

COMPOSITION OF WEIGHT LOSS WHILE DIETING: COMPARISON OF RESEARCH AND CLINICALLY-BASED METHODS.

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Practical Implications:

- Tanita BIA measurements correlate highly with both the DEXA and Underwater weighing methods. Tanita Body Composition Analyzers provide accurate results without the discomfort, expense, or expert training necessary for other methods.
- In fact, Tanita BIA correlates with both DEXA and UWW better than the two methods, normally considered the gold standards for determining body fat percentage, correlate with each other. The lower correlation between the "gold standards" suggests that it is important to use the same method consistently to determine patient fitness trends.
- Anthropometry (Calipers) did not correlate well with any of the reliable clinical methods of determining body fat.

ABSTRACT

Objective: Monitoring composition of weight loss during dieting is an important aspect of evaluating a patient's treatment program. On conventional diets ~ 75% of weight loss consists of fat (i.e., $\Delta\text{fat}/\Delta\text{body weight} \sim 0.75$). Research-based methods such as underwater weighing (UWW) and dual energy X-ray absorptiometry (DXA) are useful in assessing composition of weight loss, although not much information is available on accuracy/comparability of clinical methods including anthropometry (Anth) and bioimpedance analysis (BIA). The aim of this study was to compare body composition changes with weight loss between research-based methods and clinical methods.

Design: 16 week weight loss study of healthy obese subjects on prescribed low calorie diet.

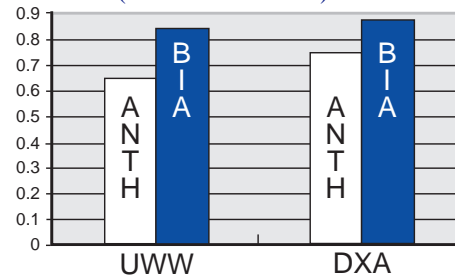
Materials & Method: Change in fat mass was assessed with UWW, DXA [Lunar DPX], Anth (Durnin-Womersley), and BIA (Tanita TBF 305).

Results: There were 73 subjects with ($X \pm SD$) age 42.6 ± 9.9 yrs & BMI = 31.7 ± 3.1 kg/m². Mean group weight loss was 5.4 kg. A correlation matrix with r values for $\Delta\text{fat mass}$ is shown in table. Both clinical methods were significantly correlated with UWW and DXA, with BIA r's > than Anth. The fraction of weight loss as fat was established for each method by regression: .79 DXA ($R^2=.83$); .77 BIA (.88); .70 UWW (.69); and .57 Anth (.65).

CORRELATION DATA (1=perfect correlation)

**p<0.001	Anth	UWW	DXA	BIA
Anth	1.000	.657**	.757**	.745**
UWW	.657**	1.000	.822**	.834**
DXA	.757**	.822**	1.000	.887**
BIA	.745**	.834**	.887**	1.000

BIA VS. ANTHROPOMETRY (Taller bar is better)



Conclusion: These results suggest clinical methods, notably BIA, correlate with and provide similar composition of weight loss results to research-based body composition methods.

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