Author's response to reviews

Title: Validity of new child-specific thoracic gas volume prediction equations

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Version: 3 Date: 9 May 2006

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RESPONSE TO REVIEWER

We thank the reviewer for their insightful comments on our paper titled “Validity of new child-specific thoracic gas volume prediction equations for air-displacement plethysmography”. A point by point response to their comments is listed below with changes in the body of the text in bold.

1. We acknowledge the reviewers comment about putting the deviation of estimates for both the TGV and %fat mass. However, we would like to not put them into the abstract given there would be six estimates for the TGV and six estimates for %fat mass, thus making the abstract more difficult to read and follow. As it is written now the message is clear with the details presented in the results section of the paper.

2. The issue of isothermal and isothermal-like air.
   a. Air that is present in the thoracic cavity, i.e. the thoracic gas volume will not maintain adiabatic conditions, in that it will not change its temperature in tandem with the rest of the air in the chamber, because it is held close to the temperature of the body. Therefore, although it is not strictly isothermal air, its temperature is held very close to that of the body, hence the appropriate term is “isothermal-like”. Some additional detail has been added to the INTRODUCTION section to help clarify this issue.

3. We appreciate the reviewer’s attention to detail and we apologize for this mistake. All citations have been checked and corrected in text and in the bibliography.

4. a. The children in the Portuguese sample were all recruited from sports clubs in which they were active participants in an array of activities. Unfortunately, we have no measures of their physical activity patterns to be able to verify the extent of their athleticism or quantify their time spent doing physical activity (other than five times a week with each session lasting approximately two hours). We have taken care in the discussion to highlight that our findings are tentative and only suggest that these equations are applicable to very active children and to indicate that substantiation in other studies is required.
   b. Given the prevalence of overweight in our samples (see table 1), particularly among the European American and African American samples, we feel that our sample provides a good overall assessment of the validity of these equations in both normal and overweight children.

General comments about Tables and Figures. We have made the changes suggested by the reviewer for the tables, however we did not have any figures, thus no changes to the figures were done.

5. **Table 1**: Prevalence of overweight has been given according to the Cole et al.\(^2\) international BMI standards. These were considered to be most appropriate for use in the present tri-ethnic sample.
6. **Table 2**: TGV units are in liters and have been added to the table legend. Since the three groups are treated separately in the analysis we feel that a group-wise comparison adds nothing to the paper and was therefore not included.

7. **Tables 3 & 4**: The r with the subsequent P-value represents potential bias. This has been clarified in the legend.

**References**