Perceptions of Point-of-Care Ultrasound Among Internal Medicine Residents and Faculty

Aaron Byczynski, DO; Ryan Powers, MD; Bailey Ray, MD; Brandon Watson, MD

ABSTRACT

Introduction: Point-of-care ultrasound (POCUS) is an increasingly common tool to address pointed clinical management and diagnostic questions in real time. The implementation of POCUS into graduate medical education, specifically in internal medicine training, has varied. This heterogeneity is likely due to several factors, including availability of ultrasound equipment, faculty with appropriate training, cost of equipment and curriculum development, and perceived utility in its application.

Methods: To further address the question of perceived utility, we surveyed internal medicine residents and faculty at an urban academic medical center in Milwaukee, Wisconsin without an established longitudinal POCUS curriculum.

Results: Surveyed residents consisted of internal medicine residents (postgraduate year [PGY] 1-3) and combined internal medicine-pediatric residents (PGY1-4 or higher). The faculty surveyed had completed training in general internal medicine and several internal medicine subspecialties. We found a consistent perceived utility in POCUS training, with 89% of residents and 92% of faculty indicating that it would be beneficial to patient care and resident education. In contrast, only 73% of faculty indicated that it adds value to their own patient care.

Conclusions: We find that the perceived value and utility of POCUS for patient care are high when the scope of the user is broad, as seen in general internal medicine faculty and residents. Subspecialization in internal medicine, particularly non-critical care medicine subspecialties, were less inclined to utilize POCUS and less likely to perceive it as valuable.

INTRODUCTION

Point-of-care ultrasound (POCUS) is an increasingly common imaging modality for real-time diagnosis and management of cardiac pathologies, pleural effusions, pulmonary edema, vascular patency, and intra-abdominal fluid accumulation, among other conditions.[1-4] Its implementation in the emergency department, operating rooms, inpatient medical wards, and outpatient medical offices has resulted in improved patient outcomes, including decreased diagnostic costs and shorter hospital length-of-stay.[5-8] Support for the incorporation of POCUS into clinical practice has been endorsed by several professional medical societies, including the American College of Physicians, Society of Hospital Medicine, and American College of Emergency Physicians.[9-11]

Coinciding with this rise has been an ongoing effort by academic medical institutions to systematically incorporate POCUS training postgraduate medical education curricula. Like their emergency medicine or anesthesiology counterparts, internal medicine residency programs are also increasingly likely to have dedicated POCUS instructional time.[12-23] However, development and implementation of a dedicated internal medicine curriculum can be a years-long process, and the scope and management of these programs can be fairly heterogeneous. For example, curricula may be organ-system specific or whole-body, resident driven or faculty led, and delivered in-person or remotely.[18-23] To date, there are no unified or sanctioned criteria set forth by accrediting bodies for POCUS training in graduate medical education.

Given this heterogeneity, internal medicine residency programs seeking to advance their POCUS educational initiatives may be hesitant to pursue what is often a resource- and labor-intensive endeavor. In addition, variability in existing ultrasound capabilities and faculty attitudes across institutions, suggests that conducting a needs assessment may be a prudent step to ensure that the

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Author affiliations: Medical College of Wisconsin, Milwaukee, Wisconsin (Byczynski, Powers, Ray, Watson).

Corresponding author: Brandon Watson, MD, Medical College of Wisconsin, 8701 W Watertown Plank Rd, Milwaukee, WI 53226; email bwatson@mcw.edu; ORCID ID 0000-0002-1578-2549

needs of residents, faculty, and patient population are met. Faculty and trainee attitudes represent an important but underreported characteristic of previously published internal medicine POCUS curriculum initiatives.[17,18]

To address this knowledge gap and offer a framework for future POCUS-related needs assessments, this study reports the attitudes and current ultrasound practices of resident and faculty at various stages of medical training within a large urban academic medical center in the Midwestern United States without an established longitudinal POCUS training curriculum.

METHODS

A questionnaire was developed as part of a needs assessment conducted during the implementation of a new point-of-care ultrasound (POCUS) training curriculum. The survey was distributed via email to internal medicine and combined internal medicine-pediatric residents and interns training at a large urban academic medical center that did not have a POCUS training program at the time of distribution. The survey was also distributed concurrently to all general internal medicine faculty and internal medicine subspecialists at the same institution. Participation was voluntary, and no reimbursement was offered. Survey responses were collected using Qualtrics XM (Qualtrics) over a 2-week period in April 2024.

The surveys distributed to faculty and residents differed, reflecting the distinct POCUS-related needs of 2 groups. To enhance the utility of results for curriculum development, most survey questions were resident oriented. Shared question themes included comfort and training with POCUS use prior to the curriculum launch, perceived need for expanded POCUS education, local barriers to implementation, and anticipated future POCUS use following training. Resident-specific questions solicited feedback on existing POCUS training opportunities available before curriculum expansion. Faculty-specific questions assessed willingness to participate in future POCUS training opportunities for themselves and for trainees.

RESULTS

Overall, 145 faculty and residents responded, including 97 residents (67%) and 47 faculty (32%) (Table 1). Among residents, 52 (54%) were postgraduate year (PGY) 1 (interns), 26 (27%) were PGY-2, 16 (16%) were PGY-3, and 3 (3%) were PGY-4 or higher. Among faculty respondents, 18 (38%) practiced general internal medicine, 3 (6%) were trained in internal medicine-pediatrics, and 26 (54%) were trained in an internal medicine subspecialty.

At the time of the survey, 87 residents (92%) reported receiving some level of POCUS training, with 80 (92%) describing that training as sporadic. Twenty-seven faculty members (56%) reported currently using POCUS in their clinical practice.

Surveyed residents reported consistently favorable perceptions of the utility and value of POCUS in clinical care. Eighty-nine residents (97%) indicated that implementation of POCUS increases the clinical value of their care (Table 2), and 88 (91%) agreed to some degree that POCUS is an essential skill to learn during residency. Eighty-seven residents (90%) reported plans to incorporate POCUS into their practice within the next 5 years, and 91 (94%) believed POCUS has potential for daily or weekly use, irrespective of perceived value. More advanced trainees were more likely to report favorable perceptions of POCUS value and use, although the number of respondents decreased with each successive year of training (PGY-1, 52 [54%]; PGY-3, 16 [16%]).

Faculty responses demonstrated greater heterogeneity and were less uniformly favorable. Regarding the impact of POCUS training on the value of care delivered by residents, 42 faculty respondents (93%) believed it would be beneficial. In contrast, 32 faculty (73%) believed that it adds value to their own clinical practice. Faculty practicing general internal medicine were most likely to report that POCUS training added value, with 17 (94%) indicating benefit to resident-provided care and 15 (83%) indicating benefit to their own care. Faculty trained in a non-critical

Table 1. Distributions of Medical and Point-of-Care Ultrasound Training Among Respondents

Respondents	n (%)
Residents	97 (67)
PGY-1	52 (54)
PGY-2	26 (27)
PGY-3	16 (16)
≥ PGY-4	3 (3)
Faculty	47 (32)
General internal medicine	18 (38)
Internal medicine–pediatrics	3 (6)
Internal medicine subspecialty	26 (55)
Cardiology	6 (23)
Endocrinology	1 (4)
Gastroenterology	1 (4)
Geriatrics	1 (4)
Hematology/oncology	4 (15)
Infectious disease	1 (4)
Infectious disease/critical care	1 (4)
Nephrology	4 (15)
Rheumatology	1 (4)
Pulmonology/critical care	6 (23)
Current POCUS familiarity	
Residents, n = 95	
Received prior POCUS training	87 (91)
Longitudinal training	7 (8)
Sporadic exposure	80 (92)
No prior POCUS training	8 (8)
Faculty, n = 47	
Using POCUS in clinical practice	27 (55)
Completed POCUS certification	9 (33)
Not currently using POCUS in clinical practice	20 (43)

Abbreviations: POCUS, point-of-care ultrasound; PGY, postgraduate year.

care internal medicine subspecialties were less likely to perceive added value, with 14 (82%) reporting benefit to resident care and 10 (63%) reporting benefit to their own care. Faculty trained in critical care medicine unanimously reported that POCUS education beneficial for residents (7, 100%), while only 4 (57%) perceived benefit to their own clinical practice.

When asked how POCUS training would affect their own care, 32 faculty respondents (73%) anticipated a positive impact, whereas 41 (91%) reported that POCUS training would positively influence patient care by residents (Figure). Faculty trained in combined internal medicine-pediatrics reported high perceived added value across all training levels.

Supplemental Table 1 presents complete results for survey items not specific to institutional barriers or local training policies.

Table 2. Perceptions of Point-of-Care Ultrasound Among Surveyed Residents and Faculty

Residents, n = 97	Total n (%)	PGY-1 n (%)	PGY-2 n (%)	PGY-3 n (%)	≥ PGY-4 n (%)
How often could diagnostic POCUS be beneficial during patient assessments?					
Totals	97 (100)	52 (54)	26 (27)	16 (16)	3 (3)
Daily	52 (54)	21 (40)	20 (77)	9 (56)	2 (67)
Weekly	39 (40)	27 (52)	5 (19)	6 (38)	1 (33)
Monthly	1 (1)	1 (2)	0 (0)	0 (0)	0 (0)
Rarely or never	1 (1)	0 (0)	1 (4)	0 (0)	0 (0)
I don't know	4 (4)	3 (6)	0 (0)	1 (6)	0 (0)
POCUS is an essential skill for patient care during residency.					
Totals	97 (100)	52 (54)	26 (27)	16 (16)	3 (3)
Strongly agree	72 (74)	34 (65)	23 (88)	13 (81)	2 (67)
Agree	16 (16)	12 (23)	2 (8)	1 (6)	1 (33)
Neutral	5 (5)	3 (6)	0 (0)	2 (13)	0 (0)
Disagree	3 (3)	2 (4)	1 (4)	0 (0)	0 (0)
Strongly disagree	1 (1)	1 (2)	0 (0)	0 (0)	0 (0)
It is very likely I will use POCUS through the next 5 years of my career.					
Totals	97 (100)	52 (54)	26 (27)	16 (16)	3 (3)
Strongly agree	74 (76)	39 (75)	19 (73)	13 (81)	3 (100)
Agree	13 (13)	8 (15)	4 (15)	1 (6)	0 (0)
Neutral	5 (5)	1 (2)	2 (8)	2 (13)	0 (0)
Disagree	3 (3)	2 (4)	1 (4)	0 (0)	0 (0)
Strongly disagree	2 (2)	2 (4)	0 (0)	0 (0)	0 (0)
Do you agree that the integration of POCUS into your clinical toolset would improve the quality of patient care provided?					
Totals	92 (95)	47 (48)	26 (27)	16 (16)	3 (3)
Strongly agree	72 (74)	36 (77)	21 (81)	12 (75)	3 (100)
Agree	17 (18)	9 (19)	4 (15)	4 (25)	0 (0)
Neutral	2 (2)	2 (4)	0 (0)	0 (0)	0 (0)
Disagree	1 (1)	0 (0)	1 (4)	0 (0)	0 (0)
Strongly disagree	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Faculty, n = 47	**Total n (%)**	**GIM n (%)**	**Med-Ped n (%)**	**CCM n (%)**	**No CCM n (%)**
How could resident POCUS training impact the quality of patient care provided by that resident?					
Totals	45 (96)	18 (38)	3 (6)	7 (15)	17 (36)
Essential for optimal care	8 (18)	5 (28)	1 (33)	1 (14)	1 (6)
Significantly improves patient care	21 (47)	8 (44)	2 (67)	3 (43)	8 (47)
Somewhat improves care	12 (27)	4 (22)	0 (0)	3 (43)	5 (29)
Minimal impact	1 (2)	0 (0)	0 (0)	0 (0)	1 (6)
I don't know	3 (7)	1 (6)	0 (0)	0 (0)	2 (12)
How much do you think being proficient in POCUS would impact the quality of patient care you provide?					
Totals	44 (94)	18 (38)	3 (6)	7 (15)	16 (34)
Significantly beneficial	13 (30)	6 (33)	3 (100)	1 (14)	3 (19)
Somewhat beneficial	19 (43)	9 (50)	0 (0)	3 (43)	7 (44)
Neutral	9 (20)	3 (17)	0 (0)	3 (43)	3 (19)
Not beneficial	3 (7)	0 (0)	0 (0)	0 (0)	3 (19)

Abbreviations: POCUS, point -of-care ultrasound; GIM, general internal medicine; Med-Ped, internal medicine-pediatric; CCM, trained in internal medicine subspecialty with critical care medicine training; no CCM, trained in internal medicine subspecialty without critical care medicine training.

DISCUSSION

Point of care ultrasound (POCUS) is a widely used diagnostic tool among internal medicine residents and faculty across multiple levels of academic training. Residents, in particular, expressed strong enthusiasm for POCUS and its incorporation into clinical practice, whereas faculty had mixed perceptions. Both groups reported a high perceived value in resident-focused POCUS training. Faculty respondents were more likely to endorse the positive impact of POCUS on resident-delivered care than on their own clinical practice. General internal medicine physicians were among the most likely to report increased value of their own patient care with POCUS integration, whereas non-critical care internal medicine subspecialists were the least likely.

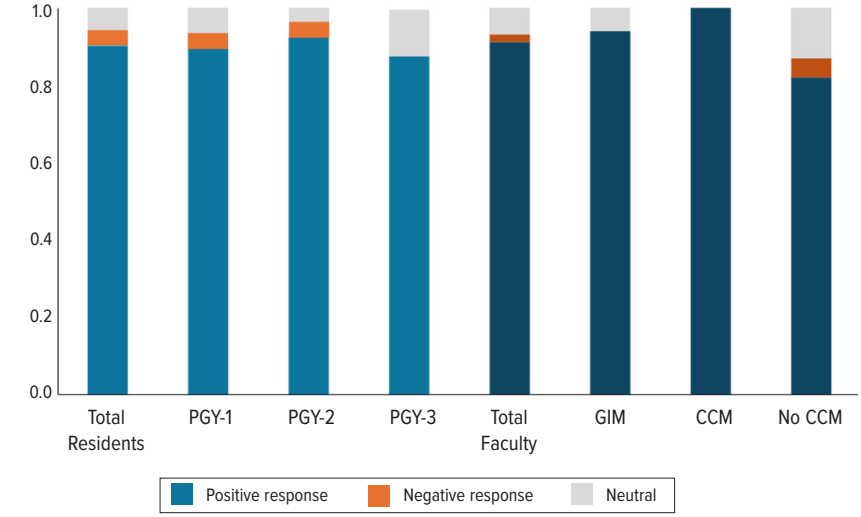
These findings are consistent with trends described in current medical education literature. Multiple reports have described the development and implementation of POCUS curricula in internal medicine residency programs and subspecialty fellowships.[17-23] However, perceptions of POCUS prior to curriculum implementation have not been consistently reported. In this study, perceived value and utility of POCUS for patient care were highest among clinicians with a broad clinical scope, as seen in general internal medicine faculty and residents. Greater subspecialization, particularly among non-critical care subspecialties, was associated with lower anticipated utilization and perceived value of POCUS.

Although several non-critical care medicine subspecialty programs offer organ-specific training, such as on nephrology, cardiology, or endocrinology, our findings suggest that attending physicians in those fields are less likely to use POCUS.[21-23] This discrepancy may reflect several factors, including hesitancy to adopt

new clinical tools at later career stages, as previously reported in some surgical disciplines, or a need for more specialized imaging modalities driven by a higher degree of variability in patient populations and their pathology profiles.[24,25] Alternatively, these findings may reflect sampling bias within our cohort and may not fully represent attitudes across all non-critical care subspecialties.

Critical care medicine faculty were more likely to endorse the benefit of POCUS training for residents than for themselves. This finding was unexpected, given the widespread use of ultrasound in intensive care settings and the extensive literature supporting its use in the intensive care unit (ICU).[26-28] This result may be influenced by institution-specific practice patterns and, more than other findings in this study, may reflect local variation rather than broader trends reflected in the literature.

Figure. Overall Perception of Resident Patient Care With POCUS Training



Responses to questions regarding the impact to the quality of care that residents provide with POCUS training were compiled and averaged to reflect overall perceptions of each demographic in this cohort.

Abbreviations: POCUS, point-of-care ultrasound; PGY, postgraduate year; GIM, general internal medicine; CCM, trained in internal medicine subspecialty with critical care medicine training; no CCM, trained in internal medicine subspecialty without critical care medicine training.

These results may be applied in several ways. First, academic medicine training programs seeking to introduce or expand POCUS curricula may use these findings to contextualize expected faculty and trainee attitudes. Second, institutions conducting local needs assessment may use these data as a comparative reference. Finally, as POCUS education continues to evolve, these findings may serve as a benchmark for longitudinal assessment of changing perceptions among trainees and faculty.

Limitations

This study has several limitations. Survey questions were developed as part of a needs assessment focused on identifying logistical considerations for implementation of a new POCUS curriculum at a large urban academic center. As a result, question wording was intentionally oriented toward resident education, and differences in question phrasing between faculty and resident surveys may confound some of the interpretation.

Inherent limitations of voluntary, anonymous survey distribution include the potential for sampling bias, particularly from respondents with prior POCUS exposure or bias towards favorable opinions. As POCUS becomes increasingly integrated into clinical care and medical education, mitigating this bias may become more challenging. Finally, the demographic distribution of respondents—particularly among faculty subspecialists—was highly variable.

CONCLUSIONS

POCUS is widely viewed by internal medicine residents and faculty as a valuable diagnostic modality with the potential to enhance patient care. Both groups perceived substantial benefit from resident-focused POCUS education. Training programs considering introducing or expanding POCUS curricula may use these findings to support their initiatives.

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Appendix: Available at www.wmjonline.org

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