

The Usefulness of POINT OF CARE ULTRASOUND in Family Medicine

An Observational Study

Stephen Erickson, MD FAAFP
Jefferson Healthcare, Pt. Townsend, WA

To contact study author, email:
Serickson@jeffersonhealthcare.org

Introduction

Physician-performed ultrasound at the point of care as an extension of traditional physical examination technique has been promoted in the medical literature to improve the accuracy of the clinical exam in Family Medicine, and other primary care disciplines. However, most of the current body of clinical research on this topic comes from the setting of the hospital Emergency Department. Many CME resources on the topic of POCUS concentrate on the ultrasound exam protocols and techniques developed by and thought to be most useful for Emergency Physicians.

This study reports and quantifies the usefulness of POCUS for a family physician in full time clinical practice

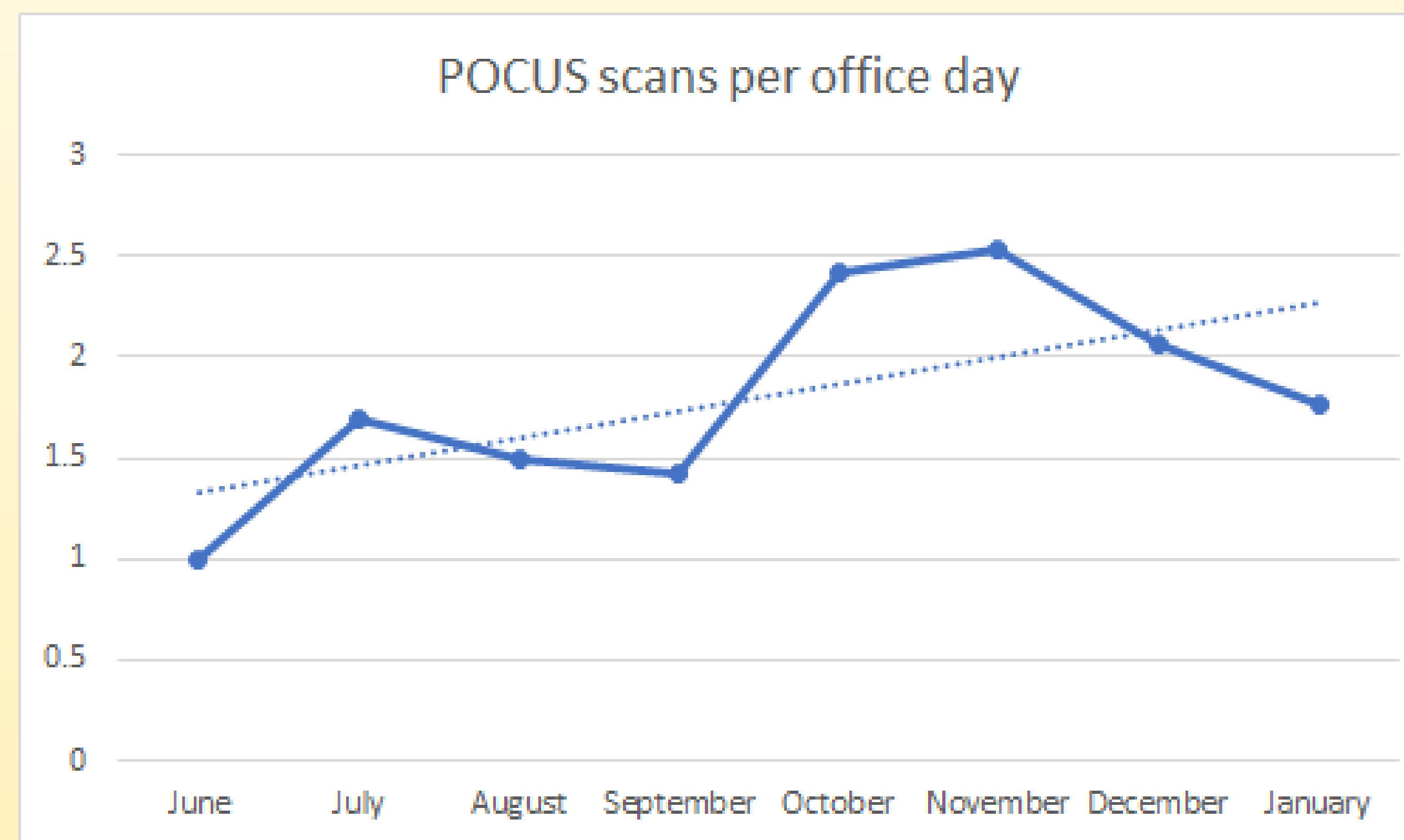
Methodology

A board-certified Family Physician with 20 years of clinical experience performing basic obstetric ultrasound introduced wider practice of point of care ultrasound (POCUS) into clinical practice after undertaking a curriculum of live continuing medical education seminars (15 hours) and self-study (approximately 30 hours) to rapidly integrate as many point of care ultrasound applications and examination protocols as possible.

POCUS exams were performed as indications arose throughout routine clinical practice. A real time log was maintained during this time period for quality and credentialing purposes of each exam including, in the physician's opinion, whether the availability and/or results of the POCUS exam resulted in any change of clinical management of the patient. Data is reported for six continuous months of use in clinical practice. The period of July through December was selected to be sure the study period covered seasonal variations in respiratory illness and other complaints that are historically seen.

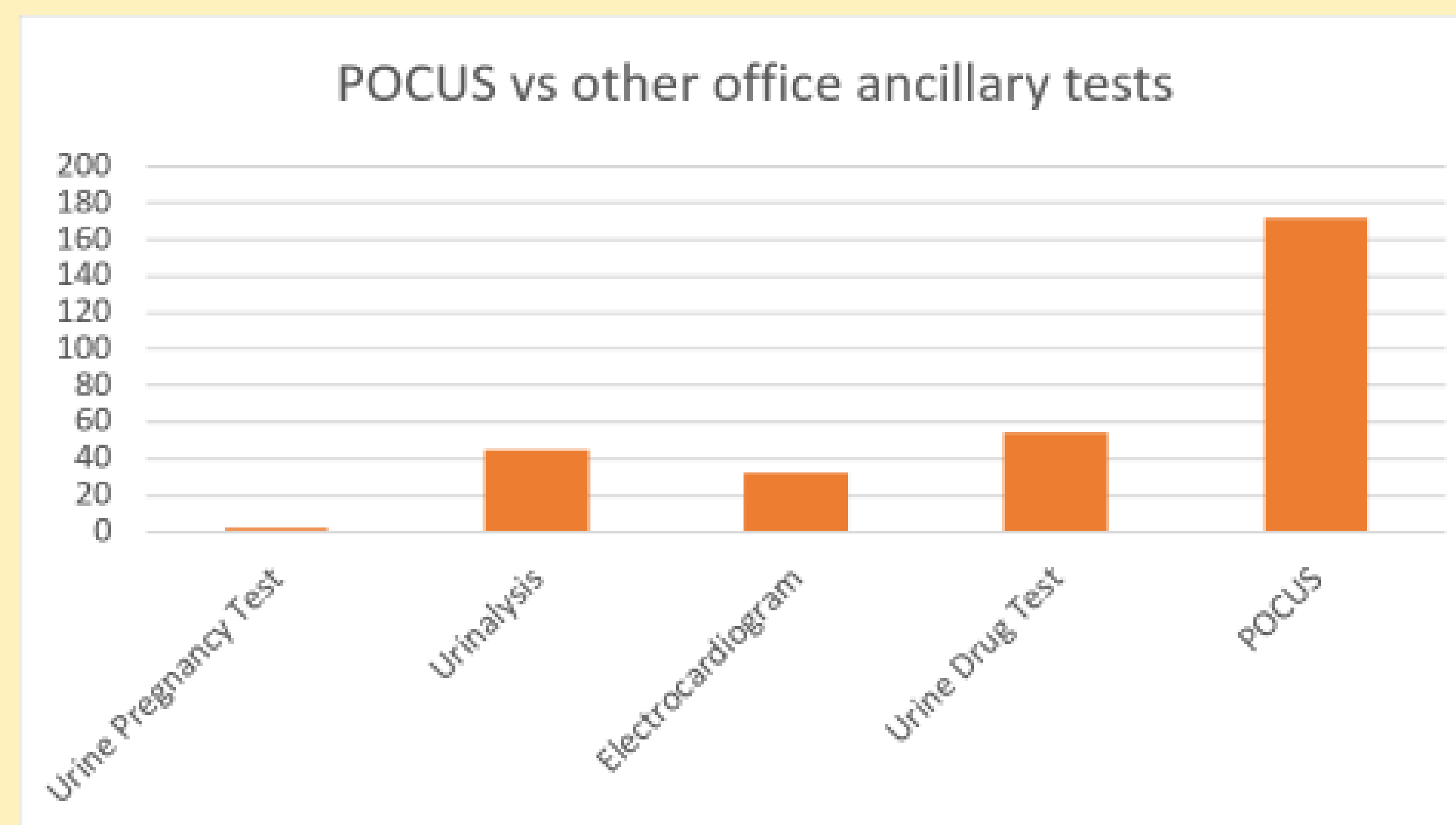
The practice setting for this observational study was a rural, full-spectrum family medicine clinic. The clinic is a federally designated rural health clinic located adjacent to and owned by a critical access hospital. The clinic sees a high percentage of medicare and medicaid patients and does low volume obstetric care. The study physician saw, on average, about 20 unique patients per clinic day.

Results



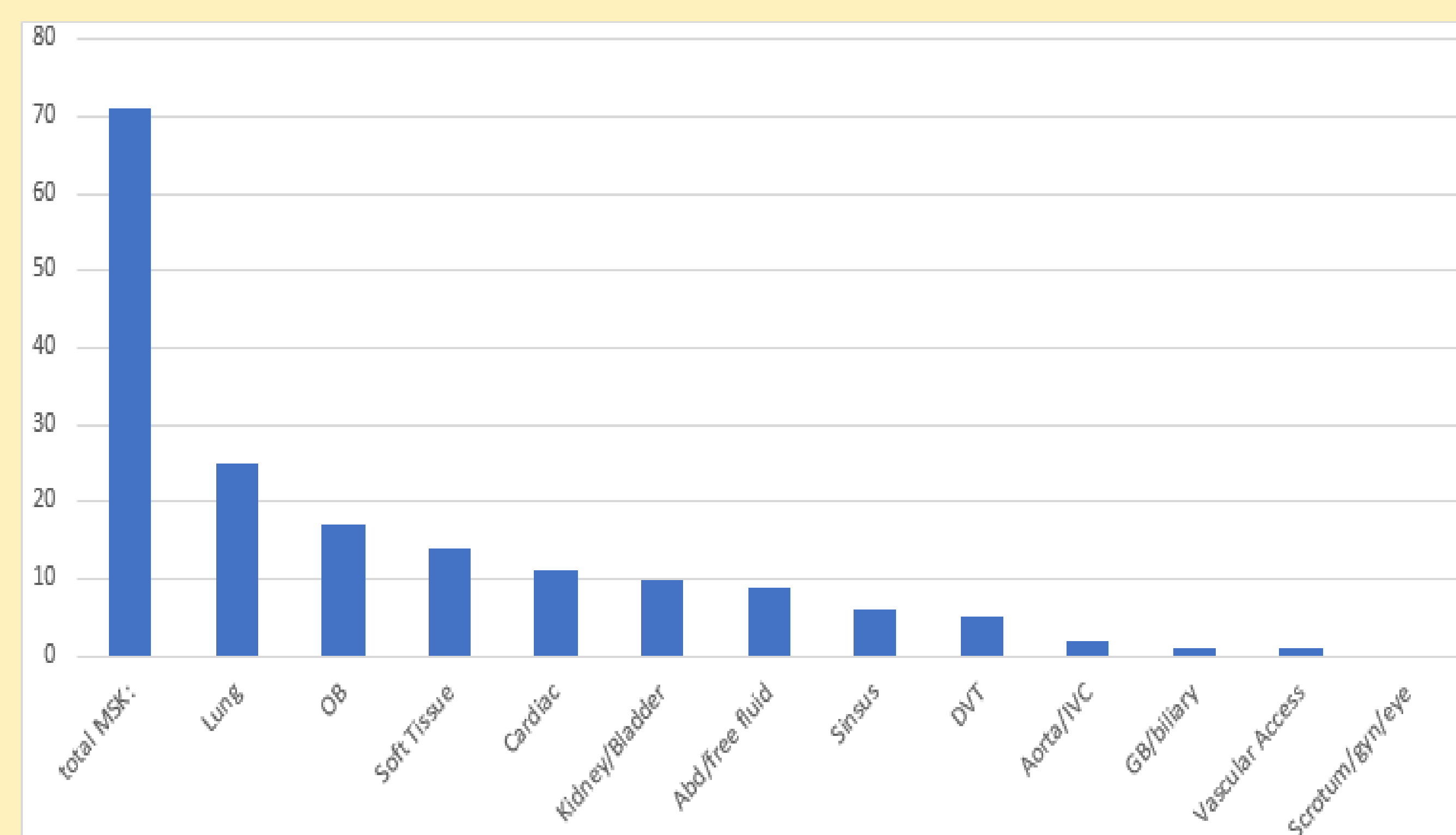
Frequency of Use

- POCUS was indicated in approximately 10% of all clinical encounters during the study period.
- The relative frequency of POCUS scanning trended slightly upward over time



Comparison to other office diagnostics:

- POCUS was more useful than any other common ancillary study in our clinic.
- The results of POCUS led to a change in clinical management of the patient 31% of the time.



The most frequently performed type of POCUS scans in this practice:

1. MSK (41%)
2. Lung (15%)
3. Obstetric (9%)
4. Soft Tissue (8%)
5. Cardiac (6%)

Discussion

This study quantifies how useful POCUS can be in a family medicine practice. This information is important to the physician contemplating the investments of both time (in training necessary to gain POCUS skills) and capital (required to purchase an ultrasound machine) required.

These results would support those investments. POCUS was frequently indicated, and frequently helpful in guiding further treatment or testing. It is also estimated that a patient who has their health condition visually displayed and explained during a POCUS exam may be more motivated to comply with treatment recommendations.

This data may also inform family medicine residency programs and teachers of primary care POCUS. It would be beneficial for training programs and continuing medical education providers to focus their educational content on those skills that are most immediately useful to practicing Family Physicians. These results would suggest that musculoskeletal ultrasound demands a much more prominent place in primary care POCUS training. POCUS of lung, OB, soft tissue, abdomen, bladder/kidney, and deep vasculature were also frequently indicated in this study, demonstrating the broad range of problems managed in a typical Family Medicine practice.

Good quality ultrasound images can now be obtained from a device small enough to carry in a coat pocket. These devices are increasingly incorporating features of artificial intelligence, digital networking, and image sharing to reduce barriers to training. POCUS equipment has become affordable for most any practice setting. We can expect these advancements to result in ever broader application of ultrasound in clinical medicine. This study adds support to family physicians who wish to become a part of that trend.

Larger studies would be helpful to validate this result in a broader group of primary care physicians.

Acknowledgements

Thanks for administrative and data support from:
Dunia Faulx, Sean Downing, Jacob Davidson

The Usefulness of POINT OF CARE ULTRASOUND in Family Medicine

FMX 2020 Poster Supplemental Information

Stephen Erickson, MD FAAFP
Jefferson Healthcare, Pt. Townsend, WA

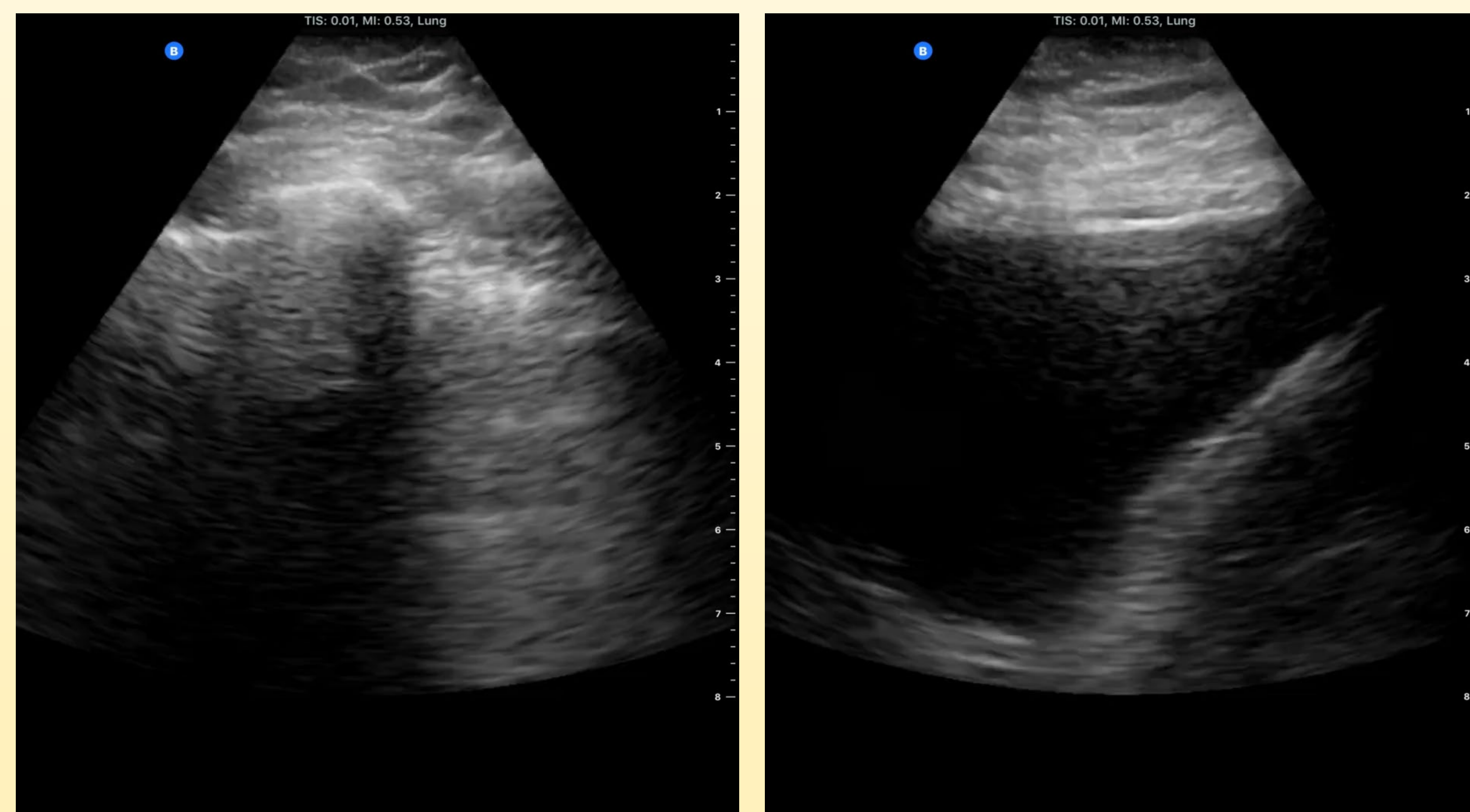
To contact study author, email:
Serickson@jeffersonhealthcare.org

Case examples of the usefulness of POCUS from this study

This 87 year old gentleman was brought to clinic by his wife who reported "He just hasn't been acting himself for the last day or two." History was complicated by the patient's advanced dementia and poor ability to communicate.

Vital signs and physical exam were rather unremarkable, but mildly labored breathing pattern led the physician to perform lung ultrasound>

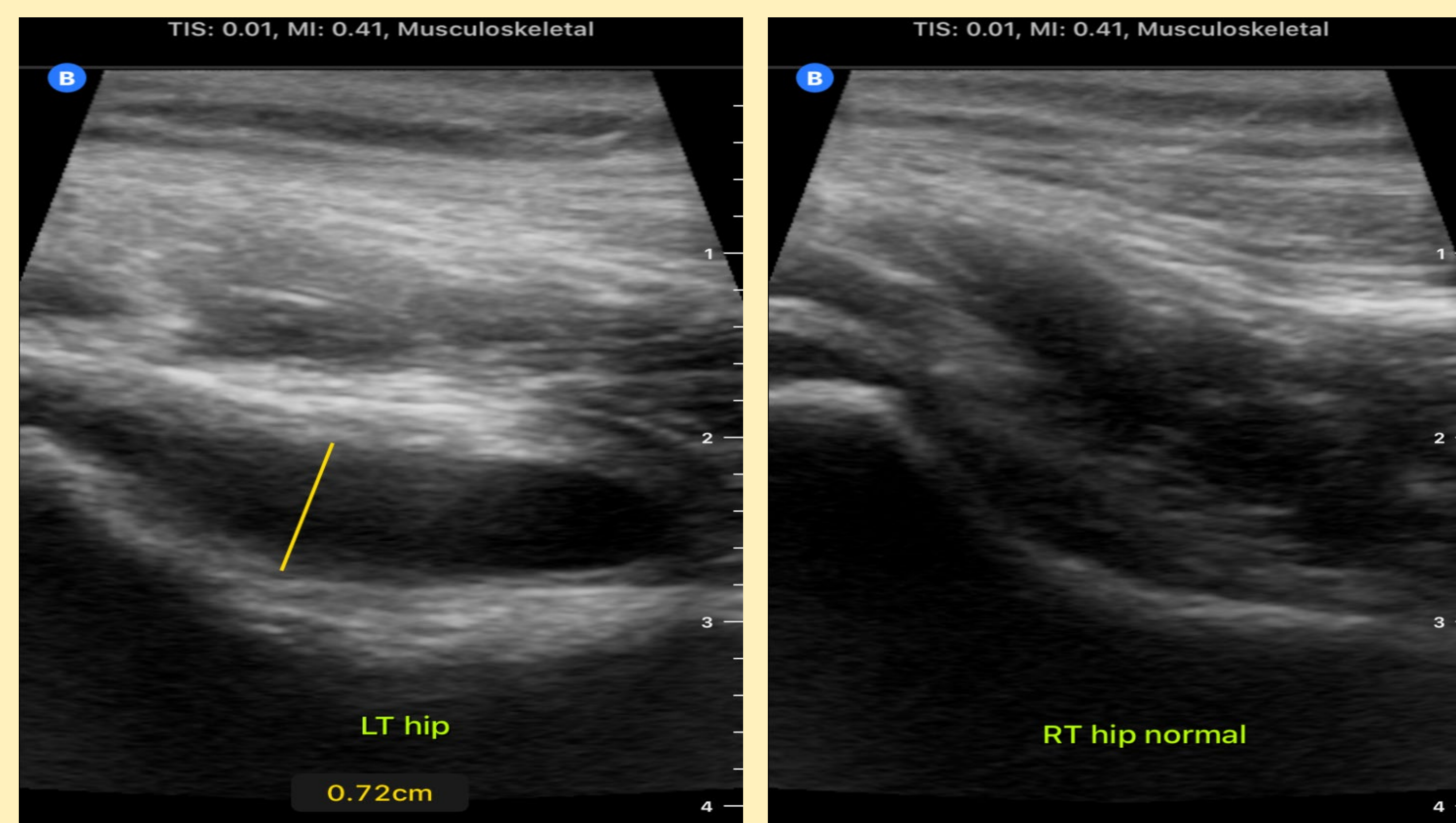
Diffuse bilateral B lines and pleural effusions were noted on POCUS, suggesting new onset CHF. He was transferred to the hospital emergency department where further testing confirmed subacute MI as the cause.



A 6 year old boy presented with a 36 hour history of left hip pain and worsening limp. There was no history of injury, and exam was normal except for some mild pain with passive flexion or extension of the hip.

Ultrasound of the hip demonstrated an effusion of the left femoroacetabular joint. This was confirmed by ultrasound comparison of the contralateral joint.

The effusion was easily and safely aspirated in the office using ultrasound guidance, and subsequent laboratory studies of the aspirate confirmed the diagnosis of toxic synovitis. The patient was observed as an outpatient and made a complete recovery within a few days.



Additional comments on the data

-The MSK ultrasound scans can be further broken down as follows:

Shoulder (34 scans)
Knee (10 scans)
Wrist (10 scans)
Hip (5 scans)
Elbow (5 scans)
Hand/finger (4 scans)
Foot/ankle (3 scans)

-Abd/Free fluid scans were performed to look for the presence of free peritoneal fluid (usually ascites) using a modification of the FAST protocol.

-I consciously chose not to do routine screening ultrasound exams for AAA during this study period. This would be another rich opportunity for POCUS scanning in Family Medicine practices

Additional References

1. Bhagra A, Tierney D M, et. Al., Point-of-Care Ultrasound for Primary Care Physicians and General Internists, *Mayo Clin Proc.* December 2016;91(12):1811-1827
2. Anderson CA, et. Al., Point of Care Ultrasound in Family Practice, a Systematic Review. *Annals of Family Medicine*, 2019;17:61-6
3. Steinmetz P, Oleskevich S. The benefits of doing ultrasound exams in your office. *J Fam Pract.* 2016; 65(8): 517-523.
4. Genc A, Ryk M, Suwała M, Zurakowska T, Kosiak W. Ultrasound imaging in the general practitioner's office – a literature review. *J Ultrason.* 2016; 16(64): 78-86.
5. Mengel-Jørgensen T, Jensen MB. Variation in the use of point-of-care ultrasound in general practice in various European countries. Results of a survey among experts. *Eur J Gen Pract.* 2016; 22(4): 274-277
6. Recommended Curriculum Guidelines for Family Medicine Residents: Point of Care Ultrasound. *AAFP Reprint No. 290D*
7. Policy Statement, "Emergency Ultrasound Guidelines"-revised. , American College of Emergency Physicians, *Annals of Emergency Medicine*, Vol 53, No.4,pp 550-570, June 2016.
8. Butterfly iQ, Butterfly Network Inc., Guilford Ct. www.butterflynetwork.com
9. Tierney DM, Becker JS, Post BD, Rosborough TK. Point-of-Care Sinus Ultrasound: Impact Within A Large Internal Medicine Clinic and Review of Technique. *Southern Medical Journal*, Vol 111, No. 7, pp 411-417
10. "Ultrasound Coding and Reimbursement" 2009, Annual updates published 2012-2019, Emergency Ultrasound Section, American college of Emergency Physicians
11. "Clinical Reimbursement Guide" Butterfly Network, Inc., Guilford CT

Jefferson
Healthcare