

Childhood Growth Measurement



Why a focus on growth measurement?

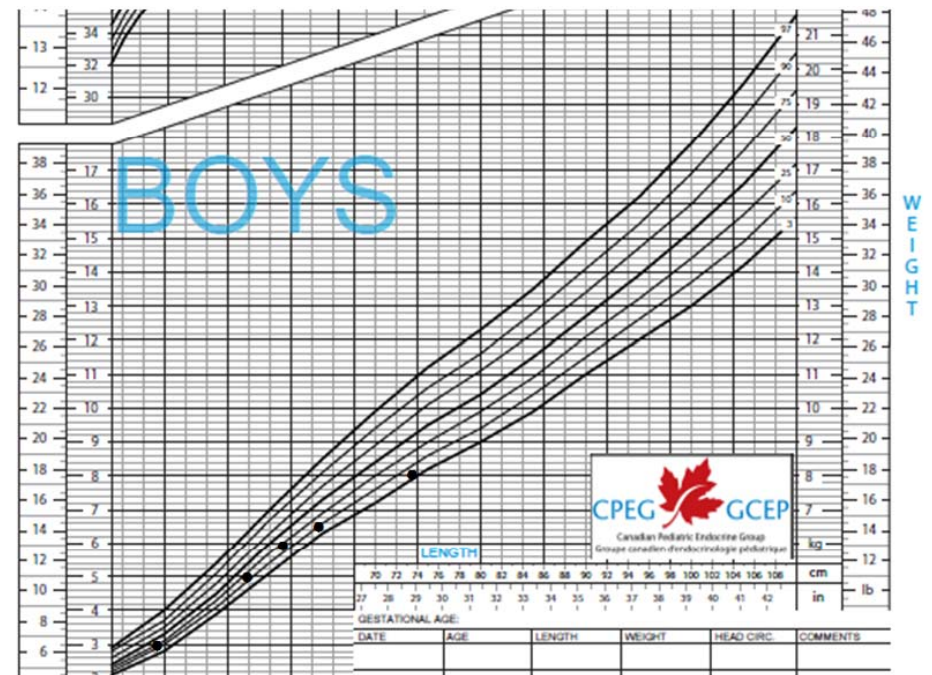
- accurate and reliable measurements are fundamental to growth monitoring
- if measurements are in error, then the foundation of the growth assessment is also in error
- erroneous or missing measurements lead to:
 - incorrect interpretation of growth patterns
 - missed or unnecessary referrals

Errors in Length Measurements

Case Example

- 10mo boy had been growing along 25th% weight-for-length, 10th% weight-for-age and 10th % length-for-age
- Last 2 length measurement errors
- Result in wt-for-length dropping to 3rd%ile
- Unnecessary referral

Weight - for - length



How are we doing?

Provincial AHS survey


Areas for Improvement

- 57% indicated staff receive growth measurement training
- 52% indicated inpatients measured upon admission

Area of Strength

- 96% indicated outpatients were measured at clinic visits

Childhood Growth Measurement Protocol



PROTOCOL

| | |
|---|--------------------------------|
| Subject/Title: Childhood Growth Measurement – Public Health and Clinical Settings | Date: April 4, 2014 |
| Authority: Healthy Living | Date Revised: April 4, 2014 |
| Classification: Protocol | Page: Page 1 of 28 |

OBJECTIVES

To enhance growth monitoring practices and child health outcomes by providing guidelines to ensure accurate and reliable measurements of infants, children and adolescents (birth to 19 years of age)

This protocol will address:

Procedure (Public Health and Clinical Settings)

Background

1. Equipment for weighing and measuring
2. Maintenance and calibration of equipment
3. Infection prevention and control
4. General guidelines for weighing and measuring

Public Health

5. Measuring weight
6. Measuring length or height
7. Measuring head circumference

Clinical Settings (inpatient and ambulatory)

8. Measuring weight
9. Measuring length or height
10. Measuring head circumference

Appendices to the protocol include:

[Appendix A – Specifications for New Growth Measurement Equipment](#)
[Appendix B – Childhood Growth Measurement Initiative: Equipment List](#)
[Appendix C – Maintenance and Calibration of Growth Measurement Equipment](#)
[Appendix D – Special Considerations for Length/Height Measurement](#)

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Components of accurate measuring

- quality equipment that is calibrated and accurate
- a standardized measurement technique
- trained measurers who are reliable and precise in their technique

General guidelines for measuring

- follow procedures and maintain/calibrate equipment
- explain procedures to caregiver and child
- use sensitive language “let’s check your weight”
- respect personal, religious, cultural perspectives
- respect the need for privacy
- place equipment on a hard, stable, even surface
- record measurements immediately
- repeat measurements if needed

Measurements and equipment

Infants – Birth to 24 months of age

| Measure: | Equipment to be used: |
|--------------------|-------------------------------------|
| weight <20kg | beam or electronic Infant scale |
| length | infant length board or infantometer |
| head circumference | head circumference tape |

Measure Weight

Birth to 24 months
weight infant nude



- put paper barrier in place and 'zero' scale
- place infant in middle of the scale
- measure and record to the nearest 0.001 or 0.01 kg

Modified measurement technique



- weigh the infant being held on a standing scale
- subtract the weight of the person holding the child from their combined weight
- record the measurement to the nearest 0.1 kg

Measure Length

- cover the length board with a paper barrier
- place infant on back in centre of length board



Positioning Head

- head against headboard
- eyes looking straight up
- chin not tucked or stretched

Measure Length



Positioning Legs

- align trunk and legs
- extend both legs (keep knees down) with toes pointed up
- bring footboard against the heels

- measure and record to nearest 0.1 cm

Modified Measurement Technique

| | |
|--|------------------------------|
| <24 months age and not able to measure in recumbent position: | Equipment to be used: |
| measure standing height add 0.7 cm to convert it to length record to the nearest 0.1cm | stadiometer |

Measure Head Circumference

- remove hair accessories and place infant on lap or flat surface
- tape measure above the eyebrows and ears and around the prominent part on the back of the head
- pull the tape snugly to compress the hair
- measure and record to the nearest 0.1 cm



Measurements and equipment

Children 2 to 19 years of age

| Measure: | Equipment to be used: |
|----------|---|
| weight | beam balance or child and adolescent (Adult) electronic scale |
| height | stadiometer |

Measure weight- 2-19 years of age

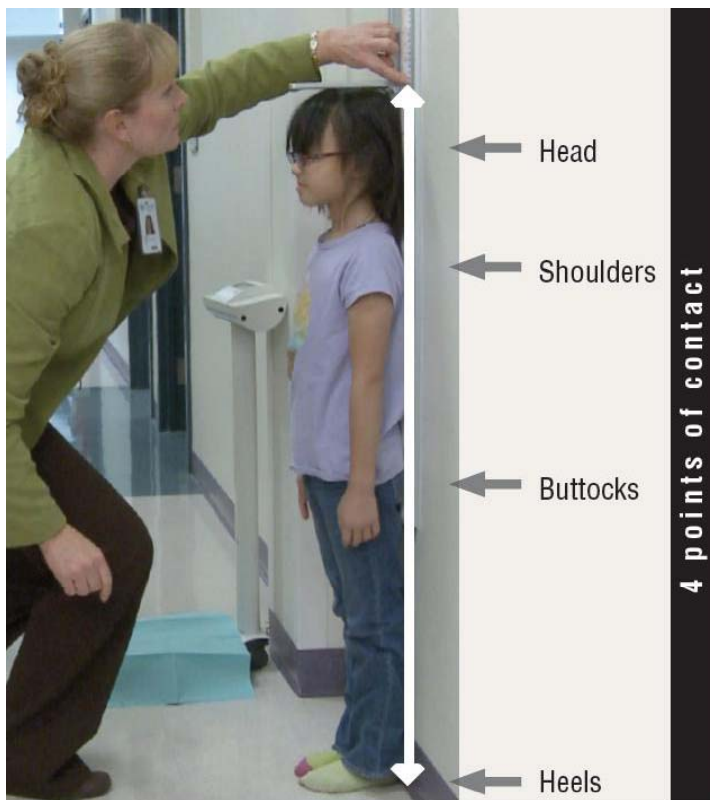


- put paper barrier in place and 'zero' scale
- remove shoes, hats and other bulky items
- child should stand unassisted in the middle of the scale
- measure and record to the nearest 0.1 kg

Modified Measurement Technique

| Unable to Stand Unassisted: | Alternate Equipment: |
|--------------------------------|---|
| ≤ 20 kg | infant scale |
| ≥ 20 kg | child and adolescent scale for tare weight sit-down, wheelchair scale |

Measure Height- Positioning



- heels almost together, legs straight, arms at sides, and shoulders relaxed
- heels, buttocks, shoulders and head touching surface
- child looking straight ahead (Frankfort Horizontal Plane)

Measure Height



- move the headpiece down to touch the crown of the head
- view the measurement with eyes parallel to the headpiece
- measure to the nearest 0.1 cm and record

Modified Measurement Technique

| Child cannot stand unassisted: | Alternate Equipment: |
|---|-----------------------------|
| measure length on a recumbent length board subtract 0.7cm to convert it to height record to the nearest 0.1cm | recumbent length board |

Special Considerations – length/ height measures

- **Obesity** - aim for at least 2 points of contact
- **Leg Asymmetry** - stand on longer leg with shorter leg supported
- **Cultural Headpiece**
 - topknot - measure to the side of the topknot
 - turban - upper arm length with equation
- **Physical Disabilities**
 - recumbent length board
 - upper arm length with equation

Upper Arm Length (UAL) - Measurement

- arm at 90°, palm up
- mark the **acromion process**
- measure to the **olecronon process**
- record UAL to the nearest 0.1cm



Upper Arm Length - Calculation

Calculate:

Standing height

$$= (4.35 \times \text{UAL cm}) + 21.8$$

If 10yr 6mo girl has an UAL
measure of 30.5 cm

Standing Height=

$$= (4.35 \times 30.5 \text{ cm}) + 21.8$$

$$= 154.5 \text{ cm}$$

This plots on the 97%ile for
height-for-age.

Plot:



How often should we measure?

| | Inpatients | Ambulatory |
|---------------------------|---|---|
| | Measure and Plot At admission and, | Measure and Plot |
| Weight | *Preams daily < 2 yrs 3 x / wk > 2 yrs 2 x / wk | at each clinic visit, or as per clinic protocol |
| Length | *Preams weekly Other q 3 months | |
| Head Circumference | *Preams weekly Other monthly | 0-2 mo monthly 2-6 mo q 2 months 6-24 mo q 3 months |

*once growth expectations are met, measure/ weight based on age

AHS Resources

- Protocol: Childhood Growth Measurement - Public Health and Clinical settings
- specifications for purchasing equipment
- maintenance and calibration guidelines
 - contact site clinical engineering or facilities
- training resources (module and videos)
- growth measurement posters

<http://www.albertahealthservices.ca/cgm.asp>

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