Should echocardiography become a core skill for intensivists?

Echocardiography allows direct visualization of the heart, vessels and pleura and is a valuable tool to acutely evaluate haemodynamic status and ventricular function. Echocardiography is also used in the critically ill to look for evidence of valvular disease, effusions, pulmonary oedema, aortic dissection and causes of refractory hypoxia. The development of abbreviated focused protocols and availability of cheaper portable equipment has resulted in increasing interest in echocardiography among intensivists.

Impact of echocardiography

Orme et al (2009) showed that adequate focussed transthoracic echocardiography images were obtainable in 91% of spontaneously breathing and 84% of mechanically ventilated critically ill patients – 51% of these images resulted directly in a change in management.

Current American College of Cardiology guidelines highlight the indications for performing echocardiography on critically ill patients (Cheitlin et al, 2003). Category I indications (useful and effective) are haemodynamic instability, suspected aortic dissection or aortic injury and multiple or chest trauma. Category IIa indications (may be beneficial) are evaluation where cardiac output monitoring is disparate with the clinical situation. Category III indications (unlikely to benefit or may cause harm) are haemodynamically stable patients with no abnormal findings or cardiac disease.

Intensivists and echocardiography

For category I indications, best practice suggests that echocardiography should be performed, but by whom? Cardiologists provide an invaluable service for routine and comprehensive echocardiography. However, difficulty obtaining cardiology support out of hours and a requirement for re-assessment after intervention highlights the need for an intensivist-led service for haemodynamically unstable patients.

The British Society of Echocardiography recognizes that: 'assessment of haemodynamics and monitoring the effects of therapeutic interventions… may be outside the experience of many accredited echocardiographers' (Fox, 2008). Intensivists are ideally positioned to broaden their skill base: with knowledge of the patient's underlying condition and unique physiology, intensivists have the ability to assess the response to an intervention.

Establishing training

While echocardiography is an emerging technique in intensive care medicine, the current 'apprenticeship model' of training is unsuitable as many consultant intensivists do not yet have established proficiency.

A 'pyramid structure' for training was proposed: the majority of intensivists have entry level skills and a small number, in a supervisory capacity, have full accreditation. The ability to assess cardiac output, fluid responsiveness and make quantitative assessments of left ventricular function is developed from the entry level skills by further training.

Entry level training includes FEEL (focused echo evaluation in life support) and FATE (focused assessed transthoracic echocardiography) courses which are supplemented by local supervised practice.

The British Society of Echocardiography accreditation in intensive care echocardiography has just been developed and includes a written assessment and logbook of 250 echocardiograms (transthoracic and transoesophageal echocardiography) with emphasis on answering clinical questions.

It is vital that intensivists continue to recognize their own limitations and ensure cardiology input is obtained whenever any doubt exists. Establishing links with cardiology services will be essential for both training and continued support.

Potential problems

There is the potential for patient care to be adversely affected by the incorrect interpretation of echocardiographic images. The images should not be used in isolation but in conjunction with all other available evidence. Saving images allows experienced review and therefore promotes local governance, audit and quality control.

Conclusions

Echocardiography improves the assessment and management of unstable critical care patients and is arguably an essential tool for patients with category I indications. It appears certain that echocardiography will become commonplace within all types of critical care and that the development of strategies to establish an intensivist-led service will be necessary. Initial and continued cardiology input is essential to maintain a viable and safe service for critical care patients. Although there will be initial barriers regarding training and supervision, these will diminish as echocardiography becomes established within critical care. Incorporation of a focused transthoracic echocardiography assessment as part of the patient's daily review will help to develop and maintain echocardiography skills. It is essential that intensivists remain aware of their own limitations. BJHM

Dr J Briggs *is Specialist Trainee in Anaesthesia,* **Dr C Carle is** *Specialist Registrar in Anaesthesia and Intensive Care Medicine and* **Dr A Roscoe** *is Consultant in Cardiothoracic Anaesthesia, Wythenshawe Hospital, Manchester M23 9LT*

Correspondence to: Dr C Carle

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Anaesthetic and critical care dilemmas are coordinated by Dr Pervez Sultan and Dr Kate Adams, Specialist Registrars in Anaesthetics, University College Hospital London

Ideas for future dilemmas can be sent to Rebecca Linssen bjhm@markallengroup.com