Reviewer's report

Title: The Correlation and Level of Agreement Between End-tidal and Blood Gas pCO2 in Children with Respiratory Distress: A Retrospective Analysis

Version: 1 Date: 27 August 2008

Reviewer: Peter D Sly

Reviewer's report:

This study has the potential to provide useful information, especially to those working in areas where access to blood gas analyses is limited. However, there are a number of issues that need to be addressed.

Major Compulsory Revisions

1. Timing of measurements: the authors admit in the discussion that not all paired measurements were obtained simultaneously but never give the number that were not, nor show the effect, if any, of these data on their results. The number of non-simultaneous measurements must be included. Preferably these data should be excluded. At the very least the analyses should be run with the data excluded and compared with the analyses including these data.

2. Age range: the age range of the patients included is extremely wide yet the authors do not consider the effect of age on their data. An analysis on the effect of age on the agreement between the two techniques must be included.

3. Correlation between EtCO2 and vpCO2: correlation analysis is, as pointed out by the authors, is not appropriate. These data, including figure 3 should be removed. If the authors want to investigate factors influencing the agreement between these two measurements this should be done using appropriate techniques.

4. Clinical interpretation: the bottom line for clinical practice is whether using EtCO2 rather than vpCO2 results in errors in clinical decision making. The authors need to include an assessment of whether any incorrect clinical decision would have been made had the clinicians relied on EtCO2.

Minor essential revisions

1. Limitations: the use of vpCO2 in this study rather that arterial CO2 has been recognised adn discussed. However, this discussion is rather weak and needs to be improved.

Discretionary reviews

1. the decision to exclude all children with chronic respiratory disease is unfortunate as this limits the clinical utility of this paper. If the data are available including an analysis of the agreement between the tests and the impact on clinical decision making in children with chronic respiratory problems would strengthen the paper.
Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

I declare that I have no competing interests