GROWTH MONITORING

DR JP,ASST PROF,ICH,MCH,KOTTAYAM

- Growth Monitoring is a screening tool to diagnose nutritional, chronic systemic and endocrinedisease at an early stage. It has been suggested that growth monitoring has the potential for significant impact on mortality even in the absence of nutrition supplementation or education
- Monitoring the growth of a child requires taking the same measurements at regular intervals,approximately at the same time of the day, and seeing how they change. A single measurement only indicates the child's size at that moment. Currently, the Government policies for growth monitoring focus on children less than 5 years of age.
- Growth monitoring is one of the basic activities of the under 5 clinics where the child is weighed periodically at monthly intervals during the 1st year, every 2 months during the 2nd year and every 3 months thereafter up to the age of 5 to 6 years(5). Growth monitoring is viewed in most programs as an activityfor weighing children regularly and plotting weight on growth charts to identify undernutrition (mostly severe Protein Energy Malnutrition) for feeding programs or to provide data on nutritional status(6).There are no national policies for growth monitoring beyond the age of 6 years. Growth monitoring differs greatly among pediatricians and often is not based on evidence. Hence, the Indian Academy of Pediatrics has made these consensus guidelines for growth monitoring as per IAP Action Plan 2006

1. Aims and Rationale

Primary aims

- To identify children with growth deviation *i.e*., undernutrition and over nutrition and to identifydiseases and conditions that manifest throughabnormal growth.*Secondary aims*1. To discuss health promotion related to feeding,hygiene, immunization and other aspects of thechild's health and behavior; education of parentsto allay their anxiety about their child's growth.
- 2. To sensitize pediatricians to use growth charts.

2. Which Charts to Use?

- Although the world's children appear to follow a similar growth pattern, still there are variations dueto ethnic, geographical, and regional factors giving different rates of maturation and adult stature. Thefinal height of different ethnic groups is different, even accounting for secular trends. Thus forassessment, a national representative sample of population data are ideal as growth standards. TheIndian Council for Medical Research (ICMR) undertook a nationwide cross Sectional study during1956 and 1965 to establish Indian reference charts.The measurements were made on children of the lower socio-economic class and hence cannot be used as a reference standard.
- The growth chartscompiled by Agarwal, *et al*. (7,9) are based onaffluent urban children from all major zones ofIndia measured between 1989-91. These chartsprovide information on growth from birth to 18years (unlike the new WHO standards providing data upto 5 years). Thus, in the presentcircumstances, these charts remain best optionfor growth monitoring in Indian children and arerecommended for use by the Growth MonitoringGuidelines Consensus Meeting of the IAP (*Figs.2-7)*. At the community worker level, thecontinued use of the Government charts formonitoring of weight is recommended.The group also recommends use of (*i*) distance charts (presented from 3rd to 97thcentiles) with data points taken at 6 monthlyintervals; (*ii*) velocity charts to see the rate ofgrowth at 6 monthly intervals; and (*iii*) BMIcharts to help in guiding

overweight (BMI for agemore than 85th centile) and obesity (>95thcentile) as per WHO recommendations.

3. How to Use Growth Charts

- At the first visit the child's name, date of birthand other details should be entered on the growthchart and the chart should be explained to theparents. This ensures that they are interested heights on the chart. Calculate the child's target height and plot it at 18 years and mark it with an arrow on the growth chart. This represents the child's projected height and hispresent height centile can be judged bytracing a line backward from this target heightto child's current height. The target range isproduced by plotting two points 8 cms aboveand below the target height and this representsthe 3rd and the 97th centile for that child.Taking those two points above and below thetarget height 97th and 3rd centiles areconstructed by tracing lines backwards to matchthe current age (*Fig. 1*).3. All the points on the growth chart should be marked only as dots and not circles around thedot.4. The height and weight should be recorded (and head circumference till 3 years) and plotted onthe chart. At all subsequent visits join the dot upto the previous dot.5. Remind parents of the time for the next measurement.The group recommends continued use of Tanner staging of sexual maturity rating(10). For anthropometricmeasurements standard techniques asdescribed by WHO should be adopted(11).

4. Recommended intervals and Parameters for Growth Monitoring

(i)	*Birth to 3 years:*
(ii)	Immunization contacts at birth,6, 10 and 14 weeks, 9 months, 15-18 months may be conveniently used for growth monitoring. Anadditional monitoring visit at 6 months withopportunistic monitoring at other contacts (illness) isrecommended. Normally growing babies should notbe weighed more than once per fortnight under6 months and no more than monthly thereafter, asthis increases anxiety. After 18 months measurementsare to be taken every 6 monthly.It is recommended that the height, weight andhead circumference be measured upto 3 years of age.Penile length (PL) and testicular descent hould be ascertained in the newborn period.
(iii)	*4 to 8 years:*
(iv)	*I*t is recommended that height and weight be measured 6 monthly during this period and BMI, PL and SMR should be assessed yearly from 6 years of age.

(*iii*) 9-18 years:

It is recommended that height, weight, BMI and SMR be assessed yearly during this period.

5. Criteria for referral

(*i*) *First three years*

• Length/height, weight or head circumference below 3rd percentile or above 97th percentile on growth chart.

• Crossing of two major percentile lines (upward or downward) *e.g*., going from above 75th percentile to below 50th percentile on height or weight chart.

• A child below or above mid parental range for height/length (

• Weight loss or lack of weight gain for a month in the first 6 months.

• Absence of weight gain for 2-3 months from 6-12 months of age.

• Micropenis.

• Unilateral or bilateral undescended testis.

• Ambiguous genitals.

(ii) Three to nine years

• Length/Height below 3rd percentile or above 97th percentile on growth chart.

• Crossing of two major percentile lines (upward or downward) *e.g.*, going from above 75th percentile to below 50th percentile on height or weight chart.

• A child below or above mid parental range for height (See calculation for target height range in *Fig. 1*).

• BMI over the 85th percentile at all ages.

• Rate of growth less than 5 cm/year.

• Girls with axillary, pubic hair growth or breast budding before 8 years and boys with axillary,pubic hair growth, genital growth or and testicular enlargement before 9 yearsin itand are more likely to keep it properly and bringit at each visit. The growth chart should be keptwith the parents in a plastic sleeve.2. Measure the parents and make a note of their Children with craniospinal irradiation or surgery for brain tumors.

• Micropenis.

(iii) Nine to eighteen years

• Height below 3rd percentile or above 97th percentile on growth chart.

• Crossing of two major percentile lines (upward or downward) *e.g.*, going from above 75th percentile to below 50th percentile on height or weight chart.

• A child below or above mid parental range for height (

• BMI over the 85th percentile at all ages.

• Arrest at the same stage of puberty for more than 2 years.

• Micropenis.

• Unilateral or bilateral Gynecomastia in boys Hirsuitism and Menstrual irregularities in girls.

• Delayed puberty that is girls with no breast budding by 14 years or no menarche by 15 years and boys with no signs of puberty by 16 years

Rate of growth of children is one of the finest indicators of the health of a community Growth monitoring followed by suitable action prevents illness, malnutrition and even death. It provides reassurance about child's health and prevents parental anxiety. On community and national level it helps identify children at risk of morbidity and mortality. It thus helps in implementation of national programmes for nutritional and medical interventions like supplementary feeding, foods to vulnerable group, underprivileged school children, etc. It is also a method to evaluate programs for improving child health and nutrition and can form the basis for policy making.