

# GROWTH MONITORING

## DEFINITION

- Routine accurate measurement and documentation of weight, length and occipitofrontal circumference (OFC)

## AIM

- To detect any abnormal growth patterns, including faltering growth

## INTRODUCTION

- Neonatal nutrition and resulting postnatal growth are major determinants in the short- and long-term outcomes of preterm neonates
- Optimal postnatal nutrition and growth are associated with more positive later health and developmental outcomes
- Consider proportional growth rather than absolute weight gain
- Preterm babies who demonstrate suboptimal growth in the early years have a higher probability of poorer cognitive developmental outcomes, while those with excessive weight gain have an increased risk of childhood and adult obesity, cardiovascular disease and diabetes
- Plot measurements of weight, length and OFC on appropriate age and sex specific growth chart to allow assessment of adequate velocity and proportionate growth
  - measurements to be undertaken by qualified member of staff trained in the use of the equipment in presence of parents as per FICare plan
- Involve parents/carers with all growth monitoring procedures

## WEIGHT

### Frequency

- Weigh all babies on admission to NNU/transitional care unit
- Weigh at least 3 times/week while an inpatient
- Weighing days on the NNU at Worcestershire Royal Hospital:
  - ITU – daily
  - HDU and side room 1&2 – Monday, Wednesday, Friday
  - Nursery – Monday and Thursday
  - TCU – every 3 days
- Plan weighing schedules taking into account developmental care needs and FICare principles
- If baby too unstable to be weighed for >5 consecutive days, and incubator does not have inbuilt scales:
  - calculate weight-for-age from appropriate growth chart
  - use as working weight (assuming baby is following their previous centile line) to ensure adequate fluids, enteral and parenteral nutrition, and drugs administered
  - reinstate routine weighing once baby stable
- If baby unstable, assess for fluid overload – impacts on accuracy of weighing for growth monitoring

### Equipment

- Class III electronic baby scales or incubator with inbuilt scales (if available) – accurate to 5 g
- All scales to be:
  - tested and recalibrated annually
  - cleaned between patients in accordance with local infection control policy

### Method

- Wash and sanitise hands and equipment as per local infection prevention policy
- Weigh baby in nappy only (no clothing)
- Use swaddled weighing for optimal developmental care

- wrap baby in a warm, pre-weighed blanket
- deduct weight of swaddle blanket, [no need to deduct weights of nappy or medical equipment (e.g. NGT, CVL, cannula etc.)]
- Record actual calculated weight on unit documentation/**BadgerNet**
- ≤999 g: to nearest 5 g
- ≥1 kg: to nearest 10 g
- Plot weight at least weekly on **BadgerNet** or sex appropriate WHO **Neonatal and infant close monitoring growth chart** [see chart or refer to RCPCH website ([www.growthcharts.rcpch.ac.uk](http://www.growthcharts.rcpch.ac.uk)) for instructions on use]
- In babies <2 kg: calculate velocity of weight gain in g/kg/day at least weekly
- Use World Health Organisation fetal weight gain as a guide:

Gestational age (weeks)	WHO fetal weight gain (g/kg/day)
23–25	20–23
26–29	17–20
30–34	13–17
35–37	10–13

- If parent is present baby will benefit from skin-to-skin contact before returning to incubator/cot

## LENGTH

### Frequency

- The gold standard is to measure all babies on admission to NNU and weekly thereafter coinciding with a weigh day whilst an inpatient

### Equipment

- ≤33 weeks or <45 cm: use Leicester Incubator Measure
- ≥33<sup>+1</sup> weeks: use length mat
- Requires 2 people to obtain an accurate measurement (1 may be parent/carer alongside trained member of staff)

***Never use a tape measure to measure length***

### Method

- Wash and sanitise hands and equipment as per local infection prevention policy
- Measure baby supine, lying flat, ensuring no clothing, gel pillow or nests restrict extension
- Remove hat or ventilation/non-invasive ventilation hat ties
- If infant is in an incubator, ensure mattress is flat and not at an angle
- Preterm babies may be measured in a nappy
- Term babies to be measured naked, no nappy
- **Operator 1:** place fixed headpiece against crown of baby's head, stabilising head by gently cupping palms of hands over baby's ears
- **Operator 2:** gently place palm of hand over baby's knee encouraging extension, sliding base plate up to meet the soles of the feet
- If baby settled and relaxed, take 3 measurements to ensure consistency
- Ensure a developmentally friendly approach is considered throughout, in line with the infant's needs at the time of measurement
- This includes consideration towards wrapped length and parent support for comfort hold/dummy and to encourage skin to skin after the procedure
- Record length in cm to nearest 0.1 cm
- Plot length weekly on **BadgerNet** or sex appropriate WHO **Neonatal and infant close monitoring growth chart** [see chart or refer to RCPCH website ([www.growthcharts.rcpch.ac.uk](http://www.growthcharts.rcpch.ac.uk)) for instructions on use]

- Calculate velocity of linear growth in cm/week monthly
- aim 1.4 cm/week as steady linear growth in preterm baby

## OFC

### Frequency

- Measure on admission to NNU and weekly thereafter coinciding with a weigh day while inpatient

### Equipment

- Disposable paper tape measure

### Method

- Wash and sanitise hands as per local infection prevention policy
- Remove hat or head gear that may obstruct measurement
- Using disposable paper tape measure, take measurement at the widest part of baby's head
  - above ears, midway between eyebrows and hairline at the front, and to the occipital prominence at the back of the head
- Record in cm to nearest 0.1 cm on NNU documentation
- Plot OFC weekly on **BadgerNet** or sex appropriate WHO **Neonatal and infant close monitoring growth chart** [see chart or refer to RCPCH website ([www.growthcharts.rcpch.ac.uk](http://www.growthcharts.rcpch.ac.uk)) for instructions on use]
- Calculate velocity of OFC growth in cm/week monthly
- aim 0.9 cm/week as steady OFC growth in preterm baby

## INTERPRETATION

- Growth charts are a tool to monitor growth and growth velocity
- After initial weight loss of 7–10%, reaching a nadir at days 3–4, nutritional strategies should aim for baby to regain birth weight by days 7–10, followed by growth along a target centile
- Babies with slow growth velocity (less than expected over 1 week period), growth failure or whose growth parameters continue to fall across centiles into week 3 of life, to have a full nutritional review
  - include calculation of any parenteral nutrition received (not only prescribed), and enteral nutrition intake
- If combined nutritional intake falls short of recommended requirements: optimise nutritional intake (see **Nutrition and enteral feeding** guideline)
- if growth remains suboptimal: see **Nutrition and enteral feeding** guideline – **Inadequate growth**
- If baby exhibiting suboptimal growth: refer to NNU nutrition team or neonatal/paediatric dietitian

## DISCHARGE

- Transfer key information regarding growth to Personal Child Health Record (PCHR) or Red Book
- Must include birth and discharge weight, length and OFC