

Body Composition: What are you made of?

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The term “Body composition” is used to describe the different components that make up a person's total body weight. Total body weight is composed of lean mass (AKA: fat free mass or FFM) (muscle, bone, and organs), fat mass, and water.

Weight scales determine only the total body mass. They do not tell you whether that mass is fat, lean mass or water. Body composition is more important than your weight in determining fitness and health.

BMI or Body Mass Index, is a method of estimating body fat percentage based upon weight and height measurements. BMI is a calculation and not a direct measurement. This calculation will only tell you if you are overweight, normal or underweight for your height. BMI makes no distinction between body weight from muscle and body weight from fat. For example, Sarcopenic obese people have a standard weight, a low BMI, but a disproportional body fat percentage. It occurs frequently in young women. Despite looking thin, they have a low level of muscle and a high percentage of body fat. It is hard to detect this kind of obesity just by BMI or through general observations, so body composition analysis is a helpful tool to detect this state of obesity (and health).

When choosing a method of body composition measurement, you want to ask yourself, “Is this a calculation or direct measurement?”. “Empirical estimation” refers to using personal information, such as gender or age, and body type (athletic build or general build). It is used in order to compensate for errors in measurements that may affect the results of a body composition analysis. For example, body fat mass of females can be estimated based on the empirical fact that women usually have more body fat mass than men. Methods that use calculations in their results use empirical data to reduce the level of error. Methods that use direct measurement do not require empirical data.

One method for measuring body composition, the Hydrostatic Method (underwater weighing method), has been considered the gold standard for body composition assessment. However, because of expense and convenience, newer technology may make underwater methods obsolete.

DEXA stands for dual energy x-ray absorptiometry. DEXA is most often used to measure bone density and lean mass, but it can also deliver fat mass readings. DEXA takes bone mineral content into consideration when determining body fat and muscle, therefore it is considered to be more accurate than underwater weighing. There is some x-ray exposure during the procedure and is costly. It can cost up to \$300 for a screening.

Because of the expense and inconvenience of underwater weighing and DEXA scans, many facilities use a simple skinfold measurements to determine body fat percent. The American College of Sports Medicine says that when performed by a trained, skilled, tester, they are up to 98% accurate. Because the degree of error is potentially high, this method of fat measurement is useless if not in the hands of an expert—someone with a lot of practice and validation. In addition, keep in mind; skinfold measurement is only testing subcutaneous fat (the fat just under your skin). This tissue is usually composed of fat cells as well as the structures that run through it like, blood vessels and nerve. Subcutaneous fat is less of a threat when it comes to diseases. Skin fold measurements are not an ideal measurement method for those who are obese and very lean. You need to search out for methods that directly measure your visceral fat (the fat around your internal organs) and total body water.

**SET FITNESS GOALS...
NOT WEIGHT GOALS**



High body fat percentage will generally mean more injuries, problems with joints and low back, higher risk of diabetes and heart disease.

BIA (Bioelectrical Impedance Analysis) is another method used to measure body fat. It's a technique that measures the body impedance (resistance or opposition) to a low, safe electrical current through the body. The current only passes through the water fluids inside the body. Based on the impedance values, the body water volume is measured. As water fluids are usually inside muscle tissues, by using the water volume, the fat free mass (FFM) is calculated. The popularity of the BIA method has grown significantly over the last few years because it is painless, quick, and easy to administer the test.

However, although easy to use, conventional BIA has not been the preferred method for testing body composition in the past because technology used only single frequency methods and relies on empirical data (application of variables such as gender, age, exercise frequency, etc) to estimate results. In addition, older models estimate the amount of intracellular water (ICW) (amount of water inside the cells) based upon the measure of extracellular water (ECW) (amount of water outside the cells). The proportion of ICW and ECW is balanced in a healthy body. The amount gets imbalanced in disease states such as renal disease, hormonal imbalances, edema and hypertension.

Whereas the majority of BIA equipment is single frequency, the emerging technology for BIA applies Direct Segmental Multi-Frequency BIA (DSMF-BIA). DSMF-BIA obtains an impedance measurement for each arm, leg, and the highly sensitive trunk (chest and abdomen). The ability to measure an accurate value of the trunk's impedance is vital to providing accurate body composition. This technology enables one to directly measure ICW and ECW. DSMF-BIA applies an 8-point tactile electrode method which allows for direct segmental analysis. Conventional methods use only 4 electrodes and divide the body into 2 segments (upper and lower body). Thus, for example, with DSMF-BIA you can determine the difference in the amount of water and fat free mass (muscle) in right and left leg. This method helps patients and athletes that need pinpoint accuracy on their muscle measurements and is also extremely helpful in rehabilitative medicine and movement cure. DSMF-BIA examines segmental development of the subject and gives exact measurements regardless of gender, age, disease and ethnicity.

There are guidelines to follow prior to testing with DSMF-BIA...

- No eating or drinking within 3 hours of the test.
- No exercise within 12 hours of the test.
- Urinate within 30 minutes of the test.
- Wear minimal clothing.
- Women should not be tested during their menstrual cycle.
- When you retest, try to perform the test at the same time you did your last test.

What should your results be?

	Males	Females
BMI	18.5-24.9	18.5-24.9
% Body Fat	10-20%	18-28%
ICW:ECW	3:2	3:2

What to look for in your body composition

1. Weight
2. Lean Body Mass
3. Body Fat Mass
4. Intracellular Water
5. Extracellular Water
6. Total Body Water
7. Dry Lean Mass
8. Body Mass Index (BMI)
9. Percent Body Fat
10. Basal Metabolic Rate
11. Segmental Lean Mass
 - Right Arm
 - Left Arm
 - Trunk
 - Right Leg
 - Left Leg

Federal Law requires that we warn you of the following:

1. Your individual health status and any required health care treatments can only be properly addressed by a professional healthcare provider of your choice. Remember: There is no adequate substitution for a personal consultation with your chosen health care provider. Therefore, we encourage you to make your own health care decisions based upon your research and in partnership with a qualified health care professional.

2. The Constitution guarantees you the right to be your own physician and to prescribe for your own health.

Don't Guess About Your Health... Schedule a Nutritional Consultation Today!

Our office provides this monthly newsletter free of charge. If you would like to sign up to receive our monthly newsletter and announcements via email, please contact our office.

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