



## BIOMEDICAL MONITORING: CLINIC PROTOCOL AND PROCEDURE SUMMARY

MEASURE	TARGET RANGE	PROTOCOL AND PROCEDURE	RATIONALE
<p><b>BLOOD PRESSURE</b></p> <p>BP is recorded with a sphygmomanometer as <b>systolic blood pressure over the diastolic pressure (e.g. 133/87).</b></p> <p><b>Systolic pressure:</b> measures the pressure when the heart is contracting, and <b>diastolic pressure:</b> measures the pressure when the heart is relaxed between each beat.</p>	<p>High blood pressure (hypertension) defined as systolic blood pressure greater than or equal to 140mmHg and/or diastolic blood pressure greater than or equal to 90 mmHg<sup>1</sup>.</p> <p>BP is a measure of health status and risk of cardiovascular complications.</p> <p>BP measures determine medication treatment regimens that aim to keep resting BP below 140/90mmHg.</p> <p><b>Lying/Sitting &amp; Standing BP</b></p> <p>A positive result is:</p> <ul style="list-style-type: none"> <li>• A drop in systolic BP of <math>\geq 20</math>mmHg with or without symptoms</li> <li>• A drop below 90mmHg even if <math>&lt; 20</math>mmHg with or without symptoms</li> <li>• A drop in diastolic BP of 10mmHg with symptoms</li> </ul>	<p>Before the consumer is seated for monitoring, determine whether sleeve is able to be rolled up or an outer garment may need to be taken off to facilitate the use of the cuff.</p> <p>Measure to upper arm circumference to determine appropriate cuff size.</p> <p>Ensure the arm is supported on a desk or on a pillow on the consumers lap. Position the cuff 2-3cm above the crook of the elbow. Wrap the cuff firmly with the artery indicator on the cuff positioned in the centre of the inside of the arm.</p> <p>2 blood pressure measurements are taken 5-10 minutes apart while the consumer is relaxed and seated. It will be necessary to record the 2 readings in order to obtain a mean blood pressure reading.</p> <p>If completing a lying/sitting and standing BP. Three readings are to be taken. First after being seated or lying for 5 minutes. Second within the first minute of standing up. Third after being stood for three minutes.</p>	<p>Tight outer garments under a BP cuff can artificially raise the BP reading.</p> <p>Consumer actions of getting up and down from the chair and taking off the outer garment can artificially briefly raise BP.</p> <p>Incorrect size cuff can artificially raise the BP reading by as much as 15mmHg.</p> <p>Muscle contraction in the unsupported arm can raise BP artificially.</p> <p>To be accurate, blood pressure measures need to be taken twice (5-10 minutes apart), and when the consumer is at rest.</p> <p>During this time, the staff member has opportunity to talk with the consumer about relevant aspects of care or any consumer concerns.</p> <p>The lying/sitting and standing BP identifies sudden drops in BP and the ability of the body to recover. Notice and document symptoms of dizziness, light-headedness, vagueness, pallor, visual disturbances etc.</p>

MEASURE	TARGET RANGE	PROTOCOL AND PROCEDURE	RATIONALE
<p><b>HEIGHT</b></p> <p>Consumers will have their standing height recorded for BMI using a wall mounted stadiometer or hard tape measure.</p>	<p>Height is a single measure recorded in metres (m) to the nearest 0.5 centimetre.</p>	<p>Consumers remove their shoes (if possible), sunglasses and any hair accessories. The consumer stands in an upright position, with their head facing forward with a level gaze and heels back against the base.</p> <p>The top plate of the height measure is brought down to rest on the head (not just sitting on top of the hair). Where there is a curvature of the spine and resulting stooped posture, the position is as described but an extension to the top plate outwards to allow for the none contact of the plate with the head.</p>	<p>For the purpose of calculating BMI, adult height measure is encouraged annually and recorded.</p> <p>If the consumer refuses to remove shoes then measure the shoe heel and subtract the difference.</p>
<p><b>WEIGHT</b></p> <p>Body weight will be recorded on calibrated scales.</p>	<p>Body weight will be measured and recorded by a single reading in kilograms (kg) to the nearest 0.1 kilogram.</p>	<p>Check that the scales are reset to zero before consumer steps onto them.</p> <p>Consumers will be encouraged to remove shoes and any heavy garments (e.g. belt/buckle, money in change, keys) before stepping onto the scales.</p> <p>Care should be taken for consumers with unsteady gait. Chair scales if available should be used in these circumstances.</p> <p>Scales should be calibrated annually.</p> <p>Where possible scales with a 200 - 250kg capacity should be used.</p>	<p>Every 0.1 kilogram counts in measuring body weight accurately. Items like coat, shoes, keys, small change and shoes, even jeans can all be surprisingly heavy. If the participant is very obese, keep in mind the scales capacity. Alternative arrangements may need to be made to obtain an accurate weight reading.</p>

MEASURE	TARGET RANGE	PROTOCOL AND PROCEDURE	RATIONALE
<b>BMI</b>	<p>&lt;18.50 = underweight</p> <p>18.5 – 25 = healthy weight range</p> <p>25 – 30 = overweight</p> <p>30 – 35 = obese stage 1</p> <p>35 - 39.9 = obese stage 2</p> <p>40+ = obese stage 3 (morbid obesity)</p>	<p>Body mass index (BMI) is calculated by weight (kg) divided by height<sup>2</sup> (m<sup>2</sup>).</p> <p>On a calculator this can be obtained by weight in kg, divided by height in metres, divided by height in metres.</p> <p>BMI = <math>W(kg) \div H(m) \div H(m)</math></p>	<p>BMI is a guide only. Identifying the BMI provides opportunity for targeted education and intervention.</p>
<b>WAIST</b>	<p>International Diabetes Association Figures (2006)</p> <p>There is an indication of android obesity, if the waist measurement is greater than:</p> <p>European/North America/ Middle East/ Mediterranean and Sub-Saharan African</p> <p>&gt;94cm male</p> <p>&gt;80cm female</p> <p>South Asian / South-East Asian / Central and South American</p> <p>≥ 90cm male</p> <p>≥ 80cm female</p> <p>Values of 102cm Male and 88cm Female are used for clinical purposes in the USA</p>	<p>3 measurements of the waist are taken with the mean recorded in centimetres (cm) using an inelastic tape, maintained in a horizontal plane, to the nearest 0.1 centimetre.</p> <p><b>Waist circumference – 3 methods</b></p> <p>Have the consumer locate the top of their hip bones and the bottom of their ribs – the waist is centre of these two points.</p> <p>Place hand midway between the persons hips and ribs get the person to bend to squeeze the hand, maintaining the hand position get the person to stand up. The hand should be locating the waist.</p> <p>Follow along the person's skin fold, located between the side flank and the back, to the centre spine, draw a horizontal line back to the person's side, this should be the waist line.</p>	<p>An android or centralised pattern of fat distribution, where excess body fat is distributed in the abdominal region rather than on the hips and thighs, plays an important role in determining risk of cardiovascular disease and diabetes, particularly in men.</p> <p>Ensure that the measuring tape is even, firm but never tight and that clothing is not interfering with the measurement. In some cases, it may be necessary for the consumer to hold up their shirt or pullover. If trousers have a "baggy" appearance, have the consumer pull them up, to better define an outline.</p>

<sup>i</sup> Adopted from the North West Adelaide Health Study Clinic Manual Protocol