

Training & Accreditation in Emergency Ultrasound

MODULE 2 AAA

Purpose of Document

This document describes the process for credentialing Emergency Physicians within Monash Health (MH) to perform 'Point of Care' Ultrasound Module 2

- Abdominal Aortic Aneurysm sonography (AAA)

Module 2 AAA is a basic module may also be undertaken in conjunction with Module 1 EFAST, or at later stage for paediatric ED specialists. Module 1 EFAST is the foundational training & credentialing module which must be completed prior to progression to advanced ultrasound modules. Completion of Module 2 AAA is not required prior to progression to advanced modules.

This should be read in conjunction with ACEM (2016) P22 *Policy on Credentialing for Emergency Department Ultrasonography: Trauma Examination and Suspected AAA*.

Background

The Physician performed AAA scan is an accurate, rapid and repeatable bedside test. Determination of the presence of an abdominal aortic aneurysm (AAA) is essential in the management of the symptomatic emergency department (ED) patient. (Tayal 2003, IFEM 2014, ACEM 2016) Sonographic assessment of the abdominal aorta for the early identification of AAAs has been shown to superior to clinical assessment. (Cosantino 2005) It has been acknowledged that AAA scanning is an appropriate use of ultrasound within MH Emergency departments.

This document describes:

- A 3 stage process for accrediting Emergency Physicians to perform Module 2 AAA scans
 1. Initial Training
 2. Induction/ Skills Development / Electronic Log Book /MH Accreditation
 3. Ongoing Audit / Skills Maintenance
- A method for auditing scan quality, maintaining a MH electronic logbook and ongoing accreditation
- A practical evaluation consisting of a direct assessment of the skills necessary to obtain and record appropriate ultrasound images for an AAA examination

STAGE 1 - Initial Training

Emergency Registrars & Consultants intending to perform ultrasound within MH are expected to complete:

- Compulsory online ultrasound physics module (external – NSW ECI)
- Appropriate practical ultrasound course (MH internal course or external private course)

Note any external PoCUS courses undertaken should be ASUM accredited standard (eg. Australian Institute Ultrasound AIU Gold Coast, Ultrasound Training Solutions U-T-S Melbourne introductory courses covering EFAST & AAA at minimum).

Module 2 AAA is a basic level module and may be undertaken with Module 1 EFAST or deferred (for Paediatric ED specialists).

STAGE 2- Induction/ Skill Development / Log Book / Accreditation

Clinicians who have undertaken the MH internal course will complete the practical skills development stage as part of Session C of the internal course structure. Clinicians who have completed an external training course will undertake an internal 90 minute induction session for eFAST/AAA modules by Sonographer educator, prior to practical skills development stage and commencing scanning at MH.

Further development of ultrasound scanning skills is achieved through one-on-one training sessions with program Sonographer or officers of EDUSEQ Committee, as required according to level of clinician scanning experience and skill. Internal course minimum requirement is 4 hours, but training sessions are unlimited. Practical scanning support, mentoring and feedback is offered throughout the completion of Stage 2.

Additional self-directed learning is expected including viewing EFAST learning tools, revising cases, journal reading and other online resources.

Stage 2 requires the completion of a logbook which documents a minimum of 15 AAA examinations:

- A minimum of 3 cases in logbook must be positive (ie. >3cm diameter aorta)
- An entry is only valid if the ED physician is the person performing the examination
- Multiple entries of same patient in the same episode of care by a physician is not acceptable
- EFAST and AAA examinations performed on the one patient is acceptable and will be electronically logged for each scan type conducted

- ED Physician is to record adequate AAA images and measurements as described in examination protocols
- Physician must complete Symphony CPU (Clinician Performed Ultrasound) of scan findings for ALL examinations performed
- Symphony CPU process produces a printed worksheet, allowing upload of ED scan to PACS, generation of an electronic log-book and provides process for quality auditing
- All examination images will be transmitted to Diagnostic Imaging server for upload to PACS
- ED physician will be provided with support & feedback during this training & skills development stage as required

Quality Auditing

- Regular auditing will be conducted and data maintained by PoCUS program Sonographer and quality audit reports provided to EDUSEQ committee, including Directors of Ultrasound & Emergency.
- Examinations will be qualitatively assessed using a simple audit system assessing technical adequacy and diagnostic accuracy of examination, with reference to correlative imaging, surgical or clinical findings to verify diagnosis (see also AAA Audit Guidelines p9).

eLOGBOOK QUALITY AUDIT FEEDBACK	
3	good scan, accurate diagnosis & technical quality
2	technical errors, but no misdiagnosis
A	misidentified aorta
1	false negative
0	false positive

- Audit results and comments for clinician feedback will be provided in personal e-logbooks maintained for clinicians
- A minimum 15 AAA examinations will be audited until a Physician achieves MH credentialing in Module 2. Thereafter, random audit of a minimum 5 examinations will be conducted each year to ensure maintenance of practical skills and quality.

Accreditation

- Once logbook requirements (minimum scan numbers and positive cases) are completed, a brief practical competency assessment will be conducted by program Sonographer. Assessment for ASUM CCPU can also be conducted at this time.
- ***Clinicians may progress to advanced Modules in ECHO, HF, RENAL, RUQ & DVT following initial MH credentialing in EFAST only. The clinician’s electronic***

logbook can be made available for those wishing to apply to obtain ASUM CCPUs.

STAGE 3: Ongoing Skills Maintenance
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After completing the MH Accreditation process, the Emergency Physician is able to perform AAA scans within MH. In order to maintain credentials they are required to:

1. Perform and log a minimum of 15 AAA scans annually (no required number of positives after credentialed)
2. Undertake 3 hours of ultrasound education annually, including a one hour update session to receive ongoing tuition through review of their own logged cases & practical scanning with Sonographer educators or officer of EDUSEQ committee

AAA Training & Evaluation

What is expected in a AAA Scan:

Machine Set-up

- Turn machine on, enter patient UR, surname & Dr initials
- Select correct transducer (C5-2MHz) or Phased array for bariatric patients
- Select correct preset (FAST or Abdomen or Vascular)

Transducer Positioning

- Orientation of transducer and correlation with image
- Interchange between longitudinal and transverse planes
- Appropriate transducer pressure
- Demonstrates the ability to manipulate the transducer to achieve the required images (sliding, rocking, rotating, heel-toe)

Image optimization

- Gain
- TGC
- Depth
- Focal zone position

Recognition of normal anatomy and landmarks

- Recognition of differences between arteries and veins

- Recognition of the Aorta & aortic bifurcation
- Recognition of the IVC
- Recognition of bowel loops, vertebral bodies and surrounding anatomy

Image interpretation

- Recognition of a normal aorta & calibre change from diaphragm to bifurcation
- Correct caliper placement & interpretation of measurement
- Identification of a AAA with fusiform or saccular dilatation

Assessment of the AAA:

- Correct caliper placement (outer wall to outer wall)
- Accurate measurement of the maximum AP diameter of the AAA

Recognition of artefacts and how to modify image accordingly:

- Increased attenuation of ultrasound beam due to patient habitus
- Patient movement or respiration
- Shadowing from calcific aorta
- Shadowing from overlying bowel

Plane 1 – Transverse

- Visualisation of the aorta from the diaphragm to bifurcation
- Measurement of the maximum outer AP diameter if AAA present, or mid Ao if normal
- Labelled Trans

Plane 2 – Longitudinal/Sagittal

- Visualisation of the aorta from the diaphragm to bifurcation
- Measurement of the maximum outer AP diameter if AAA present, or mid Ao if normal
- Labelled Long

Evaluation

- Quality audit feedback communicated in Clinician e-logbooks

eLOGBOOK QUALITY AUDIT FEEDBACK	
3	good scan, accurate diagnosis & technical quality
2	technical errors, but no misdiagnosis
A	misidentified aorta

1	false negative
0	false positive

Monash Health Practical Evaluation For Accreditation AAA

Name:

Hospital:

Date:

Evaluation

Completion in ≤ 5 minutes

Satisfactory or Non-satisfactory only

Any score of 0 = Non-satisfactory

Scores 1 or 2 = Satisfactory

2 levels of Pass scores are for feedback and to monitor area's for improvement

	0	1	2
Explain Examination	Incomplete or Misinformation	Explanation Complete but Brief	Full Explanation with Indication and Limitations
Entry of Patient Details, Selection of Transducer and Examination Presets	Unable to complete task completely	Task completed but with hesitancy	Excellent knowledge of machine, accurate data input
Image optimisation (depth, gain, TGC, focus)	Suboptimal image quality	Optimizes image but uncertainty in use of controls	Optimizes image appropriately with familiarity
Transverse View: Demonstration of Ao from diaphragm to BIF	Incomplete demonstration	Aorta mostly demonstrated but unsystematic approach	Systematic approach in demonstrating entire aorta
Trans Measurement: Correct caliper placement at widest AP diameter	Incorrect caliper placement	Correct but some hesitancy	Correct and confident
Longitudinal View: Demonstration of Ao from diaphragm to bifurcation	Incomplete demonstration	Aorta mostly demonstrated but unsystematic approach	Systematic approach in demonstrating entire aorta
Longitudinal Measurement: Correct caliper placement at widest AP diameter	Incorrect caliper placement	Correct but some hesitancy	Correct and confident
Interpretation of aortic pathology	Unable to describe ultrasound appearances	Correct but some hesitancy in describing appearances	Correct and confident descriptions of appearances
Documentation of Examination	Inadequate or suboptimal imaging	Minor improvements required in imaging	Correct and accurate imaging
Recognition of limitations and artefacts and how to modify image accordingly	Unable to recognise artefacts and/or unable to		

	adjust settings to improve image	Uncertainty in recognition of artefacts and adjustments required to improve image	Confidently recognises all artefacts and adjusts settings to improve image
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AAA QUALITY AUDIT CRITERIA

AAA module examinations will be regularly audited by PoCUS program sonographer educators for technical and diagnostic accuracy. Reference to correlative imaging, surgical and clinical findings will be made when available. Audit results will be recorded in e-logbooks for clinician quality feedback. A coloured ‘traffic light’ system of visual quality feedback will be used (see details below) with further audit comments as required.

All cases with significant error or quality problems (false positive, false negative, misidentification of aorta) will be reported to Director of Ultrasound and Emergency Department Ultrasound Education and Quality (EDUSEQ) committee for review. Immediate feedback by email or in person, will be given by program sonographer for such cases. The EDUSEQ chairperson will follow up issues of repeated poor quality or program non-compliance.

‘TRAFFIC LIGHT’ QUALITY AUDIT FEEDBACK SYSTEM	
3	good scan, accurate diagnosis & technical quality
2	technical errors, but no misdiagnosis
A	misidentified aorta
1	false negative
0	false positive

Green traffic light will be recorded for an examination with correct scan planes, adequate sonographic anatomy visualised for each view and correct clinician interpretation, as detailed in scan audit criteria below.

Orange & yellow traffic lights will be recorded for any incorrect scan planes, suboptimal demonstration of anatomy or suboptimal technical settings, as detailed in scan audit criteria below.

Red traffic light will be recorded for any false positive or false negative scan findings, whether from technical or interpretive errors, as verified by correlative imaging or other findings. All false positive and false negative cases will be reviewed and verified by EDUSEQ committee & Director of Ultrasound.

AAA AUDIT CRITERIA

TRV AORTA VIEW



- Transverse plane in central abdomen, imaged at site of maximal aneurysmal dilatation if present
- Curvilinear or phased array transducer on EFAST, ABDO or VASCULAR preset
- Anatomy - include spine, aorta, IVC
- Measurement Ao outer wall to outer wall AP plane
- Depth - adequate if no portion of aorta is cut-off OR aorta is not displayed in the superficial third of the image field
- Gain/TGC - adequate to demonstrate aorta without over-gain obscuring lumen OR under-gain making tissues appear anechoic
- Focal Zone – adequate if within +/- 5cm mid level of aorta
- Label – AO TRV

LONG AORTA VIEW



- Longitudinal plane in central abdomen, imaged at site of maximal aneurysmal dilatation if present
- Curvilinear or phased array transducer on EFAST, ABDO or VASCULAR preset
- Anatomy - include spine & aorta
- Measurement Ao outer wall to outer wall AP plane
- Depth - adequate if no portion of aorta is cut-off OR aorta is not displayed in the superficial third of the image field
- Gain/TGC - adequate to demonstrate aorta without over-gain obscuring lumen OR under-gain making tissues appear anechoic

- Focal Zone – adequate if within +/- 5cm mid level of aorta
- Label – AO LONG

References:

AUSTRALASIAN COLLEGE FOR EMERGENCY MEDICINE (2016) P22 Policy on Credentialing for ED Ultrasonography: Trauma Examination and Suspected AAA (revised). West Melbourne, VIC: ACEM

AUSTRALASIAN SOCIETY FOR ULTRASOUND IN MEDICINE (2017) Abdominal Aortic Aneurysm AAA CCPU Syllabus. Crows Nest, NSW: ASUM

TAYAL, V., GRAF, C ., et al. Prospective study of accuracy and outcome of emergency ultrasound for abdominal aortic aneurysm over two years. Acad Emerg Med. 2003 Aug;10 (8):867-71.

COSANTINO, T., BRUNO E. et.al. Accuracy of emergency medicine ultrasound in the evaluation of abdominal aortic aneurysm. J Emerg Med. 2005 Nov; 29(4):455-60.

INTERNATIONAL FEDERATION FOR EMERGENCY MEDICINE (2014) Point-of-Care Ultrasound Curriculum Guidelines. West Melbourne, VIC: IFEM

