

## BIOIMPEDANCE ANALYSIS: IMPROVED PHENOTYPING WITH WHOLE-BODY ANALYSIS

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### Practical Implications:

The 8-electrode Bioimpedance analysis (BIA) is superior to the 4-electrode foot-to-foot BIA for %fat estimation and also offers a new opportunity of evaluating skeletal muscle mass (SM) in research and clinical settings.

## ABSTRACT

**Objective:** Bioimpedance analysis (BIA) is a potential field and clinical method for evaluating %fat and skeletal muscle mass (SM). A new system has 8 (2 on each hand and foot) rather than 4 (2 on each foot) contact electrodes allowing for rapid "whole-body" and regional body composition evaluation.

**Design:** This study evaluated the BC-418 8-electrode and TBF-310 4-electrode BIA systems (Tanita Corp., Tokyo). Subjects were 13 males and females, ages 10-64 yrs. BIA was evaluated on each subject and compared to reference estimates of %fat and appendicular lean soft tissue (ALST [kg]; a measure of extremity SM), by dual-energy x-ray absorptiometry (DXA; Lunar DPX, M Madison, WI).

**Results:** There was a high correlation between %fat by 8-electrode BIA vs. DXA [ $y = 0.88x + 1.99$ ,  $R^2 = 0.89$ ;  $p < 0.001$ ] that exceeded the corresponding association with 4-electrode BIA [ $y = 0.98x - 3.6$ ,  $R^2 = 0.86$ ;  $p < 0.001$ ]. The correlation between 8-electrode predicted and DXA ALST was strong and highly significant [ $y = 0.98x + 1.35$ ,  $R^2 = 0.94$ ,  $p < 0.001$ ].

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