

International recommendations on competency in critical care ultrasound: pertinence to Australia and New Zealand

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An International Roundtable meeting on training and competency in critical care ultrasound was held in Vienna at the time of the 23rd European Society of Intensive Care Medicine Annual Scientific Meeting in September 2009. Representatives from major European and North American intensive care societies, in addition to a number from South America, Asia, Australia and New Zealand, met for 2 days and produced a consensus document, which is soon to be published in *Intensive Care Medicine*.¹ In this article I outline the consensus reached and the implications for intensive care training in Australia and New Zealand.

Background

The application of echocardiography to management of critically ill patients is now recognised as highly desirable, and for many clinicians, essential.^{2,3} With increased use of this modality, a number of difficulties have become apparent, even in Australia and New Zealand, where interest is high and equipment availability is usually not a problem. These difficulties include lack of suitable training opportunities, political challenges where other medical specialities feel threatened, a lack of clearly defined standards of practice, and a lack of comprehensive certification confirming adequate theoretical knowledge and practical ability. These challenges are identical to those experienced by many critical care physicians and trainees around the world, and indeed were the driving force behind the creation of the Roundtable. Interestingly, similar answers to many of these challenges had been arrived at independently by most participants in different countries, and after the robust debate expected whenever a gathering of critical care physicians meet, consensus on echocardiography training and competency was readily achieved.

An area not so concisely defined is general ultrasound in the management of critically ill patients. Use of ultrasound to evaluate the thorax and abdomen and to facilitate vascular access were recognised as important applications of this technology, but there was no agreement on how training and competency for these applications should be assessed. Also questioned was whether the range should extend to other applications, such as transcranial Doppler, assessment of deep venous thrombosis, and assessment of the neck in preparation for a tracheostomy.

ABSTRACT

The use of echocardiography and other applications of ultrasound in the management of critically ill patients is becoming mainstream. With increased accessibility to equipment, the main challenges are in providing training and drawing up an outline of what levels of competency should be achieved. An international body of experienced critical care physician sonographers has reached consensus on guidelines in training and on two levels of competency — basic and advanced. Formal structures to aid the physician have been developed in Australia and New Zealand.

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Review of recommendations

An overall summary is presented here, but it is recommended that the whole consensus document be reviewed for a more comprehensive perspective.¹

There was agreement that there should be two levels of competency in critical care ultrasonography.

Level 1. Basic critical care ultrasound competency

The basic level was considered to be the level that all intensivists who use ultrasound should achieve. Ultrasound should be viewed as an extension of the physical examination in evaluating critically ill patients. The basic level should be considered for inclusion in current critical care training curricula.

Components

- Ability to correctly adjust an ultrasound machine to optimise image acquisition;
- Clinical objectives: to assess left ventricular contraction and right heart function; to identify the presence of a pericardial effusion and features indicating tamponade; and to assess intravascular volume;
- Basic course, including theory and practical training of at least 10 hours, should include only transthoracic echocardiography (TTE), not transoesophageal echocardiography (TOE);

REVIEW OF INTERNATIONAL RECOMMENDATIONS

- After the basic course, there should be a follow-up of a further 30 studies that have been recorded in a logbook, with a report on each study written by the student;
 - A supervisor is required for follow-up studies, to view the studies and subsequently provide a report. The supervisor may not necessarily be an intensivist (because of limited experienced personnel available), but should be someone with experience in performing studies in the intensive care environment;
 - Competency in general ultrasound was not defined in terms of the number of studies performed, but the trainee should obtain some expertise in lung and abdomen ultrasound, and in insertion of central venous lines under ultrasound control;
 - No course examination should be required;
 - It is very important to recognise “limits of competency”. Basic ultrasound competency should be limited to emergency situations and the operator should recognise the boundaries of his or her expertise. Any observation that is not unequivocally understood should be referred to a more experienced operator.
- It is essential to recognise “limits of competency”, especially when the complexity of the underlying pathology requires special expertise (eg, in patients with congenital heart disease);
 - A process of certification or accreditation validating attainment of the required level of competency is recommended. It is regarded as essential to provide documentation of recognition by colleagues and hospital administrators.

The question as to whether an international certification process was possible produced considerable discussion. Although considered desirable, in that it would assist clinicians in countries in which political resistance stymies the development of critical care echocardiography, it was considered impracticable at this stage.

Implications of the recommendations for Australian and New Zealand intensive care

Practitioners involved in critical care ultrasound will recognise that many of the elements described above reflect views expressed in the national literature and at various intensive care meetings around Australia and New Zealand over the past few years. Indeed, the recommended two levels of competency are very similar to those concluded by the now defunct combined committee (College of Intensive Care Medicine/Australian and New Zealand Intensive Care Society) on critical care ultrasound. Having confirmed that local initiatives are in parallel with many international groups, the big question now is how to attain the twin goals of training programs for both levels and certification for the advanced level.

As a general overview, there are currently several critical care ultrasound training courses in Australia. These include, but are not limited to, courses offered by Ultrasound Training Solutions (Melbourne), the Australian Institute of Ultrasound (Gold Coast), the Nepean Institute of Critical Care Education and Research (Sydney) and the University of Melbourne. The University of Melbourne provides a Postgraduate Diploma in Perioperative and Critical Care Ultrasound, while the other institutions provide courses of varying duration with primarily hands-on training but no formal course assessment or certification. An alternative for some has been to obtain a Diploma of Diagnostic Ultrasound (DDU) (Cardiology) from the Australasian Society for Ultrasound in Medicine (ASUM). All of these courses fulfil the course requirements for Level 1, but none are sufficiently aligned with the practical content of Level 2 to satisfy the course requirements.

Level 2. Advanced critical care ultrasound competency

As a general guide, it was agreed that the program course for the advanced level should include items in the American College of Chest Physicians/Société de Réanimation de Langue Française statement.² Once again, the emphasis was on echocardiography, with a recommendation that general ultrasound should be part of the curriculum but without a definite prescription for depth and range of expertise being stated.

This advanced level allows the use of echocardiography as a haemodynamic monitoring tool, possibly the main monitoring tool in the management of intensive care patients, in addition to its obvious diagnostic role. It was not proposed that all intensivists achieve this level, but rather that every major unit would have some personnel on staff who had attained it.

Components

- The theoretical component should include course work of no less than 40 hours, made up of a combination of lectures and interactive cases;
- The practical training environment should include a locally qualified clinician to supervise hands-on sessions, including both TTE (a minimum of 150 studies) and TOE (a minimum of 50 studies);
- A logbook should be kept containing reports of all studies, co-signed by the student and supervisor to guarantee quality of content. A maximum of 2 years should be allowed for the course and collection of studies;

REVIEW OF INTERNATIONAL RECOMMENDATIONS

Level 1 (basic critical care ultrasound)

Training in basic critical care ultrasound is currently being serviced by a number of courses that have responded to market forces. Examples include RACE (Rapid Assessment by Cardiac Echo) (run by the Nepean Institute of Critical Care Education and Research), RUSH (Rapid Ultrasound in Shock) (run by the Australian Institute of Ultrasound) and HEARTSCAN (run by the University of Melbourne). A further recent development is the CCPU (Certificate in Clinician Performed Ultrasound) (run by ASUM), which has been quietly responding to the increasing application of ultrasound in various medical specialities by providing a certificate obtained through coursework (and not requiring examination) for FAST (Focused Assessment with Sonography for Trauma), vascular, surgical and acute obstetrical emergencies. A CCPU in critical care, incorporating all the elements of Level 1 as described in the international recommendations, is now offered. The 10 hours of course work can be attained through local 1–2 day courses provided by various bodies in Australia and New Zealand, once the course is registered as suitable with ASUM.

Level 2 (advanced critical care ultrasound)

Some courses in Australia provide good to excellent theoretical components of the advanced level requirements, but the practical component is more of challenge. Up to now there has been no framework similar to that outlined by the International Roundtable, and certainly no form of assessment of the practical component and subsequent certification. This disadvantages not only those experienced operators who cannot easily prove their competency outside their own institution, but also students aiming for competency. They deserve a framework with clearly defined expectations, including confirmation once they have achieved it. For example, a qualified intensivist may spend an additional year as a Critical Care Echo Fellow, perform over 300 TTE and 75 TOE studies in a teaching laboratory, and have no national certification process available to confirm his or her expertise.

Fortunately the situation has recently progressed, with the establishment of an advanced level of certification by ASUM. ASUM's DDU, well established in Australia and New Zealand for the past two decades and catering to radiolo-

gists, cardiologists and obstetricians, has now been extended to critical care. The DDU in Critical Care has been offered for the first time in 2010. It includes two examinations: the first is a physics examination common to all the different DDU subgroups, and the second is oriented to the critical care physician. The practical requirements are very similar to those outlined by the International Roundtable in terms of number of studies and the need for a logbook and supervisor. The course should address all the requirements of intensivists seeking training in advanced critical care ultrasound and provide them with a well established qualification, recognised throughout both Australia and New Zealand.

Other societies or universities may develop programs that address both the theoretical and practical requirements in the future. Any development that contributes to the evolution of quality critical care ultrasound in Australia and New Zealand should be encouraged. It has taken considerable time to bring the modality to the forefront of patient management in the intensive care unit, and even now, many patients who could benefit from its application are not receiving it.

In summary, the International Roundtable on critical care ultrasound has been a major step forward. It has provided a consensual framework for training and assessment, resulting in a more clearly defined focus for intensivists applying ultrasound in their everyday practice.

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