



Emergency Ultrasound Section

Emergency Ultrasound Credentialing Project



IFEM supports this document, which is compliant with the principles outlined in the IFEM Point-of-Care US EM ultrasound model consensus curriculum

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Emirates Society of Emergency Medicine (ESEM) Emirates Ultrasound Committee

Introduction:

Emergency Medicine (EM) in the United Arab Emirates (UAE) is a young specialty. EM was first recognized in 2000 as hospital administrators started to recruit emergency medicine trained physicians. The first emergency medicine residency program was established in 2008. Due to the increasing need for emergency physicians, as of January 2015 four more emergency medicine residency programs have been established.

Prior to the year 2000, emergency medical treatment was provided in accident & emergency rooms in public hospitals, which were staffed by general medical officers trained in medical or surgical specialties. Currently, less than 10 per cent of practicing emergency physicians in the UAE is residency trained and therefore the practice standard among emergency providers is diverse.

Over the past decade, the use of Point Of Care Emergency Ultrasound (POCUS) is prominently growing in the field of emergency medicine. POCUS was first introduced in trauma as the FAST (Focused Assessment with Sonography for Trauma) exam; since then emergency physicians began using POCUS in numerous other applications including for diagnostic purposes, procedure guidance and monitoring resuscitation. The literature provides strong evidence supporting that POCUS facilitates patient care in the emergency department.

In the UAE there is a limited number of emergency providers trained in POCUS. Recognizing the need, ESEM assembled locally based emergency physicians with advanced emergency ultrasound training who established the Emergency Ultrasound Committee (EUS) in December 2014. This is part of ESEM's vision to provide the highest standards of emergency medicine practice and to promote the professional development of emergency medicine providers in the UAE.

In order to disseminate and expand POCUS, ESEM is working to provide systematic training that will promote the utilization of POCUS among emergency providers while upholding the quality and clinical standards to an internationally recognized curriculum (Appendix 1: Summary of existing POCUS curricula).

The objectives of the Emergency Ultrasound Committee are:

- 1- To promote and provide adequate training in POCUS
- 2- To establish a locally tailored credentialing process for emergency physicians in the UAE based on recognized international POCUS curriculum.
- 3- To guide local hospitals in good governance in POCUS practice.
- 4- To promote research in POCUS

This document will cover the ESEM curriculum, level of proficiency, credentialing process and training pathway for basic emergency ultrasound certification.

Scope of Practice:

Point Of Care Ultrasound is the use of ultrasound technology for the bedside evaluation of emergency medical conditions. The use of POCUS can be categorized into: diagnostic, resuscitative, symptoms or signs-based, procedure guidance and therapeutic and monitoring. POCUS examinations are performed and interpreted by clinicians. The information obtained from POCUS examination is rapidly integrated in the evaluation of the patient.

POCUS is a goal-oriented focused examination that intends to help the clinician answer specific clinical questions that will aid in the evaluation and management of a patient. POCUS is different, and it does not replace comprehensive ultrasound examination. POCUS is synonymous with other terms including bedside, point-of-care, focused, emergency ultrasound, clinical and physician performed. POCUS does not substitute the physical examination but is considered complimentary and should be considered a separate entity that adds anatomical, functional, and physiological information to the care of the emergency department patient. It may be performed as a single examination, repeated due to clinical need or deterioration, or used for monitoring of physiological or pathological changes.

Point of Care Ultrasound Curriculum

Each emergency ultrasound application represents a clinical bedside skill that can be of great advantage in a variety of emergency settings. Emergency departments in the UAE provide acute care for variety of medical, surgical and trauma emergencies to all age groups. Most emergency departments have limited experience with obstetrics and gynecological emergencies because many hospitals triage these cases directly to obstetrics and gynecology department. Also, because patients prefer to go to specialized women's hospitals where obstetricians and gynecologist instead of emergency physicians staff the emergency departments.

Based on IFEM ultrasound curriculum guideline and local practice of emergency medicine in the UAE we categorized POCUS applications into core and enhanced applications.

Core applications (basic) include:

- 1- Introduction to ultrasound physics and knobology
- 2- Extended Focused Assessment with Sonography for Trauma (EFAST)
- 3- Evaluation of Abdominal Aortic Aneurysm (AAA)
- 4- Evaluation of Deep Venous Thrombosis (DVT)
- 5- Soft-tissue/musculoskeletal ultrasound
- 6- Procedure guidance: central vascular access

Enhanced applications (advanced) include:

1. First trimester intrauterine pregnancy
2. Biliary ultrasound
3. Basic echocardiography
4. Renal ultrasound
5. Thoracic ultrasound
6. Ocular ultrasound

The detail curriculum for each application is listed in the Appendix 2.

Level of Proficiency

- There are two levels of emergency ultrasound certifications;
 - **Basic emergency ultrasound certification.** Trainee must complete the basic emergency ultrasound training to be recognized as a certified independent practitioner of basic emergency ultrasound.
 - **Advanced emergency ultrasound certification.** Trainee must complete the basic and enhanced emergency ultrasound training to be recognized as a certified independent practitioner of advanced emergency ultrasound.
- Trainees who complete the advanced emergency ultrasound certification and are nominated by an ESEM supervisor will be considered to join the ESEM EUS instructor group.

Training Process

Based on the IFEM ultrasound curriculum guideline, POCUS training process is divided into three stages: induction, gaining experience and achieving competency.

1- Induction

The initial induction is the first contact session between trainer and trainee. It should focus on providing the core knowledge of the application, demonstration of the skill and first time to practice under trainer supervision. This will be achieved by attending ESEM basic ultrasound course or an equivalent course that includes all core applications within 2 years of application to ESEM credentialing.

2- Gaining experience

The key features of this phase are focused around optimizing the trainee's skill in:

1. Obtaining the images
2. Interpreting the images
3. Incorporating the images into clinical decision-making.

After completing an introductory course, 25 technically adequate examinations of each of the core applications should be performed under direct supervision of an ESEM instructor or ESEM certified independent practitioner. For procedural access: 10 US guided procedures should be logged or a completion of a module on ultrasound guided

procedures with simulation on a high quality ultrasound phantom.

3- Achieving competency

The final phase is assessing if the trainee achieved optimum competence in performing the application. This is done by conducting an OSCE format evaluation of the three core competencies that need to be assessed for a clinician to be certified as proficient in core POCUS application

1. Image Acquisition
2. Image Interpretation
3. Clinical integration of findings into patient management decision-making

Training Pathways (Summarized in Appendix 3):

- There are 3 potential pathways available for trainees to complete basic emergency ultrasound certification.
 1. **The residency pathway:** The pathway for physicians in residency training in emergency ultrasound is to obtain basic competency during their 4-year emergency medicine residency program.
 2. **A practice-based pathway:** allows those emergency physicians not previously exposed to training in emergency ultrasound during residency to become proficient in utilizing this technology.
 3. **Equivalence pathway:** members who hold certification based on American College of Emergency Physicians, Canadian Emergency Ultrasound Society, UK College of Emergency Medicine, Australian College of Emergency Medicine and American Registry Diagnostic Medical Sonography or equivalent will be recognized as being certified by ESEM.
- The residency and practice based pathways require didactic lessons, hands-on skill sessions, and a quality assurance program set up to review examinations until the physician has the ability to integrate this skill safely into clinical practice.
- Upon completion of the training pathway, the emergency medicine provider will be recognized by ESEM as a certified independent practitioner able to perform and incorporate POCUS applications in clinical practice and to supervise scans done by other members of their emergency department.

Residency-based Pathway.

In the UAE, most emergency medicine residency program curriculums are accredited, or in the process of being accredited, by the Accreditation Council for Graduate Medical Education International (ACGME-I). It follows guidelines that are similar to those implemented in the United States emergency medicine residency programs. Therefore, the residency-based pathway for training and proficiency in emergency ultrasound is adopted from the American College of Emergency Physician (ACEP) emergency ultrasound policy statement 2008. Specific guidelines for residency-based US education are listed in Appendix 4.

Practice-based Pathway

Induction:

- A practice-based pathway for physicians who have completed their residency training without emergency ultrasound training should include initial training in a minimum of 16-hour introductory course (ESEM basic ultrasound course or equivalent) covering all core applications with practical hands-on sessions.
- Shorter formatted (4-8 hour) CME courses covering single or a combination of applications may also be used to cover core and other emergency ultrasound applications. Some didactic training may take place by electronic means (slide, video, internet, online tutorials, CDs, DVDs, and others) but hands-on training must be incorporated for initial training of core emergency ultrasound applications.
- A wide variety of practical training models have been used in these courses. For example, didactic image presentation, video review of genuine cases, multimedia simulation models, animal models, normal human models, cadaver models, peritoneal dialysis models and patients with clinical pathology (with their consent).

Gaining experience:

- The training process for emergency ultrasonography should then move beyond didactic and practical hands-on training to include experiential and competency components. The experiential component emphasizes and develops the psychomotor and cognitive components of emergency ultrasound. The skill of the practitioner improves significantly with repetition and there is overlap in the learning curves of the different primary applications when they are learned together.
- This period can be viewed as a training, proctoring, or provisional privileging period. All ultrasound exams should be performed under direct supervision of ESEM instructor supervisor or a certified independent practitioner, reviewed for technique, speed of image acquisition, organ definition, and diagnostic accuracy.
- All scans performed during this period should be recorded in a log comparing training ultrasound examinations to other imaging tests, surgical findings, or patient outcome (appendix is an sample of the log sheet).
- Based on the emergency ultrasound curriculum adopted by numerous emergency medicine societies world wide, we recommend that at least 25 documented and reviewed examination should have been obtained in each of the core applications with a range of 25 -50 cases should be completed by the end of this period of experiential training. Some applications such as ultrasound for procedural access require fewer cases given the prior knowledge and clinical experience with the blind

procedural technique. We would recommend 10 US-guided procedures examinations or completion of a module on ultrasound-guided procedures with simulation on a high quality ultrasound phantom.

- Currently, the number of instructor supervisor is limited and therefore many trainees will have limited access to direct supervision of their examination in clinical practice. To make the process more feasible we decided to conduct credentialing courses where trainees would have opportunity to scan 25 models (some with pathology) under direct supervision of ESEM instructor supervisor.
- Once the program certifies enough independent practitioners and instructors, we anticipate we will have at least 1 designated in each hospital across the UAE who can help supervise the trainee in their hospitals and we expect that the credentialing courses will not be necessary at that point.

Assessing competency:

- Once the requisite number of scans has been performed the trainee must successfully complete written and visual exams with a pass rate of 75%.
- An assessment of image acquisition skills will be completed by ESEM certified instructor during the supervised hands-on examination.

Continuing Medical Education

As with all aspects of emergency medicine, continuing medical education as defined below in emergency ultrasound is a requisite, regardless of the pathway. Continuing medical education (CME) credits specific to ultrasound must be acquired, combined with other CME topics, and this can be done in a wide variety of formats. The amount of CME required to maintain competency is related to the number of applications being utilized, the frequency of use, and other developments in emergency ultrasound and emergency medicine at large. In general, those in charge of ultrasound programs should have at least 10 hours of continuing medical educational credits pertaining to ultrasound activities per credentialing cycle (typically 2 years). These include any of the following: Category 1 conference attendance, online educational activities, teaching, research, hands-on teaching, administration, quality assurance, image review, in-service examinations, textbook and journal readings, morbidity and mortality conferences inclusive of ultrasound cases, or others. Individual credentialed physicians should have 5 hours of the above continuing educational ultrasound activities per credentialing cycle. Educational sessions that integrate ultrasound into the practice of EM are encouraged, and do not have to be didactic in nature but can be participatory.

Appendix 1: Summary of the available Point of Care Ultrasound Curricula

| | Basic applications | Advanced applications | Credentialing process |
|---------------------------------------|---|--|--|
| Canadian Emergency Ultrasound Society | <ul style="list-style-type: none"> • Sub-xiphoid cardiac for pericardial effusions and global activity • Aorta for AAA, • Abdomen for free fluid • First-trimester IUP | <ul style="list-style-type: none"> • Procedural guidance • Thoracic • DVT • Biliary • Renal/Bladder • Soft tissue • Musculoskeletal • Ocular • Nerve Blocks | <ul style="list-style-type: none"> • Attend suitable courses available including EDE, ECCU, EDTU and University of Ottawa. • After the introductory course, a further 200 scans (50 each of cardiac, aorta, abdomen and uterus) must be performed under direct supervision of a CEUS IP. • This is followed by a series of exams: written, practical (which test the candidates ability to teach the technique) and visual. |
| UK College of Emergency Medicine | <ul style="list-style-type: none"> • FAST • Aortic assessment • Vascular access • Echo In life support | <ul style="list-style-type: none"> • Urology/renal • Hepatic/biliary • Vascular • Cardiac • Shock • Musculoskeletal • Thoracic • Gynecology and Obstetrics • Pediatric • Invasive procedures | <ul style="list-style-type: none"> • Theoretical training that covers relevant anatomy, the physics of ultrasound, levels and sophistication of equipment, image recording, reporting, artifacts, and the relevance of other imaging modalities to ultrasound. Practical experience is gained under the guidance of a named supervisor trained and experienced in ultrasound within a training department. The goal of training is adequate competency, rather than rigid adherence to a fixed number of training scans. • CEM Enhanced training requires one year of continuous practical experience (3 -5 exams per week and able to act as a Core trainer) as a Core practitioner and it allows training to satisfactory competence in each of the advanced areas |
| America College of Emergency Medicine | <ul style="list-style-type: none"> • Trauma • Intrauterine Pregnancy • AAA • Cardiac • Biliary • Urinary Tract • DVT • Soft-tissue/musculoskeletal • Thoracic • Ocular • Procedural Guidance | <ul style="list-style-type: none"> • Advanced Echo • Transesophageal Echo • Bowel (including intussusception, appendicitis, pyloric stenosis, diverticulitis, SBO) • Adnexal Pathology • Testicular • Transcranial Doppler • Contrast Studies | <ol style="list-style-type: none"> 1. Initial training in a 16 – 24 hour introductory course covering the core applications with practical hands-on sessions. 2. Shorter format (4-8 hour) courses covering single or combination of applications to cover core and other emergency ultrasound applications. 3. The training process for emergency ultrasonography should then move beyond didactic and practical hands-on training to include experiential and competency components. The experiential component emphasizes and develops the psychomotor and cognitive components of emergency ultrasound. This period can be viewed as a training, proctoring, or provisional privileging period. Ultrasound examinations performed during this period should be reviewed for technique, speed of image acquisition, organ definition, and diagnostic accuracy. |

ESEM Emergency Ultrasound Section
Point of Care Ultrasound Curriculum

| | | | |
|---|--|--|--|
| | | | <p>4. 25 – 50 documented and reviewed cases should be obtained in each core and non-core emergency ultrasound applications. Some applications such as ultrasound for procedural access require fewer cases given the prior knowledge and clinical experience with the blind procedural technique. If a number of examinations for US-guided procedure are required, ACEP recommends 10 US guided procedures examinations or completion of a module on ultrasound guided procedures with simulation on a high quality ultrasound phantom.</p> <p>5. In order to ensure quality, facilitate education, and satisfy credentialing pathways, a plan for emergency ultrasound quality assurance and improvement program should be in place.</p> |
| <p>Australian College of Emergency Medicine</p> | <ul style="list-style-type: none"> • EFAST • AAA • Limited bedside echo • Procedure guidance | <p>All advanced applications are governed by the Australian ultrasound society in medicine</p> | <ul style="list-style-type: none"> • A minimum of 25 accurate trauma examinations for the EFAST module. At least 50% of these exams must be clinically indicated and at least 5 should be positive for intraperitoneal, pleural or pericardial fluid. • A minimum of 15 accurate scans of the aorta for the Abdominal Aorta module. At least 50% of these exams must be clinically indicated and at least 5 should demonstrate an aneurysm. • A total of 50 echo examinations of which 25 are performed by the candidate (at least 5 of these clinically indicated, and all reviewed by a sonologist, and at least 5 examinations under the direct supervision of a sonologist) and a further 25 either performed or interpreted by the candidate (for example, previously recorded scans). These 50 cases must include at least two cases each of tamponade, right heart failure / massive PE, hypovolemia or distributive shock and left ventricular failure. • A bedside practical exit exam for each modality • Ongoing maintenance of credentials: at least 3 hours of ultrasound training per year and perform 25 EFAST examinations for the EFAST module and 15 aorta Scans per year for the AAA scan module. At least 4 hours of echocardiography Training per year and perform 25 echocardiographic examinations per year. |

Appendix 2: Core and enhanced Point of Care Ultrasound Curriculum

| Core Applications | |
|---|--|
| 1- Introduction to ultrasound physics and knobology | |
| Knowledge <ul style="list-style-type: none">☒ The basic components of an ultrasound system.☒ Types of transducer and the production of ultrasound, with an emphasis on operator controlled variables.☒ Use of ultrasound controls.☒ Knowing the frequencies used in medical ultrasound and the effect on image quality and penetration.☒ The interaction of ultrasound with tissue including biological effects.☒ Safety issues in ultrasound.☒ The basic principles of real time and Doppler ultrasound including color flow and power Doppler.☒ The recognition and explanation of common artifacts.☒ Image recording systems. | |
| Skills <ul style="list-style-type: none">☒ Can operate the key machine controls.☒ Transducer changing.☒ Image manipulation and storage. | |
| Behavior <ul style="list-style-type: none">☒ Safe practice.☒ Limitations of own skills.☒ Integrates ultrasound findings with clinical assessment. | |
| 2- Extended Focused Assessment with Sonography for Trauma (EFAST) | |
| Knowledge <ul style="list-style-type: none">• Describe the indications, clinical algorithms, and limitations of bedside ultrasound in blunt and penetrating thoraco-abdominal trauma.• Define the relevant local anatomy including the liver, spleen, kidneys, bladder, uterus, pericardium, and lung bases.• Understand the standard ultrasound protocol required when evaluating for hemoperitoneum, hemopericardium, hemothorax, and pneumothorax.• Recognize the relevant focused findings and pitfalls related to the detection of hemoperitoneum, hemopericardium, hemothorax, and pneumothorax. | |
| Skills <ul style="list-style-type: none">☒ Acquire and Interpret ultrasound images☒ Describe key pathologies | |
| Behavior <ul style="list-style-type: none">☒ Adheres to focused philosophy | |
| 3- Evaluation of Abdominal Aortic Aneurysm | |
| Knowledge <ul style="list-style-type: none">• Describe indications and limitations of focused ultrasound in the evaluation of abdominal aortic aneurysms. | |

- Define the local relevant anatomy including the aorta with major branches, inferior vena cava, and vertebral bodies.
- Understand the standard ultrasound protocol required when evaluating for abdominal aortic aneurysms.
- Recognize the relevant focused findings and pitfalls when evaluating for abdominal aortic aneurysms.
- Types of aneurysms
- Measurement technique

Skills

- ☒ Acquire and Interpret ultrasound images
- ☒ Describe key pathologies

Behavior

- ☒ Adheres to focused philosophy

4- Focused echocardiography (subcostal window only)

Knowledge

- Describe the indications and limitations of focused emergency echocardiography.
- Define the relevant cardiac anatomy including cardiac chambers and pericardium.
- Understand the subcostal window when evaluating for cardiac activity and pericardial effusions.
- Recognize the relevant focused findings to detect cardiac activity and pericardial effusions.
- Understand clinical relevance and potential pitfalls.

Skills

- ☒ Acquire and Interpret ultrasound images
- ☒ Describe key pathologies

Behavior

- ☒ Adheres to focused philosophy

5- Evaluation of Deep Venous Thrombosis (DVT)

Knowledge

- Describe the indications and limitations of focused 2-zone compression ultrasound for the detection of deep venous thrombosis.
- Understand the standard ultrasound protocol when performing a focused exam for the detection of deep venous thrombosis of the lower extremities.
- Vessel identification
- Graded compression
- Direct visualization of clot
- Define the relevant local anatomy associated with ultrasonic detection of deep venous thrombosis in the lower extremities.
- Recognize the relevant focused findings and pitfalls when evaluating for deep venous thrombosis

Skills

- ☒ Acquire and Interpret ultrasound images
- ☒ Describe key pathologies

Behavior

| |
|---|
| ☑ Adheres to focused philosophy |
| 6- Procedure guidance: Central venous access |
| Knowledge <ul style="list-style-type: none">• Describe the indications and limitations when using ultrasound to assist in bedside procedures.• Understand the 2D approaches of transverse and longitudinal approaches to procedural guidance with their advantages and disadvantages.• Define the relevant local anatomy.• Understand the standard protocols when using ultrasound to assist in central vascular access |
| Skills <ul style="list-style-type: none">☑ Acquire and Interpret ultrasound images☑ Perform procedure under ultrasound guidance |
| Behavior <ul style="list-style-type: none">☑ Adheres to focused philosophy |
| Enhanced Applications |
| 1- First trimester intrauterine pregnancy |
| Knowledge <ul style="list-style-type: none">• Describe the relevant local anatomy including the uterus, cervix, adnexa, bladder and cul-de-sac.• Describe the indications and limitations of focused sonography in first-trimester pregnancy pain and bleeding.• Understand the standard ultrasound protocol including transabdominal views when performing focused pelvic ultrasound in early pregnancy.• Understand the role of ultrasound and quantitative b-hCG in a clinical algorithm for first-trimester pregnancy pain and bleeding.• Understand the differential diagnosis of early pregnancy including intrauterine pregnancy, embryonic demise, molar pregnancy, ectopic pregnancy, and indeterminate classes.• Recognize the relevant focused findings and pitfalls when evaluating for early intrauterine pregnancy and ectopic pregnancy.• Early embryonic structures & location of embryonic structures in pelvis |
| Skills <ul style="list-style-type: none">☑ Acquire and Interpret ultrasound images☑ Describe key pathologies |
| Behavior <ul style="list-style-type: none">☑ Adheres to focused philosophy |
| 2- Biliary ultrasound |
| Knowledge <ul style="list-style-type: none">• Describe the indications and limitations of focused biliary tract ultrasound.• Define the relevant local anatomy including the gallbladder, portal triad, inferior vena cava, and liver.• Understand the standard ultrasound protocol when performing focused biliary ultrasound. |

- Recognize the relevant focused findings and pitfalls when evaluating for cholelithiasis and cholecystitis.

Skills

- ☑ Acquire and Interpret ultrasound images
- ☑ Describe key pathologies

Behavior

- ☑ Adheres to focused philosophy

3- Basic echocardiography

Knowledge

- Describe the indications and limitations of basic emergency echocardiography.
- Define the relevant cardiac anatomy including cardiac chambers, valves, pericardium, and aorta.
- Understand the standard ultrasound windows (subcostal, parasternal, and apical) and planes (four chamber, long and short axis) necessary to perform basic echocardiography.
- Recognize the relevant focused findings to detect cardiac activity and pericardial effusions with or without tamponade.
- Estimate qualitative left ventricular function.
- Evaluate for signs of right ventricular strain.
- Evaluate inferior vena cava compliance.
- Understand how ultrasound can allow the examiner to estimate left ventricular function and IVC compliance to guide resuscitation in patients with cardiopulmonary instability.

Skills

- ☑ Acquire and Interpret ultrasound images
- ☑ Describe key pathologies

Behavior

- ☑ Adheres to focused philosophy

4- Renal ultrasound

Knowledge

- Describe the indications and limitations of focused urinary tract ultrasonography.
- Define the relevant local anatomy including the kidneys and collecting systems, bladder, liver, and spleen.
- Understand the standard ultrasound protocol when performing focused urinary tract ultrasound.
- Recognize the relevant focused findings and pitfalls when evaluating for hydronephrosis, renal calculi, renal masses, and bladder size.

Skills

- ☑ Acquire and Interpret ultrasound images
- ☑ Describe key pathologies

Behavior

- ☑ Adheres to focused philosophy

5- Soft-tissue/musculoskeletal ultrasound

Knowledge

- Describe the indications and limitations of focused ultrasound of soft tissue and

musculoskeletal structures.

- Define the relevant local anatomy associated with ultrasonic evaluation of soft tissue and musculoskeletal structures to include:
 - Skin
 - Soft-tissue
 - Bones
 - Muscle
 - Tendon
 - Lymph Nodes
- Recognize the relevant focused findings and pitfalls when evaluating the following:
 - Soft Tissue Infections
 - Abscess versus Cellulitis
 - Foreign Body Location and Removal
 - Fractures
 - Tendon injury (laceration, rupture)
 - Joint Identification
 - Upper extremity
 - Lower extremity
 - Subcutaneous Fluid Collection Identification

Skills

☑ Acquire and Interpret ultrasound images

☑ Describe key pathologies

Behavior

☑ Adheres to focused philosophy

6- Thoracic ultrasound

Knowledge

- Describe the indications and limitations of focused ultrasound of thorax.
- Define the relevant local anatomy associated with ultrasonic evaluation of thoracic structures.
- Understand the standard ultrasound protocol when performing a focused exam for the detection of:
 - Pleural effusion
 - Pneumothorax
 - Pneumonia
 - Interstitial lung disease
- Recognize the relevant focused findings and pitfalls when evaluating for thoracic pathology

Skills

☑ Acquire and Interpret ultrasound images

☑ Describe key pathologies

Behavior

☑ Adheres to focused philosophy

7- Ocular ultrasound

Knowledge

- Describe the indications and limitations of focused ultrasound of the ocular structures

and orbit.

- Define the relevant local anatomy associated with ultrasonic evaluation of eye and orbit structures.
- Understand the standard ultrasound protocol when performing a focused exam for the detection of:
 - Posterior chamber hemorrhage
 - Retinal/ vitreous detachment
 - Other structural disruption
- Recognize the relevant focused findings and pitfalls when evaluating for ocular pathology.

Skills

- ☑ Acquire and Interpret ultrasound images
- ☑ Describe key pathologies

Behavior

- ☑ Adheres to focused philosophy

8- Other procedure guidance

Knowledge

- Describe the indications and limitations when using ultrasound to assist in bedside procedures.
- Understand the 2D approaches of transverse and longitudinal approaches to procedural guidance with their advantages and disadvantages.
- Define the relevant local anatomy for the particular application.
- Understand the standard protocols when using ultrasound to assist in procedures. These procedures may include:
 - Peripheral vascular access
 - Pericardiocentesis
 - Paracentesis
 - Thoracentesis
 - Foreign body detection removal
 - Nerve block (radial, medial, ulnar, femoral, sciatic, posterior tibial)
 - Arthrocentesis
 - Abscess identification and drainage
- Recognize the relevant focused finding when performing ultrasound for procedural assistance.

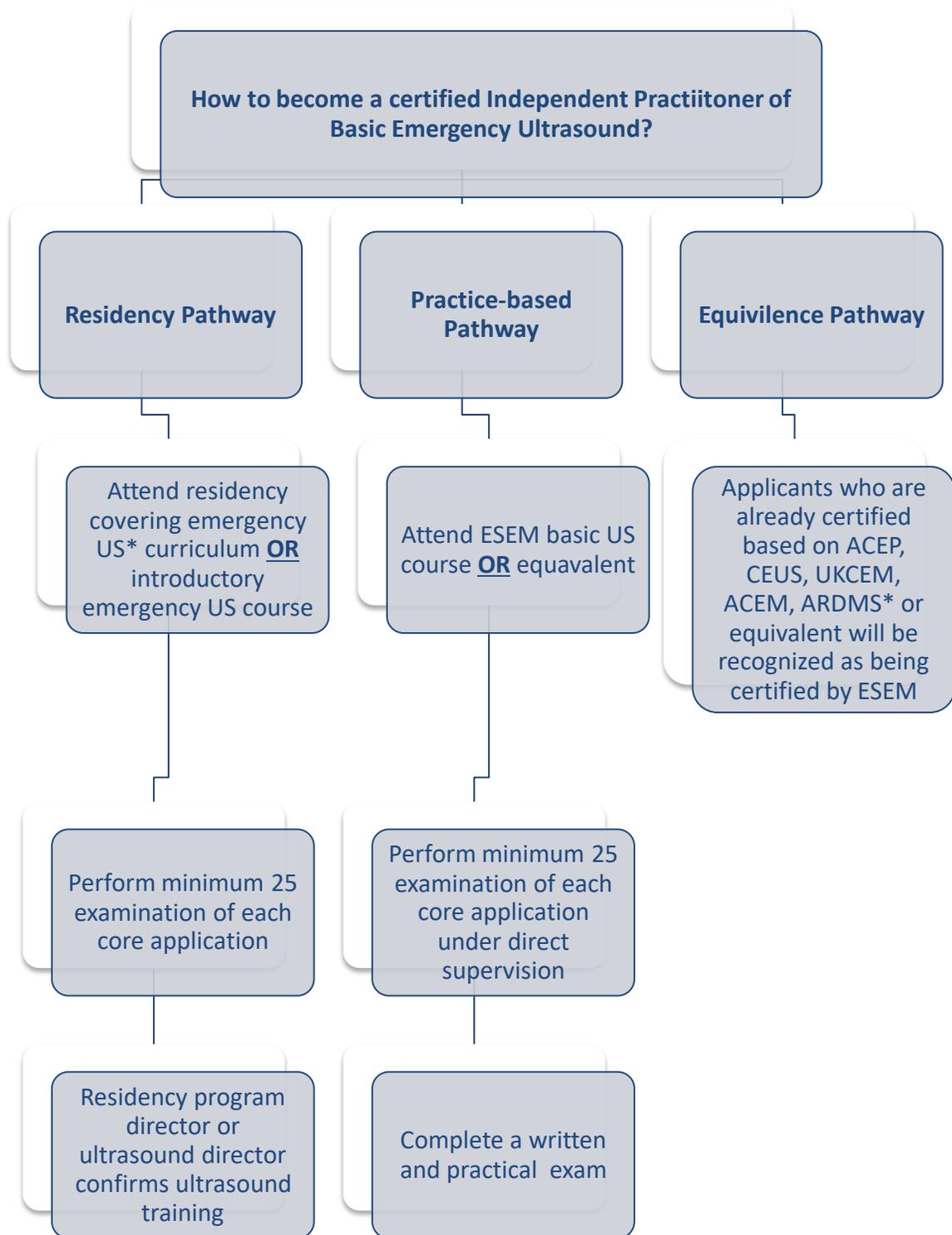
Skills

- ☑ Acquire and Interpret ultrasound images
- ☑ Describe key pathologies and pitfalls

Behavior

- ☑ Adheres to focused philosophy

**Appendix 3: Emirates Society of Emergency Medicine Basic Emergency Ultrasound
Credentialing Pathways**



* **US:** Ultrasound, **ACEP:** American College of Emergency Physicians, **CEUS:** Canadian Emergency Ultrasound Society, **UKCEM:** UK College of Emergency Medicine, **ACEM:** Australian College of Emergency Medicine and **ARDMS:** American Registry Diagnostic Medical Sonography

Appendix 4: Emergency Medicine Residency Ultrasound Education Guidelines.
Adopted from ACEP Emergency Ultrasound Policy Statement 2008

Introduction

1. It is recommended that the emergency medicine residency programs identifies a full-time faculty member specifically as its Emergency Ultrasound Director/Coordinator with the institutional support and skills capable of implementing all aspects of the educational program as described below. In addition to the EMUS Director/Coordinator it is recommended that a minimum of fifty percent of the required number of “Core Faculty” members at all emergency medicine residency programs be designated as “Core Ultrasound Faculty” and should be credentialed by the host institution in the use of ultrasound. Each program should develop, demonstrate, and retain performance measures for the Core Ultrasound Faculty. This faculty group should be available to supervise and educate its residents in emergency ultrasound and teaching the *core* applications.

2. All EM residency training programs should provide access to appropriate ultrasound equipment (systems with adequate array of transducers, imaging resolution) available during a residents clinical experience 24/7. All emergency medicine residency programs should hold textbooks covering at least emergency ultrasound and ultrasound physics in their respective libraries. In addition, residents shall be exposed to the current and historical literature concerning all emergency ultrasound applications and faculty should make every attempt to involve the residents in any current or future research projects.

Educational Program

The educational program should include all three phases of gaining competency: Induction, gaining experience and assessing competency.

1. **Induction:** All EM residents shall be provided introductory instruction in emergency ultrasound early in their EM training programs. This training should include both didactic and hands-on sessions covering critical emergency ultrasound examinations/procedures and interpretation as well as basic ultrasound physics and knobology. It is recommended that this orientation be given in the form of a 1-day course.
2. **Gaining experience:** During residency, a minimum of 2 weeks in a dedicated emergency ultrasound rotation, or an equivalent of 80 hours should be completed. Ideally, a portion of this time would come in the first year of residency training. The residents should be offered educational sessions and hands-on workshops in addition to scanning time in the ED with active patients.
- Recommendations for the rotation experience include:
 - Didactic sessions covering basic and advanced emergency ultrasound applications.
 - Scheduled reading assignments in preferred textbooks or journals.
 - Access to other educational modalities including cd/dvd/web-based educational products.
 - Access to question bank on emergency ultrasound applications.
 - Scheduled shifts devoted to performing ultrasound examinations and procedures. A significant portion of these shifts should be done with a qualified faculty member to provide direct instruction on scanning technique.
 - Either direct or indirect review of a majority of the residents images by qualified faculty to provide feedback on scanning technique, image acquisition and

- interpretation.
- Educational sessions aimed specifically at helping the resident to incorporate ultrasound into their daily clinical practice should be included.
 - Components of ultrasound education should be spread over the entire course of residency training. A single block rotation with no integration into routine clinical practice is not sufficient.

It should be noted that competency assessment can be performed using several methods, however, most experts recognize that the performance of at least **25** ultrasound examinations for each core ultrasound application promotes a minimum acceptable level of exposure. While the completion of this set number of examinations does not, by itself, delineate competency, residency programs should dedicate hours and rotations with the intent of meeting this level of experience to allow residents the best opportunity to achieve competency.

A system will be in place at all EM residency training programs where a portion of the examinations performed by EM residents will be reviewed (via still images or video capture) by faculty members to provide quality assurance AND timely feedback to the residents in training. Information regarding total ultrasound examinations completed and educational progress should be made available to residents on a regular basis.

It is recommended that emergency ultrasound education be incorporated into the core educational program for all EM residency programs. In addition to the introductory training, longitudinal didactic and hands-on instruction should be provided to EM residents throughout their residency training. This may include scheduled sessions during normal EM conference hours. It is suggested that a minimum of 20 hours of scheduled educational sessions should be given over the course of a 3 or 4-year EM residency training program.

3. Assessing Competency:

The goal of competency assessment in emergency ultrasound is to assure that each individual emergency medicine resident has a basic set of skills to allow for integration of ultrasound into their daily clinical practice after residency training is completed. The following methods are recommended tools for competency assessment in emergency ultrasonography during emergency medicine training:

1. Assessment of Ultrasound Technique -A practical exam consisting of a direct assessment of the skills necessary to obtain and record appropriate ultrasound images for the appropriate studies. The practical exam should include assessment of proper machine settings, probe positioning, image acquisition and documentation. Ultrasound images obtained during the practical exam should be assessed for technical merit and not interpretative merit including but not limited to image quality, image framing, identification of landmarks, and completeness of imaging protocol. The practical exam can be performed on actual ED patients (recommended) and/or in a simulation setting. The practical exam may include various methods to assess for adequacy of skill including but not limited to:

- OSCE- Objective Structured Clinical Examination
- SDOT- Standardized Direct Observation Tool
- Videotape of person performing ultrasound examination for later review

2. Assessment of Image Interpretation -Each EM residency training program should have an educational program established providing either static image or dynamic video review (preferred method) to assess competency of residents in both performing and interpreting focused emergency ultrasound examinations. This will allow faculty members to evaluate a resident's ability to perform these examinations during their clinical exposure. This can be a tool to evaluate ultrasound technique as well as image interpretation as examinations can be examined for completion of scanning protocols, identification of both anatomic and sonographic landmarks, and recognition of normal and pathologic findings. The medical decision making process following these examinations can also be followed.

3. A standardized multiple choice questions exam as a nationwide questions bank that may be accessed (in a secure manner) by the Ultrasound Director/Coordinator at each Emergency Medicine residency program. This test will also be used as a tool to assess resident competency in clinical decision-making based on the interpretation of images and video.

4. It is recommended that the above-mentioned competency assessment tools be utilized (at a minimum) at the end of each ultrasound rotation and in the last year of residency training. Different aspects of competency assessment may be performed at separate intervals to allow better integration of ultrasound education into the overall Emergency Medicine residency education schedule. Ultrasound skills may deteriorate over time and competency assessment may be repeated for an individual in situations where either a significant time period has elapsed (resident on other rotations where ultrasound is not used or encouraged), or deficiencies are identified.

References:

1. International Federation of Emergency Medicine. Point-of-Care Ultrasound Curriculum Guidelines.
<http://www.ifem.cc/Resources/PoliciesandGuidelines.aspx> March 2014
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3. Canadian Emergency Ultrasound Society. Recommendations standards.
<http://ceus.ca/002-standards/002-00.standards.htm>
4. The UK College of Emergency Medicine Ultrasound Sub-committee. Ultrasound Training. <http://www.rcem.ac.uk/Training-Exams/Training/Ultrasound%20training/>

