

HEIGHT AND WEIGHT - MEASUREMENT OF INFANTS, CHILDREN AND ADOLESCENTS PROCEDURE[®]

DOCUMENT SUMMARY/KEY POINTS

- This height and weight guideline has been established to ensure that all children attending hospital, either for an admission or a clinical review, will have their height and weight measurements obtained at least two to three times in a calendar year. This document addresses the importance of recording height and weight in children, necessary equipment and supplies and the correct procedure for each measurement.
- All height and weight measurements will be recorded in the EMR by the observer:
 - Admitted patients should have their height and weight recorded on admission and on a weekly basis if well enough, or before discharge.
 - Outpatients should have their height and weight measured on presentation and recorded in EMR.
 - Children with special needs should have their requirements documented and appropriate processes for measurements instituted
- All staff will learn correct measuring techniques by referring to this policy & consulting with ward based nurse educators, to provide consistent and validated outcomes
- All measuring equipment will be checked by ward staff prior to taking measurements and by biomedical engineers yearly.

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

Approved by:	SCHN Policy, Procedure and Guideline Committee	
Date Effective:	1 st March 2016	Review Period: 3 years
Team Leader:	Director of Nursing, SCH	Area/Dept: Nursing & Midwifery

CHANGE SUMMARY

- N/A – new Network document.

READ ACKNOWLEDGEMENT

- Clinical staff [medical, nursing and allied health] working in clinical areas should read and acknowledge they understand the contents of this document.

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Purpose/Scope

Children's growth and weight assessment is an important indicator of their development and overall health.¹⁷ Anthropometric measures are used for the assessment of growth in children and adolescents.

One measurement may not represent a true indication of growth, as it is only one point in time. A series of measures is required over time. Accuracy is essential.

Growth assessment involves measurement of height or length, weight and head circumference of all infants, children and adolescents over time, and recorded in the EMR.

This should be included in the routine admission process of every child to hospital^{2,7,8,17}, with immediate evaluation to determine any variations from the norm or any possible error in measurement or documentation.

Accuracy is essential for the accurate calculation of medications by weight or body surface area (BSA).

Expected results

All children should have baseline height and weight taken and recorded in the EMR. All children admitted should have weekly weights recorded in the EMR where the condition permits. Growth charts should be reviewed to assess for measurement error or deviation from the norm.

- Note that there are different growth charts based on age and gender on the EMR, and various diagnoses if needed.^{8,17}

All children will have a nutrition screen using a validated tool (PNST) on admission as part of their medical assessment. In the event that an inpatient is deemed to be at risk of malnutrition during an admission, resulting from nutrition screening, a height and weight must be recorded in the patient record. Those children found to be at nutritional risk will have a nutrition assessment conducted by a Dietitian and a Nutrition Care Plan will be developed if appropriate which will be reviewed weekly or as required.

Key performance indicator (KPI): Audit should reveal documentation of height & weight on children according to the policy recommendations.

Responsibilities

All nursing, medical or allied health staff will be responsible for taking measurements and recording in the EMR.

Any feeding and nutritional issues should be noted and referred to medical staff to review during the medical admission process, and refer for a dietetic review if necessary.

Abbreviations and definitions

Anthropometry – the study of the measurement of the human body in terms of the dimensions of bone, muscle and adipose (fat) tissue. ^{2, 6}

BMI: Body Mass Index – a ratio of weight relative to height.

EMR: Electronic Medical Record

Nutrition risk screening: The Paediatric Nutrition Screening Tool (PNST), a validated tool involving questions that assess a patient's nutritional risk. The results may generate a referral to a dietitian for further assessment.

Stadiometer – device for measuring length or height and may be used with patient supine or standing.

Equipment and supplies

Equipment should be checked for accuracy according to manufacture instructions prior to each session or at the beginning of each week. All equipment is to be checked for safety and function annually by biomedical staff. ²

Types of Equipment

- Supine infant stadiometer
- Wall mounted stadiometer
- Paper tape measure for head circumference
- Plastic tape measure for waist (abdominal girth) measure
- Baby weight scales with three decimal points
- Floor weight scales standing & sitting: all should have at least 2 decimal points for accuracy to determine smaller changes in weight.

All clinical areas should have measuring and weighing equipment appropriate to their regular patient population.

Location of specialised equipment

	Children's Hospital, Westmead	Sydney Children's Hospital, Randwick
<i>Hoist with scales</i>		
Location	Commercial Travellers (CT) ward Orthopaedic/Surgical/PICU Wards (shared)	C1 North COPD x1
<i>Wheel Chair scales</i>		
Location	Department Nutrition & Dietetics	COPD
	Department of Rehabilitation	Department of Rehabilitation, Level 2

Special techniques

- Lying measures can be obtained in children up to 113cm using the infant lying stadiometers. Otherwise laying a child on a flat examination table with a foot board, and using a metal tape, a measure can be obtained.
- Specialist techniques (skin fold thickness, knee height and other body proportion measures) is not routine as part of this policy.^{2, 3, 6} Advice should be sought from the staff who are proficient in Auxology such as endocrine nurse specialists, dietitians or orthotic staff.

Procedure

Safety

- Infants and children on scales or stadiometers should always be supervised to prevent falls and any physical injury.
- All equipment should be cleaned, checked and maintained on a regular basis according to hospital protocol.

Patient and parent considerations

1. Engage the child in play before attempting to measure. For younger children, demonstrate and play with a teddy bear or doll.
2. Explain what you are going to do, and how measurements are taken for the child and the parents.
3. Ask for parental assistance to ensure a good measure is achieved.
 - Having the parents assist and understand the need for an accurate measure is important.
 - Be quick and have parents assist in holding and reassuring. This will minimise the anxiety of being in a new environment, and meeting new staff.

Preparation

- Ensure the procedural steps are followed to get an appropriate measure.
- Re-check the measure if in doubt.
- If concerned, it is recommended that 3 measures are taken.
 - Altered growth and weight gain is a sign of a possible sign of a medical problem
 - There is a wide range of normal: +/- 3rd to 97th centile.
 - Height and weight must always be evaluated in reference to the genetic background and past medical history.

Errors in measuring

Patient's natural posture (Stance): e.g. lumbar lordosis, genu valgus of the knees, the child trying very hard to stand straight, head & shoulder position, including pushing their belly forward, bent knees bent, heels not flat to the ground.

See Appendix 2: [Guide to Accurate Measurement \(below\)](#)

Height/Length measurement

(See: [Appendix 1](#))

Infants

- Infants and children less than two to three years of age are to have length measured on a supine stadiometer.
- Two people are required to perform this task (parent & staff member) – one holding infants head and another taking the measurement.^{3, 4, 5, 6} Lie the infant supine on the board with the head at the headboard. The footboard is brought up to touch the soles of the baby's feet. Both legs should be straight with toes pointing upward.^{2, 3, 4, 5, 6}

Children/ adolescents

- Children should have their height measured using a wall mounted stadiometer, installed correctly and with appropriate support for the buttocks of smaller children.

N.B. The stadiometer should be installed over a flat hard surface floor with no carpet.

- The child should remove shoes & thick socks and heavy baggy outer clothing.
- Heels, buttocks, shoulders and back of head should touch the back plate and the child should look straight ahead.
- Slide the headboard to the top of head and take measurement.

N.B. Severely obese children and adolescents and those with poor muscle tone or physical disability etc. can be difficult to measure. Positioning can be difficult owing to their body size and leg positioning. Be consistent with technique. (See [Children with Special Requirements](#) below)

Weight measurement

Infants

- Infants and young children less than 12 months of age are weighed without clothes and a nappy, on electronic baby scales with an accuracy of up to 10 grams.
- Nappies and heavy clothing should be removed in all small children.

Children/adolescents

- Children over two years are weighed on electronic scales (standing or sitting) with an accuracy of up to 100 grams.
- Children should be weighed in minimal clothing (have their shoes and thick socks, baggy outer clothes, jackets and jumpers removed).^{3, 4, 5, 6}

Head circumference

The tape measure is placed above the eyebrows and ears, around the head to give the maximum circumference.⁶

Measure the frontal-occipital circumference, best measured from the side of the child/adolescent to ensure correct position is obtained.

N.B. Tape measure should be as close as possible to skull, hair styles i.e. pony tails and hair accessories should be removed from under tape measure.

Waist measurement

(See [appendix 1](#), "Measure4kids" documents this procedure well)

Obese patients should have abdominal waist circumference measured.

For consistency waist measurement in children should be taken over the umbilicus.



Body Mass Index (BMI)

BMI is a weight for height index that is commonly used to classify the weight status for individuals aged over 2 years. BMI is calculated by [Weight (kg)/Height (m²)]. This value will be automatically calculated in the EMR when both height and weight are recorded at the same time.^{5, 6, 9, 17}

When required medical staff will evaluate the patient's BMI and can refer appropriately.

Children with Special Requirements

- 1. Children with Spina Bifida:** unable to stand, or straighten legs.
 - **Equipment:** metal tape.
 - **Measurement of the arm span**
N.B. This is excellent measure of growth in these children, or any child with a lower limb deformity, such as contractures and muscle wasting.
 - With the patient sitting up straight as possible, measure across the upper body (front or back: whichever is the straightest, minus bulky clothing) with someone supporting the elbows in a straight line if need. Tip of middle finger left to right hand with hand held straight and taught). Make sure the arms are not convex or concave in alignment.
 - Variations in posture, scoliosis, kyphosis, elbow and shoulder contractures should be noted.
- 2. Limb discrepancy:** measure child as usual, but place a block under the shorter leg to support the stance, whilst being measured.
- 3. Gastro, General medical, Renal, Cardiac, Feeding & Dietitian clinics:** children under 1yr & depending on child's progress should have bare height & weight.
- 4. Dermatology clinics:** Children on Propananol:- bare height & weight
- 5. Scoliosis:** height & weight with brace in a gown/light clothing (brace is weighed at first visit & then deducted from total weight at each visit).
- 6. Eating Disorder Clinics:** Patients change into hospital gowns with only: privacy to be ensured but patient supervised.
 - bra & pants on for female patients
 - underpants for male patients

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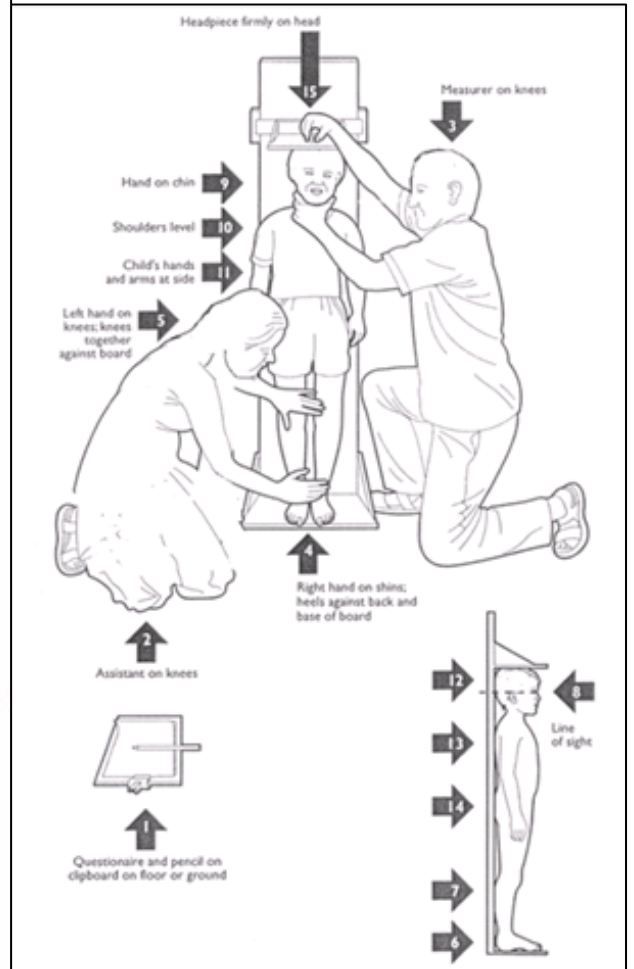
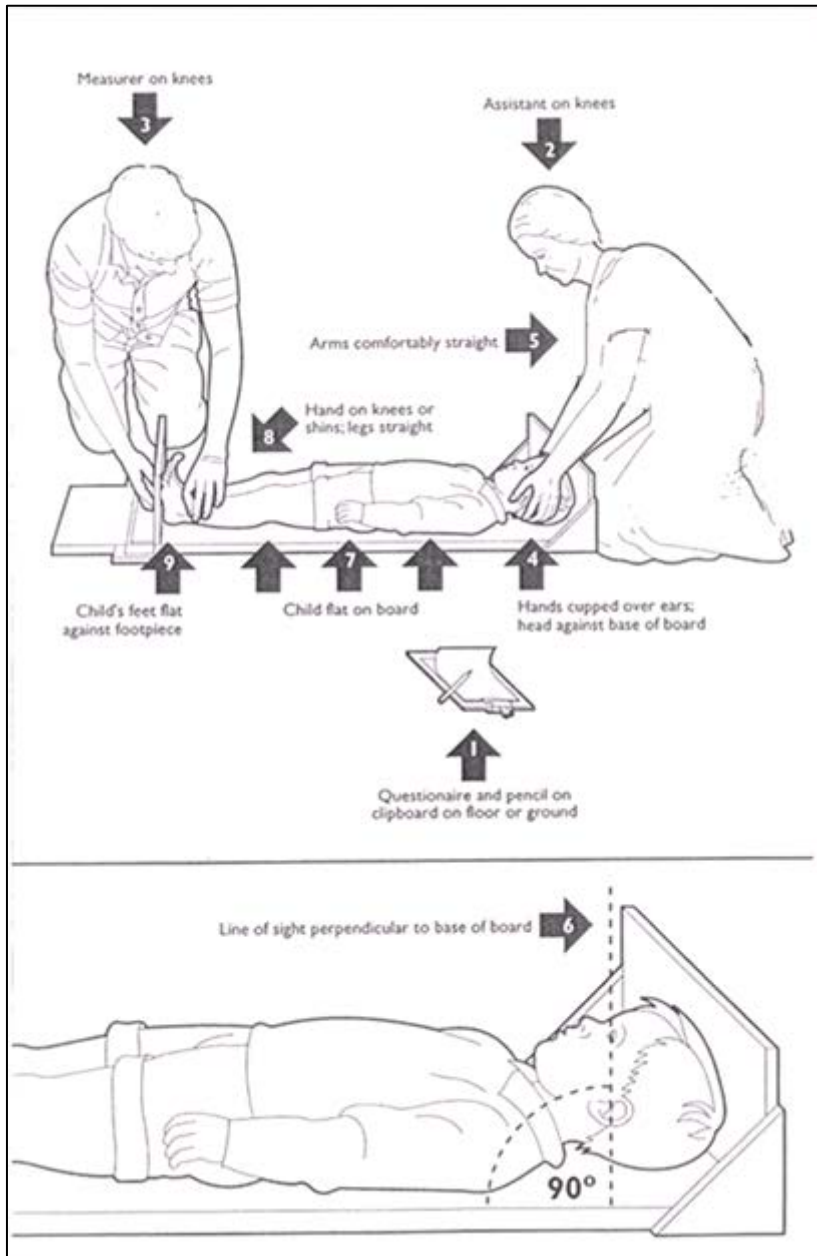
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Appendix 1: Measuring Diagrams

Measuring diagrams for standing and lying measures: Operator technique with assistant or parental help. Motherchildnutrition.org incorporated in to Weight 4kids document too.

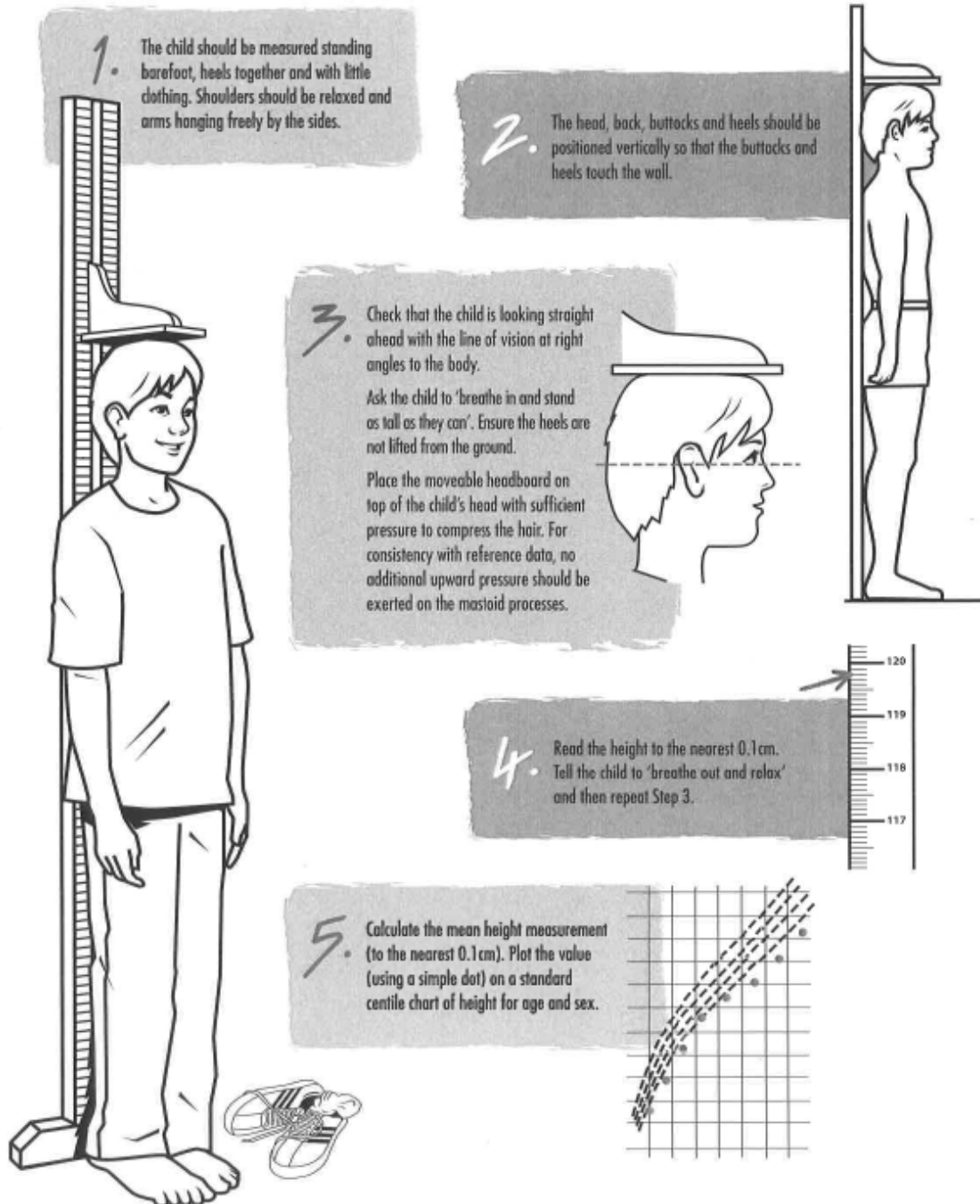


Appendix 2: Poster Guide to Accurate Measurement

"Australian Guidelines for measuring height in children greater than 2 years of age". Pfizer Endocrine Care.

Guide to Accurate Measurement

Australian guidelines for measuring height in children >2 years of age¹



1. The child should be measured standing barefoot, heels together and with little clothing. Shoulders should be relaxed and arms hanging freely by the sides.
2. The head, back, buttocks and heels should be positioned vertically so that the buttocks and heels touch the wall.
3. Check that the child is looking straight ahead with the line of vision at right angles to the body. Ask the child to 'breathe in and stand as tall as they can'. Ensure the heels are not lifted from the ground. Place the moveable headboard on top of the child's head with sufficient pressure to compress the hair. For consistency with reference data, no additional upward pressure should be exerted on the mastoid processes.
4. Read the height to the nearest 0.1 cm. Tell the child to 'breathe out and relax' and then repeat Step 3.
5. Calculate the mean height measurement (to the nearest 0.1 cm). Plot the value (using a simple dot) on a standard centile chart of height for age and sex.