Abstract

The measurement of oxygen uptake (\( \dot{V}_{\text{O}_2} \)) is an important form of metabolic monitoring for patients during anaesthesia or in intensive care. It provides an indicator of oxygen consumption and delivery to the tissues, and of cardio-respiratory function. A simple, continuous and non-invasive method of measurement of \( \dot{V}_{\text{O}_2} \) and carbon dioxide production would assist anaesthetists in monitoring patient stability. In conjunction with currently available medical monitoring equipment, vital information on a patient’s clinical status is provided.

However the measurement of \( \dot{V}_{\text{O}_2} \) has traditionally been uncommon in the operating room. For a variety of technical reasons, non-invasive measurement has been difficult to perform accurately. Invasive techniques, such as the reverse Fick method, using a pulmonary artery catheter to measure mixed venous oxygen saturation, are rarely felt justified.

The aim of this project is to test, both in the laboratory and anaesthetised patients, a new method for the continuous, non-invasive measurement of \( \dot{V}_{\text{O}_2} \). This method will utilise existing equipment and technologies (anaesthesia delivery units, anaesthetic circuits and gas analysers) and be readily adaptable to clinical use by the anaesthetist in the operating room. This is a collaborative project conducted by investigators at the Austin Hospital, The Alfred and Monash University.

About the speaker

Christopher Stuart-Andrews has many years experience working in a clinical environment as a theatre technician in both the Coronary Angiography Unit and the Operating Theatre whilst completing a Bachelors degree in Electronic engineering at Melbourne University. He recently completed a Masters degree by coursework at Monash University in biomedical engineering which focused on
quantifying the errors found in measurements made using previous devices to measure metabolic gas exchange.

He is currently enrolled as a research student at Monash University where he is concentrating on developing a new method for continuous gas exchange measurement on patients under anaesthesia and in critical care. He also currently holds the position of research assistant in both the Department of Anaesthesia and Pain Management at The Alfred hospital and the Department of Anaesthesia at the Austin and Repatriation Hospital.