MUSC Emergency Ultrasound Fellowship Handbook: Policies and Expectations

Medical University of South Carolina
Department of Emergency Medicine

Bradley Presley, MD - RDMS, Ultrasound Director
Ryan Barnes, DO - EUS Fellowship Director
Aalap Shah, MD - EUS faculty
Cindy Oliva, MD - EUS faculty
Matt Moake, MD- EUS faculty
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I. Overview

Welcome to the MUSC Emergency Ultrasound Fellowship! We are very proud of our program and excited that you are joining us. This Handbook outlines the nature and scope of the fellowship, with a breakdown of the individual components that comprise your educational experience. Particular attention is paid to how we plan on providing you with the tools you need to succeed in your career in each discipline, and on the expectations, we have of you. You will review this Handbook with the Fellowship Director at the beginning of your training and should feel free to refer to it at any point. Likewise, do not hesitate to ask the faculty about any points which may not be clear.

The Emergency Ultrasound Fellowship began in 2013 as a one-year program designed to give graduates of Emergency Medicine residency programs the skills and knowledge to become ultrasound program directors and leaders in the field of Emergency Ultrasound (EUS). There are three primary components to the fellowship program:

1. **Education**: Learning image acquisition and interpretation skills for both basic and advanced emergency and point of care ultrasound applications and developing lecturing and teaching skills by developing an EUS lecture portfolio and contributing to the program’s educational mission.

2. **Administration**: Understanding the critical components required to run an EUS program and how to best utilize information technologies for image archiving, database management, and quality assurance.

3. **Research**: Understanding the state of EUS research by participating in monthly ultrasound journal club activities, developing your own independent research/academic project, and participation in one or more ongoing EUS research projects.

The fellowship is a 12-month position as an EUS fellow and attending physician (clinical instructor) in the Department of Emergency Medicine at MUSC, and as such, it is available only to graduates of ACGME-accredited Emergency Medicine residencies who are board-certified or board-eligible. A South Carolina medical license and hospital credentialing are required prior to the start date (July 1) of the EUS fellowship. Without these, you cannot work clinically in the ED. Failure to meet these requirements may result in revocation of the offer and loss of the fellowship position.
II. Schedule

Your weekly schedule requirements are approximately 32 hours per week and are broken down as follows:

- Approximately 16 hours/week clinical shifts required (moonlighting options discussed below)
- 16 hours/week fellowship responsibilities:
  - 4 hours/week conference
  - 8 hours/week scanning
  - 4 hours/week administrative

As the fellowship progresses, scanning shifts may be substituted for scanning shift equivalents that might include teaching, research, or other administrative activities at the discretion and under the mentorship of the fellowship director or faculty designee.

Yearly, you are entitled to 4 weeks of vacation. There is some flexibility as to when you can take this, but the timing needs to be approved by the fellowship director. You will also need to clear your clinical schedule for your vacation.

During the rest of your year, your clinical and ultrasound work will be performed in the MUSC Emergency Department. There may also be educational opportunities outside of the ED, including occasional shifts with ultrasound technologists in Adult and Pediatric Radiology. These may be scheduled throughout the year.

There is no call.
III. Education

The curriculum of the EUS fellowship is designed to prepare you to be an educator and director of emergency ultrasound. The general topics covered are outlined below. Content will be delivered by faculty during weekly ultrasound conference.

CARDIAC/PULMONARY
- W1- Parasternal Window
- W2- Apical Window
- W3- Subxyphoid/Suprasternal Windows
- W4- Pulmonary

VASCULAR
- W1- Venous/DVT
- W2- Peripheral Arteries/ABI

ABDOMEN
- W1- Hepatobiliary, Pancreas, & Spleen
- W2- GI & Hernias
- W3- Genitourinary

OB/GYN
- W1- OB
- W2- GYN

MSK/SOFT TISSUE/RA
- W1- Upper Extremity
- W2- Lower extremity
- W3- Trunk/Spine

HEENT
- W1- Ocular
- W2- Head & Neck
Readings- Requisites and Rumack

REVIEW (OPTIONAL)
- W1- Trauma, MSK, and procedural
- W2- Cardiopulmonary
- W3- GI, GU, OB/GYN
Certification Exam(s)

ADMINISTRATIVE
- W1- Machines, networks, QA systems
- W2- Coding and Billing
ACEP US Mgmt Course Part I & II
IV. Reading List:

Ma and Mateer’s Emergency Ultrasound (3rd ed), Ma

Practical Guide to Critical Ultrasound, Lewis

Designing Clinical Research (4th ed), Hulley

Textbook of Clinical Echocardiography (6th ed), Otto

Ultrasound: The Requisites (3rd ed), Hertzberg

Diagnostic Ultrasound (5th ed), Rumack

Point-of-Care OB Ultrasound, Jones

Fundamentals of Musculoskeletal Ultrasound (3rd ed), Jacobson

Ultrasound Guided Regional Anesthesia (2nd ed), Grant
V. Scanning

Paramount to all else in your fellowship, you must become an expert sonographer. The skills you acquire in doing so will be invaluable to your career in emergency medicine and will make you a more powerful clinician. You should aim to become as proficient as an ultrasonography technologist in acquiring images and as a radiologist in interpreting them. Your skills need to reach a level where you feel confident in your own scans, both in identifying and ruling out pathology, and in knowing when the exams are inadequate to do so.

We will directly observe your scanning when possible and assess your images and interpretations for adequacy when not. You will have scanning shifts with the directors, both when they are working clinically, and when they are not.

Expectations:

• Perform at least 4 scanning shift equivalents per month (at least 32 hours/month). If there are rotating residents during that week, 4 hours (1/2) of your scanning time should be spent with them. If there are no residents or students, you should schedule your scanning time when a director is working clinically when possible.

• Seek out pathology and novel applications of ultrasound when possible. Your scanning should not be limited to established applications.

• Perform a minimum of 1,000 scans throughout the year. These should consist of primary ACEP emergency ultrasound applications (FAST, echo, aorta, biliary, renal, 1st trimester ultrasound, DVT, procedural, soft tissue, thoracic), but will also include some advanced applications (MSK, GI, pediatric, testicular, etc.) You should have an appropriate mix of both applications and findings (both positive and negative scans).

• Checkpoints for scans are as follows.:

  Submit 150 studies for QA by September 30th
  Submit 300 studies for QA by December 31st
  Submit 600 studies by March 31st
  Submit 1000 studies by June 30th

• Log each of your scans through Q-path.

• Have each of your scans reviewed by a director for both adequacy of image acquisition and interpretation.

• Do your own external QA. Record when a patient that you scan has an “comprehensive” study performed (i.e. cardiac echo, ultrasound, CT scan, operative report) and compare your findings to that study.

• Adhere to and enforce divisional policies regarding machine cleanliness and maintenance.
VI. Teaching

Learning to teach ultrasound is a fundamental component of your fellowship. Your teaching experience will consist of both lecturing and hands-on teaching of residents, attendings, and medical students. We feel this is an essential component to your EUS fellowship experience.

We will provide you with background information, literature review, and access to image and video clip databases to help you prepare for your lectures, as well as review them for quality and presentation style pointers. You will have ample hands-on experience scanning with us, in preparation for your independent teaching.

Expectations:

- Deliver one advanced ultrasound lecture during Thursday conference.
- Deliver four core content lectures (15 min each) during EUS conference.
- Teach during at least one medical school ultrasound lab (1-5 pm) per block (6 blocks/year).
- Teach during at least two breakout sessions/GME labs.
- Teach during scan shifts (4 hrs/week). Labs and breakout sessions count.
VII. EUS Conference

The fellowship’s primary forum for didactics and education is the EUS Conference. This will occur on a weekly basis on Wednesday mornings from 9 am to 1 pm, unless otherwise specified for a particular week. Your presence is required. At least one of the directors will be present, as will any residents, students, or other fellows on the rotation.

During conference we will have didactic lectures, journal club, scan review, literature review, research updates, administrative issues, image management, and machine maintenance. Each week’s particular schedule will vary and will be distributed in advance.

Expectations:

• Attend weekly conference.

• Prepare in advance for that week’s agenda by completing the assigned readings/literature review

• Ensure that images/videos are ready for review, including results from any appropriate follow-up/confirmatory imaging studies. Regarding teaching cases, the Fellow or EUS rotators should:

• Manage the “Journal Club” portion of the Wednesday conferences; select an article and distribute monthly when residents are rotating and twice monthly during the fellowship curriculum. Articles should be distributed by the Monday preceding conference.
VIII. Research

Emergency ultrasound is at the cutting edge of clinical research in emergency departments across the nation and world. Every day new applications and uses are being studied and tested and make immediate impact on clinical practice. We feel strongly that our division can and should be among the leaders in this field. Participation in research is an integral component of your fellowship.

We will provide you with all the mentorship, resources, and support that you need to pursue your research endeavors.

Expectations:

• Actively seek and enroll patients in all EUS research projects. When you are on a scanning shift by yourself, research enrollment should be as important as educational scanning.

• Develop at least one (1) research project. As the primary investigator, you should undertake all aspects of this research including, but not limited to, idea conception, protocol authorship, IRB approval, consent and data forms, advertisement of the study, patient recruitment and enrollment, follow-up, data analysis, statistical analysis, and manuscript authorship.

• Present at least one (1) project at a national or international conference (e.g. ACEP, SAEM, or AIUM).

• Submit at least one (1) project as lead author for publication in a peer-reviewed journal.

• Be involved with at least one (1) other ultrasound research project (does not have to be one you design and implement from the ground up) during your fellowship for which publication is planned.
IX. Administration

A thorough understanding of the administrative aspects of emergency ultrasound is a necessity for successful implementation of an EUS program in any emergency department. Administrative issues are often financial, medico-legal, or political in nature. We will do our best to ensure exposure and familiarity with each of these topics.

Expectations:

• Manage the College of Medicine 4th Year Emergency Ultrasound Elective (EMED 854)
• Attend all divisional meetings, including but not limited to meetings with the finance division, the departmental leadership, residency leadership, or other departments.
• Understand the requirements and process of billing and reimbursement for physician-performed emergency ultrasound.
• Understand the various medico-legal aspects of performing and documenting emergency ultrasounds.
• Understand the politics and business behind ultrasound machine companies.
• Understand the nature of the politics of emergency ultrasound on a national level.
• Aid in the organization and implementation of a recruitment and selection process for the following year’s fellow.
• Attend (or complete online CME content) an Ultrasound Management Course—preferably the ACEP course prior to the national meeting.
• Attend a national Emergency Ultrasound Section meeting—either ACEP or SAEM.
X. Quality Assurance

Reviewing ultrasound images is almost as important as acquiring them. To assure that you are performing high-quality sonography, your images and videos will all be reviewed by a director to assure that they support your interpretations. We refer to this as internal QA. In addition, there is external QA which compares your findings to “official” findings. To further hone your skills and prepare you for a directorship of your own, you will review other peoples’ ultrasounds and give them feedback on their scans.

Expectations:

- Participate in QA of EUS exams. You will learn the QA process in a graduated manner. At first, you will observe how the directors assess image quality and adequacy and learn the scoring system for image feedback. Once you have become familiar with the process, you will perform the QA with director oversight. When your assessment of images correlates well with director assessments, you will be granted privileges to perform QA independently. The learning curve is variable, but we expect that within a few months you should be reading scans on your own.

- Studies should undergo QA within 1 week. We will devote some time on Wednesday mornings for scan review/QA. Once you are privileged to perform QA on your own, you can do this in advance of conference.

- Email feedback to the sonographers.

- Complete callbacks regarding any missed findings or incorrect interpretations.
XI. Image Management

As technology progresses, so does sophistication of ultrasound machines and systems. With increased usage of ultrasound in the emergency department, appropriate image storage and management becomes more and more imperative.

Expectations:

- Aid in the maintenance of the Q-path workflow. Coordinate with IT and Telexyhealth to ensure appropriate upgrades and functionality.
- Add interesting/useful images and video clips to the existing EUS teaching file for educational and lecturing purposes.
- Understand the process of how to edit and convert digital images and clips from the ultrasound machine into ones that can be used in a presentation.
- Make Powerpoint and Keynote presentations incorporating video clips and still images.
XII. Moonlighting

You may choose to moonlight within our ED to supplement your educational and financial growth. Permission to moonlight must be granted by the Fellowship Director, and will only be given if:

1. You have met all your fellowship requirements to date.
2. The additional clinical shifts would not detract from your educational experience and fellowship responsibilities.

In addition to “moonlighting” shifts, you are welcome to participate in up to four (4) paid teaching courses per year through 3rd Rock Ultrasound. These will provide an invaluable teaching experience as you instruct Emergency Physicians in basic and advanced ultrasound skills. Again, these courses must not interfere with fellowship duties and must first be discussed with the Fellowship Director.
XIII. Evaluation

You will have a formal **evaluative meeting** with the Fellowship Director 4 times during the year—at the end of September, December, March, and June. At each meeting, you will receive feedback on your performance. You will also have the opportunity to evaluate the fellowship. These evaluations are meant to be constructive, and to help shape the fellowship experience into one that meets your needs. Of course, you should not feel that you need to wait until one of these sessions to give or ask for feedback—we are always eager to hear about any issues that may arise.

You will complete **three (3) OSCEs** (Observed Structured Clinical Exams) throughout the year.
XIV. Salary and Benefits

You will receive the following benefits during fellowship:

- Your annual salary of $90,000 is based on a total of 752 clinical hours (vacation hours already deducted) per year. [Any moonlighting shifts above these expected clinical hours will be paid at the MUSC clinical instructor hourly rate.]
- This corresponds to 64 hours per month (8 clinical shifts per month, approximately).
- You will work 2 overnight shifts per month, approximately.
- $3,000 CME support.
- You will receive benefits corresponding to your Clinical Instructor status.
XV. Summary of Expectations

READ
Complete reading assignments and review papers in the literature file
Critically evaluate and present at least 1 paper per month during resident curriculum
Critically evaluate and present at least 2 papers per month during fellowship curriculum

SCAN
Scan at least 8 hours per week (4hrs solo, 4hrs with learners at bedside or in lab)
Submit 150 studies for QA by September 30th
Submit 300 studies for QA by December 31st
Submit 600 studies by March 31st
Submit 1000 studies by June 30th

TEACH
Deliver one advanced ultrasound lecture during Thursday conference
Deliver four core content lectures (15 min each) during EUS conference
Teach at least one medical school ultrasound lab (1-5 pm) per block (6 blocks/year)
Teach at least two breakout sessions/GME labs
Teach during scan shifts (4 hrs/week, labs and breakout sessions count)

LEAD
Manage the 4th Year COM US Elective (EMED 854)

RESEARCH
Complete one research or academic project

PUBLISH
Send out at least one ultrasound video case per month to the emergency department
Submit one abstract/manuscript for publication