



Validation of the BodyGem® for Measurement of Resting Metabolic Rate in Children

The BodyGem® device has been evaluated for validity and reliability against a mechanical simulator, Douglas Bag-based indirect calorimetry, ventilated hood systems, and traditional metabolic carts. In each case the researchers have concluded the BodyGem is a valid and reliable indirect calorimeter for the measurement of RMR. These studies are summarized and referenced in “The BodyGem® is a Valid and Reliable Indirect Calorimeter”. Recently, researchers at Appalachian State University and University of Oklahoma have completed two studies that have also demonstrated the validity and reliability of the BodyGem and its applicability for measurement of RMR in children.

David Nieman and colleagues at ASU had 59 children, ages 7 to 13 yrs, perform 4 measures of RMR in a single test session. Two of the RMRs were measured using Douglas Bag-based indirect calorimetry and two using the BodyGem. The difference between RMRs measured with the two systems was not statistically significant, 17.4 kcals/day, and the test to test reliability for the BodyGem was $r = 0.94$.

In the other study, David Fields and associates at the University of Oklahoma used a Delta Trac II as the criterion system. The 59 male and female children (10.5 ± 3 yrs; 145.9 ± 19 cm; and 43.4 ± 18 kg) performed repeated RMR measurements under clinical resting conditions – supine for the Delta Trac II test and sitting for the BodyGem test. The difference between the two tests was, 47 kcals/day or 2.6%, and was statistically significant. However, the researchers suggest that the difference is not clinically relevant, may be due to the difference in positions used and conclude, “...the results of this study support the use of the BodyGem as a valid and reliable alternative to the Delta Trac II for the assessment of RMR in children.”

Therefore, we are now able to demonstrate that the BodyGem is a valid and reliable indirect calorimeter for measurement of RMR for both children, as young as 7 years of age, and adults. Healthcare professionals planning to use the BodyGem for the purpose of measuring resting metabolic rate in children are reminded that it is critically important the children truly be at rest and are measured under appropriate clinical conditions. Both of these research projects have been submitted for presentation at a national meeting in the Fall of 2004 and are in the process of being prepared for submission to referred journals.

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