Acute undernutrition, diarrhea

# UNDERNUTRITION

- Result from inadequate consumption, poor accretion, excessive loss of nutrients
- 3 subgroups-underweight, stunting, wasting

**Table 7.8: Classification of undernutrition**

<i>Classification</i>	<i>Criteria</i>	<i>As per WHO growth standards</i>	<i>Sub-classification</i>	<i>As per WHO Reference Standards</i>
Underweight	Low-weight-for-age	<i>Weight-for-age</i> less than minus 2 SD ( $<-2$ SD)	Moderate underweight	<i>Weight-for-age</i> below minus 2 SD and up to minus 3 SD ( $<-2$ SD to $-3$ SD)
Stunting	Low-height* (or length) for-age	<i>Height*-for-age</i> less than minus 2 SD ( $<-2$ SD)	Severe underweight	<i>Weight-for-age</i> minus 3 SD ( $<-3$ SD)
			Moderate stunting	<i>Height*-for-age</i> below minus 2 SD and up to minus 3 SD ( $<-2$ SD to $-3$ SD)
Wasting	Low-weight-for-height	<i>Weight-for-height</i> less than minus 2 SD ( $<-2$ SD)	Severe stunting	<i>Height*-for-age</i> below minus 3 SD ( $<-3$ SD)
			Moderate wasting	<i>Weight-for-height</i> below minus 2 SD and up to minus 3 SD ( $<-2$ SD to $-3$ SD)
			Severe wasting	<i>Weight-for-height</i> below minus 3 SD ( $<-3$ SD)

\*'Length' in the first two years of life

SD: Standard deviation