

Neonatal Growth Monitoring

Procedure Responsibilities and Authorisation

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| Target Audience | NICU nursing and medical team |
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Procedure Review History

| Version | Updated by | Date Updated | Summary of Changes |
|---------|--------------|--------------|---|
| 2 | Nadia Wright | | Edit to include all measurement procedures, indications for investigation, definitions. |
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Neonatal Growth Monitoring

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Neonatal Growth Monitoring

1 Overview

1.1 Purpose

To standardise the procedure of growth measurements and their documentation for neonates in the Newborn Unit. This is for the purpose of accurately tracking growth, as an indicator of healthy development, or to facilitate early intervention, to optimise outcomes.

1.2 Scope

All clinical staff in the newborn unit including nurses and the medical team.

1.3 Patient / client group

All neonates admitted in the newborn unit.

1.4 Exceptions / contraindications

- The first 7 days for babies born at 28/40 weeks gestation or less and/or with a birth weight of 1000g or less as per the [Extremely Low Birth Weight \(ELBW\) Bundle of Care for Prevention of Intra Ventricular Haemorrhage \(IVH\)](#) guideline.
- Critically unwell/unstable babies at the discretion of the medical team.

1.5 Definitions and acronyms

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|--------------------------------------|---|
| SGA | Small for gestational age is <10 th centile |
| LGA | Large for gestational age is >90 th centile |
| AGA | Appropriate for gestational age is between the 10 th and 90 th centile |
| Asymmetric growth restriction | Small for gestational age with significant centile variance between head circumference and weight |
| Head Sparing | Asymmetric growth restriction with greater centile head circumference than weight centile – suggestive of late growth restriction and is neuroprotective. |
| Symmetric growth restriction | Small for gestational age with similar centiles for weight and head circumference – suggests early and prolonged growth restriction. Can suggest reduced neuro-development. |
| Auxology | The study of all aspects of human physical growth |
| Clinical staff | Staff working in a clinical patient contact role in the newborn unit |
| Nurses | Registered and Enrolled nurses working in the newborn unit |
| Medical team | Combined team of Senior Medical Officers (SMO), Nurse Practitioners (NP), Fellows and Registrars. |

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2 Clinical management

2.1 Roles and responsibilities

Nurses:

The procedure of measuring the neonatal weight, length and head circumference and documentation of these measurements on the clinical work-station electronic growth chart and in the clinical notes .

Medical team:

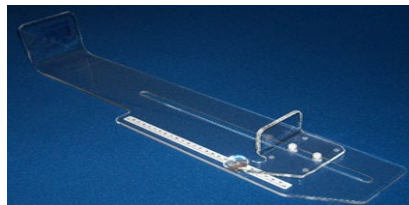
Review of the clinical work station growth charts at ward rounds to monitor growth trend and identify if intervention is required.

2.2 Competency required

- Familiarised with this guideline
- Watch the Standardized measurement techniques video provided in Bibliography C

2.3 Equipment

- A length-board (stadiometer) with a fixed headboard and moveable footboard - there are two different length-boards for use in the Newborn Intensive Care Unit.
 - a) A small perspex length-board (Ellard Instrumentation Ltd). Can be placed inside the incubator to minimise the handling required to measure small babies.



- b) A larger trolley-based length-board (Holtain Ltd), which requires the baby to be lifted from the cot or incubator to be measured.



- Weighing Scales or incubator inbuilt scales
- Paper measuring tape
- A thin cloth, warmed.
- Two nurses

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3 Procedure

3.1 Procedural considerations

- Frequency of all forms of measurements can be adjusted at medical team discretion due to clinical considerations.
- Changes from routine frequency must be documented in clinical notes with rationale.
- To facilitate family centred care the timing of all measurements should ideally be planned around parent attendance.

3.2 Frequency of measurements

Weight:

- Level 3 (ICU beds) - Weights to occur twice weekly on Sunday and Thursday
- Level 1 & 2 - Weights to occur twice weekly on Tuesday and Saturday

Head circumference and Length:

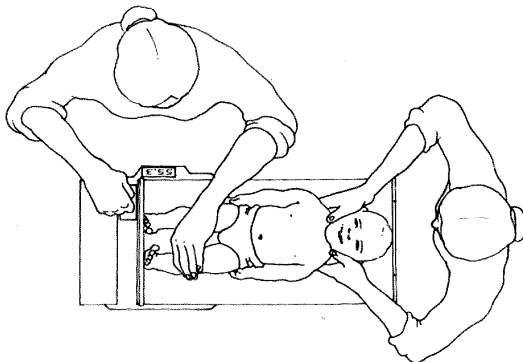
Weekly on Saturday/Sunday.

Length can be deferred for ELBW babies and acutely unwell babies until stability is achieved but rationale for deferral must be reviewed and documented weekly.

3.3 Measuring Length

Note - If using the small Perspex length-board, ensure it is flat inside the incubator or cot.

- 1) Place a warm thin cloth within the instrument frame to prevent heat loss.
- 2) Remove any clothing from the baby prior to measurement.
- 3) Two persons are required for this process
- 4) Once placed on the frame hold the baby's head so that the top of the head touches the fixed headboard. The baby's eyes should be looking straight up.
- 5) To keep the baby's head in the correct position gently cup hands over the baby's ears and places thumbs on the baby's shoulders. Apply gentle pressure to the knees to straighten the legs.



- 6) To take the measurement the carriage is moved towards the baby until the footboard is pressed against the feet gently so there is a slight compression against the sole of the foot. The soles of the feet should be flat on the board, the toes pointing upwards. The

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crown-heel length is then read from the centre of the number counter. The measurement is read to the last completed 1mm

- 7) Take three measurements and record the average of the three.
- 8) Document in the clinical notes and in the clinical work station growth chart.

Procedure tips:

- 1) If the baby bends the toes preventing the foot board from touching the soles of his/her feet: gently rub the soles and draw in the footboard when the baby draws the toes up.
- 2) Only apply minima pressure to the knees to straighten only as far as they can go without causing harm. It is not possible to straighten the knees of very preterm babies to the extent of term babies.

3.4 Measuring Head Circumference

- 1) Use a disposable paper tape-measure
- 2) Measure above the eyebrows (supraorbital ridges) and above the ears around the biggest part at the back of the head (Occiput).
- 3) Measure to the nearest 1mm.
- 4) Take three measurements and record the largest of the three
- 5) Document in the clinical notes and in the clinical work station growth chart

Procedure Tips:

- 1) Consider assistance from a second person to lift baby's head in order to place the tape measure, particularly for small and fragile babies.
- 2) Lift Baby's head off the tape measure before removing, do not slide it out as paper cuts can occur.

3.5 Measuring weight

For extremely low birth weight infants or ventilated preterm infants use the incubator scales to minimise disturbance. See Guideline - Giraffe™ Omnibed incubators and CosyTherm™ Use in NICU guidelines Ref 1485.

- 1) Remove all clothing and nappy to weigh. Only remove monitoring equipment and respiratory support if Baby can tolerate this and it is safe.
- 2) Place warmed linen on the scale and zero the scales – Ensure it is appropriately zeroed prior to unwrapping baby.
- 3) Place Baby on the scales and allow the scales to come to a conclusive number. If Baby is very active press “Hold” to freeze the number. If you are unsure of accuracy, lift Baby, zero the scales and re-check the weight.
- 4) Check the weight is consistent with Baby's growth trend – If not re-weigh to confirm.
- 5) Document the weight in the clinical notes and in the clinical work station growth chart.

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4 Documentation:

- 1) Weekly, all measurements (weight/HC/length) must be recorded clearly in the clinical notes in the red pre-forma stamp. Indicate below this if it has been entered on clinical work station.
If measurements are not completed for clinical reasons put a line through the stamp and document below the rationale for incomplete measurements.
- 2) In addition all weight measurements (twice weekly) need to be recorded in the red folder chart.
- 3) Weekly record all measurements on Clinical Work Station growth charts:
 - Log in to clinical work station
 - Under "Patient Search" Identify the Baby by the name and NHI and select
 - On the left margin in the individual patients drop-down list select "Growth chart"
 - On the left of the pop-up page growth chart select "Profile" and check the details are correct
 - If the profile is not correct select and enter the relevant details i.e. preterm (enter gestation at birth), Down syndrome or Turners to adapt the growth chart accordingly and press "Submit"
 - Select "Add New Record"
 - Enter measurements: Double check decimal points are in the correct place.
 - Select "Update" to save your measurements

5 Indicators for intervention and/or investigation:

- 1) Significantly SGA babies at birth without obvious cause: This can be a result of congenital infection
- 2) Significant LGA babies at birth: This can result from maternal diabetes both diagnoses and undiagnosed and significantly increases the risk of hypoglycaemia.
- 3) Growth that is stagnant in either weight or length – plotting in a straight line across the page and therefore dropping centiles. Poor growth can impact on a wide range of outcomes including neurodevelopmental outcomes. Dietitian referral may be required.
- 4) Growth that is rising rapidly crossing centiles: Can suggest clinical change i.e. oedema or excessive growth. Requires review.
- 5) Head circumference trend that is plateauing – Can suggest poor brain development.

6 Evidence base

6.1 Summary of rationale

Length rationale:

Measurement of the length provides information on lean body growth and bone growth over time. While single measurements provide minimal information, serial measures can identify important trends.

Weight rationale:

Measurement of weight provides information on general condition and body development in relation to nutritional intake and energy expenditure. Healthy weight gain in the neonatal period is considered to be around 15-20grams/kg/day.

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Head circumference rationale:

Measurement of the head circumference provides essential information on head growth and can be indicative of brain growth or, in some instances, neurological concerns like hydrocephalus. Single measurements provide minimal information but serial measures can identify important trends.

6.2 Bibliography

- a) Intergrowth-21st International Fetal and Newborn Growth Standards for the 21st Century, The International Fetal and Newborn Growth Consortium, Anthropometry Handbook, April 2012, University of Oxford.
- b) Holtain Neonatometer Instruction Manual, Holtain Ltd, Crosswell, Crymych, Pembrokeshire, SA41 3UF, United Kingdom.
- c) Standardized measurement techniques for growth, educational video form McMaster Children's Hospital at www.youtube.com/watch?v=LW38bqQ9vVY

6.3 Associated Waikato DHB Documents

- [Giraffe™ Omnibed incubators and CosyTherm™ Use in NICU](#) guidelines (Ref. 1485)
- [Extremely Low Birth Weight \(ELBW\) Bundle of Care for Prevention of Intra Ventricular Haemorrhage \(IVH\)](#) guideline (Ref. 6240)

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