Critical Care Ultrasound training in Europe

By Dr Adrian Wong

The use of ultrasound outside the hands of radiologists is no longer novel. Starting with cardiologists and echocardiography, other medical specialties have begun to embrace ultrasonography as part of their everyday practice. Not only is it a powerful diagnostic tool in enhancing clinical examination, but it also plays a role in resuscitation, guiding therapy and facilitating procedures. The ability to do all of this without moving a critically ill patient from the relative safety of the resuscitation room or intensive care unit argues further for its use. The main difference between such scans and those performed by radiology/sonography colleagues is that these tend to be more focussed towards answering a specific clinical question.

This article summarizes a recently published paper describing the results of a survey aimed at ascertaining the current state of Critical Care Ultrasound (CCUS) training in Europe. The survey also compared available accreditation programmes and perceived barriers in accessing CCUS training.

With the increasing number of specialties and clinicians currently utilising and/or wanting to increase their skills in point-of-care ultrasound (POCUS), there is a need for appropriate training, accreditation and perhaps most importantly governance structure around these scans. The limitations of a focussed scan must be respected to avoid POCUS clinicians practicing and reporting beyond their level of competency. Clear guidelines to define the appropriate competencies need to be agreed upon by the relevant professional bodies.

The International Federation of Emergency Medicine published their POCUS curriculum guidelines in 2014 [1]. This document pools together international experts to define the competencies, training methodology, how to keep up to date and various accreditation processes. Such a unified document across the Critical Care specialty is currently lacking.

POCUS IN CRITICAL CARE
The use of POCUS in Critical Care has lagged behind that of other specialties despite being championed by enthusiasts. In 2011, a team of experts from the European Society of Intensive Care Medicine (ESICM) and 11 other Critical Care societies published a joint paper attempting to define the necessary framework and standards required for the Critical Care physician wishing to practice POCUS [2]. It also defined the ‘core/basic’ competencies and more ‘advanced’ techniques. There was unanimous agreement that core POCUS competencies should be mandatory in all Critical Care training programmes across Europe. Crucially, it did not agree upon the details of the various ultrasound modalities nor how best to deliver the training. These decisions were left to the individual countries and training programmes.

Given this context, a survey was conducted and published which attempted to assess the state of training across Europe [3]. At the time of the survey, only five European countries had a nationally-accredited...
POCUS programme for Critical Care, although several were in development.

Unsurprisingly, echocardiography was the POCUS modality deemed most useful, being the most established. There were differences as to what should constitute core echocardiography competency. Perhaps even more fundamentally, there was disagreement with regards to whether the ability to perform transoesophageal echocardiography should be mandated. Along with Doppler studies, diastolic dysfunction etc., transoesophageal echocardiography obviously has a role in assessing cardiac function but these are more challenging skills to master and maintain.

Further differences include whether ultrasound examination of other body areas should be included into a Critical Care POCUS competency list. Lung ultrasound has grown beyond the diagnosis and treatment of pleural effusions; there is a growing body of evidence to suggest that lung ultrasound has a higher sensitivity and specificity compared to traditional clinical examination and plain radiographs for conditions such as pneumonia, pulmonary oedema and pneumothoraces. However this is a relatively new technique and hence the number of clinical experts/teachers are limited.

Abdominal ultrasound in the setting of the Emergency department (and by extension, Critical Care), has long been established by the use of Focused Assessment by Sonography in Trauma (FAST) scans in international Advanced Trauma Life Support (ATLS) courses. The ability to detect free fluid is relatively straightforward compared to the nuances of hepatic ultrasound. Countries surveyed differ in their perceived usefulness of this modality and hence whether it merits inclusion in the Critical Care curriculum.

At a more basic level, there were differences in opinion as to how best to deliver such training. The survey highlighted the lack of access to trainers as a significant barrier to training. The traditional model of one-to-one teaching by the bedside has clear advantages, including the maintenance of a high level of training, although it restricts the number of trainees. On the flip side, there are online courses whereby teaching is completely delivered at distance through videos and recorded lectures [4]. An alternative would be a hybrid of these two models — accreditation programmes such as the Dutch ICARUS [5] programme consists of face-to-face lectures, hands-on supervision at the course and an online logbook. The final assessment is conducted after a review of the submitted logbook, with the candidate undergoing a practical assessment at a chosen centre.

In summary, there are significant variations in the accreditation programmes in Critical Care POCUS internationally [Table 1]. The exact composition of the curriculum and competencies are yet to be defined. Furthermore, the mode of training delivery, minimum scan numbers and assessment format etc. have yet to be agreed upon at a European level.

THE OXFORD EXPERIENCE
In the UK, the Intensive Care Society Core Ultrasound Skills in Intensive Care (CUSIC) is the nationally accredited programme in POCUS [6], with clearly defined competencies and accreditation pathways. These have evolved with time but are reflective of the Critical Care casemix. Like in other countries, the number of recognised trainers is small and cannot match the demand. This imbalance would need to be addressed should POCUS competencies be mandated in the Critical Care curriculum. More recently, the ability to remotely mentor and supervise learners using an online, secured DICOM viewer has been developed. This offers a unique opportunity to address the trainer shortage and also the research potential to evaluate how best to deliver training.

Delivered in a modular system, the fellowship in the Oxford University Hospitals NHS Foundation Trust provides a degree of flexibility to account for learner variation. Dedicated time for both trainers and trainees are set aside to avoid the competing needs of service provision on a busy tertiary-level intensive care unit. The fellowship has been running for just under three years and has successfully taken fellows from across the world through CUSIC accreditation. In addition, we support our fellows in developing their own expertise as teachers through hands-on teaching at courses, research and publication.

THE UNANSWERED QUESTIONS – THE NEED FOR CONSENSUS AND GUIDELINES
There are significant variations in the delivery of POCUS training across Critical Care areas in Europe. These may well be justified given the variations in adult learning styles and national/local healthcare setup.

Unanswered questions include::

- Which body systems to include?
- Number of scans required to achieve competency level
A crucial gap in all the available accreditation programmes is the lack of guidance for the practitioners’ maintenance of their own expertise and level of competency. Are periodic assessments and review of logbooks required as evidence? In modern healthcare where professional standards and performance are regularly scrutinised in appraisals and the revalidation process, this issue is just as important for the trainers as it is for trainees.

However, the basic competencies should be standardised; these will form the foundation from which training programmes, teachers and learners start and build up.

Table 1 – Comparisons of available accreditation programmes (adapted from reference 3)

<table>
<thead>
<tr>
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<th>UK</th>
<th>ACCP</th>
<th>SCCM</th>
<th>ESI CM</th>
<th>Canada</th>
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<tr>
<td>Duration</td>
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<td>Theoretical Programme</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Trans-thoracic Echocardiography (TTE)</td>
<td>50 studies</td>
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<td>30 studies</td>
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<td>30 studies</td>
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<tr>
<td>Lung/pleural</td>
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<td>20 studies</td>
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<tr>
<td>Vascular access</td>
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<tr>
<td>Assessment</td>
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<td>Yes — at completion of entire portfolio</td>
<td>Variable for credentialing external bodies for certification</td>
<td>Not specified</td>
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</table>

Abbreviations:
UK - Core Ultrasound Skills in Intensive Care (CUSIC) and Focused Intensive Care Echocardiography (FICE) programme; ACCP - American College of Chest Physicians Critical Care Ultrasonography; SCCM - Society of Critical Care Medicine programme; ESI CM - European Society of Intensive Care Medicine; Canada - Canadian Intensive Care Society programme

- Number of directly supervised scans
- Face-to-face vs online or distant learning
- Method of assessment

Critical Care societies play a crucial role in providing standardised training modules. This would facilitate the individual countries and hospitals having clear pathways for trainers and trainees. As ultrasound becomes ubiquitous and accepted as a standard of care, a consensus regarding the minimum standard of training is required to maintain quality, irrespective of location / mode of training. Equally, more opportunities are needed for colleagues keen to develop and obtain these skills without compromising the integrity and quality of the accreditation.

REFERENCES
4. www.123sonography.com

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