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Original Article

Musculoskeletal Point-of-Care Ultrasonography Training Among Canadian Postgraduate Rheumatology Programs

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Abstract

Objective: This study aimed to assess the current state of musculoskeletal point-of-care ultrasonography training among the rheumatology postgraduate programs in Canada and explored the interest in developing a national curriculum.

Method: A Canadian survey was developed by academic rheumatologists including point-of-care ultrasonography experts and point-of-care ultrasonography non-users. Across Canada, all 15 adult and 3 pediatric rheumatology English and French postgraduate programs were surveyed via Survey Monkey with a standardized questionnaire.

Results: The completed response rates were 27% (24/89) for postgraduate year-4 and -5 rheumatology trainees and 61% (11/18) for program directors. Forty-two percent (10/24) of trainees had access to formal point-of-care ultrasonography training, and 67% (16/24) had some form of informal non-structured exposure. Of all respondents, 87.5% (21/24) trainees and 82% (9/11) program directors agreed or strongly agreed that point-of-care ultrasonography is an important clinical tool in rheumatology. Eighty-nine percent (8/9) of program directors felt that point-of-care ultrasonography should be a formal part of rheumatology training.

Conclusion: This national survey demonstrates that while musculoskeletal point-of-care ultrasonography is considered an important component of clinical practice, significant training barriers exist. The majority of both trainees and program directors felt that point-of-care ultrasonography should be a formal part of training and would be interested in a national standardized point-of-care ultrasonography curriculum in Canada.

Keywords: Rheumatology, ultrasound, curriculum, medical education

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Introduction

Point-of care-ultrasonography (POCUS) has been increasingly utilized in many different settings with clinically important procedural, screening, and diagnostic applications[1]. The ability to differentiate between subtle changes that are not detectable by traditional physical exam maneuvers, as well as to incorporate practice-changing results from POCUS in a real-time manner, has dramatically changed the management of patients across different subspecialties. Other attractive features of POCUS include the flexibility and convenience of its use in clinics or bedside, lack of radiation, and minimal expense[1,2].

Within rheumatology, multiple studies have demonstrated the advantages of musculoskeletal (MSK) ultrasound (US), namely the benefits of immediately diagnosing, monitoring, and treating rheumatic diseases,[3,4] which include more accurate diagnoses of small effusions and synovial proliferation and the assessment of early osteoarthritis changes and crystal deposition.[5] Musculoskeletal US use is widespread in Europe as European rheumatology training programs have integrated MSK US training into their curriculum[6-8]; for example, it is used by 80% of German rheumatologists[9] and 93% of British rheumatologists.[10] Many international societies have developed POCUS-specific courses and guidelines, including the European League for Arthritis and Rheumatism (EULAR) and the Pan-American League of Associations for Rheumatology (PANLAR).[11,12] Despite these international recommendations and the clear benefits of POCUS in advancing the clinical practice of rheumatology, the uptake by North American Rheumatologists has been limited and incorporating this imaging modality into Canadian rheumatology clinical practice and training programs has been a gradual process. As evidenced by a 2011 Canadian study that surveyed rheumatologists across Canada, the strong interest in incorporating POCUS into clinical practice was counterbalanced by limited clinical time, high training requirements, and equipment costs.[13]

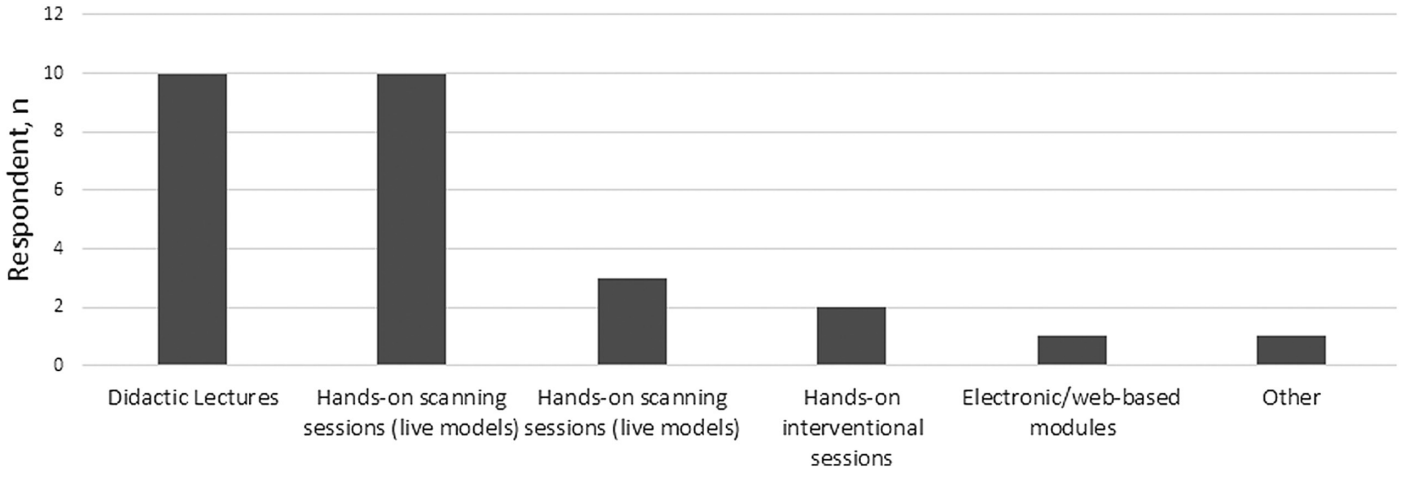

Figure 1. Teaching methods utilized.

Given that postgraduate training has been highlighted as a major barrier to implementation, it deserves further inquiry. While there are multiple studies assessing the implementation of various MSK US programs, none have evaluated the barriers to implementation. This study aimed to assess the current state of MSK POCUS training among the rheumatology postgraduate programs in Canada and explored the interest in developing a national curriculum. Since most rheumatologists do the majority of their training during these formative years, this specific time was targeted. Topics covered included current perceptions regarding POCUS for clinical practice (perspectives on its clinical utility and practical implementation into future practice) and identifying potential enablers or barriers in POCUS training and in implementing a national POCUS curriculum.

Methods

A Canadian survey was developed by academic rheumatologists including POCUS experts and POCUS non-users. The survey questions considered the use of MSK US in clinical practice, current formal and in-formal training opportunities, barriers to teaching, and the desire for a national MSK US curriculum. Questions were identical for program directors (PD) and trainees, except for demographics.

Across Canada, all 15 adult and 3 Pediatric Rheumatology English and French postgraduate programs (both trainees and PD) were surveyed via Survey Monkey with a standardized questionnaire including a section for comments. As this is a rapidly changing field with multiple programs across Canada, including new PD and new hires, a follow-up standardized phone interview survey was completed with the PD to outline the most up-to-date information regarding the MSK US programs across Canada's rheumatology programs. Approval from the Ottawa Health Science Network Research Ethics Board was obtained, and informed consent was obtained from the patients.

Main Points

- There is a lack of formal musculoskeletal ultrasound training at the postgraduate level in Canada.
- The identified primary barriers to ultrasonography teaching are the lack of a standard curriculum, time, and interest and limited access to ultrasonography machines.
- According to this survey, the majority of trainees and program directors consider that point-of-care ultrasonography training should be an official part of rheumatology education and would welcome a nationally standardized curriculum.

Results

For the online survey, completed in March 2017, response rates were 27% (24/89) for postgraduate year (PGY)-4 and -5 rheumatology trainees and 61% (11/18) for PD, where 4 and 3 respondents were from Francophone programs in each respective category, respectively.

Forty-two percent (10/24) of trainees had access to formal POCUS training, and 67% (16/24) had some form of informal non-structured exposure. The teaching methods currently available included didactic lectures and hands-on scanning sessions with live models, as well as other modalities including cadaveric scanning, hands-on interventional sessions in clinic, as well as electronic/web-based modules (Figure 1). Sixty-eight percent (16/24) of the trainees had access to a POCUS machine for use in a clinical setting; however, this access was usually limited to one clinic room in a restricted number of ambulatory clinics (not always available at all training sites), with reduced exposure within community rotations. Identified barriers included the lack of a standard curriculum, as well as limited time, interest, expertise, POCUS equipment, local POCUS champions, and ability to practice and expenses associated with external courses (Figure 2).

Of all respondents, 87.5% (21/24) of trainees and 82% (9/11) of PD agreed or strongly agreed that POCUS is an important clinical tool in rheumatology, as it was a "helpful clinical [bedside] tool … when objective inflammatory MSK disease is questioned." Comments included "I feel it is a very good adjunct to the clinical examination. And important in situations where synovitis is suspected but not definitively found on examination," and "It's role hasn't been fully decided but is very useful in certain indications." Eighty-nine percent (8/9) of PD felt that POCUS should be a formal part of the rheumatology training. The majority of trainees and PD consider POCUS to be an important clinical tool in rheumatology, and therefore, most trainees (66%, 16/24) plan to use POCUS in their future practice (Figure 3). To achieve their goals, trainees considered the Canadian Rheumatology Ultrasound Society course, joint training among programs, and even initiating their own exposure with individual staff or going to Europe for further training. Over 91% (20/22) of trainees and 100% (5/5) of PD responders would be interested in a standardized MSK POCUS curriculum.

For the updated interview survey in September 2018 with the PD, the completed response rates were 61% (11/18) for PD, where 2 respondents were from the Francophone programs. All programs were keen on implementing a

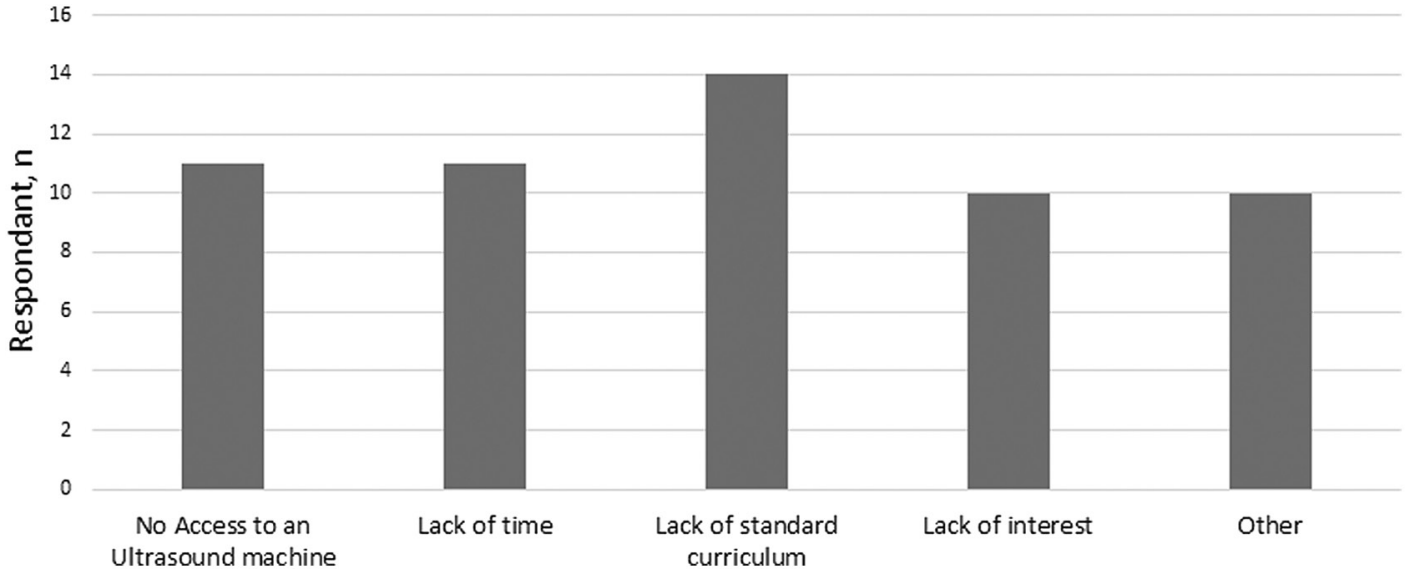

Figure 2. Barriers for teaching POCUS in programs. POCUS, point-of-care ultrasonography.

US course for their trainees and were willing to participate in a standardized course if one were to be developed. In recognizing the significant barriers in implementing a national course, including costs and recruiting experienced staff, several programs had implemented substantial changes, including prioritizing recruiting and training rheumatology faculty with specific interests and skills in MSK US.

Of all responders, 80% (8/10) had a US machine available for their trainees, primarily reserved for teaching or research for specific staff who were POCUS-trained. However, limitations included access to the machine, particularly if it was purchased for research purposes or if there were more training sites than available US machines. The majority, 67% (10/15), had informal teaching with varied didactic and practice sessions on each other, cadavers, and patients.

Discussion

Canadian rheumatologists and trainees strongly agree that POCUS is an important clinical tool in rheumatology but described limited training, access to US machines, and local experts as barriers to incorporating into their everyday practice. A worldwide study of 306 physiatrists had similar findings; the majority declared that they should perform MSK US in their everyday practice yet were unable to due to 2 predominant issues: the lack of training and US devices.[14] Further support came from a 9-country survey that found that only 22% of physiatrist respondents had received formal MSK US training during their residency.[15]

Proficiency in MSK US requires a substantial time investment. In Canada, training in MSK US is not a mandatory requirement for Royal College of Physicians and Surgeons of Canada (RCPSC) Certification in rheumatology hence must compete for curricular time and resources with other mandatory clinical exposures. One solution to this has been to apply for formalized additional MSK US training with the RCPSC. The formal designation of an Area of Focused Competence (AFC) may provide an opportunity for residents to extend their training and receive formal certification.

Until such formalized training is available, our participants reported seeking training from alternate external sources such as the Canadian Ultrasound Rheumatology Society, EULAR, and PANLAR which offer basic and advanced courses in MSK US for practicing rheumatologists and trainees for a fee. Other specialists also describe primarily receiving MSK US training from external courses and experienced mentors[15,16]

Conclusion

This national survey demonstrates that although MSK POCUS is considered important for clinical practice, barriers to training exist, including limited access to US machines (less than half had regular access), trained faculty, and a standardized curriculum. Currently, there appears to be a lack of training opportunities for rheumatology trainees, with no set formal curriculum at the postgraduate level. However, most current trainees plan to use POCUS in their future practice, with many pursuing further individualized training through external training programs. It is clear that both trainees

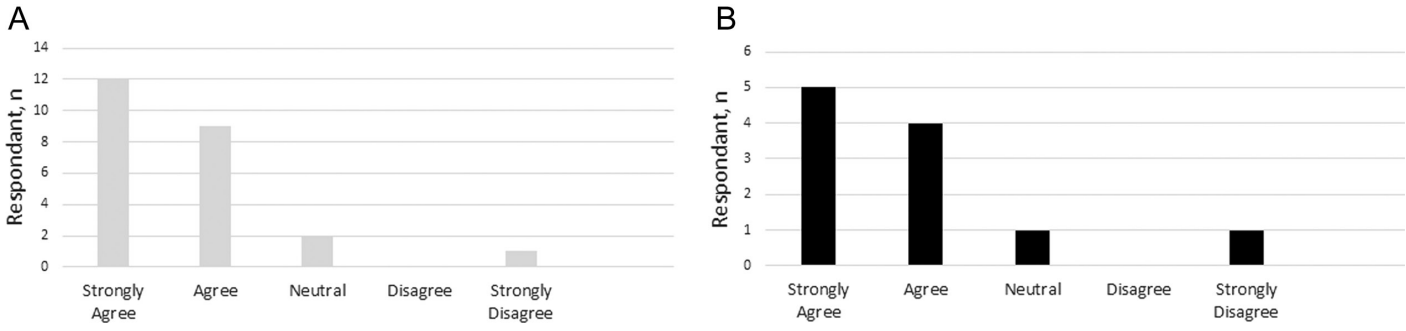

Figure 3. A, B. (A) Resident opinion: POCUS is an important clinical tool in rheumatology. (B) Program director opinion: POCUS is an important clinical tool in rheumatology. POCUS, point-of-care ultrasonography.

and PD felt that POCUS should be a formal part of training and would be interested in a national standardized curriculum. These study conclusions are limited due to the low response rate and potential bias of respondents.

There is considerable support for developing a standardized national POCUS curriculum in Canada. This study has highlighted the strong desire for a national curriculum and we hope will provide a catalyst to the future development of a national standardized US curriculum as a component of the Royal College AFC. Ultimately, MSK US proficiency in a greater number of rheumatologists has the potential to improve care for all patients with musculoskeletal diseases.

Ethics Committee Approval: Ethical committee approval was received from the Ottawa Health Science Network Research Ethics Board (Approval No: #20160707).

Informed Consent: Written informed consent was obtained from the patients.

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