



Health and well-being are closely tied to the health of the body's fat-free mass and body cell mass compartments. By focusing attention on these essential mass compartments, therapeutic strategies are more effective because important results can be measured objectively.

The **Biomarkers 2000 Body Scan Analyzer** provides a direct readout of the impedance of the human body, and estimates of fat mass, fat-free mass (lean body mass), body cell mass, extracellular mass, total body water, intracellular water, and extracellular water.

APPLICATIONS

ACUTE/CHRONIC DISEASE. Treatments which result in a progressive increase in reactance, phase angle, body cell mass and subsequent stabilization irrespective of the mechanisms involved are frequently associated with survival. Contrarily, a progressive decline in reactance, phase angle, and body cell mass is frequently associated with multiple organ failure (MOF) and carries a poor prognosis.

GERIATRICS. With aging, changes in function are due primarily to alterations in the body cell mass compartment. This compartment is functionally the most important in determining energy expenditure, protein needs, and metabolic response to physiologic stress. Candidate mechanisms include loss of motor neurons in the spine, loss of endogenous growth hormone production, dysregulation of cytokines, loss of estrogen and androgen production, inadequate protein intake, and reduced physical activity leading to a reduction in the number and size of type II muscle fibers.

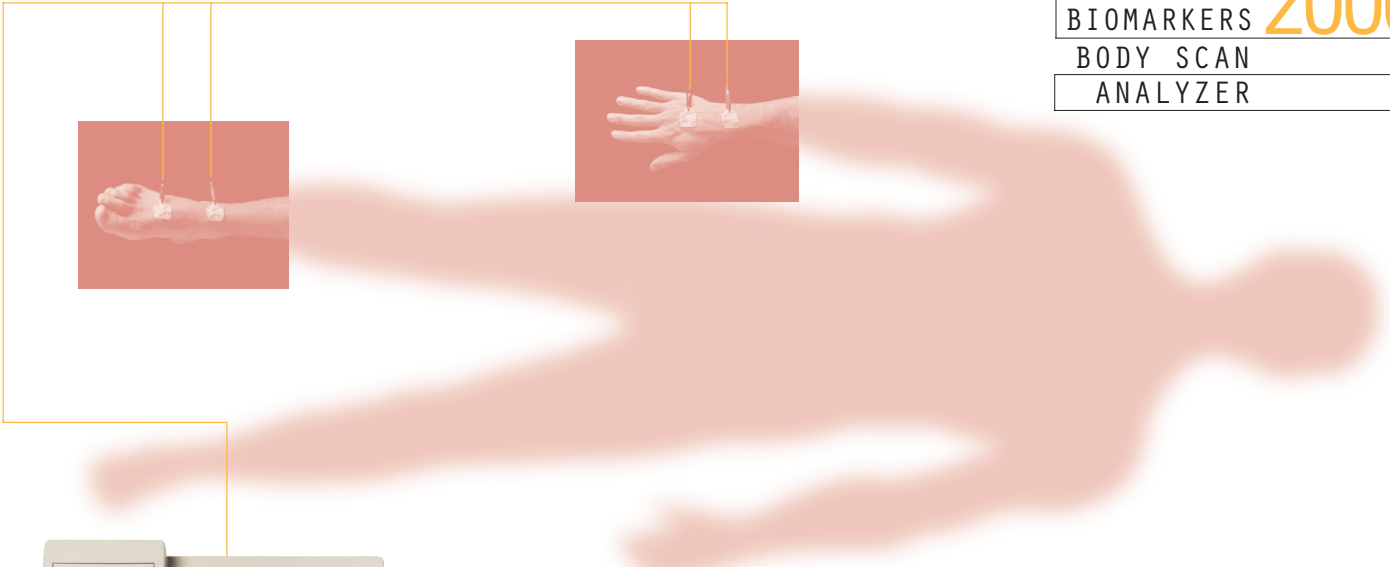
EATING DISORDERS. While low body weight is indicative of eating disorders, it is disturbances in mass and fluid compartments - low amounts of fat-free mass and body cell mass - that are life threatening. In a very real sense, the effects of malnutrition due to eating disorders differ little from the effects of malnutrition due to aging or disease. Treatment which result in a progressive increase of fat-free mass, body cell mass, phase angle, and reactance are associated with improving outcomes.

OBESITY. Specific mechanisms linking obesity to health risks are not fully understood, but recent research focusing on genes that express only in fat tissue has shown promise. These genes code for hormones associated with insulin resistance (type II diabetes) and cardiovascular plaques. While specific mechanisms remain unproven, the statistical coincidence of obesity and diabetes is nearly 80 percent. A body mass index of 30 or greater or fat-free mass less than 75 percent for males or less than 70 percent for females are useful diagnostic criteria for obesity.

LIFESTYLE ASSESSMENT. While it cannot yet be said that excess fat tissue is the cause, we know that excess fat mass is associated with heart disease, stroke, diabetes, cancer, osteoarthritis, sleep apnea, gout, infection, gallstones, and many other conditions. Excess fat mass also affects appearance, mobility, and job performance.

ATHLETIC PERFORMANCE. Large (superoptimal) fat-free mass and body cell mass compartments are the hallmark of athletes - the source of high function, strength, and endurance. In response to training, the well-nourished body adds tissue to these compartments. A progressive increase in fat-free mass, body cell mass, and phase angle are associated with increasing physical performance.

*****	BIOIMPEDANCE ANALYSIS	*****
Date:	11/17/03	Time: 03:13 pm
Patient:	_____	
Sex:	Male	Height: 71.5 in
Age:	39	Weight: 178.0 lbs
MEASUREMENTS RESULTS		
Phase Angle:	7.4 °	
Body Capacitance:	755 pF	
Resistance:	535.7 ohms	
Reactance:	69.2 ohms	
Mass Distribution	lbs	percent
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Body Cell Mass:	67.5	37.9
Extracellular Mass:	68.7	38.6
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Fat Free Mass:	136.2	76.5
Fat Mass:	41.8	23.5
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Total Weight:	178.0	100.0
ECM/BCM:	1.02	
Body Mass Index:	24.5	
Basal Metabolic Rate:	1925	cal
Water Compartments	liters	percent
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Intracellular Water:	26.0	59.1
Extracellular Water:	18.1	41.0
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Total Body Water:	44.1	100.0
TBW/Fat Free Mass:		71.4
TBW/Total Weight:		54.6



BIOIMPEDANCE MEASUREMENTS

- Resistance:**
 Range 200 to 1500 ohms
 Resolution 0.1 ohm
 Accuracy 0.1 percent
- Reactance:**
 Range 0 to 300 ohms
 Resolution 0.1 ohm
 Accuracy 0.2 percent
- Phase Angle:**
 Range 0 to 20 degrees
 Resolution 0.1 degree
 Accuracy 0.2 percent
- Test Current:**
 Less than 1 milliampere
- Frequency:**
 50 kilohertz

GENERAL INFORMATION

- Dimensions:**
 12.5" W x 8.5" L x 3.25" H
 (317mm x 216mm x 98mm)
- Weight:**
 4 lb / 2 kg net
 10 lb / 4.5 kg shipping
- Temperature Range:**
 10 degrees C to 50 degrees C
- Humidity:**
 70% or less noncondensing

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For additional information, go to:
www.biomarkers2000.com

TEST RESULTS

Bioimpedance analysis is the assessment of body composition using electrical tissue conductivity. With this non-invasive test procedure, the Biomarkers 2000 Body Scan Analyzer provides the following results:

Bioimpedance Measurements: a readout of the patient's resistance, reactance, and phase angle. This information is obtained through a direct measurement of the complex impedance of the human body.

Mass Distribution: an estimate of mass distribution, using the measured bioimpedance and entered patient data. Mass consists of fat-free mass and fat mass. Fat-free mass is further broken down into its two key components – body cell mass and extracellular mass. Body cell mass is the total cellular mass of living cells. It is the metabolically active tissue of the body. Extracellular mass is the fluid and tissue of the body found outside the cell.

Water Compartments: total body water, and its two components – intracellular water and extracellular water. Intracellular water is the fluid contained within the cell. Healthy cells maintain their integrity and hold their fluids inside. Extracellular water is the fluid outside the cell. An increase in extracellular water may indicate disturbance in the cellular membrane.

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