

Measuring Body Composition: Keeping up with an Increasingly Obese Population

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The article in this issue by Ginde et al. (1) raises a timely and important topic for obesity treatment and research—the need for practical, validated means to assess the body composition of those with BMI >35 kg/m².

The rapid spread of severe obesity has created a priority to develop practical, validated tools for measuring body composition in severely obese individuals. Measures must be valid and reproducible so that we can be confident of their accuracy over time.

Current “gold standard” methods have limitations. DXA cannot accommodate patients who weigh >250 lbs. Hydrostatic weighing requires very large subjects to climb into a tank that may induce claustrophobia. Patients also have to perform what may be physically challenging acts (e.g., exhaling and bending forward). Studies on measuring subcutaneous fat with calipers have failed to validate the method once the fat fold exceeds the caliper’s capacity.

The National Heart, Lung and Blood Institute’s (2) recommendations for performing iliac waist circumference measurements are an excellent way to measure changes in central adiposity. The methods are suitable for people of all sizes but require the user to palpate bony landmarks—a challenge, at times. Other methods require equations and assumptions that can impact the reliability of the measurements. Bioelectric impedance analysis requires assumptions about hydration that may be inaccurate, and equations used to determine body composition may not be valid when dealing with severely obese individuals.

The Ginde et al. study on air displacement plethysmography shows a potentially appropriate alternative that is also

commercially available (BOD POD, Life Measurement, Concord, CA). The machine is not without some limitations and challenges. Nonetheless, it is better outfitted for people of size.

As with hydrostatic weighing, the equipment requires patients to wear a tight-fitting bathing suit or other tight-fitting clothing that may cause physical and emotional discomfort. However, patients do not need to exhale or bend forward; the only requirement is to rest comfortably and perform a breathing test. The large seat makes for comfort, and a window that allows patients to see out can alleviate claustrophobia.

Ginde et al. indicate that the results with the BOD POD are reliable and can be used to estimate body composition in the population of severely obese individuals. Das et al. (3) showed that the equipment could also be used to estimate change in body composition pre- and post-gastric bypass surgery, which is the ideal application for this technology. The BOD POD is non-invasive and user-friendly. These features make it an easy way to determine body composition.

References

1. Ginde SR, Glibber A, Rubin F, et al. Air displacement plethysmography: validation in overweight and obese subjects. *Obes Res.* 2005;13:1232–7.
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3. Das SK, Roberts SB, Kehayias JJ, et al. Body composition assessment in extreme obesity and after massive weight loss induced by gastric bypass surgery. *Am J Physiol Endocrinol Metab.* 2003;284:E1080–8.

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