

Focused Acute Medicine Ultrasound (FAMUS) – point of care ultrasound for the Acute Medical Unit

N Smallwood, M Dacshel, R Matsa, ETabiowo & A Walden

Abstract

Point of care ultrasound (POCU) is becoming increasingly popular as an extension to clinical examination techniques. Specific POCU training pathways have been developed in specialties such as Emergency and Intensive Care Medicine (CORE Emergency Ultrasound and Core UltraSound Intensive Care, for example), but until this time there has not been a curriculum for the acutely unwell medical patient outside of Critical Care. We describe the development of Focused Acute Medicine Ultrasound (FAMUS), a curriculum designed specifically for the Acute Physician to learn ultrasound techniques to aid in the management of the unwell adult patient. We detail both the outline of the curriculum and the process involved for a candidate to achieve FAMUS accreditation. It is anticipated this will appeal to both Acute Medical Unit (AMU) clinicians and general physicians who deal with the unwell or deteriorating medical or surgical patient. In time, the aspiration is for FAMUS to become a core part of the AIM curriculum.

Keywords

Point of care ultrasound, Acute Internal Medicine, ultrasound, curriculum

Introduction

In many parts of the world ultrasound is learnt as part of the undergraduate medical curriculum, but within the United Kingdom it has traditionally been practised under the auspices of Radiology departments. With the increasing availability of ultrasound machines that are portable and relatively cheap there has been much interest in the use of point of care ultrasound (POCU). There is significant potential for POCU to both facilitate clinical decision making, and also to increase patient safety, particularly during invasive procedures. It is now considered mandatory for chest drains for pleural effusion to be undertaken with ultrasound guidance,¹ and central line insertion has long been facilitated by the use of ultrasound.² Specialties have started to develop their own training and governance standards; Emergency Medicine has incorporated the Focused Assessment with Sonography in Trauma

(FAST) protocol within their curriculum,³ and Intensive Care Medicine has recently published Core Ultrasound Intensive Care (CUSIC).⁴ The Royal College of Radiologists have issued standards relating to individual system examinations,⁵ and there is good evidence for the utility of protocolised chest ultrasonography (the ‘BLUE protocol’) in the adult patient presenting with acute respiratory failure.⁶ There has not previously been an ultrasound curriculum within the United Kingdom designed to aid the management of the unwell adult medical patient outside of Critical Care.

Within Acute Medicine, a recent trainee survey highlighted enthusiasm among trainees for some form of ultrasound training to be a core part of the Acute Internal Medicine (AIM) curriculum.⁷ In addition, clinicians on the AMU support the use of ultrasound and the development of specific guidelines for use

Table 1. FAMUS working group committee members

Dr Andy Walden (chair)	Consultant in Intensive Care and Acute Medicine
Dr Nicholas Smallwood (secretary)	ST7 in Acute Medicine, SAM trainee representative
Dr Martin Dacshel	Consultant in Acute Medicine
Dr Alastair Gilmore	Consultant in Acute Medicine
Dr Alex Horton	Consultant Radiologist
Dr Hefin Jones	Consultant Radiologist
Dr Phil Lawrenson	Consultant in Acute Medicine
Dr Ram Matsa	Consultant in Intensive Care and Acute Medicine
Dr Jenny Messenger	Consultant in Respiratory and Acute Medicine
Dr David Murday	Consultant in Acute Medicine
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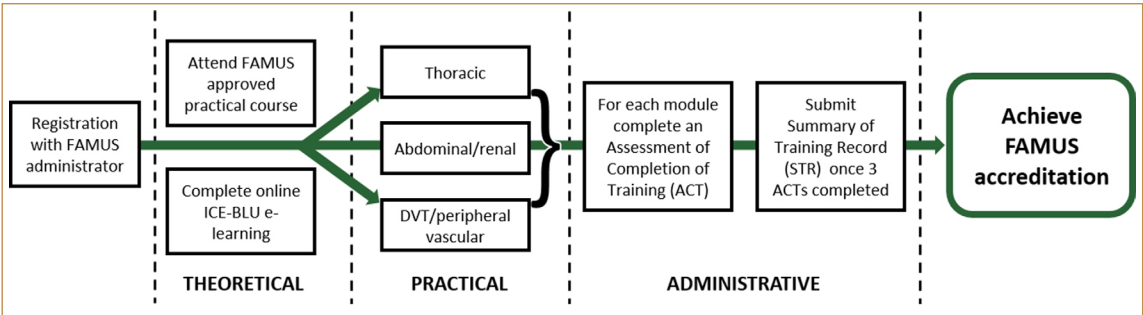


Figure 1. Overview of FAMUS accreditation process

on the AMU.⁸ We present here the first POCU guidelines developed specifically for physicians on the AMU to aid in the management of the breadth of patients who present to Acute Medicine.

It is worth noting that this article serves to provide an outline of the FAMUS accreditation process only; full details of the process and the FAMUS curriculum pack can be found on the FAMUS section of the Society for Acute Medicine (SAM) website (www.acutemedicine.org.uk/FAMUS).

Curriculum development process

A working group of clinicians from across the country with experience in POCU was convened to develop the curriculum. A survey was conducted to assess current views of POCU on the AMU,⁸ and a breakfast session run at SAMManchester 2015 to engage Acute Physicians in the process and gather further views on suitable curriculum content. A number of face to face and teleconference meetings were undertaken to develop and refine the process based – where possible – on the best available evidence for POCU.

Outline of FAMUS curriculum

The curriculum is split into four parts: a theoretical component, and thoracic, abdominal and DVT/peripheral vascular access practical components. Each practical part is a modular component of the whole curriculum and may be undertaken independently or concurrently, and consists of first supervised and then mentored practice. Once training in each curriculum area has been completed, the candidate must complete an Assessment of Completion of Training (ACT) with their Supervisor before independent practice can be undertaken in that area. Once all curriculum area has been completed, the candidate must submit a signed Summary of Training Record (STR) to the FAMUS administrator in order to gain FAMUS certification (see figure 1).

The three practical parts of the curriculum have certain pathologies that must be imaged by the candidate during the course of their training, to ensure their ability to discern all the relevant conditions that FAMUS intends to discriminate

between. These conditions are outlined in Table 2. It is worth noting that there are other pathologies that can be imaged during each system examination, but this table represents the core conditions that candidates must become competent in.

Focused echocardiography

It was agreed early on in the FAMUS development process that focused echocardiography would not form part of this curriculum. This is because a number of curricula already exist for focused echocardiography, and it was not felt necessary to add to those standards. Focused Intensive Care Echocardiography (FICE)⁹ is a curriculum devised jointly by the Intensive Care Society and British Society for Echocardiography and covers the echocardiographic assessment of the acutely unwell patient; the working group agreed it fulfilled all the requirements of a standard for use on the AMU. We strongly encourage clinicians working on the AMU to consider accreditation in FICE alongside FAMUS to enhance the assessment of the acutely unwell patient.

Ultrasound guided procedures

The FAMUS curriculum does not include training in chest or ascitic drain insertion; these procedures are covered within the Core Medical and Acute Internal Medicine curriculums. It is anticipated, however, that

Table 2. Core pathologies candidates must become familiar with during FAMUS accreditation

	Core pathologies to image
Thoracic	Increased lung water (≈pulmonary oedema) Consolidated lung (+‘shred sign’) Pleural effusion (including site marked for drainage) Rule out pneumothorax
Abdominal/renal	Abdominal free fluid (≈ascites) Bladder distension Hydronephrosis
DVT/peripheral vascular	DVT US guided peripheral vascular cannulation

*Focused Acute Medicine Ultrasound (FAMUS) – point of care ultrasound for the Acute Medical Unit***Table 3.** Minimum supervised and indicative minimum mentored training numbers and times for each system.

	Directly supervised	Mentored scans (indicative)	Minimum training time (indicative)
Thoracic	10 scans (20 lungs)	30 further scans (60 lungs)	6 months from first supervised scan
Abdominal/renal	10 scans	30 further scans	4 months from first supervised scan
DVT/peripheral vascular	5 scans for rule in DVT	Further 5 scans (10 legs) Minimum 5 supervised or mentored (depending on trainee experience) US guided peripheral vascular cannulation	1 month from first supervised scan
Overall indicative training time			8 months - 2 years

the FAMUS training process will facilitate candidates to achieve or maintain these practical competencies as a number of training scans are likely to be undertaken on patients who will subsequently require invasive procedures. The candidate will therefore be encouraged to go on and perform the procedure – with appropriate supervision where required – facilitating the achievement of practical competencies.

Once the candidate has completed training in the thoracic component of the FAMUS curriculum they will have the necessary ultrasound training to safely guide pleural procedures. FAMUS accreditation will obviate the need for candidates to achieve level 1 thoracic ultrasound training, which has previously been sought prior to undertaking ultrasound guided pleural procedures.

FAMUS accreditation process

A summary overview of the process is shown in figure 1. Candidates must first register with the FAMUS administrator at the Society for Acute Medicine and identify a FAMUS approved Supervisor from the database available via the SAM website. A fee of £50 for SAM members and £75 for non-members is payable on registration to cover administration costs. The Supervisor will oversee the candidate's training process and be responsible for the overall sign off of completion of training (the STR). Additionally, the candidate and Supervisor may identify local mentors who can act to review individual scans during the training process and recommend the candidate to progress through each stage of training.

FAMUS accreditation is competency-based rather than time-based, but an indicative minimum number of scans and training time has been determined for each system (see table 3). This will ensure the candidate achieves enough experience to become competent in each system. These training times are an *indicative minimum*, and therefore candidates who achieve the

competencies at a slower rate may well require longer training times. Similarly, for those with previous ultrasound experience (for example level 1 thoracic ultrasound), the training time may be shortened. The overall duration of training is not expected to be less than 8 months from the date of the first supervised scan (unless significant prior experience), and should be completed within 2 years. The training times will be recorded within the STR, and any reduction in modular training time must be agreed locally between Supervisor and candidate.

Stage 1: Theoretical practice. The candidate will need to complete theoretical learning in ultrasound which forms two parts. The first is an online e-learning module called Intensive Care Echocardiography-Basic Lung Ultrasound (ICE-BLU); available via the e-learning for health portal.¹⁰ The second requires the candidate to attend a FAMUS approved practical course, the dates of which will be available via the SAM website. Attendance at a course will give the practical knowledge required to undertake supervised scanning in each of the systems which make up the FAMUS curriculum.

Stage 2: Supervised practice. Each practical component of the FAMUS curriculum begins with the candidate undergoing directly supervised practice, where the supervisor or mentor will directly observe each scan undertaken in order to reinforce the process learnt during the theoretical stage. For each scan undertaken, the candidate will complete an anonymised report sheet and will agree the findings with their mentor/supervisor. After a minimum number of supervised scans (see table 3), the candidate will be able to move on to mentored practice. Regardless of prior experience, the minimum number of supervised scans must be completed.

Stage 3: Mentored practice. This stage involves the candidate gaining further experience by undertaking scans which are not directly supervised,

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but for which images are stored and a report sheet is completed. These will then be reviewed by the supervisor/mentor and the findings agreed, and must include the complete range of pathology within the curriculum. Once the minimum number of mentored scans has been undertaken and the mentor/supervisor is happy the breadth of the curriculum has been covered, the candidate will undertake the Assessment of Completion of Training to complete that component of FAMUS accreditation.

Assessment of Completion of Training (ACT). The ACT is undertaken at the end of each practical component and, if passed, signals completion in that area of the curriculum. At this stage, the candidate may practice in that area independently but is not considered FAMUS accredited until all four components of the curriculum are completed and the signed STR has been acknowledged by the FAMUS administrator. The candidate will then be registered on the FAMUS database.

Continuing professional development

FAMUS accreditation is valid for three years. Once accredited, it is incumbent on the practitioner to maintain their competency and this should be done by regular scanning. The practitioner should maintain an anonymised logbook (available from the SAM website), which should be submitted to the FAMUS administrator every 3 years. The following number of scans are required as a minimum *per year* to be undertaken in order to maintain accreditation:

- Thoracic: 30 scans
- Abdominal/renal: 30 scans
- DVT/peripheral vascular: 10 scans

Conclusion

We describe here the training pathway for an ultrasound curriculum designed specifically

for Acute Physicians: Focused Acute Medicine Ultrasound. The curriculum has been designed to be both relevant to Acute Physicians and achievable within the training program (or for those who wish to undertake it outside of the training program, for example Consultants or non-training grades). It is based on evidence for POCU, where available, and expert consensus where not.

The FAMUS standards have been approved as a specialist skill in ultrasound for the purposes of the AIM curriculum, and endorsed by the Society for Acute Medicine. Further details and information are available via the FAMUS section of the SAM website or by contacting the corresponding author.

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Abbreviations

- ACT Assessment of completion of training
- AIM Acute Internal Medicine
- AMU Acute medical unit
- CUSIC Core Ultrasound Intensive Care
- FAMUS Focused Acute Medicine Ultrasound
- FAST Focused Assessment with Sonography in Trauma
- FICE Focused intensive care echocardiography
- ICE-BLU Intensive care echocardiography-basic lung ultrasound
- POCU Point of care ultrasound
- SAM Society for Acute Medicine
- STR Summary of training record

Declaration of competing interests

Nothing to declare.

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