

Correspondence

Accuracy of transcutaneous carbon dioxide measurement

To the Editor:

We aimed to determine the reliability of transcutaneous carbon dioxide (PtcCO₂) compared with PaCO₂ in sedated subjects. After Ethics Committee approval and informed consent, seven male subjects (23–38 yr) were studied in a quiet, darkened room. The radial artery was cannulated and blood sampled at 20 min intervals for eight hours. Blood gas analysis was performed. (AVL MODEL 995). The FasTrac monitor (Critikon, USA) displayed PtcCO₂ and SaO₂ continuously. Following calibration the sensor was heated to 41°C and kept on the same site. Each subject received 15 mg midazolam *po*.

One hundred and forty-two pairs of simultaneous recordings were available for analysis: PaCO₂ values ranged from 38–53 mmHg (mean 43.0) and PtcCO₂ from 36–50 mmHg (mean 43.1). A good correlation between PtcCO₂ and PaCO₂ was demonstrated (see Figure 1A). Using the Bland and Altman method the mean PaCO₂ - PtcCO₂ gradient was 0.1 mmHg with 95% confidence limits of ± 3.6 mmHg (see Figure 1B).

Although PaCO₂ is the gold standard for blood-gas measurement, it is an invasive procedure and pro-

vides only intermittent data. Transcutaneous carbon dioxide measurement (PtcCO₂) in adults has been limited because of calibration difficulties and thermal hazards from high sensor probe temperatures.¹ These have been addressed and the Fastrac monitor is an accurate predictor of PaCO₂.^{2,3} Our findings support the reliability of PtcCO₂ as an indicator of PaCO₂. This non-invasive, continuous monitor of the adequacy of ventilatory function may be of particular value as a component of respiratory monitoring in the peri-operative period.

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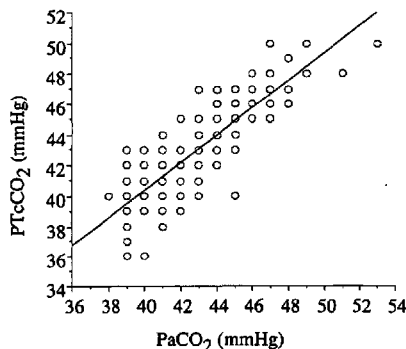


FIGURE 1A) Linear regression analysis showed a good correlation between PtcCO₂ and PaCO₂ and was described by $Y = 1.105 \times -4.43$, $r = 0.83$ ($P < 0.001$).

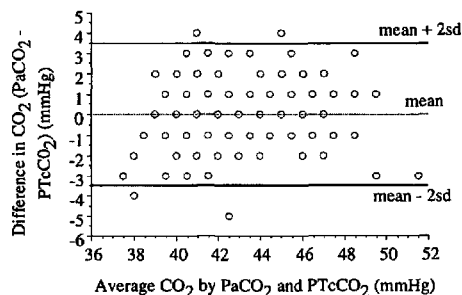


FIGURE 1B) Using the Bland and Altman method the mean PaCO₂-PtcCO₂ gradient was 0.1 mmHg with 95% confidence levels of ± 3.6 mmHg.