

Emergency medicine point-of-care ultrasonography: a national needs assessment of competencies for general and expert practice

Lisa M. Fischer, MD*; Michael Y. Woo, MD*; A. Curtis Lee, PhD*; Ray Wiss, MD[†]; Steve Socransky, MD[†]; Jason R. Frank, MD, MA*

ABSTRACT

Introduction: Emergency medicine point-of-care ultrasonography (EM-PoCUS) is a core competency for residents in the Royal College of Physicians and Surgeons of Canada and College of Family Physicians of Canada emergency medicine (EM) training programs. Although EM-PoCUS fellowships are currently offered in Canada, there is little consensus regarding what training should be included in a Canadian EM-PoCUS fellowship curriculum or how this contrasts with the training received in an EM residency.

Objectives: To conduct a systematic needs assessment of major stakeholders to define the essential elements necessary for a Canadian EM-PoCUS fellowship training curriculum.

Methods: We carried out a national survey of experts in EM-PoCUS, EM residency program directors, and EM residents. Respondents were asked to identify competencies deemed either nonessential to EM practice, essential for general EM practice, essential for advanced EM practice, or essential for EM-PoCUS fellowship trained ("expert") practice.

Results: The response rate was 81% (351 of 435). PoCUS was deemed essential to general EM practice for basic cardiac, aortic, trauma, and procedural imaging. PoCUS was deemed essential to advanced EM practice in undifferentiated symptomatology, advanced chest pathologies, and advanced procedural applications. Expert-level PoCUS competencies were identified for administrative, pediatric, and advanced gynecologic applications. Eighty-seven percent of respondents indicated that there was a need for EM-PoCUS fellowships, with an ideal length of 6 months.

Conclusion: This is the first needs assessment of major stakeholders in Canada to identify competencies for expert training in EM-PoCUS. The competencies should form the basis for EM-PoCUS fellowship programs in Canada.

RÉSUMÉ

Introduction: L'échographie pratiquée au point de service en médecine d'urgence (EPS-MU) est une compétence de base

pour les résidents inscrits aux programmes de formation en médecine d'urgence (MU) du Collège royal des médecins et chirurgiens du Canada et du Collège des médecins de famille du Canada. Bien que des bourses de recherche soient offertes en EPS-MU au Canada, il existe un faible consensus quant à la formation à inclure dans un programme d'études postdoctorales en la matière ou quant à la différence de contenu entre cette dernière formation et celle donnée dans les programmes de résidence en MU.

Objectif: L'étude visait à procéder à une évaluation méthodique des besoins des principaux intervenants afin de définir les éléments essentiels d'un programme canadien de formation postdoctorale en EPS-MU.

Méthode: Une enquête nationale a été menée parmi les spécialistes en EPS-MU, les directeurs de programme de résidence en MU et les résidents en MU. Les répondants devaient indiquer les compétences jugées non essentielles en MU, essentielles en MU générale, essentielles en MU avancée et essentielles en EPS-MU (degré d'«expert»).

Résultats: Le taux de réponse a atteint 81% (351 répondants sur 435). L'EPS a été jugée essentielle en MU générale dans les cas d'imagerie de base pour des troubles cardiaques, des lésions de l'aorte, des traumatismes et des interventions; l'EPS a été jugée essentielle en MU avancée dans les cas de symptômes indifférenciés, d'affections thoraciques rendues à un stade avancé ainsi que dans des applications interventionnelles avancées. Les compétences spécialisées en EPS ont été réservées à des fins administratives et à des applications pédiatriques et gynécologiques avancées. Enfin, 87% des répondants ont indiqué qu'il y avait des besoins en matière de formation postdoctorale en EPS-MU, d'une durée idéale de 6 mois.

Conclusions: Il s'agit là de la première évaluation des besoins des principaux intervenants au Canada visant à cerner les compétences à acquérir dans la formation spécialisée en EPS-MU. Ces compétences devraient former les assises des programmes d'études postdoctorales en EPS-MU, au Canada.

From the *Department of Emergency Medicine, University of Ottawa, Ottawa, ON, and the †Department of Emergency Medicine, Health Sciences North, Northern Ontario School of Medicine, Sudbury, ON.

Correspondence to: Dr. Lisa M. Fischer, 1053 Carling Avenue, Room EM-206, Box 227, Ottawa, ON K1Y 4E9; lisadfischer@gmail.com.

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Emergency medicine point-of-care ultrasonography (EM-PoCUS) is a safe and proven diagnostic imaging modality whose worldwide use has grown tremendously since being introduced in the early 1980s.¹⁻³ A generally accepted definition of PoCUS is “ultrasonography brought to the patient and performed by the provider in real time.”² Many studies have validated the usefulness of clinical, targeted ultrasound assessment performed by emergency physicians. The benefits of PoCUS include decreased time to diagnosis,⁴ decreased emergency department length of stay,⁵ improved success rates of invasive procedures,⁶ decreased complication rates of various procedures,⁷ and improved health care resource use.⁸⁻¹¹

In Canada, there are currently two training pathways for certification in EM: 1) a 5-year EM residency through the Royal College of Physicians and Surgeons of Canada (RCPSC), leading to a specialist (FRCPC) designation, and 2) a 1-year program through the College of Family Physicians of Canada (CFPC) undertaken after an initial 2-year training and certification in family medicine. PoCUS became a core competency standard for residents of the RCPSC and CFPC EM residency programs in 2008 and 2010, respectively.^{12,13} The current recommendations are that all residents be taught how to perform PoCUS; for a list of elements, see Table 1. The Canadian Association of Emergency Physicians (CAEP),³ the Canadian Emergency Ultrasound Society (CEUS),¹⁴ the American College of Emergency Physicians (ACEP),¹ and the Society for Academic Emergency Medicine (SAEM)¹⁵ have all published policy statements on the use of PoCUS.

Table 1. Current emergency medicine residency PoCUS requirements

Royal College of Physicians and Surgeons of Canada (2011)
Focused abdominal sonography for trauma (FAST)
Cardiac scans
Aortic scans
Pelvic scans to rule out ectopic pregnancy
Family medicine–emergency medicine residency programs (2010)
Facilitation of vascular access
Presence of intraperitoneal free fluid
Measurement of abdominal aorta diameter
Presence of pericardial fluid
Presence of cardiac motion
Confirmation of intrauterine gestation

PoCUS = point-of-care ultrasonography.

At the time this study was commenced (2010), there were two nationally advertised PoCUS fellowships (expert training programs) offered in Canada, one at the University of Ottawa and the other at Northern Ontario School of Medicine (NOMS) in Sudbury, and approximately 80 PoCUS fellowships offered in the United States.¹⁶ To our knowledge, other than an ACEP policy statement on PoCUS fellowship guidelines developed from expert consultation,¹ little consensus, research, or stakeholder consultation exists regarding what training should be included in an EM-PoCUS fellowship curriculum.¹⁷ Recent studies have found that tremendous variability exists in current EM-PoCUS curricula, both in the United States and Canada,¹⁸⁻²⁰ suggesting that guidelines are needed to ensure high-quality PoCUS training in EM residency programs.²¹ Increased PoCUS research and the establishment of high-quality PoCUS fellowships would support further advancement of the field and greater acceptance of PoCUS as a core competency for all emergency physicians and increase PoCUS use in academic, community, and international EM settings.²²⁻²⁴

The primary purpose of this study was to conduct a national systematic needs assessment to define the essential competencies for a Canadian EM-PoCUS fellowship training curriculum. Secondly, we sought to determine which EM-PoCUS competencies were considered essential for general and advanced EM practice. Medical education needs assessments typically involve the identification of discrepancies between the current and a desired state of competence in a domain.^{25,26} Observed needs are those defined by individuals with special expertise in a field and can identify gaps when they assess others. Perceived needs typically relate to learners’ perception of what they would like to learn to achieve greater competence in a domain. In this study, we sought to define both observed and perceived needs as identified by experts in EM-PoCUS, educational leaders, and EM trainees.

MATERIALS AND METHODS

Study design and population

This was a national bilingual (English/French) survey of three populations: 1) emergency physician experts in the field of PoCUS, 2) EM program directors (PDs), and 3) EM residents. The experts were identified from the CAEP and the CEUS databases, and all were instructors in one or more of the following national

courses: Emergency Department Echo (EDE), Emergency Department Targeted Ultrasound (EDTU), and Focused Emergency Department Sonography (FEDS). At the time of the study, there were 13 RCPSC and 17 CFPC EM programs in Canada.²⁷ All PDs and all 429 residents in these 30 training programs were eligible to participate. Pediatric EM specialists or trainees were not included. The study received approval from the Ottawa Hospital Research Ethics Board.

Survey content and administration

The survey instrument was developed in consultation with content experts. Items were derived from existing literature, existing training programs, and expert opinion. The survey was pilot tested with a group of four emergency physicians and four EM residents prior to distribution. The final survey consisted of three sections: demographics, competencies, and a needs assessment. Eighty-three competencies were assessed.

The study involved the simultaneous administration of two questionnaires. The first was a Web-based survey (using the commercially available online software *Survey Console*) of experts in EM-PoCUS and RCPSC and CFPC EM residency PDs. Distribution was carried out using a modified Dillman technique.^{28,29} After an email notification, which included a consent form, participants were sent a link to the survey (Appendix, online version only). Subsequent reminder notices were sent 2 weeks apart, for a total of three contacts. To encourage participation, a random draw for a gift card was offered. The second survey was a paper-based survey of all RCPSC and CFPC EM residents in Canada. Chief residents at each program were sent the surveys and asked to distribute them to all residents present at an academic session of their choosing. The chief resident noted the total number of surveys distributed and returned the completed surveys to the principal investigator. To encourage participation, chief residents were entered into a random draw for a gift card. Medical students and residents not enrolled in an EM residency program were excluded. The survey was conducted from November 2010 to February 2011, and participation was voluntary.

Data analysis

Respondents were asked to categorize each competency into one of the following groups: “not essential to EM practice,” “essential for general EM practice,” “essential

for advanced EM practice,” or “essential for fellowship-trained EM practice.” A single data abstractor entered the results into an electronic database using Microsoft *Excel*. Responses were kept anonymous, and all data were reported in aggregate. Gap scores and descriptive statistics were reported. A significant gap score was defined a priori as a difference among populations of responders of greater than 20%. If greater than 20% of participants identified a competency as being nonessential, it was classified as such. If greater than 70% of participants identified a competency as being essential for general, advanced, or fellowship-trained practice, it was classified as such. Responses from the three different groups were weighted prior to categorization. The experts’ responses were weighted 50% of the final result, and the PDs and residents were weighted at 25% each.

RESULTS

A total of 351 of 435 surveys were completed, for an overall response rate of 80.6%. Response rates for experts, PDs, and residents were 86.4% (152 of 194), 53.5% (15 of 28), and 78.4% (184 of 213), respectively. The median age in years for experts, PDs, and residents was 42.0, 46.0, and 30.6, respectively; 36.7% (129 of 435) of participants were female, and 8.9% (52 of 435) responded in French.

Demographic information for the study population is provided in Table 2. The average number of years in practice for the experts and PDs was 12 years. The vast majority (88.7 %) of the experts and all of the PDs reported working primarily in an urban or inner-city EM setting, and 66% of experts worked with a mixed adult and pediatric population, compared to 66% of PDs who worked primarily with adults. Seventy-two percent of the residents were enrolled in the RCPSC EM program and 42% were postgraduate year (PGY)-3.

Figure 1 outlines the geographic distribution of participants; 62.1% were from Ontario or Quebec. Figure 2 outlines the level of PoCUS training. Almost 75% of the experts had advanced PoCUS training, whereas 70% of the program directors were credentialed in PoCUS. Eighteen percent of residents reported having no training in PoCUS, whereas 30% were credentialed.

Table 3 provides participants’ categorization of the surveyed competencies. Sixteen competencies (19.3%) had significant gap scores, all of which arose from PDs

Table 2. Demographic information of participants

	Experts	Program directors	Residents
Surveys distributed, <i>n</i>	194	28	213
Responses received, <i>n</i> (%)	152 (78.4)	15 (53.5)	184 (86.4)
Age in years, median (range)	42.0 (29–69)	46.0 (39–59)	30.6 (25–52)
Female, <i>n</i> (%)	38 (25)	2 (13)	89 (43.6)
Year of residency, <i>n</i> (%)	N/A	N/A	
PGY-1			41 (20)
PGY-2			39 (19)
PGY-3			87 (42.4)
PGY-4			21 (19.2)
PGY-5			14 (6.8)
Program of enrolment, <i>n</i> (%)	N/A	N/A	
CCFP EM			56 (27.9)
RCPSC EM			145 (72.1)
Language of instruction in French, <i>n</i> (%)	39 (25.6)	1 (6.6)	12 (5.9)
Medical training/certification, <i>n</i> (%)			N/A
Resident	4 (2.6)	0	
CCFP(EM)	88 (57.1)	7 (70)	
CCFP (not EM)	26 (16.8)	1 (6.6)	
FRCP(EM)	25 (16.2)	9 (60)	
Other	11 (7.1)	1 (6.6)	
Years in practice, median (range)	12 (2–45)	12 (4–22)	N/A
Location of EM practice, <i>n</i> (%)			N/A
Inner city	61 (40.1)	6 (40)	
Urban/suburban	74 (48.6)	9 (60)	
Small town	10 (6.6)	0	
Other	7 (4.6)	0	
Type of EM practice, <i>n</i> (%)		N/A	
Medium volume	1 (0.6)		
High volume	19 (12.5)		
Teaching hospital	43 (28.2)		
Other	89 (58.6)		
Patient population seen, <i>n</i> (%)		N/A	
Adults	51 (33.5)		
Adults and pediatrics	101 (66.5)		

EM = emergency medicine.; N/A = not applicable; PGY = postgraduate year.

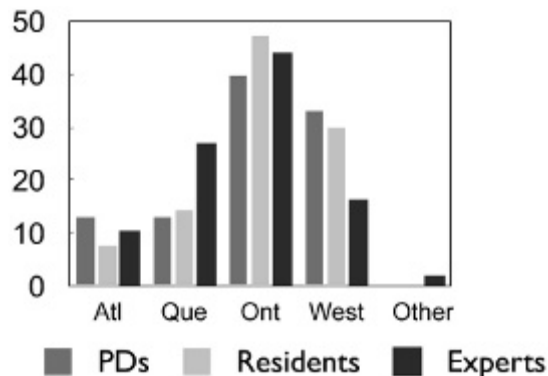


Figure 1. Geographic distribution of respondents (%).

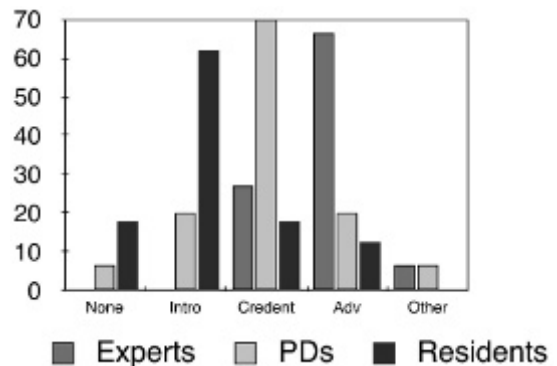


Figure 2. Level of training with PoCUS (%).

Table 3. Categorization of competencies by participants

	Core EM PoCUS (general EM practice)	Advanced EM PoCUS (special interest)	Expert EM PoCUS (fellowship trained)	Not essential for EM PoCUS at this time
Clinical scenarios	Trauma (FAST) Cardiac arrest	Undifferentiated shock* Undifferentiated shortness of breath* Undifferentiated abdominal pain*	Undifferentiated chest pain	
Ultrasound physics	Understanding differences in transducers Understanding image artifacts Basic knobology	Understanding of relationship between frequency, penetration, and resolution* Use of M-mode ultrasonography*	Use of Doppler ultrasonography*	
Diagnostic testing	Pericardial effusion Confirmation of cardiac standstill Abdominal aortic aneurysm (AAA) First-trimester intrauterine pregnancy using transabdominal view	Assessment of global cardiac activity* Assessment of inferior vena cava for volume status* Pneumothorax* Pleural effusion Fetal heart rate First-trimester intrauterine pregnancy using transvaginal view Cutaneous abscess	Cardiac wall motion abnormalities Pulmonary edema Upper extremity DVT Lower extremity DVT Acute arterial occlusion Ovarian torsion Testicular torsion Cholecystitis Choledocholithiasis Peritonsillar abscess* Achilles tendon tears Retinal detachment	PID Ovarian cyst Tubo-ovarian abscess Epididymitis-orchitis Hydrocele Testicular mass Appendicitis Diverticulitis Bowel obstruction Pancreatitis Intussuception* Hypertrophic pyloric stenosis* Abdominal/inguinal hernias Rotator cuff tears Extremity fractures Optic nerve sheath diameter for intracranial pressure Posterior vitreous detachment Retrolbulbar hematoma
Procedures	Central line placement	Foreign body localization in soft tissues Peripheral line placement* Arterial line placement* Thoracentesis Paracentesis Pericardiocentesis Arthrocentesis* Abscess drainage* Lumbar puncture Foreign body removal	Regional anesthesia	Foreign body localization in eye Confirm ETT placement Confirm pacemaker placement Hematoma block

Table 3. Continued

	Core EM PoCUS (general EM practice)	Advanced EM PoCUS (special interest)	Expert EM PoCUS (fellowship trained)	Not essential for EM PoCUS at this time
Administration	–	Administrative Directly observe learners scanning	Administrative Teach ultrasonography courses Publish original research Supervise research projects Provide physician credentialing Manage a quality assurance program Equipment purchasing Equipment maintenance Manage image archiving Curriculum development Involvement with national organizations Develop and maintain an ultrasonography fellowship Understand billing for ultrasonography	

DVT = deep vein thrombosis; EM = emergency medicine; ETT = endotracheal tube; FAST = focused abdominal sonography for trauma; PID = pelvic inflammatory disease; PoCUS = point-of-care ultrasonography.
*Competencies with gap score > 20%.

identifying a competency as being less essential than residents and/or experts.

Table 4 provides the results from the needs assessment for EM-PoCUS fellowship training. Eighty-seven percent of respondents felt that there was a need for EM-PoCUS fellowship, and 56% of respondents indicated that 6 months was the ideal length for such a fellowship. The responses of all groups indicated a perceived need for PoCUS fellows across all practice settings. There was significant variation in the number of fellowship training slots deemed to be required nationally.

A sensitivity analysis, in which the results were analyzed giving equal consideration to each of the three groups of responders rather than the predefined weighting for the expert group, found only minor differences in what was considered to be a nonessential competency and essential to fellowship training.

DISCUSSION

This is the first national needs assessment of major EM stakeholders to ascertain the competencies deemed necessary for a Canadian expert EM-PoCUS training curriculum. Eighty-seven percent of participants indicated that a need exists for EM-PoCUS fellowship training, and there was a general sense that PoCUS

fellowship-trained emergency physicians are required to work in a variety of practice settings. Fellowship training was felt to require achievement of specific competencies beyond those of advanced or independent practitioners. Competencies identified as unique for EM-PoCUS fellowship primarily involved administrative and academic responsibilities, including machine purchasing and maintenance, organization and management of a quality assurance program, training and education, research, and advocacy.

With the number of EM-PoCUS fellowship programs offered in Canada increasing, a systematic and organized approach to obtaining expertise could be developed based on competencies we identified. It is expected that many EM residents will undertake not only general PoCUS training but also advanced training during their residency. Fellowship training including clinical applications, academic expertise, and administrative roles would require between 6 and 12 months of time depending on the objectives of the program. The option for RCPSC EM residents to commence advanced training in an area of focus within EM during their PGY-4 year provides them with a unique opportunity to gain this experience. Fellowship training should also be available for practicing emergency physicians.

The items categorized by stakeholders as nonessential for EM practice may reflect the lack of evidence,

Table 4. Needs assessment for EM-PoCUS fellowship

	Experts	Program directors	Residents
Indicated a need exists for an EM-PoCUS fellowship, <i>n</i> (%)	120 (78.9)	12 (80)	172 (85.6)
Indicated they would have done an EM-PoCUS fellowship if it had been available, <i>n</i> (%)	83 (69.1)	4 (26.6)	79 (41.1)
Ideal length of fellowship, <i>n</i> (%)			
3 mo	27 (22.5)	1 (8.3)	51 (25.8)
6 mo	65 (54.2)	8 (66.6)	91 (46)
12 mo	27 (22.5)	3 (25)	54 (27.3)
18 mo	1 (0.8)	0	1 (0.5)
24 mo	0	0	1 (0.5)
Number of fellows who should be trained in Canada annually, <i>n</i> (%)			
0–3	5 (4.2)	1 (8.3)	22 (11.2)
4–6	37 (30.8)	4 (33.3)	48 (24.4)
7–9	18 (15)	2 (16.6)	42 (21.3)
10–13	20 (16.6)	3 (25)	36 (18.3)
>13	40 (33.3)	2 (16.6)	49 (24.9)
Location of need for EM-PoCUS fellows			
Rural	62 (15.3)	6 (15.8)	91 (15.4)
Community	81 (20)	7 (18.4)	120 (21.0)
Urban	94 (23.2)	10 (26.3)	126 (22)
Academic	104 (25.7)	11 (28.9)	151 (26.4)
Internationally	64 (15.8)	4 (10.5)	84 (14.7)

EM-PoCUS = emergency medicine point-of-care ultrasonography.

lack of urgency of the indication, or availability of alternatives to PoCUS. The use of EM-PoCUS for extremity fractures was identified as nonessential to EM practice, although some have deemed it essential for those practicing in remote environments without easy access to x-ray equipment.^{22,36} This discrepancy likely reflects the fact that most of our participants work in urban/suburban environments.

Many pediatric PoCUS competencies were categorized as nonessential. This likely reflects the limited evidence for emergency physicians using PoCUS in children and the nascent status of PoCUS training in pediatric EM fellowships.^{30–32} As we did not ask the resident group which population of EM patients they see most commonly, it is possible that those caring for pediatric patients were underrepresented. The lack of endorsement for pediatric competencies may also have arisen from our omission of pediatric EM specialists and fellows in the study population. It is conceivable that as PoCUS evolves and training becomes more accessible, some of the pediatric indications (such as hypertrophic pyloric stenosis or intussusception) may become more applicable to general or advanced EM practice. The same is potentially true for pediatric procedural competencies (such as paracentesis, peripheral line placement, abscess drainage, and foreign body removal).^{33–37}

The EM-PoCUS competencies currently endorsed by the RCPSC and CFPC were deemed by the participants to be essential to general EM practice. This is likely a result of the national courses offered in Canada and PoCUS training EM residents receive in Canada. This training differs from that in the United States, where guidelines include renal and gallbladder ultrasonography as part of the primary/basic indications for EM-PoCUS.¹

The category of advanced EM-PoCUS practice contained the greatest number of competencies with discrepancies. All 16 of 83 competencies with significant gap scores arose from PDs identifying a competency as being less essential compared to residents and/or experts. This may be because PDs typically have a broader view on various fellowship needs and may be reluctant to add additional required content into an already crowded training period. In addition, it is noteworthy that 30% of PDs were not credentialed in EM-PoCUS, a situation potentially arising from, or leading to, a negative perception of EM-PoCUS.

Some competencies were categorized in a manner conflicting with the current EM literature. For example, recent research has found that EM-PoCUS is superior to x-ray for the diagnosis of pneumothorax

and pleural effusions,^{38–40} yet this competency was categorized as being essential for advanced practitioners only. Similarly, the assessment of lower extremity deep vein thrombosis with PoCUS was categorized as being essential to fellowship-trained practitioners only; however, recent publications have shown this to be a quick, reliable, time- and cost-effective technique that can be easily performed by general emergency physicians.^{41,42}

LIMITATIONS

Our study has limitations and potential biases common to survey methodology. Although the survey instrument was pilot tested in an effort to eliminate ambiguous, confusing, or prejudicial items, response bias may have influenced our findings. It is possible, for example, that participants looked more favourably on PoCUS because 43% of them were experts in the field. Since many experts also derive income from teaching EM-PoCUS courses, and in some Canadian provinces, emergency physicians can bill for PoCUS, it is possible that one or both of these factors influenced the competencies that were endorsed. We were unable to determine whether differences existed between responders who were RCPSC EM trained compared to CFPC EM trained. Similarly, we were unable to determine whether differences existed between responders based on their level of training in residency, and it is possible that more senior residents view the role of PoCUS differently from their junior counterparts.

Our findings represent one point in time. Curricula evolve, and advances in clinical practice, education, and training, and research in EM-PoCUS will undoubtedly result in changes in competencies and expectations in this dynamic area of EM. It appears that PoCUS will continue to grow and be applied to an increasingly broad spectrum of clinical encounters in EM. Future challenges include maintaining high standards of training among practitioners and training expert leaders in this field. Competencies for different levels of practitioners need to be elucidated and applied nationally, and our hope is that the results of this study will help inform these important decisions.

CONCLUSION

This is the first needs assessment of major stakeholders in Canada to identify competencies for expert training

in EM PoCUS. The competencies should form the basis for EM-PoCUS fellowship programs in Canada.

Competing interests: The research reported in this publication received financial support from the Department of Emergency Medicine, University of Ottawa. Dr. Michael Woo receives a salary as fellowship director from the Department of Emergency Medicine and has received speaking fees as an EDE2 and CAEP EDTU instructor. Dr. Ray Wiss receives a salary as fellowship program co-director from the Department of Emergency Medicine, NOSM, and receives a salary as the director of the EDE course. Dr. Steve Socransky receives a salary as fellowship program co-director from the Department of Emergency Medicine, NOSM, and has received speaking fees as the director of the EDE2 course.

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APPENDIX: RESIDENT SURVEY

Designing an Emergency Medicine Ultrasonography Fellowship in Canada: National Survey of Stakeholders

Thank you in advance for completing this survey. For each survey we receive from your residency program, a ballot will be entered in a draw for \$500 to be used towards a resident social event.

Completing all three sections should take approximately 15 minutes. You will notice a table of various competencies we are interested in assessing. Please do complete to the end. Responses will be anonymously collected.

A: DEMOGRAPHICS

1. What is your gender? Please circle.

M
F

2. What year were you born? _____
3. What year of residency are you currently completing? Please circle.

Medical student
PGY-1
PGY-2
PGY-3
PGY-4
PGY-5

4. Which residency program are you registered in?

5. What university are you completing your residency at? _____
6. Which of the following reflects your level of training with EMUS? Please circle.

no formal training
introductory training
credentialed
advanced training
other (please list): _____

B: NEEDS ASSESSMENT

1. Is there a need for an EMUS fellowship in Canada? Please circle.

Y
N

2. Would you have done an EMUS fellowship had it been widely available? Please circle.

Y
N

3. What is the ideal length for an EMUS fellowship?

3 months
6 months
12 months
18 months
24 months

4. How many EMUS fellows should be trained per year in Canada?

0-3
4-6
7-9
10-13
greater than 13

5. Where is there a need for EMUS fellowship graduates? You may select more than one answer:

rural hospitals
community hospitals
urban centres
academic centres
internationally

C: COMPETENCIES

Please select the lowest level of EMUS training required for each competency.

Ex:

COMPETENCY	NOT ESSENTIAL TO ANY EM PRACTICE	ESSENTIAL TO GENERAL EM PRACTICE	ESSENTIAL TO ADVANCED EMUS TRAINING	ESSENTIAL TO EMUS FELLOWSHIP TRAINED
Trauma		x		

COMPETENCY	NOT ESSENTIAL TO ANY EM PRACTICE	ESSENTIAL TO GENERAL EM PRACTICE	ESSENTIAL TO ADVANCED EMUS TRAINING	ESSENTIAL TO EMUS FELLOWSHIP TRAINED
CLINICAL SCENARIOS				
Trauma				
Cardiac arrest				
Undifferentiated shock				
Undifferentiated shortness of breath				
Undifferentiated chest pain				
Undifferentiated abdominal pain				
PHYSICS				
Understanding of relationship between frequency, penetration and resolution				
Understanding differences in transducers				
Use of M-Mode				
Use of Doppler				
Understanding image artefacts				
Basic knobology				
CARDIAC US				
Pericardial effusion				
Confirmation of asystole				
Assessment of global cardiac activity				
Assessment of inferior vena cava for volume status				

	NOT ESSENTIAL TO ANY EM PRACTICE	ESSENTIAL TO GENERAL EM PRACTICE	ESSENTIAL TO ADVANCED EMUS TRAINING	ESSENTIAL TO EMUS FELLOWSHIP TRAINED
Assessment of wall motion abnormalities				
CHEST US				
Pneumothorax				
Pulmonary edema				
Pleural effusion				
VASCULAR US				
Abdominal aortic aneurysm (AAA)				
Upper extremity DVT				
Lower extremity DVT				
Acute arterial occlusion				
OBS-GYN US				
1 st trimester intrauterine pregnancy using <u>transabdominal</u> view				
1 st trimester intrauterine pregnancy using <u>transvaginal</u> view				
Ovarian torsion				
Ovarian cyst				
Tubo-ovarian abscess				
Assessment of fetal heart rate using M-Mode				
Assessment of pelvic inflammatory disorder				
TESTICULAR US				
Testicular torsion				
Epididymitis- orchitis				
Hydrocoele				
Testicular trauma				
testicular mass				
ABDOMINAL US				
Cholecystitis				
Choledocholithiasis				

	NOT ESSENTIAL TO ANY EM PRACTICE	ESSENTIAL TO GENERAL EM PRACTICE	ESSENTIAL TO ADVANCED EMUS TRAINING	ESSENTIAL TO EMUS FELLOWSHIP TRAINED
Appendicitis				
Diverticulitis				
Bowel obstruction				
Pancreatitis				
Intussuception				
Hypertrophic pyloric stenosis				
Abdominal/inguinal hernias				
SOFT TISSUE US				
Cutaneous abscess				
Peritonsillar abscess				
Foreign body localization in soft tissues				
MSK US				
Achilles tendon tears				
Rotator cuff tears				
Extremity fractures				
Joint effusions				
OCULAR US				
Optic nerve sheath diameter for intracranial pressure				
Retinal detachment				
Posterior vitreous detachment				
Foreign body localization in eye				
Retrobulbar hematoma				
PROCEDURAL US Using US for....				
Central line placement				
Peripheral line placement				
Arterial line placement				
Thoracentesis				
Paracentesis				

	NOT ESSENTIAL TO ANY EM PRACTICE	ESSENTIAL TO GENERAL EM PRACTICE	ESSENTIAL TO ADVANCED EMUS TRAINING	ESSENTIAL TO EMUS FELLOWSHIP TRAINED
Pericardiocentesis				
Arthrocentesis				
Abscess drainage				
Lumbar puncture				
Confirm ETT placement				
Confirm pacemaker placement				
Regional anesthesia				
Hematoma blocks				
Foreign body removal				
TEACHING				
Directly observe learners scanning				
Teach ultrasound courses				
RESEARCH				
Publish original research				
Supervise research projects				
ADMINISTRATIVE				
Provide physician credentialing				
Organize and manage a quality assurance program				
Equipment purchasing				
Equipment maintenance				
Manage image archiving				
Curriculum development				
Involvement with national organizations that promote ultrasound				
Develop and maintain an US fellowship				
Understand billing for ultrasound				

A: DEMOGRAPHICS

1. What is your gender? Please circle.

M
F

2. What year were you born? _____

3. Which of the following describes your highest level of medical training? Circle all that apply:

Resident
Physician CCFP-EM
Physician CCFP (not-EM)
Physician (FRCP-EM), Other: _____

4. When did you graduate from residency? _____

5. What province do you practice in? _____

6. Which of the locations describes where you primarily practice emergency medicine? SELECT ONE:

inner city
urban/suburban
small town
rural
remote
other: _____

7. Which of the following best describes your primarily EM practice? SELECT ONE

low volume community ED
medium volume community ED
high volume community ED
teaching hospital ED
pediatric hospital ED
other: _____

8. Which of the following groups do you primarily see in your EM practice? SELECT ONE

adults
pediatrics
both adults and pediatrics

9. Which of the following reflects your level of training with EMUS? Please circle.

no formal training
introductory training
credentialed
advanced training
other (please list): _____