Plotting preterm infants
Use the box birth weight chart for infants less than 32 weeks gestation and any other infants requiring detailed assessment.

Use this section for infants of less than 37 weeks gestation. As with term infants there may be some weight loss in the early days, before 42 weeks, plot on the 0–1 year chart with gestational correction.

Gestational correction
The actual age then draw a line back the number of weeks the infant was preterm and mark the spot with an arrow. This is the gestationally corrected age.

Some degree of weight loss is common after birth. Calculating the percentage weight loss is a useful way to identify babies who need assessment.

- Measure length until age 2. Measure height after age 2.
- A child’s height is usually slightly less than their length.
### BOYS UK-WHO Growth Chart 0-4 years

**A growth chart for all children**

The UK-WHO growth chart combines World Health Organization (WHO) standards with UK preterm and birth data. The chart from 2 weeks to 4 years of age is based on the WHO growth standard, derived from measurements of healthy, non-deprived, breastfed children of mothers who did not smoke. The chart for birth measurements (32-42 weeks gestation) is based on British children measured around 1990. The charts depict a healthy pattern of growth that is desirable for all children, whether breast fed or formula fed, and of whatever ethnic origin.

#### Weighing and measuring

- **When measuring height or weight:**
  - When measuring children up to 2 years, remove all clothes and nappy; children older than 2 years should wear minimal clothing only. Always remove shoes.
  - Weight: use only class I electronic clinical scales in a metric setting.
  - Length: record to the nearest 2 cm for children up to 1 year of age; proper equipment is essential (length board or mat). Measurers should be trained.
  - Height: from 2 years: use a rigid rule with a zero baseline. Position head and feet as illustrated with child standing as straight as possible.

#### Plotting measurements

For babies born at term (37 weeks or later), plot each measurement on the relevant chart by drawing a small dot at age 0 on the 0-1 year chart. The coloured arrows at age 0 represent UK birth weight data and show the child's birth centile.

- **Plot birth weight (and, if measured, length and head circumference) at age 0 on the 1 year chart.** The coloured arrows at age 0 represent UK birth weight data and show the child's birth centile.

#### When to measure length or height

Length or height should be measured whenever there are any worries about a child's weight gain, growth or general health.

#### Plotting measurements

- For babies born at term (37 weeks or later), plot each measurement on the relevant chart by drawing a small dot at age 0 on the 0-1 year chart. The coloured arrows at age 0 represent UK birth weight data and show the child's birth centile.

#### Centile terminology

- **Cheat card:** Indicates the height and weight centile.
- **Gestational correction:** How much lower a child's weight should be to follow the same centile after the transition.
- **Length/Height:** Used when a child is measured standing up or lying down.
- **Head circumference:** Used when a child is measured sitting up or lying down.

#### Interpreting the chart

**Assessing weight loss after birth**

Most babies lose some weight after birth but 80% will have regained their birth weight within 5 days. Fewer than 5% of babies lose more than 10% of their weight at any stage; only 1 in 50 are 10% or more lighter than birth weight at 2 weeks.

Percentage weight loss can be calculated as follows:

- **Weight loss = current weight - birth weight**
- **Percentage weight loss = (Weight loss / birth weight) x 100**

For example, a baby born at 3.5kg who drops to 3.15kg at 5 days has lost 350g or 10%; in a baby born at 3.00kg, a 300g loss is 10%.

#### Careful clinical assessment and evaluation of feeding technique is indicated when weight loss exceeds 10% or recovery of birth weight is slow.

**What are the centiles mean?**

These charts indicate a child’s size compared with children of the same age and maturity who have shown optimum growth. The chart also shows how quickly a child is growing. The centile lines on the chart show the expected range of weights and heights (or lengths). Plotting the number of children expected to be below that line (e.g. 50% below 50th, 95% below the 95th) provides orientation for ease of plotting.

#### Plotted from 37 weeks gestation

- **Plot birth weight (and, if measured, length and head circumference) at age 0 on the 0-1 year chart.** The coloured arrows at age 0 represent UK birth weight data and show the child's birth centile.

#### Weight gain in the early days varies a lot from baby to baby, so there are no lines on the chart between 0 and 2 weeks. However, by 2 weeks of age most babies will be on a centile close to their birth centile.

#### For preterm infants

A separate low birth weight chart is available for infants of less than 32 weeks gestation and any other infant requiring detailed assessment. For healthy infants born from 34 weeks and before 37 weeks, plot all measurements in the preterm section (to the left of the main 0-1 year chart) until 42 weeks gestation, then plot on the 0-1 year chart using gestational correction, as shown below.

#### The preterm section can also be used to assess the relative size of infants at the margin of ‘term’ (e.g. 37 weeks gestation) is based on British children measured around 1990. The charts depict a healthy pattern of growth that is desirable for all children, whether breast fed or formula fed.

#### What is a normal rate of weight gain and growth?

Babies do not all grow at the same rate, so a baby’s weight often does not follow a particular centile line, especially in the first year. Most children are likely to track within one centile space (the gap between the two outer lines, see diagram). In infancy, acute illness can lead to sudden weight loss and a weight centile fall, but the child’s weight usually returns to its normal centile space within 2-3 weeks. However, a gained drop through two or more weight centile spaces is unusual (fewer than 2% of infants) and should be assessed by the primary care team, including a specific health assessment.

Because it is difficult to measure length and height accurately in pre-school children, successive measurements commonly show wide variation. If there are worries about growth, it is useful to measure a child only a few occasions over time; most healthy children will show a stable average position over time.

#### Using the chart

UK children have relatively large heads compared to the WHO standard, particularly after the age of 6 months. After the age of 6 months, head circumference by the 2nd centile will be seen in only 1 in 250 children. A head circumference above the 99th centile, or crossing upwards through 2 centile spaces should only cause concern if there is a continued rise after 6 months, or other signs or symptoms.

#### Why do the length/height centiles change at 2 years?

The growth standards show length data up to 2 years of age, and height from 2.5 to 24.5 years. When a child is measured standing up, the spine is squashed a little, so their height is slightly lower. The centile line shifts slightly at age 2 to allow for this. It is important that this difference does not worry parents; what matters is whether the child continues to follow the same centile after the transition.

#### Predicting adult height

Parents like to know how tall their child will be as an adult. The child’s most recent height centile (aged 2 years) is a good idea of this for healthy children. Plot this centile on the adult height predictor to the right of the height chart to find the average adult height for children on this centile. Four out of five children will have adult heights that are within 6cm above or below this value.

#### Weight-height to BMI conversion chart

BMI indicates how heavy a child is for his or her height and is the simplest measure of thinness and fatness from the age of 2, when height can be measured fairly accurately. This chart provides an approximate BMI centile, accurate to a quarter of a centile space.

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**References**

