

How to Attract Trainees, a Pan-Canadian Perspective: Phase 1 of the “Training the Rheumatologists of Tomorrow” Project

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ABSTRACT. Objective. To identify what learners and professionals associated with rheumatology programs across Canada recommend as ways to attract future trainees.

Methods. Data from online surveys and individual interviews with participants from 9 rheumatology programs were analyzed using the thematic framework analysis to identify messages and methods to interest potential trainees in rheumatology.

Results. There were 103 participants (78 surveyed, 25 interviewed) who indicated that many practitioners were drawn to rheumatology because of the aspects of work life, and that educational events and hands-on experiences can interest students. Messages centered on working life, career opportunities, and the lifestyle of rheumatologists. Specific ways to increase awareness about rheumatology included information about practice type, intellectual and diagnostic challenges, diversity of diseases, and patient populations. Increased opportunity for early and continued exposure for both medical students and internal medicine residents was also important, as was highlighting job flexibility and availability and a good work-life balance. Although mentors were rarely mentioned, many participants indicated educational activities of role models. The relatively low pay scale of rheumatologists was rarely identified as a barrier to choosing a career in rheumatology.

Conclusion. This is the first pan-Canadian initiative using local data to create a work plan for developing and evaluating tools to promote interest in rheumatology that could help increase the number of future practitioners. (J Rheumatol First Release March 1 2016; doi:10.3899/jrheum.150314)

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HEALTH SERVICES NEEDS AND DEMAND
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Many countries, including Canada, are facing a critical shortage of rheumatologists^{1,2,3}. As of 2009, there were 0.90 practitioners for every 100,000 people in Canada, far below the recommended level of 1.2:100,000 population noted in a UK report⁴. At least 1 author has cited a much lower target of 1 provider per 70,000 people as a more accurate estimate given the increased time required for diagnostic assessments,

complex treatments, and academic commitments, which led him to refer to rheumatologists as “an endangered species”⁵.

The shortfall of rheumatologists has been widely attributed to the increasing demand from additional patients, both because of aging populations and improved diagnostics, and an inadequate supply of practitioners because of the large number of rheumatologists who are either reducing their

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practice or retiring soon, as well as the uneven distribution of providers^{6,7}. In addition, current enrolment levels in rheumatology programs are insufficient to meet present and future need⁸.

The question of how to increase the number of rheumatologists is linked to the larger issues of manpower shortages and career preferences in medicine⁹. Research on what influences the career choices of medical students in several countries identified as important influences prior exposure to a specialty and mentors, perceived good quality of life, practice environment, and work opportunities, but not salary^{10,11,12,13}. For internal medicine residents, these factors plus patients and intellectual challenge were important^{14,15,16,17}.

Medical trainees often change their minds about career choices in medical school and early residency^{18,19}, which raises the question of whether factors influencing career choices also vary over time. A few studies have looked at career choices across medical education levels. The Workforce in Rheumatology Issues Study (WRIST) compared reasons for pursuing training and a career in rheumatology by medical students, internal medicine residents, rheumatology fellows, and specialists in Canada²⁰. Role models and a guaranteed staff position influenced all but the specialists, who thought awards programs, conferences, and formal outreach would be effective. Better pay was important only for rheumatology fellows. Another study with trainees (students, residents, and fellows) showed that intellectual interest was key for all groups, but the degree of influence for quality of life, patient type, continuity of care, and job opportunities varied across groups. Role models were only moderately important and financial concerns not very important to any group²¹.

In our paper, we reported on the findings from a pan-Canadian study of what internal medicine residents, rheumatology fellows, and specialists suggested to increase interest in rheumatology among medical students. Using this information, we will create and evaluate the effectiveness of the messages and marketing tools across Canada.

MATERIALS AND METHODS

Sample. In Canada, senior internal medicine residents have an additional year of general training or 2–3 more years in a subspecialty area such as rheumatology. We enrolled learners (internal medicine residents, fellows, or postgraduate yrs 4–6) and professionals (faculty, faculty/administrators) associated with a Canadian postgraduate rheumatology program because they are “information-rich sources” of insights into rheumatology education.

Recruitment. After receiving ethics approval, the principal investigator invited directors of the 13 postgraduate rheumatology programs to join our study. Nine sites were enrolled (in alphabetical order): Dalhousie University, Nova Scotia; McGill University, Quebec; McMaster University, Ontario; Université Laval, Quebec; University of Alberta; University of British Columbia; University of Calgary, Alberta; University of Manitoba; and Western University, Ontario.

Each director e-mailed a prepared letter in French or English to their faculty, administrative staff, fellows, and internal medicine residents who were in or had completed a rotation. The invitation described the study and provided contact information for scheduling an interview and the URL for

accessing the online survey. To increase response rates, each program e-mailed at least 1 reminder to the original invitees within a month after sending the initial message²². Sampling continued until we reached “saturation” or the point where no new information emerged from the data and all identified themes were well understood^{23,24}.

Data collection. We created 2 parallel interview guides for learners and faculty/administrators with 21 open-ended and 7 demographic questions that were identical except for questions about work experience and program role. We tested the guides for face validity with 2 faculty members and 2 trainees, and made minor changes for clarity (Figure 1). One of the team members (DC) conducted all the telephone interviews in English from July 2013 to April 2014. All persons wanting to be interviewed were included. A professional typist used the MP3 audio files of the interviews to create verbatim transcripts, removing all identifying information prior to analysis.

We used the same questions to develop the self-administered online survey for Francophone participants or people preferring to not be interviewed. A professional bilingual researcher translated the surveys to French and the drafts were reviewed by a Francophone member of the team (LB). We pilot tested the surveys with 4 practitioners and 3 trainees (Figure 2). After making minor changes, we uploaded them onto SurveyMonkey (www.surveymonkey.com), a Canadian Web-based platform for self-administered anonymous questionnaires. The surveys were available from October 2013 to May 2014. We used a convenience sample of eligible learners and professionals.

Data analysis. Two team members (LL, DC) analyzed the data using the thematic framework analysis²⁵ by independently reviewing the data to identify themes, clustering responses into subthemes, and rank-ordering them for comparison across respondent groups, augmenting survey data with more detailed responses from interviewees. A third investigator (AC) reviewed the results and helped identify exemplary quotes²⁶.

We ensured study rigor through iterative rounds of data collection and analysis, linking findings to the raw data (participant quotes) as well as triangulation (multiple data types, sources, and analysts), purposive sampling to saturation, ensuring congruence between the research question and study methods (methodological coherence), discussing the results with professionals at meetings to assess use of findings, and providing information on the research team (reflexivity) below^{27,28}.

Data analysis was led by a medical anthropologist (LL) with experience in qualitative health services and medical education research working with the project manager (DC), who has experience in health services research, and the principal investigator (AC), who is a practicing rheumatologist with considerable experience in clinical and medical education research. The other investigators are program or division directors of Canadian rheumatology programs who provided expert topical knowledge.

Data presentation. For much of the data, there were differences in response patterns based on experience (learners vs professionals), but not by geographic location. We therefore combined data across sites and then compared them by experience level. We present findings about positive aspects of rheumatology (what drew people to the field, messages to students) and ways to increase interest in this field. We present the 3 most frequently mentioned themes for each of the topics and then the leading subthemes for each of them.

To improve clarity without altering the meaning of the statements from respondents, we removed portions of longer quotes, as indicated by ellipses (...), and added text in square brackets. We identified the source of each quote with a label designating group membership as follows: Jr (junior learner or resident), Sr (senior learner or fellow), F (faculty member without administrative roles in a rheumatology program), F/A (faculty-administrator), and A (nonclinical program administrator), with “IW” for interviewees. We included a unique ID number for members of each group to help ensure we included the views of many participants.

Ethics. This study was carried out in compliance with the World Medical Association Declaration of Helsinki Ethical Principles for Medical Research Involving Human Subjects (www.wma.net/en/30publications/10policies/)

Participant Information and Consent for the 'Training the Rheumatologists of Tomorrow: A Qualitative Case Study'	
Principal Investigator: Dr. Alfred Cividino (McMaster University)	
BACKGROUND: We are inviting you to join the above-named study because you are a faculty member or administrator associated with a Canadian Rheumatology post-graduate training program. In this Canada-wide study funded by the CRA (Canadian Rheumatology Association) we are gathering information from faculty, administrators, residents and fellows to help us find ways to strengthen Rheumatology education programs and increase the number of rheumatologists in Canada. Your program is in one of the 11 universities enrolled in the study, including: Alberta, British Columbia, Calgary, Dalhousie, Laval, Manitoba, McGill, McMaster, Montreal, Ottawa, and Western.	
NOTE: We have used the masculine rather than masculine and feminine pronouns throughout this survey, following the standard use in text. This is not meant to exclude anyone or indicate preference in any way.	
PURPOSE: The aims of this project are to a) better understand the workings of your Rheumatology post-graduate program, b) document experiences that you and others have had with the program, c) identify unique features in each program, and d) collect suggestions on how to increase the number of rheumatologists in Canada.	
PROCEDURES: If you agree to participate in this project, you can provide us your anonymous thoughts and experiences related to your Rheumatology program by completing this on-line survey. This should take 20 minutes or less to complete. Fluid Survey, the Canadian company hosting this survey, provides full anonymity to its users because email addresses are NOT attached to returned surveys.	
POTENTIAL BENEFITS TO YOU AND/OR SOCIETY: There will be no direct benefit to you such as payment for participating in the project. The information you provide will help the research team as we work to develop methods and material to increase the number of Rheumatologists in Canada, thereby providing better service to their patients.	
POTENTIAL RISKS AND DISCOMFORTS: When anyone is asked for an opinion there is a risk of psychological discomfort or embarrassment. To minimize that risk we are informing you as a potential participant that your participation in this study is voluntary. You may choose not to join the study and there will be no consequences attached to that decision. No one will know if you joined the study or what your views are because your email address is NOT attached to your questionnaire.	
CONFIDENTIALITY: All data we gather will remain confidential and would be disclosed only with your permission or as required by law. We will store all information and data analysis products on password-protected computers and/or in locked filing cabinets located in a locked research office (McMaster University Rheumatology Post-graduate Program Office, 25 Charlton Avenue East, Suite 801, Hamilton, Ontario) accessible only by members of the research team.	
PARTICIPATION AND WITHDRAWAL: Your participation in this project is voluntary. You may withdraw from this project at any time without consequences of any kind. You may choose not to answer certain questions. The investigator may withdraw you from this research if circumstances arise which warrant doing so.	
RIGHTS OF PROJECT PARTICIPANTS: You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this project. If you have any questions or concerns please contact : Dr. Lynne Lohfeld, Project Coordinator; tel: 905.537.6338 email: lohfeld@mcmaster.ca	
INFORMED CONSENT: Completion of this survey implies informed consent. Would you like to take this survey? [] Yes [] No	
For Faculty and Administrators (English Version)	For Residents and Fellows (English Version)
Q1. Which university are you affiliated with? Press on the arrow head to open the list. Select one option.	Same
Q1a. How are you associated with the Rheumatology program at your university? [] Faculty [] Administrator [] other	Q1a. How are you associated with the Rheumatology program at your university? [] Resident (PGY1-3) who has done/is doing a rotation in Rheumatology [] Fellow (PGY-4 or -5) who has done/is doing specialty training in Rheumatology [] other
Q2. How long have you worked in the field of rheumatology?	Q2. Are you currently a Resident or Fellow in a Rheumatology program? [] Yes, I am currently doing a rotation or specialty training in a Rheumatology Program [] No, I previously did a rotation or specialty training in a Rheumatology program
The questions on this page are about you and your role(s) as a faculty member or administrator in your Rheumatology post-graduate program. Q3. What has been your role(s) with your university's Rheumatology program? Q3a. What are the most delightful aspects of your work? Q3b. What are the least delightful aspects?	The next questions are about your views on Rheumatology as a sub-specialty area of medicine. Q3. Are you currently (thinking about) pursuing Rheumatology as your field of specialization? [] Yes [] No Q3a. If 'Yes', was this your first choice for a specialty? If 'No, what was your first choice for a specialty?

Figure 1. Web-based questionnaires for rheumatology faculty/administrators and learners (English version).

b3/17c.pdf). Each enrolled program obtained approval from its local research ethics board prior to recruiting participants. Survey respondents accessed questions only after opening the Information & Consent page and selecting the "I consent to participate in this study" option. Interviewees provided oral consent prior to answering questions.

RESULTS

Participants. There were 103 participants, 52 learners and 51 professionals, 76% of whom (78/103, 46 learners and 32 professionals) were surveyed. The other 25 participants (6 learners, 19 professionals) were interviewed. Many partici-

pants were women. The mean age of respondents was lower for learners than professionals. Two-thirds of surveyed learners planned to work in an academic hospital where 70% of the professionals currently worked. Interviewed professionals had, on average, worked in rheumatology for 13.4 years (range 3–30 yrs; Table 1). These numbers are typical of the larger populations from which the samples were drawn.

The response rate was calculated separately by site and was the proportion of invited participants who joined our study. Overall, 12% of the invited learners (range 3–33%)

For Faculty and Administrators (English Version)	For Residents and Fellows (English Version)
<p>Q4. What attracted you to the field of Rheumatology?</p> <p>Q4a. Knowing what you know today, would you still choose Rheumatology as your specialty area? When answering this question think back to when you were graduating from medical school and deciding on your career path. Would you still choose this field? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Sure</p> <p>Q4b. Why?</p>	Same
<p>Q5. Which subspecialty area(s) are you in? Please select all that apply. Write in any answers not included on the list. If you are NOT a physician, select "Not Applicable" from the list.</p> <p>Q5a. Why did you choose this / these specialty area(s)?</p> <p><input type="checkbox"/> Achondroplasia <input type="checkbox"/> Ankylosing spondylitis <input type="checkbox"/> Dermatomyositis <input type="checkbox"/> Ehlers-Danlos Syndrome <input type="checkbox"/> Fibromyalgia <input type="checkbox"/> Gout <input type="checkbox"/> Juvenile idiopathic arthritis (JIA) <input type="checkbox"/> Lupus <input type="checkbox"/> Marfan's Syndrome <input type="checkbox"/> Mixed connective tissue disease <input type="checkbox"/> Myositis <input type="checkbox"/> Osteoarthritis <input type="checkbox"/> Polycondritis <input type="checkbox"/> Polymyalgia rheumatic <input type="checkbox"/> Polymyositis <input type="checkbox"/> Psoriatic arthropathy <input type="checkbox"/> Reactive arthritis <input type="checkbox"/> Rheumatoid arthritis <input type="checkbox"/> Sarcoidosis <input type="checkbox"/> Scleroderma <input type="checkbox"/> Septic arthritis <input type="checkbox"/> Sjögren's syndrome <input type="checkbox"/> Vasculitis <input type="checkbox"/> Not Applicable (not faculty) <input type="checkbox"/> Other, please specify...</p>	Same
<p>The next questions are about your university's Rheumatology program.</p> <p>Q6. To the best of your knowledge, how is your university's Rheumatology program similar to other programs in Canada or elsewhere? Factors that you may want to discuss include: curriculum, faculty, staff, reputation, quality of education or learning environment, research opportunities, resources, patient exposure.</p>	Same
<p>Q7. How is your Rheumatology program unique or different from other programs? Factors that you may want to discuss include: curriculum, faculty, staff, reputation, quality of education or learning environment, research opportunities, resources, patient exposure, and overall quality of life.</p>	Same
<p>Q8. By all accounts your Rheumatology program is quite successful. What do you think are the main reasons for that? Factors that you may want to discuss include: curriculum, faculty, staff, reputation, quality of education or learning environment, research opportunities, resources, patient exposure.</p>	Same
<p>Q9. How could your program be improved? Remember that all responses are anonymous.</p>	Same
<p>Q10. Tell us about the research component of your program. Factors that you may want to discuss include: funding opportunities, quality of the program, reputation of researchers, collaboration across programs and disciplines, opportunities for residents and fellows to be involved, topics under investigation and types of research (clinical trials, patient-reported outcomes, quantitative, qualitative).</p>	Same
<p>Q11. Tell us about your experiences with the sub-specialty programs in your department (e.g., vasculitis, scleroderma, lupus, osteoarthritis, rheumatoid arthritis, juvenile onset arthritis, metabolic bone disease). Issues you may want to describe include: the quality and quantity of specialists on faculty, access to patients, opportunities for collaborative patient care or research.</p>	Same
<p>The next set of questions is about your thoughts on how to increase the number of Rheumatologists in Canada.</p> <p>Q12. Recent figures indicate that there is a serious shortage of Rheumatologists in Canada. How could we attract more undergraduate medical students to Rheumatology?</p> <p>Q13. If you were to speak to a group of undergraduate medical students about a career in Rheumatology -- both the positive and negative aspects -- what would you tell them?</p>	Same
<p>Q14. What could we do to better support Rheumatology trainees and newly graduated Rheumatologists? Issues you might address include: opportunities for research and publication, access to expert specialists and their patients, financial support, information on becoming a good educator, information on how to start and maintain a practice, licensing exam preparation material specifically for Rheumatology fellows.</p>	Same

Figure 1. Continued.

and 34% of invited professionals (range 26–83%) participated in our study. The lower response rates were from larger programs that had sent out considerably more invitations.

Reasons for initial interest in rheumatology. The leading reasons for interest in this field were related to work life characteristics, followed by rheumatological diseases, and

then patients. Junior learners more often mentioned an interest in rheumatological diseases; senior learners and professionals noted specific elements of work life (Table 2A). Learners were more interested in the type of practice, and professionals highlighted intellectual challenges (Table 3A). As one professional noted, “[Rheumatology] challenges you

For Faculty and Administrators (English Version)	For Residents and Fellows (English Version)
Q15. What advice or words of wisdom do you have for your Rheumatology program's planners and administrators? Q16. Please take a moment to summarize your thoughts on how to improve Rheumatology post-graduate education and increase the number of Rheumatologists in Canada. What is your key message? Q17. If there's anything else you'd like to add to what you've written so far, please add your comments in the space below.	Same
DEMOGRAPHICS: The next set of questions are about you. Information that you and other participants provide will be confidential and used to describe groups of respondents in our final report. As an example, based on demographic data we might write, "76% of all residents and fellows were females between the ages of 25 and 34". Q18a. What is your gender? <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Prefer Not to Answer Q18b. How old are you? <input type="checkbox"/> under 25 years old <input type="checkbox"/> 25-34 <input type="checkbox"/> 35-44 <input type="checkbox"/> 45-54 <input type="checkbox"/> 55-64 <input type="checkbox"/> 55 or Above Q18c. If applicable, where did you complete your undergraduate medical training? Q18d. In what type of medical setting are you working or planning to work? Check as many options as apply. <input type="checkbox"/> In a community setting <input type="checkbox"/> In an academic hospital <input type="checkbox"/> Other, please specify.	Same

Figure 1. Continued.

to be a good internist" (F/A-1). Some students also found this to be important, describing it as "being like a modern-day detective" (Sr-1 IW). Learners were also impressed with a positive work environment from "working with like-minded individuals" (Jr-20) in "an excellent culture of collegiality" (Jr-17). They noted that rheumatologists were pleasant and content, or as one fellow wrote, "most rheumatologists, according to objective studies that have looked at quality-of-life measures, are on the high end of the satisfaction and happiness scale for all specialties in medicine. It's important this gets projected to trainees" (Sr-4 IW).

Comments about rheumatological diseases said that they are interesting, diverse, or multisystemic. Learners described them in general terms as "*les plus belles maladies de médecine interne*" ["the best diseases in internal medicine"] (Sr-7), whereas professionals focused on their being diverse and complex. Learners more often mentioned being interested in patients, although both groups described them as a diverse and complex population. Role models and future earnings were among the least frequently mentioned reasons for an initial interest in rheumatology.

How to attract learners to rheumatology. The 3 leading themes were to increase exposure, specific education methods, and creating opportunities for more hands-on experiences. Together, they accounted for nearly 70% of all suggested ways to attract learners. Junior learners focused on specific teaching methods, senior learners on the need for hands-on experiences, and professionals on increasing exposure in general (Table 2B).

Comments about increasing exposure generally emphasized creating interest and awareness for learners at various

stages of their training (Table 3B). In the words of one professional, "no one is going to pick rheumatology who has never done rheumatology, so anything a program can do to get [learners] to ... spend time in rheumatology is going to be the biggest payoff" (F/A-7 IW). A resident agreed when he stated,

"Early exposure is good for making rheumatology something that people will consider ... [The] best place to target this would be during internal medicine rotations, but also the MSK [musculoskeletal] unit with first- or second-year medical students [because this] is where you get your first exposure to rheumatology" (Jr-1 IW).

Professionals had very specific recommendations on how to promote interest in the field, such as "increasing exposure to young, recently recruited rheumatologists" (F-2) and "[informing them] about what it is like to be a rheumatologist" (F/A-6). Some suggested focusing attention on medical students by such means as "collaborating with the undergraduate program to reach out to students to give them opportunities to work with us" (F-8) and "putting an emphasis on getting clerks exposed to the service and our clinics" (F-10).

Junior learners and faculty in particular suggested offering more lectures and clinical skills sessions with interesting cases. Teaching was crucial, with some participants noting that "people get turned away from rheumatology because it is often not well taught" (Jr-9). Faculty/administrators also recommended changes in educational approaches for learners, such as ensuring that "[sessions with] patient partners include not just joint exams, but also exposure to patients with [systemic lupus erythematosus], myositis,

Faculty and Program Administrators	Junior (PGY1-3s) and Senior (PGY4-6s) Learners
<ul style="list-style-type: none"> REVIEW INFORMATION AND CONSENT FORM GET INFORMED CONSENT (SIGNATURE AND DATE ON TWO COPIES OF FORM) <p>BACKGROUND I'd like to start by asking a few questions about you and the field of rheumatology.</p> <p>What attracted you to internal medicine and specifically to rheumatology? PROBE: What are the most delightful aspects of your work and career? The least delightful or enjoyable aspects?</p> <p>What has been your role or roles with the [NAME OF UNIVERSITY] Rheumatology Post-graduate Training Program?</p> <p>Where did you do your undergraduate and post-graduate training?</p> <p>If you were just finishing your undergraduate medical studies now, do you think you'd make the same decision, to become a rheumatologist? (Y/N) Why?</p>	<p>Same</p> <p>BACKGROUND Same</p> <p>---</p> <p>---</p> <p>Where did you do your undergraduate training?</p> <p>Same</p>
<p>RHEUMATOLOGY POST-GRADUATE PROGRAMS (GENERAL INFORMATION) Now I'd like to ask you about rheumatology post-graduate training programs in general.</p> <p>How is a post-graduate training program in rheumatology similar to other specialty training programs (both in general, and in internal medicine)?</p> <p>What distinguishes post-graduate training programs in rheumatology from other specialty training programs (both in general, and in internal medicine)?</p>	<p>---</p>
<p>YOUR UNIVERSITY'S RHEUMATOLOGY POST-GRADUATE TRAINING PROGRAM Next I'd like to ask you about the program at [NAME OF UNIVERSITY].</p> <p>---</p>	<p>YOUR UNIVERSITY'S RHEUMATOLOGY POST-GRADUATE TRAINING PROGRAM Same</p> <p>When you were applying for a post-graduate training program, how did you decide to join the program at [NAME OF UNIVERSITY]? PROBE: curriculum, faculty, learning environment, resources and experiences PROBE: current sub-specialty programs (vasculitis, scleroderma, lupus, metabolic disease)</p>
<p>How is the [NAME OF UNIVERSITY] program similar to other rheumatology post-grad programs? PROBE: curriculum, faculty, learning environment and experiences PROBE: curriculum, faculty, learning environment and experiences</p>	<p>Same</p>
<p>What can you tell me about the history of the [NAME OF UNIVERSITY] Rheumatology post-graduate training program?</p> <p>PROBE: How has it changed (Aims or Mission Statement, format, content, reputation)</p> <p>PROBE: How has it changed in terms of people (administrators and planners, faculty, post-graduate learners)</p> <p>PROBE: Steps taken to attract undergraduate medical students to the program</p>	<p>---</p>
<p>What can you tell me about the current sub-specialty programs within Rheumatology?</p> <p>PROBE: Training on vasculitis, scleroderma, lupus, metabolic bone disease</p> <p>PROBE: Reason(s) for developing/offering these sub-programs</p> <p>PROBE: Components of these sub-programs</p> <p>PROBE: Examples of how they are unique, high-quality</p> <p>PROBE: Discuss future (strategic) plans and directions</p>	<p>---</p>

Figure 2. Interview guides for learners and faculty and program administrators. PGY: postgraduate year.

vasculitis, etc. to give medical students a better feel for what all rheumatology encompasses” (F/A-13).

The third theme, more hands-on experiences, included suggestions such as providing more opportunities for preclinical observerships, more spaces for rotations in clerkship, and making rheumatology “a mandatory rotation in the internal medicine residency curriculum” (F-4). Few participants specifically mentioned mentors, but clearly

referred to activities that clinicians and educators do as role models. As one professional explained,

“You meet special people along the way who leave an indelible impression on you. Exposure is so important to really turn somebody on to rheumatology. Remember: there may be a future rheumatologist in the audience when you’re teaching” (Fac-1 IW).

Messages for undergraduates about rheumatology. The 3

Faculty and Program Administrators	Junior (PGY1-3s) and Senior (PGY4-6s) Learners
<p>What about research in basic science and clinical trials; what is the Rheumatology program's involvement in these areas?</p> <p>PROBE: Compare with past program (reasons ramping up, etc.)</p> <p>PROBE: Discuss future directions</p>	<p>Tell me about your thoughts on research in Rheumatology, starting as a Resident or Fellow.</p> <p>PROBE: Discuss research in relation to future career goals</p>
<p>By all accounts, the Rheumatology post-graduate training program at [NAME OF UNIVERSITY] is a successful program. What makes it so successful?</p> <p>PROBE: Examples of awards, grants, fellows, learners</p> <p>PROBE: Formal curriculum</p> <p>PROBE: Informal curriculum</p> <p>PROBE: Hidden curriculum</p> <p>How could it be improved?</p>	Same
<p>INCREASING THE NUMBER OF FUTURE RHEUMATOLOGISTS</p> <p>Recent figures indicate that there is a serious shortage of rheumatologists in Canada. Based on what you know or have heard, what do you think is most attractive about the field of rheumatology for undergraduate medical students considering their training and career options?</p> <p>PROBE: What is the most / least attractive about a career in rheumatology?</p>	<p>INCREASING THE NUMBER OF FUTURE REUMATOLOGISTS</p> <p>Recent figures indicate that there is a serious shortage of rheumatologists in Canada. Let's assume you've been asked to speak to a group of undergraduate medical students about to select their area of specialty training. What would you tell them about a career in Rheumatology?</p> <p>PROBE: Most and least attractive aspects of being a Rheumatologist</p>
---	And what would you tell them about the training program at [NAME OF UNIVERSITY]?
What do you think can be done to attract more undergrads into the sub-specialty of rheumatology?	Same
What about ways of retaining more trainees and newly graduated rheumatologists?	Same
What about the rheumatology program at [NAME OF UNIVERSITY]: What do you think are ways to attract more undergrads to this program?	Same
What about ways of retaining post-grads in the program?	Same
<p>WRAP-UP</p> <p>What advice or words of wisdom do you have for rheumatology post-graduate program planners and administrators at [NAME OF UNIVERSITY]?</p>	<p>WRAP-UP</p> <p>Same</p>
Is there anything I've forgotten to ask or that you'd like to discuss in more detail?	Same
Thinking back over everything we've discussed today, what would be a key message you could give?	Same
<p>Now I'd like to ask you a few questions about yourself. The answers will be used to describe our study population. Information will be presented for the group. For instance we might say, "53% of our respondents were female", or "the mean age of our respondents was 52.6 years."</p> <p>a) Gender [Male] [Female]</p> <p>b) Age (How old are you?)</p> <p>c) What year did you complete your undergraduate medical studies?</p> <p>d) When did you complete your post-graduate training in Rheumatology?</p> <p>e) How long have you worked as a [Rheumatologist] / [Administrator] / [Staff person]?</p>	<p>Same</p> <p>a) Same</p> <p>b) Same</p> <p>c) Same</p> <p>d) What year are you in your post-graduate training in Rheumatology?</p> <p>---</p>

Figure 2. Continued.

Table 1. Demographic characteristics of study participants by data source (survey or interview)*.

Characteristic	All Respondents		Surveyed Respondents		Interviewed Respondents	
	Learners	Professionals	Learner, n = 46	Professional, n = 32	Learner, n = 6	Professional, n = 19
Female, %	73.1	58.8	75.0	59.3	50.0	58.8
Mean age, yrs**	30.1	44.6	31.1	49.5	28.8	46.4
Will work in academic hospital, %	—	—	66.7	70.4	—	—
Yrs worked in rheumatology	—	—	—	—	—	13.4

* Percentages are based on the number of participants in a group who provided information. ** Surveyed respondents were asked to indicate their age by selecting 1 of the listed 10-year age groups. To calculate average age we used the midpoint of the age groups.

Table 2. Rank-ordered list of themes by topic, by group. Number (n) refers to number of suggestions made by respondents in a particular group or subgroup. Rank order for themes in each group or subgroup was determined by the proportion of responses per theme (numerator) divided by the total number of responses (denominator). Because only the 3 top-ranked themes are shown, the proportions will not equal 100%.

Table 2A. Reasons for initial interest in rheumatology, n = 165 comments*.

Theme	Overall, n = 65		Learners Junior, n = 34		Senior, n = 23		Overall, n = 53		Professionals Faculty, n = 24		Faculty/Admin, n = 29	
	Rank	n (%)	Rank	n (%)	Rank	n (%)	Rank	n (%)	Rank	n (%)	Rank	n (%)
Work life, n = 52	2nd	22 (33.8)	2nd	10 (29.5)	1st	12 (38.7)	1st	30 (56.6)	1st	12 (50.0)	1st	18 (62.1)
Diseases, n = 38	1st	28 (43.1)	1st	17 (50.0)	2nd	11 (35.5)	3rd	10 (18.8)	3rd	5 (20.8)	3rd	5 (17.2)
Patients, n = 28	3rd	15 (23.1)	3rd	7 (20.5)	3rd	8 (25.8)	2nd	13 (24.6)	2nd	7 (29.2)	2nd	6 (20.7)

Table 2B. How to attract learners to rheumatology, n = 97 comments*.

Theme	Overall, n = 30		Learners Junior, n = 13		Senior, n = 17		Overall, n = 36		Professionals Faculty, n = 21		Faculty/Admin, n = 15	
	Rank	n (%)	Rank	n (%)	Rank	n (%)	Rank	n (%)	Rank	n (%)	Rank	n (%)
Exposure, n = 29	2nd	8 (26.6)	3rd	2 (15.4)	2nd	6 (35.3)	1st	21 (58.4)	1st	13 (61.9)	1st	8 (53.4)
Teaching, n = 19	1st	11 (36.7)	1st	8 (61.5)	3rd	3 (17.6)	2nd	8 (22.2)	2nd	6 (20.6)	3rd	2 (13.3)
Experience, n = 18	1st	11 (36.7)	2nd	3 (23.1)	1st	8 (47.1)	3rd	7 (19.4)	3rd	2 (6.9)	2nd	5 (33.3)

Table 2C. Messages for undergraduates, n = 190 comments*.

Theme	Overall, n = 53		Learners Junior, n = 22		Senior, n = 31		Overall, n = 51		Professionals Faculty, n = 25		Faculty/Admin, n = 26	
	Rank	n (%)	Rank	n (%)	Rank	n (%)	Rank	N (%)	Rank	N (%)	Rank	N (%)
Work life, n = 40	1st	20 (18.9)	3rd	4 (18.2)	1st	16 (51.6)	1st	20 (39.2)	1st	13 (52.0)	3rd	7 (26.9)
Career, n = 34	2nd	17 (16.0)	1st	10 (45.5)	3rd	7 (22.6)	2nd	17 (33.3)	2nd	7 (28.0)	1st	10 (38.4)
Lifestyle, n = 30	3rd	16 (15.1)	2nd	8 (36.3)	2nd	8 (25.8)	3rd	14 (27.5)	3rd	5 (20.0)	2nd	9 (34.6)

Calculations are made based on the totals and percentages for the 3 top-ranked items only. The top-ranked item for each subgroup is shown in bold face unless there is a tie. * Other topics for Table 2A: treatments (n = 17), lifestyle (n = 17), career/job-related issues (n = 7), and miscellaneous comments (n = 7); for Table 2B: special events and activities (n = 13), mentors (n = 8), and miscellaneous comments (n = 10); for Table 2C: treatments (n = 25), patients (n = 21), diseases (n = 18), and miscellaneous comments (n = 10).

leading themes for this topic were, in rank order, to emphasize positive aspects of working as a rheumatologist, future career opportunities, and the lifestyle of rheumatologists. These accounted for 61% of all recommended messages. Junior learners and faculty/administrators mostly suggested highlighting career opportunities, whereas senior learners and faculty-at-large focused on telling students about work life issues (Table 2C).

Junior learners, more than the other respondent groups, suggested informing students about how rapidly the field is expanding. In contrast, senior learners and professionals wanted to tell audiences that “if you love to be challenged, this is your subspecialty” (F/A-13). Senior learners and professionals tended to recommend that messages describe the type of practice that rheumatology is, such as it being an “outpatient-based specialty that is very clinical” (Sr-8) and “a very hands-on discipline” (F-9) with “a nice mix of procedural and cerebral work” (Sr-13). There were also many opportunities to open “a diversified practice with many areas of interest to explore” (F-6), such as “specializing further to create niche areas of interest, including research” (F/A-13).

Some senior learners also suggested describing the collegial work environment in this field because “*les rhumatologues eux mêmes sont des gens gentils, généreux, sympathiques, et aiment la vie et leur travail*” [“rheumatologists are nice people — generous, friendly, and love their life and work”] (Sr-10).

Job-related messages included information on both the availability and flexibility of work, with professionals focusing on availability of jobs and learners on career flexibility. As one professional noted, “[We should tell them] there’s a good career opportunity in rheumatology” (F/A-8 IW). Typical messages from learners were to “[tell them that rheumatologists] can work anywhere” (Jr-7).

Messages about the lifestyle of rheumatologists focused on both quality of life and having a good work-life balance (Table 3C). For learners, there were no clear patterns to their suggestions, but professionals emphasized a positive quality of life, noting “[there is] less stress than [in] many other specialties ... [because] it is extremely rare to have to attend a call at night” (F-13). They also suggested telling students the following: “according to a recent survey, we are the

Table 3. Rank-ordered list responses by respondent group. Number (n) refers to number of suggestions made by respondents in a particular group or subgroup. Rank order for themes in each group or subgroup was determined by the proportion of responses per theme (numerator) divided by the total number of responses (denominator). Because only the 3 top-ranked themes are shown, the proportions will not equal 100%. Values are n (%) unless otherwise specified.

Table 3A. Reasons for Initial Interest in Rheumatology

	Overall	Learners		Overall	Professionals	
		Junior	Senior		Faculty	Faculty/Admin
Work life, n = 52, n	22	10	12	30	12	18
Type of practice	9 (40.9)	4 (40.0)	5 (41.7)	7 (23.3)	3 (25.0)	4 (22.2)
Work environment/colleagues	7 (31.8)	3 (30.0)	4 (33.3)	6 (20.0)	2 (16.7)	4 (22.2)
Interesting/challenging field	4 (18.1)	1 (10.0)	3 (25.0)	11 (36.7)	4 (33.3)	7 (38.9)
Use of technology	2 (9.1)	2 (20.0)	0 (0.0)	6 (20.0)	3 (25.0)	3 (16.7)
Diseases treated, n = 38, n	28	17	11	10	5	5
General observations	12 (45.5)	7 (41.2)	5 (45.5)	2 (20.0)	0 (0.0)	2 (40.0)
Diversity, types	10 (35.7)	6 (35.3)	4 (36.3)	6 (60.0)	4 (80.0)	2 (40.0)
Multisystemic	6 (21.4)	4 (23.5)	2 (18.2)	2 (20.0)	1 (20.0)	1 (20.0)
Patients seen, n = 28, n	15	7	8	13	7	6
General observations	9 (60.0)	4 (57.1)	5 (62.5)	6 (46.2)	3 (42.9)	3 (50.0)
Physician-patient relationship	6 (40.0)	3 (42.9)	3 (37.5)	7 (53.8)	4 (57.1)	3 (50.0)

Table 3B. Ways to Attract Learners

	Overall	Learners		Overall	Professionals	
		Junior	Senior		Faculty	Faculty/Admin
Increase exposure, n = 29, n	8	2	6	21	13	8
General methods/practices	4 (50.0)	1 (50.0)	3 (50.0)	6 (28.6)	3 (23.2)	3 (37.5)
Focus on medical students	2 (25.0)	1 (50.0)	1 (16.7)	8 (38.1)	5 (38.4)	3 (37.5)
Focus on internal medical residents	2 (25.5)	0 (0.0)	2 (33.3)	7 (33.3)	5 (38.4)	2 (25.0)
Education/teaching, n = 19, n	11	8	3	8	6	2
General methods/practices	5 (45.5)	4 (50.0)	1 (33.3)	4 (50.0)	4 (66.7)	0 (0.0)
For medical students	6 (54.5)	4 (50.0)	2 (66.7)	4 (50.0)	2 (33.3)	2 (100.0)
Experience, n = 18, n	11	3	8	7	2	5
General methods/practices	1 (9.0)	0 (0.0)	1 (12.5)	3 (42.9)	1 (50.0)	2 (40.0)
For medical students	5 (45.5)	3 (100.0)	2 (25.0)	3 (42.9)	0 (0.0)	3 (60.0)
For residents	5 (45.5)	0 (0.0)	5 (62.5)	1 (14.2)	1 (50.0)	0 (0.0)

Table 3C. Topics for Messages to Undergraduates

	Overall	Learners		Overall	Professionals	
		Junior	Senior		Faculty	Faculty/Admin
Work-life issues, n = 40, n	21	4	17	20	13	7
Type of practice	9 (42.9)	0 (0.0)	9 (52.9)	10 (50.0)	7 (53.8)	3 (42.8)
Challenging, interesting field	10 (47.6)	4 (100.0)	6 (35.3)	6 (30.0)	3 (23.2)	3 (42.8)
Work environment/colleagues	2 (9.5)	0 (0.0)	2 (11.8)	2 (10.0)	1 (7.7)	1 (14.4)
Technology involved	0 (0.0)	0 (0.0)	0 (0.0)	2 (10.0)	2 (15.3)	0 (0.0)
Lifestyle issues, n = 38, n	16	8	8	14	5	9
Quality of life	8 (50.0)	4 (50.0)	4 (50.0)	11 (78.6)	3 (60.0)	8 (88.8)
Life-work balance	8 (50.0)	4 (50.0)	4 (50.0)	3 (21.4)	2 (40.0)	1 (11.2)
Job-related factors, n = 34, n	17	10	7	17	6	10
Flexibility	11 (64.7)	7 (70.0)	4 (57.1)	7 (41.2)	3 (50.0)	3 (30.0)
Availability	6 (35.3)	3 (30.0)	3 (42.9)	10 (58.8)	3 (50.0)	7 (70.0)

The top-ranked item for each subgroup is shown in bold face unless there is a tie.

happiest specialists. What more do you need to say?” (F-05). *Negative messages about rheumatology.* There were only 32 comments about problems with being a rheumatologist, usually provided as messages to share with medical students wanting to learn about this field. Most of them related to

rheumatology as a clinic-based nonprocedural chronic care discipline. Participants recommended providing information such as “*doit aimer l’examen physique*” [“you have to love doing physical exams”] (Sr-12), “a consult can take hours” (Sr-1), and “if you don’t have patience, don’t do rheum!” (F/A-7).

Very few respondents commented about low remuneration, noting that rheumatologists are “at the bottom of the pay scale for internists because we have no procedures” (F/A-8), but that “[it is] not a fantastic salary, but reasonable” (F/A-10). Some participants also noted that students should know it can be stressful to work with a large number of patients with chronic pain. As one explained, “Sometimes the severity of the diseases can be emotionally challenging” (Sr-5).

DISCUSSION

In Canada over the last 20 years, significantly fewer medical trainees entered nonprocedural specialties such as rheumatology. This indicates that there is a pressing need to interest and inform medical trainees about such fields before they finalize their career choices.

We asked learners and professionals associated with postgraduate rheumatology programs across Canada to share their views on messages and methods to help interest students in pursuing rheumatology experiences in their undergraduate and early postgraduate training years. For some topics, learners and professionals had diverging views, and for others, rheumatology fellows’ opinions were similar to those of professionals. This points to the value of including more than 1 set of participants in our study to ensure a wide range of perspectives. In addition, based on their many years in the education system, professionals may offer suggestions that are feasible within the structure of undergraduate and postgraduate medical education, whereas learners know more about what would appeal to their peers. We also learned that both professionals and learners identify the value of focusing attention on a wide range of learners in their undergraduate and postgraduate years of education²⁹.

We were surprised at the relatively limited mention of the importance of mentors, in contrast to some other studies^{30,31,32}. This might be because teaching is a skill that is less developed in rheumatologists than clinical or research skills³³ and that rheumatology is seriously underrepresented in some medical school curricula^{34,35}. This may also be why some researchers point to the need to find novel ways to inform students about key aspects of work and life as rheumatologists^{36,37}. We also learned that the relatively low pay rate of rheumatologists compared with other subspecialty areas is not perceived as a major barrier to students considering a career in this field, which is consistent with the finding of other studies³⁸.

Researchers in many fields note that early exposure can help medical students make informed choices. They state that educational experiences should identify what practitioners do, the intellectual challenge, and the type of patient care in a specialty³⁹, as well as being more proactive when encouraging students and networking with clinical educators from several locations⁴⁰. However, specific suggestions such as strengthening the musculoskeletal curriculum, exposing residents to patients in a variety of settings, and providing opportunities

to attend special events^{41,42} may be beyond a program’s control. Likewise, the suggestion to train faculty to become effective teachers is challenging given that there is no agreement on the best way to teach chronic illness care^{43,44}.

Much of the literature states that medical students and residents change their minds before making a final career choice, but this claim is rarely based on comparing the views of multiple groups. By comparing views of learners at different stages of training with those of professionals, we have identified a broad range of perspectives that may help us create more effective interventions that are well received by trainees and acceptable to educators and clinicians.

A limitation of our study is that we did not ask specifically about overcoming barriers to low enrolment in rheumatology, but instead asked for suggestions to inform and interest medical students so they would be more likely to seek out experiences in rheumatology as a step along the path to choosing a career in this field. The aim was to catalog recommendations for messages and means to inform medical students that could be developed and evaluated in rheumatology programs and medical schools across Canada. This is the focus of the next phase of our research.

Another limitation is our low response rate for learners. This is likely due to the small size of rheumatology programs in Canada and the competing demands for residents’ time. Rigorously collecting data from 103 respondents representing a wide range of perspectives allowed us to answer our research question and to begin developing a national platform to address the shortage of rheumatologists, starting with the lack of information and/or interest in this field by undergraduates. Sampling to saturation ensured that our findings are valid and broadly representative of the views of those involved in the field.

To our knowledge, ours is the first project of its kind in rheumatology, with a pan-Canadian network of educators working to address a serious medical staff shortage. In the next phase of our research program, we will develop and test the ability of specific messages and methods to spur trainees to consider gaining experience in rheumatology. This is a necessary first step to choosing rheumatology as a future career. Lessons we learn, including how to collect meaningful data to guide the development of information and recruitment tools, may be useful to others.

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