Maternal and Child Health Nurse
BMI education resource

Section 2: Weighing and measuring a child

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Section 2: Weighing and measuring a child

To assess whether a child is a healthy weight, the first step is to obtain an accurate height and weight.

The areas addressed in this section are:
- What equipment you need to weigh and measure children.
- How frequently equipment should be calibrated.
- The key procedures on how to accurately weigh and measure children.
- An understanding of some errors that can occur when weighing and measuring.

Did you know?
Based on a survey completed by 175 Maternal and Child Health Nurses in February 2006:
- 84% of 2 year olds are always or almost always weighed and measured.
- 38% of 4 year olds are always or almost always weighed and measured.
- 81% of respondents use digital scales.
- 23% of respondents use a rigid stand alone stadiometer.
- 6% of respondents have specific training in child measurement, and 70% completed training during a maternal child health course.

Equipment for weighing and measuring

The first step is to have the right equipment to obtain an accurate height and weight for the child.

Necessary equipment
To accurately calculate BMI you will need:
- Measuring equipment (ideally a Stadiometer with millimetre gradations).
- Scales (ideally electronic scales that weigh in kilograms, accurate to at least 0.1kg).
- A calculator.
- Girl and Boy BMI charts.
Equipment calibration

When was the last time you heard a parent say, “That’s not what our home scales says he weighs”? It is important that weighing scales at any health or medical centre weigh accurately. It is important to have your weighing equipment calibrated at least annually. Digital scales are more accurate, though may need more frequent calibration.

There is less evidence regarding the frequency of calibration for stadiometers, although best practice would be to have these calibrated annually – at the same time as the weighing scales. Calibration of stadiometers would also be required if there were changes in circumstances, such as adding or removing carpet or moving the position of the stadiometer.

Take a moment – reflect
When was the last time you had your weighing scales calibrated?
☐ Within the last year ☐ 1–2 years ago ☐ 3–4 years ago ☐ > 5 years ago ☐ Don’t know

When was the last time you had your measuring equipment (stadiometer) calibrated?
☐ Within the last year ☐ 1–2 years ago ☐ 3–4 years ago ☐ > 5 years ago ☐ Don’t know

Check your response on page 14.

Did you know?
Based on a survey completed by 175 Maternal and Child Health Nurses in February 2006:
• 64% had the scales used in their practice calibrated in the last year.
• 32% didn’t know when their scales were last calibrated.
• 9% had the measuring equipment used in their practice calibrated in the last year.
• 86% didn’t know when the measuring equipment was last calibrated.

Preparation

Take a moment – reflect
• Are you always aware of the clothing that a child is wearing when they are going to be weighed and measured?

The CD ROM contains a video clip on how to prepare young children for weighing and measuring.

To view the video clip, go to the “Resources” section of the CD ROM, click on the Video button and then click the video link title “How to prepare young children for weighing and measuring”.

Points to remember when preparing a child for weighing and measuring
Ensure that the following items are removed:
• Shoes
• Hair ornaments that may impede measurement
• Hair bands if hair is tied up and likely to impede measurement
• Hats
• Heavy outer garments (coat, jacket, big jumper)
• Heavy articles in pockets

Take a moment – reflect
• Under what types of circumstance do you think that you might forget to remove these items?
• What strategies would you use to get a child to cooperate to remove these items?
Measuring weight

Take a moment – reflect
• Where are the scales placed in your practice? Does this placement ensure best accuracy?
• Where do you position the child on the scales?
• How do you record the weight?

The CD ROM contains a video clip on how to accurately weigh young children.

To view the video clip, go to the “Resources” section of the CD ROM, click on the Video button and then click the video link title “How to accurately weigh young children”.

Points to remember when weighing a child
1. Ensure the scales are placed on a hard surface, and not moved around too often.
2. Press “on” button. Wait until scales show “0.0”.
3. Ask child to stand:
   • Centred on scales,
   • Feet evenly apart,
   • Hands by the side, not holding onto anything.
4. Ask the child to look straight ahead and stand still.
5. Read and record the measurement to nearest 0.1 kg. Write it immediately in the Child Health Record.
6. If the display flashes between two weights even when the child is standing perfectly still (eg. 20.5kg and 20.6 kg) record the weight to the nearest 0.05 kg (eg 20.55kg).

If you have balance weighing scales, read the following information for instructions for correct use.

Instructions for using balance scales
1. Ensure both weights are placed at zero.
2. Ask child to stand:
   • Centred on scales,
   • Feet evenly apart,
   • Hands by the side, not holding onto anything.
3. Ask the child to look straight ahead and stand still.
4. Slide the large weight slowly across the beam until you find a point at which the scales overweigh, then move the weight back one unit.
5. Slide the small weight slowly across the beam, until the scales are nearly balanced (often indicated with a central pointer).
6. Nudge the small weight gently until the scales are balanced. You may need to nudge the weight both backwards and forwards to achieve this.
7. Combine the total weights and record the weight accurate to 0.1kg (100g). For example if the large weight was on 14kg and the small weight on 600g, the child’s weight would be 14.6kg.
8. Write the measurement immediately in the Child Health Record.
What inaccuracies occur with weighing?
Errors can occur when weighing a child. What errors can you think of? Write these in the box below.

Your answers:

Check your answers with those supplied on page 14.

Implications of inaccurate weighing
These inaccuracies could easily result in a child being wrongly classified. For example, children who are a healthy weight could be classified as being “overweight” and vice versa. Misclassification can cause:
- Unnecessary concern,
- Inefficient use of resources, and/or
- Treatment not being provided where it is required.

More detailed examples related to inaccuracies are provided in Section 3: Calculating and plotting BMI.
Measuring height

Take a moment – reflect
• What equipment do you currently use to measure height?
• How do you position the child for measuring height?
• How do you read the height measurement?
• What information do you record and where is it recorded?

The CD ROM contains a video clip on how to accurately measure young children.

To view the video clip, go to the “Resources” section of the CD ROM, click on the Video button and then click the video link title “How to accurately measure young children”.

Points to remember when measuring a child
1. Bring the child over to the stadiometer and explain that you are going to measure their height.
2. Ask and/or help child to stand:
   • Up straight,
   • Feet and heels together,
   • Heels back against the upright section of the stadiometer,
   • Arms relaxed (floppy) by sides.
3. Ask child to look straight ahead at marker on the wall. Arms should be relaxed by sides, with palms facing inwards. Gently position their head: hold your hand around their jaw, so that the top of their head and the stadiometer form a right angle and their chin is not pointing down towards their chest.
4. Check that their head is still positioned correctly and their heels are still flat on the floor. Bring the set square down to rest on the child’s head.
5. Crouch down so your eye is level with where the height is shown and record the measurement to nearest 0.1cm. Make a note of this measurement immediately.
6. Ask the child to step off and step back onto the stadiometer and record a second measurement (you may be surprised by how much repeated height measures can differ). Take an average of these two measurements and record this in the Child Health Record.

Important note: If the two measurements disagree by 0.5cm or more, take a third measurement and calculate an average from the two closest measurements. Record this average in the Child Health Record.
What inaccuracies occur with measuring height?
Errors can occur when measuring a child for a number of reasons. What errors can you think of? Write these in the box below.

Your answers:

Check your answers with those supplied on page 14.

Implications of inaccurate measuring of height
Inaccuracies in measuring height could easily result in a child being wrongly classified. For example, if an overweight child’s height is recorded as taller than they actually are, they could be classified as normal weight. On the other hand, a healthy weight child could be wrongly measured as shorter than they actually are and classified as overweight, which could then cause unnecessary concern and inefficient use of resources.

More detailed examples related to inaccuracies are provided in Section 3: Calculating and plotting BMI.

Did you know?
Based on a survey completed by 175 Maternal and Child Health Nurses in February 2006:
- 86% respondents used correct equipment for measuring height.
- 14% used incorrect measuring equipment such as a fixed wall chart and book resting on the child’s head to create a 90-degree angle, or a hand-held yardstick.
Section 2 Answers

When was the weighing equipment in your practice last calibrated?

<table>
<thead>
<tr>
<th>Within the last year</th>
<th>Congratulations. Your scales have been calibrated in line with the recommendations.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 2 years ago</td>
<td>Not too bad, but your scales are due for another calibration.</td>
</tr>
<tr>
<td>3 – 4 years ago</td>
<td>Your scales are in desperate need for calibration, please make it a priority.</td>
</tr>
<tr>
<td>&gt; 5 years ago</td>
<td>Your scales are in desperate need for calibration, please make it a priority.</td>
</tr>
<tr>
<td>Don't know</td>
<td>Check when your scales were calibrated at the first opportunity. If it was over a year ago, they need to be calibrated.</td>
</tr>
</tbody>
</table>

When was the measuring equipment (stadiometer) in your practice last calibrated?

<table>
<thead>
<tr>
<th>Within the last year</th>
<th>Congratulations. Your stadiometer has been calibrated in line with the recommendations.</th>
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<tr>
<td>Don't know</td>
<td>Check when your stadiometer was calibrated at the first opportunity. If it was over a year ago, it will need to be calibrated.</td>
</tr>
</tbody>
</table>

Inaccuracies with weighing - Suggested answers

- Child wearing shoes.
- Child wearing heavy garments – e.g. coat, thick jumper.
- Child not standing still on scales.
- Child carrying heavy toys in pockets.
- Wrong equipment – e.g. scales not accurate to 0.1kg.
- Scales not calibrated properly.
- Reading the measurement wrongly.
- Scales not on a hard surface, so able to “rock”.

Inaccuracies with measuring height - Suggested answers

- Child wearing shoes.
- Child wearing hair up high, hair ornaments or a hat.
- Child positioned wrongly – e.g. with feet apart, heels not pushed to the back of stadiometer, knees bent or head angled incorrectly.
- Child standing on tip toes with heels off the floor at the last minute.
- Not reading height at eye level – this can alter the reading by several millimetres.
- Wrong equipment – e.g. using a book and tape measure.
- Stadiometer not accurate to nearest millimetre.
- Stadiometer not calibrated properly.
- Only taking one reading.
- Stadiometer not on a hard surface, so able to “rock” forward or backwards.