This information is from the
Centers for Disease Control and Prevention

What is BMI?

BMI is a person's weight in kilograms divided by the square of height in meters. BMI does not measure body fat directly, but research has shown that BMI is moderately correlated with more direct measures of body fat obtained from skinfold thickness measurements, bioelectrical impedance, densitometry (underwater weighing), dual energy x-ray absorptiometry (DXA) and other methods 1,2,3. Furthermore, BMI appears to be as strongly correlated with various metabolic and disease outcome as are these more direct measures of body fatness 4,5,6,7,8,9. In general, BMI is an inexpensive and easy-to-perform method of screening for weight category, for example underweight, normal or healthy weight, overweight, and obesity.

How is BMI used?

A high BMI can be an indicator of high body fatness. BMI can be used as a screening tool but is not diagnostic of the body fatness or health of an individual.

To determine if a high BMI 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 is BMI used to measure overweight and obesity?

BMI can be used 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. BMI can be used as a screening tool for body fatness but is not diagnostic.

What are some of the other ways to assess excess body fatness besides BMI?

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 1,2,3. However, these methods are not always readily available, and they are either expensive or need to be conducted by 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?

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

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

How is BMI interpreted for adults?

For adults 20 years old and older, BMI is interpreted using standard weight status categories. These categories are the same for men and women of all body types and ages.

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 or Healthy Weight
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 person who is 5' 9".

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 or Healthy Weight
	169 lbs to 202 lbs	25.0 to 29.9	Overweight
	203 lbs or more	30 or higher	Obese

For children and teens, the interpretation of BMI depends upon age and sex. For more information about interpretation for children and teens, read – What is a BMI percentile and how is it interpreted?

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

BMI is interpreted differently for children and teens, even though it is calculated using the same formula as adult BMI. Children and teen's BMI need to be age and sex-specific because the amount of body fat changes with age and the amount of body fat differs between girls and boys. The CDC BMI-for-age growth charts take into account these differences and visually show BMI as a percentile ranking. These percentiles were determined using representative data of the U.S. population of 2- to 19-year-olds that was collected in various surveys from 1963-65 to 1988-94[11].

Obesity among 2- to 19-year-olds is defined as a BMI at or above the 95th percentile of children of the same age and sex in this 1963 to 1994 reference population. For example, a 10-year-old boy of average height (56 inches) who weighs 102 pounds would have a BMI of 22.9 kg/m2. This would place the boy in the 95th percentile for BMI – meaning that his BMI is greater than that of 95% of similarly aged boys in this reference population – and he would be considered to have obesity.

How good is BMI as an indicator of body fatness?

The correlation between the BMI and body fatness is fairly strong[1,2,3,7], but even if 2 people have the same BMI, their level of body fatness may differ[12].

In general,

- At the same BMI, women tend to have more body fat than men.
- At the same BMI, Blacks have less body fat than do Whites[13,14], and Asians have more body fat than do Whites[15]
- At the same BMI, older people, on average, tend to have more body fat than younger adults.
- At the same BMI, athletes have less body fat than do non-athletes.

The accuracy of BMI as an indicator of body fatness also appears to be higher in persons with higher levels of BMI and body fatness[16]. While, a person with a very high BMI (e.g., 35 kg/m2) is very likely to have high body fat, a relatively high BMI can be the results of either high body fat or high lean body mass (muscle and bone). A trained healthcare provider should perform appropriate health assessments in order to evaluate an individual's health status and risks.

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 between 25 and 29.9 would be classified as overweight and anyone with a BMI over 30 would be classified as obese.

However, athletes may have a high BMI because of increased muscularity rather than increased body fatness. In general, a person who has a high BMI is likely to have body fatness and would be considered to be overweight or obese, but this may not apply to athletes. A trained healthcare provider should perform appropriate health assessments in order to evaluate an individual's health status and risks.