

## Department of Medicine

### Internal Medicine Residency Program Rotation Curriculum

#### I. Rotation Sites and Supervision

**Rotation Name: Internal Medicine Point-of-care Ultrasound Elective**

Site	Faculty Supervisor	Key Faculty Participating	Administrator
UCIMC	Omar Darwish, MS, DO (odarwish@uci.edu)	Afshan Baraghoush, MD Ultrasound Chief Resident Cardiology Attending	Noosha Eftekharian 714.456.5726

#### II. General Description of the rotation

- a. Site & Setting: Hospitalized patients at UCI Medical Center
- b. Types of patients: Hospitalized stable patients in the emergency room, observation unit, med/surg and telemetry floors.
- c. Type of clinical encounters: Patients will be selected from the in-patient medicine teams and ER. Ultrasound elective team must request for permission to ultrasound the patients for educational purposes .
- d. General description of the educational environment: Bedside ultrasound experience, patient actors during conferences, and conference rooms for reviewing images.
- e. Specific teaching methods: One-on-one teaching, conferences, self review of pod-casts, journal articles.

#### III. Educational rationale and Major Goals of Rotation

- a. It is well known that point of care ultrasound (POCUS) is well established in emergency settings because it allows for early diagnosis and treatment of life-threatening conditions (e.g. tamponade) . Although we do have our share of rapid responses and code-blues on the floors, POCUS can also help with narrowing down the differential diagnosis quicker in those with undifferentiated chest pain, dyspnea, and syncope in stable patients. In addition, we will also use POCUS to evaluate for abscesses and lower extremity deep vein thrombosis.
- b. Educational goals of this rotation include:
  - Demonstrate an understanding of the basic physics of ultrasound technology
  - Learn how to properly operate a bedside ultrasound machine
  - Detect situations where a point-of-care bedside ultrasound can help narrow down the differential diagnosis
  - Become proficient in bedside cardiac, IVC, pulmonary and soft tissue ultrasound
  - Distinguish between normal vs abnormal ultrasound images
  - Apply the ultrasound findings and translate it into medical care of the patient

#### **IV. Rotation logistics and teaching methods for this rotation**

The rotation will be open to PGY 1, 2, and 3 residents.

##### **a. Hands-on**

- You will receive one-on-one hands on training with a faculty member and ultrasound chief during your two week elective.

##### **b. Viewing**

- Faculty member and/or ultrasound chief will review ultrasound images in a conference room
- Cardiology Attending will provide education on how to interpret echo images.
- Pod-Casts. Itunes: Look under J. Christian Fox, MD, Emergency Ultrasound for all Podcast except for Pulmonary. For Pulmonary ultrasound, please review, Liz Turner, MD, UC Irvine Critical Care Ultrasound
  1. Knobology (42 min)
  2. Cardiac (41 min)
  3. Aorta and IVC (29 min),
  4. IntroPulmonaryUS (36 min)
  5. RUSH (53 min)
  6. Soft tissue
  7. DVT Ultrasound (36 min)

##### **c. Ultrasound Conferences**

- Monday 12-1pm: Critical Care and Anesthesiology Department
- ICU Ultrasound Wednesday DSR session (if applicable during your rotation)
- Wednesday 1-4pm: ER review of ultrasound images

##### **d. Journal Review**

- You will be required to review two articles from the *Journal of Ultrasound in Medicine* and go over your review with a faculty member and/or ultrasound chief resident.

#### **V. Level of Responsibility**

**a.** Must complete a pre-test (30 minutes) in Building 26, Hospitalist conference room or Dr. Darwish's office the first Monday of the rotation.

**b.** Mandatory to complete by the end of the rotation:

- Log a minimum of 60 patient scans during the rotation
- Post Test Score >60% on written exam
- Pass the practical exam
- Complete all Pod-Casts
- Attend all Ultrasound conferences
- Review two ultrasound journal articles
- Attend scheduled one-on-one sessions with faculty

#### **VI. Rotation Schedule**

The rotation is a Monday-Friday elective with no weekends! You will receive your detailed schedule the week prior to the rotation. Most days will include 1-2 hours of hands-on instruction followed by assigned scanning of hospitalized patients. You will also need to complete pod-casts and critically assess 2 journal articles during your rotation.

## **VII. Key Topics**

1. Knobology
2. Cardiac Ultrasound with IVC and Aorta
3. Pulmonary Ultrasound
4. Soft Tissue Ultrasound
5. Lower Extremity Vascular Ultrasound
6. Abdominal, Renal and Bladder Ultrasound, and Joint (only in 3 week rotation)

### **1. Knobology**

- a. Demonstrate knowledge in basic ultrasound physics
- b. Demonstrate how to interpret the ultrasound images by using “ultrasound language” correctly (e.g. hyper vs hypoechoic)
- c. Acquire ultrasound images by understanding the importance of orientation of the probe to the patient and interpreting the information on the ultrasound screen.
- d. Choose the right ultrasound probe based on the various applications
- e. Recognize ultrasound artifacts and understand how they are created

### **2. Cardiac Ultrasound with IVC and Aorta**

- a. Acquire 4 views of the heart: parasternal long axis, parasternal short axis, apical 4 chamber and subxyphoid view.
- b. Recognize the chambers of the heart in each view
- c. Qualitatively assess the LV function
- d. Recognize how to distinguish between a pericardial effusion vs pleural effusion
- e. Identify the inferior vena cavae (IVC) and be able to measure the diameter
- f. Assess for IVC collapse with respiration and estimate the RA pressure
- g. Assess for severity of mitral valve regurgitation on the apical view
- h. Distinguish between the IVC and Aorta
- i. Recognize an abdominal aortic aneurysm in the sagittal and transverse views

### **3. Pulmonary Ultrasound**

- a. Recognize the visceral parietal pleural interface (VPPI) and normal lung sliding
- b. Use M-mode to identify normal lung pattern
- c. Use M-mode to identify a pneumothorax
- d. Identify the mirror artifact of the liver and spleen
- e. Recognize a pleural effusion
- f. Recognize A and B lines

### **4. Soft-Tissue Ultrasound**

- a. Identify the appearance of normal soft tissue
- a. Recognize the ultrasound appearance of cellulitis
- b. Differentiate between cellulitis and abscess

### **5. Lower Extremity Vascular Ultrasound**

- a. Demonstrate how to position a patient for evaluation of a deep vein thrombosis
- b. Identify the femoral artery and vein & popliteal artery and vein
- c. Recognize abnormal compressibility of the femoral or popliteal veins

**VIII. Resources**

**a. Review Audio Ultrasound Videos for Emergency Physicians on Itunes (by Dr. Fox an Dr. Liz Turner)**

1. Knobology
2. ECHO with volume responsiveness
3. Aorta and IVC
4. Pulmonary Ultrasound
5. Soft Tissue Ultrasound
6. DVT Ultrasound

**b. Articles from *Journal of Ultrasound Medicine***

**IX. Evaluation methods**

Professional competencies will be evaluated by (check all that apply)

Evaluation Method	Direct Observation & Feedback	Journal Club	Written Exam	Report or Presentation	Other (specify)
Competency	X		X		
Patient Care					
Medical Knowledge	X	X	X		
Practice-based Learning					
Communication Skills	X	X			
Professionalism	X	X			
Systems-based Practice					

Faculty will complete resident evaluation forms on New Innovations and provide face to face feedback at the end of the rotation. Residents will complete evaluations of faculty and the rotation on New Innovations. Evaluations will be reviewed by the Program Director, program leadership and curriculum committee.