

## What is a BIA? (And why do you need one?)

Bioelectrical Impedance Analysis or Bioimpedance Analysis (BIA) is a method of assessing your “body composition”—the measurement of body fat in relation to lean body mass. It is an integral part of a health and nutrition assessment.

*Improving your BIA measurement by lowering your percentage of unhealthy body fat can help reduce your risk to a variety of serious health conditions.*

### Why is Body Composition Important to My Health?

Research has shown that body composition is directly related to health. A normal balance of body fat is

associated with good health and longevity. Excess fat in relation to lean body mass, a condition known as altered body composition, can greatly increase your risks to cardiovascular disease, diabetes, and more. BIA fosters early detection of an improper balance in your body composition, which allows for earlier intervention and prevention. BIA also provides a measurement of fluid and body mass that can be a critical assessment tool for your current state of health.

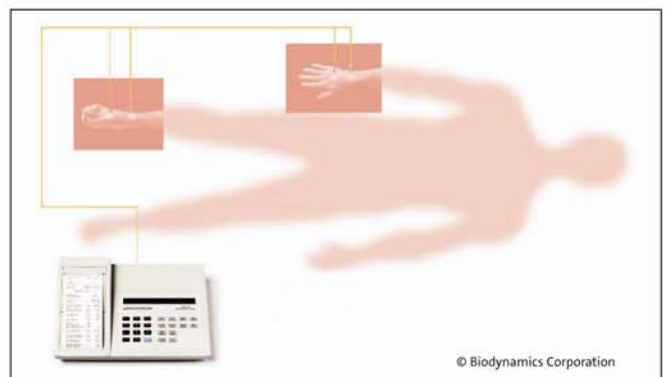
BIA also serves to measure your progress as you work to improve your health. Improving your BIA measurement, or maintaining a healthy BIA measurement, can help keep your body functioning properly for healthy aging and reduced risk to illness. With your BIA results, we can recommend a

personalized dietary plan, nutritional supplements, and exercise to help you support optimal health and well-being for a lifetime.

### How Does a BIA Work?

BIA is much more sophisticated than your bathroom scale, but just as painless—and almost as quick. BIA is a simple procedure that can be performed right in our office in a matter of minutes with the help of a sophisticated, computerized analysis.

This analyzer “calculates” your tissue and fluid compartments—using an imperceptible electrical current passed through pads placed on one hand and foot as you lie comfortably clothed on an exam table. In just minutes, we’ll have very accurate measurements to help create an effective, personalized program to improve your health status.



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***** BIOIMPEDANCE ANALYSIS *****			
Date:	02/21/03	Time:	11:40 am
Patient:	_____		
Sex:	Male	Height:	75.0 in
Age:	35	Weight:	160.0 lbs
MEASUREMENTS RESULTS			
Phase Angle:	6.5 °		
Body Capacitance:	617 pF		
Resistance:	583.5 ohms		
Reactance:	66.8 ohms		
Mass Distribution	lbs	percent	
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Body Cell Mass:	63.9	39.9	
Extracellular Mass:	68.9	43.2	
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Fat Free Mass:	132.8	83.1	
Fat Mass:	27.2	16.9	
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Total Weight:	160.0	100.0	
ECM/BCM:	1.08		
Body Mass Index:	20.0		
Basal Metabolic Rate:	1881	cals	
Water Compartments	liters	percent	
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Intracellular Water:	24.3	57.3	
Extracellular Water:	18.1	42.7	
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Total Body Water:	42.4	100.0	
TBW/Fat Free Mass:	70.4		
TBW/Total Weight:	58.4		

## Interpreting Your BIA Results

Your healthcare provider will go over your results in detail. Briefly, here are the measurements your BIA will provide:

**Phase Angle**—Calculated using the measurements of resistance and reactance, which are indicators of cellular health independent of weight. Normal values with age and gender.

**Body Capacitance**—The body's energy storage amount due to intact cellular membranes.

**Resistance**—The flow of electrical current related to body water found in healthy cells. Since fat cells contain very little water in comparison to healthy cells, a higher resistance indicates more fat mass. Healthy lean tissue is indicated by a lower resistance.

**Reactance**—The ability of cells to store energy (related to body capacitance). A low reactance indicates a breakdown in cell membranes' selective permeability. A higher reactance means healthier cells.

**Body Cell Mass**—The “living” cells of the body, such as those found in muscle, organs, blood, and immune cells. Also includes intracellular water (water contained within your cells).

**Extracellular Mass**—Includes bone, cartilage, ligaments, and other non-metabolically active tissues along with extracellular water.

**Fat-Free Mass**—A measure of total nonfat body compartments (also called lean body mass). Contains most of the body's water.

**Fat Mass**—The amount of stored fat in the body.

**ECM/BCM**—Ratio of extracellular mass (ECM) to body cell mass (BCM). A lower value, indicating a higher ratio of living to inactive mass, is desirable. Normal values are near 1.0 (a 50/50 distribution).

**Body Mass Index (BMI)**—A ratio of weight to height used as a quick measure of health status. Values from 19-24 are desirable.

**Basal Metabolic Rate**—Based on fat-free mass, the number of calories your body uses each day, not counting the extra calories you burn through exercise.

**Intracellular Water (ICW)**—Water volume of body cell mass (i.e., water in the “living” cells).

**Extracellular Water (ECW)**—Water volume outside the body cell mass.

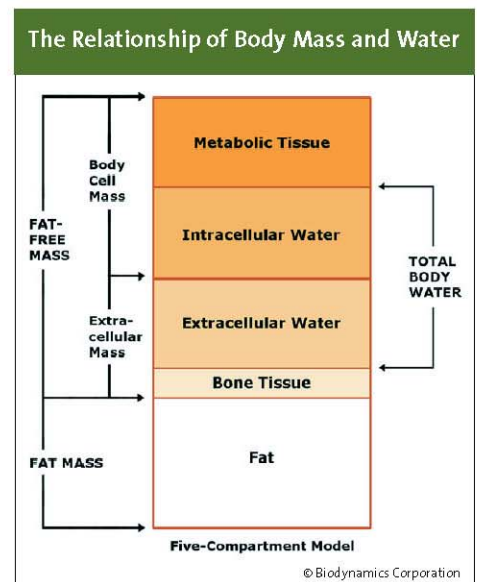
**Total Body Water (TBW)**—Sum of ICW and ECW.

**TBW/Fat-Free Mass**—The percentage of fat-free mass that is water.

**TBW/Total Weight**—The percentage of total weight that is water.

## Follow-Up Tests

Your healthcare provider may recommend a series of follow-up BIA tests to monitor your health or measure your progress.



## Body Composition Testing

Bioimpedance analysis (BIA) is a reliable method of measuring body composition, including percentage of body fat and lean body mass. Measurements are taken with a bioimpedance analyzer, which uses electrodes similar to EKG electrodes. The machine passes a harmless, ultra-low level electrical current through the body. Lean tissue, which is over 70% water, is a good conductor of electrical current. Fatty tissue—low in water, is not. Thus, the resistance to the flow of electrical current measured by the analyzer can be used to calculate body composition.

Participants will need to remove their right shoe and sock or stocking. The electrodes are placed on the right hand and foot while the individual is lying down on an exam table. This whole procedure takes only a few minutes and a computer prints out the results. Optimal body fat ranges from 12%-25% for women, and 5%-20% for men.

Over 100 independent studies, conducted by researchers over the past 20 years, have demonstrated that bioimpedance analysis can provide an accurate and clinically useful assessment of body composition. However, for the most accurate results, the following guidelines should be followed:

- 1. Do not eat for 4 hours prior to testing.**
- 2. Do not exercise for 12 hours prior to testing.**
- 3. Do not consume alcohol for 24 hours prior to testing.**
- 4. Drink at least 1 quart of water one hour before your test (you may void as needed).**
- 5. Do not drink caffeine the day of your test.**
- 6. Do not wear pantyhose.**

Please follow these guidelines for your next visit.

*Follow-up Appointment:*