Indirect calorimetry is currently underutilised in clinical and research settings and is not widely recommended for use outside of the intensive care unit. This is due to many factors, including cost, lack of expertise, technical limitations in certain populations (eg, patients with high ventilatory needs), requirement for specialised training, need for completion under stringent conditions and lack of de

The range of available open circuit system configurations ensures that indirect calorimetry measurements can be completed in spontaneously breathing or ventilated patients across the healthcare continuum (acute, subacute and rehabilitation settings). Canopy and ventilated hood configurations provide the most accurate measure of energy expenditure, as they are less likely to interfere with breathing patterns and gas measurement readings, and should be considered for clinical and research purposes. Facemask or mouthpiece/nose clip configurations provide useful information on physical activity-related changes in energy expenditure, but unfamiliarity and constriction can interfere with the stability of gas exchange measurement.

The Deltatrac II, the most well-known being the total collection system (eg, Douglas bag) and the modern open circuit system, which are currently used (eg, Deltatrac II, Quark RMR). Open circuit systems range from desktop devices with facemasks or mouthpieces/nose clips in spontaneously breathing patients to arrangements that include a canopy or ventilated hood. The reliability and validity vary between indirect calorimetry systems and configurations. All of this needs to be carefully considered along with the purpose of use prior to purchasing devices, as costs vary between AUD10 000 to 60 000 per unit.

Psychometric properties when completing measurements: Specialised training is required for the accurate use and interpretation of indirect calorimetry measurements. Several elements can be assessed to confirm test reliability. The respiratory quotient, a ratio of VCO₂ produced to VO₂ consumed, provides an indication of unreliable tests when readings are outside the normal physiological range of 0.67 to 1.3. The stability of measurements can also be assessed by determining if a test reaches a ‘steady state’, commonly defined as a variation in VO₂ and VCO₂ of < 10% for five consecutive minutes. A steady state period is considered to reflect total daily energy expenditure and has been shown to provide reliable measurements of total daily energy expenditure. For measurements that do not reach a steady state, a 30-minute or longer indirect calorimetry measurement is generally considered a valid and reliable measure of energy expenditure in most populations. Therefore, test duration varies and is heavily influenced by test stability.

**References**