



## About BMI for Adults

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Adult  
BMI Calculator  
(/healthyweight/assessing/bmi)

### What is BMI?

Body Mass Index (BMI) is a number calculated from a person's weight and height. BMI is a fairly reliable indicator of body fatness for most people. BMI does not measure body fat directly, but research has shown that BMI correlates to direct measures of body fat, such as underwater weighing and dual energy x-ray absorptiometry (DXA).<sup>1, 2</sup> BMI can be considered an alternative for direct measures of body fat. Additionally, BMI is an inexpensive and easy-to-perform method of screening for weight categories that may lead to health problems.

### How is BMI used?

BMI is used as a screening tool to identify possible weight problems for adults. However, BMI is not a diagnostic tool. For example, a person may have a high BMI. However, to determine if excess weight is a health risk, a healthcare provider would need to perform further assessments. These assessments might include skinfold thickness measurements, evaluations of diet, physical activity, family history, and other appropriate health screenings.

### Why does CDC use BMI to measure overweight and obesity?

Calculating BMI is one of the best methods for population assessment of overweight and obesity. Because calculation requires only height and weight, it is inexpensive and easy to use for clinicians and for the general public. The use of BMI allows people to compare their own weight status to that of the general population.

To see the formula based on either kilograms and meters or pounds and inches, visit [How is BMI calculated and interpreted \(/healthyweight/assessing/bmi/adult\\_bmi/index.html#Interpreted\)?](/healthyweight/assessing/bmi/adult_bmi/index.html#Interpreted)

### What are some of the other ways to measure obesity? Why doesn't CDC use those to determine overweight and obesity among the general public?

Other methods to measure body fatness include skinfold thickness measurements (with calipers), underwater weighing, bioelectrical impedance, dual-energy x-ray absorptiometry (DXA), and isotope dilution. However, these methods are not always readily available, and they are either expensive or need highly trained personnel. Furthermore, many of these methods can be difficult to standardize across observers or machines, complicating comparisons across studies and time periods.

### How is BMI calculated and interpreted?

#### Calculation of BMI

BMI is calculated the same way for both adults and children. The calculation is based on the following formulas:

Measurement Units	Formula and Calculation
<b>Kilograms and meters (or centimeters)</b>	<p>Formula: <math>\text{weight (kg)} / [\text{height (m)}]^2</math></p> <p>With the metric system, the formula for BMI is weight in kilograms divided by height in meters squared. Since height is commonly measured in centimeters, divide height in centimeters by 100 to obtain height in meters.</p> <p>Example: Weight = 68 kg, Height = 165 cm (1.65 m) Calculation: <math>68 \div (1.65)^2 = 24.98</math></p>
<b>Pounds and inches</b>	<p>Formula: <math>\text{weight (lb)} / [\text{height (in)}]^2 \times 703</math></p> <p>Calculate BMI by dividing weight in pounds (lbs) by height in inches (in) squared and multiplying by a conversion factor of 703.</p> <p>Example: Weight = 150 lbs, Height = 5'5" (65") Calculation: <math>[150 \div (65)^2] \times 703 = 24.96</math></p>

#### Interpretation of BMI for adults

For adults 20 years old and older, BMI is interpreted using standard weight status categories that are the same for all ages and for both men and women. For children and teens, on the other hand, the interpretation of BMI is both age- and sex-specific.

For more information about interpretation for children and teens, visit [Child and Teen BMI Calculator \(http://apps.nccd.cdc.gov/dnpabmi\)](http://apps.nccd.cdc.gov/dnpabmi).

The standard weight status categories associated with BMI ranges for adults are shown in the following table.

BMI	Weight Status
Below 18.5	Underweight
18.5 – 24.9	Normal
25.0 – 29.9	Overweight
30.0 and Above	Obese

For example, here are the weight ranges, the corresponding BMI ranges, and the weight status categories for a sample height.

Height	Weight Range	BMI	Weight Status
5' 9"	124 lbs or less	Below 18.5	Underweight
	125 lbs to 168 lbs	18.5 to 24.9	Normal
	169 lbs to 202 lbs	25.0 to 29.9	Overweight
	203 lbs or more	30 or higher	Obese

### How reliable is BMI as an indicator of body fatness?

The correlation between the BMI number and body fatness is fairly strong; however the correlation varies by sex, race, and age. These variations include the following examples: <sup>3,4</sup>

- At the same BMI, women tend to have more body fat than men.
- At the same BMI, older people, on average, tend to have more body fat than younger adults.
- Highly trained athletes may have a high BMI because of increased muscularity rather than increased body fatness.

It is also important to remember that BMI is only one factor related to risk for disease. For assessing someone's likelihood of developing overweight- or obesity-related diseases, the National Heart, Lung, and Blood Institute guidelines recommend looking at two other predictors:

- The individual's waist circumference (because abdominal fat is a predictor of risk for obesity-related diseases).
- Other risk factors the individual has for diseases and conditions associated with obesity (for example, high blood pressure or physical inactivity).

For more information about the assessment of health risk for developing overweight- and obesity-related diseases, visit the following Web pages from the National Heart, Lung, and Blood Institute:

- [Assessing Your Risk](http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/risk.htm) ([http://www.nhlbi.nih.gov/health/public/heart/obesity/lose\\_wt/risk.htm](http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/risk.htm)) [Ⓒ](http://www.cdc.gov/Other/disclaimer.html) (<http://www.cdc.gov/Other/disclaimer.html>)
- [Body Mass Index Table](http://www.nhlbi.nih.gov/guidelines/obesity/bmi_tbl.htm) ([http://www.nhlbi.nih.gov/guidelines/obesity/bmi\\_tbl.htm](http://www.nhlbi.nih.gov/guidelines/obesity/bmi_tbl.htm)) [Ⓒ](http://www.cdc.gov/Other/disclaimer.html) (<http://www.cdc.gov/Other/disclaimer.html>)
- [Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults](http://www.nhlbi.nih.gov/health-pro/guidelines/archive/clinical-guidelines-obesity-adults-evidence-report) (<http://www.nhlbi.nih.gov/health-pro/guidelines/archive/clinical-guidelines-obesity-adults-evidence-report>) [Ⓒ](http://www.cdc.gov/Other/disclaimer.html) (<http://www.cdc.gov/Other/disclaimer.html>)

### If an athlete or other person with a lot of muscle has a BMI over 25, is that person still considered to be overweight?

According to the BMI weight status categories, anyone with a BMI over 25 would be classified as overweight and anyone with a BMI over 30 would be classified as obese.

It is important to remember, however, that BMI is not a direct measure of body fatness and that BMI is calculated from an individual's weight which includes both muscle and fat. As a result, some individuals may have a high BMI but not have a high percentage of body fat. For example, highly trained athletes may have a high BMI because of increased muscularity rather than increased body fatness. Although some people with a BMI in the overweight range (from 25.0 to 29.9) may not have excess body fatness, most people with a BMI in the obese range (equal to or greater than 30) will have increased levels of body fatness.

It is also important to remember that weight is only one factor related to risk for disease. If you have questions or concerns about the appropriateness of your weight, you should discuss them with your healthcare provider.

### What are the health consequences of overweight and obesity for adults?

The BMI ranges are based on the relationship between body weight and disease and death.<sup>5</sup> Overweight and obese individuals are at increased risk for many diseases and health conditions, including the following: <sup>6</sup>

- Hypertension
- Dyslipidemia (for example, high LDL cholesterol, low HDL cholesterol, or high levels of triglycerides)
- Type 2 diabetes
- Coronary heart disease
- Stroke
- Gallbladder disease
- Osteoarthritis
- Sleep apnea and respiratory problems
- Some cancers (endometrial, breast, and colon)

For more information about these and other health problems associated with overweight and obesity, visit [Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults](http://www.nhlbi.nih.gov/health-pro/guidelines/archive/clinical-guidelines-obesity-adults-evidence-report) (<http://www.nhlbi.nih.gov/health-pro/guidelines/archive/clinical-guidelines-obesity-adults-evidence-report>) [Ⓒ](http://www.cdc.gov/Other/disclaimer.html) (<http://www.cdc.gov/Other/disclaimer.html>).

## Is BMI interpreted the same way for children and teens as it is for adults?

Although the BMI number is calculated the same way for children and adults, the criteria used to interpret the meaning of the BMI number for children and teens are different from those used for adults. For children and teens, BMI age- and sex-specific percentiles are used for two reasons:

- The amount of body fat changes with age.
- The amount of body fat differs between girls and boys.

Because of these factors, the interpretation of BMI is both age- and sex-specific for children and teens. The CDC BMI-for-age growth charts take into account these differences and allow translation of a BMI number into a percentile for a child's sex and age.

For adults, on the other hand, BMI is interpreted through categories that are not dependent on sex or age.

## References

<sup>1</sup>Mei Z, Grummer-Strawn LM, Pietrobelli A, Goulding A, Goran MI, Dietz WH. Validity of body mass index compared with other body-composition screening indexes for the assessment of body fatness in children and adolescents. *American Journal of Clinical Nutrition* 2002;75:97–985.

<sup>2</sup>Garrow JS and Webster J. Quetelet's index (W/H<sup>2</sup>) as a measure of fatness. *International Journal of Obesity* 1985;9:147–153.

<sup>3</sup>Prentice AM and Jebb SA. Beyond Body Mass Index. *Obesity Reviews*. 2001 August; 2(3): 141–7.

<sup>4</sup>Gallagher D, et al. How useful is BMI for comparison of body fatness across age, sex and ethnic groups? *American Journal of Epidemiology* 1996;143:228–239.

<sup>5</sup>World Health Organization. Physical status: The use and interpretation of anthropometry. Geneva, Switzerland: World Health Organization 1995. WHO Technical Report Series.

<sup>6</sup>[Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults \(http://www.nhlbi.nih.gov/health-pro/guidelines/archive/clinical-guidelines-obesity-adults-evidence-report\)](http://www.nhlbi.nih.gov/health-pro/guidelines/archive/clinical-guidelines-obesity-adults-evidence-report)  [\(http://www.cdc.gov/Other/disclaimer.html\)](http://www.cdc.gov/Other/disclaimer.html).

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