ANZCA
FPM

PG47BP Guideline on training and practice of perioperative diagnostic point-of-care ultrasound (POCUS) Background Paper 2024

Short title: Perioperative diagnostic POCUS BP

1. Introduction and Background

Point-of-care ultrasound (POCUS) is well established for cardiac examination but there has been rapid expansion of use of surface ultrasound to examine other regions and organ systems as its significant clinical value has been demonstrated in acute care settings and as access to the required equipment has been improved through portability and reducing cost. An understanding of the benefits and pitfalls of using this technology to guide clinical decision making in the perioperative setting is essential. Thus, it has become evident that there is the need for guidance regarding training and practice of POCUS for anaesthetists and hence the development of this document.

2. Scope discussion

2.1 Practitioners

There is recognition that a number of specialties frequently utilise POCUS for diagnostic, procedural and therapeutic purposes and have defined guidance. These specialities include cardiology, emergency medicine [1] and intensive care. Whilst this document may be used as a resource by such specialist physicians it has been produced as guidance for anaesthetists using point of care ultrasound in the perioperative setting. To support alignment of principles of POCUS training and practice, there was emergency medicine representation on the document development group.

2.2 Diagnostic versus procedural ultrasound

Ultrasound is widely used by anaesthetists to assist with procedures such as regional anaesthesia and vascular access. Whilst such procedural ultrasound requires knowledge of anatomy, ultrasound technology and equipment as well as defined skills, it was decided that the purpose was distinctly different, and the scope was too large for one professional document. Thus, scope was limited to the use of ultrasound to assist with clinical diagnosis and clarification in the perioperative setting.

2.3 Anatomical regions

PG47 aims to support the use of POCUS in common peri-operative anaesthesia practice and the concept of “core” POCUS studies was developed to describe the areas of expanding use of diagnostic ultrasound by anaesthetists in their everyday practice. Consideration was given, with specialist emergency medicine practitioner input, to including Extended Focused Assessment with Sonography in Trauma (EFAST) recommendations. The consensus of the DDG was that such POCUS examinations are generally conducted in clinical areas where trauma patients are being assessed, often by emergency medicine specialists, rather than the routine perioperative setting. Anaesthetists undertaking emergency assessment of trauma patients need to be aware of the training required to conduct FAST or E-FAST safely and efficiently and this is well described.[1]

Whilst abdominal ultrasound may be part of a cardiovascular examination (inferior vena cava examination for example), it was decided that examination of other intra-abdominal organs or structures is not routine anaesthetic practice.

Ocular ultrasound, cerebro-vascular ultrasound and deep venous thrombosis diagnosis are similarly not frequently performed by anaesthetists and require specific training. They have not been included at this stage and are thus described as “additional”.

2.4 Cardiac POCUS has established guidance and is recognised as a valuable skill for anaesthetists trained in its use. Lung and pleura examination is often intimately related and thus an important adjunctive skill. There are a number of national and international guidelines that provide sound recommendations for training and practice. As they each vary in the nominated number of views to be obtained, specific description in the professional document was felt to be unwarranted. Nevertheless, adoption of one of the recognised

guidelines should be considered. Recommendations for use and training in cardiac POCUS for children are limited although there are some published international guidelines.[2]

Recommended published guidelines for cardiac POCUS include:
USA- Spencer, 2013[3]
Canada - Meineri, 2021[4]
Europe - Neskovic, 2018[5]
Australia - Royse, 2012[6]

2.5 There are a number of **lung POCUS** guidelines with some variation in number and sequence of views.

Recommended published guidelines for lung POCUS include:
International -Volpicelli – 2012[7]
USA -Bronshteyn – 2022[8]
Australia - Royse – 2012[9], Ford - 2016[10]

2.6 Focus on **gastric** ultrasound has been increased by the expanding use of medications that slow gastric emptying and thus guidance has been sought for training in gastric POCUS.
Published guidelines are in general agreement regarding the conduct of gastric point-of-care ultrasound. Examinations should follow the guidelines published by one of the following:
Perlas et al. Can J Anesth 2018[11]
Haskins et al. RAPM 2018[12]
Sidhu et al. Australasian Anaesthesia 2023[13]

2.7 **Airway** examination using ultrasound is recognised as a potentially valuable tool in certain prescribed situations such as identification of anatomy prior to or during airway management including preparation for, and real-time guidance of, front of neck access. It is less commonly used by anaesthetists as a diagnostic tool perioperatively but there is evidence for its utility in the intensive care setting including for airway assessment, ETT confirmation, and facilitation of crico-thyrotomy.[14]

3. Review of issues

3.1 Specification of training requirements

3.1.1 Volume of practice.
The aim of recommending any particular number of ultrasound studies to be performed to achieve competence is multifactorial. It supports acquisition of technical skill, identification of normal and pathological anatomy and understanding of both applications and limitations of the particular POCUS technique. Such a recommendation generally assumes that the practitioner has limited prior experience in that area.
There is international consensus around the general numbers required for competence in the performance of cardiac POCUS and EFAST. In arriving at a prescribed number of recommended studies to support clinical competence in other POCUS areas, on occasions an average of guideline suggestions has been adopted. For example, 20 supervised studies for thoracic POCUS is the average of Canadian and North American. [4] [8] Such consensus does not yet exist for other areas such as gastric, airway etc but extrapolation, based on learning theory, can be made to some extent.

3.1.2 Prior ultrasound experience
Clinicians who regularly use ultrasound in their practice, such as ultrasound-guided regional anaesthesia or cardiac anaesthesia practitioners, will have acquired a sound level of ultrasound acquisition and interpretation skills. It was considered reasonable that less volume of practice is therefore needed to achieve the required level of competence for training in additional modalities of POCUS, particularly where these additional modalities involve limited anatomical areas and limited physiological complexity, for example gastric and airway ultrasound. This is consistent with published evidence.[15, 16] For gastric POCUS, different volumes of practice can be considered for clinicians with ultrasound experience versus those without. Ideally evidence of prior experience should be available.

3.1.3 Access to POCUS training

With newer modalities that are not yet adopted widely ("additional POCUS modalities"), it is recognised that access to clinical environments where there is tuition and supervision is likely to be limited. Also, at this stage specific POCUS courses are few in number. Alternative modes of learning such as simulation and on-line modules are likely to be important in supporting the development of POCUS skills. Remote supervision with review of recorded images and videos is appropriate during the post-workshop phase, that is, after some form of formal procedural skills assessment is performed. The rationale for this is two-fold: (a) to facilitate the training of those in rural/regional or private practice settings and (b) to allow for wider adoption to achieve a critical mass of practitioners.

3.1.4 Continuing professional development
Continuing professional development (CPD) involves activities designed to maintain or improve skills and knowledge in POCUS modalities. In the absence of clear guidance elsewhere for POCUS, and recognising real-world challenges in different practice environments, a minimum number, based on half the number of patient and volunteer studies needed for training, is defined for studies to be performed annually. This number is related to each modality, and is the same for all practitioners, whether or not they have required fewer cases during training because of prior ultrasound experience elsewhere. This is also in addition to case discussion and review, and targeted educational activities related to the relevant POCUS modalities.

3.2 Reporting
The report, containing the elements listed in Section 5.4 of PG 47, should be available in the patient's medical record. A separate approved template or form is encouraged, but if not practical then a minimum requirement is for a report to be entered into the patient's anaesthesia or medical progress notes.

4. Summary

Indications for use of point of care ultrasound in perioperative anaesthetic practice are rapidly evolving. Sound training to acquire technical skills and an understanding of the pitfalls and risks underpins ultrasound supported clinical decision making. These documents, PG47and its Background Paper, provide training and maintenance of skill recommendations, based on current national and international guidance, that aim to support clinical competence. It is recognised that there may be challenges in meeting the recommendations, particularly for rural and remote practitioners, until training programs for newer POCUS modalities become more broadly established.

Related ANZCA documents

PG47 Guideline on training and practice of perioperative diagnostic point-of-care ultrasound (POCUS)
PG46 Guideline on training and practice of perioperative cardiac echocardiography in adults 2024

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