

**The What and Why of BMI**  
*By Paul K. Walnum, LAT, ATC, CSCS*

BMI (Body Mass Index) is often cited and used as a screening tool to classify underweight, overweight and obesity in adults. Obesity is defined as “an abnormally high proportion of body fat.”, and Overweight is defined as “an excessive amount of body weight that includes muscle, bone, fat, and water.” (National Institutes of Health). But, as many of you may be aware, BMI has its limitations and is not an accurate indicator of total body fatness. In fact, BMI doesn’t directly measure body fat at all, but rather assesses an individual’s health risk based upon their total body weight (in kilograms) relative to their body height (divided by height in meters squared).

So, if BMI doesn’t really measure my body fat, why is it still used in the health and fitness industry? Good question! To give an adequate answer, let’s look at a little BMI background:

- 1830-1850 – Adolphe Quetelet, a Belgian statistician, develops the Quetelet Index of Obesity (eventually becoming BMI) used to measure obesity in adult populations by dividing an individual’s weight by the square of their height.
- 1980’s – Insurance industry height and weight tables begin to be abandoned and BMI becomes the international standard for measuring overweight and obesity in populations (as utilized by the World Health Organization (WHO)).
- 1990’s – U.S. public health departments and other research institutions carry out studies linking “overweight” and “obesity” to various health conditions such as heart disease, diabetes, hypertension, hyperlipidemia, stroke, cancer and breathing disorders to name a few. BMI is used to identify individuals who may be at increased risk for these chronic diseases.
- 1998 – National Institutes of Health (NIH) announce their BMI guidelines in an effort to ensure that doctors, researchers, dieticians, and government agencies are all following similar standards in identifying overweight and obesity and its associated health risks.
- 2001-2004 – Data from the National Health and Nutrition Examination Survey (NHANES), which incorporated BMI, indicates that 65% of U.S. adults are overweight (BMI  $\geq$  25.0) and about 31% are obese (BMI  $\geq$  30.0).

In addition, a review of professional literature reveals that BMI is considered by many to be a useful screening tool for identifying obesity in the general population and is the measurement of choice for many researchers and health professionals. BMI is also the most cited definition used in published professional and healthcare literature. Even NIOSH, NFPA and USFA use BMI in their statistical reporting.

The American College of Sports Medicine (ACSM) recognizes that BMI has significant limitations in that it does not provide a direct measure of body fat and does not take into account age, gender, or the difference between lean muscle and fat mass. ACSM also acknowledges that there are more sophisticated and accurate measures of body composition available (i.e. underwater weighing, air displacement [Bod Pod], bioelectrical impedance, etc.). However, in contrast to BMI, there are no clearly defined or agreed upon levels of body fatness that identify the point at which morbidity and mortality significantly increase. Until there is sufficient research and consensus on this point, BMI most likely will continue to be used as the primary means to identify overweight and obese populations.

Presently, ACSM has defined obesity as a percent of body fat at which point disease increases. Both ACSM and the American Council on Exercise (ACE) have provided body fat percentage guidelines that are not age adjusted, but offer a general framework for use:

	<u>ACSM</u>			<u>ACE</u>	
<u>Body Type</u>	<u>Female</u>	<u>Male</u>	<u>Level</u>	<u>Female</u>	<u>Male</u>
Athlete	<17%	<10%	Essential fat	10-12%	2-4%
Lean	17-22%	10-15%	Athletes	14-20%	6-13%
Normal	22-15%	15-18%	Fitness	21-24%	14-17%
Above Average	25-29%	18-20%	Acceptable	25-31%	18-25%
Over-fat	29-35%	20-25%	Obese	32%+	26%+
Obese	35%+	25%+			

*Paul is the Manager of Injury Prevention and Rehabilitation for Public Safety Medical Services, an Indianapolis-based occupational health clinic dedicated to public safety professionals.*