



**College of Intensive Care Medicine
of Australia and New Zealand**
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STATEMENT ON THE ROLE OF ECHOCARDIOGRAPHY IN INTENSIVE CARE MEDICINE

Written by the CICM Ultrasound Special Interest Group (USIG).

Critical Care Echocardiography (CCE) was introduced into intensive care medicine practice several decades ago and is now established as a mainstream technique. It is widely used for the diagnosis, monitoring and management of the critically ill patient. Evolving experience and research in CCE has justified its role in the diagnosis of undifferentiated shock, management of the difficult post cardiac surgery patient and patients in cardiac arrest and guidance of urgent interventions.

CCE provides unique insights to intensive care specialists in a time efficient manner because of its immediate bedside availability, relatively non-invasive nature and repeatability. It differs significantly from a routine cardiology echocardiography study. In addition to the standard structural and functional assessment made by routine echocardiography, CCE addresses specific dynamic pathophysiological circulatory abnormalities such as heart-lung interaction in ventilated patients, complex vasoactive and inotropic pharmacological interventions, circulatory volume disorders and mechanical circulatory support. Moreover, CCE is also used to guide and monitor procedures such as vascular cannulation, pericardial drainage, and placement of ECMO cannulas.

Critically ill patients often present major challenges to adequate ultrasound imaging because of an inability to optimise patients positioning, lung over-distension induced by mechanical ventilation, the presence of drains and postoperative dressings, and occasionally, simultaneous ongoing resuscitation efforts. Thus CCE requires high quality modern ICU-dedicated ultrasound equipment to maximise the quality of imaging and minimise the risk of misdiagnosis.

Safe and accurate echocardiography in the intensive care environment requires appropriate knowledge, hand skills and an ability to integrate echocardiographic findings into the complex clinical and pathophysiological state of an individual patient. Such knowledge and skills can only be acquired following appropriate structured training under expert supervision. CCE is not a replacement for clinical history, physical examination and standard investigations applicable to the critical care setting, but a valuable extension of traditional practice.

Basic CCE became part of the curriculum of the training program of the College in 2014 with the aim of ensuring that all future intensive care specialists have this level of knowledge and skill. Basic CCE involves learning basic haemodynamic assessment from a short focused course emphasising relevant theory, followed by supervised hands-on training.

A further advanced level of training, requires a significantly longer period of theoretical and practical learning, and constitutes a 'subspecialty' interest and ability in CCE. A small group of practising intensive care Fellows now pursue one to two year-long critical care echocardiography fellowships. Some CICM Fellows are highly proficient, internationally recognised experts in transthoracic and transoesophageal echocardiography, contributing expertise in training and research in CCE to the wider intensive care community.

The College has established an Ultrasound Special Interest Group because it recognises the valuable contribution of CCE to intensive care practice, teaching and research. This has facilitated development of standardised structured education in CCE for CICM trainees and Fellows, formation of evidence-based and expert supported recommendations for training, equipment and performance of CCE, and the coordination of multicentre CCE research.

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