

## **Methods of Assessment of Weight**

### **Body Mass Index (BMI) (weight (kg)/height (m)<sup>2</sup>)**

Calculate your BMI ([click here](#))

Weight classification based on BMI

Underweight <18.5 kg M<sup>2</sup>

Normal weight >18.5 to <25

Overweight 25 to >29.9

Obesity (class I) >30 to <35

Obesity (class II) >35 to <40

Obesity (class III) >40

### **BMI classification in children is different:**

Their BMI changes with age, as their weight and height change with age. Consequently BMI percentiles (rather than absolute BMI) specific for age and height is obtained by plotting his/her BMI for his/her weight on the Center for Disease Control (CDC) BMI curves. Different BMI curves are used for boys and girls.

**<5% Underweight**

**5% to <85% healthy weight**

**85% to <95% Overweight**

**95% to 99% obese**

**>/= 99% severely obese**

In most cases the higher your BMI the more you are at risk of developing cardiometabolic conditions such as abnormal lipids, low HDL-cholesterol (the good cholesterol), increase triglycerides (TG), increased LDL-cholesterol (the bad cholesterol that predisposes to inflammation lining blood vessels that lead to atherosclerosis, heart disease and stroke). For each 1 point increase in BMI in men and women, there is a 12% chance of surviving to the age of 70 years

For a list of the conditions associated with increased BMI, please view our **[Medical Conditions Associated with Obesity document](#)**.

## **The disadvantage of BMI**

- May not correlate with metabolic health of the individual; for example there is the metabolically healthy obese individuals with normal lipids (cholesterol), blood pressure, blood sugar and there is the metabolically unhealthy individuals with normal weight
- This is also referred to as the “obesity paradox”

BMI is an unreliable representation of one’s weight because it calculates one’s obesity strictly on the individual’s height and weight. It does not take into consideration the individual’s fat mass and muscle mass. For example a 6-foot footballer with a BMI of 35 kg/m<sup>2</sup> has different body composition with a sedentary 5.5-foot male with the same BMI. The footballer most likely has more muscle mass and may be more metabolically healthy.

BMI also does not distinguish between men and women, not does it take race and ethnicity into consideration- hence BMI classification is different for Asians.

## **Percentage Body Fat:**

It is another way of classifying obesity. It is the ratio of a person’s body fat mass divided by the person’s weight

Normal Percentage body fat:

Women 25%-31%

Men 18%-24%

Obesity:

Women  $\geq 32\%$

Men  $\geq 25\%$

Percentage body fat compositions for athletes and for individuals that are physically active are, however, different from the normal values indicated above.

### **Advantages of Percentage body fat measurement:**

- May reflect more accurately the individuals metabolic health than BMI
- Correlates with metabolic syndrome

### **Limitation of percentage body fat:**

- More expensive when obtained using bioimpedance technique
- Not easily accessible
- Body fat percentage assessment using single site skin calipers may not be reproducible

-Reference ranges not validated to correlate with cardio metabolic diseases.

### **Neck Circumference:**

Normal for men  $\leq 17$  inches and for women  $\leq 16$  inches

Normal neck circumference  $>17$  inches in men and  $>16$  inches in women associated with increased risk for diabetes, cardiovascular disease, and sleep apnea.

### **Waist Circumference:**

Normal

Men  $> 40$  inches (102 cm)

Women  $> 35$  inches (88 cm)

Waist: Hip ratio (WHR)

Men  $>1:1$

Women  $> 0.8$

#### **Advantages of waist circumference:**

-Correlates with visceral adipose tissue

(I.e. Fat deposition around and within organs in the abdomen.)

Therefore a good indicator of an individual's cardio metabolic risk.

-Correlates with metabolic syndrome

-Can easily be measured

-It's cheap

#### **Disadvantages:**

-Differ in different races or ethnic groups

-Question of reproducibility