ENDOCRINOLOGY & DIABETES UNIT
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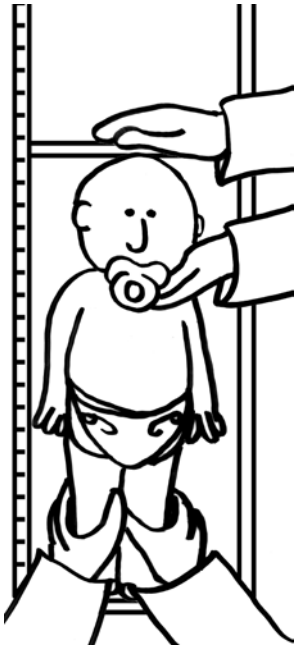
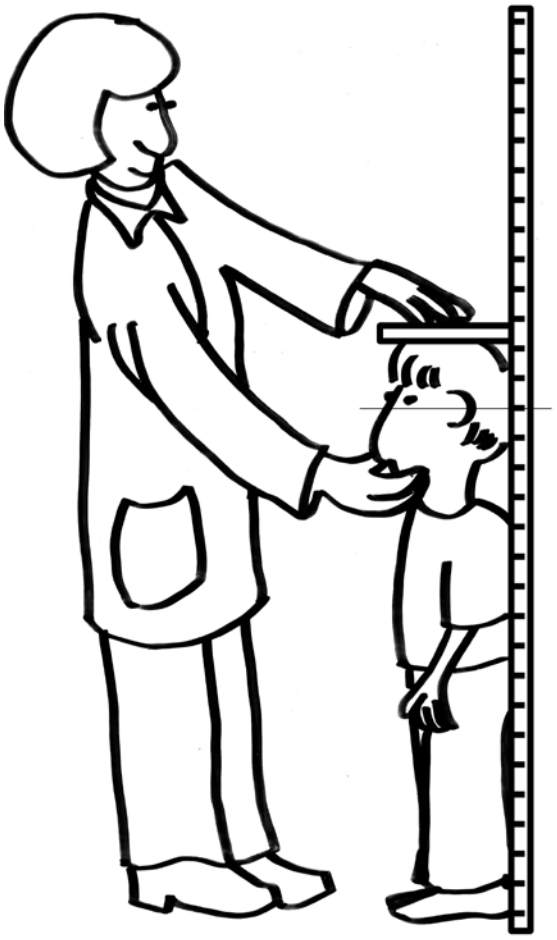
STANDARD MEASUREMENTS FOR ENDOCRINE PATIENTS

1. Parental Heights (first visit)	**Technique:** • measure both **birth** parents if possible • plot same-sex parent height on growth chart • plot father's height on female growth curve by **subtracting** 13 cm (5") from father's height • plot mother's height on male growth curve by **adding** 13 cm (5") to mother's height
2. Supine Length (every visit for children ≤3 years) 	**Technique:** • shoes and thick socks off • hold child with legs and knees straight, toes pointing upward and feet flat against the foot piece (bulky diapers may need to be removed) • gently straighten child • gently lift chin so it is perpendicular to board and eyes are facing straight forward. (*Frankfurt Plane) • calculate annual growth velocity: $\frac{\textit{height (this visit)} - \textit{height (last visit)}}{\textit{age (this visit)} - \textit{age (last visit)}}$ or $\frac{\textit{height (this visit)} - \textit{height (last visit)}}{\textit{\# of months since last visit}}$ *then* multiply by 12 • double-check all lengths • **if length or growth velocity discrepant with last visit, double-check measurement and supine stadiometer** • use brackets to document on flow sheet • between ages 30–36 months, measure supine and upright

***Frankfurt Plane**: A line drawn between the top of the ear canal and the lower margin of the left orbit (eye socket) should be parallel to the ground.

3. Standing Height
(every visit for children ≥3 years)



Technique (expected to be 1 cm less than supine length):

- shoes off
- child standing with heels, buttocks and shoulders in contact with stadiometer
- feet together
- gently straighten child
- gently lift chin so it is perpendicular to board and eyes are facing straight forward. (Frankfurt Plane)
- double-check all heights
- **if height or growth velocity discrepant with last visit, double-check measurement and stadiometer**
- calculate annual growth velocity:

$$\frac{\text{height (this visit)} - \text{height (last visit)}}{\text{age (this visit)} - \text{age (last visit)}}$$

or

$$\frac{\text{height (this visit)} - \text{height (last visit)}}{\text{\# of months since last visit}}$$

then multiply by 12

- comment on flow sheet if measurements are >18 months apart

For children unable to stand:

- measure on supine stadiometer
- use brackets to document measurement is supine on flowsheet and graph.

4. Weight
(every visit)

Technique:

- weigh child in light clothing
- plot babies <3 yrs on weight for length chart
- calculate BMI for children overweight or underweight:

$$\frac{\text{wt (in kg)}}{[\text{length (in m)}]^2}$$

- record and plot on graph

5. Head Circumference
(first visit and every visit for children ≤5 years)

Technique:

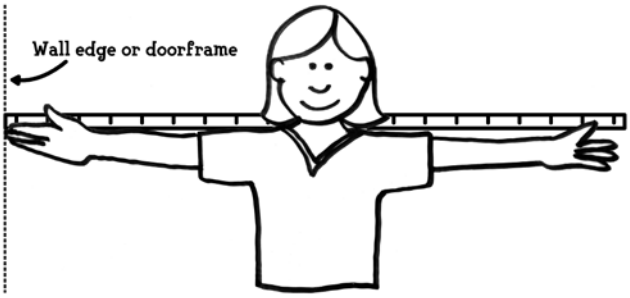
- use non-stretchable tape measure
- place tape from maximal occipital prominence around to area just above the eyebrow
- record and plot on graph

6. Sitting Height
(every visit for child with history of spinal fusion or radiation)

Technique

- have child sitting on flat topped stable stool with buttocks and shoulders against stadiometer
- feet flat on the floor if possible
- gently straighten child and hold head in Frankfurt plane
- subtract height of stool from measured height.
- Record

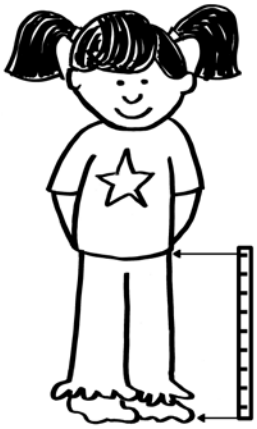
7. Arm Span
(first visit for growth patients and each visit for patients who can not be measured standing or supine)



Technique:

- have child standing erect against a wall, looking straight forward, with arms stretched parallel to the floor (palms should be facing forward)
- mark location of the ends of the middle fingers
- measure the distance between the marks
- infant arm span: measure across the back while lying in supine position.
- normal arm spans:
  - infants to toddler: AS < length
  - by age 10 (boys): AS = height
  - by age 12 (girls) AS = height
  - in puberty AS > height

8. Lower Segment
(first visit for growth patients)



Technique:

- have child standing erect looking straight forward
- measure from the crest of the pubic bone down to a point on the floor inside the right foot, in front of the heel
- upper-to-lower segment ratio:

$$\frac{\textit{length - lower segment}}{\textit{lower segment}}$$

- normal U/L segment ratios:
  - <10 years: U/L > 1.0
  - 10 years: U/L ≈ 1.0
  - >10 years: U/L < 1.0

9. Knee Height
(useful when height or armspan are not accurately measurable)

stature = [KH (cm) × 2.69] + 24.2

Technique:

- Have child sitting with the knee and ankle each bent to a 90° angle
- **With a Rosscraft sliding caliper, measure the distance from the heel to the anterior surface of the thigh over the femoral condyles**
- **The measurement should be taken twice.**
- **In children with hemiplegia or notable asymmetry, the uninvolved or less-involved side should be measured. Otherwise, the left side should be measured.**

Helpful Links:

Canadian Pediatric Society www.cps.ca/en/tools-outils/who-growth-charts

Dietitians of Canada
www.dietitians.ca/Dietitians-Views/Prenatal-and-Infant/WHO-Growth-Charts/WHO-Growth-Charts---Resources-for-Health-Professio.aspx

US Department of Health and Human Services: Maternal and Child Health Bureau
depts.washington.edu/growth/

Centers for Disease Control and Prevention www.cdc.gov/growthcharts/