

BRIEF REPORT

Current State of Point-of-Care Ultrasound Use Within Family Medicine

Juana Nicoll Capizzano, MD, Marie-Claire O'Dwyer, MB BCh, BAO, MPH, Wendy Furst, MA, Melissa Plegue, MA, Ryan Tucker, MD, Nikhil Theyyanni, MD, and Diane M. Harper, MD, MPH, MS

Background and Objectives: Following the publication of Point-of-Care-Ultrasound (POCUS) curriculum guidelines from the American Academy of Family Physicians in 2016, there has been a rapid expansion in POCUS curricula across family medicine departments in the US. There is growing appreciation for the potential role of POCUS in enhancing the clinical care family physicians provide to patients. The primary aim of our study was to evaluate the utilization of POCUS in outpatient clinic care across Family Medicine departments nationwide and to identify perceived or realized barriers in integrating POCUS use for clinic care.

Methods: The questions were part of a larger omnibus survey of US Department of Family Medicine chairs, conducted by the Council of Academic Family Medicine Educational Research Alliance (CERA) between August 6 to August 31, 2021.

Results: 81% of departments have at least 1 POCUS-trained faculty, with 44% of departments using POCUS in some ambulatory clinical care. Currently, only 6% have established billing for the POCUS they perform. Faculty time, as well as funding, for POCUS training were seen as 2 primary barriers. The purchasing of equipment and billing for POCUS were described by FMCs as difficult.

Conclusions: As POCUS use continues to rise in Family Medicine, it is imperative to create a more efficient and less hindered road to growth. Collaboration across departments to share best practices in training, purchasing equipment and billing for POCUS will be important to facilitate high-quality POCUS access for our patients. (J Am Board Fam Med 2022;35:809–813.)

Keywords: Curriculum, Faculty, Family Medicine, Family Physicians, Point-of-Care Systems, Ultrasonography

Background

Point-of-care ultrasound (POCUS), or bedside ultrasound, has been called the “visual stethoscope” of the 21st Century.¹ Recognizing the potential of POCUS in enhancing primary care delivery,^{2–4} the American Academy of Family Physicians (AAFP) developed recommendations and guidelines for POCUS training and use in 2016.^{5–8} However, several major roadblocks to widespread dissemination of POCUS into clinical care exist including lack of

POCUS-trained faculty to teach a POCUS curriculum,⁹ purchasing and storing equipment, training clinicians to use the technology and interpret images,¹⁰ and understanding how to bill for clinical POCUS use.^{11,12}

There is a dearth of literature on how Family Medicine (FM) departments are faring on their journeys toward POCUS use in clinical care. The primary aim of our study was to evaluate the utilization of POCUS in outpatient clinic care across FM departments nationwide and to identify perceived or realized barriers in integrating POCUS use for ambulatory clinic care.

Methods

The questions were part of a larger omnibus survey of US Department of Family Medicine Chairs (FMCs) conducted by the Council of Academic Family Medicine Educational Research Alliance

This article was externally peer reviewed.
Submitted 20 January 2022; revised 25 March 2022; accepted 6 April 2022.

From Department of Family Medicine, Michigan Medicine (JNC, MO, WF, MP, DMH); Department of Emergency Medicine, Michigan Medicine (RT, NT).

Funding/Support: None.

Conflict of interest: None.

Corresponding author: Juana Nicoll Capizzano, MD, 1801 Briarwood Circle, Ann Arbor, MI 48108 (E-mail: jcapizza@med.umich.edu).

(CERA) between August 6 to August 31, 2021. The methodology has previously been described in detail.¹³ While department chairs may not have boots-on-the-ground knowledge of POCUS, they have a broad knowledge-base of the necessary components to make a POCUS program sustainable. We, therefore, chose to query department chairs in the CERA survey. The project was approved by the American Academy of Family Physicians Institutional Review Board in August 2021.

Survey Questions

Respondents were asked about POCUS use for clinical care within their department, including how many physician faculty were trained, whether they have a residency POCUS curriculum in their department, and whether they bill for POCUS use. In addition, they were asked about perceived barriers and facilitators to the provision of POCUS in ambulatory clinical care as well as the overall perceived importance of POCUS for outpatient patient care. Our survey questions were piloted by FM educators (not part of the target population) and modified according to their suggestions. (Appendix)

Analysis

The prevalence of POCUS use and barriers to incorporating POCUS were assessed through frequencies of survey responses. Characteristics of responding chairs and their departments were tested for association with barriers, perceived importance of POCUS, and current curriculum and billing procedures using χ^2 tests. Training, billing, and purchasing equipment were compared within respondents using the Wilcoxon Signed-Rank test or McNemar test to evaluate whether the 3 barriers differ in their levels of perceived difficulty.

Results

Among the 96 respondents who completed the survey (50% response rate), 81% of FMCs report having at least 1 POCUS trained faculty: 59% of departments reported 2 or more faculty trained in POCUS; 22% of departments had 1 faculty trained in POCUS, and a further 7% of departments were in the process of training at least 1 individual. Only 11% of departments did not have any current faculty in training or trained in POCUS. Perceived

importance was not associated with having higher numbers of trained faculty in this study but 87.5% of chairs felt that POCUS use in ambulatory care was somewhat or very important.

FMCs reported that 32% of departments had a POCUS curriculum, 28% were in the process of creating one, and 15% were considering the possibility of developing a POCUS curriculum. The presence of a POCUS curriculum was highly related to having faculty trained in POCUS ($P < .001$). Moreover, faculty time to receive training was overwhelmingly the largest barrier to increasing numbers of trained POCUS faculty (48%). Another 15% of FMCs cited the lack of funding to pay for training faculty as the most important barrier.

Seven out of 10 chairs described purchasing POCUS equipment as somewhat or very difficult and 73% found establishing billing for POCUS somewhat or very difficult. Only 6% of FMCs report billing for POCUS: 23% report that they are in the process of learning how to bill for POCUS (17% bill for some but not all POCUS use), and 52% of FMCs report not billing for POCUS. The number of faculty trained was significantly associated with billing practice ($P = .004$), and there was a strong relationship between department size and billing, in that departments that bill have more full-time faculty than those who do not ($P = .009$).

Time and/or funding to train faculty was perceived as the most useful facilitator to grow POCUS use in clinical care (30%). Collaboration with existing programs that have established POCUS programs was ranked the most useful facilitator by 21%, followed by funding for POCUS equipment (20%).

Discussion

POCUS is rapidly becoming recognized as 1 of the most effective, cost and time-saving bedside tools of the 21st century.⁶⁻⁸ POCUS has utility for assessing patients, providing real-time diagnostic and monitoring information, and plays a key role in optimizing many procedures with direct visualization.^{3-5,11,14} It is clear from this study that POCUS training across academic FM departments has dramatically expanded over the past 2 years, but significant barriers to clinical implementation continue to exist.

In 2019, a mere 6% of FM programs offered an established POCUS curriculum, according to a CERA survey of residency directors.¹⁵ Our findings highlight that in summer 2021, 32% of US FM departments have an established POCUS curriculum and an additional 28% are in the process of creating one. Of the FMCs surveyed, 81% reported at least 1 POCUS-trained faculty member. Although FMCs cited the lack of faculty time and funding to be the most significant barriers to growing their current clinical POCUS use, we would expect these to become less important over time for several reasons. First, the rapid expansion of POCUS curricula across FM residencies will lead to growing numbers of new graduates entering the FM workforce already competent in POCUS. In addition, with the gaining popularity of handheld ultrasound devices, we anticipate a decline in the costs associated with starting and growing a POCUS program. Hence, tackling the identified barriers in acquiring appropriate POCUS equipment and implementing successful billing practices becomes imperative for FM departments.

Department chairs recognize that billing for POCUS is a particular challenge. Despite 80% of surveyed department chairs reporting at least 1 POCUS trained faculty member, only 6% reported that their department is currently billing for POCUS use in ambulatory clinical care. This is broadly in line with data from a retrospective Medicare claims study which reported 9.2% of primary care physicians billed for POCUS during 2012 to 2017, with approximately half of this by family physicians (4.8%).¹⁶

Most FMCs (73%) reported difficulty with establishing billing for clinical POCUS use. To bill for POCUS, physicians must document a report, as well as capture and store the patient images permanently, and fulfill any other criteria for billing specific radiologic CPT codes.¹² While these are unfamiliar to most family physicians and primary care administrators, they are arguably the key steps currently preventing the expansion of POCUS use into ambulatory clinical care. Significant initial costs for POCUS training, equipment, and secure software packages could be offset if departments can learn to successfully bill for clinical POCUS use. Collaborating with the 6% of departments that have successfully implemented billing for POCUS use in ambulatory care may be 1 avenue that could be explored to address these difficulties.

While the American Academy of Family Physicians has published guidelines for residency POCUS curricula, there are no FM-specific guidelines that define training privileges and billing.¹⁷ There is a pressing need for Family Physician experts in POCUS to convene a working group to clarify credentialing standards as proposed by the Chair of the American Academy of Family Physicians (AAFP) POCUS Members Interest Group.¹² A POCUS working group could also foster ties and encourage collaboration across US FM departments to aid in knowledge sharing for best practices for POCUS use for FM patients. Reviewing best practices from other specialties with established POCUS use (such as Emergency Medicine and Sports Medicine) but with a family medicine lens may offer an avenue to address challenges in training, credentialing and billing

A key limitation of this study is that there is no agreed definition of 'POCUS' so it has been defined very broadly for the purpose of this study. It is possible that department chairs may have been unaware of some specific POCUS use within their departments (eg, gynecological exams).¹² The CERA survey design limited our questionnaire to 10 questions only with no open-ended responses permitted. This prevented deeper interrogation of perceived barriers and prevented examination of the specific types of POCUS being integrated into care and being billed successfully. It may be the case that the FMCs would not have easy access to this information, suggesting a further examination into both.

Although it is evident that POCUS use in FM is more prevalent compared with 5 years ago, there are several factors that serve to hinder the growth of POCUS use. With a lack of time for faculty to receive training cited as the most significant barrier to establishing a POCUS curriculum, FMCs indicated that faculty time and funding to receive training would be the most helpful for them to grow POCUS use in clinical care. Chairs also reported that funding for equipment and collaboration with departments that have established POCUS programs would be useful. Moreover, approximately 70% of our respondents found purchasing equipment and establishing billing to be difficult. We strongly recommend more immediate, purposeful, and intentional collaborations with already existing POCUS programs outside of FM as well as with developed and developing POCUS programs within FM.

Teaching Point of Significant Clinical Relevance

POCUS use in FM is significantly expanding across the US with implications for educational, scholarly, and clinical missions. Academic family physicians trained in POCUS, the rapid development of POCUS curricula in FM departments, and the emerging dissemination of POCUS use into ambulatory clinical care across the United States continues to rise. Successful billing strategies will allow continued POCUS training for faculty. Cross-institutional FM department collaboration and knowledge sharing of best practices in billing, acquiring POCUS equipment, and standardized training offers sustainability of this vital program.

To see this article online, please go to: <http://jabfm.org/content/34/4/809.full>.

References

1. Sekiguchi H. Tools of the trade: point-of-care ultrasonography as a stethoscope. *Semin Respir Crit Care Med* 2016;37:68–87.
2. American Association of Family Physicians. Recommended Curriculum Guidelines for Family Medicine Residents Point of Care Ultrasound. Reprint accessed October 2021. https://www.aafp.org/dam/AAFP/documents/medical_education_residency/program_directors/Reprint290D_POCUS.pdf.
3. Løkkegaard T, Todsén T, Nayahangan LJ, Andersen CA, Jensen MB, Konge L. Point-of-care ultrasound for general practitioners: a systematic needs assessment. *Scand J Prim Health Care* 2020;38:3–11.
4. LoPresti CM, Boyd JS, Schott C, et al. A national needs assessment of point-of-care ultrasound training for hospitalists. *Mayo Clin Proc* 2019;94:1910–2.
5. Weeper M, Hutchins M, Beachy E, McGuire N. Considerations for implementing point-of-care ultrasound in a community-based family medicine residency program. *J Med Educ Curric Dev* 2019; 6:2382120519884329. Published 2019 Nov 1.
6. Smallwood N, Dachsies M. Point-of-care ultrasound (POCUS): unnecessary gadgetry or evidence-based medicine? *Clin Med (Lond)* 2018;18: 219–24.
7. Andersen CA, Holden S, Vela J, Rathleff MS, Jensen MB. Point-of-care ultrasound in general practice: a systematic review. *Ann Fam Med* 2019;17:61–9.
8. Bhagra A, Tierney DM, Sekiguchi H, Soni NJ. Point-of-care ultrasonography for primary care physicians and general internists. *Mayo Clin Proc* 2016;91:1811–27.
9. Barron KR, Wagner MS, Hunt PS, et al. A primary care ultrasound fellowship: training for clinical practice and future educators. *J Ultrasound Med* 2019;38:1061–8.
10. Wong J, Montague S, Wallace P, et al. Barriers to learning and using point-of-care ultrasound: a survey of practicing internists in six North American institutions. *J Ultrasound* 2020;12:19.
11. Wagner M. Considerations when acquiring point-of-care ultrasound (POCUS) equipment: advice for general internists. *SGIM Forum* 2019;42:1–3.
12. Shen-Wagner J. Family medicine billing for point-of-care ultrasound (POCUS). *J Am Board Fam Med* 2021;34:856–8.
13. Seehusen DA, Mainous AG, 3rd, Chessman AW. Creating a centralized infrastructure to facilitate medical education research. *Ann Fam Med* 2018; 16:257–60.
14. Moore CL, Copel JA. Point-of-care ultrasonography. *N Engl J Med* 2011;364:749–57.
15. Hall JWW, Holman H, Barreto TW, et al. Point-of-care ultrasound in family medicine residencies 5-year update: a CERA study. *Fam Med* 2020;52: 505–11.
16. Niblock F, Byun H, Jabbarpour Y. Point-of-care ultrasound use by primary care physicians. *J Am Board Fam Med* 2021;34:859–60.
17. American College of Emergency Physicians. Emergency ultrasound guidelines. *Ann Emerg Med* 2009; 53:550–70.

Appendix

Questions Included in CERA Survey of Department Chairs

Point of Care Ultrasound (POCUS) is broadly defined as any or all clinician-performed, bedside ultrasound examinations.

1. How important do you think POCUS use in ambulatory clinical care is for your department?
 - a. Not important at all
 - b. Not very important
 - c. Somewhat important
 - d. Very important
 2. How many of your faculty are trained to use POCUS? (Faculty are defined as all department MD/DO faculty performing any ambulatory clinical care at any outpatient site staffed by departmental faculty not limited to educational or core sites)
 - a. 0
 - b. 0, but at least one is currently receiving training
 - c. 1
 - d. 2 or more
 3. What is your department's current level of use of POCUS for ambulatory clinical patient care?
 - a. None
 - b. We are considering the possibility of bringing POCUS into our clinical care
 - c. We are in the process of bringing POCUS into clinical care
 - d. We are increasing the use of POCUS in our clinical care
 - e. We currently use POCUS in clinical care
 4. Which of the following best describes your billing for POCUS in ambulatory clinical patient care?
 - a. We do not bill for POCUS
 - b. We are in the process of learning how to bill for clinical POCUS
 - c. We bill for some but not all of POCUS use
 - d. We currently bill for POCUS
 5. Do you currently offer a POCUS curriculum in your family medicine residency?
 - a. No, we do not have a POCUS curriculum
 - b. We are considering the possibility
 - c. We are in the process of creating one
 - d. Yes, we have a POCUS curriculum
- The next few questions attempt to understand the barriers you may face, or have faced, in trying to develop a clinical POCUS program. NOTE: For those of you who do not have any plan to use POCUS in your department or program, please answer the following based on your perception of difficulty.
6. How would you describe the difficulty of training faculty to use POCUS (this includes acquiring, interpreting, and transferring images)?
 - a. Very difficult
 - b. Somewhat difficult
 - c. Not very difficult
 - d. Not difficult at all
 7. What do you think is the *largest barrier*, if any, to obtaining more trained POCUS users?
 - a. Lack of faculty interest
 - b. Lack of time for faculty to receive training
 - c. Lack of funds to pay for training
 - d. Lack of equipment
 - e. Other
 - f. There are no barriers to obtaining more trained POCUS users in our department
 8. How would you describe the difficulty of purchasing POCUS equipment (financially)?
 - a. Very difficult
 - b. Somewhat difficult
 - c. Not very difficult
 - d. Not difficult at all
 9. How would you describe the difficulty of establishing billing for clinical POCUS use?
 - a. Very difficult
 - b. Somewhat difficult
 - c. Not very difficult
 - d. Not difficult at all
 10. Which, if any, would be or has been the *most helpful* for you to grow your POCUS use in clinic care?
 - a. Time/funding to get training
 - b. Funding for equipment
 - c. Help from other departments that use POCUS in clinic care
 - d. Collaboration with existing departments/programs that have established POCUS use
 - e. None of the above