

Height and weight measurements No: 006D

1. Introduction

Height and weight measurements provide the necessary details to calculate the body mass index of subjects. This information provides a quantitative measure of obesity in individuals.

2. Responsibilities

Research nurses trained in the method are responsible for recording height and weight measurements from all subjects.

3. Equipment

- Marsden digital weighing scales
- Calibration weights (80kg) and height measure standards
- Marsden ultrasonic height measure

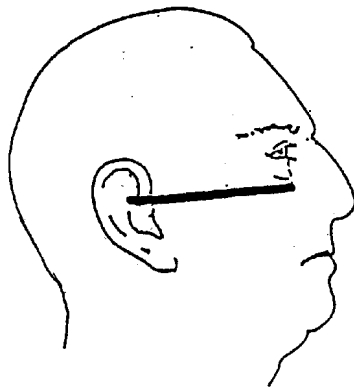
4. Method

4.1 Measurement of height

All subjects should be measured without shoes or socks. All hairstyles should allow the height measure to sit comfortably on their head.

- Instruct the subject to stand on a level floor with feet parallel and pointing forwards. Ensure the subject is standing unsupported and clear of any furniture which may impair the ultrasonic beam.
- Ensure that the subject is standing as tall as possible. Position the head in the Frankfurt Plane position (see figure 1), the lower border of the left orbit and the upper margin of the external auditory meatus are horizontal.
- Place the measure on the subjects head and ensure the spirit level is balanced.

Figure 1



The Frankfurt plane

- Instruct the subject to breathe out gently during the measurement. A bleep denotes the reading has been taken, take the measure off the subjects head, turn it over and read the height in the viewfinder. Record the height in centimetres.
- Ensure you have all the subjects details clearly recorded in the subjects case report file. The subjects participation in the procedure is then complete.

4.2 Measurement of weight

All subjects should be weighed in light clothing; coats, jackets and shoes should be removed.

- Instruct the subject to remove excess clothing, overcoats and shoes. Pockets containing money or keys should be emptied and any heavy jewellery should be removed.
- The scales comprises of 2 parts: a platform on which the subject stands and a hand-held control unit which displays the subject's weight. Place the weighing scales platform on an even floor surface. Hold the display unit in your hand or place it on a nearby table.
- Ensure the subject is ready to step onto the platform, switch the scales on and then press the ON button. Select kg's using the units button. The viewfinder should display [0.0], if it doesn't press the zero button until it is displayed.
- Instruct the subject to stand very still on the scales platform and ensure that they are standing free (not leaning on a chair or wall).
- The weight will be displayed in the viewfinder. Record the reading in kilograms and gram increments. If there is oscillation between two values, instruct the subject to stand still, if it still continues to oscillate take the lower reading.
- After the weight has been recorded instruct the subject to stand off the platform and re-apply any overclothes and shoes.
- Ensure you have all the subject's details clearly recorded in the subject's case report file. The subject's participation in the procedure is then complete. Switch off the scales.

4.3 Calculation of Body mass index

The scales can calculate the BMI measurement automatically. To achieve this, the following procedure should be performed:

- Record the subject's weight in kilograms. Listen to the bleep of the scales to denote the weight has been successfully recorded.
- Press and hold the BMI button on the scale's handset for at least 3 seconds. The screen will alter and show you a height of 1.70m. Alter this measurement using the HOLD (up) and SLOW (down) keys to the subject's own height recording. DO NOT measure the subject's height on the scales, as this will not be a true height recording. The subject must stand on the floor to have their height measured.
- After you have entered the subject's height, press the BMI button again. The BMI will automatically be calculated and displayed in the viewfinder.

- Subject's with a BMI greater than 30 should be excluded.
- Alternatively the body mass index can be calculated by using the following calculation:-

$$\text{Body mass index} = \text{Weight (Kg)} / [\text{Height {m}}]^2$$

The following arbitrary range of BMI values is widely used as a classification of obesity:

BMI > 30 = obese
BMI = 25-29 = overweight
BMI < 25 = normal
BMI < 19 = underweight

5. Additional Information

- The weighing scales should be calibrated monthly using the 80kg calibration weights. Any calibration drifts should be recorded in the calibration record book. Subsequent subject weights should be adjusted according to the calibration drift.
- Weight measurement is usually more accurate if performed first thing in the morning.
- The height measuring device should be calibrated using the set height calibration rods. A calibration record should be maintained in the calibration record book. Height measurements should be taken and adjusted according to the calibration drift.
- Both the weight and height measurement should be recorded twice.

6. Reference Documents

1. O'Brien E.T et al, (1995), ABC of Hypertension, BMJ Publishing group, London, 1-34
2. Measuring obesity - classification and description of anthropometric data, WHO report - consultation on the epidemiology of obesity. Warsaw 21-23 Oct 1987.