GUIDELINES ON MINIMUM CRITERIA FOR ULTRASOUND WORKSHOPS

1. PURPOSE AND SCOPE

This document is a guideline of the Australasian College for Emergency Medicine (ACEM) and describes the minimum criteria appropriate for an emergency medicine ultrasound workshop in Australasia.

This document should be read in conjunction with the ACEM policy document *P22 (Policy on Credentialing for Emergency Medicine Ultrasonography)*, which specifies appropriate criteria for credentialing of individuals.

2. OBJECTIVES OF ULTRASOUND WORKSHOPS

The objectives of ultrasound workshops are to:

(a) Understand the theory of ultrasound.

(b) Understand practical applications and limitations of focussed emergency ultrasound.

(c) Understand credentialing process for specific emergency ultrasound indications.

(d) Understand need for ongoing emergency ultrasound CPD to maintain skills.

(e) Demonstrate proficiency in performing and interpreting emergency ultrasound scans.

3. RESOURCES

Emergency ultrasound workshops require a significant commitment of personnel, equipment and advanced planning. Basic components necessary include:

(a) The workshop faculty must include a medical specialist with appropriate and extensive clinical experience and qualifications.

(b) Instructors must have significant practical experience in the application of emergency ultrasound.

(c) Registered sonographers can be utilised to assist with teaching of the skills related to the fundamentals of ultrasound, image acquisition and interpretation.

(d) Ultrasound practical sessions (see below) should include appropriate ultrasound machines and transducers with a ratio of no less than 1 machine for a maximum of 5 students.

(e) Live ultrasound models must be used for scanning sessions, preferably including both normal subjects and patients with demonstrable pathology (e.g. peritoneal dialysis patients, patients with known abdominal aortic aneurysm).

(f) A workshop syllabus as well as a list of recommended texts and other references should be provided.

(g) The workshop site should be of sufficient area to accommodate both lectures and the practical sessions.

(h) Evidence of attendance should be provided including the numbers of workshop hours for CPD points.

(i) A form of pre-and post-test should be conducted to demonstrate some acquisition of ultrasound proficiency and interpretation.

(j) The workshop must provide an appropriate certificate at completion.

4. WORKSHOP CONTENT

4.1 Physics

- Piezoelectric effect
- Wave characteristics – cycle, frequency, period, wavelength, amplitude
- Echogenicity
- Image resolution
- Attenuation
- Doppler effect
- Impedance
- Reverberation
- Shadowing
- Enhancement

4.2 Instrumentation

- Probe types
- Probe selection
- Image labelling
- Focus
- Gain
- Time gain compensation
- Orientation
- Scan planes
- Image measurement

For each area of focussed ultrasound (4.3 onwards), the following should be covered:

- introduction
- superficial and sonographic anatomy
- sonographic protocols
- clinical algorithms and integration
- limitations / pitfalls reporting

4.3 Extended Focussed Assessment with Sonography for Trauma (EFAST)

4.3.1 Anatomy

- Liver
- Spleen
- Kidneys
- Pericardium
- Lung bases
- Bladder
- Uterus
- Ribs pleural line

4.3.2 EFAST Practical

- Right upper quadrant/Morrison's pouch
- Left upper quadrant/spleno-renal area
- Subxiphoid
- Pelvic
- Diaphragm
- Lung

4.3.3 EFAST Findings

- Haemoperitoneum
- Haemopericardium
- Haemothorax
- Pneumothorax

4.3.4 Integration into Clinical Practice and Algorithms

- Blunt versus penetrating injury

4.4 Abdominal Aortic Examination

4.4.1 Anatomy

- Aorta and major branches
- Inferior vena cava
- Vertebral bodies

4.4.2 Abdominal Aorta Practice

- Aorta longitudinal and transverse with measurements
- Appearance of thrombus
- Inferior vena cava

4.4.3 Findings

- Abdominal aortic aneurysm
- Ectatic aorta

4.4.4 Integration into Clinical Practice Algorithms

- Haemodynamically unstable patient
- Pulsatile mass
- Back pain
- Flank pain

4.5 Echocardiography in Life Support

4.5.1 Anatomy

- Cardiac chambers
- Cardiac valves
- Pericardium
- Great vessels
- Lung

4.5.2 Echocardiography Practice

- Parasternal long axis
- Parasternal short axis
- Apical 4 and 5 chamber
- Subcostal long and short axis
- Inferior vena cava

4.5.3 Findings

- Pericardial effusion and tamponade
- Left ventricular size and systolic function
- Right ventricular size and systolic function
- Estimation of volume status

4.5.4 Integration into Clinical Practice Algorithms

- Haemodynamically unstable patient
- Cardiac arrest

4.6 Introduction to Procedural Ultrasound

4.6.1 General Principles

- Direct vs indirect method
- In-plane vs out-of-plane model

4.6.2 Vascular access

- Venous anatomy
- Arterial anatomy
- Practical sessions using phantoms

4.6.3 Pleural and Abdominal Aspirations

- Anatomy
- Fluid identification
- Loculation identification
- Practical sessions

4.6.4 Foreign Body

- Identification
- Methods of removal
- Practical sessions using phantoms

5. PRACTICAL ULTRASOUND SESSIONS

It is essential that practical ultrasound sessions include:

(a) Minimum time - two hours on each side of abdominal aortic aneurysm, EFAST and ultrasound guided procedures.

(b) Maximum student: instructor ratio 5:1.

(c) Instructor who demonstrates correct application protocol for emergency indication;

(d) Sufficient time to allow student to demonstrate competence.

(e) Demonstration of normal and abnormal anatomy. Patients or professional-grade simulators are preferable for abnormal anatomy, however, they may not always be readily available. In such cases, ultrasound cineloops showing the same pathology may be substituted.

(f) Workshops covering Echo in Life Support must fulfil the criteria outlined in the ACEM policy document *P61 Credentialing for Focussed Echocardiography in Life Support*.

6. ACEM RECOGNISED WORKSHOPS

All ultrasound workshops wishing to receive recognition by ACEM must submit an application form along with the required workshop material to the ACEM ED Ultrasound Subcommittee for consideration.

ACEM will recognise workshops that cover the core emergency uses of ultrasound – Extended Focussed Assessment with Sonography for Trauma, abdominal aortic aneurysm, procedural and echo in life support. Workshops that cover other clinical uses, whilst encouraged and supported by ACEM, should be recognised by other appropriate bodies (e.g. other Colleges or the Australasian Society for Ultrasound in Medicine).

7. DOCUMENT REVIEW

Timeframe for review: every five (5) years, or earlier if required.

7.1 Responsibilities

Document authorisation: Council of Advocacy, Practice & Partnerships
Document implementation: ED Ultrasound Subcommittee
Document maintenance: Policy and Research Department

7.2 Revision History

Version	Date of Version	Pages revised / Brief Explanation of Revision
V1	July 2000	Approved by Council
V2	Sept 2001	Approved by Council
V3	July 2006	Approved by Council
V4	July 2012	Approved by Council
V5	Nov 2013	Approved by Council
V6	Mar 2016	Approved by Council of Advocacy, Practice and Partnerships 'Workshop' has replaced the use of 'course' throughout the policy. "Purpose and Scope' combined under one heading. Items previously included under 'Scope' now included under a new heading – 'Objectives of Ultrasound Workshop'. Minor changes made under 'Resources': The term 'workshop faculty' is used in place of 'Course faculty'. A record of workshop hours is now required for CPD points rather than CME points.
V7	Aug 17	Approved by Council of Advocacy, Practice and Partnerships clarified models to be used for scanning [3(d)]; provided for the use of ultrasound cineloops [5(e)]; corrected typo in [3(d)] - changed *'no more than 1 machine for a maximum of 5 students'* to *'no less than 1 machine for a maximum of 5 students'.*