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Evaluation of a pilot rural mentorship programme for and by pre-clerkship medical students

Abstract

Introduction: While medical school interventions can help address rural physician shortages, many urban Canadian medical students lack exposure to rural medicine. The Rural Mentorship Programme (RMP) is a 4-month pilot initiative designed by medical students to bridge this gap by pairing preclerkship medical students at an urban medical school with rural physician mentors to provide exposure to rural careers.

Methods: A realist-influenced methodology evaluated perceived benefits and challenges of RMP, assessed how RMP influenced mentee perceptions and intentions towards rural careers, and investigated factors leading to success. Quantitative and qualitative data were collected through evaluative pre-, post-, and 4-month post intervention surveys, mentor interviews and a mentee focus group. Likert scales assessed satisfaction, attainment of objectives and mentee changes in perceptions and intentions.

Results: 18/23 mentees and 11/15 mentors completed at least 1 survey; 5 mentees joined the focus group and 3 mentors were interviewed. Most mentees were of non-rural backgrounds and initially neutral about pursuing rural practice. RMP helped mentees better understand rural careers. They especially valued the mandatory community clinical visit and forming relationships with mentors. Mentors enjoyed teaching, reflecting on their careers and demonstrating the merits of rural practice. Transportation and scheduling were major programme challenges.

Conclusions: This pilot suggests that structured mentorship programmes can improve understanding of, and provide exposure to, careers in rural medicine for urban medical students. Results will inform future programme development.

Keywords: Medical student, medical student interest groups, mentorship, programme evaluation, rural medicine, undergraduate medical education

Résumé

Introduction: Alors que les interventions des écoles de médecine peuvent contrer la pénurie de médecins en régions rurales, beaucoup d'étudiants

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en médecine des régions urbaines du Canada ne sont pas exposés à la médecine rurale. Le *Rural Mentorship Programme* (RMP) est une initiative pilote de 4 mois conçue par des étudiants en médecine pour combler cette lacune en appariant des étudiants d'une école de médecine urbaine n'ayant pas encore fait leur stage clinique à des médecins-mentors des régions rurales pour exposer les étudiants à une carrière en milieu rural.

Méthodes: Une méthode influencée par la réalité a évalué les bienfaits et les difficultés perçus du RMP, a évalué comment le RMP influait sur les perceptions et intentions des mentorés envers une carrière en région rurale et s'est penchée sur les facteurs de réussite. Des données quantitatives et qualitatives ont été recueillies par enquêtes évaluatives avant, après et 4 mois après l'intervention, par entrevues avec les mentors et par un groupe cible composé de mentorés. Des échelles de Likert ont évalué la satisfaction, l'atteinte des objectifs et la variation des perceptions et intentions des mentorés.

Résultats: Dans l'ensemble, 18 mentorés sur 23 et 11 mentors sur 15 ont répondu à au moins 1 enquête; 5 mentorés SE sont joints au groupe cible et 3 mentors ont été interviewés. La plupart des mentorés étaient d'origine non rurale et étaient initialement neutres à l'idée d'une pratique rurale. Le RMP a aidé les mentorés à mieux comprendre la carrière en milieu rural. Ils ont surtout apprécié la visite clinique obligatoire en communauté et la relation qu'ils ont formée avec leur mentor. Les mentors ont valorisé enseigner, réfléchir sur leur carrière et démontrer les mérites de la pratique rurale. Le transport et les horaires étaient les grands défis du programme.

Conclusions: Ce projet pilote laisse croire que les programmes de mentorat structurés améliorent la compréhension des étudiants en médecine des régions urbaines à l'idée d'une carrière en médecine rurale et exposent ces étudiants à la médecine rurale. Les résultats éclaireront l'élaboration de futurs programmes.

Mots-clés: Mentorat; étudiant en médecine; médecine rurale; éducation médicale de premier cycle; évaluation du programme; groupes d'intérêts d'étudiants en médecine

INTRODUCTION

Rural Canadians are less likely to have a family doctor.¹ While 17.6% of Canadians live outside urban centres, only 8.2% of physicians live in rural areas.^{2,3} Fortunately, physicians in rural communities have a broad range of clinical practice and work long hours to serve diverse populations distinct from those in cities (e.g., higher proportion of Indigenous Peoples).^{4,5} Nonetheless, residents of rural regions experience a higher burden of disease^{5,6} and increasing access to health care providers remains an important strategy to alleviate inequities between urban and rural Canadians.⁷

Strategies to mitigate rural physician shortages have included financial incentives for staff, rural exposure and curriculum enhancement for trainees, and increasing medical school enrolment of rural candidates and those with an interest in rural medicine.⁸⁻¹⁷

Despite these efforts, many medical students – particularly those in large

urban institutions – lack exposure to rural medicine. In 2017, our student-run Rural Medicine Interest Group (RMIG) informally surveyed undergraduate medical students at the University of Toronto; 73% (61/84) of responding students in years one to three had an interest in rural medicine, but only 40% (50/84) had participated in a rural medical placement. This mismatch between interest and curriculum opportunity, along with the known deficit in rural practitioners, led to our development of the Rural Mentorship Programme (RMP).

Rural Mentorship Programme description

The RMP [Figure 1] is delivered by RMIG medical students at the University of Toronto. The programme pairs first- and second-year medical students with a staff or resident physician mentor working in one of 4 rural communities outside Toronto. Rural sites were within a 2 h drive and were associated with our institution's Rural Residency Programme (Midland, Orangeville,

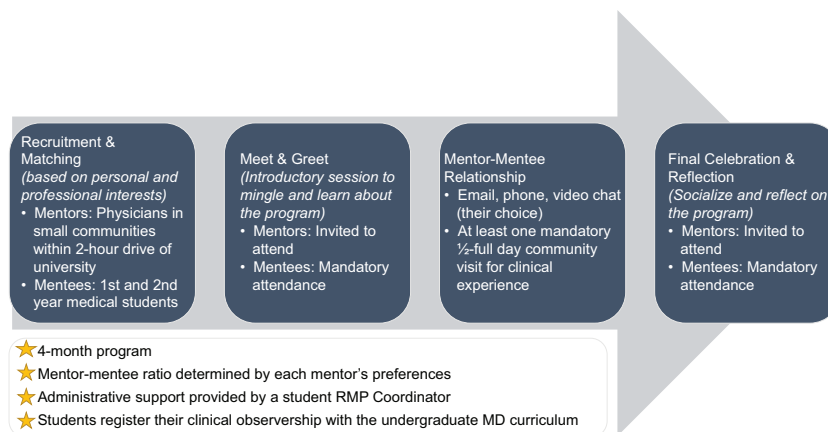


Figure 1: Process overview of the rural mentorship programme.

Orillia and Port Perry). We used the Rural and Northern Healthcare Panel definition of “rural” when establishing this mentor network: ‘A rural community is one that has a population of <30,000 people and is located >30 min in travel time from a larger community’.¹⁸ Mentor-mentee matches are based on the described personal and professional interests of both parties. One mentor can take on as many mentees as desired. Within our 4-month programme, student mentees attend an on-campus orientation meeting, communicate with their mentor, participate in one mandatory clinical visit in their mentor’s community, and reflect on their experience after programme completion. The pilot launched in Fall 2018, with mentor-mentee interactions taking place between October 2018 and February 2019.

Programme evaluation

Our accompanying programme evaluation aimed to assess the mentorship experiences of participating students and physicians by evaluating: (1) how RMP influenced students’ perceptions and intentions for rural careers; (2) the perceived benefits and challenges of the programme and (3) factors leading to RMP success. This information aimed to help establish how mentorship can practically assist urban medical schools like ours in providing rural exposure that may influence career selection.

Methods

The RMP is a complex and context-specific educational intervention where participants and

broader institutional and socio-cultural contexts together influence its success.¹⁹ We therefore used a realist-influenced methodology to dissect how and why the unique RMP structure and setting affected the experiences of rural physician mentors and urban pre-clerkship medical students interested in exploring rural medical practice.^{20,21}

A mixed methods approach using surveys with Likert scales and narrative comments, interviews and a focus group was employed. Physician mentors and student mentees were recruited to participate in the programme evaluation via E-mail and verbal announcements. Participation was voluntary and did not impact their ability to participate in RMP. All participants provided informed written or verbal consent. This project received institutional Research Ethics Board approval.

Instruments

Surveys

Quantitative and qualitative data were collected from mentees and mentors through evaluative surveys at (1) programme entry, (2) programme exit and (3) 4 months’ post programme (mentees only). Both entry surveys gathered demographic information (e.g., rural upbringing) and motivations to participate. The mentee entry survey included ratings of perceived importance of programme objectives. Mentors were asked about anticipated challenges. Both exit surveys included programme satisfaction, levels of agreement with programme objectives and intentions for ongoing mentor-mentee relationships. Narrative responses investigated perceived benefits and challenges. The mentee follow-up survey asked

about maintenance of mentoring relationships and intentions for rural careers.

Focus group/interviews

A 60-min in-person mentee focus group and 20-min web-based or telephone interviews with mentors were conducted.

Data collection

Entry surveys were distributed to all participants on programme commencement. Exit surveys were distributed immediately following programme completion and follow-up surveys 4 months thereafter. Each was completed within 3–4 weeks of distribution.

Immediately following programme completion, all mentees were invited to participate in the focus group. Mentor interviews were conducted within 8 weeks of programme completion. All were digitally recorded and transcribed verbatim.

Data analysis

Each participant was assigned a unique identifier, and data were de-identified before analysis. Incomplete surveys (<50% complete) were removed.

Qualitative

Qualitative data from surveys, focus groups and interviews underwent descriptive thematic content analysis.^{22,23} Transcripts were individually reviewed by at least 2 researchers who generated initial codes using a line-by-line inductive approach. A joint preliminary coding framework was developed and shared with the research team, agreed on, applied to all transcripts and modified accordingly until all data relevant to the research questions were accounted for. Methodological triangulation of surveys, interviews and focus groups was used.^{24,25}

Quantitative

Descriptive statistics (i.e., mean, median, mode and proportions) were performed using Microsoft Excel.

RESULTS

The RMP was a 4-month pilot running from October 2018 to January 2019. We matched

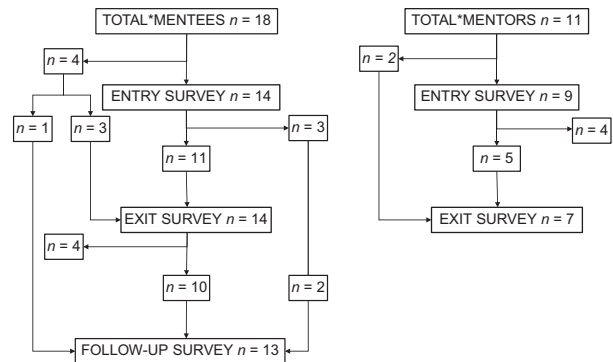


Figure 2: Flow of survey completion. *TOTAL = number of unique mentees/mentors completing at least one survey.

15 rural physician mentors with 23 first-and second-year medical student mentees. Eight mentors each took on 1 mentee; the remainder had 2 or 3 mentees each.

Participants

At least one survey was completed by 18 unique mentees ($n = 14$ entry, $n = 14$ exit and $n = 13$ follow-up) and 11 unique mentors ($n = 9$ entry and $n = 7$ exit), resulting in strong overall response rates (mentees: 78%, mentors: 73%) [Figure 2]. Several participants were lost to follow-up; some completed only the exit and/or follow-up surveys; 11 mentees and 5 mentors completed both entry and exit surveys, and 8 mentees completed all surveys [Table 1].

Five mentees participated in the post-programme focus group and 3 mentors participated in phone interviews. Most mentees completing the exit survey (86%, 12/14) participated in one community clinical experience, and 14% (2/14) participated in > 2 clinical experiences (max = 3). A discrepancy in the left-to-right arrangement of Likert scales in the Mentor Exit Survey led to inconsistent responses and necessitated quantitative data exclusion from analysis.

Programme objectives

Table 2 summarises how mentees perceived the importance of each programme objective and if the programme helped them to achieve that objective. All objectives were at least ‘somewhat important’, and 6 were achieved at least ‘very well’. Objectives 3 and 5 were less effectively achieved.

Table 1: Demographic characteristics of survey participants

	Entry		Exit*		Follow-up*
	Mentees (n=14), n (%)	Mentors (n=9), n (%)	Mentees (n=11), n (%)	Mentors (n=5), n (%)	Mentees (n=10), n (%)
Year of study					
1	5 (36)	-	4 (36)	-	2 (20)
2	9 (64)	-	7 (64)	-	8 (80)
Gender					
Male	6 (43)	4 (44)	5 (45)	3 (60)	5 (50)
Female	8 (57)	5 (56)	6 (55)	2 (40)	5 (50)
Racial/ethnic background [†]					
White	9 (64)	7 (78)	8 (73)	4 (80)	8 (80)
South Asian	3 (18)	1 (11)	2 (18)	1 (20)	0
East Asian	2 (12)	0	1 (9)	0	2 (20)
First Nations/ Indigenous	0	0	0	0	0
Other	0	3 (33)	0	1 (20)	0
Rural upbringing [‡]					
0	10 (71)	1 (11)	8 (73)	1 (11)	8 (80)
<25	1 (7)	1 (11)	1 (9)	0	0
25-49.9	1 (7)	1 (11)	1 (9)	0	1 (10)
50-74.9	0	1 (11)	0	1 (11)	0
75-99.9	0	0	0	0	0
100	2 (14)	5 (56)	1 (9)	3 (60)	1 (10)

*Only participants completing the entry survey are reported, as demographics were not collected in the exit and follow-up surveys. [†]To preserve participant anonymity, ethnicities represented by only 1 participant are reported in aggregate groups. Two mentors selected 2 groups for racial/ethnic background, [‡]Approximate time spent living in a rural community during first 18 years of life. Rural=Population <30,000 and >30 min away in travel time from a community of >30,000 people. All data are reported as n (%)

Mentee satisfaction

Mentees were very satisfied with the programme [Table 3]. Two mentees indicated dissatisfaction with some aspects (i.e., overall programme, suitability of their mentor match, communication with their mentor and visit to their mentor's community); these participants did not complete a clinical experience and/or had difficulty communicating with their mentor.

Perceived benefits

Perceptions of rural medicine

The RMP helped mentees develop stronger understandings of rural family medicine careers and lifestyles. Numerous students described greater appreciation for the broad scope, skill sets, and variety of roles of rural family physicians. One noted: 'My preceptor started with emerge but shifted to family but also doing hospital. You might not hear their scope of practice being

so broad'. Some learners commented that rural family physicians have strong relationships with patients and their communities. Overall, students and mentors stated the programme provided new perspectives about the experience of rural practice.

Intentions for a rural career

Half of mentees entered the RMP with an intention to practise rurally (21% [3/14] 'Very likely'; 28% [4/14] 'Likely'); half were undecided (50% [7/14] "Neutral"). Mentees described RMP as a helpful professional and career development opportunity that provided direction for future practice and training. 'I learned how I can seek opportunities in my training to develop the skills necessary to practise family medicine in emergency and hospital settings without necessarily having to do a plus one (i.e., enhanced skills) programme'. Several students said the experience confirmed their pre-existing interest in rural family medicine. RMP supported medical knowledge

Table 2: Mentee programme objectives

Objectives	Median, mode	
	Perceived importance	Achievement of objective
Demonstrate an understanding of social, cultural, economic, and environmental factors influencing health in rural settings	5, 5	4, 4
Discuss challenges and approaches to practicing medicine in lower resourced settings	5, 5	4, 4
Develop awareness of the diverse and changing needs of rural communities and how to address them	5, 5	3, 3
Differentiate between the scope of practice of physicians in rural and urban contexts	4, 4	4, 4
Describe nuances of navigating personal and professional relationships in the context of rural medical practice	4, 4	3, 2
Reflect on your personal and professional development goals and values.	4, 4	4, 5
Discuss relevant lifestyle considerations in career development	4.5, 4.5	5, 5
Reflect on your potential role in a rural practice setting.	4, 4	4.5, 5

Likert scale (perceived importance of each programme objective): 1-Not important at all, 2-Somewhat unimportant, 3-Neutral, 4-Somewhat important, 5-Very important, Likert scale (self-reported achievement of programme objectives): 5-Extremely well, 4-Very well, 3-Moderately well, 2-Slightly well, 1-Not well at all. n=14 for all objectives in both entry and exit

acquisition and allowed students to network in rural settings. Mentors believed RMP inspired mentees to consider future rural training or practice.

Value for mentors

Mentors volunteered with RMP because they enjoy teaching and wanted to help students and promote rural medicine. They also valued reflecting on their lifestyle and practice and were proud of their careers and accomplishments. One mentor explained, 'I was inspired by the incredible

medical students that I met. The experience also gave me renewed pride in my community and helped to remind me of the reasons I chose to work in a rural practice'. In general, mentors enjoyed sharing the benefits of careers in rural medicine.

Factors leading to programme success

Clinical experience

Mandatory community visits and clinical experiences were considered the most valuable programme components. Mentees observed clinical practice in the context of a small community, often as their 'first rural shadowing experience.' Many felt the experience was more 'hands-on' than their urban clinical experiences, given fewer mentee numbers, and with mentors who encouraged active involvement in clinical care. The clinical exposure helped mentees contrast urban and rural practice.

Authentic mentor-mentee relationship

An authentic mentor-mentee relationship was key to programme satisfaction. Mentees appreciated that mentors were invested in delivering positive experiences, were receptive to individual learning goals, and offered practical lifestyle and career insights. One mentor described the importance of relationship-building to create a supportive environment: 'A lot of things you talk to a mentor about are things that you need advice about or things you would ask in a trusting relationship. And a trusting relationship is one that you have to build'.

Balance of structure and flexibility

All participants wanted a programme with sufficient structure to limit organisational and administrative burden and enough flexibility to ensure clinical experience was scheduled at mutually agreeable times. Mentors liked the flexibility of offering clinical exposure tailored to mentee learning goals. They simultaneously appreciated provision of clear role expectations and suggestions for mentorship approaches (e.g., conversation starters provided to mentors and mentees). One mentee shared that the programme 'was an easy opportunity and low work on my part to

Table 3: Mentee programme satisfaction rating summary

Programme element	Median	Mentees rating 4 or 5, n (%)
Overall programme	5	12 (86)
Amount of information you were given about the programme	4.5	13 (93)
Online registration process	5	14 (100)
Suitability of mentor match	5	13 (93)
Meet and greet	4	13 (93)
Programme coordination	4.5	12 (86)
Communication with your mentor	5	13 (93)
Visit to your mentor's community	5	12 (86)

Likert scale: 1=Extremely dissatisfied, 2=Somewhat dissatisfied, 3=Neither satisfied nor dissatisfied, 4=Somewhat satisfied, 5=Extremely satisfied. n=14 mentees for all programme elements

make connections'. A mentor cautioned that too many administrative tasks (e.g., recruiting other mentors and completing several evaluation forms) may reduce interest from busy rural physicians.

Ongoing relationship

In the Exit survey, 79% of mentees (11/14) agreed with the statement 'I feel comfortable communicating with my mentor if I have questions'. However, in follow-up surveys, 45% (5/11) of those mentees reported 'our relationship ended when the programme was over'; 36% (4/11) maintained some degree of ongoing relationship with their mentor (2/11 were lost to follow-up). Of mentees reporting they would 'likely return for future clinical experiences' in the Exit survey (36%, 5/14), one person visited their mentor prior to the follow-up survey.

Challenges and tensions

Degree of rurality and transportation

Transportation to rural communities was the most prevalent barrier. Mentees without cars faced financial and logistical difficulties despite some public transportation availability, carpooling support, and a small travel stipend. Similarly, mentors were unable to travel into the city for the Meet and Greet and Final Celebration. Despite these transportation challenges, many mentees

commented that they desired experiences in even more rural or remote communities than those available in the RMP.

Scheduling and availability

Scheduling clinic visits was another major programme challenge. Student availability did not necessarily align with physician clinical hours; thus, 2 mentees were unable to visit their mentor's community. Furthermore, limited public transportation options and long travel times hindered students' ability to arrive at distant clinics.

DISCUSSION

We found that RMP mentees gained a stronger understanding of the work and life of rural physicians and achieved programme objectives. This group of pre-clerkship medical students were mostly of non-rural backgrounds and began the programme either neutral or already interested in rural medicine. They were satisfied with the programme, especially the clinical visit. Although most had positive mentor relationships, these relationships did not generally continue beyond programme completion. Transportation and scheduling were the main programme challenges. Positive satisfaction ratings, improved understanding of rural medicine and achievement of learning objectives provided strong encouragement for programme continuation.

The rural community visit and clinical experience were resoundingly the most valuable RMP element for both groups. Large group gatherings, in contrast, were less valued. Similarly, the Northern Ontario School of Medicine's Remote and Rural Community Placements evaluation found 1st year students placed little value in non-clinical community activities.²⁶ When developing rural curricula, clinical exposure should be prioritised as essential; positive learning experiences in rural communities attract physicians to rural practice.^{12,13}

A meaningful mentor-mentee relationship was also key to RMP success. Supportive mentors and role models facilitate valuable medical learning experiences and positive perceptions of rural medicine.²⁷⁻³⁰ Furthermore, programme factors RMP mentees noted as helpful (i.e., engaged and available mentors, lifestyle and career insights and

professional development) are consistent with a review of medical student mentorship programmes.³¹ Several such programmes have positively influenced residency and specialty choice,³² suggesting that structured rural mentorship could have a similar downstream impact.

Despite mentees' intentions to maintain mentor contact post programme, 4-month follow-ups indicated this did not generally occur in spite of general participant satisfaction with their mentor-mentee match. Our 4-month RMP appears to successfully introduce students to rural medicine for learning and career exploration; however, to increase rural physician recruitment and retention, a longer structured programme or protected curriculum time for longitudinal mentoring may be necessary. Other studies demonstrate that more intensive and longitudinal rural clinical exposure influences rural practice location more effectively than brief community experiences.^{15,17,33}

Our physician mentors also benefited from this RMP. In addition to promoting opportunities and challenges of careers in rural medicine, mentors perceived advantages similar to those described previously, including: Opportunities to improve teaching skills, reflect on values and work practices, and garner satisfaction from supporting students.^{34,35} Limiting administrative tasks like evaluative surveys appears to promote programme success, which may partly explain the paucity of published physician mentor data. Advertising physician participation benefits may attract additional rural physicians into RMPs.

A major programme challenge was transportation. We chose rural sites already associated with our institution's postgraduate curriculum and accessible within a 2-h drive. Unfortunately, as a student-run programme with limited funding and administrative capacity, we were unable to adequately support the transportation needs of all mentees, and several desired more remote rural clinical experiences. While exposing urban students to a wider range of remote and rural locations can generate stronger interest in rural practice,³⁶ it would be logistically and financially challenging for the RMP. Greater faculty and medical school programme involvement and community funding are being pursued. Virtual medicine offers a promising avenue for medical students to explore remote

clinical care, especially given telecare's increasing relevance in both rural healthcare and medical education during the COVID-19 pandemic; however further research is needed.^{37,38}

Our RMP is one of a few formal medical student RMPs in Canada and appears to be the first thoroughly evaluated. Internationally, medical schools with comprehensive 'rural tracks' (i.e., including a mentorship component) note similar benefits to RMP, but these intensive programmes are not easily comparable to our extracurricular programme being delivered by and to urban-based students.^{30,39} Given its potential value, strategising for rural medical student mentorship is an area requiring further exploration.

Limitations

Study limitations include being underpowered for comparative statistics, despite a strong overall response rate. Loss to follow-up, failure to complete the entry survey, and an exit survey error led to data exclusion. However, our mixed methods approach and data triangulation facilitated thorough exploration of the research questions. Finally, the value of RMP may be inflated because it was a voluntary rather than mandatory programme.

Future research should include a greater number of participants, longer follow-up time, and assessment of eventual mentee practice location. Future RMP improvements may include lengthening the structured programme, increasing the number of required clinical experiences, and broadening the programme to involve more remote community mentors. Our major ongoing challenge is lack of transportation to the rural communities. Increased funding, protected curriculum time, enhanced administrative capacity, and involvement of virtual medicine may address such limitations.

CONCLUSIONS

The RMP effectively helped these urban preclerkship medical students gain a stronger understanding of rural medicine. Clinical exposure and authentic mentoring relationships were key to programme success. This programme is now delivered annually by the student-run RMIG. Although its standalone impact on career

decisions cannot yet be determined, we are hopeful that this early positive experience may influence learners to pursue further rural training during clerkship and residency. This study suggests that urban medical schools can provide rural exposure through structured mentorship programmes to improve student understanding and consideration of possible careers in rural practice. To corroborate our findings, further research on rural medical student mentorship is needed.

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Have you encountered a challenging ECG lately?
In most issues of the CJRM, we present an ECG and pose a few questions. On another page, we discuss the case and provide answers to the questions.

Please submit cases, including a copy of the ECG to Suzanne Kingsmill, Managing Editor, CJRM, 45 Overlea Blvd., P.O. Box 22015, Toronto ON M4H 1N9 or email to manedcjr@gmail.com

Cardiogrammes ruraux

Avez-vous eu à décrypter un ECG particulièrement difficile récemment?
Dans la plupart des numéros du JCMR, nous présentons un ECG assorti de questions.
Les réponses et une discussion du cas sont affichées sur une autre page.

Veuillez présenter les cas, accompagnés d'une copy de l'ECG, à Suzanne Kingsmill, rédactrice administrative, JCMR, 45, boul. Overlea, C. P. 22015, Toronto (Ontario) M4H 1N9;
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