

Ultrasound for everyone – Why?

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Anaesthetists are expected to be the hospital expert in the rapid assessment of the severity of disease so they can provide the safest possible perioperative anaesthetic, analgesia and medical care plan. They are also expected to be the expert in percutaneous insertion of needles for invasive haemodynamic monitoring and regional analgesia and know how to perform emergency needle-guided relief of airway obstruction, tension pneumothorax and effusions compressing the lungs and/or heart. The pressures on anaesthetists continue to increase with an ageing population and an associated increase in severity of illness, proportion of emergency procedures with an associated limit in time for preoperative assessment.

Traditional (before ultrasound) training relies on performing a clinical history, physical examination, interpretation of available test results and sometimes requiring more preoperative tests prior to proceeding with anaesthesia and surgery. Despite the considerable training that anaesthetists undergo, there often remains uncertainty in the accuracy of clinical assessment and needle placement, that may result in sub-optimal patient care and safety.

Point of care ultrasound (POCUS) enables rapid bed-side visual guidance of both clinical assessment and needle placement in real-time, improving both diagnostic and procedural accuracy. The use of ultrasound has evolved from discrete office-based procedures in cardiology and radiology to an extension of the hand, replacing the stethoscope, enabling 'ultrasound assisted examination' and 'ultrasound assisted procedures'. Some common uses of POCUS for anaesthesia include fasting state, detection, quantification or exclusion of common cardiac and respiratory diseases, haemodynamic monitoring (TOE), deep venous thrombosis and raised intracranial pressure. POCUS has re-ignited regional anaesthesia. The resulting explosion of the use of POCUS in anaesthesia and critical care has led to an increasing requirement in specialty training, spreading to other medical and surgical specialties, medical students, paramedics, allied health and ACLS algorithms.

The costs of POCUS include equipment and training. Equipment costs are reducing, with hand-held devices available for under \$AUD5,000.

Training costs are much more significant and should be guided by evidence base for the ever-increasing indications for POCUS. Although research answers lag behind clinical use, the evidence will be the main focus on this presentation.