

Perioperative Point-of-Care Ultrasound (POCUS) for Anaesthetists: Is It Time to Introduce Formal Training?

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Abstract

This article reviews point-of-care ultrasound (POCUS) in the perioperative period. Ultrasound-guided techniques for regional anaesthesia and vascular access have been well-established in anaesthesia for many years. However, integration of whole-body POCUS into UK anaesthetic practice remains limited. There is a growing body of evidence highlighting the benefits of POCUS throughout the perioperative period. Widespread use may help to improve patient care in anaesthesia.

Key words: point-of-care ultrasound; perioperative; anaesthesia

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Introduction

Point-of-care ultrasound (POCUS) uses bedside ultrasound, with real-time image interpretation, to influence clinical decision-making. Ultrasonographic assessment of the heart, lungs and abdominopelvic region has been shown to be superior to clinical examination and history-taking alone ([Guevarra and Greenstein, 2020](#)). In anaesthesia, whole body POCUS has extensive perioperative uses, from assessment of cardiac function to the identification respiratory distress and aspiration risk.

Focused Cardiac Ultrasound (FoCUS)

Focused Cardiac Ultrasound (FoCUS) combines four acoustic windows to provide a gross assessment of biventricular function and interrogate surrogate markers of volume status ([Li et al, 2020](#)). Pre-operatively, FoCUS can be used in patients with unexplained cardiac symptoms to ascertain whether further cardiology work-up is required. Intra-operatively, FoCUS can identify the aetiology of acute hypotension more accurately than standard monitoring and clinical assessment ([McCormick et al, 2018](#)). Additionally, it has been demonstrated that FoCUS can detect regional wall motion abnormalities (RWMAs) despite normal intra-operative electrocardiogram (ECG) recordings ([Li et al, 2020](#)).

Lung and Airway Ultrasound

The utility of lung ultrasound (LUS) in identifying common lung pathologies is well documented ([Guevarra and Greenstein, 2020](#)). Studies consistently demon-

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strate LUS outperforms examination and X-ray in the diagnosis of pneumothorax and pneumonia. A meta-analysis conducted by [Asmara et al \(2022\)](#) showed that LUS had a sensitivity and specificity of 89% and 94%, respectively in the identification of pulmonary oedema. Compared to X-ray, LUS offers a rapid and portable means of image interpretation. Additionally, basic LUS skills are relatively simple to learn and have excellent reproducibility ([McCormick et al, 2018](#)).

Recently, airway POCUS has shown promise. Practical applications include evaluation of airway anatomy to predict difficult facemask ventilation. In a “can’t intubate, can’t ventilate” scenario, POCUS can assist in the identification of the cricothyroid membrane for emergency front of neck access ([You-Ten et al, 2018](#)). Further research comparing pre-operative airway POCUS with laryngoscopy views may help to determine whether it can also provide a non-invasive alternative to the Cormack-Lehane classification in predicting airway difficulty for tracheal intubation.

Gastric Ultrasound

Gastric ultrasound provides an adjunct to airway planning. Various gastric antrum scanning protocols have been developed which correlate well with aspiration risk. Low and high-risk gastric fluid volumes pre-operatively are defined as $<1.5 \text{ mL}\cdot\text{kg}^{-1}$ and $>1.5 \text{ mL}\cdot\text{kg}^{-1}$, respectively. A study by [Baettig et al \(2023\)](#) demonstrated that routine gastric ultrasound changed the airway plan to a more liberal approach in 19% of the cases studied, negating the need for a definitive airway.

Conclusion

Despite the highlighted benefits of POCUS, as with all practical skills, there is a degree of inter-user variability. This has the potential to cause patient harm if images are incorrectly interpreted. The Royal College of Radiologist (RCR) has recently produced comprehensive guidance for clinicians using POCUS who are not radiologically trained. Perhaps future amendments to the Royal College of Anaesthetist curriculum should mandate formal POCUS training. Competency assessment and certification guided by the RCR recommendations may help to limit user variability, improve inter-collegiate confidence, and ultimately, patient care.

Availability of Data and Materials

All the data of this study are included in this article.

Author Contributions

LW was the sole author and was responsible for the design of the work, drafting and revision of content, and approval of the version to be published. LW has participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

Not applicable.

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Conflict of Interest

The author declares no conflict of interest.

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