What is Body Composition Analysis

Body composition analysis is a method used to reveal what your weight really means. Body composition analysis refers to the quantitative assessment of the distribution of muscle, fat, and water. The distribution of these elements plays an important role in health, in disease and in human performance.

Body composition can be analyzed with different methods such as the caliper, hydrostatic weighing, Dual Energy X-Ray Absorptiometry (DEXA), or via Bioelectrical Impedance Analysis (BIA).

The Chicago Neuroscience Institute (CNI) uses leading-edge technology which uses bioimpedance analysis (BIA) technology to assess lean body mass, fat mass, water distribution, body mass index (BMI), percent body fat (PBF), visceral fat levels and extremity muscle distribution. Body composition analysis used to determine baseline values and to measure change.

Body Composition History

It is important to track trends and changes in your body composition. The system that we use provides a simple chart depicting historical data such as past weight, skeletal muscle mass, percent body fat, and also ECW/TBW ratio.
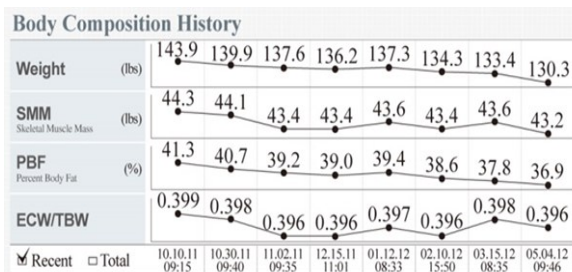
Our Body Composition Device

CNI uses a sophisticated medical grade system to measure total and regional body composition. The system represents one of the most accurate Bioimpedence devices in health-care. In less than 60 seconds, non-invasive accurate, objective, and easy to understand measurements to evaluate a patients current health status and to track treatment outcomes.

Each test will print out a full-page reveal the muscle, fat, and water values of the user. Empowered by objective data, you and your healthcare providers will be able to more effectively identify, treat and manage your clinical conditions.
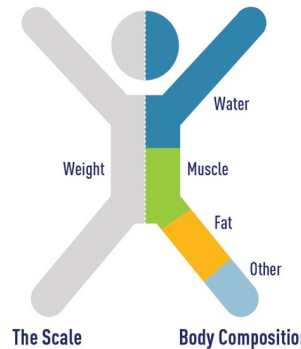
Body Composition Analysis Measures

- weight
- intracellular water
- lean body mass
- extracellular water
- body fat mass
- total water
- percent body fat
- visceral fat score
- body mass Index
- segmental lean analysis

Helps Promote Successful Weight Management

Body composition analysis gives healthcare providers including nutritionists and dietitians with the facts required to effectively understand and empower individuals in weight loss and weight management programs. Body composition analysis can be used to:

- determine baseline body composition and link these parameters to dietary changes.
- assess basal metabolic rate (BMR) to create more targeted and effective nutrition programs.
- track changes over time to ensure an individual's progress and success.

Why I Need to Know My Body Composition

Body composition analysis determines what your weight *really* represents? It is important to go beyond the scale and obtain a detailed breakdown of your weight in terms of muscle, fat, and water. There are numerous health risks associated with having abnormal body composition. This includes increased risk for developing chronic disorders such as coronary artery disease, arterial hypertension, hypercholesterolemia, diabetes, nonalcoholic fatty liver disease, dyslipidemia, and cancer. Personal knowledge of body composition values can help guide and motivate you to make healthy choices. The values can also be used by your healthcare provider to develop a personalized treatment plan, direct care and measure outcomes

Obesity has been directly linked to over 50 diseases.

William Delaney, BS, CES Body Composition Specialist

Will currently is CNI's Human Performance Specialist who is a graduate from Northern Illinois University with an emphasis on the therapeutic approach to rehabilitation. He became a Metabolic Specialist in 2015 and is currently training to achieve status as a professional bodybuilder in the World Natural Bodybuilding Federation .

His special interest analyzing body composition for different types of patients who desire to maintain optimal BMI and helping athletes use body composition for training and enhancing performance.

Special Applications of Body Composition

Sports Performance

Sport performance is highly dependent on body composition, which influences variables such as power, speed, agility, reaction time, and balance. An increase in lean body mass contributes to strength and power development. In addition, a sufficient level of lean body mass contributes to speed and agility. Reduced nonessential body fat contributes to improved muscular and cardiorespiratory endurance. Athletes competing in sports that require high levels of flexibility benefit from having low levels of body fat. Optimum body composition improves joint position sense (proprioception) and overall spatial awareness resulting in more efficient balance and movement.

Neurological Performance

The human body contains an elaborate network of specialized sensory nerve endings which provide movement and spatial information to the central nervous system. The nerve network serves as a sort of biological global positioning system. Changes in body composition alter the densities and relationships between tissues; thus, altering soft tissue mechanics and neurological control. This influences body awareness and movement.

Personal Training and Rehabilitation

Body composition analysis can be used to demonstrate change, increase motivation and provide feedback for individuals in training or rehabilitation programs. Feedback is essential to ensure success. Body composition analysis can be used to establish a baseline, to set appropriate and attainable goals, and to track changes over time. Body composition analysis can also be used to:

- assess muscle distribution and target areas weakened by injury.
- identify muscle and fat imbalances in specific segments of the body.
- monitor changes to determine efficacy of an exercise or rehabilitation program.

Assessment of Disease Risk

Cardiovascular Disease

Knowledge of body composition is important for understanding cardiovascular health and risk for developing progressive cardiovascular disease. High blood volume, increased water levels in the body, and strains on the heart are all issues that arise from conditions like obesity. BMI is commonly used to determine a patient's risk for cardiovascular disease; however, BMI overlooks a patients' visceral fat which is often linked to a higher risk for cardiovascular disease. Body composition analysis can aid in:

- obtaining objective fluid measures and guide fluid management strategies
- effectively monitoring nutrition status and guide nutritional interventions
- accurately tracking patient progress and predicting interventional outcomes

> *Obesity has been directly linked to diabetes and over 50 diseases.*

Aging and Muscle Loss

As individuals get older they tend to lose muscle mass, a condition referred to as sarcopenia. Gradual muscle loss leads to weakness, impaired movement loss of postural stability and risk for diabetes. It in sedentary or older individuals body composition analysis helps:

- Identify muscle loss associated with increased risk for falls.
- assess muscle mass recovery through rehabilitation programs.
- reveal asymmetry of muscle loss which may destabilize posture and gait
  track fluid imbalances related to loss of muscle mass.

Why Should I Have A Body Composition Analysis?

Every one should have an annual body composition analysis. Individuals who are overweight should have studies done every 3-6 months. Individuals who have any of the following conditions should have regular body composition analysis as part of their plan of care

- diabetes
- osteoarthritis
- injury recovery
- obesity
- joint instability
- abnormal gait
- lymphedema
- sarcopenia
- malnutrition
- edema
- back pain
- cardiovascular disease

Before training   After training
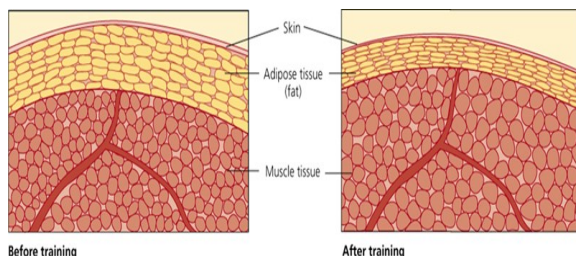
Negative Consequences of Excess Fat?

Fat (adipose tissue) is comprised primary of loose connective tissue and fat cells (adipocytes). Fat is generally classified by its type, location, volume and pattern of distribution. These characteristics influence the impact fat has on health and disease.

Classifications of fat based on distribution include visceral fat (also known as organ fat or intra-abdominal fat), subcutaneous fat (fat under the skin), intramuscular fat (interspersed in skeletal muscle) and ectopic fat. Fat cells secrete many different chemicals and subsequently influence body physiology and organ function.. For example, high levels of body fat contribute to pro-inflammatory and pro-thrombotic (blood clotting) states.

Director of the Institute
David H. Durrant, BS, DC, PhD(c)

Dr. Durrant is the current Director of the Chicago Neuroscience Institute. After his doctoral training Dr. Durrant completed a residency and achieved board certification in neurology. He is pursuing a PhD in Health Services with emphasis on the application of molecular imaging in neurology.

Dr. Durrant has maintained active Diplomate status with the American Chiropractic Board of Neurology. Dr. Durrant has attained prestigious Fellow status with American College of Spine Physicians and Fellow status with the International Academy of Clinical Neurology. He is the current President of the American Academy of Spine Physicians. Dr. Durrant has a longstanding interest in the area of neurology and sports medicine. He spent time observing and studying physical performance testing protocols at the United States Olympic Camp.

Professional Experience

- Board Certified Chiropractic Neurologist
- Director of Chicago Neuroscience Institute
- President of the American Academy of Spine Physicians
- Board Member of the International Spine Association
- Fellow of International Academy of Chiropractic Neurology
- Diplomate of the American Board of Chiropractic Neurology
- Author of a benchmark Neurology Textbook
- Prior Advisor to the Board of the Marine Military Academy
- Prior consultant to the Human Performance Lab a the Marine Military Academy
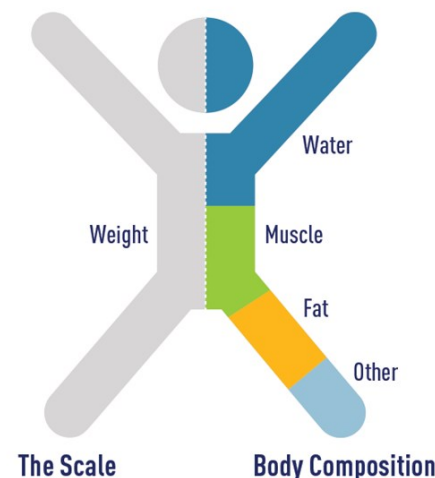- Physician consultant to Elite and Olympic athletes

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Body Composition Analysis

"Weigh In on the Facts and Improve your Health".

The Scale   Body Composition
Weight   Water
          Muscle
          Fat
          Other

CNI

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