

Kent Surrey and Sussex Neonatal Operational Delivery Network

Principles of Practice Growth Monitoring

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Aim of Guideline

To standardise the practice of growth monitoring Neonatal units within KSS

To ensure parents are fully informed of the benefits of weighing and measuring to ensure optimal growth

To ensure clinician' practice remains evidence based whilst on a rotation programme

To ensure infants' well-being is optimised throughout weighing and measuring procedures

Background

Cumulative growth deficit in preterm infants is well documented. Therefore, a large proportion of infants admitted to units within KSS are at risk of growth deficiency, poor nutritional stores and poor development. Poor growth and nutrition can lead to many undesirable outcomes includes poor wound healing, increased infection rates, poor brain growth and impacts on long term neurodevelopment and cognitive developmental outcomes.

Anthropometrics that should be measured (ESPGHAN 2022) are weight, length and head circumference (OFC). Weight is not a sufficient indicator of nutritional status as it can be affected by other internal factors including fluid shifts, bowel movements and urine output at a given time.

Monitoring of growth is essential for:

- 1) Accurate calculation of drug doses
- 2) Calculations of Intravenous fluids including Parenteral Nutrition (PN)
- 3) Calculation of feeds
- 4) Determining the use of breast milk fortifiers, post discharge formula or other supplements and formulas
- 5) Calculation of physiologic parameters (e.g. tidal volume, cardiac output)

Regular audits should be in place to ensure the aims of these Principles of Practice are adhered to.

Objectives

1. Each infant requires an electronic WHO Growth Chart.
2. Training on use of growth charts and responsibility to assess growth will be given to all staff
3. All staff that measure infants' length, weight and head circumference should have appropriate training on taking measurements and accurately plotting them
4. Infants should be weighed according to the Infant Weight Measurement principles
5. Infants should be measured according to the Infant Length Measurement principles
6. Infants head circumference should be measured according to the principles of measuring infants head circumference
7. Growth aims for individual infants should be discussed on the ward or nutrition round

Environment of the infant / Developmentally Supportive Strategies

- Consider the most appropriate equipment to use:
 - For preterm infants <32 weeks gestational age or <1.5kg in weight, measures may be made directly within an incubator.
 - For infants ≥32 weeks gestational age or ≥1.5kg in weight, measures can be made outside of the incubator.
- Consider **CPAP hats**:
 - To obtain a weight – leave the CPAP hat on and ensure that the weight of the equipment is taken off the total weight obtained
 - To obtain a length – either remove the hat if appropriate; for infants on SNIPPV/NIPPV it may not be appropriate to measure lengths
 - **Delay the measuring of head circumference** for infants requiring head coverings for CPAP/NIPPV
- Consider strategies to support the regulation of the infant and the maintenance of a settled state / prevent the infant from becoming distressed:
 - Only measure if the infant is showing no signs of distress (as below)
 - Prior to measuring preterm infants, they should have their nappies removed and undressed if they have any clothing on (see point on swaddling)
 - Infants can be measured with a dry nappy if required
 - Swaddling:
 - zero scale
 - weigh the swaddle
 - swaddle the infant & take the weight of the infant + swaddle
 - takeaway the weight of the swaddle
 - Developmentally supportive (and appropriate) handling when transferring the infant – a swaddled or flexed and contained position may help the infant to stay regulated. Minimise the distance moved between the cot and scales as much as possible. Move infant gently and close to your body and avoid fast position changes /onto scales/incubator.
 - Parents present/aware of measuring times and supported to (be) lead the transfer of their baby by themselves / be as involved as possible (for their involvement in transferring the infant) and to offering positive touch, talking, containment prior and after weighing and measuring
 - Appropriate time of the day for infant e.g. after a feed, after a nap, during bundle of cares etc to minimise disruption
 - Pacing – monitor the infant's behavioural states and cues and allow time for infant to regulate during procedures
- Be sensitive to changes to clinical status or distress, and if necessary, stop measures

Getting equipment clean and ready

- Before measurements are made it is important to ensure everything required for making and recording a measurement is available:
 - Ensure there is sufficient antibacterial sanitiser, tissues and paper with which to clean and line the weighing and measuring scales as well as other equipment (e.g. segmometers)
 - All equipment should be calibrated as per manufacturer's guidelines as well as conforming with local guidelines e.g. calibrating length measures.

- Before measures are undertaken, it is important to ensure all equipment is working properly, undamaged and cleaned with antibacterial sanitiser (before and after every measurement)
- After measurements are taken, ensure that all waste items e.g. tissues, paper, soiled nappies should be disposed of using local waste policies.

Equipment

Measuring weight

- Weighing scales are on a level surface and in a safe place as close to the infant as possible for infants.
- Given the variability in measurements depending on device, ideally at least two consecutive weights should be undertaken with the same scale, i.e. internal or external. Document which scale has been used (internal or external scales) to highlight to the clinical team in case of unusual weight development.

Measuring length (refer to appendix 1)

- Length measure that will fit into an incubator or a cot
- Alternatively use a roll mat
- Disposable, paper tape measures in extremely preterm infants, should not be damaged or creased.

Measuring head circumference

- Disposable paper tape measures should not be damaged or creased.

Infection Control Procedures

- Prior to completing measures hands should be washed, as per hospital infection control guideline.
- Hands should be thoroughly dried prior to performing a measurement.

Principles of Practice Weight Measuring for Preterm Infants

Frequency of Weight Measuring

- Extreme pre-term babies born <26 weeks: Daily weights should be measured for the first 7-10 days weeks gestation whilst on IV's fluids including PN. Transition can then be made to twice weekly weights
- Preterm infants born $\geq 26+0$ weeks: Daily weights should be measured until day 5 (or reaching 100 mls/kg/day) and clinically stable with the expected weight loss. Transition can then be made to twice weekly weights
- Some babies may need more frequent weighing as requested by the clinician at other times. This may include, but not exclusive to, babies with renal failure, cardiac abnormalities or other medical conditions.
- All infants should be weighed twice a week once stable and up until discharge
- All measurements should be transferred from the weight chart to the WHO growth chart on a weekly basis

Procedure

- Two people will be required to weigh the infant, ideally one of these should be the infant's parent.
- If incubator scales are available, infants should be weighed in the incubator and the manufactures standard operating procedure should be followed. Ensure the incubator is laid flat
- All **non-essential** monitoring and equipment should be removed, for example electro-cardiogram leads, pulse oximetry probe, arm or leg splints and nappies.
- For all **essential** monitoring and equipment, a list of what different components weigh to standardize the process of subtraction is useful
- Before the infant is transferred to the scales, the lead person should be identified and describe the steps for her team as below. The other persons should affirm the process and their roles and the lead counts for lifting and transferring the infant
- The lead person should line the scale cradle with a blanket or sheet if the infant is not swaddled.
- The assisting parent/nurse should stand on the opposite side of the weighing scale ready to help receive the infant from the parent / lead/nurse.
- The lead person should ensure they have a pen and paper next to the scale to record the measure
- The parent/nurse should operate the 'On' button to ensure the scales are zeroed before a measure is made.
- Parents can hold any other lines are held aloft for the duration of the measure.
- Weigh the infant on the scales. Subtract the weight of swaddling and any essential equipment unable to be removed for weighing

- The procedure should be completed twice and if the weights differ by more than 10g a third measure should be made
- Double check the figures with your colleague/parent
- Place infant back in incubator or parents' skin-to-skin using a reverse of the procedure.
- Once the infant is replaced in the cot, parents can re-dress the infant. The Lead person can ensure all the non-invasive monitoring equipment is reattached and the infant repositioned.
- Ensure the infant/infant remains settled and introduce strategies named above to optimise infant's/infant's states.
- The measurement should then be recorded in kgs to the nearest decimal place (0.01kgs) on Badgernet/other electronic medical notes/written documentation
- If using outside scales appropriate for outside the incubator, ensure the scales are cleaned and put away
- If using incubator scales, ensure the base is adjusted back to the optimum tilt for the infant.
- The incubator doors should then be closed.

Expected weight gain once baby is stable and growing

- <2kg (<34weeks gestation): 15-20g/kg/day
- >2kgs (moderate to late pre-term): 10-15g/kg/day
- 25-35g/day in term babies

Supporting Parents and Staff: Wrapped Weighing for Preterm Infants

Wrapped weighing is recommended to improve the weighing experience, by supporting physiological stability and behavioural organisation.


Encouraging parents to be involved with weighing is a good opportunity for them to get to know their baby closely and to observe and communicate with them. It also encourages good attachment which is the close relationship between parent and child. With support from the member of staff looking after the baby, the parents and their baby should have a relaxing and enjoyable experience. Staff should encourage, support, and educate parents in the process as partners in care.



Weighing aim

- ❖ Establish current weight, using weighing scales.
- ❖ Calculating and documenting weight loss or gain.
- ❖ Process should be done whilst providing comfort, reducing stress and offering appropriate levels of support for babies, to optimise developmental outcome.
- ❖ Weighing a baby can provide a positive bonding experience for baby and parents and be a positive milestone towards going home.
- ❖ To achieve an appropriate weight gain according to gestation, clinical condition and other anthropometric measurements



Staff Responsible	Equipment Needed
NICU staff	Thermometer Baby scales on a secure base (lock wheels if on) Towels/ blanket Pre-weighed dry nappy Clean clothes/ bedding Camera
Process	<p>When facilitating weighing for a baby talk to the baby and tell them what you are doing, speaking softly and being aware of how you are moving them, responding to the baby's cues and individual needs.</p> <p>Weighing can be a new and overwhelming experience; the aim is to reduce stress for the baby and make it a positive experience for both baby and parents.</p>
Timing and preparing parents	<p>Plan with parents when would be the best time for their baby to be weighed. The weight is often an important milestone for parents, so encourage both parents to be there and have a camera ready.</p> <p>If it is the first time weighing the baby, the parents maybe feeling unsure. We can do a demo first to help with this.</p> <p>It is important to choose a time when the baby is likely to be awake and relaxed and is a convenient time. Avoid times when baby is likely to be hungry or recently have fed.</p> <p>Ensure the environment is quiet, calm, and away from bright lights or draughts.</p>

Preparation	<p>Prepare the weighing scales with a soft surface, such as a folded towel or blanket.</p> <p>Ensure the scales are set to '0' once the towel is in place.</p> <p>Ensure the nappy the baby is wearing is clean and dry and pre-weighed, or ready on the scales.</p> 
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<p>Wrapped weighing</p>	<p>Gently wrap the baby in their nest or a large blanket- so that he/she is enclosed in a flexed midline position.</p> <p>Turn the baby gently into the side lying position, then pick the baby up and out of the incubator/cot. (Holding baby against parents' body, for security without elevating them through the air unsupported)</p> <p>Transfer baby to the weighing scales, whilst maintaining their side lying contained position, encouraging the parents to provide containment and support by speaking softly to baby</p> <p>This is a good opportunity to change the bedding in the incubator/ cot, with fresh lining.</p> 
<p>Document</p>	<p>Weigh baby and document the weight</p>
<p>Settling baby after weight</p>	<p>Return the baby to the incubator by the reverse process or offer skin to skin to parents.</p> <p>Remove the towel/blanket from baby and deduct the clean nappy from the baby's weight to get the correct weight.</p> <p>To help the baby settle into a relaxed state or regain physiological stability, parents should be encouraged to remain with their baby, use containment holding, skin to skin and provide comfort until their baby stabilises.</p> <p>Encourage parents to settle the baby back into a comfortable position</p> <p>Consider skin to skin contact after weighing, this will help regulate body temperature and stabilise baby physiologically and provides parents with the opportunity to help their baby rest and recuperate.</p> 

Alternatively, place baby in a well-supported comfortable position, being aware of previous position.

Use supportive aids appropriate for age.



Review

Encourage parents to reflect, consider and document any adverse reactions, noting techniques that supported the baby well.

Celebrate this new milestone with parents if gained weight!



Principles of Practice Length Measuring for Preterm Infants

Frequency of Measuring

1. Length should be measured in all preterm infants >28 weeks' gestation, or 7 days post birth, every 1-2 weeks in high dependency and special care.
2. Infants in intensive care should have length measured at the discretion of the doctors or relevant health care professionals within one month duration of their stay

Procedure

- Two people will be required to take the length measure, ideally one of these should be the infant's parent
- Before the infant is transferred to the scales, the lead person should be identified and describe the steps to the parents as below. Parents should confirm their understanding of the process for lifting and transferring the infant
- All infants should be measured lying down on a supine measuring device.
- The lead person should carefully open one side of the incubator and place the measure next to the infant, ensuring the flat aspect of the sides of the head and foot plates are on the mattress
- Ensure the infant is lying in a supine position
 - Lead person should unlock the sliding food paddle and move it to the end of the rule
 - Lead person should then place the incubator measure alongside the infant, gently placing the fixed paddle against the crown (top) of the infant's head
 - Parent/person 2 should stand on the other side of the incubator and carefully open the other side
 - Parent/person 2 should then gently place the infant's feet in the dorsiflexed position (e.g. feet – toes pointing at a 45 degree angle upwards) and gently place their hand on the knees in order to straighten the legs as much as possible and only gentle pressure should be applied
 - Parent/person 2 should ensure the infant is as straight and as flat as they can be
 - Lead person should then slide the sliding paddle up to the infants heels and lock it in place whilst the infant's feet and knees are held by the parent/nurse in the correct position
 - Lead person should then lock the sliding paddle of the incubator measure at the position of the infants length and gently remove it from the incubator
 - The incubator measure should be placed on a clean surface, and Person 1 should close the side of the incubator. Parent/person 2 should ensure the infant is settled, repositioned and close the 2nd side of the incubator
- The incubator measure can then be read and recorded in cm to the nearest decimal place in the medical notes on the appropriate day.

Principles of Practice

Head Circumference Measuring for Preterm Infants

Frequency of Head Circumference Measuring:

1. OFC should be measured weekly and plotted on the WHO growth charts

Procedure

1. Two people will be required to take the measure, ideally one of these should be the infant's parent
2. Before the infant is confirmed with parents their understanding of the process
3. Where a 1m disposable tape is being used to make measures in preterm infants and infants; pre-cut the paper tape to 25cm – 60cm lengths to allow for ease of use.
4. If appropriate and where possible and clinically safe to do, non-invasive ventilation caps should be removed prior to measure with a parent holding the nasal or facial mask in place.
5. For mechanically ventilated infants, parents should gently hold the endo-tracheal tube in place so as to ensure it is not accidentally dislodged during the taking of the head circumference measure.
6. The lead person should pass the paper tape around the most anterior protuberance of the forehead and posterior protuberance of the head to obtain the largest circumference measure possible.
7. Read the measurement to the nearest 0.1cm (1mm) and document. This process should be completed (where possible) three times and the mean (average) measurement should be used e.g. add the three values together and divide by three.
8. The lead person should then replace the non-invasive ventilation mask and reposition the infant, ensuring that any hats or clothing is replaced.

For preterm/term infants who can be sat up

1. Preterm infants should be held upright by the parent to perform an accurate measurement.
2. Position the lasso or paper tape so that the zero mark is on the side of the head – this makes it easier to read.
3. Head circumference measurements should always be taken from midway between the eyebrows and the hairline at the front of the head and the occipital prominence at the back. However, this is a guide only and for infants with unusual shaped heads, you should always measure the largest circumference possible.
4. Pull the lasso/ paper tape snugly to compress the hair. Make sure that the tape passes the occipito-frontal plane (as described above) and does not slip when getting the reading. It may be helpful to ask the parent to hold the tape in place on the back of the head with a finger.
5. Read the measurement to the nearest 0.1cm (1mm) and document this on Badgernet and gender and age-appropriate growth charts. This process should be completed (where possible) three times and the mean (average) measurement should be used e.g. add the three values together and divide by three.

Appendix 1: Equipment

[Dunmow | Health for all Children](#)

[Marsden HM-80D Marsden Baby Tray and Digital Height Rod Measure | Marsden Weighing \(marsden-weighing.co.uk\)](#)

Appendix 2: Resources

- Stress signs and cues: <https://neonatalnetworkssoutheast.nhs.uk/professionals/guidelines/tvw-guidelines/cue-based-care>
- Behavioural stages: [Developmental follow-up of children and young people born preterm](#)
- Education and Training Video: KSS Measuring Video: <https://youtu.be/GcHLvJKAbXc>



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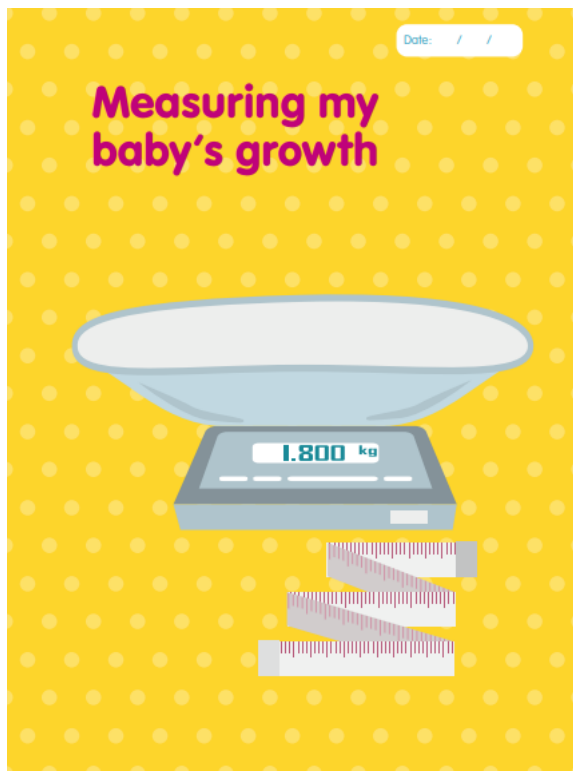
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Resources

Baby Steps: Our Neonatal Journey card: Measuring My Baby's Growth



Weighing and measuring

Weighing your baby on the neonatal unit will be carried out frequently to monitor their growth and nutritional status. Your baby's consultant will determine the frequency of weighing depending on their clinical need.

To have a better picture of nutritional status and growth, your baby's weight and length will be measured. Your baby's head circumference is also important as it reflects their brain growth.

The neonatal team can support you to be involved as much as possible and consider strategies to help your baby feel comfortable whilst they are weighed and measured. Your baby can feel reassured by your voice, gentle touch and presence. You could offer skin-to-skin before and/or after weighing and measuring and offer positive touch, talk, hum or sing to your baby.

Parents know their baby best, and during weighing and measuring is a good opportunity to learn about your baby's behavioural cues and be able to respond in a way that helps your baby feel comfortable and safe. Babies born prematurely generally prefer to be moved slowly and rest in a flexed position with their hands close to their mouth. You can help them by wrapping your baby in a soft muslin or keep them in their nest during weighing and measuring.

To minimise the disruption to your baby's routine, they will be weighed at an appropriate time of the day, when they are awake and calm, avoiding feeding and nap times.

Tips from parents

'Although you will worry...try not to focus too much on the numbers. It is normal for your baby's weight and size to fluctuate. Try to take each day at a time and not compare'

Scan the QR codes for more information:

Understanding
your baby's
growth charts
Tommy's website



Weight
conversion chart
South East
website

