



**SAN ANTONIO  
REGIONAL HOSPITAL**

## **Simulation Suite & Ultrasound (POCUS) Training Rotation Curriculum with Goals & Objectives**

Sarkaria Family Patient Simulation Suite, Western U of Health Sciences— Internal Medicine Residency

*Goals & Objectives Stratified by Level of Training (PGY-2 / PGY-3)*

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### **Overview and Organization**

Organization / Site: Sarkaria Family Patient Simulation Suite; San Antonio Care 4 U ER

The team is led by the attending, who bears final responsibility for simulated patient management. The Internal Medicine resident works closely with the attending and gradually assumes more autonomous decision-making responsibility in a graded fashion, and the senior resident is expected to teach junior residents and medical students.

Correct and timely diagnosis is paramount to caring for patients with a myriad of medical problems, and has been aided by point-of-care ultrasound (POCUS). Residents must gain experience both performing image-guided procedures and interpreting images. The Point-of-Care Imaging training provides residents opportunities to learn the ultrasound findings of normal and abnormal anatomy and of common diseases, understand the indications for POCUS, and use POCUS appropriately to guide interventional procedures. The goal is for the resident to become competent in the cost-effective use of ultrasound imaging in the evaluation and treatment of disease and in performing procedures.

### **Levels of Supervision**

Residents are supervised by an attending physician and, where applicable, sonographers for all patients.

Levels of supervision include:

- Direct Supervision — the supervising physician is physically present with the resident and patient; residents are initially directly observed to build skills.
- Indirect Supervision, with direct supervision immediately available — the supervising physician is on site and immediately available.
- Indirect Supervision, with direct supervision available — the supervising physician is immediately available by phone or electronic means.

### **Assessment Scale — Entrustment**

The basic evaluation unit is entrustment. Attendings determine the level at which they trust the resident to perform each skill:

- 1 — Cannot perform the skill even with assistance (critical deficiency).
- 2 — Can perform the skill under proactive, full supervision.

- 3 — Can perform the skill with reactive supervision (readily available upon request).
- 4 — Can perform the skill independently.
- 5 — Can act as a supervisor and instructor for the skill.

## The Six ACGME Core Competencies — Objectives by Level of Training

Objectives are stratified for PGY-1, PGY-2, and PGY-3 residents, reflecting increasing entrustment. Senior objectives are cumulative — PGY-2 residents also meet PGY-1 objectives, and PGY-3 residents meet all prior objectives.

### 1. Patient Care and Procedural Skills

*All residents must provide compassionate, culturally sensitive, and appropriate care for simulated patients while evaluating and treating disease, and develop a fundamental understanding of how simulation training allows practice of technique before application on real patients under faculty supervision.*

#### PGY-1 — Build foundational skills under supervision

- Become familiar with the indications, contraindications, complications, limitations, alternatives, and interpretation of the following ultrasound studies: abdomen, renal/bladder, lower-extremity veins, cardiac echocardiogram, and bladder scan.
- Understand the role of image guidance for common procedures and take part, as appropriate to level of training, in the following ultrasound-guided or simulated procedures:
  - Endotracheal intubation
  - Thoracentesis and paracentesis
  - IV-line placement
  - Central venous access (central and arterial line placement)
  - Lumbar puncture and arthrocentesis
  - NG-tube placement
  - Foley catheter placement and CAUTI prevention
  - Mega Code and Basic Life Support
  - Rapid Response and clinical deterioration
  - Night Float / cross-cover simulation, including handoff
- Develop core POCUS image-acquisition skill (during the continuity-clinic half day, ER rotation, and sim lab) in the following areas:
  - Abdomen — identify ascites, common collection locations, largest fluid pocket, and safest paracentesis site
  - Right upper quadrant — identify liver and gallbladder, diagnose or exclude cholelithiasis, assess sonographic Murphy's sign
  - Chest — identify pleural effusion and safest thoracentesis site; identify pneumothorax
  - Cardiac — obtain standard views (parasternal long/short, apical four-chamber, subxiphoid), identify pericardial effusion, assess mitral regurgitation and aortic stenosis, estimate ejection fraction, examine the IVC
  - Vascular — identify jugular vein/carotid artery and common femoral vein/artery, differentiate vein from artery, and check patency
  - Renal — evaluate for hydronephrosis
  - Bladder — estimate bladder urine volume

#### PGY-2 — Perform with increasing independence (in addition to PGY-1)

- Perform ultrasound-guided and simulated procedures with increasing independence as level and experience permit.
- Counsel simulated patients and families on decisions involving ultrasound studies and procedures.
- Expand image interpretation across the core POCUS applications.

### **PGY-3 — Interpret independently, teach, and supervise (in addition to PGY-1 and PGY-2)**

- Independently perform and interpret POCUS studies and image-guided procedures.
- Interpret results within the context of patient comorbidities, pretest probability of disease, and the sensitivity and specificity of the study.
- Assist in teaching PGY-1 residents and supervise junior learners.

***Instructional / Training Methods:** Supervised reading of ultrasound studies and supervised performance of interventional procedures; simulation; read-out sessions with radiology and cardiology.*

***Evaluation Methods:** Competency-based checklist check-off (procedural, POCUS, and case-scenario), direct observation, and attending (with AI-assisted) session review.*

## **2. Medical Knowledge**

*Residents will demonstrate knowledge of the appropriate use of procedures and ultrasound imaging in the evaluation of common conditions and apply it to patient care.*

### **PGY-1 and PGY-2 — Understand appropriate use of imaging and procedures**

- Develop an understanding of the appropriate use of procedures and ultrasound imaging for patients with the following presenting conditions:
  - Acute abdomen
  - Ascites
  - Bladder obstruction
  - Congestive heart failure
  - Deep venous thrombosis
  - Gallstones
  - Hydronephrosis
  - Pleural effusion
  - Pneumothorax
  - Valvular disease
  - Shock

### **PGY-3 — Interpret in clinical context (in addition to PGY-1 and PGY-2)**

- Interpret results within the context of simulated patient comorbidities, pretest probability of disease, and the sensitivity and specificity of the study.

***Instructional / Training Methods:** Case-based learning, ER POCUS-specialist didactics during noon conference, module-based independent study.*

***Evaluation Methods:** Checklist competency check-off, case-based questioning, faculty review.*

## **3. Practice-Based Learning and Improvement**

*Residents will appraise and apply scientific evidence to the appropriate use of ultrasound and procedures and improve their practice.*

#### **PGY-1 — Build foundational skills under supervision**

- Access current national guidelines to apply evidence-based strategies to the appropriate use of echocardiography and ultrasound studies and procedures.
- Participate in case-based decision-making.

#### **PGY-2 — Manage independently (in addition to PGY-1)**

- Develop progressive independence in understanding studies evaluating the utility of echocardiography, ultrasound, and interventional techniques, through the cardiology rotation and independent study.

#### **PGY-3 — Lead, supervise, and teach (in addition to PGY-1 and PGY-2)**

- Critically appraise the evidence base for POCUS applications and facilitate the learning of junior residents.

*Instructional / Training Methods:* Guideline review, evidence appraisal (e.g., POCUS Evidence Atlas), case-based decision-making.

*Evaluation Methods:* Self-assessment and reflection, checklist review, teaching evaluations.

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### **4. Interpersonal and Communication Skills**

*Residents will demonstrate communication skills that convey information effectively to colleagues and the simulated care team.*

#### **PGY-1 — Build foundational skills under supervision**

- Demonstrate organized, articulate electronic and verbal communication that conveys information to other healthcare professionals, colleagues, and simulated team members.
- Practice structured handoff communication (I-PASS) in cross-cover simulations.

#### **PGY-2 — Manage independently (in addition to PGY-1)**

- Communicate imaging findings and their implications clearly within the team.

#### **PGY-3 — Lead, supervise, and teach (in addition to PGY-1 and PGY-2)**

- Model effective communication and closed-loop handoffs and coach juniors in the simulated environment.

*Instructional / Training Methods:* Simulated team communication, structured handoff practice, direct observation.

*Evaluation Methods:* Direct observation, checklist review, faculty feedback.

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### **5. Professionalism**

*Residents will demonstrate professional responsibility, ethical behavior, and respect in the simulation environment.*

#### **PGY-1 — Build foundational skills under supervision**

- Demonstrate a strong commitment to professional responsibilities through conduct, ethical behavior, professional attire, collegial interactions, and devotion to patient care.

#### **PGY-2 — Manage independently (in addition to PGY-1)**

- Counsel patients and families on decisions involving ultrasound studies and procedures.

#### **PGY-3 — Lead, supervise, and teach (in addition to PGY-1 and PGY-2)**

- Provide constructive criticism and feedback to more junior members of the team and serve as a role model.

*Instructional / Training Methods:* Role modeling, simulated patient/family communication, direct observation.

*Evaluation Methods:* Faculty ratings, multisource feedback, self-reflection.

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## 6. Systems-Based Practice

*Residents will demonstrate awareness of the value, costs, and appropriate use of imaging and procedures.*

### **PGY-1 — Build foundational skills under supervision**

- Understand that imaging and procedural decisions involve cost and risk and that POCUS can reduce unnecessary referrals when used appropriately.

### **PGY-2 — Manage independently (in addition to PGY-1)**

- Identify current quality issues in the use of echocardiography and ultrasound for diagnosis.

### **PGY-3 — Lead, supervise, and teach (in addition to PGY-1 and PGY-2)**

- Demonstrate awareness of alternatives when discussing interventional procedures and their costs, risks, and benefits, and assist in teaching PGY-1 residents.

*Instructional / Training Methods: Cost-and-value discussion, appropriate-use case review, teaching.*

*Evaluation Methods: Direct observation, checklist review, faculty ratings.*

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## Common Cross-Cover Pages (Simulation)

Night Float and cross-cover simulations include common overnight pages and the associated skills of prioritization, time management, and handoff:

- Chest pain
- Fever
- Electrolyte abnormalities
- Prioritization and time management
- Handoff skills using the I-PASS framework

## Practical Approach to Learning POCUS

Independent learning uses Butterfly Education and Ultrasound content, available free to residents and faculty once a Butterfly device is purchased (accessible via Butterfly login on the web or app); ACP also has content available to members. A total of 32 modules are to be assigned and completed by the PGY-3 year.

### **Fundamentals (Butterfly)**

- Introduction to Butterfly
- Orientation
- Gel and Butterfly
- Holding the Butterfly
- Activating the Butterfly

### **Cardiac / Cardiovascular (Butterfly)**

- Focused cardiac protocol
- Parasternal long-axis (PLAX) view
- Apical four-chamber (AP4) basics
- Apical five-chamber (AP5) basics

- Subcostal four-chamber (SC4) basics
- Cardiac PLAX pericardial effusion
- Cardiac HFrEF
- E-point septal separation
- IVC midline view
- IVC hepatic view
- IVC percent collapse

*Additional module categories (e.g., lung, abdomen, vascular, and procedural guidance) are assigned to complete the 32-module curriculum.*

## Teaching Methods and Resources

### Supervised Learning

- Supervised reading of ultrasound studies and supervised performance of interventional procedures.
- Initial emphasis on identifying key diagnostic findings in commonly ordered studies; once mastered, focus shifts to medical decision-making and procedural skill.
- ER POCUS-trained specialist didactics during noon conference.

### Textbooks and Online Resources

- Soni, Arntfield, and Kory, Point-of-Care Ultrasound (Elsevier).
- Pfenninger and Fowler's Procedures for Primary Care, 4th edition.
- Free open-access medical (FOAM) resources: ACEP ultrasound guidelines, Ultrasound Podcast, Sonoguide, and emergency ultrasound teaching sites.
- ACC POCUS Workbook; IMPOCUS: A Weekend on the Wards; The Curbsiders POCUS episode.
- The Evidence Atlas (POCUS Atlas): synopses, sensitivity/specificity, likelihood ratios, and linked references.
- Core Ultrasound (Ultrasound of the Week) and Core Ultrasound Podcast.
- UpToDate; optional radiology images via Radiopaedia.

## Evaluation

- Verbal in-clinic and inpatient observations, chart review, and individual feedback during half-days in the Sarkaria Sim Suite, Care 4 U clinic, and Emergency Room rotations.
- Attending (with AI assistance) competency-based session check-off for procedural training, POCUS training, and case scenarios in the sim lab.

## Rotation Structure

- In general, the rotation runs Friday afternoons (the last Friday of the month).
- Residents complete a checklist of diagnostic and interventional skills and return it to the Program Coordinator upon completion; residents may use bedside ultrasound on the floors and in the ED.
- Residents may work with several attendings and with sonographers to develop POCUS and procedural skills as the case mix permits.
- The rotation is hands-on: residents participate in discussion of study appropriateness, image interpretation, and differential diagnosis, and in radiological procedures as appropriate.
- Case-based learning is emphasized, with read-out sessions with radiology and cardiology and reading based on cases reviewed during the day.

- Residents may be asked to perform focused literature searches or presentations and to simulate communication with patients, families, and providers, always with discretion and decorum.
- Call and weekend responsibilities are determined by the attending. Hours must comply with ACGME requirements and are subject to approval by the Program Director.