

EMERGENCY PHYSICIANS CAN RELIABLY ASSESS PATIENT CARDIAC OUTPUT USING NON-INVASIVE ULTRASONIC CARDIAC OUTPUT MONITOR (USCOM)

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Aims:

Cardiac output is important for diagnosing shock and monitoring the response to therapy. USCOM is a new, non-invasive, stand-alone device for measuring cardiac output using Continuous Wave Doppler technology. The aims of this prospective study were firstly to determine the number of proctored studies necessary for skill acquisition, and secondly to evaluate the reliability of USCOM cardiac output assessments in the emergency department.

Methods:

Two emergency physicians (one had completed the credential training for emergency ultrasound and another was undergoing emergency ultrasound training) from a teaching hospital emergency department underwent one hour of training from an USCOM Ltd credentialed trainer. Each of them independently performed USCOM cardiac output assessments on a convenience sample of 15 emergency department patients. Records of the acoustic image were reviewed by two independent, accredited trainers using the Fremantle Protocol, using validated six image-scoring criteria (gold standard). Skill acquisition was assessed at the 5th, 10th and 15th examinations. Two trained emergency physicians then each performed blinded protocolised examinations on 44 emergency department patients. Inter-assessor reliability was evaluated.

Results:

During the training period, the average image score improved from 3.5/6 at the 5th assessment to 4.5/6 at the 10th assessment to 6/6 (maximum possible) at the 15th assessment. Subsequent analysis of 88 cardiac output assessments in 44 emergency department patients (adult patients with a variety of presenting complaints) demonstrated excellent inter-assessor correlation ($r=0.93$, 95% CI (0.88-0.96)).

Conclusion:

Emergency physicians can be trained to obtain reliable cardiac output estimations upon emergency department patients with the USCOM over the course of 15 patient assessments.