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Authorship is very personal; when acknowledged, it is a source of pride of accomplishment. When denied, it feels like an affront. It has been years but I still remember writing the first few drafts of a paper which I shared but when it was later published in a different form by my colleague, my name was not on it. That's the aspect of ownership cherished by authors.

The reciprocal aspect from the reader's perspective is accountability. Each and every author listed is responsible for the accuracy and integrity of the work as a whole. Any of the authors should be able to stand by the work and be able to investigate and resolve questions of ethics, duplicate submission, errors, libel, misconduct, fraud, plagiarism, bias, financial relationships, prior publication and the like.

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Those linked concepts of attribution, ownership and

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- Drafting the work or reviewing it critically for important intellectual content; AND
- Final approval of the version to be published; AND
- Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved'.

In the end, was I really an author of the paper that lacked my name? No, the paper had gone through several transmutations, with which I was sympathetic, but I did not review, or in the end approve, the final form. I was an important contributor, but not an author.

REFERENCE

1. Defining the role of Authors and Contributors. Available from: <https://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html>.

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Le statut d'auteur est très personnel. Lorsqu'il est reconnu, c'est une source de fierté et d'accomplissement. Lorsqu'il est refusé, c'est ressenti comme un affront. Même si cela fait déjà plusieurs années, je me souviens encore avoir écrit les premières ébauches d'un document que j'ai partagé, mais lorsque mon collègue l'a publié plus tard sous une forme différente, mon nom n'y figurait pas. C'est cet aspect de propriété qui est cher aux auteurs.

Du point de vue du lecteur, l'aspect réciproque est la responsabilité. Chaque auteur mentionné est responsable de l'exactitude et de l'intégrité du travail dans son ensemble. Chacun des auteurs doit être en mesure de défendre son travail, d'enquêter et de résoudre toutes questions en matière d'éthique, de double soumission, d'erreurs, de diffamation, d'inconduite, de fraude, de plagiat, de partialité, de relations financières, de publication antérieure, etc.

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Ces concepts liés d'attribution, de propriété et de responsabilité nous guident au CJRM dans l'interprétation des règles de l'ICMJE en matière de paternité d'une œuvre:¹

- « Contributions substantielles à la conception ou à l'élaboration de l'œuvre, à l'acquisition, à l'analyse ou à l'interprétation des données pour le travail; ET
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En fin de compte, étais-je vraiment l'auteur de l'œuvre qui ne portait pas mon nom? Non, l'œuvre avait subi plusieurs changements, dont j'en comprenais la raison je ne l'avais ni révisé ni, au final, approuvé sous sa forme finale. J'avais été un contributeur important, mais pas un auteur.

RÉFÉRENCE

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Refocusing

Rural health services are an essential part of the fabric of rural life. Despite the fact that about 19%¹ of Canadians live in rural areas, only 8%² of physicians practise in rural areas. The figure for family physicians is 14% compared to 2% of specialists.² This means that rural physicians and rural health teams will deal with higher workloads and more complex patients, all within the context of limited resources and further distances from tertiary care. Lack of a national workforce plan, lack of a service plan for communities/hospitals and a lack of a culture of societal responsibility from training and licensing institutions have led us to this problem.

The SRPC is a small organisation which hopes to inspire big changes in our current system. We had incredible success with our National Advanced Skills Training Programme and your executive and chief operating officer are working hard to find continued funding for this valuable programme. We are hard at work defining a rural health and human resource strategy to inform policymakers and educational institutions to make socially accountable decisions when it comes to training our future colleagues. We are actively working on creating what we see as the core values of rural medical education to help future practitioners see the joy in comprehensive generalist practice.

As members, you can help with this work. Please consider attending our 32nd Annual Rural and Remote Medicine Conference April 24–26/2025. This year's conference theme, 'Where the Rivers Meet: Building Bridges in Rural Medicine for a Brighter Future', is inspired by the convergence of rivers in Winnipeg, our host city. The theme symbolises the power of connection – bringing together rural healthcare professionals to share knowledge, foster community and address the challenges of burnout that have become even more pressing post-pandemic. There will be opportunities to learn and contribute to the aforementioned topics with colleagues and thought leaders. As a volunteer organisation, we will always find a place for keen and passionate colleagues who want to advance the mission of the society.

I thank you again for the work you do to support your communities. It is time for decision-makers to know that the people who grow our food, tend to our resources and protect our landscapes deserve equitable access to healthcare. Living in these places is not simply a choice, but also a privilege.

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Se recentrer

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Les services de santé en milieu rural sont un élément à part entière de la vie rurale. Bien qu'environ 19%¹ des Canadiennes et Canadiens vivent dans des zones rurales, seuls 8%² des médecins y exercent. Ce chiffre est de 14% pour les médecins de famille et de 2% pour les spécialistes.² Cela signifie que les médecins et les équipes de santé en milieu rural devront faire face à des charges de travail plus importantes et à des patients plus complexes, le tout dans un contexte de ressources limitées et de distances plus grandes par rapport aux soins tertiaires. L'absence de plan national des effectifs, l'absence de plan de service pour les communautés/hôpitaux et l'absence d'une culture de responsabilité sociétale de la part des institutions de formation et d'autorisation d'exercer nous ont conduits à ce problème.

La SMRC est une petite organisation qui espère inspirer de grands changements dans notre système actuel. Nous avons connu un succès incroyable avec notre Programme national de formation et compétences avancées. Votre directeur général et chef des opérations travaillent dur pour trouver un financement continu pour ce programme si important. Nous travaillons d'arrache-pied à la définition d'une stratégie en matière de santé rurale et de ressources humaines afin d'informer les décideurs politiques et les établissements d'enseignement pour qu'ils prennent des décisions socialement responsables lorsqu'il s'agit de former nos futurs collègues. En outre, nous travaillons activement à la création de ce que nous considérons comme étant les valeurs fondamentales d'une formation médicale rurale afin d'aider les futurs praticiens à apprécier une pratique généraliste complète.

En tant que membres, vous pouvez contribuer à ce travail. Nous vous invitons à participer à notre 32^e conférence annuelle sur la médecine en milieu rural et éloigné, qui se tiendra du 24 au 26 avril 2025. Le thème de la conférence de cette année sera: "Where the Rivers Meet: Building Bridges in Rural Medicine for a Brighter Future". Il s'inspire de la convergence des rivières à Winnipeg, notre ville d'accueil. Ce thème symbolise le pouvoir de la connexion-réunir les professionnels de la santé en milieu rural pour partager les connaissances, favoriser la communauté et relever les défis de l'épuisement professionnel qui sont devenus encore plus pressants après la pandémie. Il y aura des occasions d'apprendre et de contribuer aux sujets susmentionnés avec des collègues et des chefs de file éclairés. En tant qu'organisation bénévole, nous trouverons toujours une place pour des collègues enthousiastes et passionnés qui souhaitent faire avancer la mission de la Société.

Je vous remercie à nouveau pour le travail que vous accomplissez dans le soutien de vos communautés. Il est temps que les décideurs sachent que les personnes qui cultivent notre nourriture, s'occupent de nos ressources et protègent nos paysages méritent un accès équitable aux soins de santé. Vivre dans ces endroits n'est pas seulement un choix, mais aussi un privilège.

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Predictors of sustained rural practice

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Abstract

Introduction: Despite efforts by Canadian medical schools to recruit students who are intent on rural practice, rural communities in Canada still face disparities in their physician workforce. Our study aims to identify the variables which predict those physicians who will not only enter rural practice but will remain in rural practice.

Methods: Between 2002 and 2004, 2070 Canadian 1st-year medical students were invited to participate in an entry survey delineating career choice, attitudes and sociodemographic data. Of these, 1542 were included in a 2013 analysis to assess the influences on early practice in rural family medicine (FM), and a total of 1530 were included in the current analyses to assess influences on both mid-career rural FM practice and rural FM retention. Variables identified by bivariate analyses as being associated with rural family practice were entered into backward stepwise logistic regression analyses to identify their relative predictive strength on choosing and sustaining a career in rural FM.

Results: Of the 1530 physicians included in this study, where 88 (5.8%) physicians were practising in a rural setting in 2013, now 61 (4.0%) were practising rural FM with the remainder practising urban FM ($n = 505$; 33%) or speciality medicine ($n = 964$; 63%). Our study found that an early preference for rural practice, having parents with less formal education, being married or in a common-law relationship at medical school entry, coming from a smaller hometown and expressing a desire for a shorter postgraduate training on entry to medical school were predictive of mid-career rural practice location. We also found that having parents with postgraduate education and placing greater emphasis on medical lifestyle at medical school entry were predictive of a mid-career switch away from a rural practice location to a non-rural practice location.

Conclusion: These characteristics can be considered by medical school leaders to support the recruitment of candidates to, and retention of, physicians in rural communities.

Keywords: Health care, medical school admissions, primary care, rural medicine

Résumé

Introduction: Malgré les efforts déployés par les facultés de médecine canadiennes pour recruter des étudiants désireux d'exercer en milieu rural, les communautés rurales du Canada sont toujours confrontées à des disparités au niveau de leurs effectifs médicaux. Notre étude vise à identifier les variables qui prédisent les médecins qui non seulement entreront dans la pratique rurale, mais y resteront.

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Méthodes: Entre 2002 et 2004, 2 070 étudiants canadiens en première année de médecine ont été invités à participer à un sondage d'entrée décrivant le choix de carrière, les attitudes et les données sociodémographiques. De ce nombre, 1 542 ont été inclus dans une analyse de 2013 visant à évaluer les influences sur la pratique précoce de la médecine familiale rurale (MF), et un total de 1 530 ont été inclus dans les analyses actuelles visant à évaluer les influences sur la pratique de la MF rurale à mi-carrière et sur la rétention de la MF rurale. Les variables identifiées par les analyses bivariées comme étant associées à la pratique de la médecine familiale rurale ont été introduites dans des analyses de régression logistique pas à pas à rebours afin d'identifier leur force prédictive relative au choix et maintien d'une carrière en MF rurale.

Résultats: Sur les 1 530 médecins inclus dans cette étude, alors que 88 (5,8%) médecins exerçaient en milieu rural en 2013, 61 (4,0%) pratiquaient la MF rurale, alors que les autres pratiquaient la MF urbaine ($n = 505$; 33%) ou la médecine spécialisée ($n = 964$; 63%). Notre étude a révélé qu'une préférence précoce pour la pratique rurale, le fait d'avoir des parents moins scolarisés, d'être marié ou de vivre en union libre au moment de l'entrée à l'école de médecine, de venir d'une petite ville natale et d'exprimer le désir d'une formation postdoctorale plus courte au moment de l'entrée à l'école de médecine, étaient des facteurs prédictifs d'une pratique en milieu rural à mi-carrière. Nous avons également constaté que le fait d'avoir des parents ayant suivi une formation postuniversitaire et d'accorder une plus grande importance au mode de vie médical lors de l'entrée à l'école de médecine était un facteur prédictif d'un changement de lieu d'exercice en milieu de carrière, d'un lieu d'exercice rural à un lieu d'exercice non rural.

Conclusion: Ces caractéristiques peuvent être prises en compte par les responsables des facultés de médecine pour soutenir le recrutement de candidats et le maintien des médecins dans les communautés rurales.

Mots-clés: Médecine rurale; admission dans les écoles de médecine; soins primaires; soins de santé

INTRODUCTION

The shortage of physicians in the rural and remote regions of Canada is a well-documented and ongoing challenge.¹ Rural and remote residents face much lower access to healthcare services compared to urban residents, including having a regular medical doctor.² While rural communities are home to 18% of Canada's population, they are served by only 8% of Canadian physicians.³ These communities also face a disproportionately high mortality and morbidity rate compared to urban communities, with the disparity in the physician workforce likely a significant contributing factor.³⁻⁶

By way of their training programmes, Canadian medical schools have an important responsibility in resolving the scarcity of rural physicians. Proposed strategies to address rural physician shortages include accepting applicants from rural communities, reducing financial barriers for rural student applications and their enrolment into medical school, increasing mandatory rural undergraduate and postgraduate clinical exposure, providing adequate rural elective training opportunities, including rural physicians as clinical preceptors, hiring rural faculty members and placing rural physicians on admissions committees.⁷⁻⁹ However, despite

targeted efforts to recruit students intent on rural practice, rural communities in Canada still face disparities in their primary care physician workforce compared to urban communities.⁵

Previous research by the authors found that physicians practising rural family medicine (FM) 5–8 years after graduation were more likely than their non-rural peers to be older, in a relationship on entry to medical school, have completed school in a rural community, report a stronger societal orientation and express a greater desire for a varied scope of practice at medical school admission.¹⁰ These student attributes can aid medical schools in developing targeted engagement activities to recruit students to medical school who are more likely to practise in a rural setting. In addition to the importance of recruiting physicians to rural settings, retention of these recruits is critical with one in seven physicians leaving their rural practice in Canada within 2 years of arriving.¹¹ There is a paucity in data on the characteristics that may promote retention once practitioners enter these rural settings.^{7,9,12} Therefore, an understanding is needed of not only what variables are associated with physicians choosing to practise in rural settings but an understanding of what factors predict them staying or leaving rural practice later into their careers.⁷

Now, 14–17 years since our cohort of physicians graduated from medical school, we aim to determine the career interests, demographics and attitudinal variables present at medical school entry that predict current ‘mid-career’ rural practice. We also aim to identify any variables that predict which rural family physicians leave rural practice mid-career.

METHODS

As previously reported, between 2002 and 2004, we collected the data from students in 15 classes at 8 of 16 Canadian medical schools.¹⁰ While all medical schools were invited to participate, eight schools accepted the invitation and were included in the study. The survey, consisting of 41 items covering career choice, attitudes and sociodemographic data, was voluntarily completed by 1st-year medical students within the first 2 weeks of medical school. While students were encouraged to include their name to enable follow-up, this was not mandatory for participation. In addition, students were informed of their right to withdraw from the study at any time.

In 2013, approximately 10 years after the original medical school entry survey and 5–8 years after the students had graduated, data from the original survey were linked to the same physicians’ current practice location which was then classified as either rural or non-rural.^{13,14} From this dataset, we identified the predictors of early-career rural practice. For the current study, the 2013 dataset was linked to the physicians’ most recent practice locations. Where possible, practice locations were sourced from the 2020 Scott’s Medical Database (<https://www.scottsdirectories.com/canadian-directories/canadian-medical-directory>), a database of Canadian physicians’ areas of practice and geographic distribution. For those physicians who did not appear on the 2020 Scott’s database, searches were made in the 2019, 2018, 2017, 2016 and 2015 databases in that order. This was followed by an internet search to locate any more recent practice locations. Finally, an internet search was conducted for practice locations of any physicians not appearing in the Scott’s database at all over this time frame.

Physicians’ practice locations were then classified as either rural or non-rural using the rural and small town codes, a Canadian definition

of rurality developed by Statistics Canada, that includes locations with a population of <10,000 people.¹⁴ In order to ensure an optimal sample size for analysis, our questionnaire asked applicants if they hailed from a hometown with a population of <50,000 people.

The resulting dataset contained the data from all three time points – entry to medical school, early-career and mid-career – allowing us to identify both predictors of mid-career rural practice and predictors of leaving rural practice mid-career.

Principal components factor analysis was performed to condense the 27 attitudinal career influences from the entry survey into a smaller number of coherent attitudinal factors. Items required a minimum factor loading of 0.45, and factors had to have an eigenvalue >1 to be retained.

Bivariate analyses were used to identify the associations between current rural FM practice and both the attitudinal factors and demographic variables measured at entry to medical school. Variables identified by bivariate analyses as being statistically significantly associated with rural family practice were then entered into backward stepwise logistic regression analyses to identify their relative predictive strength.

To address the issue of rural FM physician retention, physicians practising rural FM at the time of our 2013 study, who currently remained in rural practice, were compared with those who had been practising rural FM in our 2013 study but had since left rural practice. Bivariate analyses were again used to identify differences in attitudinal and the demographic variables measured at entry to medical school between the two physician groups. Variables identified by bivariate analyses as being statistically significantly associated with rural family practice retention were entered into backward stepwise logistic regression analyses to identify their relative predictive strength.

All statistical analyses were performed in IBM SPSS, version 22 (IBM Corp. Released 2023. IBM SPSS Statistics for Windows, Version 29.0.1.0 Armonk, NY: IBM Corp). This project was approved by the Behavioural Ethics Research Board at the University of British Columbia (H21-00825).

RESULTS

While 2070 Canadian students were invited to

participate in our entry survey, a total of 1542 of these were included in the 2013 analyses to assess early practice in rural FM, and 1530 were included in the current analyses to assess mid-career rural FM practice and retention. The loss of subjects to follow-up was primarily due to incomplete data [Figure 1].

Of the 1530 physicians included in this study, 61 (4.0%) were practising rural FM with the remainder practising urban FM ($n = 505$; 33%) or speciality medicine ($n = 964$; 63%).

Factor analysis of the 27 attitudinal items on entry to medical school yielded 7 overarching factors, with only one attitudinal item, a desire for short postgraduate training, not falling within the factors and therefore included as a separate item in analyses [Table 1].

Bivariate analyses showed 8 of the demographic and attitudinal variables and factors from entry to medical school differed according to whether or not a physician was practising rural FM mid-career [Table 2].

The eight variables found to be associated with mid-career rural FM practice were then entered into a binary logistic regression analysis to determine their respective importance, with the resulting model presented in Table 3. When entry career interests were included in the regression

analysis, the predictors of sustained rural FM practice were an early interest in rural FM, having less educated parents and being married or in a committed relationship on entry to medical school. With entry career interests excluded from the model, predictors of sustained rural FM practice expanded to include being married or in a committed relationship and having less educated parents, plus growing up in a small town and desiring a shorter postgraduate training at medical school entry.

At medical school entry, 181 (11.8%) of our sample of $n = 1530$ named rural FM as their top career choice on entry to medical school with 88 (5.8%) practising FM in a rural location at the time of our 2013 study; by the current study, this had dropped to 61 (4.0%). While 40 physicians in the current study had left rural FM since the 2013 study, this was partially offset by 13 physicians moving to rural FM from urban FM practice.

Bivariate analyses were used to identify the associations between the demographic variables and attitudinal factors at entry to medical school and whether or not a physician switched or stayed with rural FM between the 2013 study and the current study [Table 4].

Compared to physicians who continued practising rural FM, those who had switched

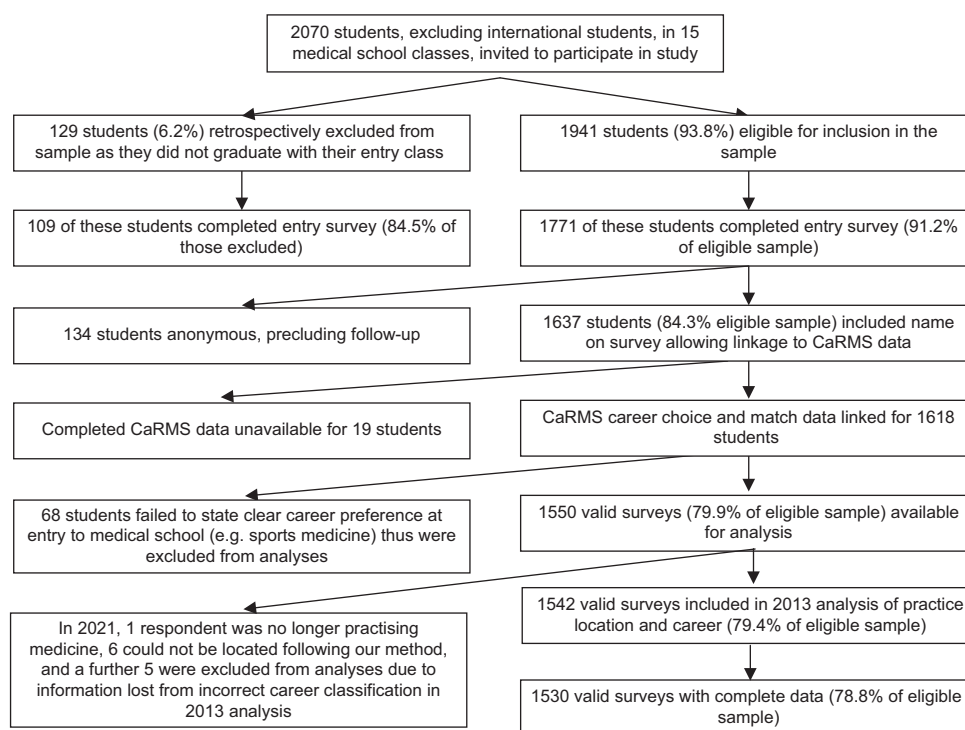


Figure 1: Recruitment and follow-up of cohort.

Table 1: Factors derived from analysis of underlying attitudinal variables on entry to medical school				
	Loading ^a	Mean (SD)	Eigen value ^b	Cronbach's alpha ^c
Factor 1 – medical lifestyle				
X: Flexibility outside of medicine	0.802	3.65 (1.11)	3.19	0.83
V: Acceptable hours of practice	0.784	3.41 (1.25)		
W: Flexibility inside of medicine	0.756	3.85 (1.02)		
N: Acceptable on-call schedule	0.737	3.34 (1.21)		
Y: Keeping options open	0.679	3.58 (1.08)		
Factor 2 – societal orientation				
U: Health promotion important	0.693	3.64 (1.17)	2.77	0.74
L: Long term relationship with patients	0.679	3.31 (1.22)		
F: Focus on patients in the community	0.669	3.33 (1.22)		
S: Social commitment	0.640	3.29 (1.26)		
D: Interesting patient population	0.544	4.27 (0.87)		
H: Focus on non-urgent care	0.500	2.67 (1.14)		
Factor 3 – prestige				
K: High income potential	0.759	2.16 (1.17)	2.65	0.74
J: Adequate income to eliminate debt	0.713	2.14 (1.31)		
M: Status among colleagues	0.693	1.92 (1.05)		
T: Stable/secure future	0.633	1.79 (1.10)		
O: Less uncertainty	0.454	2.15 (1.08)		
Factor 4 – hospital orientation				
G: Focus on urgent care	0.756	2.95 (1.25)	2.31	0.69
E: Focus on in-hospital care	0.722	2.89 (1.28)		
I: Results of interventions immediately available	0.680	3.09 (1.23)		
P: Prefer medical problems to social problems	0.514	2.54 (1.36)		
Factor 5 – scope of practice				
A: Wide variety of patient problems	0.817	3.61 (1.86)	1.75	–0.50 ^d
B: Narrow variety of patient problems	–0.703	2.74 (1.27)		
Factor 6 – role model				
Z: Meaningful past experience with physician	0.854	2.96 (1.45)	1.72	0.58 ^d
Q: Emulate a physician	0.845	2.51 (1.42)		
Factor 7 – skills and interests				
C: Good fit with skills	0.622	2.18 (1.30)	1.39	0.20 ^d
R: Research interests	0.476	2.38 (1.38)		

^aLoading represents the correlation between the item and overall factor, ^bEigen value measure the variance of the factor, ^cCronbach's alpha measures internal consistency of test scores with a 'high' alpha indicating an underlying construct, ^dOnly two component items in this factor thus r value given as $r=\alpha$ under these conditions. SD: Standard deviation

practice away from rural FM since the 2013 study were significantly more likely to have postgraduate educated parents and to have considered medical lifestyle more important on entry to medical school. No association was found between an entry career interest in rural FM and a physician staying in or switching from rural FM ($\chi^2 = 3.197$, $df = 2$, $P = 0.202$).

When the two variables found to be associated with switching from rural FM practice were entered into a binary logistic regression analysis to ascertain their respective importance, both remained highly significant [Table 5]. Compared to their peers who stayed in rural FM practice, physicians who switched away from rural FM

placed a higher value on medical lifestyle and were more likely to have parents with a postgraduate education [Table 6].

DISCUSSION

The aims of this study were to develop a model predicting mid-career rural FM practice and to develop a model predicting a mid-career switch away from rural FM practice by physicians previously working in a rural setting using variables that could be easily measured on entry to medical school. Such models may aid medical school administrators wanting to ensure an adequate supply of medical students intending

Table 2: Demographic and attitudinal differences between mid-career physicians practising rural family medicine and all other physicians

	Rural FM (n=61)	All other medicine (n=1469)	P
Demographic variables			
Age (mean years)	25.9	23.9	<0.001
Gender (% female)	54.1	57.9	0.560
Relationship status (% single)	47.5	71.9	<0.001
Hometown population (% <50,000)	39.3	20.7	<0.001
Family/friends in FM (%)	23.0	20.4	0.622
Family/friends in any field of medicine (%)	36.1	39.1	0.637
Parental education (% postgraduate educated)	23.0	45.7	<0.001
Attitudinal factors ^a			
Factor 1 – medical lifestyle	3.54	3.57	0.818
Factor 2 – societal orientation	3.60	3.41	0.060
Factor 3 – prestige	1.83	2.04	0.040
Factor 4 – hospital orientation	2.61	2.88	0.024
Factor 5 – varied scope of practice	3.89	3.41	<0.001
Factor 6 – role model	2.79	2.73	0.748
Factor 7 – skills and interests	2.09	2.29	0.066
Item AA – short postgraduate training	2.41	1.90	0.003

FM: Family medicine

Table 3: Multivariable logistic regression analysis of factors found to be significantly associated with enduring mid-career rural family medicine practice (compared to all other fields of medicine)

	n (%) or mean (SD) of those practising rural FM	Crude OR (95% CI)	Adjusted OR ^b (95% CI) including entry career choice	Adjusted OR ^c (95% CI) excluding entry career choice
Rural FM career interest on entry to medical school				
Not considered	11 (1.5)	1.0*	1.0*	
1 st choice	21 (11.6)	8.47 (4.00–17.92)	3.40 (1.38–8.42)	-
Considered but not 1 st choice	29 (4.6)	3.13 (1.55–6.31)	2.48 (1.20–5.10)	-
Relationship status				
Single	29 (2.7)	1.0*	1.0*	1.0*
Married or equivalent	32 (7.2)	2.82 (1.69–4.72)	1.79 (1.01–3.15)	1.69 (1.07–3.32)
Hometown population				
>50,000	37 (3.1)	1.0*	1.0*	1.0*
<50,000	24 (7.3)	2.49 (1.47–4.22)	1.49 (0.83–2.67)	1.86 (1.07–3.23)
Parental education				
Postgraduate studies	14 (2.0)	1.0*	1.0*	1.0*
Undergraduate or lower	47 (5.6)	2.83 (1.55–5.19)	2.18 (1.17–4.07)	2.24 (1.20–4.17)
Item AA - Item AA – short postgraduate training ^a	2.4 (1.3)	1.40 (1.16–1.69)	1.21 (0.97–1.50)	1.24 (1.00–1.53)

*Reference category. ^aFor continuous variables - each unit increase on Likert Scale is associated by the stated increase in the OR. ^bIn 70.5% of cases, the model correctly classified whether or not a physician was practising rural FM mid-career (specificity=70.6%, sensitivity=67.2%). ^cIn 70.5% of cases, the model correctly classified whether or not a physician was practising rural FM mid-career (specificity=70.9%, sensitivity=63.3%). OR: Odds ratio, CI: Confidence interval, FM: Family medicine, SD: Standard deviation

to not only enter rural FM but to be practising rurally at mid-career.

To develop a predictive model for mid-career rural practice, we used logistic regression with a dependent variable of 'mid-career practice in rural FM' versus 'a mid-career practice in some other field of medicine'. The latter group included

both specialists and urban family physicians, thus it was inevitable some differences between urban and rural family physicians would be obscured.

We found that a stated preference for rural practice, being married or in a common-law relationship on entry to medical school and having

parents with less formal education were predictive of current mid-career rural practice location. The strongest of these predictors was an early interest in rural FM with those who named it as their first-choice career being more than three times as likely to be practising rural FM mid-career than those who had never considered rural FM as an option. These findings are different to the findings from a previous study carried out with this same cohort analysed in their early career,

where those with a first-choice interest in rural FM at medical school entry were 10 times more likely to be practising rural FM than those who had not considered it.¹⁰ While still important, the influence of interest in rural FM at medical school entry wanes over these physician's practice lives in a rural setting. This fall in the predictive power of an interest in rural FM at medical school entry may be due a decline in the predictive value of this variable or to a relative increase in importance of other factors not collected in the original study at medical school entry and thus not accounted for in our model.

The challenge of a self-declared metric of interest in future rural practice at medical school entry is that it can be easily fabricated by medical school applicants if they presume it to be of value to an admission committee. In this study, students had already gained admission to medical school, so it is likely their interest in rural FM was truly

Table 4: Changes in practice type and location of our sample between 2012 and 2020

Career in 2012 and 2020	n (%)
Stayed with rural FM	48 (3.1)
Switched from rural FM	40 (2.6)
Switched to rural FM	13 (0.8)
Other	1429 (93.5)
Total	1530 (100.0)

FM: Family medicine

Table 5: Demographic associations with switching or staying in rural family medicine

	Stay with rural FM (n=48)	Switch from rural FM (n=40)	P
Demographic variables			
Age (mean years)	26.0	26.2	0.919
Gender (% female)	47.9	55.0	0.508
Relationship status (% single)	45.8	57.5	0.276
Hometown population (% <50,000)	39.6	45.0	0.608
Family/friends in FM (%)	20.8	20.0	0.923
Family/friends in any field of medicine (%)	33.3	37.5	0.684
Parental education (% postgraduate educated)	22.9	45.0	0.028
Attitudinal factors and items			
Factor 1 – medical lifestyle	3.41	3.87	0.006
Factor 2 – societal orientation	3.62	3.76	0.376
Factor 3 – prestige	1.81	1.87	0.765
Factor 4 – hospital orientation	2.67	2.49	0.317
Factor 5 – varied scope of practice	3.92	3.92	0.879
Factor 6 – role model	2.77	2.98	0.436
Factor 7 – skills and interests	2.22	1.96	0.163
Item AA – short postgraduate training	2.42	2.02	0.099

FM: Family medicine

Table 6: Associations with switching or staying in rural family medicine practice between 2012 and 2020

	n (%) or mean (SD) of those switching from rural FM	Crude OR (95% CI)	Adjusted OR ^b (95% CI)
Parental education			
Undergraduate or less	22 (37.3)	1.0*	1.0*
Postgraduate studies	18 (62.4)	2.75 (1.10–6.89)	2.74 (1.05–7.13)
Factor 1 – medical lifestyle ^a	3.9 (0.8)	2.24 (1.22–4.12)	2.21 (1.20–4.08)

*Reference category, ^aFor continuous variables-each unit increase (on Likert Scale) is associated by the stated increase in the OR, ^bIn 68.2% of cases, the model correctly classified whether or not a rural FM physician would switch from rural practice mid-career (specificity=70.8%, sensitivity=65.0%). FM: Family medicine, SD: Standard deviation, OR: Odd ratio, CI: Confidence interval

representative of their desires. However, such declarations before admission could be expected to be gamed by students. Still, assessing a medical school applicant's interest in rural practice may be an important means to support future rural practice of mid-career practitioners. In addition, it likely remains important to explore other variables that we did not access, both demographic and attitudinal, that are predictive of interest in rural practice at the time of admissions to medical school.

When regression analysis was repeated with early career preferences removed from the model, predictors of mid-career rural FM expanded to include not only having parents with less formal education and being married or in a common-law relationship on entry to medical school but also coming from a smaller hometown and expressing a desire for shorter postgraduate training on entry to medical school.

It is unclear why lower parental education was the strongest of these predictors. Research suggests a significant association between parental education beyond a baccalaureate degree and their offspring's enrolment in professional or doctorate programmes.¹⁵⁻¹⁷ While it would be expected that higher parental education would be associated with a child's higher education (i.e. a degree in medicine), it is not clear why lower parental education differentiates urban family practice from rural family practice. Given the relationship between higher postgraduate education and living in urban settings, family physicians with postgraduate educated parents are likely predisposed to select urban locations.¹⁸ It is speculation, but rural family physicians who grew up with lower educated parents may simply prioritise the attributes of rural life (i.e. more family time, closeness to extended family and community belonging).¹⁹⁻²²

When entry career preference was excluded from the model, the physician's hometown population was also found to be important in predicting mid-career rural FM practice, with those from smaller communities more likely to be practising rural FM at mid-career than those from larger communities. In our previous study, we found that students from a smaller community were 2.4 times more likely to practise in a rural community. This influence was seen to wane over time with being from a smaller community

having a smaller influence on rural practice at mid-career (1.9 times). Rural origin may be a marker for an individual appreciating the benefits of future rural life and may include the benefits of belonging to a smaller community and the subsequent lifestyle decisions of wanting to live, work and engage outside of work with like-minded individuals in a similar environment in which they were raised.¹⁹⁻²⁴ Another possible reason is the personal fulfilment of serving communities that had raised them. Finally, given ageing parents and the demands of childrearing where physicians' children may draw on their parents for their own childcare needs or their need to provide care to ageing parents, it is possible that family physicians are choosing to live near their rural-dwelling parents. It has been shown that for adults with at least one living parent or adult child, the majority had their nearest parent or adult child within 30 miles.^{25,26} It is unclear what may account for the decrease in predictive effect of rural upbringing in mid-career; however, possibilities include variables outside the scope of our study, children of the rural physician growing and moving away from the community for school, work, etc., career and educational opportunities and predictable work schedules offered in urban compared to rural settings.

We found the students who were married or in a common-law relationship at medical school entry were 1.7–1.8 times more likely to be practising in a rural location at midcareer depending on whether or not entry career preference was included in the model. This association was similar to that shown in the previous study (1.7 times) for family physicians practising in a rural setting in their early careers.¹⁰ Prior research has identified the physician partner as an important influence in a physician's consideration of practising in a rural setting.²⁷ While we found this association in early and mid-career, we did not access the physician's partner origin at medical school entry nor did we assess their partner's current vocational or non-vocational practice and interests.

Our logistic regression model excluding medical school entering career preference found that valuing short postgraduate training on entry to medical school is predictive of rural family practice mid-career. This may relate to those who are rurally inclined seeing themselves as problem solvers who are comfortable with uncertainty and wish to start practising without the benefit of

longer, or potentially greater certainty, provided by other postgraduate training programmes.²⁸

To develop a predictive model for a mid-career switch away from rural FM to non-rural FM, we used logistic regression with a dependent variable of 'switched from rural FM to non-rural FM between 2013 and 2020' versus 'remained in rural FM from 2013 to 2020'. We found that having parents with postgraduate education and placing higher importance of medical lifestyle on entry to medical school were predictive of a mid-career switch away from a rural family practice location. As we stated regarding predictors of mid-career rural practice compared to all other physicians, it is not clear why lower parental education differentiates family physicians staying in rural practice from those leaving rural family practice for a more urban practice setting. Given the relationship between higher postgraduate education and living in urban settings, family physicians with postgraduate educated parents may be predisposed to select urban locations.¹⁸

We found that physicians who switched away from rural FM placed a higher value on medical lifestyle than those who stayed practising rurally. This finding is at variance with our assumption that rural family physicians who grew up with lower educated parents may simply prioritise the attributes of rural life. This discrepancy may be due to the items contained in the lifestyle factor (flexibility outside of medicine, acceptable hours of practice, flexibility inside of medicine, acceptable on call schedule, keeping options open) do not completely capture the positive attributes of rural life.

Our study results may inform strategies to help address the rural FM shortage in Canada. We would suggest that while the academic and extracurricular merit of candidates should continue to be adjudicated, other characteristics such as candidate hometown or parental education level are important items for consideration at admissions if medical schools are to fulfil their social accountability mandate of increasing the number of rural physicians for Canada. The relationship status of a candidate cannot be utilised in admissions given that this is a protected attribute under the Canadian Human Rights Act and as such it remains crucial that the use of any demographic characteristic does not contravene this Act.²⁹ These small numbers of

findings do show that there is an enduring 'rural type' that is able to sustain a rural practice at least until mid-career. We call on others to build on our results to continue seeking ways to admit those students that will serve the healthcare needs of rural Canadians – now and into the future.

CONCLUSION

Our study is the first of its kind to demonstrate trends in the characteristics associated with practising rural FM mid-career. Our study has determined that rural interest at medical school entry is still important in predicting mid-career rural FM practice. Hometown population has become less important in predicting practice mid-career, whereas pre-medical school relationship status has become more important. Lower parental education has also been found to be an important predictor for mid-career practice. These characteristics and their trends from early career to mid-career rural FM practice may be used by medical school leaders to identify and support the candidates that will help address the ongoing critical need for physicians in rural communities.

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Factors influencing retention of International Medical Graduates in rural practice

Abstract

Introduction: Canada relies on international medical graduates (IMGs) to provide a significant proportion of primary care in rural communities. However, retaining IMGs in rural practices across Canada remains a challenge. We explored the literature to learn what factors influence IMGs' retention in rural practice and what has been recommended in the literature to address these factors.

Methods: We focused search strategies on peer-reviewed literature sources (between 01 January 2012, and 31 December 2023) that explored and identified factors connected to the rural practice retention of IMGs in Canada (and areas transferable to the Canadian context).

Results: Twenty of 1002 articles were selected. Factors were categorised as structural, professional, family, community and personal. Structural barriers identified included overall lack of support, limited access to tertiary care centres and unsustainable model of care. Professional challenges included physician burnout, limited mobility and limited scope of practice. Conversely, community integration, opportunities for spousal employment and accessible schools for children were the common facilitators of IMG retention. Key recommendations to enhance IMG retention that were identified, included: (1) providing fair contracts, funding supports, and balanced workloads; (2) having community-directed recruitment models to match physician expectations for income level, workload and spousal employment and (3) having physician-led retention support groups to help physicians adequately settle in.

Conclusion: This study identified the barriers and facilitators to IMG retention in rural medicine and mapped out evidence-based recommendations for each factor. Engaging and tailoring support strategies unique to the needs of IMGs in rural communities would improve IMG retention.

Keywords: Evidence-informed recommendations, foreign medical graduate, international medical graduate, physician retention, rural health support, rural medicine

Résumé

Introduction: Le Canada compte sur les diplômés internationaux en médecine (DIM) pour fournir une part importante des soins primaires dans les communautés rurales. Cependant, la rétention des DIM dans les pratiques

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rurales à travers le Canada reste un défi. Nous avons exploré la littérature pour connaître les facteurs qui influencent la rétention des diplômés internationaux en médecine (DIM) dans la pratique rurale et ce qui a été recommandé dans la littérature pour aborder ces facteurs.

Méthodes: Nous avons axé nos stratégies de recherche sur des sources de documentation évaluées par des pairs (entre le 1^{er} janvier 2012 et le 31 décembre 2023) qui exploraient et identifiaient des facteurs liés au maintien des DIM dans la pratique rurale au Canada, ainsi que les domaines transférables au contexte canadien.

Résultats: Sur 1 002 articles, vingt ont été sélectionnés. Les facteurs ont été classés en cinq catégories: structurels, professionnels, familiaux, communautaires et personnels. Les obstacles structurels identifiés comprenaient le manque général de soutien, l'accès limité aux centres de soins tertiaires et un modèle de soins non viable. Les défis professionnels comprenaient l'épuisement professionnel des médecins, une mobilité limitée et un champ d'action restreint. À l'inverse, l'intégration dans la communauté, les possibilités d'emploi pour les conjoints et les écoles accessibles pour les enfants sont autant de facteurs qui facilitent la rétention des DIM. Les principales recommandations visant à améliorer la rétention des DIM qui ont été identifiées sont les suivantes: 1) proposer des contrats équitables, des aides au financement et des charges de travail équilibrées; 2) disposer de modèles de recrutement orientés vers la communauté pour répondre aux attentes des médecins en matière de niveau de revenu, de charge de travail et d'emploi des conjoints; et 3) disposer de groupes de soutien à la rétention dirigés par des médecins pour aider les DIM à s'installer de manière adéquate.

Conclusion: Cette étude a permis d'identifier les obstacles et les facteurs facilitant la rétention des DIM en médecine rurale et de formuler des recommandations fondées sur des données probantes pour chaque facteur. L'engagement et l'adaptation de stratégies de soutien spécifiques aux besoins des DIM dans les communautés rurales permettraient d'améliorer leur rétention.

Mots-clés: Diplômé international en médecine, Diplômé étranger en médecine, Médecins diplômés à l'international, Rétention des médecins, Soutien à la santé en milieu rural, Médecine rurale, Recommandations fondées sur des données probantes

INTRODUCTION

The recruitment and retention of healthcare professionals, particularly physicians in rural areas remains a challenge for many countries, including Canada.¹ With a significant proportion of Canada's population residing in rural areas, equitable access to primary care must be ensured. Although efforts to increase the number of Canadian-trained physicians in rural areas are being made, many rural communities rely on international medical graduates (IMGs) to meet their healthcare needs.²⁻⁴

IMGs are physicians who have obtained their primary medical degree outside the country in which they currently practise.² They play a crucial role in providing healthcare services to underserved rural populations, thus addressing the shortage of physicians in rural areas in Canada and other countries transferrable to the Canadian context.^{3,4} However, retaining IMGs in rural practice is affected by a variety of factors which could be professional, family or community related.^{5,6} While previous studies^{4,6-12} have explored the factors influencing physician retention in rural practice, very few have focused on factors unique to IMGs, which include: cultural adaptation,² nuances in local medical practice,¹² potential language barriers,^{2,3}

recognition and acceptance by local communities,⁶ navigating licensure and certification processes² and potential gaps in region-specific medical knowledge.¹³ Research on rural physician retention in Canada and other countries such as Australia, the United States and the United Kingdom have reported evidence-based recommendations that could be transferable to the Canadian context.¹⁴⁻²⁰ Therefore, we sought to learn from peer-reviewed literature, what factors influence IMG retention in rural practice in Canada (and areas transferable to the Canadian context) and what evidence-based strategies have been recommended in the literature to address these factors.

METHODOLOGY AND METHODS

Scoping reviews are used to determine the extent, range and quality of evidence on a given area of interest where evidence is emerging.²¹ In this study, we employed a systematic approach to searching and reviewing the articles within the discipline of primary care, rural medicine and health systems using the Joanna Briggs Institute (JBI) guideline for scoping review,²² based on the Arksey and O'Malley' methodological framework.²³ We used the Preferred Reporting Items for Systematic

reviews and Meta-Analyses extension for Scoping Reviews²¹ as our reporting guideline.

We focused our search strategy on peer-reviewed literature sources that explored and identified factors connected to the retention among IMG physicians providing primary care in the rural and remote areas in Canada (or areas transferable to the Canadian context e.g. the UK, the USA, Australia and New Zealand). These factors could be intrinsic (inherently related to an individual's motivations, feelings, thoughts and processes) or extrinsic (external motivators or influences that come from outside an individual), acting as facilitators or barriers to IMG-physician-retention physicians in rural or remote areas of practice.

Protocol and registration

There was no pre-published or registered protocol before the commencement of this study.

Eligibility criteria

Table 1 provides a descriptive summary of the eligibility criteria for this study. Inclusion criteria for articles were developed *a priori* to include the following: (1) peer-reviewed articles which reported associations, predictors and relationships between IMG physicians working in rural or remote areas and determinants that influence their decision to stay or leave, (2) peer-reviewed articles carried out in rural or remote areas in Canada (or areas transferable to the Canadian context e.g. the UK, the USA, Australia and New Zealand), and (3) peer-reviewed articles published in English between 01 January 2012 and 31 December 2023. Our article search was limited to article publications post-2012 to match the period after

the Saskatchewan International Physician Practice Assessment program was implemented, to explore the advancements in retention efforts since then. Study protocols, opinion pieces, conference abstracts and dissertations were excluded.

Information sources and search strategy

We worked with an academic librarian to identify the conceptual groups of terms which we combined and individually adapted to the database-specific search. These terms included: IMG (including synonyms), rural practice (including synonyms), physician retention (including synonyms), and Canada (or areas transferable to the Canadian context e.g. the UK, the USA, Australia and New Zealand). Table 2 for search syntax generated and modified to identified electronic databases. Studies were identified by searching electronic databases and handsearching reference lists of included articles. The following databases were searched (1 January 2012, to 31 December 2023) to identify relevant articles to include in the study: Medline-Ovid; PubMed Web of Science Scopus and Education Resource Information Center.

Selection of sources of evidence

Two iterative stages were employed to select the sources of evidence for this review study. In the first stage, we screened titles and abstracts of all articles using the following keyword syntax [Table 2]: IMGs (and synonyms) AND retention (and synonyms) AND rural practice (and synonyms) and Canada (or the US, the UK, Australia, and New Zealand). In the second stage, we screened and reviewed the full-text articles of citations included from the first stage. The eligibility criteria

Table 1: Eligibility criteria

Criteria	Inclusion	Exclusion
Population	International Medical Graduate Physicians (as defined in the study)	Non-international medical graduate physician, or Canadian medical graduate physicians, other health professionals such as nurses, etc.
Place of study	Canada (or areas transferable to the Canadian context e.g., the UK, USA, Australia and New Zealand)	Areas not transferable to the Canadian context
Geography	Areas defined with each study as rural or remote	Urban, metro urban, cities
Healthcare areas	Retention, decision to move out from rural area in primary care settings	Secondary or tertiary care, medical education, medical training
Language	English	Non-English
Time period	2012–2023	Before 2012
Study type	Original studies published in a peer-reviewed journal	Opinion pieces, review studies, study protocols, case reports, dissertations, historical and grey literature

Table 2: Keyword search syntax used for library search

Population/

International adj1 medical adj1 graduate* OR Foreign adj1 medical adj1 graduate OR Migrant adj1 physician* OR overseas* adj1 trained adj1 physician* OR overseas* adj1 trained adj1 health adj1 professional.ti.ab*

Retention

Physician adj3 retention OR job adj2 retention OR job adj2 satisfaction OR fulfilment OR career adj2 advancement OR contentment OR job adj2 dissatisfaction.ti.ab

Practice geography/

Rural adj2 medic* OR rural adj1 population* OR rural adj1 communit* OR rural adj1 practice OR rural adj2 practice OR rural adj2 health OR rural adj2 health adj1 servic* OR remote adj1 area OR underserved adj1 area OR family adj2 medic* OR family adj2 practice OR family adj2 physician OR general adj2 practitioner OR general adj2 practice OR emergency adj2 medicine OR emergency adj2 practice OR emergency adj2 physician OR specialty adj2 practice OR remote adj2 health OR Medicine OR surgery.ti.ab

Location/

Canada OR Alberta OR British adj1 Columbia OR Manitoba OR New adj1 Brunswick OR Newfoundland adj1 and abj1 Labrador OR Northwest adj1 Territor* OR Nova adj1 Scotia OR Nunavut OR Ontario OR Prince adj1 Edward adj1 Island OR Quebec OR Saskatchewan OR Yukon OR United States of America OR USA OR Australia OR New Zealand OR United Kingdom OR the UK.ti.ab

#2 AND #4 AND #6 AND #8

listed in Table 1 were used to screen the eligibility for inclusion of the article for data extraction.

Data charting process and data items

Data were extracted into Microsoft Excel (Microsoft Corporation, version 16) for data cleaning and analysis. The title fields used to extract the data from included articles were author (s)/citation, title and year of publication, study objectives, study type, study design, setting, definition of rural, methods, study characteristics (e.g. specialties, participants, sample size, age range, years of practice, years of experience, etc.), study findings (barriers, facilitators to IMG retention and recommendations to mitigate them) and study limitations.

Data synthesis and critical appraisal of included studies

We categorized the results in this review as the barriers and facilitators of IMG retention and synthesized recommendations from included articles after critically appraising each included article using the JBI critical appraisal toolkit.²⁴ We thereafter assessed the overall strength of evidence provided by each included study using the Oxford Centre for Evidence-Based medicine (OCEBM) level of evidence toolkit.²⁵ To ensure rigour, trustworthiness and credibility of results, we met bi-weekly to discuss, review and revisit our study research questions, and evaluation protocols to ensure we adhered strictly to these guidelines.

RESULTS

Selection of sources of evidence

A flowchart showing our article selection is found in Figure 1.

Characteristics of sources of evidence

Table 3 summarises the general and methodological characteristics of all 20 articles included in this study. Fourteen (70%) of included studies were published between 2012 and 2017. Fourteen (70%) of included studies were set in Canada, while 6 (30%) were in Australia. Six (30%) of included studies focused on IMG physicians alone, while the rest had a mix of IMGs and domestically trained physicians. Eight (40%) used quantitative study methods, 9 (45%), qualitative and 3 (15%) mixed methods.

Results of individual sources of evidence

Articles were included based on their relevance to answering one or more of the research questions, which included identified factors that challenged or motivated IMG retention in rural medical practices. We also extracted evidence-based recommendations for policy and practice that could address these identified factors.

Synthesis of results

Tables 4 summarise the factors (barriers and

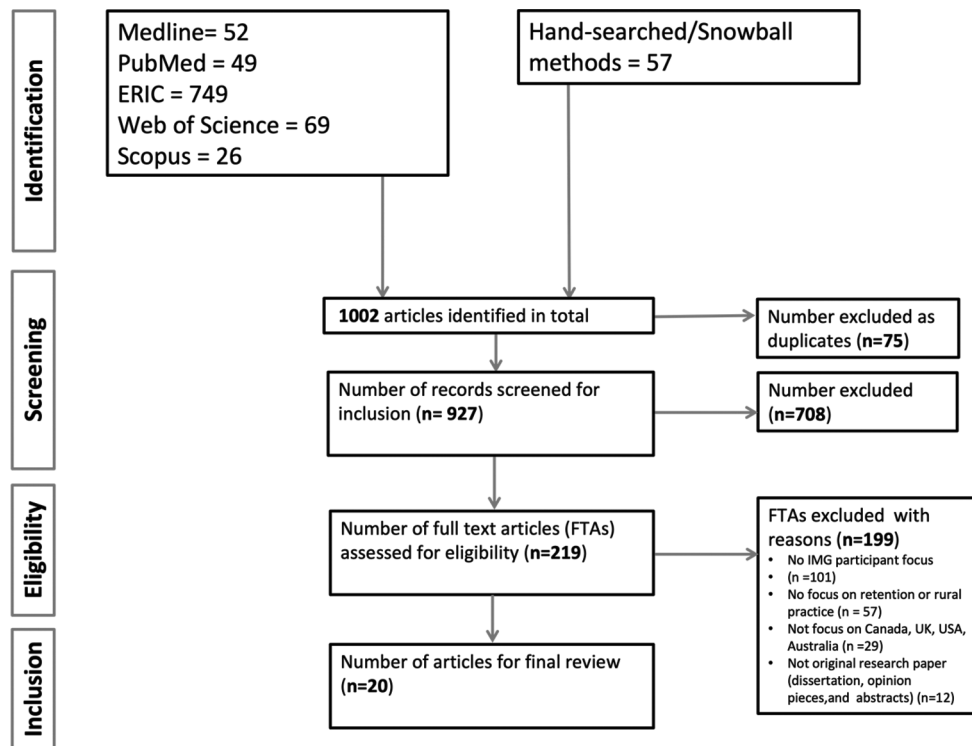


Figure 1: Preferred Reporting Items for Systematic reviews and Meta-Analyses flowchart showing selection of articles for scoping review. FTAs: Full-text articles, ERIC: Education resource information center.

	<i>n (%)</i>	Article citation
Publication year		
2012–2017	14 (70)	5,26-28,31,32,34,35,37,40,41,52,56
2018–2023	6 (30)	21,29,30,33,36,38,39
Country		
Canada	14 (70)	5,26-31,34-36,40,41,52,56
Australia	6 (30)	32,33,37-39,41
New Zealand	0	-
UK	0	-
USA	0	-
Rural definition		
Definition of rural provided	12 (60)	5,26,27,31,34-36,38,40,41,52,56
Definition of rural not provided	8 (40)	28-30,32,33,37,39,42
Physician category		
Studied IMGs alone	6 (30)	36,37,39,40,42,52
Studied IMGs mixed	14 (70)	5,26-35,38,41,56
Study type		
Quantitative	8 (40)	26,32,33,35,40,41,52,56
Qualitative	9 (45)	5,27,29,30,34,36-38,42
Mixed methods research	3 (15)	28,31,39
Data collection methods*		
Primary data	16 (80)	5,27-31,33-42
Structured questionnaire	7 (35)	28,31,33,35,39,40,41
Interview/focus group discussions	12 (60)	5,27-31,34,36-39,42
Secondary data (data registry)	5 (25)	26,32,41,52,56

*Multiple overlap for cited studies. IMGs: International Medical Graduates

facilitators) that influence IMG retention in rural practice thematised accordingly as: structural factors, professional factors, family factors, community factors and personal factors. These themes encompass the common factors that influence IMG retention in rural practices, with further subthemes providing detailed insights. Major themes are identified for each of these factors with attending subthemes elucidating on major themes.

Factors that challenge international medical graduate retention in rural practice (barriers)

The most common factors challenging IMG retention (identified by frequency count) were professional and structural factors, followed by family related factors, then community factors, and personal factors. Healthcare systemic institutional issues^{5,26-35} (which included overall lack of support,^{30,35} limited access to tertiary care centres,^{27,28,30-34} unsustainable model of care²⁸⁻³⁰ and poor infrastructure/innovative drive^{5,30}) along with physician burnout,^{26-28,30,34-38} poor physician wellness supports,^{30,34,36,37} and excessive workloads,^{26,27,30,34,39} limited mobility and scope of practice for IMGs,^{5,27,30,32,34} and a lack of opportunity for professional development in rural areas,^{27-35,38,39} were tied as the most common identified barriers to IMG retention in rural practices. Other barriers included poor community support,^{27,28,31,33-36,39} disintegration and engagement,^{30,31,36,39} family related factors, such as: lack of spousal employment/career advancement,^{5,26-28,30,31,33,34,36,39} poor education facilities/opportunities for kids,^{27,30,31,33} lack of professional support or collegiality^{5,27,31,34,37-39} and personal dislike for rural lifestyle^{5,34} or remote areas.^{31,32} See Table 4 for more descriptions on barriers challenging IMG retention in rural practice.

Factors that facilitate international medical graduate retention in rural practice (facilitators)

The most common factors facilitating IMG retention were community, family-related factors, professional and personal factors. Our study identified community integration, which includes community friendliness,^{5,26-28} trust,^{30,31} intimacy,^{34-36,38-40} diversity^{35,36,39,40} and engagement,^{5,27,28,31,36,38,39} to be the most common facilitator for IMG retention. Next were spousal factors such as opportunities for spousal employment,^{5,26-31,36,39,40} spousal support

for family to stay in rural areas,^{5,26-28,30,31,34,36,39,41} strong and accessible education system/childcare services for children^{26-32,36,40} and opportunities for recreation/entertainment.^{27,31,42} The nature, structure and scope of practice were identified as another facilitator to IMG retention in rural practice.^{5,27,29,30,32,34,36-41} These included practice set-up, positive work environment,^{5,27,30,34,36-39} collegial support,^{5,27,30,34,38,39} practice independence/ownership,^{27,32} and balanced work schedules.^{5,27,36-38} Other facilitators to IMG retention in rural practice are further described in Table 4.

Recommendations to enhancing retention of international medical graduates in rural communities

We identified the recommendations to enhance IMG retention in rural communities in our study [Figure 2]. These recommendations were further mapped to address the factors identified to influence IMG retention in rural practice. The most common recommendation was to engage IMGs and communities in enhancing retention by providing support strategies (e.g. funding support, fair contracts, moving and retention allowances, etc.) for IMG spouse and family.^{5,27,29,31-33,37,39} Other recommendations that cut across structural, professional to family-related and personal factors included: Professional and social inclusion in rural practice, employing a mix of IMGs and locally trained physicians alike, building team support systems (supports for self-care, continued professional development, balanced workloads, innovation, leadership, etc.), providing suitable resources to conduct work with flexible schedules having physician-led retention support groups in community to figure how best to help physicians settle in adequately, having community-directed recruitment models where communities match expectations for income level, workload, amenities for rural physicians, spousal employment and children education opportunities.^{27,28,34,36,37,39}

DISCUSSION

The retention of IMGs in rural practice is crucial to ensure sustainability of rural healthcare services and the well-being of rural communities. Our study showed that structural/institutional, professional and family-related factors are the key determinants of IMG retention in rural

practice. Although most of these factors could be transferable to non-IMGs, we also found that, for IMGs, the challenges of rural practice are exacerbated by the additional barriers of cultural and religious differences, language barriers, unfamiliarity with the local healthcare system and workplace/community discrimination or hostility.

We thematised our results for the ease of comprehension and level of importance (i.e. structural, professional, family, community and personal) with regard to informing strategic changes. We categorised the modifiable factors as extrinsic (structural, professional and community) and nonmodifiable as intrinsic (e.g. family and personal). However, we acknowledge there is an intricate interplay between these factors which is crucial to informing the retention of IMG in rural communities. This interplay can be seen in how extrinsic and intrinsic factors influence each other and collectively impact the decision-making process of IMGs regarding rural practice. For example, a supportive professional environment (extrinsic) that offers autonomy and a broad scope of practice can make rural practice more appealing, potentially outweighing personal or family concerns (intrinsic) about rural living. Similarly, community factors (extrinsic), such as a welcoming community and good patient relationships can mitigate personal apprehensions (intrinsic) about cultural fit and integration. Conversely, strong family ties or personal preferences (intrinsic) might lead a physician to seek out rural opportunities that offer a better work-life balance or align with their values, despite potential challenges related to structural or professional factors (extrinsic). This intricate interplay highlights the need for a holistic approach to strategies aimed at enhancing IMG retention in rural communities, addressing both modifiable and non-modifiable factors to create a supportive and attractive environment for IMGs and their families. Several studies^{5,7,9,10,15,27,36,43-45} have highlighted and corroborated the relationships between these factors and how they enable or de-motivate IMG retention in rural practice.

We found from our study that community factors matched with professional and structural factors served as the most important drivers of IMG retention. These are corroborated in similar studies^{46,47} exploring physician recruitment and retention in Canada, Australia and some parts of

the United States.^{2-4,7,8,11-13,16,48-52} These studies have highlighted community integration as the singular most important facilitator for IMG retention in rural areas while acknowledging the value of having a well-structured healthcare system, broadened scope of practice and autonomy for the rural physician workforce.^{2-4,7,8,11-13,16,46-54} In this context, it's important to recognize that individual preferences and personal factors, such as age, gender and one's prior place of residence, identified in our study, are aspects that are less amenable to change.

Solutions to the issues impacting physician workforce in rural practices are complex and multifaceted. As such, it is essential to acknowledge that addressing the shortage of healthcare professionals, particularly IMG physicians in rural communities, requires a multifaceted approach that takes into consideration the factors identified in this study, and the unique needs of rural communities in question.⁴⁶ Policies to encourage IMG physician retention in rural Canada should be tailored^{52,55} for IMGs due to the unique challenges and circumstances faced by this physician group as identified in our study results.

In mapping out recommendations for enhancing IMG retention in our study, we categorised them into two overlapping groups for ease of understanding: extrinsic, which include practical recommendations based on modifiable factors of IMG retention and intrinsic, which includes non-practical or non-modifiable solutions. Again, the role of community was highlighted as a crucial factor in retaining IMGs in rural practice. Key recommendations for community involvement include community-directed recruitment, providing support for spousal employment opportunities and education for families, involving the community in the design of payment models, compensation and allowances and providing community structural supports to combat workplace discrimination, racism and promote inclusivity, community connectedness and engagement.^{5,27,36,37} However, it is also important to note that physician institutional bodies (such as, the Canadian Medical Association and the Society of Rural Physicians of Canada in Canada; or the Australian Medical Association and the Rural Doctors Association of Australia in Australia) as well as non-IMG physicians and other healthcare practitioners, have a role

Table 4: Factors influencing physician retention in rural practice

Factors	Theme	Descriptions making it more likely to move	n (%)	Article citation
Barriers				
Structural	High workforce turnover rates	Low staffing and high turnover rates of other staff in rural practice ^{5,28,34}	3 (15)	5,28,34
	Healthcare systemic/institutional issues	Overhead costs of running a clinic not commensurate to financial income ^{26,27} Poor/lacking continuity of care ²⁸⁻³⁰ Non-sustainability in model of care delivery ^{27,28,33} Limited access to tertiary care centres for referral, specialists, and allied health care professionals ^{27,28,30-34} Poor medical infrastructure/practice set-up and innovative drive (i.e., preserving the status quo) ^{5,30} Overall lack of institutional support ^{30,35}	11 (55)	5,26-35
	Systemic racism/discrimination	Racism/discrimination and workplace harassment in the system and among staff/colleagues ^{26,34,37}	3 (15)	26,34,37
Professional	Financial burden	IMGs on special funded return-of-service related to residency ⁵⁶	1 (5)	56
	Limited mobility and scope of practice attached to contracts	Limited mobility from limited freedom to choose versus mandated employment based on contract. ⁴⁰ E.g., conditional licenses, ⁴⁰ mandatory return-of-services for IMGs, ^{52,56} bonded status a 10-year moratorium, ^{33,36} and other regulatory requirements attached to contract ^{32,37} Limited scope of practice, ^{5,27} limited autonomy, and utility of skills attached to contract ^{30,32,34}	11 (55)	5,27,30,32-34,36,37,40,52,56
	Professional wellbeing	Burnout from excessive workload, excessive on-call duties, and lack of time off for vacations ^{26-28,30,34-38} Poor physician wellness supports ^{30,34,36,37} Dissatisfaction with professional life, professional relationships/underappreciation, and working conditions ^{26,27,30,34,39}	11 (55)	26-28,30,34-39
	Lack of collegiality	Disconnectedness with non-IMG colleagues ^{5,27,31,34,37-39} Misunderstanding in communication ^{34,37} Poor collegial treatment from rural and urban colleagues ^{26,27,31,34,37-39} Distrust and questioning IMG physicians' competencies ^{27,32,34,37}	9 (45)	5,26,27,31,32,34,37-39
	Lack of opportunity for professional development	Lack of opportunities for career advancement or personal development ^{27,29,34,35,38,39} Distance from training sites for CME/CPD ^{28,30,31,34}	11 (55)	27-35,38,39
	Lack of financial incentive	Lack of financial support for workload and overtime ^{5,26-28,30,33,34} Inflexible payment models ³⁰	8 (40)	5,26-28,30,31,33,34
	Balancing professional and personal boundaries	Loss of anonymity (i.e., maintaining health personal-professional boundaries) ^{31,34}	2 (10)	31,34

Contd...

Table 4: Contd...				
Factors	Theme	Descriptions making it more likely to move	n (%)	Article citation
Barriers				
Family	Nature/ characteristic of patient	Complex patient panel ³⁰	1 (5)	30
	Spousal/family determinant factors	Being married to a non-physician male spouse ⁵² Spouse living in the prairies of Canada ⁴¹ Spouse born in Asia or Africa ⁴¹ No family or friend in community or living close by ³⁴	3 (15)	34,52
	Family intention to move out brought by:	Lack of spousal employment ^{5,26-28,30,31,33,34,36,39} No spousal support/agreement to stay ^{5,27,30,31,34,39} Lack of opportunities for spouse to advance career/education ^{27,30-33,39} Poor education facilities for kids ^{27,30,31,33} Unmet collective family needs ^{27,33,34,36} (e.g., health, safety)	10 (50)	5,26-28,30-34,36,39
	Remoteness and distance	Area too remote ^{27,31,33,34,39} Extreme distance to family members ^{31-34,39} Long distance to good education ^{27,30-34,36,39} Long distance to entertainment/leisure amenities ^{27,31,33,34} Long distance to cultural and religious events ^{31,33,34,39}	8 (40)	27,30-34,36,39
	Community disintegration	Poor community engagement/engagement activities ^{27,28,31,33-36,39} Lack of cultural diversity and acceptance/cultural and ideological differences (including cultural and religious opportunities to thrive) ^{30,31,36,39} Lack of professional community and/or professional networks ^{27,31} Community insecurity and privacy ^{31,34} Poor community support for IMG physicians ^{27,31,33,34,39}	9 (45)	27,28,30,31,33-36,39
Personal	Language barriers	Inability to understand and/or communicate with community members and to be understood by community members ³⁴	1 (5)	34
	Nature and historical traits	Harsh weather conditions ³⁰ Poor community traits/peculiarities ^{30,38}	2 (10)	30,38
	Social determinants/ personal characteristics	Age: Younger IMGs ^{26,32} Gender/marital status: Female and married IMGs, ^{26,52} male and single IMGs ²⁶ Residence/immigration: Immigrated from Africa, ^{26,41} IMG moving from city to rural area following immigration ^{26,32,40} Language barriers ²⁶	5 (25)	26,32,40,41,52
	Personal preferences	Poor financial incentive/high living cost ^{26,27,35} Long distance from work ^{31,32} Dislike for rural areas ^{5,34} Unbalanced social life ³⁴ Very small community size (challenging personal-professional balance of boundaries, and personal privacy) ^{31,34}	7 (35)	5,26,27,31,32,34,35

Table 4: Contd...

Factors	Theme	Descriptions making it more likely to move	n (%)	Article citation	
Facilitators					
Structural	Nature and structure of payment models	Multiple options in remuneration structure ^{27,30,34,39} Adequate modes of remuneration ^{27,30,34,39}	4 (20)	27,30,34,39	
	Institutional support for IMGs	Innovation/improved medical facilities ^{5,27,34,39} Freedom to choose/goodness of fit test ^{5,27,34,39} Compensation/additional incentive for migration decisions to rural practice (relocation support) ^{5,27,30,34,35,39}	6 (30)	5,27,30,34,35,39	
Professional	Nature and structure of work	Practice set-up (positive work environment, interprofessional team focused care, continuity of care/practice) ^{5,27,30,34,36-39} Broad scope of work, autonomy, and duties as a physician (enhancing skill development) ^{5,27,29,30,32,34,36,38} Balanced work schedule ^{5,27,36-38} Practice ownership/independence ^{27,32} Affiliation to academic center ^{27,32}	10 (50)	5,27,29,30,32,34,36-39	
	Collegial support	Presence of specialist support ^{27,34,38,39} Supportive and friendly peers and colleagues ^{5,27,30,34,38,39} Friendly staff and solid workforce ^{5,27,34,38,39}	6 (30)	5,27,30,34,38,39	
	Professional advancement	Availability and access to CME/CPD activities/opportunities to teach/personal and career development ^{27,29,30,35,38,39}	6 (30)	27,29,34,35,38,39	
	Financial and non-financial incentives	Physician compensation ^{5,27,30,34,35,39} (e.g., signing bonuses, housing, education, reimbursements for travel expenses, relocation support, retirement plans) Financial incentives relative to workload ^{27,34,35,39}	6 (30)	5,27,30,34,35,39	
	Family	Spousal and family determinant factors	Being married to a non-physician female spouse ^{31,52} Married with children ^{31,41} Having other family member living together ^{27,31} (mother, mother in-law, father, cousins, etc.) Having other family and/or friends living close ^{27,31,33}	5 (25)	27,31,33,41,52
		Spousal benefits	Spousal support to stay ^{5,26-28,30,31,34,36,39} Opportunities for spousal employment (two income earning power) ^{5,26-31,36,39,40} Spouse having a rural background ^{27,31,34} Spouse having ties to specific community ^{27,31,34} Opportunities for networking and professional development ^{26,27,31,39,40} (for non-physician spouses)	11 (55)	5,26-31,34,36,39,40
		Children benefits	Strong education system/childcare services within community and/or access to one close to community ^{26-32,36,40} Opportunities for recreation entertainment, leisure for children and/or access to one close to community ^{27,31,34} Opportunities to make friends with other children ^{27,31} Safety of children ^{30,31}	10 (50)	26-31,34,36,40

Contd...

Table 4: Contd...				
Factors	Theme	Descriptions making it more likely to move	n (%)	Article citation
Facilitators				
Community	Collective family benefits	Collective desire of family to stay ^{27,28,31,34,39}	5 (25)	27,28,31,34,39
	Community integration	Community friendliness, trust, intimacy, and warmth ^{5,26-28,30,31,34-36,38-40} Cultural diversity ^{35,36,39,40} Strong community engagement ^{5,27,28,31,36,38,39} and integration both professionally and non-professionally ^{26,31,39,40} Community appreciation and support for IMGs, families, and members ^{5,27,30,31,33,34,39} Community safety and privacy ^{31,34} Community inclusivity of other cultural and religious activities ^{31,39,40} Strong community leadership and administration in fundamental needs provision ^{27,31,34} (health, education, recreation)	13 (65)	5,26-28,30,31,33-36,38-40
	Nature, location, and access	Location relative to accessing basic amenities ^{27,36,39} Peculiar community attractive traits such as natural environment for fun, weather tourist attraction, sports ^{5,30,34,36,38} Access to transport, easy mobility, motorable roads, access to other communities, and the city ^{27,31,34,39}	8 (40)	5,27,30,31,34,36,38,39
	Social determinants/ personal characteristics	Age: Older aged IMGs ⁴¹ Gender/marital status: Male and married ^{52,41} Residence/immigration grew up in a rural area; born or immigrated from the USA, ⁴¹ less years since arrival to rural area, ⁴¹ moving from rural-to-rural area following immigration ^{27,34,40} Currently studying ⁴¹	5 (25)	27,34,40,52
Personal	Personal preferences ³⁸	Preference for rural lifestyle ^{5,27,28,30,34,36,38} Having rural background/previous rural experience ^{5,27,30} Good proximity to work ^{31,35} Having ties to specific community ²⁷ High income/compensation ^{33,34} Relatively larger rural areas ^{31,34} Low cost of living ³⁵	10 (50)	5,27,28,30,31,33-36,38

IMGs: International medical graduates, CME/CPD: Continuing medical education/continued professional development

to play in supporting IMGs to settle in rural communities. In addition, our study highlighted the role of financial supports to incentivise IMG retention in rural areas in Canada (and Australia). These financial incentives should be considered in light of identified IMG retention barriers and combined with strategies tailored to address these unique challenges faced by IMGs to ensure their long-term retention.^{11,34} In summary, our

study recommendations can be captured with the word 'support', which includes support from the community, support for family, support from physician peers, and support from the structural systems that oversee rural healthcare delivery. These supports should be facilitated by engaging rural communities with the IMG physicians and key stakeholders in co-designing systems and strategies to facilitate retention.^{6,45,56}

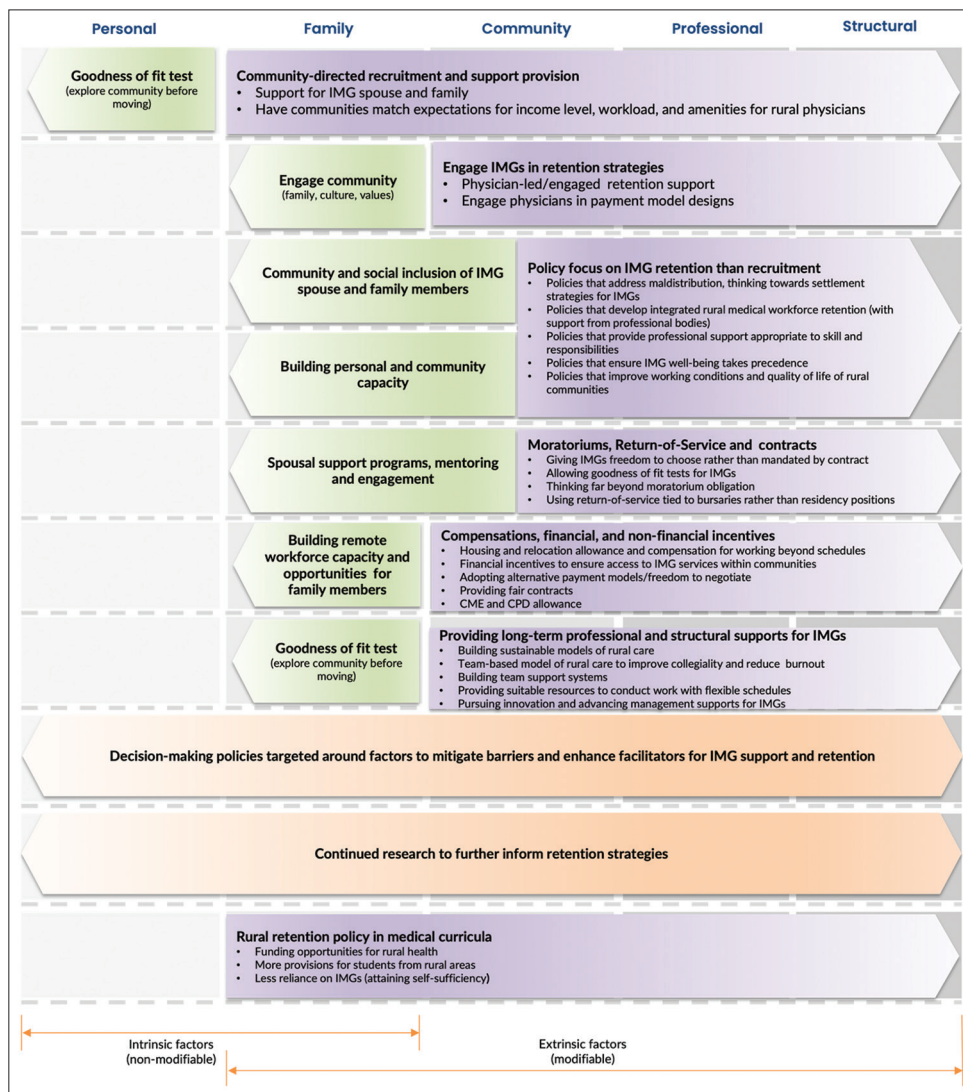


Figure 2: Recommendations to enhancing retention of international medical graduates in rural communities mapped for thematized factors. IMGs: International medical graduates.

It is noteworthy that the overall purpose of enhancing the physician workforce, whether in urban or rural practice, is to improve the quality of care delivered to patients over the long term.⁵⁷ Physician retention is critical for maintaining continuity of care and building relationships between the healthcare system and the community, which can improve patient outcomes and satisfaction. It is also crucial to acknowledge that physician retention strategies should consider the overall health and well-being of physicians themselves.⁵⁸ Physician burnout, disconnection, dissatisfaction and high turnover rates can negatively impact a physician's overall well-being as well as the quality of care they provide to rural communities.⁵⁹⁻⁶¹ Therefore, enhancing physician retention in rural communities should

go hand in hand with ensuring that physicians, including IMGs and non-IMGs, are supported physically, mentally, and professionally.

Limitations

Our study is not without its limitations. First, because of the limited scope of original studies on IMG retention in Canada, we expanded our search strategy to include studies from Australia, the USA and the UK which bear similarities in healthcare delivery for rural, metropolitan and urban areas. However, some of our findings may not be generalisable to rural areas with dissimilar settings and health system dynamics. In addition, some of the included review articles captured mixed experiences of IMG and non-IMG physicians

which may not have fully captured the in-depth experiences of IMGs in some rural areas in Canada. Third, some articles included in this review study used self-reported measures. This reliance on self-reported and/or perceived experiences further introduces limitations to our study results, as they may not fully capture objective behaviours or generalisable attitudes across broader populations due to the subjective nature of personal reporting and interpretation. Finally, the evidence for our study's recommendations is categorised as OCEBM levels III (non-randomised controlled cohort/follow-up studies) and IV (case-series, case-control and historically controlled studies), as it is based on non-randomised cohort, case-series and case-control studies without including systematic reviews or randomized trials. As such, these recommendations are more appropriately seen as informed guidance or expert opinions rather than definitive conclusions, pending further validation by higher-level evidence. Nonetheless this limitation does not negate the validity and reliability of the quality of evidence from these studies.

CONCLUSION

We identified the factors that influence the retention of IMGs in rural areas and categorized them as, structural, professional, family-related, community and personal and factors. Our results revealed professional and structural factors to be the most significant barriers to retention while community and family-related factors were the most common facilitator. Based on our evidence-based recommendations, tailored support strategies should be implemented to address the unique challenges faced by IMGs in rural communities. Our study provides important recommendations for enhancing IMG retention in rural practices, which can be applicable in Canada or other countries with similar contexts such as the UK, the USA, Australia and New Zealand.

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Ten-year retrospective study on medico-legal risk of family physicians providing anaesthesia care in Canada, 2013–2022

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Abstract

Introduction: Anaesthesiologist medico-legal risk is well reported in the literature, however, there is little data regarding the medico-legal risk of family practice anaesthetists (FPAs) in Canada. We aimed to describe the expert criticisms from medico-legal cases involving family physicians providing care within the scope of anaesthesia.

Methods: Medico-legal cases involving FPAs providing anaesthesia-related care were identified from a national repository at the Canadian Medical Protective Association. Civil legal cases, medical regulatory authority (college) complaints and hospital complaints were included in the descriptive analysis where medical coding was available. Cases were closed between 1 January 2013 and 31 December 2022.

Results: There were 50 medico-legal cases involving 50 FPAs providing anaesthesia-related care to 50 patients. At least half of the cases involved American Society of Anaesthesiologists Physical Status Classification I and II patients in an outpatient or ambulatory setting. Thirty patients experienced healthcare-related harm, of which most were classified as moderate, severe or death. Expert criticisms were mainly associated with situational awareness, clinical decision-making, documentation and communication issues with the patient, family or substitute decision-maker.

Conclusion: This study presents family physicians providing anaesthesia-related care with an opportunity to increase their awareness of commonly identified expert criticisms from medico-legal cases related to their area of practice. While the medico-legal risk we report is predominantly associated with provider and team factors, the retrospective nature of medico-legal cases makes the assessment of system factors difficult and thus requires further investigation. Nonetheless, FPAs are pivotal to and growing in number in the Canadian healthcare context and, therefore, this study could contribute to developing targeted training and education programmes to promote patient safety within their scope of practice.

Keywords: Anaesthesia, family physicians, medico-legal risk, patient safety, rural medicine

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Résumé

Introduction: Les risques médico-légaux auxquels sont exposés les anesthésiologistes sont bien étayés par la littérature. En revanche, peu de données ont été publiées sur les risques médico-légaux auxquels font face les médecins de famille exerçant l'anesthésie au Canada. Dans cette étude, nous avons cherché à décrire les critiques formulées par des expertes et experts dans des dossiers médico-légaux qui mettent en cause des médecins de famille prodiguant des soins qui relèvent de l'anesthésie.

Méthodes: Des dossiers médico-légaux portant sur des médecins de famille prodiguant des soins ayant trait à l'anesthésie ont été recensés dans une base de données d'envergure nationale à l'Association canadienne de protection médicale. Des actions civiles, des plaintes auprès d'organismes de réglementation de la médecine (Collèges) et des plaintes intrahospitalières ont été incluses dans l'analyse descriptive lorsqu'un codage médical était accessible. Les dossiers analysés ont été conclus entre le 1^{er} janvier 2013 et le 31 décembre 2022.

Résultats: En tout, 50 dossiers médico-légaux ont été recensés; ces dossiers mettaient en cause 50 médecins de famille ayant prodigué des soins liés à l'anesthésie à 50 patientes et patients. Au moins la moitié des dossiers portaient sur des cas correspondant aux niveaux I et II de la classification de l'état physique de l'American Society of Anesthesiologists, dans un contexte ambulatoire ou en clinique externe. Trente personnes traitées ont subi un préjudice découlant de la prestation de soins. Dans la majorité des cas, il s'agissait d'un événement d'intensité modérée ou grave ou encore d'un décès. Les critiques formulées par des expertes ou experts portaient essentiellement sur la conscience situationnelle, la prise de décision clinique, la tenue de dossiers et les problèmes de communication avec la personne traitée, sa famille ou la personne prenant les décisions en son nom.

Conclusion: Cette étude, qui porte sur des dossiers mettant en cause des médecins de famille prodiguant des soins relevant de l'anesthésie, est l'occasion d'éclairer ces médecins sur les critiques couramment formulées par les expertes et experts dans des dossiers médico-légaux portant sur leur champ d'exercice. Les risques médico-légaux dont nous faisons état dans l'article découlent principalement de facteurs liés aux médecins et à l'équipe. Cela dit, il y aurait lieu d'approfondir l'analyse des facteurs systémiques; la nature rétrospective de l'examen des dossiers médico-légaux rendant cet aspect difficile à évaluer. Il n'en demeure pas moins que le nombre de médecins de famille exerçant l'anesthésie est en croissance dans le système de santé canadien et que leur rôle y est incontournable. Cette étude pourrait servir de tremplin à l'élaboration de programmes de formation ciblés pour promouvoir la sécurité des soins dans ce champ d'exercice.

Mots-clés: Anesthésie, médecins de famille, risques médico-légaux, sécurité des patients, médecine rurale

INTRODUCTION

The history of general practice anaesthesia as a distinct subspecialty of general practice started around the 1970s. General practice anaesthetists (GPAs) were expected to complete a 6-month training programme approved by the Royal College of Physicians and Surgeons to receive hospital anaesthesia privileges. In 1988, the Association of Canadian University Departments of Anaesthesiology required a minimum of 1 year's training to acquire the range of skills necessary to deliver such anaesthesia care that included critical care, paediatric and adult anaesthesia, in rural communities.¹ Family practice anaesthetists (FPAs) have since provided an essential service to small hospitals in Canada. Ten-year physician billing data from 2011/12 to 2020/21 indicated that nerve block

procedures performed by FPAs in Canada have doubled to 27% and FPAs performed 19%–21% of total anaesthesia and other anaesthesia procedures.²

Patient safety is a hallmark of anaesthesia practice. Clinical care algorithms, research, behaviour change approaches and rigorous training programmes have helped in making the delivery of anaesthesia safer for patients.^{3–6} New technologies, protocols, guidelines and cognitive aids taught during the training of graduates have resulted in improving care across urban and rural communities in Canada.^{7–10} Physicians providing anaesthesia-related care have benefitted from research from around the world through the National Audit Projects in the United Kingdom, the American Society of Anesthesiologists (ASAs) Closed Claims Project in the United States and the Canadian Medical Protective

Association (CMPA) closed medico-legal cases in Canada.¹¹⁻¹³

The CMPA supported an analysis of civil legal cases in 2007–2016 involving airway-related anaesthesia performed by Fellow of the Royal College of Physicians of Canada (FRCPC) anaesthesiologists.¹³ The study identified areas for practice improvement for anticipated and unanticipated difficult airway management. The findings from Crosby *et al.* may not be generalisable to FPAs. Therefore, this study reports the number of closed medico-legal cases supported by the CMPA between 2013 and 2022 involving FPAs and describes the expert criticisms linked to the FPA's care. This information could be used to inform quality improvement or education initiatives for anaesthesia-related care provided by FPAs in Canada. Further, FPAs will be able to increase their awareness of current issues associated with medico-legal risk within their scope of practice.

METHODS

Study design

The CMPA provides medico-legal support, advice and education to its over 110,000 physician members, including trainees, in Canada. The CMPA also uses its medico-legal repository to conduct safe medical care research. The repository relies on physician members to voluntarily contact the CMPA and submit materials when seeking advice or support for medico-legal matters. We performed a retrospective study of medico-legal cases supported by the CMPA that were closed between 1 January 2013 and 31 December 2022. Cases included civil legal matters, medical regulatory authority (college) complaints and hospital complaints.¹⁴

Case selection

Cases were eligible for inclusion if the case was coded and contained a family physician who had provided anaesthesia-related care. General practice physicians were included and considered synonymous to family physicians due to similarities in anaesthesia training programmes. Medico-legal cases assisted by the CMPA are routinely coded using the contributing factors framework.¹⁵ An overview of how medico-legal cases were coded by

the CMPA has been described elsewhere.¹⁴ Cases were identified for inclusion using Statistical Analysis System (SAS) Enterprise Guide 8.3 to select for cases that included a family physician who had provided anaesthesia-related care and that the case contained medical coding. If the same patient incident had more than 1 medico-legal case, then only the highest case ranking was retained (civil legal matters > regulatory college complaints > hospital complaints). Cases were manually reviewed to remove cases that involved corticosteroid injections into the joint, obstetrics or where cases did not relate to the anaesthesia care provided by the family physician.

Data collection

Confidentiality for both patients and healthcare providers was ensured by de-identification of the data. SAS was used to abstract frequency data which included the case type, population size where care was provided, care location, years of practice as a family physician, patient harm [Appendix 1], ASA physical status classification and contributing factor classifications.

Data analysis

Two authors (AS and KL) manually reviewed peer-expert opinions assessing the care of the FPA. Examples pertaining to the categories of the contributing factor classifications [Appendix 2] were written as composites representative of issues identified by the peer experts. Composites were written such that anonymity was reasonably maintained by removing identifying components (e.g. locations, names, dates and overly specific case details).

Ethics

Ethics approval was obtained from the Canadian ethics review panel of the Advarra Institutional Review Board (PRO00020829) in compliance with Canada's Tri-Council Policy Statement on the Ethical Conduct for Research Involving Humans (TCPS 2).

RESULTS

Case, physician and patient characteristics

Case, physician and patient characteristics are

Table 1: Case characteristics for closed medico-legal cases involving family physicians providing anesthesia-related care, 2013–2022 (n=50 cases; 50 physicians; 50 patients)

Characteristic	n (%)
Case type	
Civil-legal action	22 (44)
College and hospital complaints	28 (56)
Population size where care was provided	
Rural and small urban (<30,000)	36 (72)
Medium urban (30,000–99,999)	9 (18)
Large urban (≥100,000)	5 (10)
Care location	
Outpatient and ambulatory care	30 (60)
Inpatient	20 (40)
Physician years of practice	
≤10	22 (44)
>10–20	10 (20)
>20	18 (36)
ASA physical status	
1	13 (26)
2	18 (36)
3	6 (12)
4	2 (4)
5	0
Not applicable or unknown	11 (22)
Patient harm*	
None or mild	6 (13)
Moderate** or severe	14 (26)
Death	10 (17)
Inherent risk	6 (12)
Not applicable	14 (32)

*Patient harm categories defined in Appendix 1, **Moderate harm classification was not a classification before 2017. ASA: American Society of Anaesthesiologists

summarised in Table 1. The CMPA coded and closed 12,771 cases between 2013 and 2022 involving family physicians. From these cases, we identified 50 medico-legal cases that met inclusion criteria. Cases were evenly represented by civil-legal action and college or hospital complaints. Care was predominantly provided in outpatient and ambulatory care within rural and small urban settings with a population <30,000.

The 50 cases involved 50 family physicians providing anaesthesia-related care to 50 patients. Nearly half (22/50) of named physicians had 10 or less years of practice [Table 1]. Thirty-one patients had an ASA physical status of 1 or 2, and 60% of the patients experienced healthcare-related harm [Table 1]. Despite well-managed care, 6 patients encountered harm related to inherent risks of the investigation, medication or treatment provided.

Contributing factors

In 33 (66%) of the 50 cases, peer experts criticized aspects of care related to provider, team or system factors [Table 2]. Each case may have criticism associated with 1 or more of these factors. Table 2 provides additional subcategories for provider and team factors, which were identified in 76% and 64% of cases containing peer expert criticism, respectively.

Provider factors relate to a healthcare provider's decisions, actions or influences which contributed to a patient safety incident, increased the risk of an incident or negatively affected the physician and patient relationship. In the 25 cases that contained criticism linked to provider factors, our analysis indicated that the most common factors related to clinical decision-making and situational awareness. These themes are associated with the healthcare provider's ability to make appropriate decisions about tests and investigations as well as to interpret, understand and make inferences based on the information gathered. Specifically, in 13 and 10 cases, a deficient assessment or insufficient knowledge/skill was identified as a criticism, respectively. Anonymized, composite examples of provider factors are provided in Table 3.

Coordination of healthcare requires team interaction. In our analysis, the patient is considered part of the healthcare team reflecting the importance of communication and documentation amongst team members. In the 21 cases that contained criticism linked to team factors, our analysis indicated that the most common factors related to documentation for the medical record and communication with the patient, family or substitute decision-maker. Specifically, 5 of 9 cases, where criticisms of communication with the patient, family or substitute decision-maker were present, were related to consent processes. Anonymized, composite examples of team factors are provided in Table 4.

With the increasing complexity of patients and increasing burden of administrative tasks on family physicians, expert criticism of system factors was identified in 3 cases. Due to confidentiality with respect to small case numbers, no composite examples are provided, however, cases were related to inadequate protocols, insufficient resources and inefficient clinical practices within an office setting.

Table 2: Contributing factors in cases with peer expert criticisms of family physicians providing anaesthesia-related care, 2013–2022 (n=33 cases)

Contributing factor classification	n (%)*
Provider factors	25 (76)
Clinical decision-making (e.g., deficient assessment, failure to perform a test/intervention)	18 (55)
Situational awareness (e.g., insufficient knowledge/skill, inadequate monitoring or follow-up)	14 (42)
Procedural violations (e.g., deviation in clinical procedures or clinical practice guidelines)	6 (18)
Team factors	21 (64)
Documentation issues	12 (36)
Communication breakdown with patient, family, or substitute decision-maker	9 (27)
Communication breakdown and coordination of issues between physicians	4 (12)
System factors**	3 (9)

*There may be more than 1 contributing factor on a case, **Number of cases is too few to provide detail

Table 3: Case examples associated with peer expert criticisms of provider factors of family physicians providing anaesthesia-related care, 2013–2022

Clinical decision-making

Example 1: A FPA failed to arrange for monitoring of a patient when they temporarily left the operating room

Example 2: A patient developed complications when a FPA extubated a patient without realizing the patient remained partially paralyzed, and then failed to re-intubate the patient immediately

Example 3: A patient experienced respiratory and cardiac arrest when an FPA failed to secure the patient's airway and did not recognise the cause of the patient's hypoxia was oesophageal intubation

Example 4: A situation involving a potentially difficult airway warranted the FPA to have used capnography, and it was not optimal to wait until the emergency medical services personnel arrived to secure the airway with an endotracheal tube

Situational awareness

Example 1: A FPA did not recognise that inability to ventilate a patient, absent end-tidal carbon dioxide and gastric insufflation were signs of endotracheal tube dislodgement

Example 2: Choice of patient monitoring, such as an inappropriate cycle time for blood pressure monitoring and absence of end-tidal carbon dioxide monitoring was considered inadequate for the level of ASA physical status categorisation

Procedural violations

Example 1: An FPA inadvertently administered the incorrect medication due to not reading the label on the syringe

Example 2: Propofol was administered in an office setting by an FPA who was also performing the procedure

ASA: American Society of Anaesthesiologists, FPA: Family practice anaesthetist

Table 4: Case examples associated with peer expert criticisms of team factors of family physicians providing anaesthesia-related care, 2013–2022

Documentation issues

Example 1: Documentation in the anaesthesia record was missing descriptions of apnoeic events

Example 2: Details of dose and timing of medications that were administered were not recorded in the anaesthesia record

Communication breakdown with patient, family or substitute decision-maker

Example 1: A sudden change to general anaesthesia was made while the patient was on the OR table, when consent for spinal anaesthesia was discussed and agreed to in the pre-admission clinic, for an elderly patient with multiple high-risk respiratory comorbidities

Example 2: A FPA inappropriately suggested that a patient's procedure would be cancelled in the event that they refused to consent to pre-operative medication

Communication breakdown and coordination of care issues between physicians

Example 1: A nurse expressed concerns about a patient's position to the FPA shortly before the patient slid off the operating table

Example 2: When a patient developed haemodynamic deterioration, the FPA failed to inform the OR team of the critical situation

Example 3: An incision was initiated on the wrong extremity before the team's completion of the surgical safety checklist

FPA: Family practice anaesthetist, OR: Operating room

DISCUSSION

We described medico-legal case characteristics and expert criticisms of family physicians providing anaesthesia-related care. Almost 3-quarters (36/50) of the cases occurred in rural and small urban areas, and of patients with an ASA physical status reported, 31/39 (79%) were 1 or 2. Patient harm was at least moderate in 80% (24/30) of cases where healthcare-related patient harm had occurred.

The care locations were expected to be mostly rural and small urban areas and ASA physical status to predominantly be 1 or 2. Family physicians providing anaesthesia-related care are often located in rural regions and must make decisions about the suitability of providing anaesthesia care for the patients' specific ASA physical status classification with respect to the available resources and their respective training.¹⁶ Further, there may be limitations on the anaesthesia privileges that a family physician may provide based on their training. For example, British Columbia defines within their family practice an anaesthesia privileging dictionary that physicians generally support ASA physical status 1 or 2, with the ability to provide anaesthesia care to higher risk patients under specific circumstances such as when the hospital has appropriate peri-operative surgical programme capabilities.¹⁷

Expert criticisms identified by our study highlight the importance of a physician's ability to appropriately monitor and perform additional investigations as required by their analysis of a patient's condition over time. Further, communication with the patient, as well as documentation in the medical record, were prominent areas of expert criticism. Broadly, the categories of expert criticisms are similar to those identified in Canadian medico-legal cases involving FRCPC anaesthesiologists reported by Crosby *et al.*, however, due to differences in case selection criteria, the cases from our study are not directly comparable.¹³ Focused continuing professional development courses are available to address the types of issues identified by the expert criticisms in our study. A few Canadian-designed courses such as Ottawa Anaesthesia Skills in Simulation and Simulating Crises for Optimal Response in Emergencies focus on clinical decision-making and situational awareness for

FPAAs.^{18,19} The Universities of Calgary and British Columbia organise refresher courses for FPAs to cover most aspects of provider and team factors involved in patient harm.^{20,21}

Access to anaesthesia care in rural and remote areas is a current issue. Improving access to care in rural and remote communities in Canada requires addressing shortages in the medical workforce providing rural anaesthesia care.¹⁶ Estimates from 2018 by Simkin *et al.* indicate that there are at least 534 FPAs practising in Canada, excluding data from Québec, Nunavut and Northwest Territories.²² In 2018, about 15% of the anaesthesia workforce were FPAs and although these FPAs make up only a small proportion of all family physicians, we anticipate that this number will potentially grow to address the deficit of anaesthesia services in rural and remote regions.¹⁶

Strengths and limitations

CMPA medico-legal cases represent a small proportion of patient safety incidents overall because not all events lead to a complaint against a physician in a civil legal, college or hospital matter. Further, physician members choose to report complaints to the CMPA at the physician's discretion. Therefore, these cases may not represent all complaints across Canada. Furthermore, clinical information and the level of detail available in cases varies. Nonetheless, the CMPA has access to a rich source of medico-legal information that can provide valuable insights related to medico-legal risk for physicians in Canada.

This study is a descriptive study that is retrospective in nature. Medico-legal cases are influenced by recall bias, and analyses of these cases are prone to hindsight bias and outcome bias because the analysis of our data relies on the accuracy of medico-legal records and opinions.

Patient harm reported in this study may not be directly related to the anaesthesia provided by the family physician. Patient harms are influenced by other unmeasured variables such as patient comorbidities and care provided by other healthcare providers. Thus, the proportion of severity of harms cannot be generalised as a reflection of the safety of family physicians providing anaesthesia care. However, the cases presented do illustrate potential ways to improve

anaesthesia care and educational opportunities to improve skills.

Future research directions

Systems factors have not been adequately addressed by this study due to limitations in the type and source of information used. Future research could examine the impact of the integration of checklists and protocols such as the World Health Organization's surgical safety checklist on patient safety in rural settings and explore how it has been or could be implemented in a Canadian setting.²³ These settings are more common where FPAs practise and thus would be the most beneficial settings to evaluate. Further, addressing system factors issues would include other providers in the circle of care, therefore, extending beyond FPAs.

CONCLUSION

We are not aware of any recent literature describing a national set of medico-legal cases of family physicians providing anaesthesia-related care in Canada. This study has addressed a gap therein by describing the types of provider and team factors identified by expert criticism in medico-legal cases in Canada. As the need for FPAs increases, it is incumbent that the quality of care continues to improve to promote patient safety. This study has identified areas for improvement to facilitate the goal of safer medical care in rural and remote communities.

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Conflicts of interest: Karen Lemay, Shan Jin, Anne Steen, Jeffrey Smith and Gary Garber were employees of the Canadian Medical Protective Association, a not-for-profit mutual defence organisation for physicians, at the time of this study. No other competing interests were declared.

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Appendix A – Canadian Medical Protective Association Terms and Definitions

Appendix 1: Outline of the Canadian Medical Protective Association definitions of patient harm of relevance to this study.^a Definitions were adapted from the American Society for Healthcare Risk Management's Healthcare-Associated Preventable Harm Classification Tool^b unless otherwise indicated. Table modified from Smith *et al.*, 2023^c

Term	Description
Patient safety incident ^d	An event or circumstance that could have resulted, or did result, in unnecessary harm to the patient
Healthcare-related harm ^d	Harm arising from or associated with plans or actions taken during the provision of healthcare, rather than an underlying disease or injury
No harm (asymptomatic)	Patient safety event or patient safety incident that reached the patient but the patient reports no symptoms and no treatment is required
Mild harm	Patient harm is symptomatic, symptoms are mild, loss of function or harm is minimal (permanent or temporary), and minimal or no intervention is required (e.g., extra observation, investigation, review, or minor treatment)
Moderate harm	Patient harm is symptomatic, requiring intervention (e.g., additional moderate or minor operative procedure, additional therapeutic treatment) or an increased length of stay, or causing permanent or temporary harm or loss of function
Severe harm	Patient harm is symptomatic, requiring life-saving intervention or major medical/surgical intervention, or resulting in a shortening life expectancy, or causing major permanent or temporary harm or loss of function
Death	Healthcare-related death
Inherent risk	Healthcare-related harm that resulted from inherent risks associated with a particular investigation, medication or treatment. The standard of care was met as determined by peer experts
Not applicable	The case involves criticism of non-technical skills, no criticisms of the care, or the harm outcome is unknown

^aCalder LA, Neilson HK, Whyte EM, Ji J, Bhatia RS. Medico-legal cases involving cardiologists and cardiac test underuse or overuse. *CJC Open* 2021;3:434-41,

^bHoppes M, Mitchell J. Serious Safety Events: A focus on Harm classification: Deviation in Care as Link. Getting to Zero™ White Paper Series. 2nd ed.. Chicago, Illinois: American Society for Healthcare Risk Management; 2014, ^cSmith JD, Lemay K, Lee S, Nuth J, Ji J, Montague K, Garber GE. Medico-legal issues related to emergency physician's documentation in Canadian emergency departments. *Can J Emerg Med* 2023;25:768-75, ^dWorld Health Organization. More Than Words: Conceptual Framework for the International Classification for Patient Safety – Final Technical Report. World Health Organization; 2009

Appendix 2: Definitions for medical coding of expert opinions using the contributing factors framework.^c Select factors and definitions are provided as relevant to this study

Contributing factor	Definition
Provider factors	One of 4 thematic high-level categories that makes up the structure of the contributing factors framework (i.e., provider, team, and system factors and patient safety indicator). Provider factors relate to a healthcare provider's decisions, actions or influences which contributed to a patient safety incident, increased the risk of an incident or negatively affected the physician and patient relationship. Healthcare providers include any member of the healthcare team (e.g. physician, nurse, pharmacist and physiotherapist)
Clinical decision-making	The use of knowledge, including situational awareness, to guide decisions to elicit clinical clues, to formulate diagnostic impressions, to order investigative or follow-up procedures, to acquire data to monitor a course of action or evaluate the severity or probability of an outcome or to select a management course
Deficient assessment	Deficient histories and general evaluation. Includes deficient evaluation for the purpose of prescribing or related to the performance of a procedure
Failure to perform a test/intervention	Delay or failure to perform a diagnostic test (excludes assessment) or therapeutic intervention (e.g., ECG, pharmacotherapy, surgery)
Situational awareness	A person's perception and understanding of the dynamic information that is present in the environment. It involves keeping track of what is happening and includes anticipating what might need to be done
Insufficient knowledge/skill	Issues involving a provider's clinical knowledge, skill, technique, training or education. Also includes when the provider is required to complete training or education related to these topics or when a member proactively initiates training or education for the same
Inadequate monitoring or follow-up	Delay, absent or incomplete follow-up of diagnostic test results and/or monitoring of a patient's clinical condition (e.g., vital signs, O ₂ saturation, neurologic assessment), and if required act upon abnormal findings and plan future care
Team factors	The team's communication and coordination issues which contributed to a patient safety incident, increased the risk of an incident or negatively affected the physician and patient relationship. The patient is considered an important part of the healthcare team
Documentation issues	Issues related to inadequate, delayed or illegible medical records (written or electronic)
Communication breakdown with patient, family, or substitute decision-maker	Breakdowns in communication between a healthcare provider and the patient, family or substitute decision-maker; include issues with consent discussion, informed discharge and disclosure meetings
Communication breakdown and coordination of issues between physicians	Breakdowns in communication between healthcare providers and includes support staff; include issues with the coordination of patient care, consults, handovers and supervision of trainees (residents and medical students)
System factors	The lack, malfunction, or failure of policies, operational processes, or supporting infrastructure (e.g. equipment or resource limitations) which contributed to a patient safety incident, increased the risk of an incident, or negatively affected the physician and patient episode of care
Resource issues	Insufficient or unavailable health care resources; including beds, staff, equipment
Office issues	Issue or violation involving an office's environment, practices and non-clinical policies
Clinical procedures	Issue or violation involving common clinical tasks as per a standard checklist, protocol, care map, clinical pathway and decision tree; specified by institution, department or care team

^cMcCleery A, Devenny K, Ogilby C, Dunn C, Steen A, Whyte E, *et al.* Using medicolegal data to support safe medical care: A contributing factor coding framework. *J Healthc Risk Manag* 2019;38:11-8. ECG: Electrocardiogram

The occasional nasal septal hematoma management

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INTRODUCTION

Nasal fractures are the most common facial fracture in adult and paediatric populations.^{1,2} Trauma seen in sports, motor vehicle accidents, domestic violence and non-accidental childhood injury³ can cause nasal fractures. Many nasal fractures involve injury to the septum which can develop into a septal hematoma.⁴ Once diagnosed, incision and drainage of the hematoma must be performed within 72–96 h⁵ of onset to reduce the likelihood of septal cartilage necrosis, nasal deformities and complications from the infection.⁴ In large centres, an emergency physician or otolaryngologist generally performs the procedure; however, it is firmly within a rural generalist's scope of practice to diagnose and manage septal hematomas.

ANATOMY AND PHYSIOLOGY [FIGURE 1]⁶

The nasal septum has two main functions: creation of two cavities for air transmission and structural support for the nose.⁷ It consists of the quadrangular cartilage which is inferior to the nasal bone⁸ and superior to the maxillary, pre-maxilla and palatine crests.⁷ Posteriorly, the septum is composed of bony structures including

the vomer, the perpendicular plate of the ethmoid bone and the maxillary crest.⁸ It is anchored by the upper and lower lateral cartilages.⁸ The septum has four layers of tissue overlaying it, collectively named the mucoperichondrium.⁹ Going superficial to deep, the layers of the mucoperichondrium are the mucosal layer, basal layer, lamina propria and perichondrium.⁹

Blood supply to the septum occurs from branches of both the internal and the external carotid artery [Figure 2].⁷ Off the internal branch, the anterior ethmoidal artery supplies the superior aspect of the septum.⁷ Off the external branch, the sphenopalatine artery supplies the posterior and inferior septum.⁷ Finally, off the external branch, the superior labial artery and greater palatine artery supply the anterior portion of the septum, known as Little's area.^{7,10} All of these arteries converge at Kiesselbach's plexus located within Little's area.¹⁰ Venous flow leaves the septum through multiple outflow tracts. The anterior septum drains through the anterior facial vein.¹¹ The posterior septum drains from either the ophthalmic vein or the pterygoid plexus which converge at the cavernous sinus within the cranium.^{8,11} Sensory innervation to the septum is supplied by the anterior and posterior ethmoid nerve, as well as the sphenopalatine nerve.⁵

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AETIOLOGY

Central proximity and protrusion from the face make the nose an optimal location for injury.¹² The force of trauma can disrupt blood flow to the perichondrium by rupturing the attached blood vessels within the mucoperichondrium, causing bleeding to accumulate in the subperichondrial space.^{4,13} If the septal cartilage fractures, blood can migrate through the septum and cause a unilateral septal hematoma [Figure 3]¹⁴ to develop into a bilateral hematoma [Figure 4].^{15,16} Blood contained within the subperichondrial compartment lifts the mucoperichondrium off the septum, and subsequently inhibits blood flow to the septum, resulting in ischaemia and septal necrosis within 72 h from onset.^{5,17} Stagnant blood and necrotised cartilage are good media for infection. When present, bacteria can release proteolytic enzymes which further break down the septal cartilage.⁴ This necrosis can lead to irreversible destruction of the nasal cartilage and result in a nasal bridge

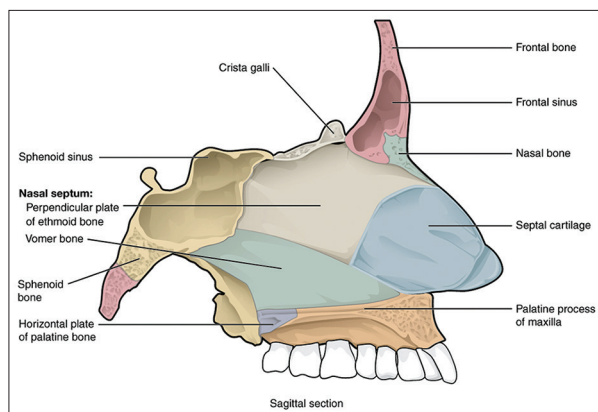


Figure 1: Bone of nasal cavity.⁶

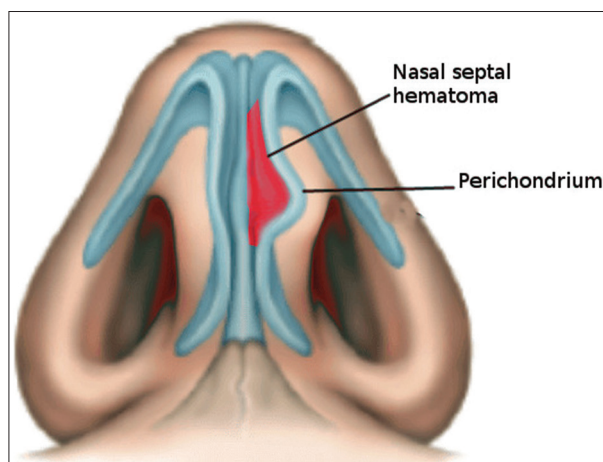


Figure 3: Nasal septal hematoma.¹⁴

collapse.¹⁸ This collapse, known as a 'saddle nose deformity', is only reparable by rhinoseptoplasty.^{10,18} Furthermore, unmanaged septal hematomas may progress into an abscess, orbital cellulitis, sepsis, meningitis, osteomyelitis, intracranial abscess or cavernous sinus thrombosis.^{4,10} Therefore, proper recognition-and-intervention for septal hematomas by rural clinicians is imperative.

PHYSICAL EXAMINATION AND DIAGNOSIS

Nasal injuries typically involve trauma of varying severity, so it is imperative to assess airway, breathing and circulation, conduct a full set of vitals and complete a thorough neurological examination before septum assessment.¹⁹ Septal hematomas are a clinical diagnosis. The most common presentation is a septal bulge creating obstruction, but it may also present with facial pain, facial lacerations, fever or rhinorrhoea.⁴ An obstructing bulge may also represent a deviated septum.³ To differentiate, take a cotton tip or blunt instrument and press it into the bulge.¹³ If it is boggy or compressible, a septal hematoma is more likely.⁴ If it is firm, a deviated nasal septum is more likely.⁴ A practitioner can also confirm if a bulge is a hematoma by aspirating blood from the bulge with a needle.¹⁹ Note, if the hematoma has coagulated, attempting to aspirate blood may fail.

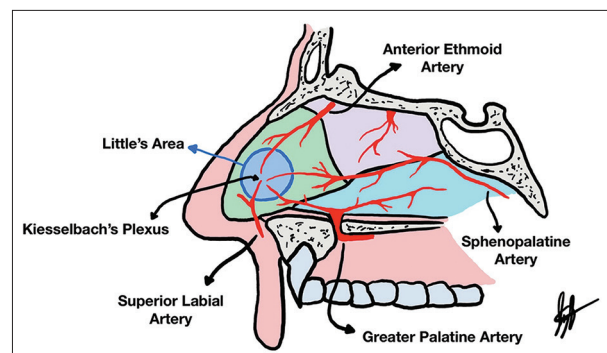


Figure 2: Septal artery flow.

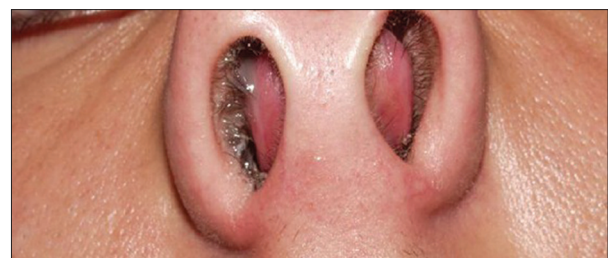


Figure 4: Bilateral septal hematoma.¹⁶

EQUIPMENT [FIGURE 5]

1. Visualisation:
 - Nasal speculum
 - Light source according to available resources (i.e. headlamp or otoscope).
2. Cleansing:
 - Seventy per cent isopropyl alcohol pad or chlorhexidine gluconate 2% and 70% isopropyl alcohol swab.
3. Vasoconstriction:
 - Cotton tip applicator, cotton balls or nasal pledgets
 - Xylometazoline or oxymetazoline and 2% lidocaine.
4. Local anaesthetic:
 - Two per cent lidocaine with epinephrine 1:100,000 (if epinephrine is available) for combined anaesthetising and vasoconstricting
 - One millilitre syringe
 - 25–27 g needle × 1.5" L.
5. Aspiration:
 - Ten millilitre syringe
 - 18 g needle × 1.5" L.
6. Incision:
 - Scalpel size #15 or #11.

7. Forceps:
 - Bayonet forceps.
8. Suction:
 - Frazier suction.
9. Irrigation:
 - Angiocatheter (20 g intravenous angiocatheter)
 - Normal saline in a 10-mL syringe.
10. Nasal packing:
 - Nasal tampon with strings size 5.5 or 7.5 cm for anterior packing/sponge with water-soluble antibiotic ointment or saline 100 mL bottle.

PROCEDURE

1. Position the seated patient by extending their head¹⁰
2. Cleanse the surrounding external skin of the nares using either antiseptic 70% isopropyl alcohol swab or chlorhexidine gluconate 2% and 70% isopropyl alcohol solution.¹² Let the site dry for 30 s–1 min¹²
3. Insert a nasal speculum, opening it vertically to visualise the nasal cavity,¹² and use an otoscope/headlamp as a light source [Figure 6]
4. Soak either pledgets, cotton balls or cotton tip applicators in vasoconstricting agents xylometazoline or oxymetazoline²⁰ mixed with anaesthetising 2% lidocaine in a 1:1 ratio.⁵ If using cotton balls, stretch them out horizontally to lengthen the balls and match the length of the septum. Use bayonet forceps to insert pledgets or cotton balls bilaterally into the nares. Leave these in place for 5–10 min to anaesthetise and vasoconstrict the nares^{17,21}

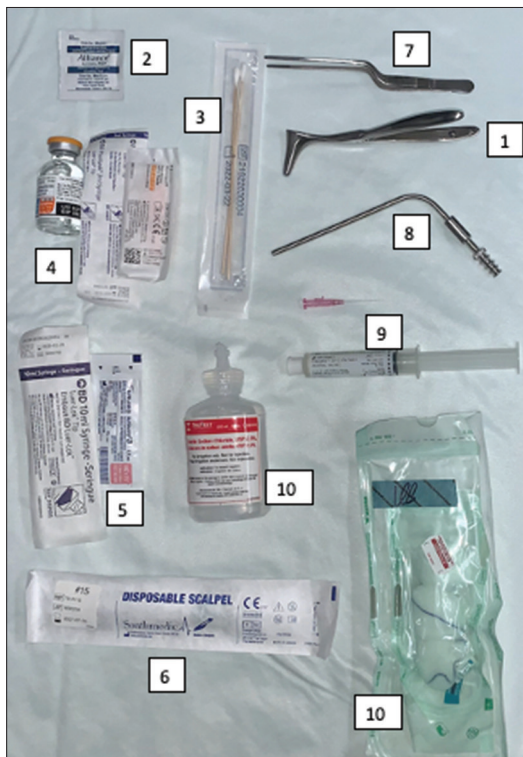


Figure 5: Nasal septal tray.



Figure 6: Nasal speculum insertion.

- If using a cotton tip applicator, place it on the roof of the nasal cavity to create a nerve block bilaterally as demonstrated in Figure 7.¹²
- Remove the pledgets/cotton balls/cotton tip applicator. Using a 1 mL syringe with a 25–27 g × 1.5" needle inject 2% lidocaine, with 1:100,000 epinephrine if available, to the anterior aspects of the septal epithelium known as the caudal edge and the columella between nares.⁷ Allow it 10 min to act to ensure the septal hematoma is anaesthetised²¹
 - Attempt to aspirate blood from the septal hematoma using an 18-g needle on a 10-mL syringe.¹⁸ If any concern of infection, send the aspirate for gram staining and anaerobic and aerobic culturing¹²
 - To remove any remaining clot and prevent accumulation of another hematoma incise the hematoma with a size #15 or #11 scalpel, making either a horizontal incision of 5–10 mm,^{17,22} or vertical incision 1–2 cm along the caudal septum¹² down to the cartilage. One technique is to make a vertical 'L'-shaped incision.¹² Care must be taken to only cut into the hematoma and avoid any of the surrounding structures [Figure 8]
 - Gently spread apart the incision using bayonet forceps and evacuate any clots with Frazier suction.¹⁰ Make the incision wider if required to remove coagulated blood and examine the septum for necrosis.¹⁷ A bilateral septal hematoma, in the majority of cases, can be evacuated out of a single nasal cavity incision as the fractured septum allows passage of blood from the opposite cavity when contralateral nasal septal pressure is applied.¹² If this fails to excise the hematoma, repeat the same steps listed above in the other nasal passage
 - With an angiocatheter attached to a 10-mL syringe of normal saline, irrigate within the incision to flush out any remaining clots²²
 - The final step is to pack the nares bilaterally with a nasal tampon/sponge to prevent recurrence of a septal hematoma [Figure 9]¹⁷
 - Select appropriately sized tampon that has the length for anterior packing, such as 5.5 cm.²³ Smear it with either antibiotic ointment or petroleum jelly before placement.²³ In the horizontal plane, aligned with the ear lobe, insert the nasal tampon or nasal sponge with



Figure 7: Cotton tip applicator.

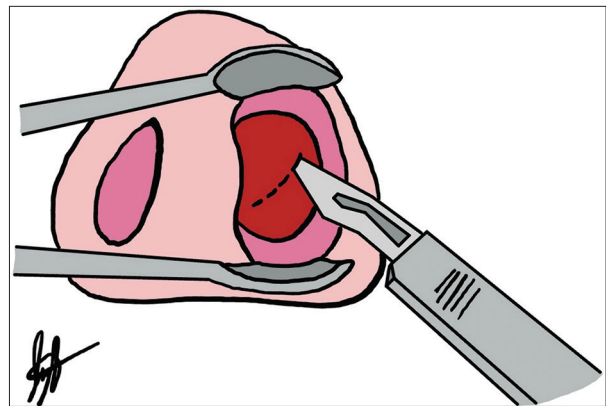


Figure 8: Nasal septal hematoma incision.



Figure 9: Nasal tampon insertion.

bayonet forceps to assist if needed.¹² Once in place, infiltrate it with sterile water for further expansion.²³ This compresses the tissue in the nasal cavity and prevents the recurrence of a hematoma.¹⁷ Note, if available, the tampon is an easier approach and better tolerated than packing, from a patient's perspective.¹²

FOLLOW-UP INSTRUCTIONS

Best practice is to remove the packing after 24–36 h.¹⁰ Discharge the patient with pain control, such as acetaminophen, informing them that hematomas take approximately 1 week to heal.^{12,17} Tell patients to avoid non-steroidal anti-inflammatory drugs as they increase the risk of bleeding.¹² If there is concern for infection, or if packing is to remain *in situ* for >24 h, one should consider starting the patient on antibiotic coverage for common bacteria such as *Streptococcus pneumoniae* or *Staphylococcus aureus*.^{17,22} Inform patients they need to return to the emergency department if they develop signs or symptoms of infection, signs of meningitis or if any nasal bleeding occurs.¹² Finally, consultation with ear, nose and throat needs to be established for patients who go on to develop repeat septal hematomas, abscesses, structural saddle deformities or complications listed previously.

CONCLUSION

Septal hematomas may result from direct trauma to the nose. Rural clinicians should look for nasal septal hematomas when assessing patients with facial or nasal trauma. If missed, permanent saddle nose deformities from septal necrosis can occur, and possible complications such as sepsis, abscess or meningitis may develop.^{4,13} Septal hematomas are manageable in a rural setting and the steps to promptly assess, diagnose and treat them have been provided here for a clinician to follow.

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Letter to the editor concerning “I’m on the coast and I’m on methadone:” A qualitative study examining access to opioid agonist treatment in rural and coastal British Columbia’

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Dear Editor,

It is with great interest that we read the recently published original article entitled “I’m on the coast and I’m on methadone:” A qualitative study examining access to opioid agonist treatment in rural and coastal British Columbia in the *Canadian Journal of Rural Medicine*.¹ The authors have addressed an important topic, and we extend our appreciation to authors to identify the contextual factors that can influence access to opioid agonist treatment in rural and coastal settings.¹

In the Methods section, the authors mentioned the word trustworthiness of results, which is the backbone of any qualitative study; nevertheless, it would have been really insightful how authors ensured credibility, dependability, confirmability and transferability in this study.² Triangulation has been acknowledged as an important aspect of data collection, and it can be accomplished in the number of ways, namely data triangulation, interviewer triangulation and methodological triangulation.³ No such form of

triangulation has been done, and thus it is not easy to believe about the credibility of results. Further, no mention has been done about the audit trail, reflexivity of the investigators, inter-rater reliability, data saturation, etc., all of which are integral pillars in the conduct of an effective qualitative study.^{2,4}

I was happy to note that each interview lasted 45–60 min as it would have given an adequate time for the investigators to understand the topic in depth from participants’ perspective. However, the endpoint of all interviews has not been mentioned – whether the interviewers waited for data saturation or till all research questions were asked?³

We are happy that the authors acknowledged the study limitations, as it is an important part of data reporting. However, the article would have got more weightage, if the authors had given attention to different aspects of trustworthiness in this community-based qualitative study.

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Paradigms, values, assumptions and debates regarding 'proper' qualitative research

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I was pleasantly surprised to learn about a letter to the Editor of *CJRM* questioning aspects of our qualitative approach in our recently published paper.¹ From my experience, these dialogues are usually reserved for qualitative methodology journals and the PhD-level advanced qualitative research course that I teach every winter. While I appreciate the comments received, there are some incorrect assumptions made in this letter that warrant a response.

First, research trustworthiness was called into question. As mentioned in our article, we utilised a community-based approach and we engaged a group of local partners, including people who use drugs, clinicians and other direct service providers, where results were shared and they provided feedback, which 'enhance(d) the accuracy and trustworthiness of the results'.¹ This is a key component of any community-based study and acts as a form of triangulation.² Who better to assess the results of our study than those whom are tied to the very topic under consideration! Of course, those informed by the positivist realism paradigm would likely disagree with

such an epistemological foundation that embraces the co-construction of knowledge through community engagement rather than obtaining an 'objective reality' through other sources (e.g., medical records).

Assumptions were also made about the supposed 'pillars' of qualitative research with reference to various concepts such as reflexivity and data saturation. The assumption here is that these pillars cross all qualitative research, when in fact, their inclusion is dependent on which research paradigms, axiological and onto-epistemological assumptions, qualitative methodologies (e.g. grounded theory and ethnography) and analytic techniques (e.g., thematic analysis and axial coding) are informing the study at hand.³ For example, one of the founders of grounded theory, Glaser, does not support reflexivity given the 'clean mental state' that grounded theorists are to have before any study.⁴ Similarly, depending on the branch of qualitative phenomenology, reflexivity may hold strong (hermeneutic) versus no (transcendental) relevance.⁵

We conducted a thematic analysis in our study and did not rely on data

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saturation, and similarly, this concept is not a 'pillar' across all qualitative research. Saturation, or information redundancy, is aligned more so with positivist realism and some grounded theory approaches. For others, it has been highly criticised as a 'logical fallacy'⁶ and critiqued by several prominent qualitative methodologists from the interpretivist paradigm, including Braun and Clarke for its incorrect use in thematic analysis, as saturation does not align with the values and assumptions embedded within constructivism/interpretivist approaches such as ours.⁷

Finally, while some readers may have benefited from a more fulsome discussion of our research approach, the word limit for most medical journals means that qualitative researchers need to be selective on what can be reported without taking away from the interview data. This was the case for this article and many others. Nevertheless, I hope this response has shed some light on our research, incorrect assumptions and current debates in qualitative research. I welcome dialogue on these important matters and perhaps this will lead to future editorial considerations in this journal on

article length and reporting requirements for qualitative studies.

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Conflicts of interest: There are no conflicts of interest.

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1. Hodgson K, Bowles JM, Mansoor M, Rooke E, Bardwell G. I'm on the coast and I'm on methadone: A qualitative study examining access to opioid agonist treatment in rural and coastal British Columbia. *Can J Rural Med* 2024;29:117-24.
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Regarding Webber, V., Bajzak, K. and Gustafson, D. L. (2023). The impact of rurality on vulvodynia diagnosis and management: Primary care provider and patient perspectives. Canadian Journal of Rural Medicine, 28 (3), 107–115

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We are writing to request a change in the authorship line for a paper published in 2023.

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In line with the ICMJE guidelines defining the role of authors, and after consulting with members of our research team and senior administrators in the Faculty of Medicine at Memorial University, we request the addition of four contributors to the authorship of this paper.

The revised authorship line would be:

Webber, Valerie PhD¹; Bajzak, Krisztina MD, MSc, FRCSC², Gustafson, Diana L. MEd, MFA, PhD³, Logan, Gabrielle MSc⁴, Badaiki, Winifred MD, MHE⁵, Graham, Wendy MD, CCFP, FCFP, FRRMS⁶ and Duggan, Norah BSc, BMedSc, MD, CCFP, FCFP⁷

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GL, WB, WG and ND contributed to the study design, data acquisition and interpretation of the primary care provider (PCP) data described in this publication. These authors also contributed to an unpublished manuscript that reported PCP study findings. The analysis presented in the 2023 published manuscript contains some overlapping information from that unpublished

PCP manuscript. The 2023 publication combines PCP data with additional data from a separate patient study. Because of an oversight, these additional authors did not have the opportunity to review the final submission of the publication referenced above.

We ask that you make this change and thank you for helping us with this correction.

Val Webber, Krisztina Bajzak and Diana L Gustafson.

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Conflicts of interest: There are no conflicts of interest.

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Opportunities for family physicians including physicians with enhanced skills in Surgery, Obstetrics & Anesthesia

Recruitment Incentives
Relocation Reimbursement
Group or Solo Medical Practice

Top of the line medical services including CT Scanner, Obstetrics, Dialysis, Medical Unit, Surgery, Addiction Recovery and more!

Candace Kopec, Executive Director, St. Joseph's Hospital
candace.kopec@saskhealthauthority.ca

**Learn more about what we have to offer at
www.stjosephsestevan.ca**



Brockville General Hospital is currently seeking candidates for the following positions:

- Hospitalist
- Emergency Medicine Physician
- Pediatrician
- Obstetrician/Gynecologist

Located in the heart of the breathtaking Thousand Islands, Brockville General is the perfect place to practice and play. See for yourself at: <https://imagine.Brockville.Life>.

Take advantage of:

- Competitive salaries
- Focus on work-life balance and flexibility
- Collegial, team-based culture
- Short commute to work
- Opportunities for new graduates

For position details, scan the QR code or email us at physicianrecruitment@brockvillegeneralhospital.ca.



**Brockville
General Hospital**
Right here, with you.



qrco.de/bfD9OR



Make a difference in the future of rural medicine!

Become a mentor

Help inspire and support the next generation of rural physicians by offering valuable learning experiences outside of traditional academic settings. Contribute to the current and growing need of rural physicians in Canada.



A pathway to your rural medical future!

Become a mentee

With the SRPC Mentor Program, you'll get the chance to gain invaluable knowledge, develop key competencies, and build lasting relationships that will help shape your future career as a rural healthcare provider.



ICEM2025
24th International Conference on Emergency Medicine
Montreal, Canada, May 23 - 28

Innovation | Collaboration | Education | Motivation

24th International Conference on Emergency Medicine

May 23-28, 2025 | Palais des congrès de Montréal, Canada

Program Highlights:

- 9 Plenary Sessions
- 70+ Educational Sessions
- Pre-conference Courses and Workshops
- POCUS Competition
- Educational Marketplace
- Gala & Docs That Rock

Why Attend?

- Connect with 2,000+ EM professionals
- Explore cutting-edge research and best practices
- Enhance your skills through interactive workshops
- Discover the latest technologies in emergency care
- Experience the charm of Montreal in spring!

REGISTER TODAY! Visit www.icem2025.com for more information.



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PhysicianRecruitment@InteriorHealth.ca



Emergency Medicine
Almonte General Hospital
Full Time/ Part Time / Locum

Almonte General Hospital is a 52 bed community hospital, located 35 minutes from downtown Ottawa.

- Competitive AFA
- 24/7 Anesthesia
- CT coming summer of 2024
- Mentorship program available
- Average 40 patients / day

Qualifications

- ACLS
- NRP (on site certification available)

Contact

Medical Affairs Coordinator Agh.info@mrha.ca



Hospitalist Medicine Program

Smiths Falls Site

Full Time / Part Time Opportunities

The Perth- Smiths Falls District Hospital is a two site 85 bed, acute care community hospital serving a regional population of 66,000.

The community of Smiths Falls (pop. 9,000) is conveniently located midway between Kingston and Ottawa, along the Rideau Canal.

- ✓ Return of Service eligible
- ✓ Student Loan Forgiveness program eligible

Practice Profile

- Most Responsible Physician (MRP) for unattached adult patients
- Week long / 7 Day week (Saturday – Friday)
- 30 Medical/ Surgical beds (includes ALC) plus 4 bed Level 2 ICU
- Staffing = 2 Hospitalists daily (flexibility in patient assignment).
- 0800 - 1700 hrs in house coverage (one hospitalist must always be on site).
- 1700-2200 hrs available by telephone
- 2200 – 0800 hrs in house coverage by ED physician
- EMR (Medi Tech) / eScripton / PACs/ CT / MRI
- Full complement of specialty back up locally; Anesthesia / Internal Medicine/ General Surgery/ Ob/Gyn/ Ortho / Physiatry /Urology
- Established links with tertiary care centres 1 hour away (Kingston / Ottawa)

Remuneration

- Fee for Service + \$600 / day (weekday / weekend day)

Contact

Carlene MacDonald, Physician Recruiter, physicianrecruitment@psfdh.on.ca 613 285 5057 c



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*We advocate for access to healthcare
close to home for all Canadians*

JOIN NOW!

SRPC.CA



WORK WITH
Wonder

#WeAreWAHA

About the Weeneebayko Area Health Authority (WAHA):

The Weeneebayko ("Two Bays" – James Bay and Hudson's Bay) Area Health Authority (WAHA) provides medical services to 6 communities on the shore of James and Hudson's Bay; Moose Factory, Moosonee, Fort Albany, Kashechewan, Attawapiskat and Peawanuck. The population of the West Coast of James Bay is approximately 12,000 people; Primarily First Nations. The hospital is located in Moose Factory.

- *Challenge yourself to provide comprehensive health care to remote First Nation communities*
- *Faculty appointments at Queen's University, Northern Ontario School of Medicine, University of Toronto, and University of Ottawa, with a well-developed teaching practice*
- *Become a member of an exceptionally multidisciplinary team with full-time surgical and anesthesia as well as back up specialty services. New on site is a CT Machine and Portable MRI (head)*
- *Very generous compensation package with a yearly travel allowance plus remote medicine funding bonus*
- *Signing bonuses up to \$20,000, housing in Moose Factory provided with all amenities included*
- *Recruiting Locums and full-time family doctors, salary ranges from \$370,550 - \$420,000 • Now offering ER and OB incentives*



Life at WAHA

Inspired by the land and its people, our unique way of life focuses on what really matters—nurturing a deep sense of community within the walls of WAHA and beyond. We find joy and laughter through a heartfelt connection and trust in our relationships. We marvel at the splendor of the land, soaking up glorious views of the northern lights, and spending time in nature. This helps us feel alive and rejuvenated, knowing we are part of something greater than ourselves.

Ready to experience the wonder of WAHA, join us!



**Join
us!**

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Jaime Kapashesit
Physician Services Coordinator, WAHA
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