

SPECIAL ARTICLE

The State of Point-of-Care Ultrasound in Family Medicine

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ABSTRACT

Point-of-care ultrasound (POCUS) allows clinicians to make real-time decisions at the bedside for patients that can impact their care. Initial literature on POCUS use in family medicine surfaced in the 1980s, but widespread use in family medicine began only in the last decade, and a growing number of family medicine physicians now use POCUS to evaluate multiple organ systems. Requirements from the Accreditation Council for Graduate Medical Education and the American Board of Family Medicine (ABFM) have driven curriculum development and use within family medicine residency programs, and ABFM data show that family medicine graduates are increasingly using POCUS in practice. The Society of Teachers of Family Medicine sponsors a national task force that is working on standardizing POCUS education and defining the scope of POCUS in family medicine residency education. As excitement for and use of POCUS continues to grow, we need to continue to evaluate and work through systemic barriers impeding POCUS use. Also, as we continue educational efforts around faculty development and resident training, parallel efforts around implementation in the primary care clinic must occur. Looking forward, uniting as a specialty and doing this together are critical. Collaborative, multi-institutional initiatives that work with the national family medicine organizations, such as the POCUS Research, Innovation, and Medical Education Learning Network, will provide the platform for us to come together on this effort. Approaching this work thoughtfully is essential, as doing so will ultimately improve the care and outcomes of our patients.

INTRODUCTION

Dr José L. Díaz-Gómez defined point-of-care ultrasound (POCUS) as “the acquisition, interpretation and immediate clinical integration of ultrasonographic imaging performed by a treating clinician at the patient’s bedside.”¹ POCUS helps answer a focused clinical question as an extension of the physical exam in place of a comprehensive examination of an anatomical area or complete organ system. Although ultrasound technology has been used in medicine for decades, its role within family medicine has evolved more gradually than in other specialties. Growing evidence of its clinical utility, technological advances, educational initiatives, and residency training requirements set forth by the Accreditation Council for Graduate

Medical Education (ACGME) and the American Board of Family Medicine (ABFM) have progressively expanded POCUS use in family medicine. Nevertheless, widespread implementation remains challenging because of limited curricular time, a workforce largely trained before formal POCUS education became standard, equipment and implementation costs, uncertainty in billing and documentation, and the perception of ultrasound as a specialist-driven modality associated primarily with radiology, cardiology, and obstetrics.^{2,3}

EVOLUTION OF POCUS IN FAMILY MEDICINE

Ultrasound gained widespread clinical traction during the 1990 s and early 2000 s in emergency medicine (EM)

and critical care, where applications such as the Focused Assessment with Sonography for Trauma (FAST) examination and basic cardiac and lung imaging improved diagnostic speed and clinical decision-making in acute care settings.⁴ Within family medicine, interest in POCUS emerged earlier but developed more gradually. In 1988, Hahn *et al.* published one of the earliest reports describing a structured, 14 month ultrasound training program for eight family physicians. Participants learned obstetric ultrasound, achieved steady improvements in proficiency, and ultimately produced radiologist-rated acceptable examinations in 94% of cases while successfully completing independent competency assessments.⁵ Two years later, Rodney *et al.* demonstrated that family physicians could competently perform obstetric ultrasound following relatively brief but structured continuing medical education, providing early evidence that ultrasound could be successfully integrated into family practice.⁶

As ultrasound technology became more portable and affordable during the 2000 s and 2010 s, its feasibility for use in primary care increased substantially.⁷ Concurrently, evidence supporting its clinical value continued to accumulate. In 2002, Wordsworth and Scott demonstrated that trained general practitioners could perform acceptable-quality ultrasound examinations in a rural primary care practice, reducing downstream hospital utilization and health care costs while improving patient satisfaction through timely local access to imaging.⁸ These studies highlighted POCUS as a tool capable of addressing diagnostic gaps in family medicine, particularly in rural and underserved communities, while supporting value-based care through greater efficiency, diagnostic accuracy, and cost containment.^{7,8}

CURRENT USE IN FAMILY MEDICINE

While historically POCUS within family medicine has been reserved for the more specialized areas of the discipline, such as sports medicine and obstetrics, family physicians are now using POCUS to complement physical exams, guide procedures, and perform screening tests.⁹ POCUS beyond obstetrics and sports medicine is well within the scope of family medicine and aids in the diagnosis and treatment of many common conditions. Current use has expanded to nearly all body systems. Arnold *et al.* described the exam types relevant to family medicine with strong evidence (abdominal aortic aneurysm screening, deep vein thrombosis, procedural guidance, respiratory distress, musculoskeletal [MSK] and rotator cuff, skin and soft tissue infections), moderate evidence (appendicitis, biliary colic, bowel perforation, heart failure, elevated intracranial pressure, internal bleeding in trauma [FAST], renal colic, pericardial effusions, retinal detachment), and limited evidence (scrotal pain, MSK outside of the shoulder, fractures) supporting their use.⁹ However, this representation of historical evidence supporting these exam types is rapidly changing as research supporting POCUS in primary care grows.

According to Nathanson *et al.*, the most common applications used by primary care physicians are bladder, urinary retention, and joint injections; however, those researchers did not specify whether the physicians were internists or family physicians.³ For the authors of this paper, all family physicians and national ultrasound educators, the most common applications used are lung, MSK, obstetric, renal, soft tissue, and vascular.

All these exams can be performed in a family medicine or urgent care clinic. While initially learning to scan, adding POCUS to a clinical encounter may slow clinicians down. But, for daily POCUS users, Andersen *et al.*'s study of the use and impact of POCUS in general practice showed that the median time for a POCUS exam is 5 minutes.¹⁰ This finding corresponds to Patrick *et al.*'s study of EM attendings, physician assistants, and residents, which showed the mean time for a single application exam was 6 minutes, with time spent on the exam decreasing as experience rises.¹¹ The addition of POCUS during the patient evaluation led to increased confidence in the final diagnosis in 89% of encounters and changed the diagnosis and management plan in almost 50% of encounters. Additionally, performing POCUS was found to reduce the need for further imaging and referrals to hospitals or secondary clinics.¹⁰ Beyond the potential for POCUS to change management directly at the bedside, patients reported that after an examination that included POCUS they felt both like they were more thoroughly examined and that POCUS improved the quality of care they received.¹² With the investment of just a few minutes in each encounter where POCUS is used, family physicians provide higher value care with more confidence and more accurate diagnoses, order fewer imaging studies, and refer less often.

Despite these benefits, POCUS use remains low in family medicine. Niblock and colleagues reported that fewer than 10% of family physicians used POCUS between 2012 and 2017.¹³ However, in 2023, ACGME introduced its requirement of POCUS education in family medicine residency curricula. The following year, ABFM introduced coming requirements for POCUS competence for ABFM Board Eligibility by June 2029. Since the introduction of these requirements, POCUS interest has grown rapidly within family medicine. In the ABFM 2024 graduate survey, 37% of graduates reported they were prepared to use POCUS, with 25% of graduates using POCUS in practice—an increase from 2019 when POCUS was first added to the survey, when 21% stated they were prepared during residency and 17% were practicing with POCUS.¹⁴

EDUCATIONAL STATE OF THE FIELD

Undergraduate Medical Education

Currently, no standardized POCUS curricula or requirements for medical students exist, but the topic is commonly included. In one survey of US medical schools, approximately 72.6% of respondents reported they had an ultrasound curriculum.¹⁵ Of those, 73.8% reported ultrasound training within basic science coursework and 35.4% within clinical years. Another study,

by Russell et al, found similar results that 66% of allopathic medical schools had a curriculum, but only 15% of schools were offering a longitudinal curriculum across all 4 years of training. Family medicine faculty were involved in teaching POCUS at 31% of the schools, although this paled compared to EM physicians at 94% and internal medicine physicians at 48%,¹⁶ likely reflecting the slower uptake of POCUS in family medicine. Like our EM colleagues, family physicians trained in POCUS use it in a wide array of applications, making family physicians ideally suited to teach medical students the basics of POCUS across different body systems and clinical contexts.

This lack of family medicine-led POCUS training is consistent with reports from family medicine clerkships. A 2023 Council of Academic Family Medicine Educational Research Alliance (CERA) survey of family medicine clerkship directors found that 65% felt that POCUS was important for students in family medicine, but only 13.5% offered a structured POCUS experience within family medicine rotations.¹⁷ This finding could be linked to the fact that 78% of clerkship directors reported they did not perform POCUS within their personal practice.¹⁷

Graduate Medical Education

Outside of family medicine, EM incorporated POCUS into routine clinical practice more than a decade ago, with widespread implementation in emergency departments and its inclusion as an ACGME core competency milestone since 2012.¹⁸ ACGME also includes POCUS competency milestones in anesthesiology, whereas obstetrics and gynecology, internal medicine, and pediatrics do not yet have comparable residency requirements.¹⁹ However, interest continues to expand across disciplines, with internal medicine publishing consensus recommendations for core ultrasound applications in its residency training in 2025.²⁰

For graduate medical education within family medicine, ACGME in 2024 included in its required didactic and clinical experiences that “residents should have experience in using point-of-care ultrasound in clinical care,”²¹ but the requirement failed to define what applications or experiences must be included. In 2016, nearly a decade prior, the American Academy of Family Physicians published POCUS curricular recommendations for residency programs,²² but the number of exams included proved inapproachable to many except the most intrepid POCUS enthusiasts. Still, a 2019 CERA survey of program directors found that 95% of respondents were in the process of creating POCUS curricula, compared to 25% in a 2014 survey.²³

Because both the conditions evaluated by a family physician and the possible applications of POCUS are so broad, the Society of Teachers of Family Medicine (STFM) sought to narrow the focus and create consensus around what should be included in residency training curricula. STFM convened a POCUS Education Task Force to determine the scope of POCUS in family medicine through a validated, consensus-based research process as well as hosted the first national

Family Medicine POCUS Summit that brought together US and Canadian representatives from the major family medicine organizations and experts from other specialties. Through this initiative, Delphi studies were conducted and remain ongoing to generate expert-informed, consensus-based recommendations intended to develop a standardized framework for POCUS training within family medicine.²⁴ The Task Force has published findings around generalized competencies and recommended applications for family medicine residency curricula (Table 1).^{25,26}

With guidance from the STFM POCUS Task Force, ABFM announced that POCUS will become a required procedural competency for family medicine residency graduates by June 2029. In doing so, ABFM emphasized the importance of POCUS to contemporary family medicine practice and acknowledged that achieving excellence and consistency in its implementation will require a coordinated, specialty-wide initiative.

Fellowships

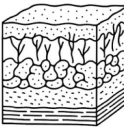
Fellowship opportunities for POCUS also exist within family medicine. In 2008, Emergency Ultrasound Fellowships formed to standardize the application process and share resources. The organization has evolved into the Society of Clinical Ultrasound Fellowships, which includes primarily EM fellowships; however, a few exist for family medicine, internal medicine, and pediatrics. Within family medicine, most of the fellowship programs are sponsored by their institution’s EM department and open to family medicine applicants. A smaller subset stands within their family medicine department. Other fellowships within family medicine, such as obstetrics and sports medicine, include POCUS as part of the fellowship but focus on one body system.

For our specialty, considering investing in the creation and accreditation of family medicine specific POCUS fellowships is important. If so, providing a fellowship experience that matches the clinical landscape in which a typical family medicine physician practices and that is inherently unique from that of our EM colleagues would be paramount.

CURRENT BARRIERS TO POCUS USE IN FAMILY MEDICINE

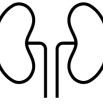
The challenges we face for teaching ultrasound are closely tied with the barriers to clinical use. How do we teach our learners what is not yet commonplace within our specialty? The most cited barriers to implementation of POCUS at the bedside are a paucity of trained faculty, lack of capital investment into equipment and software, and discomfort with independent image interpretation.²³ According to a recent article, 81% of residencies have at least one faculty member that is trained in POCUS, yet only 6% have set up a billing methodology in their institution.² Notably, the number of general POCUS practitioners is likely much lower, given that this particular survey did not define POCUS and likely captured residency faculty who perform only obstetric or MSK POCUS. Regardless, this finding suggests that the barriers are systemic.

TABLE 1. Applications Meeting Consensus for Inclusion in Family Medicine Residency Graduation Requirements

Body system	Application	Round one positive consensus count	Round two positive consensus count	Round three positive consensus count	Average Likert score in included round	Round it was included
Pulmonary						
	Pleural effusion	25	N/A	N/A	4.92	Round 1
	Pneumonia	24	N/A	N/A	4.68	Round 1
	Pulmonary edema	24	N/A	N/A	4.76	Round 1
	Pneumothorax	23	N/A	N/A	4.28	Round 1
Cardiac						
	Dilated cardiomyopathy	16	20	N/A	3.76	Round 2
	Right ventricular strain	19	21	N/A	3.96	Round 2
	Pericardial effusion	25	N/A	N/A	4.92	Round 1
	Heart failure with reduced ejection fraction	25	N/A	N/A	4.88	Round 1
	Left ventricular hypertrophy	21	N/A	N/A	4	Round 1
	Cardiac tamponade	20	N/A	N/A	4.24	Round 1
Obstetric and gynecologic						
	Uterine position (ie, anteverted, retroverted)	19	20	N/A	3.96	Round 2
	Intrauterine pregnancy identification	25	N/A	N/A	4.88	Round 1
	Fetal position and presentation	25	N/A	N/A	4.48	Round 1
	Fetal heart rate	25	N/A	N/A	4.76	Round 1
	IUD	24	N/A	N/A	4.4	Round 1
	Amniotic fluid measurement	23	N/A	N/A	4.36	Round 1
	Pregnancy dating by crown rump length	23	N/A	N/A	4.44	Round 1
	Placental location	21	N/A	N/A	4.12	Round 1
	Multiple gestation	21	N/A	N/A	4.16	Round 1
Soft tissue						
	Cellulitis	25	N/A	N/A	4.92	Round 1
	Abscess	25	N/A	N/A	4.92	Round 1
	Foreign body	25	N/A	N/A	4.68	Round 1
	Lipoma	25	N/A	N/A	4.56	Round 1
	Cyst (epidermal inclusion cyst)	25	N/A	N/A	4.48	Round 1
	Edema	24	N/A	N/A	4.52	Round 1
	Soft tissue mass	22	N/A	N/A	4.2	Round 1
Vascular						
	Lower extremity proximal DVT	23	N/A	N/A	4.64	Round 1
	IVC diameter (central venous pressure elevation)	N/A	24	N/A	4.24	Round 2
	IVC collapsibility (central venous pressure elevation)	25	N/A	N/A	4.68	Round 1
	Abdominal aortic aneurysm	25	N/A	N/A	4.8	Round 1
Procedural						
	Abscess drainage	24	N/A	N/A	4.76	Round 1
	Foreign body removal	23	N/A	N/A	4.36	Round 1
	Soft tissue mass removal	22	N/A	N/A	4.32	Round 1

(Continued)

TABLE 1. Applications Meeting Consensus for Inclusion in Family Medicine Residency Graduation Requirements (Continued)

Body system	Application	Round one positive consensus count	Round two positive consensus count	Round three positive consensus count	Average Likert score in included round	Round it was included
	Knee joint injection/ aspiration	22	N/A	N/A	4.4	Round 1
	IUD placement	21	N/A	N/A	4.24	Round 1
	Paracentesis	21	N/A	N/A	4.24	Round 1
Musculoskeletal						
	Knee effusion	25	N/A	N/A	4.68	Round 1
	Baker's cyst	25	N/A	N/A	4.52	Round 1
	Ganglion cyst	23	N/A	N/A	4.2	Round 1
	Shoulder effusion	21	N/A	N/A	3.96	Round 1
	Carpal tunnel syndrome	21	N/A	N/A	4.08	Round 1
	Hematoma	20	N/A	N/A	3.96	Round 1
	Fracture	20	N/A	N/A	4	Round 1
	Achilles tear	20	N/A	N/A	4.12	Round 1
Abdominal or biliary						
	Gallbladder sludge	23	23	N/A	4.08	Round 2
	Free fluid in the abdomen	25	N/A	N/A	4.84	Round 1
	Cholelithiasis	24	N/A	N/A	4.8	Round 1
	Cholecystitis	22	N/A	N/A	4.44	Round 1
Renal or bladder						
	Hydronephrosis	25	N/A	N/A	4.76	Round 1
	Bladder volume	24	N/A	N/A	4.8	Round 1
	Simple renal cyst	23	N/A	N/A	4.4	Round 1
	Foreign body (Foley catheter) in bladder	23	N/A	N/A	4.32	Round 1
	Nephrolithiasis	20	N/A	N/A	3.88	Round 1
Ocular						
	Retinal detachment	20	N/A	N/A	4	Round 1

Note: N/A indicates item was not in the round for voting because of not having met consensus or being added in a later round.

Abbreviations: DVT, deep vein thrombosis; IUD, intrauterine device; IVC, inferior vena cava

Having one faculty member that is passionate and invested does not imply that enough faculty are trained and engaged to change the culture surrounding POCUS within an institution. Those with few credentialed physicians may incur difficulty with institutional acceptance of family physicians performing, interpreting, and most importantly, billing for their expertise. A 2023 survey of one academic family medicine department revealed one-third of respondents citing inability to bill as a barrier to using POCUS.²⁷ Capizzano et al² and Shen-Wagner²⁸ also highlighted how few programs are set up to bill for POCUS. The problem transcends the United States, with a Danish study identifying the same billing barrier.¹⁰ Without billing for this work, family medicine departments are challenged to achieve financial sustainability and invest in the hardware or software required to implement workflows needed to perform, document, and bill for POCUS, thus slowing widespread adoption.²⁸

Additional investigation is needed around systemic barriers and common local factors impeding widespread implementation within family medicine, with an emphasis

on elucidating strategies that produce fiscal sustainability. The impact of educational initiatives, residency curricula, and fellowships hinges on whether POCUS can be sustainably implemented into day-to-day workflows in the family medicine environment.

THE FUTURE OF POCUS IN FAMILY MEDICINE

As we work to address faculty development, examining what has worked well in other specialties is prudent. The Society of Hospital Medicine, in collaboration with CHEST (American College of Chest Physicians), offers a POCUS certificate program requiring both didactic and hands-on experience.²⁹ In family medicine, STFM offers a longitudinal certificate program for family medicine faculty³⁰; independent POCUS workshops, virtual online fellowships, and intensive in-person fellowships comprise the remainder of faculty development opportunities. However, similar to residents, faculty need longitudinal options that provide mentored feedback and incorporate competency assessments.³¹ Evidence shows that skills from single trainings decay over time and

that learners benefit from hands-on training.^{32,33} This finding suggests that the blended model of virtual and in-person exposures seen in the STFM and CHEST training programs may be essential to robust faculty development around POCUS in family medicine.

As mentioned earlier, the need for widespread clinical implementation (eg, electronic medical record integration, billing) should be a focused barrier to work through. Clinical research is needed to outline a logistical blueprint for adoption within primary care clinics. We need to use validated implementation science methods to systemically identify what context-specific barriers exist to sustainable POCUS use in primary care and match these to evidence-based implementation strategies. As education around POCUS increases in medical school, residency, and at the faculty level, this challenge of POCUS implementation into the primary care setting will become the bottleneck for its growth in family medicine. A proactive approach will be paramount to dismantling the barriers that currently exist and anticipating others that could arise.

A group well-positioned to tackle these barriers is the POCUS Research, Innovation, and Medical Education (PRIME) Learning Network.³⁴ Intentionally designed to bring the family medicine community together to collaborate on POCUS across multiple institutions nationwide, the network has an initial emphasis on hybrid longitudinal faculty development, competency assessments, and sustainable POCUS implementation. By creating a structured, collaborative learning community, PRIME aims to equip residents, faculty, and practicing primary care providers with the skills, confidence, and institutional support necessary to integrate POCUS into clinical care, teaching, and assessment.

Through shared curricular resources, mentorship, and multi-institutional collaboration, PRIME aims to foster a scalable and equitable approach to POCUS education across diverse residency settings. To guide this network, PRIME is establishing a national advisory board with support from several key organizations, including the Association of Family Medicine Residency Directors, American Academy of Family Physicians, Association of Departments of Family Medicine, American College of Osteopathic Family Physicians, and STFM. This advisory structure will guide strategic priorities, ensure alignment with national educational standards, and promote dissemination of best practices. Ultimately, PRIME seeks to serve as a national home for POCUS innovation, scholarship, and faculty development, supporting residency programs in building sustainable, high-quality POCUS training that improves patient care and learner outcomes in family medicine.

CONCLUSIONS

POCUS within family medicine has matured from narrow applications of sports medicine and obstetrics into a modality aligned with the core values of family medicine—patient-centered, high-quality, and high-value care. It has been proven

to be an accurate and cost-saving way of providing clinical care, yet its integration into family medicine remains incomplete. Barriers such as having few trained faculty, budgetary constraints, hesitation with image interpretation, and inability to bill for POCUS exams have slowed growth. Relatively low numbers of practicing clinicians using ultrasound have made POCUS use appear to be an exception rather than the standard of care that evidence tells us it should be. Thanks in part to ACGME and ABFM formalizing POCUS as a core competency within family medicine, interest in POCUS and its inclusion in family medicine curricula is growing rapidly. To realize this potential for both learners and practicing clinicians, efforts must prioritize scalable faculty development, institutional investment in equipment, and integration that allows for smooth workflows and the ability to capture revenue to reinvest in POCUS infrastructure. More work in implementation science is needed to identify barriers, test strategies for sustainable adoption, and create culture change.

Collaborative, multi-institutional initiatives, such as PRIME, that share resources, create mentorship, and assess competency will help to avoid duplicative and expensive efforts, ensuring equity across training sites. If family medicine can embrace these investments, POCUS can be translated into everyday primary care practices—improving care for our patients.

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