

COMMENTARY

An Academic Family Physician's Point-of-Care Ultrasound (POCUS) Experience

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In family medicine (FM), point-of-care ultrasound (POCUS) usage is rising. Clinically, acute outpatient concerns often lends itself to more opportunities to use POCUS. Common scans utilized in the acute, outpatient setting include soft tissue masses, foreign body assessments, preprocedural guidance for incision and drainage and soft tissue mass excisions, deep vein thrombosis (DVT) ultrasound (US), joint effusions, right upper quadrant (RUQ) US assessments to check for gallstones, lung US for respiratory infections (especially in children), shoulder rotator cuff assessments, bladder US, and US assisted/guided procedures such as Baker's cyst aspirations, Carpal tunnel injections, and DeQuervain tenosynovitis injections. The goal of this commentary is to share clinical scenarios that can be helpful to use POCUS in the outpatient setting. With the advent of handheld US, recent Accreditation Council for Graduate Medical Education FM updates to recommend residents to learn POCUS³, and nationwide efforts spreading POCUS into residencies and primary care departments; I am optimistic that this will inspire and empower primary care physicians to learn and use POCUS effectively to benefit patients where and when they need care the most. (J Am Board Fam Med 2025;38:949–954.)

Keywords: Family Medicine, Medical Education, POCUS, Point-of-Care Systems, Primary Care Physicians, Primary Health Care, Technology, Ultrasonography

Introduction

In family medicine (FM), point-of-care ultrasound (POCUS) usage is rising. As of 2022, 81% of FM departments have at least one POCUS-trained faculty member.¹ Although there is high interest and perceived importance of using POCUS, there are low comfort levels in performing POCUS.² This can be due to variety of reasons, including lack of trained providers, ultrasound equipment, and funding for training.³ To address the barriers of education, there are emerging educational programs, such as STFM's FM POCUS educator's certificate course.⁴

Clinically, appropriate opportunities to use POCUS are more common during acute outpatient concerns than annual or preventive visits. POCUS can be used to identify soft tissue masses, aid in preprocedural

planning, check for joint effusions, guide Baker's cyst drainage, and more.

The goal of this commentary is to share clinical scenarios that can be helpful to use POCUS in the outpatient setting. To my knowledge, 1 other commentary has been written by 2 internal medicine primary care physicians.¹

Clinical Utilization of POCUS

Here are selected clinical case scenarios in the outpatient setting that illustrate the transformative impact of POCUS on patient care:

Soft Tissue

- **Identification of a Soft Tissue Mass:** A male patient presents with a left posterior back mass for 1 year. The soft, rubbery mass is estimated to be 4 cm in diameter, likely lipoma. Despite the examination and explanation of findings, the patient is adamant to pursue imaging and removal. POCUS allowed for accurate, quick, non-ionizing confirmation of the size and identification of a soft tissue mass. In addition, this can aid in pre-procedural planning prior

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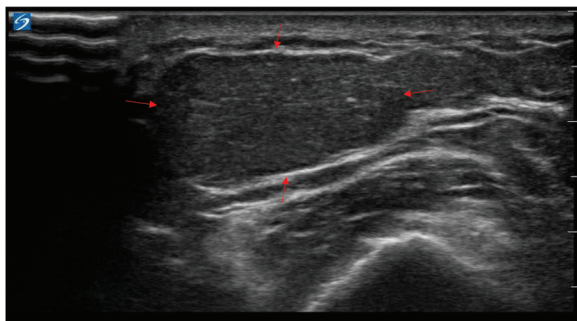
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Figure 1. Lipoma. The linear internal reflectors within a well circumscribed, oval shaped isoechoic mass is suggestive of a lipoma.



to soft tissue mass removal. Based on the large size of 6 cm confirmed by POCUS, the patient was preferentially referred to dermatology, rather than in-office removal. Research in primary care has shown notable differences in size estimation between physical exams and POCUS, impacting medical decision-making² (Figure 1).

- **Reassurance and Patient Education:** In an abdominal wall abscess case, POCUS allowed the clinician to communicate findings clearly and allow the patient to visualize the pathology, showing a highly anxious patient the exact location of the cavity. POCUS is 94.6% sensitive, and 85.4% specific for identifying abscesses.⁵ Over subsequent visits, the clinician demonstrated how the cavity was shrinking. This immediate feedback was invaluable and not easily achievable with traditional radiology, improving patient education and safety by serving as evidence to avoid unnecessary repeat procedures. There is evidence that POCUS is well received by patients, providing reassurance and improved patient understanding and patient satisfaction^{6,7} (Figure 2).

Figure 2. Abscess. Irregularly bordered hypoechoic to anechoic mass with internal isoechoic contents.

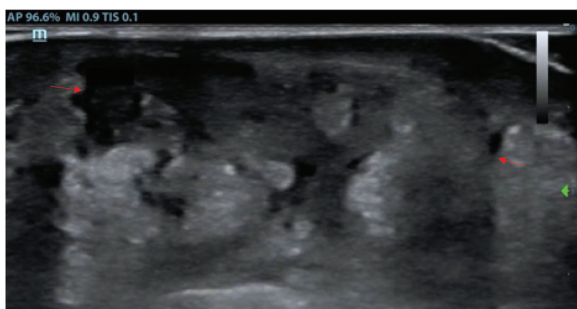
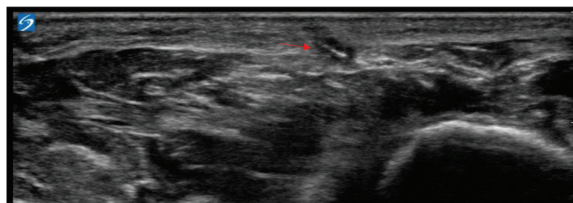


Figure 3. Foreign body. A small hyperechoic foreign body is seen in the superficial soft tissue, highlighted by a hypoechoic halo sign surrounding it.



- **Foreign Body:** For a patient accidentally stepping on glass, POCUS revealed evidence of a foreign body, and guided removal. Pooled sensitivity and specificity for foreign body identification were 72% and 92% respectively⁸ (Figure 3).

Musculoskeletal

- **Joint Effusions:** POCUS helped assess joint effusions in patients with equivocal physical exams. By checking for joint effusions before performing arthrocentesis, unnecessary procedures have been avoided (Figure 4).
- **Posterior Knee Pain:** An elderly patient presented with painful posterior left knee symptoms had a suspected Baker's cyst. POCUS guided the needle to the cyst without risking injury to the popliteal vasculature and simultaneously ruled out a popliteal Deep Vein Thrombosis (DVT) (Figure 5).
- **Carpal Tunnel:** For a patient with pain and numbness in the median nerve distribution, POCUS was beneficial to visualize and measure

Figure 4. Knee effusion. There is a hypoechoic stripe in the middle, depicting a small to moderate knee effusion seen in the suprapatellar bursa between the patella (superficial hyperechoic bone on left) and femur (deep hyperechoic bone on right).

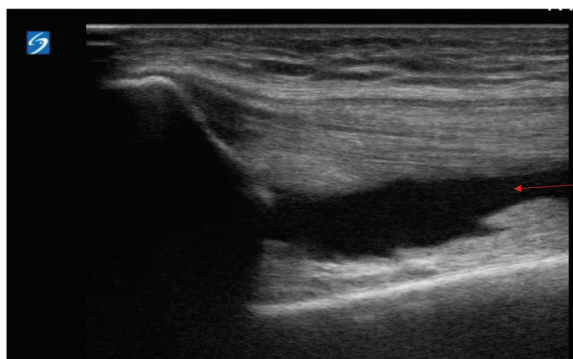
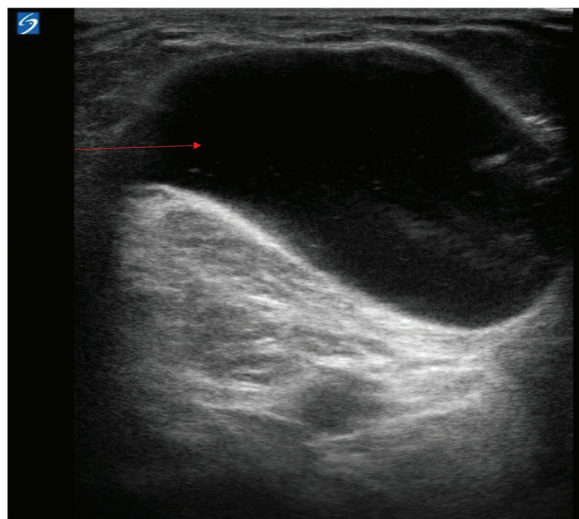


Figure 5. Baker's cyst. A hypoechoic balloon-like mass seen in the posterior medial knee, in between the semimembranosus and medial gastrocnemius muscles.



the median nerve, accurately directed the injectate to the proper location hydro-dissecting the nerve, resulting in effective pain relief (Figure 6).

- **Achilles Tear:** An elderly male playing pickleball experienced an audible pop and swelling in the posterior ankle. POCUS showed a full thickness Achilles tear, expediting workup with orthopedics for follow up (Figure 7).
- **Achilles Pain and Magnetic Resonance Imaging (MRI) Deferral:** Another patient expressed concern about their Achilles pain and requested an MRI. While the exam noted tenderness at the distal Achilles insertion, Thompson test was negative. Utilizing POCUS, the patient was reassured that the Achilles fibers were intact, suggesting tendinopathy rather than a tear. The

Figure 6. Median nerve. With a linear probe in transverse position, an anechoic oval structure with honeycomb appearance is seen highlighted, at the distal transverse carpal crease of the wrist.

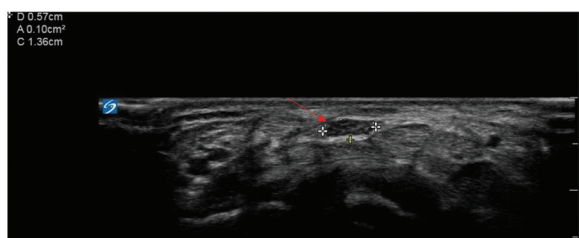
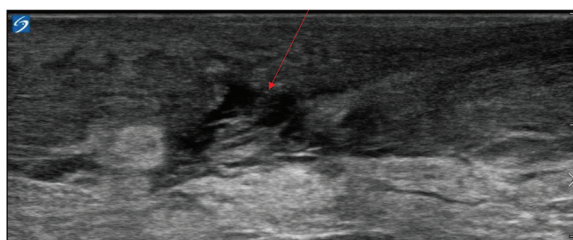


Figure 7. Achilles tendon near-complete tear. Achilles tendon visualized in longitudinal axis with anechoic near-complete tear seen in the middle, with both stumps visualized to the left and right of the anechoic area.



patient left feeling assured and ready for physical therapy without an MRI (Figure 8).

- **Full-Thickness Muscle Tear:** A patient presented after an Emergency Department (ED) evaluation for a traumatic left medial knee pain following a motorcycle accident. An X-ray was negative, but due to medial knee swelling and warmth, the provider suspected an abscess or hematoma. A bedside Ultrasound (US) revealed a near-complete medial vastus medialis tear, confirmed by MRI, leading to a more accurate treatment plan (Figure 9).

DVT

- **Positive DVT:** A male with a history of DVT presented with left calf pain and discoloration after recent international travel. POCUS enabled rapid treatment with initiation of Eliquis by the end of the appointment. Another case involved a male with history of

Figure 8. Achilles tendinopathy. Achilles tendon seen in longitudinal axis. There is an area of Achilles hypertrophy or thickening seen to the right of the screen, as well as diffuse heterogeneity with hypoechoic areas, suggestive of tendinopathy.

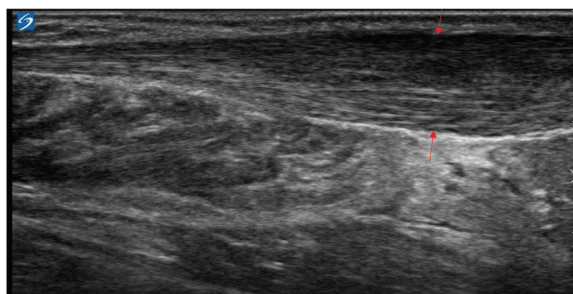
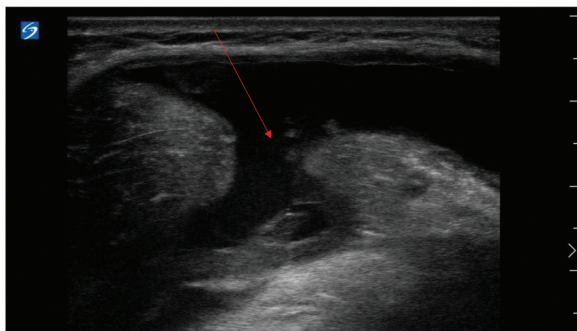


Figure 9. Muscle tear. There is an anechoic area indicating a full thickness tear, with retractions of the muscle seen to the left and right of the screen.



cancer, initially suspected to have a calf strain but identified on POCUS to have extensive femoral and popliteal DVT, who had prompt initiation of anticoagulation treatment all in the same office visit.

- **Negative DVT:** Numerous DVT rule-outs were conducted for low-risk patients per Wells Criteria, effectively eliminating the need for ED referrals, particularly before weekends when outpatient radiology services are unavailable. POCUS sensitivity and specificity with DVT diagnosis is 88% and 95% overall.⁹ In primary care, DVT POCUS has the potential to significantly change clinical management and curtail low-risk DVT related ED visits.

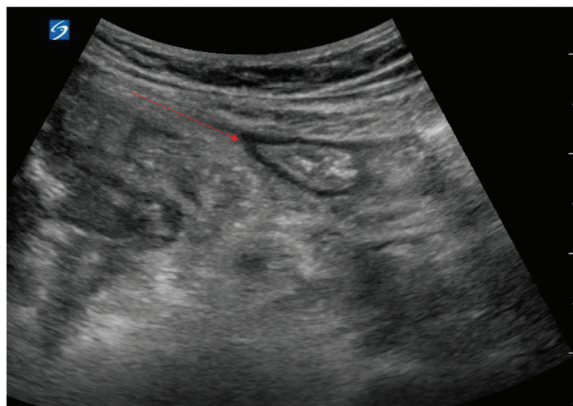
Lung

- **Ruling Out Pneumonia:** During winter, pediatric patients frequently present with upper respiratory infection (URI) symptoms lasting 3-4 weeks. Utilizing lung US, patients and parents were reassured that no significant pneumonia was visible, deferring the need for a chest X-ray and avoiding unnecessary radiation exposure in a low-risk scenario. For diagnosing pneumonia in children, the sensitivity was 96% and specificity 93%.¹⁰

Abdomen

- **POCUS as a Complement to Physical Exam:** An elderly female with abdominal pain and fever exhibited rebound tenderness in the right lower quadrant, raising suspicion for appendicitis or diverticulitis. The specificity for diagnosing appendicitis is 97%,¹¹ and diagnosing diverticulitis is 90%.¹² POCUS increased the diagnostic confidence, revealing signs of

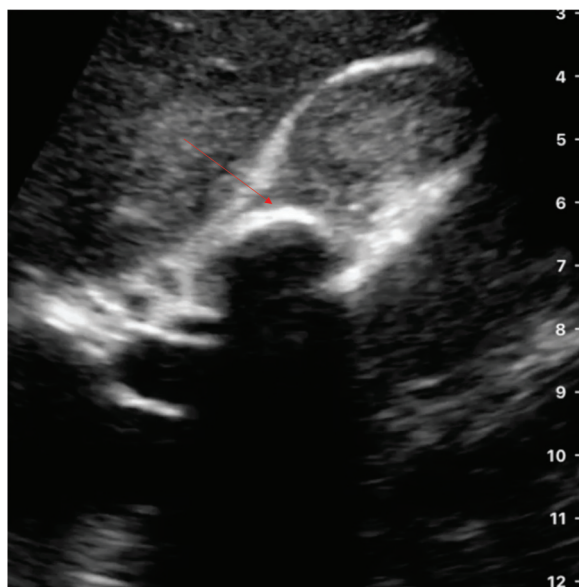
Figure 10. Abdominal inflammation. In the area of concern in the right lower quadrant, there was an area of bowel seen with an anechoic ring of fluid surrounding it, suggestive of inflammation, correlating to the physical examination of rebound tenderness and significant pain out of proportion to examination. On confirmatory Computed Tomography (CT), this was found to be a complicated cecal diverticulitis.



colon inflammation, eventually leading to a Computed tomography (CT) confirming complicated cecal diverticulitis and hospitalization for IV antibiotics. (Figure 10).

- **Ruling in Urinary Retention:** An elderly gentleman presented with lower urinary tract symptoms and inability to void. POCUS revealed over one liter of post-void residual urine, prompting appropriate referral for foley placement and urology consultation.
- **Ruling in Gallstones:** A middle-aged female with suspected biliary colic needed a US but faced scheduling delays. POCUS for gallstones have shown high sensitivity and specificity of 94% and 93%, respectively.¹³ For detection of cholecystitis, sensitivity and specificity was 73% and 93%, respectively.¹³ Within moments of scanning, POCUS identified a large gallstone in the gallbladder neck, allowing the clinician to promptly counsel the patient on elective cholecystectomy and an expedited surgical referral (Figure 11).
- **Ruling in Hernia:** An elderly female was evaluated in the ED for colicky right lower quadrant abdominal pain. A CT abdomen did not show any acute findings. On follow up, due to her colicky pain, POCUS revealed a fat-containing partially reducible inguinal hernia, suspecting this is a possible reason for her discomfort. This was not seen or commented on the CT report. Ultrasound can diagnosis inguinal hernias with a sensitivity of 86%, and a specificity of 77%,¹⁴

Figure 11. Gallstone. There is a rounded hyperechoic mass with posterior acoustic shadowing seen, suggestive of a gallstone near the gallbladder neck. In addition, there is also isoechoic sludge seen within the gallbladder.

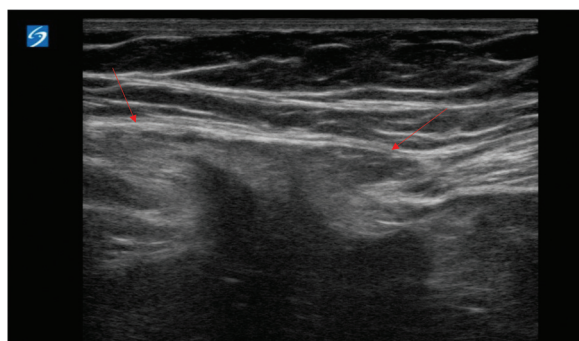


and has a role in stratifying clinically evolving hernias.¹⁵ A radiology ultrasound confirmed these findings. She was scheduled for an elective hernia repair (Figure 12).

Obstetrics/Gynecology (OBGYN)

- **Ruling in Intrauterine Pregnancy:** For a patient with a positive pregnancy test and missed menstrual period, POCUS provided an immediate diagnosis allowing for immediate counseling for next steps. Specificity is 92-100% confirming

Figure 12. Hernia. A hernia is seen protruding through the peritoneal defect, made more prominent with a valsava maneuver.



an intrauterine pregnancy when gestational sac and yolk sac or fetal pole are seen.¹⁶

- **Ectopic Pregnancy:** A female patient followed up in primary care after leaving the emergency room against medical advice for vaginal bleeding. A positive urine pregnancy test prompted a POCUS which showed a gestational sac with fetal heart tones seen outside the uterus, which suggested an ectopic pregnancy. This expedited a referral to emergency and OBGYN specialists for an urgent left salpingectomy.

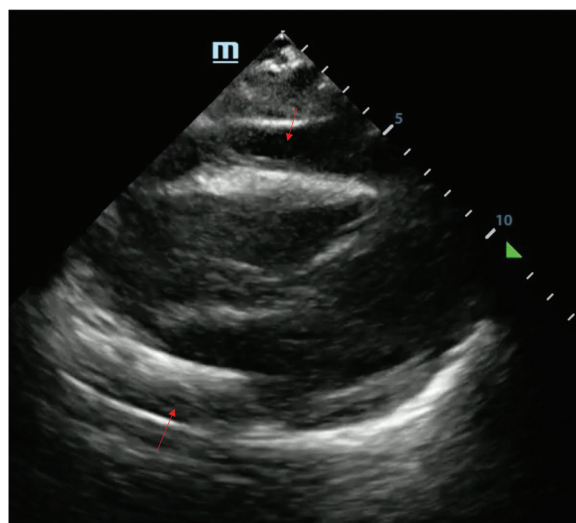
Cardiac

- **Pericardial Effusion:** In a challenging case of a pericardial effusion of unclear etiology, POCUS allowed the clinician to assess whether the effusion was worsening throughout multiple return clinic visits. Diagnosing pericardial effusions have a sensitivity of 96%, and a specificity of 98%.¹⁷ This occurred while coordinating care with specialists, including cardiologists and rheumatologists. This approach reduced patient anxiety without requiring repeated radiation. The patient was eventually diagnosed with lupus. (Figure 13).

Summary

These clinical scenarios highlight ways in which POCUS can be utilized in the outpatient clinic, with some cases significantly changing the management.

Figure 13. Pericardial effusion. In this subcostal view of the heart, there is an anechoic effusion circumferentially surrounding the pericardium.



With the advent of handheld US, recent Accreditation Council for Graduate Medical Education FM updates to recommend residents to learn POCUS³, and nationwide efforts spreading POCUS into residencies and primary care departments; I am optimistic that this will inspire and empower primary care physicians to learn and use POCUS effectively to benefit patients where and when they need care the most.

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