# Bone Density and Body Composition Research Core

To advance interdisciplinary health sciences research and innovation by providing high quality bone density and body composition measures to investigators at Brigham and Women's Hospital (BWH), Partners HealthCare and the broader, medical and research community.

BRIGHAM AND WOMEN'S HOSPITAL

HARVARD MEDICAL SCHOOL

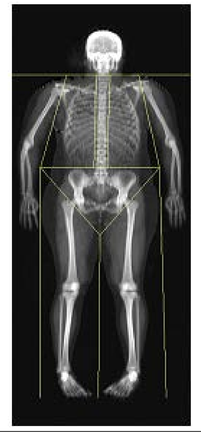
## EQUIPMENT

Discovery W, Hologic, Bedford, MA
Dual-energy X-ray Absorptiometry (DXA) Scanner
Software Version: APEX 4.5.3.2

## WHOLE BODY

**Bone Density**

- Areal Bone Mineral Density (aBMD: g/cm$^2$)
- T-score (compared to young normals)
- Z-score (matched for age, race, and sex)
- Least Significant Change (LSC): 0.008 g/cm$^2$ for males and 0.010 g/cm$^2$ for females



**Body Composition**

- Fat Mass (g)
- Lean Mass (g)
- Android/Abdomen region
- Gynoid/Hip region

**Adipose Indices**

- Body fat percentage
- Visceral Adipose Tissue Area (cm$^2$) and Mass (g)
- Truncal Fat
- Limb Fat

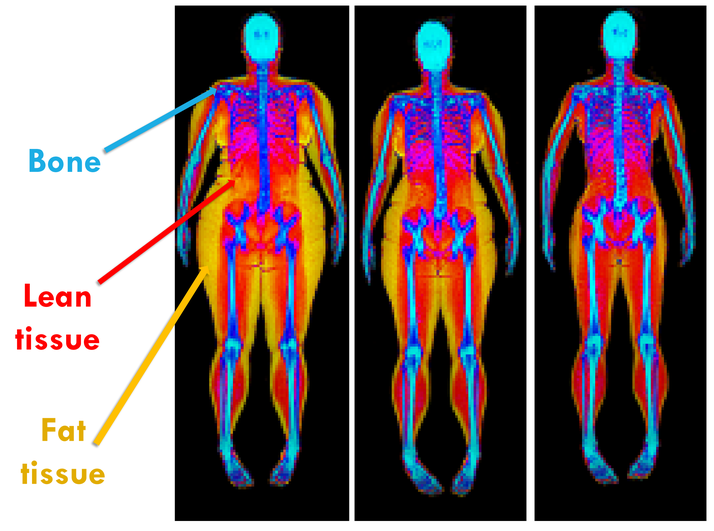
**Lean/ Sarcopenia Indices**

- Lean Mass Index (kg/m$^2$)
- Appendicular Lean Mass Index (kg/m$^2$)

## RESEARCH APPLICATIONS

- **Obesity and weight loss**
- **Anorexia nervosa**
- **Athletes**
- **Female Athlete Triad**
- **Elderly**
- **Postmenopausal women**
- **Transplant patients**
- **Cystic fibrosis**
- **HIV**
- **End stage renal disease**
- **Cancer**
- **Diabetes**

## CHANGES TO BODY COMPOSITION OVER TIME ON A WEIGHT LOSS DIET




## LOCATION

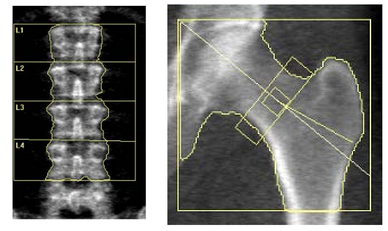
221 Longwood Avenue, 2nd floor, Richardson Fuller Building Boston, MA 02115

**Contact Cindy Yu by:**

phone: (617) 732-5643 email: cyu@bwh.harvard.edu

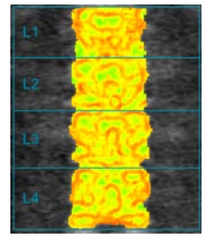
## SPINE AND HIP BONE DENSITY

- Measurement of aBMD (g/cm$^2$) of the spine (L1-L4) and the hip (total hip and femoral neck)
- T-score (compared to young normals)
- Z-score (matched for age, race, and sex)
- Least Significant Change (LSC): 0.017 g/cm$^2$ for spine, 0.022 g/cm$^2$ for femoral neck and 0.014 g/cm$^2$ for total hip



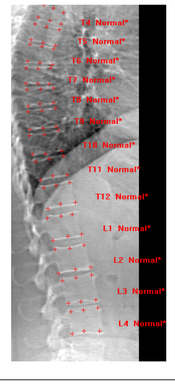

## TRABECULAR BONE SCORE (TBS)

- An analytical, non-invasive measure performed on DXA images of the lumbar spine and is associated with the skeletal microarchitecture
- Predicts fracture risk independent of bone density




## VERTEBRAL FRACTURE ASSESSMENT (VFA)

- Assesses vertebral fractures along the thoracic and lumbar spine (T4-L4)
- Vertebral fractures:
  - Are the most common osteoporotic fracture
  - Increase morbidity and mortality
  - Increase the risk of subsequent fractures independent of BMD




## CORE TEAM

Meryl S. LeBoff, MD
Core Director

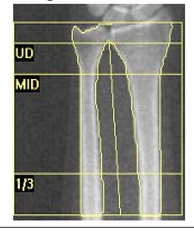
Sharon Chou, MD
Core Assistant Director

John Barry
Core Financial Administrator

Cindy Yu, CBDT
Core Technical Manager & DXA Technologist

## FOREARM BONE DENSITY

- Measurement of aBMD (g/cm$^2$) of the 1/3 radius (99% cortical bone)
- T-score (compared to young normals)
- Z-score (matched for age, race, and sex)



# Would you like to learn more about your body composition?

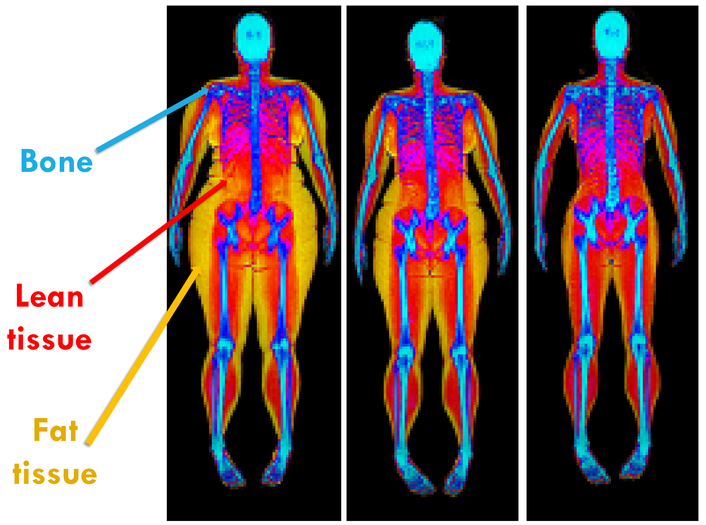



Image above from a weight loss program

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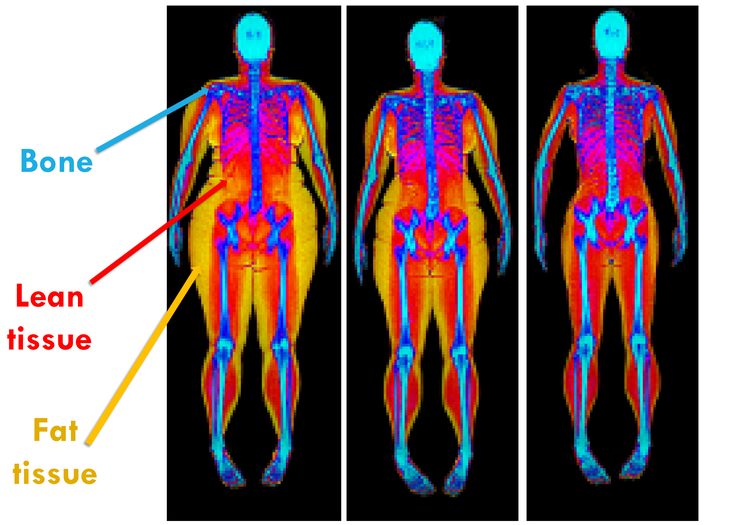


Image above from a weight loss program