Recommendations

- Standard body measurements include height, weight and waist circumference.
- Measure the height and weight of adult and pediatric patients and clients.
- Measure waist circumference of only adult patients and clients.
- Use of estimated or self-reported data is not recommended.
- Body mass index (BMI) should be calculated from measured height and weight.
- BMI and waist circumference are used together to help estimate health risk. Health risk should not be based on BMI and waist circumference alone, but should be components of a more complete health assessment.

Health Benefits

Regular and accurate measurements of height, weight, and waist circumference, as part of a complete health assessment, provide important data about general health, risk of chronic disease and progression of pre-existing health problems.1

Key Questions

What is body mass index?

Body mass index (BMI) is a useful indicator to measure overweight and obesity and related health risk.1,2,3

BMI is calculated as follows: weight in kilograms divided by (height in metres, squared), or kg/m².1

Do not rely on self-reported height or weight.4,5

BMI does not provide information regarding the distribution of body fat or body composition.1,2 Distribution of body fat has an effect on health risk; for example, individuals with more fat in the abdominal area have a higher risk of disease.1

For adults:

Canadian Guidelines for Body Weight Classification in Adults 18 years and older using1

<table>
<thead>
<tr>
<th>Classification</th>
<th>BMI (kg/m²)</th>
<th>Risk of developing health problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt;18.5</td>
<td>Increased</td>
</tr>
<tr>
<td>Normal weight</td>
<td>18.5-24.9</td>
<td>Least</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0-29.9</td>
<td>Increased</td>
</tr>
<tr>
<td>Obese Class I</td>
<td>30.0-34.9</td>
<td>High</td>
</tr>
<tr>
<td>Class II</td>
<td>35.0-39.9</td>
<td>Very high</td>
</tr>
<tr>
<td>Class III</td>
<td>≥40.0</td>
<td>Extremely high</td>
</tr>
</tbody>
</table>

The BMI is not for use with pregnant or lactating women.1

For 65 years and older refer to Guideline: Seniors Health Overview
For children and adolescents:

For children and adolescents BMI-for-age is determined by plotting calculated BMI on the BMI-for-age gender-specific CDC (2000) growth chart.\(^2\)

- A healthy body weight is defined as a BMI-for-age equal to or greater than the 5\(^{th}\) percentile and less than the 85\(^{th}\) percentile.\(^2,6\)
- Overweight is defined as a BMI-for-age equal to or greater than the 85\(^{th}\) percentile and less than the 95\(^{th}\) percentile.\(^2,6\)
- Obesity is defined as BMI-for-age equal to or greater than the 95\(^{th}\) percentile.\(^2,6\)

Refer to Guidelines: Pediatric Weight Management; Adult Weight Management

Why measure waist circumference?

Waist circumference (WC) is an indicator of abdominal fat, and is an independent indicator of health risk.\(^1\) Adults with a high waist circumference are at increased risk of developing health problems such as type 2 diabetes, cardiovascular disease and high blood pressure.\(^1\)

Adults with a BMI over 35 are already categorized as very high risk for health conditions due to obesity; therefore, WC does not provide additional information regarding level of risk.\(^1,2\) WC can be used to monitor body composition changes during weight management treatment.

The WC cutoff values listed below are recommended by Health Canada. WC classification should be used as one component of a comprehensive health assessment.\(^1\)

<table>
<thead>
<tr>
<th>Waist circumference cutoff points(^\dagger)</th>
<th>Risk of developing health problems(^*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men ≥102 cm (40 inches)</td>
<td>Increased</td>
</tr>
<tr>
<td>Women ≥88 cm (35 inches)</td>
<td>Increased</td>
</tr>
</tbody>
</table>

\(^\dagger\)Not for use with pregnant or lactating women.

\(^*\)Increased WC can also be a marker for increased risk for developing diabetes and other chronic diseases, even in persons with normal weight.\(^7\)

\(^*\)Risk for type 2 diabetes, coronary heart disease, hypertension.

Research indicates WC cutoffs may be different in certain ethnic or racial populations.\(^3\) As a result, the International Diabetes Federation has proposed ethnic-specific WC cutoff values [see table below]. These values have not been fully validated against outcomes of chronic disease; however, they are presently recommended for study purposes and may be used in clinical assessment for individuals of the specified ethnic groups.\(^2\)
Nutrition Guideline
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| Ethnic-specific values for Adult Waist Circumference |
|---------------------------------|--------|------------------------------------------------|
| Country or ethnic group         | Waist Circumference |          |
|                                 | Men     | Women  |
| Europid                        | ≥94 cm  | ≥80 cm |
| South Asian, Chinese, Japanese  | ≥90 cm  | ≥80 cm |
| South and Central American      | Use South Asian cutoff points until more specific data are available |
| Sub-Saharan African             | Use Europid cutoff points until more specific data are available |
| Eastern Mediterranean and Middle East (Arab) | Use Europid cutoff points until more specific data are available |

How should height be measured?

**Adults:**
Height is measured with the individual wearing no shoes, standing in an erect position, looking straight ahead, with feet together, heels against a wall or measuring board. A horizontal bar or a similar device should be lowered so that it rests flat on the top of the person’s head. Height should be recorded to the nearest 0.5 cm.¹

Some people may not be able to place their heels against the wall due to body shape. The person should stand erect with contact of the buttocks against the wall. To ensure the person is standing in an erect position, align the earlobe, shoulder, hip and ankle in a straight line.

**Children and Adolescents:**
Children or adolescents should be measured without shoes, standing with heels, calves, buttocks, shoulder blades, and back of the head touching the measuring board.⁹ This may be difficult for an obese child; in this case, help the child to stand on the board with one or more contact points touching the board and the trunk balanced over the waist (i.e. not leaning forward or back).⁹ Position child with heels close together, legs straight, arms at sides, shoulders relaxed and looking straight ahead.¹⁰ The parent or childcare provider can help to align a young child. Measure to nearest 0.1 cm.⁹,¹⁰

If child 2 years old or younger and cannot stand, measure recumbent length and subtract 0.7 cm to convert it to height.⁹

How should weight be measured?

**Adults:**
An appropriate weight scale should be used in a clinical setting. It should provide a large low profile base, wheelchair accessible (ramp or level access) with a capacity of 364 kg (800 lbs) or greater. Weight should be measured with shoes off, single layer of light clothing and with pockets emptied. Measurement should be to the nearest 0.2 kg.¹

The scale should be located in an area that provides privacy for the measurement and permits individuals to remove excess clothing.¹⁰ Appropriate seating should be located in the area to permit individuals to sit comfortably to remove footwear.
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Children and Adolescents:

Children ≥2 years who can stand without assistance should be weighed using either a calibrated beam balance or electronic scale. The child or adolescent should be weighed without shoes and wearing only lightweight undergarments or a gown. If it is too cold or socially unacceptable to undress a child, or the child resists being undressed, remove as much clothing as able and note in the chart that the child was clothed when weighed. Record weight to the nearest 0.01 kg or ½ ounce.

If child will not stand still, use tared weighing. Tared weighing requires a scale that can be re-set to zero (“tared”) with the person just weighed still standing on it. To do tared weighing, weigh the parent on the scale, then reset the scale to zero. While the parent remains standing on the scale, give them the child to hold. Only the child's weight will appear on the scale.

How should waist circumference be measured?

1. Identify the midpoint between the bottom of the individual's rib cage and the top of the iliac crest. It is helpful to have the individual assist in finding the midpoint.
   - Palpate on yourself to show the individual what you are trying to find and have them mimic your hands to find the top of the iliac crest.
   - If instructing the individual to do the measurement independently, ask him/her to use a mirror to ensure that the tape is parallel to the floor all the way around.
   - If you cannot find the midpoint, then find the top of the iliac crest and measure. Document where the measurement was taken.

2. Have the individual stand with feet 25 to 30 cm (10 to 12 inches) apart, arms relaxed at sides.
3. Place a non-stretchable measuring tape horizontally around the abdomen at the identified midpoint.
4. Apply sufficient tension to maintain tape position without indenting the skin.
5. Crouching on the individual's right side, use a cross-handed technique to measure to the nearest 0.5 cm. The measurement should be taken at the end of a normal expiration. Ensure that the individual does not contract the abdominal muscles.
6. Repeat the measurement 3 times. Average the measurements, rounding the result to the nearest 0.5 cm.
7. Clean the tape before and after each use.
Other suggestions:
- Ask the individual to undo his/her belt and pants/skirt to remove any pressure in the abdomen.
- The measurement should be taken on bare skin, not over clothing.
- If the individual has a skin fold, ensure the measurement is taken on the exterior of the fold.
- Have at least a 2-metre tape measure available.
- If using a retractable tape measure that makes noise when pulling out, pull the tape out before doing the measurement.

### Should waist circumference be measured in children and adolescents?

For children and adolescents, waist circumference is a good predictor of adiposity and risk level for heart disease.\(^2\) Reference data for waist circumference in children and adolescents have been developed for several countries, including Canada, but appropriate national reference data and standardized measurement protocols are lacking. Further research is needed to determine the best use of waist circumference in the clinical setting and its association with health risks independent of BMI in the overweight pediatric population.\(^2\)

Use in clinical practice is recommended only as a monitoring tool by health professionals for individual children until waist circumference measurement protocols and health-related classification criteria for children and adolescents are developed.\(^2\)

### How are BMI and waist circumference combined to assess health risk for adults?

For adults, BMI and waist circumference measurements can be combined to help assess health risk for individuals. Health risk should not be based on BMI and waist circumference alone, but should be components of a more complete health assessment.\(^1\)

The Canadian Guidelines for Weight Classification in Adults combines the risk assessment for BMI and WC as follows:\(^1\)

<table>
<thead>
<tr>
<th>Body Mass Index (BMI)</th>
<th>Normal</th>
<th>Overweight</th>
<th>Obese Class I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waist Circumference (WC)</td>
<td>&lt; 102 cm (Males)</td>
<td>Least risk</td>
<td>High risk</td>
</tr>
<tr>
<td></td>
<td>&lt; 88 cm (Females)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>≥ 102 cm (Males)</td>
<td>Increased risk</td>
<td>Very high risk</td>
</tr>
<tr>
<td></td>
<td>≥88 cm (Females)</td>
<td>High risk</td>
<td></td>
</tr>
</tbody>
</table>

### How often should BMI and waist circumference be measured?

BMI and WC should be measured as part of any routine health assessment. Other determinants of health risk, including presence or absence of obesity-related disease and lifestyle habits, should also be considered to establish the individual's overall health risk.
How can one measure and talk about body measurements in a respectful and sensitive manner?  

Having height, weight, and waist circumference measured can cause anxiety and embarrassment. It is very important for health professionals to use sensitivity when height and weight is being measured.

Always make sure that measurements take place in a private location to protect confidentiality of the individual. Consider having the individual face away from the scale if she or he shows anxiety about being weighed. Record the measurements without judgment or comments. Offer the individual the choice of seeing or not seeing the result.

Given that many individuals feel embarrassment, shame, and anxiety surrounding their weight, it is important to use language about weight that people prefer and feel comfortable with. When communicating with an individual regarding his/her measurements, try to use desirable term such as “weight”, “excess weight”, or “BMI” to refer to body weight. Avoid undesirable terms such as “fatness”, “heaviness”, “excess fat”, “unhealthy BMI/body weight”, “large size”, “weight problem”, “obesity”, etc.

Are there any handouts on body measurements I can use with my clients?

Refer to approved provincial Alberta Health Services nutrition handouts to support patient education. For more information, contact Nutrition.Resources@albertahealthservices.ca
References


