The accuracy of non-invasive carbon dioxide monitoring: a clinical evaluation of two transcutaneous systems

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We determined the accuracy of two transcutaneous carbon dioxide monitoring systems (SenTec Digital Monitor with V-Sign Sensor and TOSCA 500 with TOSCA Sensor 92) for the measurement of single values and trends in the arterial partial pressure of carbon dioxide in 122 adult patients during major surgery and in 50 adult patients in the intensive care unit. One or several paired measurements were performed in each patient. The first measurement was used to determine the accuracy of a single value of transcutaneous carbon dioxide; the difference between the first and the last measurements was used to analyse the accuracy and to track trends. We defined a 95% limit of agreement of \( \leq 1 \text{kPa} \) as being clinically useful. There was insufficient agreement between transcutaneous carbon dioxide partial pressure values derived from the two systems and arterial carbon dioxide values for both single values and trends as defined by our suggested limit of agreement. We conclude that these systems cannot replace conventional blood gas analysis in the clinical setting studied.

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