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For healthcare professional use only

A practical guide for parents to monitor their child's growth at home



Aim of this document

The purpose of this document is to help parents/carers to perform growth measurements at home, whilst access to healthcare professionals and services is limited. Guidance on performing growth measurements will support those with measuring equipment (scenario 1) or without (scenario 2).

How to use this document:

This document provides guidance on:

- a) How to perform weight and length/height measurements at home
- b) Which equipment can be used
- c) How to assess your child's growth and how frequently to monitor



Important note: This document is provided as guidance and should not be used as a substitute for medical advice.

1. When measuring equipment is available at home

Weight measurement: <2 years of age



- **Equipment required:** Clean digital weighing scales (either baby or family scales), on a table or level surface (not on a carpet or wobbly wooden floor)
- **Before you start:** Remove all clothing, including nappy, socks and vests

If you have a baby scale:

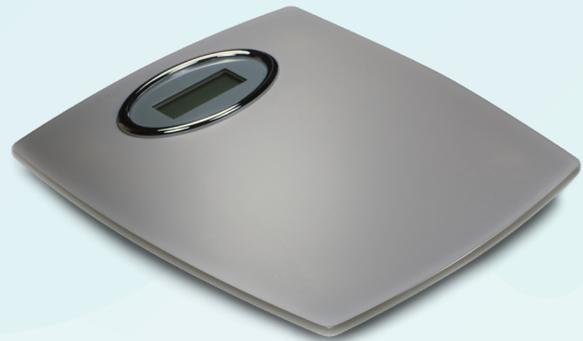
1. Place kitchen towel or a light baby blanket on the scales. Zero the scales with this on it before you start the weighing procedure.
2. Place the baby on their back lying down.



If it is possible, write down up to the closest 2 decimal points (e.g. 6.75 kg) but if not possible, then to 1 decimal point (e.g. 6.7 kg).

If you have a family digital scale:

1. Stand on the digital scale and ask a second person to note the weight measurement down.
2. The second person should then hand you your baby/toddler.
3. Ask the second person to write the new reading down and then subtract the old reading from the new reading to record your baby's weight. As before, this should be to the closest 2 decimal points if possible.



Repeat the weighing process twice, in order to get two measurements. If there is more than 50 g difference between the two measurements, repeat for a 3rd time and take the average of all three measurements.

Weight measurement: >2 years of age



- **Equipment required:** Clean digital family weighing scales, on a level surface (e.g. tiles) and not on a carpet or wobbly wooden floor
- **Before you start:** Weigh only in light clothing so remove shoes, socks and most clothes



Perform the length/height after the weight, when your child is already undressed.

1. Ask your child to stand in the middle of the scale, feet slightly apart, and to remain still until the weight appears on the display.
2. Write down the weight to the nearest 0.1 kg and repeat once in order to check the measurement.



Length measurement: <2 years of age

All children below 2 years of age should have their length measurement taken whilst lying down. A healthcare professional would normally use a length board (see figure 1), but you can design one at home by following the instructions below. This method requires two people.

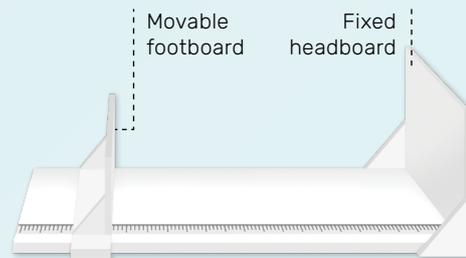


Figure 1.



- **Equipment required:** Skirting board, book, tape measure and a towel
- **Before you start:** Remove all of the infant's clothing including anything covering their feet



1. Using sticky tape, affix a tape measure to the hard floor surface. Fix 0 on the measuring tape to the bottom of the skirting board.
2. Place the towel flat on the ground, beside the tape measure, so that your baby will be comfortable and not lying directly on the floor.
3. Gently place your child onto the towel and ensure that the crown of the head touches the skirting board. One adult should hold the baby's head, where the ears and eyes are perfectly aligned in a vertical line upwards against the skirting board (see figure 2).
4. Make sure that the tape measure is flat, and in a straight line. The second adult should gently flatten the legs and place the book at the child's feet and take the reading where the tape meets the heel of the foot (figure 2).

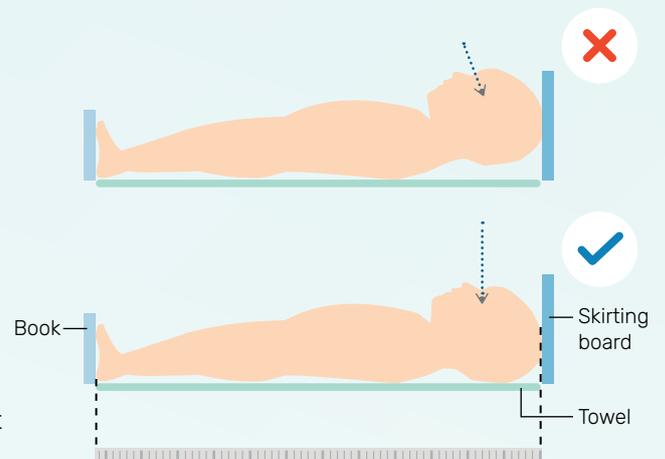


Figure 2.



Repeat this a 2nd time and if there is more than a 0.1 cm difference between the two measurements, repeat for a 3rd time and take the average of all three measurements.

Height measurement: >2 years of age

After the age of 2, children can be measured standing up. A healthcare professional would normally use a stadiometer (see figure 3), but you can design one at home using a tape measure and a book.



Figure 3.



- **Equipment required:** A solid floor without skirting board, book, tape measure
- **Before you start:** Remove your child's shoes, socks and hair bands. Make sure your child is wearing light clothing



1. Before taking the measurement, stick a piece of A4 paper to the wall with tape around the area where you estimate your child's height, so that you can make a mark at this point.
2. Help your child to stand on the floor with feet slightly apart. The back of the head, shoulder blades, buttocks, calves, and heels should all touch the wall. The child's trunk should be balanced over the waist, i.e., not leaning back or forward.
3. Stabilize your child's knees and ankles (so that they do not flex their knees) to help keep the legs straight and feet flat, with heels and calves touching the wall.
4. Position your child's head so that it is in a neutral position facing forward (head should not be tilted up or down). Still keeping the head in position, ask a second person to gently place a hardback book on the child's head.
5. Ask your child to step away from the wall and make a mark on the A4 paper where the lower site of the book meets the wall.
6. Using the tape measure, measure from this point to the floor.



Record the child's height in centimeters to the last completed 0.1 cm if possible. Repeat this a 2nd time and if there is more than a 0.1 cm difference between the two measurements, repeat for a 3rd time and take the average of all three measurements.

Assessing your child's growth

After you have completed the above measurements it is important to try to identify trends, or patterns, of growth in your child. Please follow the steps below to assess your child's growth.



Important note:

- i. If you own a **growth chart** with previous growth measurements plotted (i.e. from your previous medical appointments), new measurements should be plotted on the existing growth chart to provide you with a trend
>> In this case, please skip step 1 and move directly to step 2.
- ii. If you **do not have a growth chart**, start plotting all growth measurements on a new growth chart
>> In this case, please follow all the steps.

Reminder: If you have previous measurements (i.e. from your previous medical appointments) but these have not been plotted on a growth chart, please plot all growth measurements together on a new growth chart. Similarly to the scenario (ii), follow all the steps.

Step 1 Use **WHO** growth charts

Use the World Health Organization (WHO) growth charts in the link below, or WHO-based local country growth charts, which may be obtained online from your country's local health department.

Choose the appropriate chart for your child based on their age and gender:

a) Gender adapted growth charts:



<https://www.who.int/tools/child-growth-standards/standards>

b) Age adapted growth charts:



Weight measurement & age

Weight-for-age graph (birth - 2 years)
Weight-for-age graph (2 years - 5 years)



Length/Height measurement & age

Length-for-age graph (birth - 2 years)
Height-for-age graph (2 years - 5 years)



Note: For home growth measurements, it is best to focus on 2 categories of charts
→ Weight-for-age and Length/Height-for-age (depending whether your child is above or below 2 years)

Step 2

Plot your measurements on the relevant growth chart and identify growth trends or patterns

Find the age on your child's growth chart first (this will be on the x-axis/the line at the bottom of the chart) and use a ruler to help guide you to plotting the weight/length/height (on the y-axis/the line on the left hand side on the chart) that corresponds to the child's measurements. Please see the examples below.



Note: It is important to establish your child's age in weeks accurately. This is particularly important for babies < 1 year of age. It is easier to use an online age calculator to obtain the exact age in weeks for a young baby, to ensure that the plotting of growth is as accurate as possible. You can follow this link: <https://www.calculator.net/age-calculator.html>

Example 1

Boy

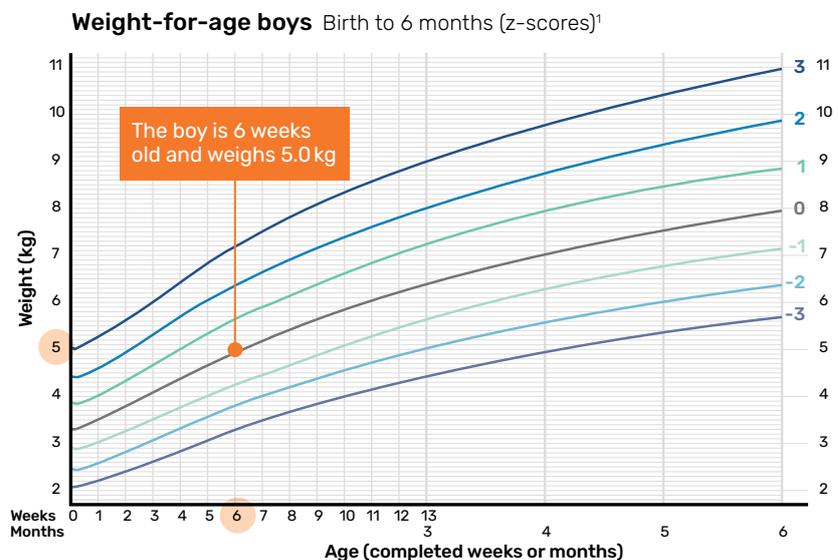
5.0 kg weight

6 weeks of age

Use the weight-for-age growth chart and plot the points as outlined above.



Similarly, plot all the available measurements and connect the points with a straight line to better observe any trends or patterns.



Example 2

Boy

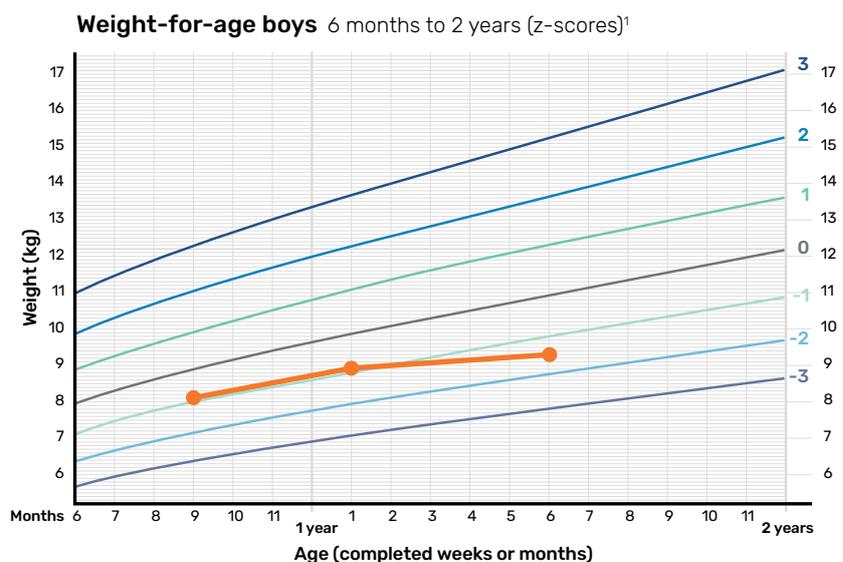
(3 different measurements over time as shown below)

9 months: 8.2 kg

13 months: 9.0 kg

18 months: 9.3 kg

The chart opposite shows the growth measurements of a boy plotted on a weight-for-age chart at 3 different times over the course of a year (at 9 months, 13 months, 18 months).



Note: Each measurement should be taken twice before you plot your child's growth on the graph. At the first available opportunity please measure your child's weight and length/height at a health clinic with more accurate equipment.

Step 3

Interpreting growth trends/plotted points

Before you start to interpret a growth trend, it is important to understand:

1. The curved lines on the graph are reference lines that will help you interpret the plotted points and identify trends or patterns.
2. The line labeled 0 on each chart represents the average weight or length/height for that age. The other curved lines are z-score lines. **Z-score lines** are used to describe **how far a measurement is from the average**.² For example, a z-score of 1 describes a difference of 1 standard deviation from the average measurement.²

The larger the z-score, the greater the difference from the average.² A **positive z-score** indicates a measurement that is **higher than average**, while a **negative z-score** indicates a measurement that is **lower than average**.² Being higher or lower than average is not necessarily a 'bad' thing, it is more important to **identify changes** in your child's growth.

Interpretation of weight/growth trends scenarios

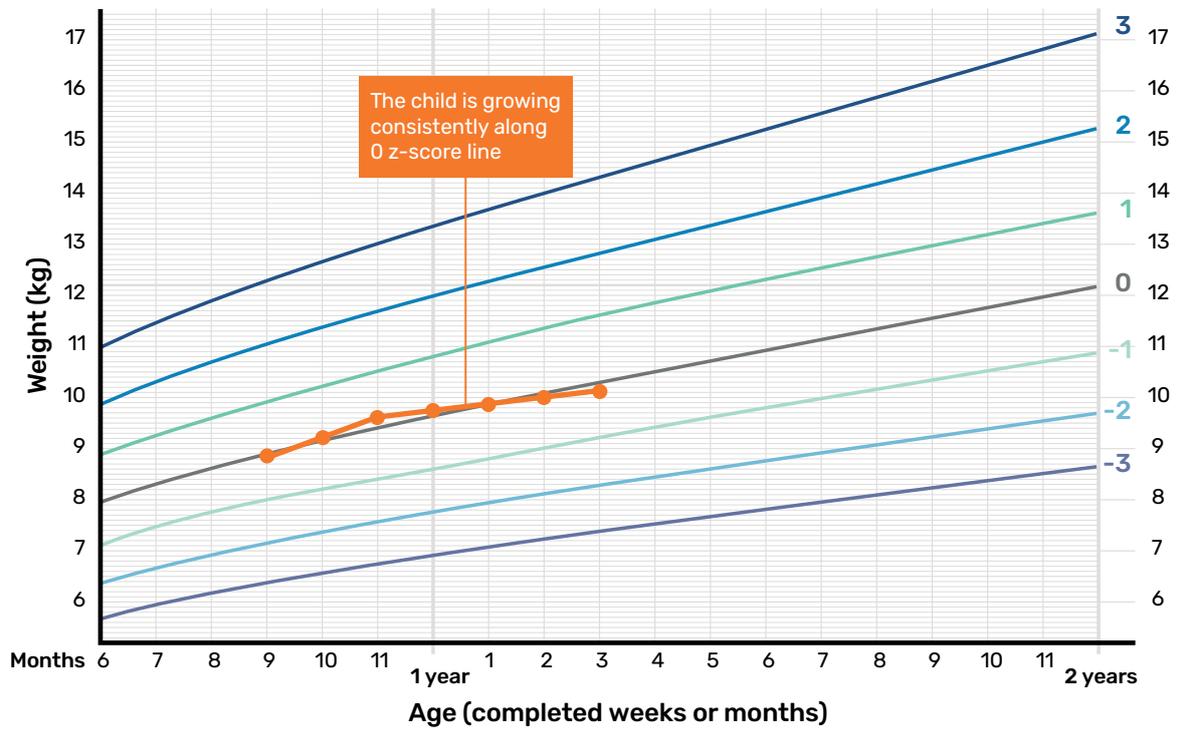
| Growth trend | | Action | | Examples |
|--|---|---|---|-----------|
| Child is growing well in weight for age, following the same line | ➡ | Your child is growing well. Continue to measure growth and observe for any different trend that may develop | ➡ | Example 1 |
| Child is dropping 1 or more z-score(s) in weight for age (crossing from 1 z-score line to the line below) | ➡ | Closely monitor and contact your HCP | ➡ | Example 2 |
| A child that is gaining weight and is going up 1 or more z-score(s) (crossing from 1 z-score line to the line above) | ➡ | Closely monitor and contact your HCP | ➡ | Example 3 |
| A child is growing between z-score lines, but has not yet changed z-score | ➡ | Closely monitor and contact your HCP if you are concerned | ➡ | Example 4 |

i **Note: Please look at the 4 examples on the following pages and familiarize yourself with the interpretations in order to better identify your child's growth trends or patterns.**

Example 1

Weight-for-age boys

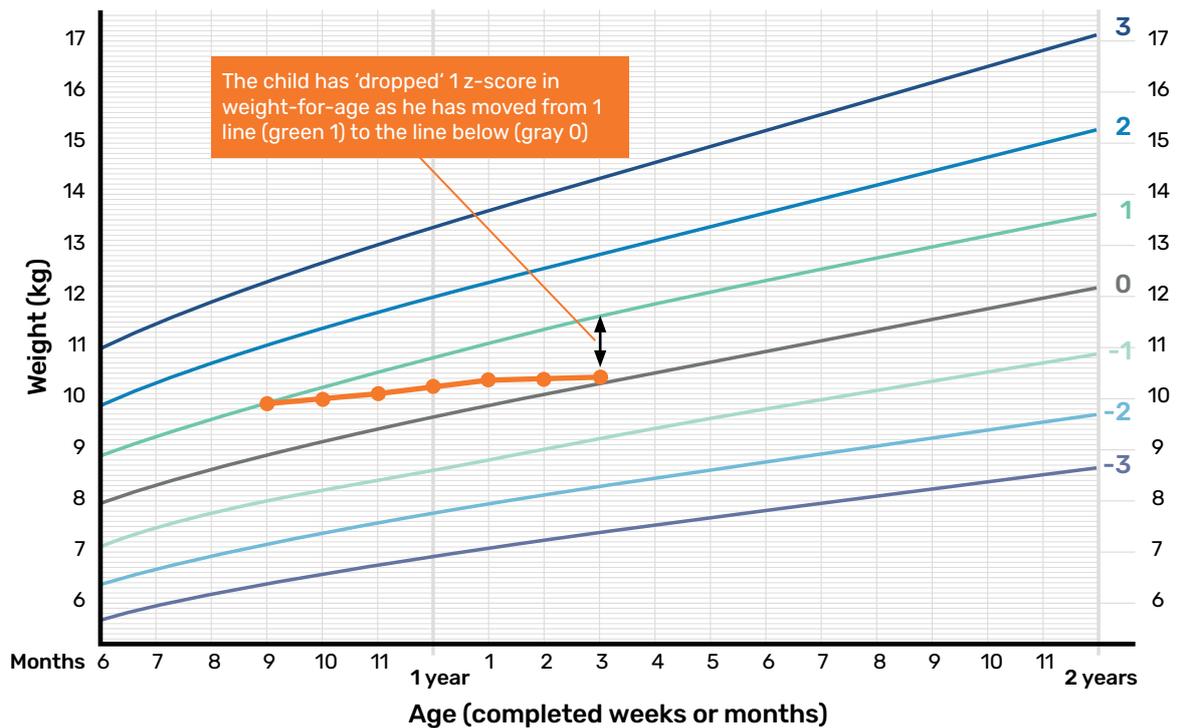
6 months to 2 years (z-scores)¹



Example 2

Weight-for-age boys

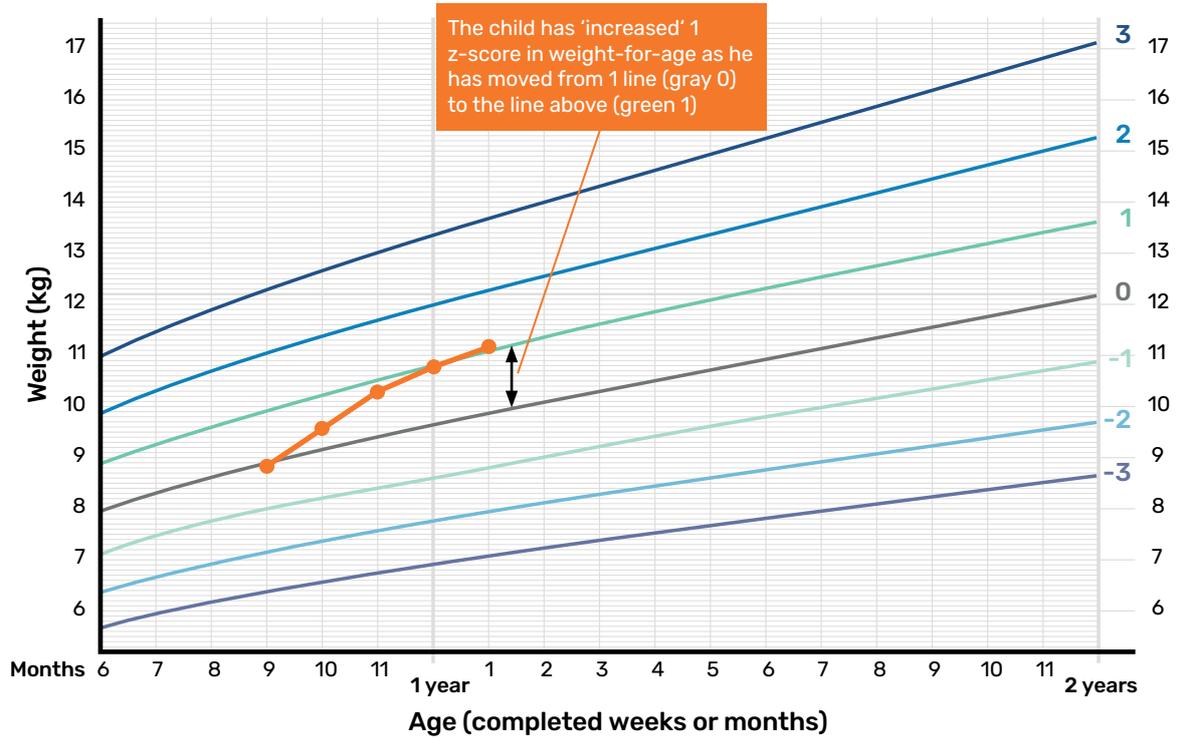
6 months to 2 years (z-scores)¹



Example 3

Weight-for-age boys

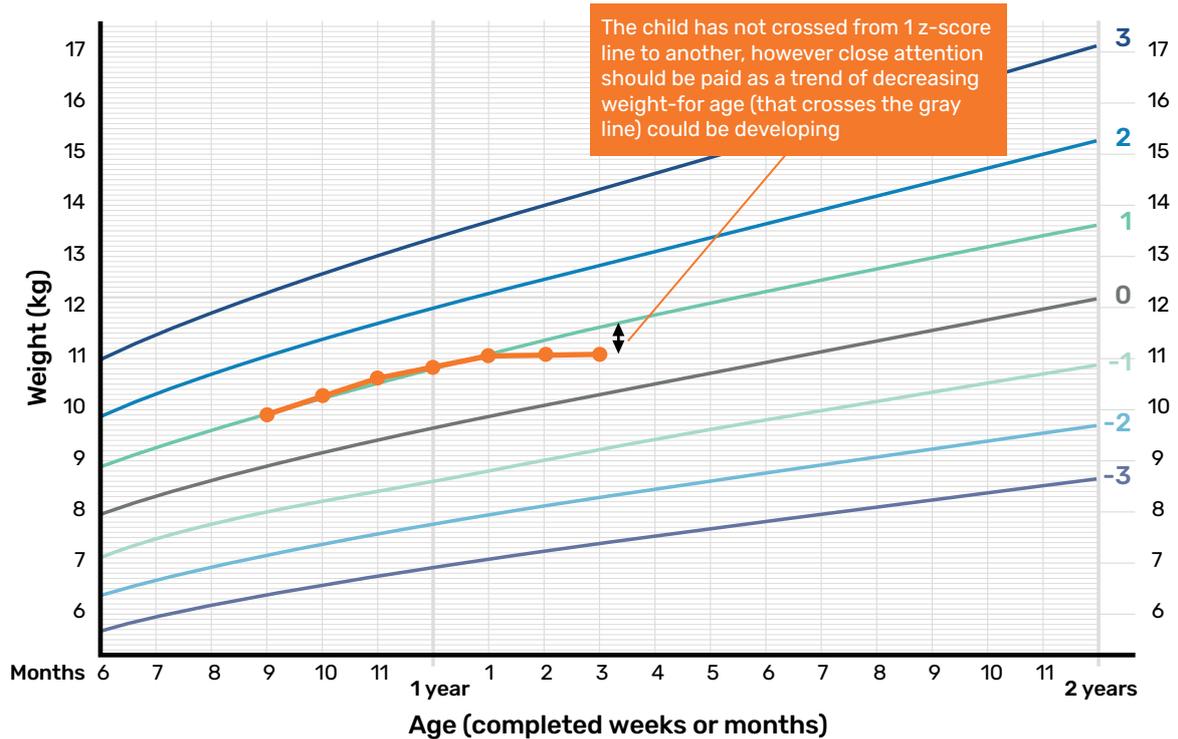
6 months to 2 years (z-scores)¹



Example 4

Weight-for-age boys

6 months to 2 years (z-scores)¹



Growth monitoring: frequency of measurements

Where there is a concern regarding growth – measurements should be repeated regularly (Table 1)

Table 1: Frequency of anthropometrical measures where there are growth concerns

| Growth measurements | Preterm infant ≤37 weeks gestational age | If < 1 month old | 1 – 6 months | 6 – 12 months | From 1 year |
|---------------------|--|------------------|--------------|---------------|-------------|
| Weight | 2 – 3 x week | 2 x week | Weekly | Fortnightly | Weekly |
| Length | Monthly | Monthly | Monthly | Monthly | 3 monthly |

2. When measuring equipment is not available

If you do not have any measuring equipment e.g. tape measure or scales, consider the following points:

1. Was there concern about your child's growth before? This is important to assess the level of concern.
2. Do you think that your child is not gaining weight/your child's clothes are looser than they were and/or you are not changing to new clothes as anticipated?
3. Does your child have a poor appetite/refuse meals more than usual or is your child tiring more easily during feeds and not finishing milk/refusing milk?
4. Does your child have more frequent vomiting/loose stools?



Important note: If you have answered yes to one or multiple of the above questions, contact your healthcare professional via phone/video consultation to assess what services are available to help.

Useful resources

Infant Toddler Forum

<https://infantandtoddlerforum.org/>

Webinar on how to take growth measurements at home, delivered by a pediatric nutrition expert

<http://www.rosan-paediatricdietitian.com/how-to-guide-on-monitoring-child-growth-at-home/>

References

1. World Health Organization. Training Course on Child Growth Assessment. Geneva, WHO, 2008.
2. World Health Organization. Child growth standards. Boys simplified field tables- Weight-for-age: Birth to 5 years (z-scores).



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