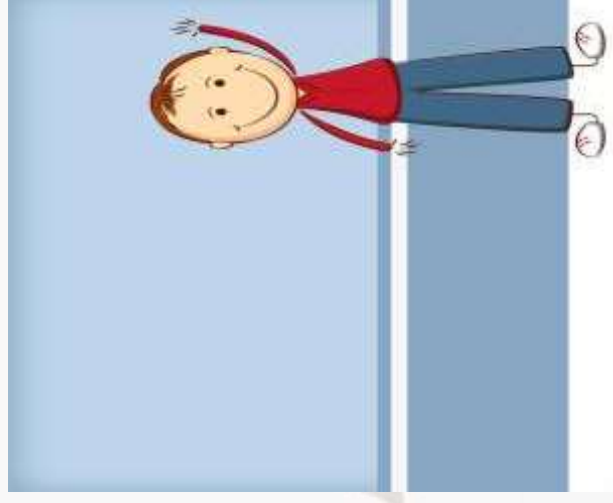


# ANTHROPOMETRIC MEASUREMENT



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## Anthropometry: Introduction

- Anthropos - "man" and Metron "measurement"
- A branch of anthropology that involves the quantitative measurement of the human body.
- It is the single most portable, universally applicable, inexpensive and non-invasive technique for assessing the size, proportions and composition of the human body.
- It is used to evaluate both under & over nutrition.
- The measured values reflects the current nutritional status & don't differentiate between acute & chronic changes

## Parameters of anthropometry

### Age dependent factors:-

- a) Weight
- b) Height
- c) Head circumference
- d) Chest circumference

### Age independent factors:-

- a) Mid-arm circumference (1-5 years)
- b) Weight for height
- c) Skinfold thickness
- d) Mid upper arm/height ratio

## Weight

- The measurement of weight is most reliable criteria of assessment of health and nutritional status of children.

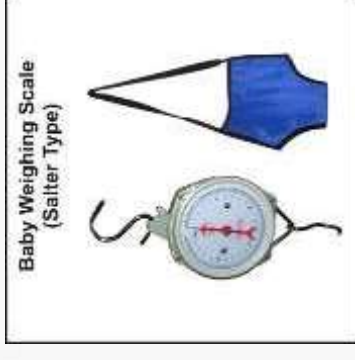
•The weight can be recorded using a :

Beam type weighing balance

Electronic weighing scales for infants and children

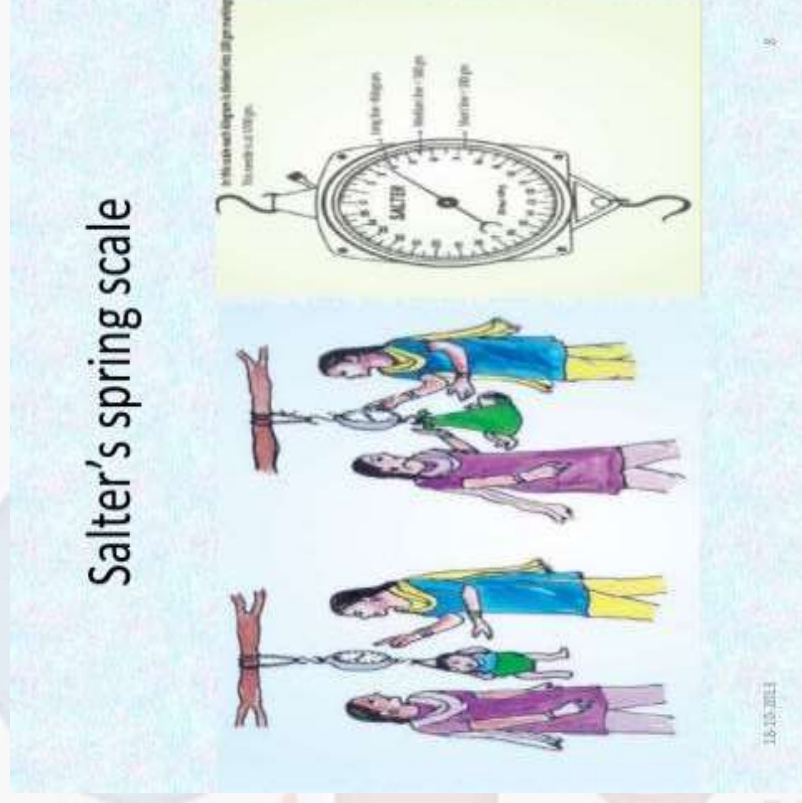
Bathroom type of mechanical scale (very unreliable)

Salter spring machine (in field conditions)





Salter spring scale is used in community



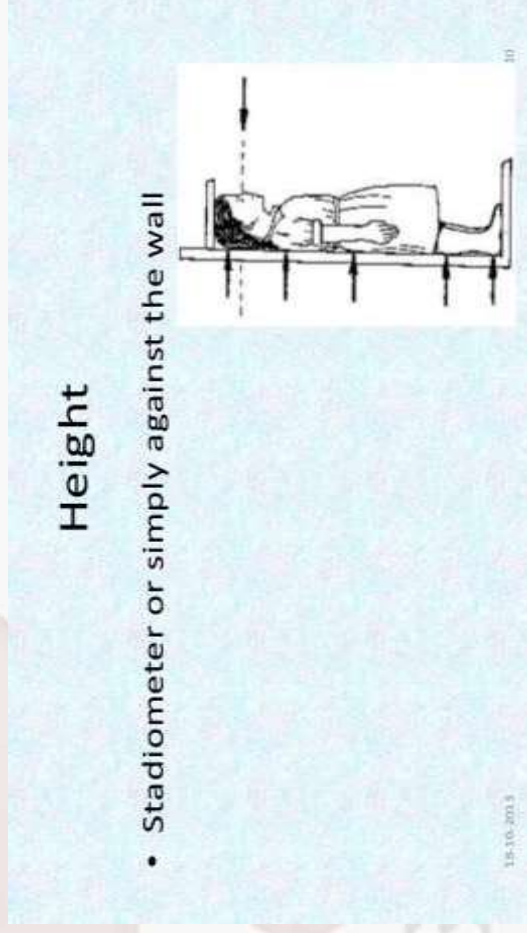
## Length


It is measured with the help of Infantometer.



## Height

It is measured with the help of stadiometer





A.0-4 months	1.0kg/month(30g/day)
5-8 months	0.75kg/month(20gm/day)
9-12 months	0.50kg/month(15g/day)
1-3 years	2.25kg/yr
4-9 years	2.75 kg/yr
10-18 years	5.0-6.0kg/yr (0.5kg/month)

B. Weight at 4-5 months	2 x birth weight
Weight at 1 year	3 x birth weight
Weight at 2 years	4 x birth weight
Weight at 7 years	7 x birth weight

## FORMULAS TO CALCULATE EXPECTED WEIGHT

- a) Up to 12 months
  - Expected weight (kg) =  $(\text{age in month} + 9) / 2$
  
- B) 1-6 Years
  - Expected weight (kg) =  $2 \times (\text{Age in years} + 5)$
  
- c) 5- 14 years
  - Expected weight (kg) =  $4 \times \text{age in years}$



## Classification of Malnutrition by Indian Academy of Pediatrics

Weight for age *	Grade of malnutrition
>80 %	Normal
71-80%	Grade 1 (Mild)
61-70%	Grade 2 (Moderate)
51-60%	Grade 3 (Severe)
<50%	Grade 4 (very severe)

## Question??

% = actual wt of baby in kg

$$\text{-----} * 100 = \%$$

Normal wt of baby according to age

8 month = 8.5 kg

- Actual wt 7.5

Age of baby is 6 month = 6 kg actual wt

Expected wt of baby at 6 month =  $(\text{age in month} + 9) / 2$   $(6 + 9) / 2 = 7.5$  kg

7.5

$$\text{-----} * 100 = 88.2\%$$

8.5

## Length or Height/Stature Measurement Technique

- Upto 2 years of age Recumbent Length is measured with the help of an Infantometer .
- **Normal length of new born baby =48-53 cm**
- In older children Standing Height or Stature is recorded. It is convenient to use an Inbuilt Stadiometer affixed on the wall which provides a direct read out of height with an accuracy of +/- 0.1cm.



# Height Velocity

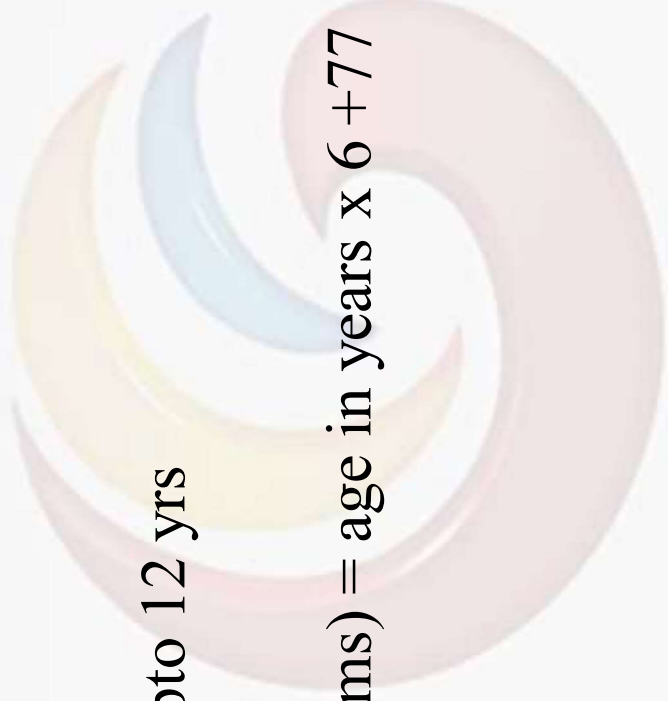
AGE	Approximate rate of increase in stature
Birth to 3 months	3.5cm/month
3 – 6 months	2.0cm/month
6 – 9 months	1.5cm/month
9 – 12 months	1.3cm/month
2 – 5 years	6 – 8cm/year
5 – 12 years	5cm/year

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B] Expected height upto 12 yrs

length or height (in cms) = age in years x 6 +77 ( wheelch's formula )



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# Expected head circumference in children

Age	Head circumference (cm)
At birth	33-35
2 months	38
3 months	40
4 months	41
6 months	42 - 43
1 year	45 - 46
2 years	47 - 48
5 years	50 - 51

## Head Circumference Growth Velocity

Till 3 months	2 cm/month
3 months – 1 year	2cm/3 month
1 – 3 year	1cm/ 6 month
3 – 5 year	1cm/ year



During first year there is 12 cm increase in head circumference , while 1 – 5 year age , only 5 cm gain occur in head size.

## Relationship between head size with Chest Circumference:

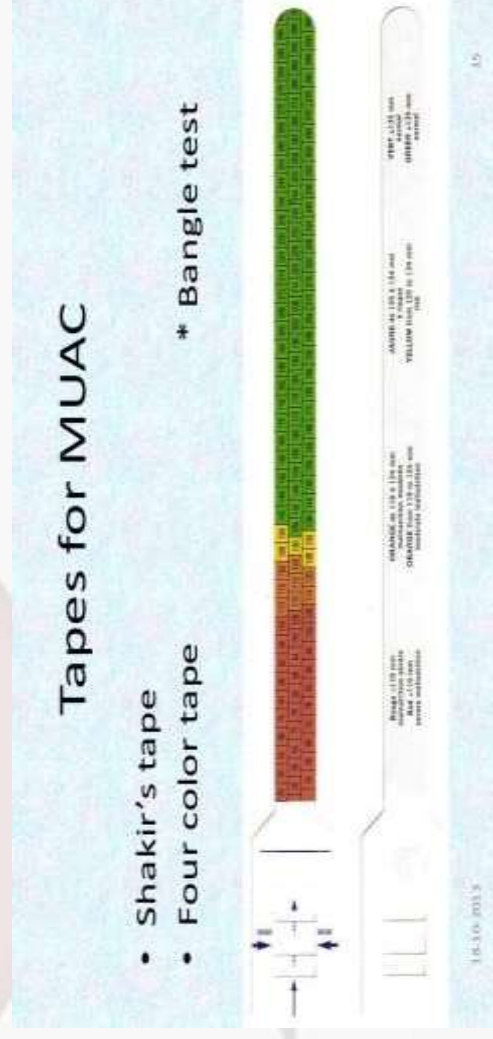
- **At birth:** head circumference > chest circumference by upto 3 cms.
- At around **9 months to 1 year** of age: head circumference = chest circumference,
- but **thereafter** chest grows more rapidly compared to the brain.





## MID-UPPER ARM CIRCUMFERENCE

- During 1-5 Yrs of age it remains reasonably static between 15-17cms among healthy children .
- It is conventionally measured over the left upper arm , at a point marked midway between acromion (shoulder) and olecranon (elbow) with arm bent at right angle.



## **REFERENCES**

1. Parul dutta , Text book of Pediatric Nursing , 4<sup>th</sup> Edition , Page no : 56-58



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Thank you



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