

## Challenges in infant body composition

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**To the Editor:** Given the importance of early-life body composition in growth and health, a single method that is both precise and accurate across the entire life span is desirable. Our recent findings indicate the Pediatric Option for the BOD POD (COSMED USA, Concord, CA), which uses air displacement plethysmography (ADP) to assess body volume, accurately estimates percentage fat for children 2–6 y of age (1). The Pediatric Option accommodates children who are too large for the infant ADP (PEA POD), but not mature enough to adhere to the commands/procedures of the BOD POD. The recent paper by Rosendale and Bartok (2) suggests that the Pediatric Option fails to fill the remaining gap between 6 mo and 2 y of age. However, there are a number of methodological concerns regarding the study that indicate additional work is needed to firmly conclude whether or not the Pediatric Option can provide valid estimates of body composition in this age range.

First, the minimum age for which the device has been approved by the Food and Drug Administration is 2 y. The rationale for limiting use of the Pediatric Option to children >2 y of age is that by that age, children are more likely to be able to comply with the requirement to remain still/calm inside the test chamber. The authors reported “no association between behavior (crying and movement) and body composition”; however, in the study by Fields and Allison (1), comprehensive data on vocalization and movement were collected, and subject noncompliance (chiefly crying) in children <2 y was common (~40%), resulting in a 7.2% fat unit difference as compared with the four-compartment model. The study by Rosendale and Bartok (2) did not attempt to examine the validity of the Pediatric Option among the subset of children who were able to successfully complete three repeated measurements of body volume, as is required by the protocol. Because such a large proportion of children were reported to undergo only one or two body volume measurements, this suggests that behavioral compliance was low. Inclusion of children in the validation study that could not complete all three repetitions of the test likely contributed to the poor agreement

between methods. Second, Rosendale and Bartok (2) used different lean mass hydration reference data for the two methods (Butte coefficients for the Pediatric Option (3), and Fomon coefficients (4) for the comparison method); use of the same coefficients is ideal when comparing methods. Last, the study by Fields and Allison (1) used the four-compartment model as the criterion method for comparison to the Pediatric Options whereas Rosendale and Bartok used total body water. The four-compartment model is superior to any single method, given that it relies upon the fewest assumptions in the estimation of body composition (5,6). In conclusion, we believe the study by Rosendale and Bartok (2) has several methodological limitations, requiring further work to assess the validity of the BOD POD Pediatric Option in very young children. We suggest that behavioral issues in this age group are likely to prohibit its use in infants <2 y.

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