

Current Use and Barriers to Point-of-Care Ultrasound in Primary Care: A National Survey of VA Medical Centers

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ABSTRACT

BACKGROUND: More primary care providers (PCPs) have begun to embrace the use of point-of-care ultrasound (POCUS), but little is known about how PCPs are currently using POCUS and what barriers exist. In this prospective study, the largest systematic survey of POCUS use among PCPs, we assessed the current use, barriers to use, program management, and training needs for POCUS in primary care.

METHODS: We conducted a prospective observational study of all VA Medical Centers (VAMCs) between June 2019 and March 2020 using a web-based survey sent to all VAMC Chiefs of Staff and Chiefs of primary care clinics (PCCs).

RESULTS: Chiefs of PCCs at 105 VAMCs completed the survey (82% response rate). Only 13% of PCCs currently use POCUS, and the most common applications used were bladder and musculoskeletal ultrasound. Desire for POCUS training exceeded current use, but lack of trained providers (78%), ultrasound equipment (66%), and funding for training (41%) were common barriers. Program infrastructure to support POCUS use was uncommon, and only 9% of VAMCs had local policies related to POCUS. Most PCC chiefs (64%) would support POCUS training.

CONCLUSIONS: Current use of POCUS in primary care is low despite the recent growth of POCUS training in Internal Medicine residency programs. Investment in POCUS training and program infrastructure is needed to expand POCUS use in primary care and ensure adequate supervision of trainees.

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INTRODUCTION

Point-of-care ultrasound (POCUS) is defined as the use of ultrasound at the point of patient care to answer a specific diagnostic question or guide the performance of an invasive procedure.¹ More primary care providers (PCPs) are using POCUS, given its applicability in acute care settings.² The Alliance for Academic Internal Medicine in 2019 formally endorsed POCUS training in Internal Medicine,³ and Internal Medicine residency programs have subsequently bolstered POCUS training and use in recent years.⁴⁻⁶ Although 61% of Internal Medicine residency programs reported having an ultrasound curriculum in 2020,⁶ little is known about the current use of POCUS by PCPs.

To better understand POCUS use in primary care clinics (PCCs), we conducted a national survey to assess current use, training, barriers, and program management in PCCs in the Veterans Affairs (VA) Healthcare System. Our study's findings can guide implementation of POCUS in primary care, along with the development of POCUS training curricula and program infrastructure.

METHODS

We performed a prospective observational study of all VA Medical Centers (VAMCs) between June 2019 and March 2020. A multidisciplinary POCUS Technical Advisory Group of emergency medicine, hospital medicine, and critical care physicians collaborated with the VA's Healthcare Analysis and Information Group to develop and disseminate a web-based survey systemwide. The survey included questions on current use, barriers, institutional support, equipment, and training needs of POCUS. The University of Texas Health San Antonio Investigational Review Board deemed this study to be nonresearch (Protocol Number: HSC20210630NRR). Chiefs of Staff (n = 130) of all VAMCs initially completed 10 questions about facility-level POCUS use, training, competency, and policies. Next, section chiefs of PCCs associated with 128 VAMCs were identified and received 18 questions on POCUS use, training needs, workflows, and equipment availability in PCCs.

RESULTS

A total of 105 of 128 surveys were completed (82% response rate), and characteristics of the PCCs are summarized in [Table 1](#). Currently, 13% of PCCs had at least one provider using POCUS and 29% had providers who desired POCUS training. Few PCPs received prior training through residency/fellowship or continuing medical education

courses. The most common POCUS applications used were bladder, urinary retention, and joint injections. Desire for training in bladder and musculoskeletal POCUS applications exceeded current use ([Figure](#) and [Appendix](#)).

Only 1 in 5 facilities had a process for providers to obtain POCUS training. Two-thirds of chiefs would support participation of their physicians in an on-site or regional POCUS course. Program infrastructure to support POCUS use was uncommon. Few chiefs (9%) reported having local policies related to POCUS use, such as credentialing, machine maintenance, and documentation.

Barriers to POCUS use were common among PCCs ([Table 2](#)). The most common barriers reported were lack of trained providers (78%), available ultrasound equipment (66%), funding for training (41%), perceived benefit (40%), and clinician champion (39%). In open-ended survey questions, some chiefs stated that ultrasound techniques would be difficult to implement in

PCCs, and POCUS use was either not needed or needed only on a limited basis.

DISCUSSION

We have conducted the largest systematic survey of POCUS use by PCPs, and our findings can further guide POCUS implementation in primary care. In contrast to hospital medicine and emergency medicine,^{7,8} relatively few PCPs currently use POCUS. Our results are consistent with a recent national survey, which showed that only 17% of Internal Medicine residency programs provided POCUS training in outpatient settings.⁶ Most PCC chiefs recognize the benefits of POCUS and key barriers, such as lack of training, that must be addressed to foster widespread adoption of POCUS in PCCs.

Current use of POCUS in primary care is low despite the recent growth of POCUS training in Internal Medicine residency programs.⁶ Lack of training, equipment, and program infrastructure were identified as significant barriers to POCUS use. The training gap between residents and their supervising physicians continues to widen, with residents becoming more proficient.^{6,9} Substantive investment in POCUS training of attending physicians nationwide is needed to ensure adequate supervision of trainees.

Most PCCs lacked available ultrasound equipment, and chiefs felt that improved access to ultrasound machines would promote training of PCPs and residents. Chiefs frequently reported that lack of program infrastructure at their VAMC would prevent PCPs from receiving POCUS credentials. Image archiving, documentation, and quality

CLINICAL SIGNIFICANCE

- Few primary care clinics currently use point-of-care ultrasound (POCUS), based on a national survey conducted among Veterans Affairs Medical Centers.
- The most common barriers to POCUS use in primary care were lack of trained providers, ultrasound equipment, and funding for training.
- Investment in POCUS training and program infrastructure is needed to expand POCUS use in primary care and ensure adequate supervision of trainees.

Table 1 Characteristics, Current Use, and POCUS Training Received in Primary Care Clinics at VA Medical Centers (n = 105 Facilities)

Characteristic	Data
Active primary care patients, FY2020	
<5000	49 (47%)
5000-10,000	40 (38%)
>10,000	16 (15%)
VHA facility complexity level*	
High	76 (72%)
Low	29 (28%)
Region	
Northeast	25 (23%)
Midwest	30 (29%)
South	29 (28%)
West	21 (20%)
Location	
Urban	90 (86%)
Current use	
At least one primary care provider uses POCUS	14 (13%)
Providers have desire for POCUS Training	30 (29%)
Service Chief knows of ≥1 facility-wide policy for POCUS	9 (9%)
Current process to obtain POCUS training	20 (19%)
Service Chief supports POCUS training	67 (64%)
Training source†	
Via CME	
None	7%
Few (1%-25%)	29%
Some (26%-50%)	14%
Most (>50%)	0%
Unknown/unclear	50%
Via residency/fellowship	
None	14%
Few (1%-25%)	43%
Some (26%-50%)	0%
Most (>50%)	0%
Unknown/unclear	43%

CME = Continuing Medical Education; POCUS = point-of-care ultrasound; VA = Veterans Affairs; VHA = Veterans Health Administration.

*High-complexity facilities have high levels of patient volume, patient risk, specialists, teaching, and research. Low-complexity facilities have medium to low levels of patient volume and patient risk, and some to little teaching or research.

†Data presented from the primary care clinics that reported use of POCUS (n = 14).

improvement and quality assurance programs are critical for assessment of POCUS competency.⁸

Although POCUS use in other specialties has been shown to improve diagnostic accuracy, procedural success rates, complication rates, costs, and patient satisfaction,⁹ chiefs reported lack of studies in primary care settings as a barrier to adoption. High-quality POCUS research on effective implementation and clinical outcomes in primary care may promote increased utilization.^{10,11}

Strengths of our study include high response rates and broad representation of VAMCs nationwide. However, our

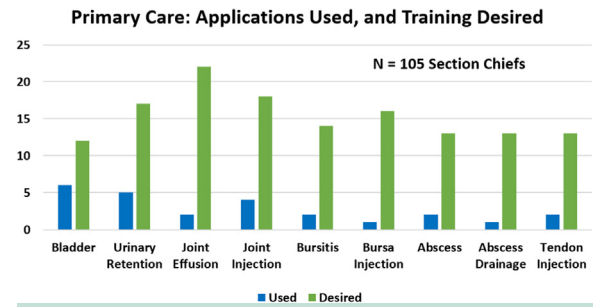


Figure Most common POCUS applications used and training desired in primary care.

*The survey had 68 applications including cardiac, pulmonary, abdominal, procedures, skin/soft tissues/musculoskeletal, and other systems.

data are limited to PCCs located at VAMCs and freestanding community-based outpatient clinics were not included in our survey. Few respondents were from rural PCCs. Although PCPs in rural settings were more likely to use POCUS in a 2018 study, no rural PCCs in our survey used POCUS.¹² Further, our findings may not be generalizable to non-VA health care systems, although VAMCs are often staffed by physicians who practice at affiliated medical schools and non-VA facilities.

There is potential for improved outcomes, patient satisfaction, and lower total costs with POCUS use in primary care.^{9,10} Development of national guidelines for POCUS use in primary care, along with support for faculty training, equipment, and program infrastructure are needed to expand POCUS adoption in primary care.

Table 2 Barriers to POCUS Use in Primary Care Clinics at VA Medical Centers (n = 105 Facilities)

Barriers	Data
Training	
Lack of trained providers	82 (78%)
Lack of funding for training	43 (41%)
Lack of training opportunities	36 (34%)
Lack of funding for travel	24 (23%)
One or more TRAINING barriers listed above	83 (79%)
Equipment	
Lack of ultrasound equipment	69 (66%)
Lack of funding for ultrasound equipment	27 (26%)
One or more EQUIPMENT barriers listed above	69 (66%)
Infrastructure	
No clinician champion	41 (39%)
Lack of funding for support staff	35 (33%)
Lack of privileging criteria	28 (27%)
Lack of funding for simulation space	24 (23%)
Lack of standard reporting form	16 (15%)
Lack of facility leadership support	14 (13%)
Lack of image archiving	10 (10%)
One or more INFRASTRUCTURE barriers listed above	57 (54%)
Other	
No perceived benefit	42 (40%)
No barriers identified	6 (6%)

DISCLAIMER

The contents of this publication do not represent the views of the US Department of Veterans Affairs or the United States Government.

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SUPPLEMENTARY DATA

Supplementary data related to this article can be found online at <https://doi.org/10.1016/j.amjmed.2023.01.038>.

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APPENDIX POCUS APPLICATIONS USED AND TRAINING DESIRED WITHIN PRIMARY CARE (N = 105)

Application	Used	Training Desired
Abdominal		
Bladder	6 (6%)	12 (11%)
Urinary retention	5 (5%)	17 (16%)
Abdominal aortic aneurysm (AAA)	2 (2%)	9 (9%)
Hydronephrosis	1 (1%)	7 (7%)
Peritoneal fluid	1 (1%)	7 (7%)
Nephrolithiasis	1 (1%)	5 (5%)
Biliary	1 (1%)	5 (5%)
Hernia	1 (1%)	5 (5%)
Appendicitis	1 (1%)	4 (4%)
Small bowel obstruction	1 (1%)	2 (2%)
Prostate	1 (1%)	2 (2%)
Pneumoperitoneum	1 (1%)	1 (1%)
Uterus	0 (0%)	6 (6%)
Ovaries	0 (0%)	6 (6%)
Intrauterine pregnancy	0 (0%)	4 (4%)
Focused assessment with sonography for trauma (FAST)	0 (0%)	1 (1%)
Procedures		
Joint injection	4 (4%)	18 (17%)
Tendon injection	2 (2%)	13 (12%)
Bursa injection	1 (1%)	16 (15%)
Abscess drainage	1 (1%)	13 (12%)
Paracentesis	1 (1%)	3 (3%)
Peripheral IV access	1 (1%)	3 (3%)
Central line placement	1 (1%)	1 (1%)
Arterial line placement	1 (1%)	0 (0%)
Arthrocentesis	0 (0%)	12 (11%)
Foreign body removal	0 (0%)	6 (6%)
Intrauterine device insertion	0 (0%)	6 (6%)
Nephrostomy tube	0 (0%)	6 (6%)
Suprapubic catheter	0 (0%)	2 (2%)
Chest tube	0 (0%)	1 (1%)
Peripheral nerve blocks	0 (0%)	1 (1%)
Endotracheal intubation	0 (0%)	1 (1%)
Lymph node biopsy	0 (0%)	0 (0%)
Prostate biopsy	0 (0%)	0 (0%)
Thoracentesis	0 (0%)	0 (0%)
Peripherally inserted central catheter (PICC) placement	0 (0%)	0 (0%)
Lumbar puncture	0 (0%)	0 (0%)
Liver biopsy	0 (0%)	0 (0%)
Breast biopsy	0 (0%)	0 (0%)
Thyroid biopsy	0 (0%)	0 (0%)
Pericardiocentesis	0 (0%)	0 (0%)
Skin/soft tissues/musculoskeletal		
Joint effusion	2 (2%)	22 (21%)
Bursitis	2 (2%)	14 (13%)
Abscess	2 (2%)	13 (12%)
Synovitis	2 (2%)	12 (11%)
Shoulder/rotator cuff	2 (2%)	12 (11%)
Tendinopathies	2 (2%)	11 (10%)
Foreign body	1 (1%)	9 (9%)
Cellulitis	1 (1%)	8 (8%)
Lymph nodes	1 (1%)	5 (5%)

(Continued)

Application	Used	Training Desired
Fractures	0 (0%)	7 (7%)
Pulmonary		
Pleural effusion	1 (1%)	11 (10%)
Pulmonary edema	1 (1%)	7 (7%)
Pneumonia	1 (1%)	7 (7%)
Pneumothorax	1 (1%)	5 (5%)
Cardiac		
Volume status (inferior vena cava/internal jugular)	1 (1%)	10 (10%)
Pericardial effusion	1 (1%)	9 (9%)
Left ventricular function	1 (1%)	7 (7%)
Advanced hemodynamic measurements	0 (0%)	1 (1%)
Other		
Deep vein thrombosis (DVT)	1 (1%)	12 (11%)
Arterial flow	1 (1%)	4 (4%)
Neck mass	1 (1%)	2 (2%)
Thyroid gland	0 (0%)	3 (3%)
Parathyroid glands	0 (0%)	1 (1%)
Eye-posterior chamber	0 (0%)	1 (1%)
Optic nerve sheath diameter	0 (0%)	0 (0%)
Venous mapping	0 (0%)	0 (0%)
Intravascular ultrasound	0 (0%)	0 (0%)