

Canadian Journal

of

Rural
Medicine

Journal canadien

de la

médecine
rurale



The official journal of the Society of Rural Physicians of Canada

Le journal officiel de la Société de la médecine rurale du Canada

VOLUME 27, NO. 2, SPRING 2022

VOLUME 27, N° 2, PRINTEMPS 2022

IN THIS ISSUE

DANS CE NUMÉRO

Motor vehicle accidents among Indigenous Peoples in Canada

The Occasional cervical biopsy

A potential desert? Northern Ontario's obstetrical services in 2020



EXPLORE YOUR OPTIONS

DISCOVER MORE AT

healthmatchbc.org

Health Match BC is a free health professional recruitment service funded by the Government of British Columbia (BC), Canada.

Phone (Toll-Free): 1-833-425-2404 | Email: Physicians@healthmatchbc.org

Location:
Fort St. John, BC



srpc.ca
cjrm.ca

SCIENTIFIC EDITOR
RÉDACTEUR SCIENTIFIQUE
PETER HUTTEN-CZAPSKI, MD
Haileybury, ON.

ASSOCIATE SCIENTIFIC EDITOR
RÉDACTEUR SCIENTIFIQUE ASSOCIÉ
GORDON BROCK, MD
Temiscaming, QC.

MANAGING EDITOR
DIRECTRICE DE LA RÉDACTION
SUZANNE KINGSMILL, BA, BSC, MSC
Toronto, ON.

ASSISTANT EDITORS
RÉDACTEURS ADJOINTS
MIKE GREEN, MD
Kingston, ON.

MARY JOHNSTON, MD
Blind Bay, BC

TRINA M. LARSEN SOLES, MD
Golden, BC

SARAH GILES, MD
Kenora, ON

JAMES ROURKE, MD
Ottawa, NL

RON SPICE, MD
Okotoks, AB.

GABE WOOLLAM, MD
Happy Valley-Goose Bay, NL

Canadian Journal of Rural Medicine (CJRM) is owned by the Society of Rural Physicians of Canada (SRPC). It appears in Winter, Spring, Summer and Fall. It is printed by The Lowe-Martin Group, Ottawa, ON.

Address all correspondence to:
Editor, CJRM
manedcjrm@gmail.com

CJRM is indexed in Emerging Sources
Citation Index, MEDLINE/Index
Medicus, Web of Science

Publications Mail Agreement no. 4138705.
Send address changes to: SRPC, Box 893,
Shawville, QC J0X 2Y0
819-647-7054
819-647-1949; fax: 819-647-2485
info@srpc.ca

ISSN 12037796

All prescription drug advertisements have
been cleared by the Pharmaceutical
Advertising Advisory Board.

Printed by The Pontiac Printshop Ltd.,
Shawville, QC

© 2022 Society of Rural Physicians of Canada
| Published by Wolters Kluwer - Medknow



Canadian Journal

of
**Rural
Medicine**

Journal canadien

de la
**médecine
rurale**

VOL. 27, No. 2, SPRING 2022 / PRINTEMPS 2022

EDITORIALS / ÉDITORIAUX

- 47 Wave theory of rural medicine — *Peter Hutten-Czapski, MD*
- 48 Théorie de la vague en médecine rurale — *Peter Hutten-Czapski, MD*
- 49 President's message. A reflection — *Gabe Woollam, MD, FCFP, FRRMS*
- 50 Message du président. Une réflexion — *Gabe Woollam, MD, FCFP, FRRMS*

ORIGINAL ARTICLES / ARTICLES ORIGINAUX

- 51 Motor vehicle collision-related injuries and deaths among Indigenous Peoples in Canada: Meta-analysis of geo-structural factors — *Naomi G. Williams, MSW, Kevin M. Gorey, PhD, Amy M. Alberton, PhD*
- 61 Northern Ontario's Obstetrical Services in 2020: A developing rural maternity care desert — *Eliseo Orrantia, MD, CCFP, Peter Hutten-Czapski, MD, CCFP, Mathieu Mercier, BScN, Samarth Fageria, MMASc*

CASE REPORT

- 69 Pathological fractures leading to the incidental diagnosis of rickets — *Mohammed Abraham, MD, CCFP (EM), CFPC Dipl., ABOM*

PROCEDURAL ARTICLE

- 72 The occasional cervical biopsy — *Julia Robson, BSc, Cara van der Merwe, BHSc, Leslea Walters, MD, FRCSC, Laura Noack, MD, CCFP, Sarah M. Giles MD, CCFP (EM)*

PODIUM

- 77 Why COVID-19 could be a boon for rural patient transfers — *Carolyn Ruth Wilson, MD, CCFP FCFP*



*'Babes In The Woods' © 2022
Dawn Gerety
36" x 48" Acrylic painting on canvas*

*www.ArtSeriously.com
Find me on the 'gram! @
dawngeretyart*

*Lifelong Alaskan Dawn Gerety is
known for painting whimsical
interpretations of Arctic wildlife and
adventures.*

ARE YOU AN AUTHOR OR A RESEARCHER?

Do you have an original research paper ready to submit?

Are you working on a research paper and looking to have it published?

Think of the Canadian Journal of Rural Medicine.

If you have a research paper archived, dust it off and send it in!

We welcome original research studies, case reports and literature reviews that have a rural medicine edge.
(3500 words or less)

Submissions will be peer reviewed for potential publication.

Learn more and find instructions online.

www.srpc.ca/cjrm

THE LISTSERV

SRPC members are welcome to join at any time. The Listserv is a network of physicians in rural practice, allied healthcare providers, and academia interested in rural medicine. RURALMED has a Canadian focus, and its purpose is to support rural practitioners, whether they be rural GP/FPs or rural specialists, by providing a forum for discussion, debate, and the exchange of ideas and information.

Contribute to, or follow the email discussions in any of the following groups.

RuralAnesthesia RuralMed MedRurale
StudentRuralMed

Learn more or subscribe online.

www.srpc.ca/ruralmed

Wave theory of rural medicine

Peter Hutten-Czapowski,
MD¹

¹Scientific Editor CJRM,
Haileybury, ON, Canada

Correspondence to:
Peter Hutten-Czapowski,
phc@srpc.ca

The art of rural generalist medicine continues, but it is not continuous. There are frequent disturbances that crest and trough. The energy propagates through the rural medicine medium with many sources and frequencies. At times the interference pattern is out of phase and the disturbance is reduced, and at times interference is enhanced with added amplitude nearing the breaking point.

Rural doctors are quite close to the warp and weft of the medium. On a personal level, I would posit that all rural doctors feel it, not the least in these times of uncertainty. At times it's too much and we need to still the waters. Most of us manage to cope, but we know of many who must leave for the city before they break, and others who are unable to get out of the way and are broken by the tsunami wave. Let's remember them well.

Organisationally, the Society of Rural Physicians of Canada has long appreciated that people's ability to do the good work will ebb and flow. Even and especially in rural leadership, there are times when you

can, and times when you can't. This is one of the benefits of a collective of generalists. Anyone's work can carry on with a little help from our friends.

I would argue that rural medicine itself is subject to these forces. There are times when collaborators for cooperative measures are simply not there, and other times when they are. This applies to research funding, government support, medical association orientation and so on. It doesn't matter if it's scientific publishing, rural incentives or collaborative works with other organisations.

Through my years, I remember being an angry young man. Many times I heard people telling me, 'no'. With hindsight, I can say that it's not that this or that can't be done. Even when the person says no, it's really a statement that I, we, they, can't right now. It's not a no, or rather, I don't consider it a no, but a 'yes, perhaps later'. Persistence and an openness to others in the rural medium has opened doors that have seemed shut before.

To all of you doing the good work, thanks.

Access this article online

Quick Response Code:



Website:
www.cjrm.ca

DOI:
10.4103/cjrm.cjrm_5_22

Received: 12-01-2022 Revised: 12-01-2022 Accepted: 25-01-2022 Published: 26-03-2022

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

How to cite this article: Hutten-Czapowski P. Wave theory of rural medicine. Can J Rural Med 2022;27:47-8.

Théorie de la vague en médecine rurale

Peter Hutten-Czapowski,
MD¹

¹Rédacteur Scientifique,
JCRM, Haileybury, ON,
Canada

Correspondance:
Peter Hutten-Czapowski,
phc@srpc.ca

L'art de la médecine générale rurale continue, mais il n'est pas continu. Les perturbations vont et viennent. L'énergie se propage dans le milieu de la médecine rurale selon plusieurs sources et plusieurs fréquences. Parfois, l'interférence est déphasée et la perturbation est réduite, et parfois, l'interférence est rehaussée à une amplitude qui frôle le point de rupture.

Les médecins ruraux sont très proches de la chaîne et trame du milieu. Sur le plan personnel, je dirais que tous les médecins ruraux le sentent, surtout en cette période d'incertitude. Parfois c'est trop, et il faut calmer les eaux. La plupart d'entre nous parviennent à composer avec la situation, mais nous en connaissons beaucoup qui doivent retourner en ville avant de briser, et d'autres qui sont incapables de s'échapper et sont brisés par la force du tsunami. Ne les oublions pas.

Sur le plan organisationnel, la Société de la médecine rurale du Canada sait depuis longtemps que la capacité de faire un bon travail fluctue. Même et surtout en matière de leadership rural, il y a des moments où c'est possible, et d'autres où ce ne l'est pas. C'est là l'un des bienfaits d'un

collectif de généralistes. Le travail de l'un peut continuer avec un peu d'aide d'un ami.

Je dirais que la médecine rurale en soi est assujettie à ces forces de la nature. Il y a des moments où les collaborateurs aux mesures de collaboration sont tout simplement absents, et il y en a d'autres où ils sont présents. Cela s'applique au financement de la recherche, à l'aide gouvernementale, à l'orientation de l'association médicale, et j'en passe. Peu importe s'il s'agit d'une publication scientifique, d'incitatifs ruraux ou d'une collaboration avec d'autres organisations.

Avec les années, je me souviens d'avoir été un jeune homme en colère. J'ai essuyé des refus plus d'une fois. Avec le recul, je peux dire que ce n'est pas tant qu'une chose soit impossible. Mais c'est plutôt que je, nous, eux, ne pouvons agir immédiatement. Ce n'est pas un refus ou plutôt je ne le vois pas comme tel, mais plutôt comme un «oui, peut-être plus tard». En médecine rurale, la persistance et l'ouverture envers autrui ont ouvert une porte qui semblait être fermée auparavant.

Merci à tous ceux qui font un bon travail.

Gabe Woollam, MD,
FCFP, FRRMS¹

¹President Society of
Rural Physicians of Canada,
Happy Valley Goose Bay,
NL, Canada

Correspondence to:
Gabe Woollam,
president@srpc.ca

**Society of Rural
Physicians of Canada**
**Société de la médecine
rurale du Canada**

PRESIDENT / PRÉSIDENTE
DR. GABE WOOLLAM - MD
CCFP FCFP FRRMS
Happy Valley Goose Bay, NL

PRESIDENT-ELECT
DR. SARAH LESPERANCE - MD,
CCFP PETITCODIAC NB

TREASURER / TRÉSORIER
DR. GAVIN PARKER - BSc, MSc
(Med. Ed.), M.D., CCFP
(FPA), FRRMS
Pincher Creek, AB

SECRETARY / SECRÉTAIRE
DR. ELAINE BLAU, MD CCFP
FCFP FRRMS
Tobermory, ON

MEMBER-AT-LARGE
DR. MERRILEE BROWN - MD
B.A&Sc(Hon) CCFP
FCFP FRRMS
Assistant Professor Queens,
Lecturer UofT, NOSM
Port Perry, ON

DR. SARAH GILES - MD,
CCFP (EM), FCFP, FRRMS
KENORA, ON
DR. PAUL DHILLON - MD,
CCFP (EM), SECHLT, BC

CHIEF OPERATING OFFICER
RESPONSABLE ADMINISTRATIVE
JENNIFER BARR
SRPC Office, Shawville, Que.

SRPC / SMRC
Box 893, Shawville QC J0X
2Y0; 819 647-7054, 877 276-
1949; fax 819 647-2485;
info@srpc.ca

srpc.ca

Access this article online

Quick Response Code:



Website:
www.cjrm.ca

DOI:
10.4103/cjrm.cjrm_7_22

President's message. A reflection

The past 2 years have posed many challenges for our members and our organisation.

Nonetheless, the SRPC has made big strides in advocating for rural generalism and the health of rural people.

Early 2021 saw the formal conclusion of the Rural Road Map Implementation Committee. The SRPC is now continuing the work of the rural road map with on-going projects such as collaborating with Canadian Institute for Health Information (CIHI) on rural research, disseminating the consensus statement on rural patient transfers, advocacy work around national licensure and involvement in a Health Human Resources planning group at the Canadian Medical Forum. We have also reached out to multiple stakeholders to explore common goals and identify ways to improve rural health care.

Recognising our responsibilities in reconciliation, the SRPC introduced a successful webinar series on Indigenous health. This series provides our members with access to knowledge and evidence that is essential for delivering culturally safe care to Indigenous patients and communities. In Fall 2021, the SRPC Indigenous Committee issued a statement that called upon governments to 'invest in indigenous peoples individually and collectively, listen to the wisdom of Indigenous peoples, and collaborate on the solutions they propose to the many inequities that persist'.¹ We also asked SRPC members to learn from and listen to their

Indigenous patients, identify injustices and inequities, and advocate for change in policies and laws negatively impacting indigenous communities.

Under the leadership of the SRPC Student Committee, we introduced a mentorship programme that aims to connect medical students and residents to rural physicians from across the country. This is a way to support career exploration, guidance and increase understanding of the scope of rural practice. This programme is thriving! We have successfully matched 100 learner mentees with a rural mentor physician!

While the past 2 years have been a bizarre time for all of us, it has been my absolute pleasure to have served as the SRPC president. I look forward to on-going involvement with the organisation in my role of past-president during the next term. Thank you to the past presidents and to the many dedicated SRPC members for help and guidance during my tenure.

The society is in excellent hands with our amazing staff, and Dr. Sarah Lesperance will be a great successor. She has worked in many different rural and remote parts of the country, and continues to be a dedicated rural generalist. I hope that some normalcy may shine on us during her future as President of the SRPC.

REFERENCE

1. Available from: https://www.srpc.ca/resources/Documents/indigenous_health/Truth_and_Reconciliation_Statement_FINAL.pdf. [Last accessed on 2022 Feb 22].

Received: 20-01-2022 Revised: 22-01-2022 Accepted: 25-01-2022 Published: 26-03-2022

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

How to cite this article: Woollam G. President's message: A reflection. Can J Rural Med 2022;27:49-50.

Message du président. Une réflexion

Gabe Woollam, MD,
FCFP, FRRMS¹

¹Président, Société de la
Médecine Rurale, Happy
Valley Goose Bay, NL,
Canada

Correspondance:
Gabe Woollam,
president@srpc.ca

Les deux dernières années ont été tout un défi pour nos membres et notre organisation.

Malgré cela, la SMRC a fait des pas de géant dans la défense du généralisme rural et la santé des résidents des régions rurales.

Au début de 2021, le comité du Plan d'action pour la médecine rurale a formellement conclu ses activités. La SMRC continue désormais le travail du Plan d'action pour la médecine rurale avec des projets comme la collaboration avec l'ICIS en recherche rurale, la dissémination de l'énoncé de consensus sur le transfert des patients des régions rurales, le travail de militantisme en faveur du permis national d'exercer et la participation à un groupe de planification de la main-d'œuvre en santé au Forum médical canadien. Nous avons également communiqué avec de nombreux intervenants afin d'examiner nos objectifs communs et de déterminer les façons d'améliorer les soins de santé en milieu rural.

Parce qu'elle reconnaît sa responsabilité dans la réconciliation, la SMRC a lancé une populaire série de webinaires sur la santé des Autochtones. Cette série donne accès à nos membres à des connaissances et à des données probantes qui sont essentielles à la prestation de soins adaptés à la culture des patients et des communautés autochtones. À l'automne 2021, le Comité sur la santé autochtone de la SMRC a émis un énoncé qui pressait le gouvernement " d'investir individuellement et collectivement auprès des peuples autochtones, d'écouter la sagesse des peuples autochtones et de collaborer aux solutions qu'ils proposent aux nombreuses iniquités persistantes¹.

Nous avons également demandé aux membres de la SMRC de laisser leurs patients autochtones leur enseigner, de relever les injustices et iniquités et de prôner le changement des politiques et des lois qui ont un impact négatif sur les communautés autochtones.

Sous le leadership du Comité d'étudiants de la SMRC, nous avons lancé un programme de mentorat qui vise à associer les étudiants en médecine et résidents aux médecins ruraux du Canada. C'est une façon de contribuer à l'exploration de carrière, à l'orientation et à une meilleure compréhension de la portée de la pratique rurale. Ce programme est florissant! Nous avons apparié 100 mentorés à un médecin rural!

Alors que les deux dernières années ont été très bizarres pour nous tous, j'ai eu l'extrême plaisir de servir à titre de président de la SMRC. Je suis impatient de continuer à contribuer à l'organisation à titre de président sortant durant le prochain mandat. Un grand merci aux anciens présidents et aux nombreux membres dévoués de la SMRC pour leur aide et leurs conseils durant mon mandat.

La Société est entre bonnes mains de notre personnel exceptionnel, et la Dre Sarah Lespérance sera une excellente successeuse. Elle a travaillé à titre de généraliste dans de nombreuses régions rurales et éloignées du pays, et elle continue de le faire. Je souhaite qu'une certaine normalité jaillisse durant son mandat de présidente de la SMRC.

RÉFÉRENCE

1. Available from: https://www.srpc.ca/resources/Documents/indigenous_health/Truth_and_Reconciliation_Statement_FINAL.pdf . [Last accessed on 2022 Feb 22].

Motor vehicle collision-related injuries and deaths among Indigenous Peoples in Canada: Meta-analysis of geo-structural factors

Naomi G. Williams,
MSW¹,
Kevin M. Gorey, PhD¹,
Amy M. Alberton,
PhD²

¹School of Social Work,
University of Windsor,
Ontario, Canada, ²School
of Social Work, Wichita
State University, Wichita,
Kansas, USA

Correspondence to:
Naomi G. Williams,
willily@uwindsor.ca

This article has been peer
reviewed.

Abstract

Introduction: Indigenous Peoples are much more likely than non-Indigenous Peoples to be seriously injured or die in motor vehicle collisions (MVCs). This study updates and extends a previous systematic review, suggesting that future research ought to incorporate social-environmental factors.

Methods: We conducted a systematic review and meta-analysis of the published and grey literature on MVCs involving Indigenous Peoples in Canada between 2010 and 2020. We focussed on personal (e.g. driving an old vehicle) and community social-environmental-economic factors (e.g. prevalent low socioeconomic status).

Results: Eleven comparative cohorts that resulted in 23 at minimum, age-standardised, mortality or morbidity rate outcomes were included in our meta-analysis. Indigenous Peoples were twice as likely as non-Indigenous Peoples to be seriously injured (rate ratio [RRpooled] = 2.18) and more than 3 times as likely to die (RRpooled = 3.40) in MVCs. Such great risks to Indigenous Peoples do not seem to have diminished over the past generation. Furthermore, such risks were greater on-reserves and in smaller, rural and remote, places.

Conclusion: Such places may lack community resources, including fewer transportation and healthcare infrastructural investments, resulting in poorer road conditions in Indigenous communities and longer delays to trauma care. This seems to add further evidence of geo-structural violence (geographical and institutional violence) perpetrated against Indigenous Peoples in yet more structures (i.e. institutions) of Canadian society. Canada's system of highways and roadways and its remote health-care system represent legitimate policy targets in aiming to solve this public health problem.

Keywords: Canada, First Nations, hospitalisation, Indigenous, Inuit, Métis, morbidity, mortality, motor vehicle collision, reserve, rural

Résumé

Introduction: Les Autochtones ont beaucoup plus tendance que les non-Autochtones à subir des blessures graves ou à perdre la vie dans une collision de véhicules motorisés. La présente étude actualise et élargit une

Access this article online

Quick Response Code:



Website:
www.cjrm.ca

DOI:
10.4103/cjrm.cjrm_42_21

Received: 27-06-2021 Revised: 19-10-2021 Accepted: 21-10-2021 Published: 26-03-2022

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Williams NG, Gorey KM, Alberton AM. Motor vehicle collision-related injuries and deaths among Indigenous Peoples in Canada: Meta-analysis of geo-structural factors. Can J Rural Med 2022;27:51-60.

revue systématique antérieure qui avait conclu que la recherche future devait incorporer les facteurs socio-environnementaux.

Méthode: Nous avons réalisé une revue systématique et méta-analyse de la littérature publiée et parallèle sur les collisions de véhicules motorisés entre 2010 et 2020 chez les Autochtones du Canada. Nous nous sommes concentrés sur les facteurs socio-environnementaux personnels (p. ex. vieux véhicules) et communautaires (p. ex. prévalence de faible statut socio-économique).

Résultats: Onze cohortes comparatives ayant donné au minimum 23 paramètres d'évaluation du taux de mortalité ou de morbidité standardisés en fonction de l'âge ont été incluses dans notre méta-analyse. Les Autochtones avaient deux fois plus tendance que les non-Autochtones à subir des blessures graves (rapport des taux $[RT_{\text{groupe}}] = 2,18$) et présentaient un risque plus de 3 fois plus élevé de perdre la vie ($RT_{\text{groupe}} = 3,40$) dans une collision de véhicules motorisés. La dernière génération d'Autochtones n'a pas vu cet énorme risque diminuer. En outre, le risque était supérieur dans les réserves et dans les agglomérations plus petites, plus rurales et plus éloignées.

Conclusion: Ces agglomérations sont parfois dépourvues de ressources communautaires, y compris d'un investissement important dans les infrastructures de transport et de santé, ce qui explique les routes en mauvaise condition et les délais prolongés pour recevoir des soins de traumatologie dans les communautés autochtones. Cela semble ajouter d'autres preuves de violence géostructurelle [violence géographique et institutionnelle] perpétrée contre les Autochtones dans encore plus de structures (les institutions) de la société canadienne. Le réseau canadien de routes et d'autoroutes, et son système de santé en région éloignée représentent des cibles légitimes pour les politiques qui visent à résoudre ces problèmes de santé publique.

Mots-clés: Canada, hospitalisation, Autochtone, Premières Nations, Inuit, Métis, morbidité, mortalité, collision de véhicules motorisés, réserve, rural

INTRODUCTION

As an Anishinaabe kwe, the genesis of my interest in the current study was serving as a research assistant for the project 'Motor Vehicle Collisions in First Nations, Métis, and Inuit Communities'.¹ However, my interest is not merely scholarly. I am a member of Walpole Island First Nation, Bkejwanong Territory, and during my tenure on the project, 2 members of our community died in a motor vehicle collision (MVC). I am also reminded of the fatal crash that occurred near Windsor, Ontario, on 3 September 1999, which took the lives of 8 people, including a Bkejwanong community member.² She was a grandmother, mother, auntie and traditional helper. Their deaths had a great impact on our community. Such premature deaths represent many years of lost life with an incalculable loss for our future. To reduce these tragic losses, we need to better understand their magnitude and causes among Indigenous Peoples.

A previous systematic review focussed on personal-behavioural causes of MVCs in Canada.³ However, scholarly observations have indicted various structures (or institutions) of Canadian society, including banking, housing child welfare, education and healthcare, which also have a negative impact on Indigenous Peoples and may

contribute to MVC morbidity and mortality.⁴ For example, Indigenous Peoples, especially those living in rural or remote areas, may have limited access to emergency medical care and may have to travel great distances on highways, with higher speed limits than urban streets, putting people at greater risk.^{5,6} Thus, structural factors should be assessed as they relate to Indigenous Peoples' MVC-related morbidity and mortality.

The purpose of this updated research synthesis was to systematically review this field's research over the past decade, focussing on social-structural explanations for prevalent MVCs in Indigenous communities. We also conducted a controlled meta-analysis as one had not yet been done. More statistically significant findings from research syntheses will assist decision-makers, Indigenous and non-Indigenous, in more clearly identifying and meeting the diverse needs of Indigenous communities to prevent MVCs and to diminish serious injury and death rates.

MORBIDITY AND MORTALITY DUE TO MOTOR VEHICLE COLLISIONS AMONG INDIGENOUS PEOPLES

One in every 6 or 7 Canadians is seriously injured each year, these injuries being the primary

cause of approximately one of every 15 deaths. Indigenous Peoples in Canada have been observed to experience 2- to 6-fold greater such risks than non-Indigenous Peoples.^{7,8}

Road-related injuries, primarily from MVCs, account for more than 30,000 hospitalisations and 3000 deaths each year and cost Canadians more than 5 billion dollars annually.⁹ Initial estimates of the prevalence of MVCs among Indigenous Peoples as well as the resultant seriousness of injuries and apparent greater risk of death are alarming.^{6,10-12} The precise magnitude of the relative risks (RRs) of injury and death experienced by Indigenous Peoples in Canada is not yet known,¹³ although a two-fold RR has been suggested.³ Finally, it is unknown if such risks due to MVCs have changed significantly over this research field's generational timeframe, nor do we understand very well how such risks differ, if at all, among Indigenous groups in Canada: First Nations, Inuit and Métis. This study aims to advance such knowledge.

Oppression in Canada's remote social structures

Scholars emphasise the importance of transcending the study of personal characteristics and behaviours to study structural risks experienced by Indigenous Peoples. According to Jervis *et al.*, the impacts of trauma caused by high rates of MVC-related deaths among American Indians in the United States exemplify post-colonial oppression.¹⁴ Mullaly has made similar inferences in Canada and Australia, suggesting that Indigenous morbid and mortal health disadvantages arise from the structural violence Indigenous Peoples experience across society.¹⁵⁻¹⁸ Moreover, oppression may be intimately related to geography, especially in Canada, where far more Indigenous Peoples live in rural and remote places.¹⁹ These geo-structural barriers also have an impact on non-Indigenous populations living in rural communities.²⁰ Often, there is a shortage of healthcare nurses and physicians as well as inadequate trauma care.^{21,22} However, Indigenous communities are affected by colonial violence due to governmental values and policies, which further exacerbate health disparities among Indigenous Peoples.²³ Research in this field must begin to account for such geographic and structural factors. This study does.

'Place' is probably as or more important than the person in understanding this field. An example may bring this notion to life. First, a cursory glance at a map of Canada shows a pattern of 1000–2000 km separating each province's sparsely populated, remote northern places from densely populated, southern urban and relatively resource-rich places. Next, imagine an Indigenous family in a tragic single car crash that resulted in very serious injuries on a remote road more than 1000 km away from the nearest trauma centre. This Indigenous family would be at much greater risk than an otherwise similar non-Indigenous family in Toronto, for example. The reasons for their greater jeopardy may not have been at all personal, rather, geographic and structural or geo-structural. One could surmise that this family could have suffered from the lack of protective engineering of the northern road system and also from a lack of healthcare resources, resulting in transportation delays of emergency care to the scene, as well as to specialised trauma care.

Finally, research methodologists have become more interested in developing valid measures of community-level risks (and protections), especially in understudied rural and remote places. Their work has tended to de-emphasise personal-level risk factors while emphasising community-level structural factors.²⁴⁻²⁸ This and related epidemiologic fields have long used ecological, community-level measures of socio-economic status (SES) as proxies for the SES of individuals living within those communities. Typical examples are the prevalence of low-income households/Peoples within census tracts or census subdivisions. Every effort was made to incorporate such geo-structural characteristics into this research synthesis related to Indigenous Peoples residing in geographically diverse places.

Previous reviews of motor vehicle collisions among Indigenous Peoples in Canada

Short *et al.* conducted a systematic review of 20 studies published between 1980 and 2010.³ They valuably, but roughly estimated that Indigenous Peoples were twice as likely as non-Indigenous Peoples to be seriously injured or die in MVCs and began to explore primarily personal explanations for such observed Indigenous

disadvantages (e.g. gender, substance misuse and age of vehicle). Another relevant systematic review of interventions designed to prevent MVC-related injuries and deaths among Indigenous Peoples also focussed primarily on personal factors (e.g. responsible alcohol consumption and aspects of safe driving including child/booster seat and seatbelt use).²⁹ These previous reviews began to advance society's understanding of the extent of this public health problem in Canada and additionally provided hopeful evidence that there are ways to effectively diminish the magnitude of the problem. However, important contributions notwithstanding, the review by Megan Short *et al.* was limited in several ways. It did not include a meta-analysis, and its narrative findings did not account for potential confounds. For example, age is a fundamental covariate that should be accounted for in any study of health or healthcare, and it was not always included. There seemed to have been little collaboration between researchers and Indigenous community-based stakeholders.

Researchers have suggested that future research should incorporate social factors such as mores related to community attitudes towards safe versus reckless driving. We concur but would suggest additional foci on geo-structural factors related to physical and economic environments. This study will update and extend the previous systematic review,³ adding a meta-analytic component that, at minimum, accounts for age in addition to primary study sample sizes. It will also explore the independent effects of geo-structurally vulnerable places where Indigenous Peoples tend to live on-reserve, in small urban or rural places, or relatively impoverished communities.

METHODS

Study selection

The following research literature databases were searched: *Cumulative Index of Nursing and Allied Health Literature Complete*, *First Nations Periodical Index*, *Google Scholar*, *HealthSTAR*, *Indigenous Peoples of North America*, *Indigenous Studies Portal*, *Medline via PubMed*, *Métis Voyageur*, *ProQuest Dissertations and Theses Global*, *PsycINFO*, *Social Services Abstracts*, *Social Work Abstracts*, *Sociological Abstracts* and the *Web of Science: Conference Proceedings Citation Index*.

Published peer-reviewed and gray, unreviewed and unpublished sampling frames were searched to guard against publication bias.^{30,31}

Article titles or abstracts were searched with this broad keyword search scheme: (Indigenous or Aboriginal or First Nations or Inuit or Métis) and (mortality or morbidity or injury or hospitalisation or emergency department or trauma or potential years of life lost). Searches were then triangulated with the following full text search scheme: (motor vehicle or car or automobile or traffic or road) and (crash or collision or accident). Eligible studies had to meet these inclusion criteria: (1) conducted in Canada, (2) used a longitudinal cohort design, (3) compared an Indigenous with a non-Indigenous group and (4) mortality or morbidity rates were, at minimum, age-standardised. Studies that did not report results in enough detail to calculate an effect size metric were excluded. Bibliographies and authors of retrieved studies were snowball-searched for additional eligible studies. The study selection process, cross-validated by 2 reviewers, identified 11 relevant studies for this meta-analysis.^{4,13,32-42}

Meta-analysis

This meta-analysis observed random effects on discrete outcomes.⁴¹⁻⁴⁶ The unit of analysis was the unique hypothesis test. Between-ethnocultural group comparisons were observed for mortal or morbid outcomes. These were treated as independent hypotheses. Each study could contribute only once to each hypothesis test. If a primary study provided multiple outcomes related to the same hypothesis, the estimated ethnocultural-outcome association was pooled so that that study would contribute only one data point for that hypothesis test.

Mortality or morbidity rate ratios that were at least age-standardised, estimated primary study RRs. Natural logarithms of study RRs were weighted by their inverse variances, computed from standard errors ($1/SE^2$) so that larger, more precise studies carried more weight. Standard errors were estimated from study statistics, generally from reported 95% confidence intervals (CIs). Such precision-weighted effects were then pooled within domains of interest using weighted regression models. Pooled RRs within 95% CIs were calculated from regression

statistics, as were tests of heterogeneity (χ^2) and meta-analytic-between-group comparisons (z). All statistical significance decisions were made at the α criterion of 0.05, and RRs greater than 1.00 indicated greater mortalities and morbidities among Indigenous Peoples. All authors agreed on data extraction from each study. Subsequently, the meta-analysis was completed by the third author. It was then cross-validated by the first two authors. On cross-validation, there was 90.9% agreement among the analysts. Consensus was reached through discussion.

The following hypotheses were tested. First, compared to non-Indigenous Canadians, Indigenous Peoples have significantly greater mortality after MVCs. Second, Indigenous Peoples have significantly more prevalent serious injuries after MVCs. Third and fourth, Indigenous disadvantages, mortal and morbid, are greater in geo-structurally vulnerable places where transportation and healthcare structures

may be inadequately resourced. When possible, we explored the potential moderating influence of other available personal, contextual and research design characteristics of the primary studies and their participants.

RESULTS

Sample description

Descriptive characteristics and mortality or morbidity outcomes of the 11 studies retrieved for this meta-analysis are, respectively, displayed in Tables 1 and 2. Published between 2010 and 2019, 5 sampled Canadian national and 6 sampled provincial populations of Indigenous Peoples and non-Indigenous Peoples between 1990 and 2015: British Columbia (3), Alberta (2), Newfoundland and Labrador (1). The majority did not disaggregate the experiences of diverse Indigenous Peoples across Canada, while

Table 1: Description and outcomes of studies included in the meta-analysis: Indigenous versus non-Indigenous motor vehicle collision-related mortality

Reference	Populations Places Cohort years	Research design Sampling frame Analytic samples Covariate adjustments ^a	Outcomes risk ratios ^b (95% CI)
Tjepkema <i>et al.</i> , 2010	Aboriginal and non-Aboriginal 25 or older Urban Canada 1991 to 2001	Prospective cohort Canadian Mortality Database and Census 16,300 and 2,062,700 Age, gender and metro versus small urban	Mortality RR=3.75 (3.27-4.29) RR _{women} =4.13 (2.46-6.93) RR _{men} =3.51 (2.32-5.32)
Tjepkema <i>et al.</i> , 2011a	Métis, non-Status Indians and non-Aboriginal 25 to 74 years of age Canada 1991 to 2001	Prospective cohort Canadian Mortality Database and Census 11,600, 5400 and 2,475,700 Age and gender	Person-years of life lost RR=2.75 (2.54-2.98) RR _{women} =1.79 (1.31-2.43) RR _{men} =3.42 (2.75-4.24)
Tjepkema <i>et al.</i> , 2011b	Status Indians and non-aboriginal 25 to 74 years of age Canada 1991 to 2001	Prospective cohort Canadian Mortality Database and Census 55,600 and 2,475,700 Age and gender	Person-years of life lost RR=4.04 (3.68-4.44) RR _{on-reserve} =4.53 (4.07-5.05) RR _{off-reserve} =2.78 (2.34-3.31)
Yacoub, 2012	First Nations and non-First Nations All ages Alberta 2000 to 2009	Retrospective cohort Alberta Death File, FN Mortality Database and Census: 355 and 3461 Age	Mortality RR=3.76 (1.70-8.32)
BC coroners service and first nations health authority death review panel, 2017	First Nations and non-First Nations 15 to 24 years of age British Columbia 2010 to 2015	Retrospective cohort BC Coroners Service and First Nations Health Authority: 95 and 1115 Age	Mortality RR=2.38 (1.02-5.57)

^aPotential confounds that were accounted for by sample restriction, matching, regression modeling or direct standardisation, ^bRisk ratios were adjusted in regressions or directly standardised. Risk ratios greater than 1.00 indicate greater Indigenous mortality. BC: British Columbia, CI: Confidence interval, FN: First Nations, RR: Rate ratio

Table 2: Description and outcomes of studies included in the meta-analysis: Indigenous versus non-Indigenous motor vehicle collision-related morbidity

Reference	Populations Places Cohort years	Research design Sampling frame Analytic samples Covariate adjustments ^a	Outcomes risk ratios ^b (95% CI)
Alaghebandan <i>et al.</i> , 2010	Aboriginal and non-Aboriginal New-born to 19 years of age Newfoundland and Labrador 1995 to 2001	Retrospective cohort Hospital Discharge Database and Census 72 and 2032 Age and gender	Hospitalisations RR=1.71 (1.54-1.91) RR _{passenger} =1.75 (1.30-2.34) RR _{pedestrian} =1.65 (1.12-2.44)
George <i>et al.</i> , 2015	Aboriginal and General Population All ages British Columbia 1991 to 2010	Retrospective cohorts Population Data BC and Census 585 and 6756 Age, gender and HSDA	Hospitalisations RR=2.84 (2.78-2.89) RR ₁₉₉₁ =2.89 (2.74-3.07) RR ₂₀₁₀ =1.45 (1.06-1.87)
Brussoni <i>et al.</i> , 2018	Aboriginal and General Population All ages British Columbia 1991 to 2010	Retrospective cohort BC Health Insurance Registry and Census 12,683 and 262,819 Age, gender and HSDA	Hospitalisations RR=1.89 (1.85-1.94) RR _{women} =2.13 (2.03-2.24) RR _{men} =1.69 (1.63-1.75) RR _{non-metro} =2.71 (2.61-2.82) RR _{metro} =1.73 (1.63-1.84) RR _{on-reserve} =2.00 (1.93-2.07) RR _{off-reserve} =1.77 (1.71-1.83)
Oliver and Kohen, 2012	Aboriginal and non-Aboriginal ^c New-born to 19 years of age Canada (not Quebec) 2001 to 2006	Retrospective cohort Hospital Morbidity Database and Census 944 and 12,898 Age and gender	Hospitalisations RR=2.42 (2.30-2.55) RR _{women} =2.82 (2.54-3.14) RR _{men} =2.22 (2.02-2.43)
Finès <i>et al.</i> , 2013	Aboriginal and non-Aboriginal ^c 20 or older Canada (not Quebec) 2004 to 2010	Retrospective cohort Discharge Abstract Database and Census 26,000 and 704,000 Age and gender	Hospitalisations RR=2.92 (2.90-2.95) RR _{women} =3.42 (3.36-3.49) RR _{men} =2.50 (2.46-2.54)
Sanchez-Ramirez <i>et al.</i> , 2019	Métis and General Population All ages Alberta 2013	Retrospective cohort Alberta Health Insurance Registry and Métis Nation of Alberta: 4225 and 518,592 Age	Emergency department visits RR=1.44 (1.09-1.90)

^aPotential confounds that were accounted for by sample restriction, matching, regression modeling or direct standardisation, ^bRisk ratios were adjusted in regressions or directly standardised. Risk ratios >1.00 indicate greater Indigenous mortality, ^cDA-based ecological analysis: DAs with 33% or more Aboriginal Peoples compared to DAs with fewer aboriginal peoples (respectively, 77.0% aboriginals and 2.8% aboriginals). DAs: Dissemination area, BC: British Columbia, CI: Confidence interval, FN: First Nations, HSDA: Health service delivery area, RR: Rate ratio

5 observed the unique experiences of First Nations (3) or Métis (2) People. Overall, these studies seemed representative of Canadians of all ages: All ages (4), adults 20–25 or older (4) infants to 19-year-old youths (2) and youths to emergent adults 15–24 (1).

The 11 studies were all population-based, cohort studies, 8 retrospective or historical, and 3 prospective. Moreover, with the exception of 2 studies that had fewer than 100 Indigenous participants, these were quite large, statistically powerful investigations. In aggregate, more than eight million people participated, however,

Indigenous samples (range = 72–55,600, median = 4225) were markedly smaller than the non-Indigenous ones (range = 1115–2,475,700, median = 262,819). Consistent with inclusion criterion, all of the studies at least accounted for age in their multivariable analyses, 3 for age alone, 5 for age and gender, while 3 accounted for an additional covariate. Two of the studies were government-based reports while the remainder were peer-reviewed articles (2 had initially been released as grey documents). A total of 23 independent study results were included in our meta-analysis. The description of the 23 outcomes

were all statistically and practically significant and in the direction of hypothesis support, that is, Indigenous disadvantages.

Meta-analytic findings

The overall pooled RR of dying in a MVC among Indigenous Peoples in Canada was huge. Compared with their otherwise similar non-Indigenous counterparts, Indigenous victims were more than 3 times as likely to die; RR = 3.40 (95% CI 2.68, 4.31). The Indigenous risk of injury, typically serious injuries requiring hospitalisation, was also quite large, representing a two-fold greater risk among Indigenous victims: RR = 2.18 (95% CI 1.82, 2.61). These pooled mortality and morbidity RR estimates differed significantly ($z = 18.02$, $P < 0.05$) so they were meta-analysed separately.

Mortality

Table 1 displays primary study and meta-analytic findings related to mortality. First, the mortality outcomes were observed to be significantly heterogeneous ($\chi^2[4] = 41.92$, $P < 0.05$) warranting the testing of their moderation, centrally by place. Second, one study allowed for the testing of the geo-structural vulnerability hypothesis. As hypothesised, Indigenous risks were significantly and substantially larger on-reserve (RR = 4.53 [95% CI 4.07, 5.05]) than off-reserve (RR = 2.78 [95% CI 2.34, 3.31]), $z = 6.53$, $P < 0.05$. Third, consistent with much previous research, men (RR = 3.44 [95% CI 3.16, 3.75]) were at significantly greater risk than women (RR = 2.28 [95% CI 2.19, 2.56]), $z = 5.60$, $P < 0.05$. Fourth and finally, RRs did not change significantly over time nor did any other participant, contextual, or research design characteristic significantly predict mortality risk.

Morbidity

Table 2 displays primary study and meta-analytic findings related to morbidity. Injury outcomes were also observed to be significantly heterogeneous ($\chi^2[5] = 1,030.67$, $P < 0.05$). Again, one study allowed for the testing of the geo-structural vulnerability hypothesis, but this time in two ways. As hypothesised, Indigenous risks were

again significantly larger on-reserve (RR = 2.00 [95% CI 1.93, 2.07]) than off-reserve (RR = 1.77 [95% CI 1.71, 1.83]), $z = 8.66$, $P < 0.05$. Indigenous risks were also significantly larger in non-metropolitan (RR = 2.71 [95% CI 2.61, 2.82]) than in metropolitan areas (RR = 1.73 [95% CI 1.63, 1.84]), $z = 31.83$, $P < 0.05$. Counter-hypothetically, women (RR = 2.70 [95% CI 2.66, 2.74]) seemed to be at significantly greater risk of serious injury than men (RR = 2.07 [95% CI 2.05, 2.10]), $z = 28.11$, $P < 0.05$. Though one study in British Columbia suggested diminishing risks,³⁶ the overall pooled RR risk did not change significantly over time. Finally, only one study disaggregated RRs by passengers or pedestrians. Their risks did not differ significantly: RR_{passengers} = 1.75 (95% CI 1.30, 2.34) versus RR_{pedestrians} = 1.65 (95% CI 1.12, 2.44), $z = 0.52$, $P = 0.61$. No other personal, contextual or research design characteristic significantly predicted morbid risks.

Adjunct findings

Six predominantly ecological studies, 3 included in this meta-analysis along with 3 related studies, provided interpretive adjuncts.^{4,37-39,47,48} Using multivariable regression models and related statistical techniques, they endeavoured to advance the understanding of how lack of community-level resources may explain Indigenous disadvantages, especially in rural and remote places. Substantial proportions (33%–90%) of the MVC-related injury and mortality rate differences between Indigenous Peoples and non-Indigenous Peoples could be explained by community-level socioeconomic factors. A case-control study of MVC-related injuries on- or off-reserve in Saskatchewan was particularly instructive.⁴⁷ It found greater on-reserve risks could be substantially explained by personal and community-level socioeconomic factors. For example, factors such as having a very old car and poor road conditions were extremely predictive of serious injury, ranging from RRs of 2.50 to greater than 6.00, community-level risks being consistently larger than personal ones. Such may reflect transportation infrastructural resources in Indigenous communities and a lack of related resources necessary to adequately treat the roads, particularly in the wintertime. Finally, Haas's dissertation study additionally implicated

healthcare infrastructure inadequacies in remote northern places.⁴⁸

DISCUSSION

Our research cross-validated the most important finding of Short *et al.*'s previous systematic review of the relative risks of serious injuries and deaths post-MVCs among Indigenous Peoples in Canada.³ They roughly estimated that Indigenous Peoples experience twice the risk of their non-Indigenous counterparts. The pooled estimates of this, more controlled, meta-analytic review concurred, but further suggested that the previous risk estimates were probably underestimates. We estimated that Indigenous Peoples in Canada were twice as likely as non-Indigenous Peoples to be seriously injured and 3–4 times as likely to die in MVCs. The outcomes of the investigations pooled in our updated review also strongly suggested that these profound Indigenous disadvantages have been longstanding, not having changed significantly over the past generational timeframe. Our review also aimed to build upon the previous review's emphasised person-level risks by incorporating geo-structural risk factors. Indigenous risks were observed to be even greater on-reserves in rural and remote places across Canada. Consistent with a contemporaneous systematic review of USA-based primary studies and a British Columbia-based ecological study, another structure of society, the potentially inadequately engineered or treated system of highways and roads in geographically vulnerable places was implicated.^{5,49} Our results were consistent with those of Haas's Ontario-based dissertation study and a national study of remoteness in Canada,^{48,50} indicting another structure of Canadian society – an inadequately resourced system of urgent triage/transport/trauma-care in such remote places.

Limitations and future research recommendations

As the overall pooled results related to the much greater incidence of MVC-related injuries and deaths among Indigenous Peoples were based upon the experiences of over 8 million people with the predominant retrospective cohorts systematically replicated by 3 prospective

cohorts, we have great confidence in the validity of those estimates. For a number of reasons, though our results about potentially important moderations of those overall effects inspired less confidence and so were more tentative. First, the meta-analysis result of greater community-level risks experienced by Indigenous Peoples, on-reserves or in isolated rural and remote places, was based upon only three study outcomes. Second, the inference that community-level socioeconomic measures tell us more about community resources than personal resources was based upon a small number of ecological studies. Although the construct and predictive validities of such expansive geographical measures in Canada's remote reserves have been suggested, they have not yet been confidently clarified.^{24,25} Finally, we had originally hoped to be able to advance an understanding of the potentially distinct experiences of diverse Indigenous groups in Canada. Unfortunately, we were unable to do so for lack of meta-analytic power.

Future research teams should consider the following. First, the few existing tests of the effects of geo-structural factors by comparing reserves and other geographically vulnerable places ought to be systematically replicated across the provinces and territories. Second, validating studies of community-level ecological measures, especially in Canada's most isolated places, would help solidify geo-structural inferences, that is, that it is primarily the structures of society that are implicated here. Towards this end, mixed-methods investigations might augment administrative databases. For example, photovoice-like methods might be used to learn more about MVC scenes.⁵¹ Alternatively, the addition of sentinel quantitative measures may go a long way towards solidifying this field's knowledge about the effects of remoteness, for example: distances and/or delay times between residences, crash sites and trauma centres. Third, the experiences of distinct Indigenous communities and their people ought to be disaggregated in analyses and reporting. Fourth, we echo Short *et al.*'s suggestion that researchers in this field must work closely, indeed 'collaborate' with Indigenous communities.³ Such involvement throughout the research project, from idea generation to dissemination of findings, is bound to produce results that are more face valid and so practically

useful to Indigenous communities as well as to scholarly and non-Indigenous decision-making communities.^{52,53} At last, to address this health disparity, it is of great importance to consult with Indigenous communities and ensure all healthcare professionals are trained in cultural competency, as recommended by the Truth and Reconciliation Commission of Canada.²³ The hope is to mitigate MVC injuries and deaths that affect Indigenous Peoples by providing healthcare resources.

CONCLUSION

This meta-analysis affirmed a previous systematic review's concerns that Indigenous Peoples in Canada are much more likely than non-Indigenous Peoples to be seriously injured and die in MVCs. It also observed that Indigenous risks seem to be significantly greater on-reserves and in rural and remote places. Such places may lack community resources, including fewer transportation and healthcare infrastructural investments, resulting in poorer road conditions and longer delays to trauma care. Canada's system of highways and roadways and its remote healthcare system represent legitimate policy targets to solve this public health problem.

Acknowledgement: We gratefully acknowledge the editorial assistance of Russell Nahdee (Anishinaabe), coordinator of the Aboriginal Education Centre, University of Windsor.

Financial support and sponsorship: Nil.

Conflicts of interest: There are no conflicts of interest.

REFERENCES

- Angell GB, North J, Williams N. Utilizing Indigenous Pathways of Knowledge Transfer to Build Injury Free Communities. New Orleans, LA: Society for Social Work and Research; 2017.
- MacGregor D. Sugar bear in the hot zone: Understanding and interpreting the political basis of traffic safety. In: Rothe JP, editor. *Driving Lessons: Exploring Systems that Make Traffic Safer*. Edmonton, MB: The University of Alberta Press; 2002. p. 125-42.
- Short MM, Mushquash CJ, Bédard M. Motor vehicle crashes among Canadian Aboriginal people: A review of the literature. *Can J Rural Med* 2013;18:86-98.
- Brussoni M, George MA, Jin A, Amram O, McCormick R, Lalonde CE. Hospitalizations due to unintentional transport injuries among Aboriginal population of British Columbia, Canada: Incidence, changes over time and ecological analysis of risk markers. *PLoS One* 2018;13:e0191384.
- Pollack KM, Frattaroli S, Young JL, Dana-Sacco G, Gielen AC. Motor vehicle deaths among American Indian and Alaska Native populations. *Epidemiol Rev* 2012;34:73-88.
- Community Health Programs Directorate. Unintentional and Intentional Injury Profile for Aboriginal Peoples in Canada. Ottawa, ON: Health Canada; 2001.
- Billette J, Janz T. Injury in Canada: Insight from the Canadian Community Health Survey. Ottawa, ON: Statistics Canada; 2011.
- Statistics Canada. Mortality: Summary List of Causes 2005. Ottawa, ON: Statistics Canada; 2009.
- Parachute. The Cost of Injury in Canada. Available from: https://parachute.ca/wp-content/uploads/2019/06/Cost_of_Injury-2015.pdf. [Last accessed on 2021 June 25].
- British Columbia Office of the Provincial Health Officer. Pathways to Health and Healing: 2nd Report on the Health and Well-Being of Aboriginal Peoples in British Columbia. Provincial Health Officer's Annual Report 2007. Victoria, BC: Ministry of Healthy Living and Sport; 2009.
- Karmali S, Laupland K, Harrop AR, Findlay C, Kirkpatrick AW, Winston B, et al. Epidemiology of severe trauma among status Aboriginal Canadians: A population-based study. *CMAJ* 2005;172:1007-11.
- Yao X, Skinner R, McFaull S, Thompson W. At-a-glance – 2015 injury deaths in Canada. *Health Promot Chronic Dis Prev Can* 2019;39:225-31.
- Sanchez-Ramirez DC, Chen Y, Randall JR, Sporidis MJ, Svenson L, Voaklander B, et al. Injury-related health services use and mortality among Métis Peoples in Alberta. *Can J Public Health* 2019;110:422-9.
- Jervis LL; Al-SUPERPFP Team. Disillusionment, faith, and cultural traumatization on a northern plains reservation. *Traumatology* 2009;15:11-22.
- Mullaly B. Challenging Oppression: A Critical Social Work Approach. Don Mills, ON: Oxford University Press; 2002.
- Alberton AM. Predictive Effects of (neo)Colonialism and other Forms of Structural Violence on Involuntary Contacts with the Criminal Justice System in Canada: A Statistical Analysis with an Autoethnographic Perspective (Doctoral Dissertation). ProQuest Dissertations Theses; 2020. p. 2487186463.
- Maddison S. Indigenous identity, 'authenticity' and the structural violence of settler colonialism. *Identities* 2013;20:288-303.
- Pedersen JS, Malcoe LH, Pulkington J. Explaining aboriginal/non-aboriginal inequalities in postseparation violence against Canadian women: Application of a structural violence approach. *Violence Against Women* 2013;19:1034-58.
- Banerji A; Canadian Paediatric Society; First Nations, Inuit and Métis Health Committee. Preventing unintentional injuries in Indigenous children and youth in Canada. *Paediatr Child Health* 2012;17:393-4.
- Bell N, Simons RK, Lakha N, Hameed SM. Are we failing our rural communities? Motor vehicle injury in British Columbia, Canada, 2001-2007. *Injury* 2012;43:1888-91.
- Jiang HY, MacLean A, Yoon J, Hughes S, Kim MJ, Anantha RV, et al. Evaluation of trauma resources in rural northern Alberta identifies opportunities for improvement. *Can J Surg* 2020;63:E383-90.
- Wilson C, Rourke J, Oandasan I, Bosco C. Progress made on access to rural health care in Canada. *Can Fam Physician* 2020;66:31-6.
- Truth and Reconciliation Commission of Canada. Honouring the Truth, Reconciling for the Future: Summary of the Final Report of the Truth and Reconciliation Commission of Canada. Available from: https://ehprnh2mwo3.exactdn.com/wp-content/uploads/2021/01/Executive_Summary_English_Web.pdf and indicate. [Last accessed on 2022 Feb 21].
- Buajitti E, Chiodo S, Rosella LC. Agreement between area- and individual-level income measures in a population-based cohort: Implications for population health research. *SSM Popul Health* 2020;10:100553.
- Fuller D, Neudorf J, Lockhart S, Plante C, Roberts H, Bandara T, et al. Individual- and area-level socioeconomic inequalities in diabetes mellitus in Saskatchewan between 2007 and 2012: A cross-sectional analysis. *CMAJ Open* 2019;7:E33-9.

26. Gorey KM. Regarding "Associations between socioeconomic status and cancer survival." *Ann Epidemiol* 2006;16:789-91.
27. Gorey KM, Holowaty EJ, Fehringer G, Laukkanen E, Richter NL, Meyer CM. An international comparison of cancer survival: Metropolitan Toronto, Ontario, and Honolulu, Hawaii. *Am J Public Health* 2000;90:1866-72.
28. Terashima M, Rainham DG, Levy AR. A small-area analysis of inequalities in chronic disease prevalence across urban and non-urban communities in the Province of Nova Scotia, Canada, 2007-2011. *BMJ Open* 2014;4:e004459.
29. Short MM, Mushquash CJ, Bédard M. Interventions for motor vehicle crashes among Indigenous communities: Strategies to inform Canadian initiatives. *Can J Public Health* 2014;105:e296-305.
30. de Smidt GA, Gorey KM. Unpublished social work research: Systematic replication of a recent meta-analysis of published intervention effectiveness research. *Social Work Res* 1997;21:58-62.
31. Grenier AM, Gorey KM. Effectiveness of social work with older Peoples and their families: A meta-analysis of conference proceedings. *Soc Work Res* 1998;22:60-4.
32. Alaghehbandan R, Sikdar KC, MacDonald D, Collins KD, Rossignol AM. Unintentional injuries among children and adolescents in Aboriginal and non-Aboriginal communities, Newfoundland and Labrador, Canada. *Int J Circumpolar Health* 2010;69:61-71.
33. British Columbia Coroners Service, First Nations Health Authority Death Review Panel. A Review of First Nation Youth and Young Adult Injury Deaths, 2010-2015. Victoria: BC Coroners Service; 2017.
34. Finès P, Bougie E, Oliver LN, Kohen DE. Hospitalizations for unintentional injuries among Canadian adults in areas with a high percentage of Aboriginal-identity residents. *Chronic Dis Inj Can* 2013;33:204-17.
35. George MA, Jin A, Brussoni M, Lalonde CE. Is the injury gap closing between the Aboriginal and general populations of British Columbia? *Health Rep* 2015;26:3-14.
36. Oliver LN, Kohen DE. Unintentional injury hospitalizations among children and youth in areas with a high percentage of Aboriginal identity residents: 2001/2002 to 2005/2006. *Health Rep* 2012;23:7-15.
37. Tjepkema M, Wilkins R, Pennock J, Goedhuis N. Potential years of life lost at ages 25 to 74 among Status Indians, 1991 to 2001. *Health Rep* 2011;22:25-36.
38. Tjepkema M, Wilkins R, Senécal S, Guimond É, Penney C. Mortality of urban Aboriginal adults in Canada, 1991-2001. *Chronic Dis Canada* 2010;31:4-21.
39. Tjepkema M, Wilkins R, Senécal S, Guimond E, Penney C. Potential years of life lost at ages 25 to 74 among Métis and non-Status Indians, 1991 to 2001. *Health Rep* 2011;22:37-46.
40. Yacoub W. First Nations Health Status Report: Alberta region 2010-2011. Edmonton, AB: Health Canada Alberta Region; 2012.
41. Greenland S. Quantitative methods in the review of epidemiologic literature. *Epidemiol Rev* 1987;9:1-30.
42. Cooper HM. Research Synthesis and Meta-Analysis: A Step-by-Step Approach. 5th ed. Los Angeles, CA: Sage; 2017.
43. Greenland S, O'Rourke K. On the bias produced by quality scores in meta-analysis, and a hierarchical view of proposed solutions. *Biostatistics* 2001;2:463-71.
44. Grizzle JE, Starmer CF, Koch GG. Analysis of categorical data by linear models. *Biometrics* 1969;25:489-504.
45. Hedges LV. Fixed effects models. In: Cooper H, Hedges LV, editors. *The Handbook of Research Synthesis*. New York: Russell Sage Foundation; 1994. p. 285-99.
46. Stroup DF, Berlin JA, Morton SC, Olkin I, Williamson GD, Rennie D, et al. Meta-analysis of observational studies in epidemiology: A proposal for reporting. Meta-analysis Of Observational Studies in Epidemiology (MOOSE) group. *JAMA* 2000;283:2008-12.
47. Desapriya E, Fujiwara T, Verma P, Babul S, Pike I. Comparison of on-reserve road versus off-reserve road motor vehicle crashes in Saskatchewan, Canada: A case control study. *Asia Pac J Public Health* 2011;23:1005-20.
48. Haas B. The Mortality Cost of Undertriage of Major Trauma in Ontario (Doctoral Dissertation). ProQuest Dissertations Theses; 2012. p. 1333382752.
49. Brussoni M, Jin A, George MA, Lalonde CE. Aboriginal community-level predictors of injury-related hospitalizations in British Columbia, Canada. *Prev Sci* 2015;16:560-7.
50. Subedi R, Greenberg TL, Roshanafshar S. Does geography matter in mortality? An analysis of potentially avoidable mortality by remoteness index in Canada. *Health Rep* 2019;30:3-15.
51. Catalani C, Minkler M. Photovoice: A review of the literature in health and public health. *Health Educ Behav* 2010;37:424-51.
52. Banner D, Bains M, Carroll S, Kandola DK, Rolfe DE, Wong C, et al. Patient and public engagement in integrated knowledge translation research: Are we there yet? *Res Involve Engage* 2019;5:8.
53. Harding T, Oetzel J. Implementation effectiveness of health interventions for indigenous communities: A systematic review. *Implement Sci* 2019;14:76.

SRPC AND THE ROUNDS

The Society of Rural Physicians of Canada is excited to renew its partnership with Boondoc Technologies to deliver a customized clinical Community on The Rounds. The Rounds is a professional clinical network - developed in Halifax, Nova Scotia. Each month, over 5,000 Canadian physicians log in to The Rounds to access new information and clinical content and participate in expert-led clinical discussions. The Rounds platform supports physicians and their associations by improving connectivity, association collaboration and providing a secure portal for information sharing. Login to the SRPC Community by visiting this link: www.therounds.com/SRPC/home

Northern Ontario's Obstetrical Services in 2020: A developing rural maternity care desert

Eliseo Orrantia, MD,
CCFP¹, Peter Hutten-
Czapski, MD, CCFP²,
Mathieu Mercier,
BScN³, Samarth
Fageria, MMASc⁴

¹Division of Clinical
Sciences, Northern Ontario
School of Medicine,
Marathon, Ontario,
Canada, ²Division of
Clinical Sciences, Northern
Ontario School of Medicine,
Haileybury, Ontario,
Canada, ³Northern Ontario
School of Medicine, Thunder
Bay, Ontario, Canada,
⁴Faculty of Medicine,
Memorial University, St.
John's, Newfoundland and
Labrador, Canada

Corresponding to:
Eliseo Orrantia,
eorrantia@mfbt.org

This article has been peer
reviewed.

Abstract

Introduction: Rural maternity care services matter. Obstetrical care in rural Canada has seen concerning trends of service closures and decreasing numbers of family physicians who predominantly provide this service. Such reductions have been shown to have a serious impact on maternal/foetal well-being.

Methods: This study investigated the present state of obstetrical services in Northern Ontario, comparing results to those of the last similar survey in 1999. All 40 Northern Ontario communities with hospitals were surveyed, as were the 16 midwife practices in the region.

Results: Of the 35 rural and 5 urban hospitals surveyed, the number not offering obstetrical care has risen from 37.5% in 1999 to 60% in 2020, with all the closures having been rural sites. There have been no re-openings of obstetrics in hospitals that did not offer obstetrics in 1999. Women in the 9 communities that had offered maternity services in 1999, but no longer do in 2020, now travel an average of over 1.5 h to access these services. In those communities that continue obstetrics, but stopped offering caesarean sections, women now travel 2.5 h for this surgery. Although the total number of general physicians remains at the 1999 level, the number offering intrapartum care has dropped by 65% in urban centres and by 49% in rural ones still providing maternity care.

Conclusions: Like much of the rural United States, rural Northern Ontario is well on its way to becoming a maternity care desert. As proven in Southern Australia, supportive government policies and programmes should be established and education reform enacted to reverse this concerning trend.

Keywords: Midwifery, obstetrics and gynaecology, patient oriented research, primary care, rural health and medicine

Introduction: Les services de maternité en région rurale comptent. On observe une tendance préoccupante de fermeture des services d'obstétriques et de réduction du nombre de médecins de famille qui offrent surtout des soins obstétriques dans les régions rurales du Canada. Ces réductions ont montré avoir un impact grave sur le bien-être de la mère et du fœtus.

Méthodes: Cette étude s'est penchée sur l'état actuel des services d'obstétriques au

Access this article online

Quick Response Code:



Website:
www.cjrm.ca

DOI:
10.4103/cjrm.cjrm_4_21

Received: 11-01-2021 Revised: 21-04-2021 Accepted: 07-05-2021 Published: 26-03-2022

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Orrantia E, Hutten-Czapski P, Mercier M, Fageria S. Northern Ontario's Obstetrical Services in 2020: A developing rural maternity care desert. Can J Rural Med 2022;27:61-8.

nord de l'Ontario, et a comparé ses résultats à ceux de la dernière enquête semblable réalisée en 1999. Les 40 communautés du nord de l'Ontario dotées d'un hôpital ont été incluses dans l'enquête, tout comme les 16 pratiques de sages-femmes de la région. **Résultats:** Sur les 35 hôpitaux ruraux et les 5 hôpitaux urbains interrogés, le nombre qui n'offrait pas de soins obstétricaux est passé de 37,5 % en 1999 à 60 % en 2020, et toutes les fermetures ont eu lieu dans des centres ruraux. Aucun hôpital sans soins obstétricaux en 1999 n'avait ouvert un service en 2020. Les femmes des 9 communautés qui offraient des services de maternité en 1999, mais pas en 2020, doivent maintenant faire 1,5 heure de route en moyenne pour accéder à ces services. Dans les communautés qui offrent toujours des services d'obstétrique, mais ne réalisent plus de césariennes, les femmes doivent maintenant faire 2,5 heures de route pour recevoir cette intervention. Même si le nombre total de généralistes demeure le même qu'en 1999, le nombre qui offre des soins périnataux a chuté de 65 % dans les centres urbains et de 49 % dans les centres ruraux qui offrent toujours des soins de maternité.

Conclusion: Tout comme dans la majorité des régions rurales des États-Unis, les soins de maternité dans les régions rurales du nord de l'Ontario brilleront sous peu par leur absence. Comme l'a démontré le sud de l'Australie, des politiques et programmes de soutien gouvernemental doivent être mis sur pied et une réforme de l'éducation doit être mise de l'avant pour inverser cette tendance préoccupante.

Mots-clés: Soins primaires, première ligne, sage-femme, obstétriques et gynécologie, recherche axée sur les patients, santé et médecine rurale

INTRODUCTION

Rural maternity care matters. The loss of obstetrical services can intensify health disparities in rural Canada, given its massive geographic area and low population density.¹ In rural Canada, obstetrical care is provided predominantly by family physicians,² though the percentage attending deliveries has dropped from 68% in 1983, to 10.% in 2010.³ Over the past 15 years, small volume maternity programmes have seen closures in rural Canada and centralisation to urban areas,⁴⁻⁶ often with local rural emergency departments, anaesthesia and general surgery closing as well.⁷ This amplifies the breakdown of maternity services,⁷ eroding the social and economic fabric of rural communities.⁶

Rural obstetrical service closure is a widespread issue affecting many other affluent countries such as Australia,⁸ France,⁹ Britain¹⁰ and the United States.¹¹ This trend is occurring despite the fact that such resource-rich countries maintain high quality outcomes in small, low-volume obstetrical facilities¹² as well as in those without caesarean section capability.¹³

Rural parturient women without local obstetrics have to travel for even basic procedural maternity care services^{4,14} and, in many cases, need to relocate to another community while awaiting delivery. Those who travel for more than 1 h for obstetrical care are at a seven times higher likelihood of psychological distress and

anxiety as compared to women with local access.¹⁵ Having to leave their communities weeks before they are expecting is traumatic, isolating, socially disrupting and compromises their continuity of care.^{5,7} Rural women and families also incur costs associated with travel, accommodation and childcare, as well as lost wages.^{4,6} Lack of local obstetrical services has been linked to an increase in perinatal mortality⁴ and longer travel times to access maternity care has been associated with a higher neonatal mortality.¹⁶

Midwifery has the potential to reduce health system opportunity costs, as well as incorporate task shifting and resource reallocation in rural Ontario.¹⁷ Midwifery has been a regulated health profession in Ontario since 1994, and has seen its birth attendance surge from 8000 in 2003 to 22,000 in 2013.¹⁷ As of 2018, Ontario had 963 registered midwives and 105 midwifery practices serving 239 communities.¹⁸

Our present study surveys hospital-based obstetrics, in 40 Northern Ontario communities, as a follow-up to Hutten-Czapski's study¹⁹ in 1999 which found a 500% increase in hospitals not offering obstetrical services as compared to 1981.²⁰ In addition, information has been collected on the 16 midwifery practices in Northern Ontario (French River and north). This supports our goals of ascertaining the current labour and delivery services in Northern Ontario and to contrast and compare the involved health human resource, as well as the service availability, to that of 1999.

METHODS

We modelled the survey after that of Hutten-Czapski (1999)¹⁹ which had been pilot-tested in his study. Between May 12, 2020 and June 12, 2020, a telephone survey of all community hospitals in Northern Ontario, including one community which was missed in the 1999 survey, was conducted. Initial hospital contact was made through the switchboard operator who received a semi-structured questionnaire. The switchboard operator was asked how many GPs were on staff and whether their hospital offered obstetrical services. If obstetrical services were unavailable, the switchboard operator was asked where the nearest maternity centre was and what the land transfer time was to get there. These times were later verified by using Google Maps. If obstetrical services were available, the call was transferred to the maternity ward charge nurse. The nurse then received a semi-structured questionnaire that asked for such information as how many of the hospital's GPs attended deliveries and whether caesarean sections were performed locally. If obstetrical services were offered and no caesarean sections were done, the road distance to the nearest centre with caesarean-section capability was recorded and later verified by Google Maps. If the respondent did not know the answers, the call was forwarded until someone in their institution with this knowledge was reached.

Midwifery services were also surveyed. All Northern Ontario Midwifery practices were identified using the Association of Ontario Midwives' (AOM) search directory. Each practice in Northern Ontario was called and questions were answered by the midwives themselves. All practices were asked questions from the same semi-structured questionnaire to understand their practice characteristics as well as their service area. This questionnaire was pilot-tested with three midwives before use. The data provided was cross-referenced against data the hospitals provided.

All surveys of both hospitals and midwives were carried out by the same member of the research team.

The original data set from Hutten-Czapski's 1999 study¹⁹ was used to determine changes

between 2020 and 1999. As one community was included in the 2020 study that was not in the 1999 study, it was possible to retrospectively determine the 1999 level of obstetrical service and distances to obstetrical and caesarean sections. This was added to the data for 1999, but the number of general practitioners and number offering obstetrical services could not be determined.

Travel time to the nearest obstetrical and/or caesarean section services was determined using Google maps driving times between the communities for all communities except for Moosonee, which does not have road access. For this community, travel time was determined by average flying time. We considered travel time to be zero for patients in communities offering the services.

Validation of data obtained by hospital survey was done with cross reference to the Canadian Institute of Health Information (CIHI) and Statistics Canada data on the number of deliveries in 2019 occurring in the communities we found to be offering obstetrical services.

Statistical analysis

The distribution of communities by the level of obstetrical services available was compared between 1999 and 2020 using Chi-square analysis and *t*-tests to test for differences between the proportions within each level. Differences in travel times and number of GPs providing obstetrical services were determined using matched pair *t*-tests when all communities, or all rural communities, were included and sign rank Wilcoxon tests within smaller subgroups. Analysis of variance was used to test the difference between the means for distances travelled and number of GPs delivering by differences in obstetrical services offered between 1999 and 2020 (never having obstetrical services, obstetrical services in 1999 only and obstetrical services in both 1999 and 2020). The community for which some data was missing was excluded from matched analysis of number of GPs and number of GPs delivering. Communities with a population of <30,000 were considered rural. All data analysis was completed using SPSS (IBM SPSS Statistics for Windows, version 25, IBM Corp., Armonk, N.Y., USA) and considered significance as $P < 0.05$.

Ethics

The Lakehead University Research Ethics Board decided that this study did not require formal research ethics approval as it involved interaction with individuals who were not the focus of the research to obtain information.

RESULTS

The communities surveyed represent all 35 rural and 5 urban communities with hospitals in Northern Ontario. All 40 hospitals provided full responses to the survey. Of the 40 hospitals surveyed, the percentage not offering obstetrical care (Level 0) has risen from 37.5% in 1999 to 60% in 2020 [Table 1]. All the loss of obstetric services has been rural, with now 69% of the rural Northern Ontario communities with hospitals no longer providing these services. Table 1 describes the general characteristics of community hospitals by the level of obstetrical services offered and the changes noted. This includes a relative reduction of 57% in communities providing obstetrics with no local caesarean section capabilities (Level 1a) and a 71% relative reduction in communities with obstetrics supported by a local caesarean section service provided predominately by general surgeons (Level 1c). We did not find any community that was providing obstetrical services in 2020 that had not been doing so in 1999.

Data provided by CIHI, as well as Statistics Canada, confirmed that the Northern Ontario communities, found to be providing obstetrical delivery services in 2020, had each carried out more than 5 deliveries in the last year. This external data helps confirm an active obstetrical programme in each of these communities.

For the 40 communities studied, the average distance travelled to access obstetrical services increased from 19 min in 1999 to 41 min in 2020 ($P = 0.004$). Table 2 shows the travel time for the 35 rural communities, grouped based on their historic and present obstetrical service delivery. The average travel time to access caesarean-section services, for the 40 hospitals studied, increased from 49 min in 1999 to 61 min in 2020 ($P = 0.041$). In the community that continues offering obstetrics but stopped offering C-sections, patients must now travel 2.5 h for this surgery.

From 1999 to 2020, there has been a significant decrease in the average number of general physicians attending deliveries in the Northern Ontario communities surveyed [Table 3]. Urban communities have had an overall decrease of 65% in the average number of general practitioners providing this service per community, while rural communities have seen a decrease of 49% [Table 3]. These changes have occurred despite the overall average number of general physicians in the Northern Ontario communities surveyed having been 14 in 1999 and 13 in 2020 ($P = 0.839$).

Table 1: Community numbers by obstetrics service provision

LOC	Frequency (%)		Mean difference (%)	<i>P</i>
	1999 (<i>n</i> =40)	2020 (<i>n</i> =40)		
Obstetrics service				
0 (no obstetrics services)	15 (37.5)	24 (60.0)	22.5	<0.05
1a (low-risk obstetrics services, no C-sections)	7 (17.5)	3 (7.5)	10	-
1b (obstetrics+C-section by general practitioner)	5 (12.5)	6 (15.0)	2.5	-
1c (obstetrics+C-section by general surgeon)	7 (17.5)	2 (5.0)	12.5	-
2+ (obstetrics+C-section by obstetrician-gynecologist)	6 (15.0)	5 (12.5)	2.5	-

LOC: Level of care

Table 2: Current travel time from rural communities to obstetrical services

	Obstetrics never offered		Obstetrics only in 1999		Obstetrics in 1999 and 2020		<i>P</i>
	<i>n</i>	Mean	<i>n</i>	Mean	<i>n</i>	Mean	
Time travelled to obstetrics services (min)	15	49.33	9	97.78	11	0.00	0.000
Time travelled to C-section services (min)	15	56.66	9	128.33	11	39.55	0.001

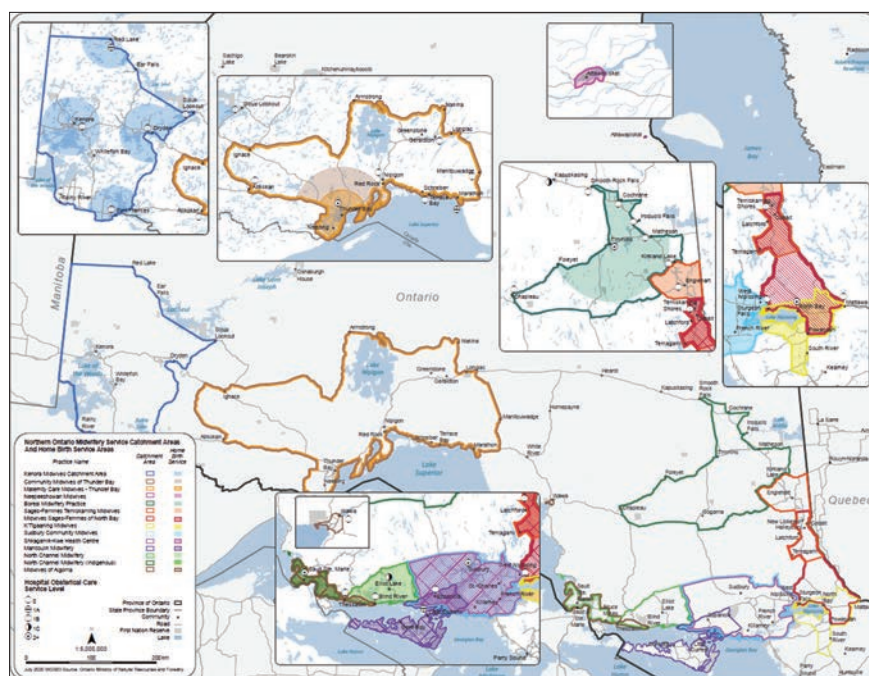


Figure 1: Northern Ontario Midwifery practices map.

Table 3: Average number of general practitioners providing obstetrics per community

	1999	2020	Mean	Wilcoxon
			difference	signed-rank
				test (P)
All communities (n=16)	7.25	3.38	3.87	0.001
Rural communities (n=11)	7.45	3.82	3.636	0.007
Urban (n=5)	6.8	2.4	4.4	0.042

Fifteen of the 16 Midwifery practices in Northern Ontario responded to all questions from our survey. We were able to obtain the missing data from the non-responding practice through a combination of local hospital sources and the AOM. Overall, 50 midwives provide services to Northern Ontario within 16 practices. The mean annual deliveries reported attended by each practice was 92 (10–380). Neepeeshowan Midwives in Attawapiskat reported the lowest annual delivery numbers (10) while Sudbury Community Midwives reported the highest (380). On average, reported home births made up 29.3% (5–90%) of midwifery deliveries, with 70.7% (10–95%) occurring in hospital settings. Manitoulin Midwifery reported the lowest hospital birth rate (10%) and Maternity Care Midwives in Thunder Bay reported the highest (95%). Some practices limited home birth services to clients within a set distance of their practice within their

catchment area; half of practices set a limit of 30 min travel time, 5/14 (35.7%) practices set a 60–75 min limit, and 2/14 (14.3%) practices had no travel limit within their catchment area [Figure 1]. Overall, the average time midwives will travel to provide home birth care is 50 min. Two midwifery practices, both in Thunder Bay, did not offer delivery services but provided prenatal and post-natal care.

DISCUSSION

Grim news. In Northern Ontario, there are now fewer rural communities offering obstetrical services, longer travel times for rural women not able to access local obstetrical delivery services, or caesarean sections, and fewer doctors per community providing obstetrics. Large parts of Northern Ontario are becoming maternity care deserts.

In the United States, 34.6% of their counties have been defined as being maternity care deserts.²¹ These are broadly defined as not having hospitals or providers providing obstetrical care. These, often rural, environments, with a lack of local obstetrical resources and greater travel time to access these services, are known to add duress to families and put women's health at risk.¹⁵ Similar maternity care deserts are developing in Northern Ontario and its population is likely to be experiencing the same health challenges.

In Ontario, throughout the period of time encompassed by this study, there have always been obstetrical services for pregnant women. The defining question has always been how far do parturients need to travel? In the 21-year period examined for the 40 communities, the average travel to obstetrical services has doubled (19–41 min) and there has been an increase to over an hour (49–61 min) to access C-sections. This continues the concerning trend of longer times to maternity care in the region. This deterioration is further accentuated in the subset of communities that lost obstetrical services in the interim, where women must now travel over 1.5 h to access maternity services and over 2 h to the nearest hospital with C-section capability [Table 2]. These distance calculations do not incorporate all the other Northern Ontario rural communities which, not having hospitals, depend on their neighbouring communities offering obstetrics for their maternity care. Doing so would clearly worsen the overall access times. With Kornelson's 2011 paper¹⁵ establishing an hour of transit time to maternity services as being a threshold for increased risk to parturients, we then have more than a concerning trend in a substantial number of rural Northern Ontario communities. We have women and their infants at increased risk of poor outcomes.

Midwifery practices have become important in sharing the demand for obstetrical services, but they are not effective in reversing the maternity care deserts of Northern Ontario. For example, a pregnant woman living in Manitouwadge, a community without local hospital obstetrical services, but in the catchment area of the Thunder Bay midwifery groups, is required to travel 400 km to receive service from a midwife. In Ontario, Midwifery practices have catchment areas specifically defined by their contractual agreements with government. The individual Midwifery practices then decide on the geographic limits of their home birthing services based on reasonable travel time to a hospital with obstetrical services [Figure 1]. The predominant Midwifery practice model in Northern Ontario is still anchored to the geographic presence of hospitals providing obstetrical services, effectively limiting their impact on rural regions.

Over 20 years ago Dr. Hutten-Czapski asked for educational action to 'strengthen programmes

to provide family practice trainees with the skills and attitudes that they need to practise obstetrics in rural Canada in hopes of changing the ongoing trend he found of rural Northern Ontario hospitals closing obstetrical services.¹⁹ As determined by this present study, the trend has not abated. In the intervening years, the Northern Ontario School of Medicine (NOSM) has been created with the social accountability mandate of meeting the needs of its Northern communities and the potential to help reverse this concerning trend. It can be done, and at least one path forward has already demonstrated success. In 2007, a potential crisis in rural obstetrics was detected in Southern Australia with a looming shortage of general practitioners providing rural maternity care. Factors contributing to this impending shortage were determined to be the rise of specialisation, centralisation of services, concerns regarding indemnity and litigation, rural work and difficulty maintaining competence.²² Understanding these underpinnings of the threat spurred the development of a comprehensive training and support programme which propelled the recovery of maternity services in that region and reversed the trend of service closures.²² Educational evolution as well as novel government initiatives to appropriately fund and support general practitioners providing obstetrical care were instrumental in its success.

Attempting to determine root causes of Northern Ontario's obstetrical challenges lead to hypothesising on the data this study has found. For example, is the decline seen of Level 1c hospitals (those with general surgeons performing the majority of C-sections) due to a change in the curriculum of general surgery residencies, as C-section competency is no longer required? Is the decline of Level 1a hospitals (those with obstetrical services, but no C-section capability) due to the perceived risk of this service by providers even when the data shows that such service provision is safe?¹³ Establishing the particular factors that have led to the maternity care service closures, as well as examining the impact of these closures on the health of the resident population would be important next steps in further understanding the issue and informing region-specific solutions.

The state of maternity care in Northern Ontario points to the urgent need to reverse the

ongoing trend of service closures. With presently only 11 northern rural hospitals continuing maternity services and an average of <4 physicians providing deliveries per site, rural obstetrics is at risk as is our ability to educate the next generation of rural maternity care providers.

Leadership in education is needed for nursing, midwifery and family physician obstetrical skills development, as well as for surgical caesarean training programmes for both family doctors and general surgeons, to ensure that not only the basic skills are taught but also that learners are given opportunities to develop the attitudes and confidence needed to practise them in rural settings. However, this will not suffice. Sustainable rural maternity care requires much more than adequately trained providers. To flourish, it needs to be supported by a complex healthcare ecosystem that recognises its importance.

Leadership in Government is needed at all levels to develop the appropriate policies and deliver the dedicated health-care dollars to maintain rural maternity care services. Rural hospitals need to be expressly funded to provide this service for their communities. Specialist-focused, tertiary care referral centres need to provide neighbouring rural obstetrical programmes with seamless, dedicated clinical support, as well as collaborate in the delivery of the continuing education they require.

Leadership in advocacy of rural maternity care in Canada, such as by the Society of Rural Physicians of Canada, needs to continue to remind policy makers that the trend of maternity care service closures continues and that service collapse will have large negative impacts that will be difficult to reverse.

Strengths and Limitations

While this study has limitations in that it relies on self-reporting, potentially resulting in some inaccuracies, it does represent all the hospitals in Northern Ontario with a complete response rate and a similarly comprehensive survey of regional Midwifery practices with only one small practice not responding. The results reported herein may not have application beyond our study area, but they do appear to reflect the trends for access to rural obstetrics seen elsewhere.

CONCLUSION

Since 1981 Northern Ontario has had 40 years of wandering in an increasingly consolidated maternity care desert. Rural women and their families need support to lead us out.

Financial support and sponsorship: This study was financially supported by NOSM Summer Student Research Grant.

Conflicts of interest: There are no conflicts of interest.

REFERENCES

- Shah TI, Clark AF, Seabrook JA, Sibbald S, Gilliland JA. Geographic accessibility to primary care providers: Comparing rural and urban areas in Southwestern Ontario. *Can Geogr* 2020;64:65-78.
- Darmawikarta D, Levit A. Baby Blues. Challenges and Limitations of Delivering Obstetrics Care in Rural Canada; *UWOMJ* 2014;83:27-29.
- Dove M, Dogba MJ, Rodríguez C. Exploring family physicians' reasons to continue or discontinue providing intrapartum care: Qualitative descriptive study. *Can Fam Physician* 2017;63:e387-93.
- Grzybowski S, Stoll K, Kornelsen J. Distance matters: A population based study examining access to maternity services for rural women. *BMC Health Serv Res* 2011;11:147.
- Miller KJ, Couchie C, Ehman W, Graves L, Grzybowski S, Medves J. No. 282-rural maternity care. *J Obstet Gynaecol Can* 2017;39:e558-65.
- Yeates L. Patients at the Centre: Sustaining Rural Maternity – It's All About the Surgery! White Paper; November 2016. Available from: http://www.perinatalservicesbc.ca/Documents/Resources/SystemPlanning/Rural/RuralNetworksWhitePaper_2016.pdf. [Last accessed on 2021 Mar 17].
- Rural and Remote Maternity Care in Ontario: Analysis and Recommendations; 2015. Available from: <https://www.ontariomidwives.ca/sites/default/files/Rural%20and%20Remote%20Maternity%20Care%20in%20Ontario%20Analysis%20and%20Recommendations%20FINAL.pdf>. [Last accessed on 2021 Mar 17].
- Roach S, Downes S. Caring for Australia's Most Remote Communities: Obstetric Services in the Indian Ocean Territories. *Rural Remote Health* Apr-Jun 2007; 7:699. [doi:10.22605/RRH699].
- Impact of Maternity Unit Closures on Access to Obstetrical Care: The French Experience between 1998 and 2003 – ScienceDirect. Available from: <https://www.sciencedirect.com.proxy.lib.nosm.ca/science/article/pii/S0277953608003985?via%3Dihub>. [Last accessed on 2021 Mar 17].
- Bosanquet N, Ferry J, Lees C, Thornton J. Maternity Services in the NHS; March 10, 2021. Available from: http://democms.them.co.uk/client_files/www.reform.co.uk/files/maternity_services_in_the_nhs.pdf. [Last accessed on 2021 Mar 17].
- Hung P, Kozhimannil KB, Casey MM, Moscovice IS. Why are obstetric units in rural hospitals closing their doors? *Health Serv Res* 2016;51:1546-60.
- Tracy SK, Sullivan E, Dahlen H, Black D, Wang YA, Tracy MB. General obstetrics: Does size matter? A population-based study of birth in lower volume maternity hospitals for low risk women. *BJOG* 2006;113:86-96.
- Grzybowski S, Fahey J, Lai B, Zhang S, Aelicks N, Leung BM, et al. The safety of Canadian rural maternity services:

- A multi-jurisdictional cohort analysis. BMC Health Serv Res 2015;15:410.
14. Blake J. Joint position paper on rural surgery and operative delivery. J Obstet Gynaecol Can 2016;38:7.
 15. Kornelsen J, Stoll K, Grzybowski S. Stress and anxiety associated with lack of access to maternity services for rural parturient women. Aust J Rural Health 2011;19:9-14.
 16. Kornelsen J, McCartney K, Williams K. Centralized or decentralized perinatal surgical care for rural women: A realist review of the evidence on safety. BMC Health Serv Res 2016;16:381.
 17. Mattison CA. Introducing midwifery-led birth centres to Ontario. HRO-ORS 2015;3(1): Article 2. 1-10. [doi: 10.13162/hro-ors.v3i1.559].
 18. Midwifery by the Numbers | Association of Ontario Midwives. Ontariomidwives.ca. Ontario Midwives; 2020. Available from: <https://www.ontariomidwives.ca/midwifery-numbers>. [Last accessed on 2021 Mar 17].
 19. Decline of Obstetrical Services in Northern Ontario [CJRM – Spring 1999]. Available from: https://www.collectionscanada.gc.ca/eppp-archive/100/201/300/cdn_medical_association/cjrm/vol-4/issue-2/0072.htm. [Last accessed on 2021 Mar 17].
 20. Black DP, Fyfe IM. The safety of obstetric services in small communities in northern Ontario. Can Med Assoc J 1984;130:571-6.
 21. Nowhere To Go: Maternity Care Deserts Across the U.S; 2020 Report. Available from: <https://www.marchofdimes.org/materials/2020-Maternity-Care-Report.pdf>. [Last accessed 2021 Mar 17].
 22. Campbell AM, Brown J, Simon DR, Young S, Kinsman L. Leading the rebirth of the rural obstetrician. Med J Aust 2014;201:667-70.

COUNTRY CARADIOGRAMS: SUBMIT A CASE!

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

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

Cardiogrammes ruraux

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

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

M4H 1N9;
manedcjrm@gmail.com

Pathological fractures leading to the incidental diagnosis of rickets

Mohammed Abraham¹,
MD, CCFP(EM),
CFPC Dipl., ABOM

¹Division of Emergency
Medicine, Department of
Family Medicine, McMaster
University, Hamilton,
Ontario, Canada

Correspondence to:
Mohammed Abraham,
mabraham@haltonhealth-
care.com

This article has been peer
reviewed.

INTRODUCTION

Rickets is a bone demineralising disease secondary to Vitamin D, calcium and/or phosphate deficiency, resulting in clinically significant skeletal and systemic permanent morbidities.¹ Vitamin D deficiency rickets is the most common preventable metabolic bone disease in children worldwide,¹ with nutritional Vitamin D deficiency being the most common cause. Other less common aetiologies relate to disorders in the renal, hepatic or intestinal systems.¹ Nutritional rickets has not been eradicated from Canada. In a national survey of Canadian paediatricians, the annual incidence of nutritional rickets was estimated at 2.9 cases per 100,000 in children younger than 3 years.² The mean age at diagnosis in Canada is 1.4 years, and the vast majority of the patients are exclusively breast-fed and of darker skin. Recent immigrants and Indigenous Canadians are also at a higher risk of the disease.² The incidence of nutritional rickets increases significantly for Indigenous children. Between 2001 and 2010, there were 4.2 cases per 100,000.³ The Canadian Paediatric Society recommends Vitamin D supplementation of 400 IU/day for all infants during their

1st year, increasing to 800 IU/day for Northern Indigenous communities during winter.⁴

Certain findings on the physical examination [Table 1] could suggest the diagnosis of rickets. Furthermore, paediatric visits that entail plain radiographs are common, including limb radiographs in trauma and chest radiographs for respiratory symptoms. Rural family and emergency physicians are usually the first to interpret plain X-rays, and the patient departs before the radiologist interpretation report becomes available.⁵ In rickets, osteopaenia and pathological fractures are common due to bone demineralisation.¹ In addition, there are several distinctive radiological signs of rickets [Table 2]. Because of the rapid growth of the epiphysis, in the form of rarefaction of the provisional zone of calcification with the widening of epiphysis–diaphysis distance, rickets most commonly begins at the distal ends of long bones.⁶ Infants are more likely to get chest radiography, rather than limb; thus, the early signs of rickets can be observed in the humeral head.⁶

Rural physicians could initiate treatment upon the initial diagnosis by recommending parents increase their child's intake of high-Vitamin D food,

Received: 21-03-2021 Revised: 23-05-2021 Accepted: 31-05-2021 Published: 26-03-2022

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Abraham M. Pathological fractures leading to the incidental diagnosis of rickets. Can J Rural Med 2022;27:69-71.

Access this article online

Quick Response Code:



Website:
www.cjrm.ca

DOI:
10.4103/cjrm.cjrm_18_21

such as fatty fish, increased sunlight exposure and Vitamin D supplementation. All patients suspected to have rickets should be referred to a paediatric tertiary care centre for a further work-up to rule out less common causes of rickets. In addition, because of the low impact needed to induce fracture in rachitic bones, pathological fractures could be mistakenly reported as non-accidental fractures due to child abuse or neglect.

CASE HISTORY

A previously healthy 17-month-old Canadian boy of South-Asian descent was brought into the emergency department of a rural hospital by his parents after sustaining a minor injury. His parents stated that he fell from standing while he was trying to reach a toy on the floor. Since then, he had refused to use his left upper limb and cried whenever the forearm was touched. A focussed physical examination revealed intact skin, no obvious deformity, normal spontaneous range of motion of the elbow and wrist with mild swelling and localised tenderness over the distal forearm.

An X-ray of the left forearm, including the wrist joint, was obtained. The anteroposterior view [Figure 1] and lateral view [Figure 2] demonstrated buckle fractures of the distal radial and ulnar diaphyses. In addition to the positive radiological findings, directly related to the patient’s visit, there were other incidental findings. These included osteopaenia, concave metaphyses, widening of the metaphyseal ends and brush-like metaphyseal margins. Based on the radiological findings, the diagnosis of rickets was suggested.

Further history revealed that the patient was exclusively breast-fed. As a result, nutritional counselling was provided to his parents. The patient was treated with a forearm splint and Vitamin D supplementation. The parents were also recommended to increase his exposure to sunlight and introduce a diet rich in Vitamin D.

Table 1: Physical examination findings ^[1]	
Location	Clinical features
Head	Frontal bossing: Expansion of cranial bones relative to facial bones Craniotables: Softening of skull bones on palpation delayed closure of the anterior fontanelle delayed dentition
Chest	Harrison sulcus: A transverse chest wall sulcus created by the diaphragm pulling on the weakened ribs Pigeon chest: Forward projection of the sternum Ricket rosary: Beads along the costochondral junction
Limbs	Bowing: Genu varum or valgus Recurrent fractures with minor mechanism of injury Delayed standing or walking

Table 2: Radiological findings of rickets ^[1,6]	
Bones	x-ray findings
Long bones	Cupping: Concave metaphysis Fraying: Feathery metaphyseal margin Splaying: Widening of the metaphysis Bowing of the diaphysis Widening of the physis The white line of Frenkle: Ossification of a provisional zone of calcification in healing rickets
Chest	Rachitic rosary: Bulbous costochondral enlargement Humeral head: Long bones findings (see above)
Spine	Biconcave vertebral bodies Scoliosis Triradiate pelvis



Figure 1: The anteroposterior view of the wrist joint



Figure 2: The lateral view of the wrist joint

In addition, to rule out other less common causes of rickets, the patient was referred to a paediatric tertiary care centre for a further work-up. Given the diagnosis and pathological nature of the injury, and the absence of other red flags of child abuse/neglect, a non-accidental injury report was not initiated.

DISCUSSION

Rickets is re-emerging in Canada. Children with undiagnosed rickets continually present to rural physicians. The initial diagnosis of rickets can occur incidentally on plain radiographs. Given that rural physicians are the first to interpret their patients' plain radiographs and the potential prevention of the profound morbidity of the disease, there is an urgent need for heightened awareness among rural physicians to recognise the disease among infants with dark skin, Indigenous and exclusively breast-fed infants. Finally, the knowledge and identification of the radiological features of rickets would aid rural physicians in distinguishing those fractures from non-accidental injuries. As a result, this will avoid wrongfully accusing the parents of

non-accidental injury and the unwarranted reporting to Children's Aid Society (CAS). Because nutritional rickets is more prevalent among Indigenous and recent immigrant children, CAS reporting could further contribute to them experiencing an unintended racial discrimination when accessing health-care.

Financial support and sponsorship: Nil.

Patient consent received.

Conflicts of interest: There are no conflicts of interest.

REFERENCES

1. Wharton B, Bishop N. Rickets. *Lancet* 2003;362:1389-400.
2. Ward LM, Gaboury I, Ladhani M, Zlotkin S. Vitamin D-deficiency rickets among children in Canada. *CMAJ* 2007;177:161-6.
3. Singleton R, Lescher R, Gessner BD, Benson M, Bulkow L, Rosenfeld J, *et al.* Rickets and Vitamin D deficiency in Alaska native children. *J Pediatr Endocrinol Metab* 2015;28:815-23.
4. Vitamin D supplementation: Recommendations for Canadian mothers and infants. *Paediatr Child Health* 2007;12:583-98.
5. Torreggiani WC, Nicolaou S, Lyburn ID, Harris AC, Buckley AR. Emergency radiology in Canada: A national survey. *Can Assoc Radiol J* 2002;53:160-7.
6. Markowitz RI, Zackai E. A pragmatic approach to the radiologic diagnosis of pediatric syndromes and skeletal dysplasias. *Radiol Clin North Am* 2001;39:791-802, xi.

The occasional cervical biopsy

Julia Robson, BSc,¹
Cara van der
Merwe, BHSc¹,
Leslea Walters, MD,
FRCSC^{2,3,4},
Laura Noack, MD,
CCFP^{4,5},
Sarah M. Giles MD,
CCFP (EM)^{4,5,6}

¹Faculty of Health Sciences,
School of Medicine, Queen's
University, Kingston,
Ontario, Canada, ²Winnipeg
Health Sciences Centre,
Women's Hospital,
Winnipeg, Manitoba,
Canada, ³Department of
Obstetrics and Gynecology,
Rady College of Medicine,
University of Manitoba,
Winnipeg, Manitoba,
Canada, ⁴Lake of the
Woods District Hospital,
Kenora, Ontario, Canada,
⁵Department of Family
Medicine, Faculty of
Medicine, Northern
Ontario School of Medicine,
Thunder Bay, Ontario,
Canada, ⁶Department of
Family Medicine, Faculty
of Medicine, University of
Ottawa, Ontario, Canada

Correspondence to:
Sarah M. Giles,
smgiles@dal.ca

This article has been peer
reviewed.

INTRODUCTION

The rates of cervical cancer in Canada, as well as the associated morbidity and mortality, have decreased substantially over the past 40 years thanks to screening programmes and human papilloma virus (HPV) vaccination programmes.^{1,2} The success of these programmes still relies on screening for early cervical cancer through Papanicolaou (Pap) smears, cervical biopsies, and increasingly, HPV testing. The Canadian Task Force on Preventive Health Care recommends initiating cervical screening at the age of 25 years and many provinces have adjusted their guidelines to reflect this evidence.³ Pap smears are screening tests for asymptomatic patients with the aim of identifying patients who require colposcopy and biopsies. As soon as an abnormality is seen, a biopsy is indicated – it is insufficient to only perform a Pap smear on a patient who is symptomatic or who has an abnormal cervix. While abnormal Pap smear results generally lead to colposcopy, in the setting of an obvious abnormality, cervical biopsy remains firmly within the scope of primary care physicians⁴ as biopsy may expedite management of precancerous or cancerous lesions, and can also reduce overtreatment by identifying abnormalities that can be followed

over time.⁵ Further, family physicians with sufficient colposcopy training, as well as available equipment and facilities, may perform colposcopy.

WHEN TO BIOPSY?

The indications for a cervical biopsy include abnormalities in the cervix on inspection or palpation. A Pap test with repeated unexplained inflammation, atypical squamous cells of unknown significance or consistent with a low-grade squamous intraepithelial lesion (LSIL) or a high-grade squamous intraepithelial lesion (HSIL) is an indication for colposcopy.^{6,7} Generalists should biopsy grossly abnormal cervical lesions to speed diagnosis. If HPV testing is available, results should be incorporated into the risk assessment and course of action.⁸

The most common type of biopsy used to collect specimens from the cervix is a punch biopsy. However, the location of the lesion, suspected grade of abnormality and previous procedures all influence which method is selected.⁸ A curette can be used to obtain an endocervical biopsy. Alternatively, a cone biopsy is considered to be a form of excisional treatment because it removes the transformation zone but would require referral to a specialist.⁸

Received: 25-02-2021 Revised: 24-06-2021 Accepted: 11-07-2021 Published: 26-03-2022

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Robson J, van der Merwe C, Walters L, Noack L, Giles SM. The occasional cervical biopsy. Can J Rural Med 2022;27:72-6.

Access this article online

Quick Response Code:



Website:
www.cjrm.ca

DOI:
10.4103/cjrm.cjrm_13_21

COLPOSCOPY IN PRIMARY CARE AND TELECOLPOSCOPY

Abnormal cervical biopsy results may lead to a colposcopist referral. Colposcopy is part of approximately 12% of American family physicians' practices.⁹ While similar statistics are not currently available for Canada, colposcopy training may be offered as part of residency programmes or as an additional certification. The American Society for Colposcopy and Cervical Pathology and Society of Obstetricians and Gynaecologists of Canada run excellent courses and provide initial training for primary care practitioners interested in becoming colposcopists. As there is no formal standard, however, being able to perform colposcopy in the primary care setting depends on physician training, comfort level, equipment availability, staff support, and the needs of the local community.⁹

There is also an emerging literature on telecolposcopy, which may have a place in assisting rural physicians whose patients would otherwise have to travel unreasonably long distances to see a colposcopist. Using telecolposcopy could potentially reduce costs and improve patient outcomes.¹⁰ Additionally, preliminary research found that telecolposcopy may be just as acceptable to patients as traditional colposcopy.¹¹

CONTRAINDICATIONS, RISKS, AND BENEFITS OF CERVICAL BIOPSY

Relative contraindications to cervical biopsy include late pregnancy or active labour, active cervical or vaginal infection, any of which can increase the likelihood of bleeding or infection, increase spurious findings, and/or decrease the sensitivity and specificity of the biopsy.⁷ If a patient is palliative a cervical biopsy cannot be justified. Finally, if a patient does not consent to a cervical exam or biopsy, that is an absolute contraindication to these procedures. The risks associated with cervical biopsy include pain, bleeding, infection, and psychological distress.⁵ Some of the benefits of cervical biopsy include early identification and management of intraepithelial lesions.⁵

EQUIPMENT

- Sterile Gloves
- Speculum

- Lubricant
- Light source
- Povidone 10% solution
- Normal saline
- Cotton balls/swabs
- Ring forceps
- Lidocaine spray/lignocaine gel
- Endocervical curette
- Cytobrush
- Cervical punch biopsy forceps
- 3.0 non-braided dissolvable suture material
- Needle drivers
- Scissors
- Forceps
- Monsel's paste (you can make your own if you have difficulty ordering it)¹³
- Labelled specimen jar containing formalin
- Pencil to draw and label lesions and biopsy sites
- Pads for the patient after the procedure.

PROCEDURE

If the biopsy is planned, patients may be instructed to take ibuprofen/naproxen/acetaminophen the night before and the morning of the cervical biopsy to reduce pain. Biopsies cause mild to moderate pain, especially in women with a prior history of dysmenorrhea, so consideration of pain control strategies in advance is important.¹⁵

1. When obtaining a routine Pap smear, be ready to opportunistically biopsy lesions that you might find. It may be useful to have a gynecology caddy set-up that can be brought into the room immediately should a specimen need to be collected
2. Obtain informed consent prior to the procedure and give the patient the option of having a chaperone attend the procedure. Some patients find that music during the procedure may help reduce anxiety¹⁶
3. Prepare necessary tools and solutions from the above list, including those needed for the cervical biopsy itself. Warm the smallest effective speculum with water if it is made of metal. Ask the patient to lie in the dorsal lithotomy position
4. Begin by examining the vulva for lesions or other abnormalities. Perform a bimanual exam if not done at or around the time the le-

- sion was found. Examine the inguinal region to identify any abnormal lymph nodes or other masses⁷
5. Insert the speculum gently, wipe away mucous using a cotton swab or gauze held by ring forceps
 6. Examine the cervix for signs of infection and inflammation. In addition, inspect for any cervical abnormalities⁷ If indicated, and the patient has consented, swab for gonorrhoea and chlamydia at this point (or collect a urine sample after the exam)
 7. Although the literature remains incomplete and is sometimes contradictory, recent research suggests that topical lidocaine spray applied to the cervix or topical lignocaine gel may be effective in reducing pain during the procedure when compared to forced cough or injected local anesthesia.¹⁷⁻¹⁹ The strategy used for pain control should depend on patient preference, local availability, and provider experience. Intracervical anaesthetic injection may increase procedure time and cause pain with injection, and it is not yet clear whether it decreases overall procedure-related pain.^{20,21} However, a lack of topical pain control should not prevent a biopsy. Many clinicians do not use anaesthesia and, instead, distract the patient by asking them to cough
 8. To evert the os one may use a cotton tipped swab
 9. Characterize abnormal zones of the cervix for later documentation based on their percentage size and 'clock position' on the cervix. In particular, the features of each lesion as well as details of their margins should be noted
 10. Apply povidine to the cervix using cotton swabs or gauze held in ring forceps
 11. If there is a cervical polyp where the base of the stalk can be seen, simply grasp the polyp as close to the base as possible with ring forceps and twist until it detaches. Do not do this if the patient is on an anti-coagulant. If the stalk is not visible, consider referral
 12. For lesions appearing to extend into the endocervical canal, perform an endocervical curettage using an endocervical curette. Use the endocervical curette to scrape all the way around the endocervical canal and put the tissue from the curette into formalin. Use a cytobrush to pick-up the remaining tissue in the endocervical canal. If an endocervical curette is not available, sample the tissue using a cytobrush. Rotate the cytobrush approximately five times in the endocervical canal. For large lesions, a wedge piece can simply be cut out with a scalpel. Once the sample has been obtained, the tip can then be removed and dropped into the formalin suspension
 13. Using Tischler forceps if available, begin with any area on the posterior aspect of the cervix that appears abnormal to avoid bleeding that may obscure anterior sites. Place the 'fixed jaw' portion of the forceps on the "os side" of the lesion, with the other portion placed on the posterior aspect of the cervix. Each biopsy should be approximately 3 mm deep.¹⁷ If Tischler forceps are not available, simply use a small scalpel to obtain a tissue sample. Additional cutting and rotation should be avoided.²² Continue to biopsy any additional lesions, using a cotton swab to control any bleeding that obscures visibility. If possible, take at least two biopsies, including the most abnormal-looking lesion.^{4,23-26} All biopsies can be placed in the same specimen container containing 10% formalin⁴ [Figures 1 and 2].
 14. After all biopsies are completed, apply Monsel's paste to areas that continue to ooze.²⁷ If Monsel's paste is not available, apply pressure for 3 min. If bleeding cannot easily be controlled, place a suture using 3.0 absorbable suture material. Once bleeding is satisfactorily controlled, gently remove the

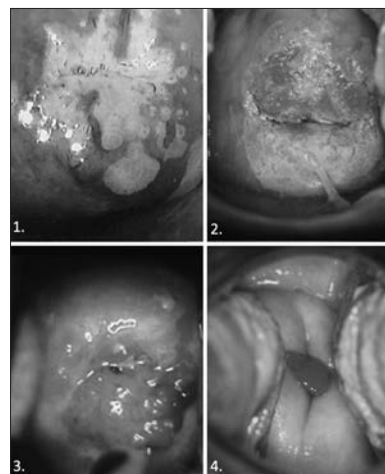


Figure 1: Examples of cervical pathology including atypical squamous cell of the cervix (1), high-grade squamous intraepithelial lesion (2), invasive squamous cell of the cervix (3), and a cervical polyp (4).¹²



Figure 2: Image depicts Tischler biopsy forceps, which are used to obtain biopsies of the cervix.¹⁴

speculum, inspecting the vaginal walls for any abnormalities. For unexpected heavy bleeding, place gauze soaked in Monsel's solution up against the lesion and then pack the vagina with packing material (such as Kerlex gauze) with as much packing as possible to apply pressure and then reassess bleeding frequently. If the bleeding is going through the packing, the patient's vitals are unstable, or you are concerned, call the nearest centre with an on-call gynaecologist for advice. Re-drape and offer the patient a wipe and pad

15. Document details of the exam and draw and label a diagram of the patient's cervix to detail the locations of lesions as well as the sites that were biopsied
16. A vasovagal response may occur after the procedure, so ask the patient to remain supine for a few minutes prior to asking them to sit and then stand slowly.

After the procedure

Inform the patient that for hours to days after the procedure, dark/black-appearing Monsel's paste and clotted blood (similar in consistency to coffee grounds) may be discharged from the vagina.^{6,7} For pain and/or cramping after the procedure, suggest and make sure the patient has access to ibuprofen, naproxen or acetaminophen. Also advise the patient on signs of potential infection and when to return for additional evaluation (any of pelvic pain, fever, foul odour, discharge and bleeding that requires more than a thin pad). Patients should avoid tampons, douching (for which there is never an indication) and intercourse for 1–2 weeks after the procedure. Indicate initial impression, when the patient should expect results, and what will happen next.

CONCLUSION

When the appropriate equipment is available, primary care-based cervical biopsy can accelerate appropriate management of suspected cervical cancer.⁵

Financial support and sponsorship: Nil.

Conflicts of interest: There are no conflicts of interest.

REFERENCES

1. Mosavi-Jarrahi A, Kliewer EV. Cervical cancer incidence trends in Canada: A 30-year population-based analysis. *J Obstet Gynaecol Can* 2013;35:620-6.
2. Canadian Cancer Statistics Advisory Committee. Canadian Cancer Statistics 2019. Toronto, ON: Canadian Cancer Society; 2019.
3. Phillips SP, Bates S, Mavriplis C, Greiver M, Patel T, Hayes MJ, *et al.* Cervical cancer screening for young women. First do no harm. *Can Fam Physician* 2020;66:14-8.
4. Burness JV, Schroeder JM, Warren JB. Cervical colposcopy: Indications and risk assessment. *Am Fam Physician* 2020;102:39-48.
5. Khan MJ, Werner CL, Darragh TM, Guido RS, Mathews C, Moscicki AB, *et al.* ASCCP colposcopy standards: Role of colposcopy, benefits, potential harms, and terminology for colposcopic practice. *J Low Genit Tract Dis* 2017;21:223-9.
6. Denise DW. Laboratory and diagnostic tests – Cervical biopsy (Punch Biopsy, Endocervical Curettage, Cone Biopsy, Cervical Conization, Loop Electrosurgical Excision Procedure). New York: The McGraw-Hill Companies, Inc., The Professional Book Group; 2008. p. 143.
7. Mayeaux EJ Jr., editor. Colposcopy and directed cervical biopsy. In: *Essential Guide to Primary Care Procedures*. 2nd ed., Ch. 74. Philadelphia, PA: Lippincott Williams & Wilkins; 2015. p. 576-87.
8. Perkins RB, Guido RS, Castle PE, Chelmow D, Einstein MH, Garcia F, *et al.* 2019 ASCCP risk-based management consensus guidelines for abnormal cervical cancer screening tests and cancer precursors. *J Low Genit Tract Dis* 2020;24:102-31.
9. N.d.; Colposcopy (Position Paper). American Academy of Family Physicians (AAFP). Available from: <https://www.aafp.org/about/policies/all/colposcopy-position-paper.html>. [Last accessed on 2021 Feb 21].
10. Murugesu S, Galazis N, Jones BP, Chan M, Bracewell-Milnes T, Ahmed-Salim Y, *et al.* Evaluating the use of telemedicine in gynaecological practice: A systematic review. *BMJ Open* 2020;10:e039457.
11. Ferris DG, Litaker MS, Gilman PA, Leyva Lopez AG. Patient acceptance and the psychological effects of women experiencing telecolposcopy and colposcopy. *J Am Board Fam Pract* 2003;16:405-11.
12. Brookside Associates Endocervical Polyp, Moderate Dysplasia of Cervix, High Grade Lesion of Cervix, & Invasive Squamous Cell Carcinoma. Available from: https://brooksidepress.org/Products/OBGYN_101/MyDocuments4/Text/CervicalDisease/cervical_disease_and_neoplasia.htm. [Last accessed on 2021 Jan 05].
13. Comprehensive Cervical Cancer Control: A Guide to Essential Practice. 2nd ed. Geneva: World Health Organization; 2014. Annex 13, How to Make Monsel's Paste. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK269598/>. [Last accessed on 2021 Feb 21].
14. Basu P, Sankaranarayanan R. Atlas of Colposcopy – Principles and Practice: IARC CancerBase No. 13. Lyon, France: International

- Agency for Research on Cancer; 2017. Available from: <https://screening.iarc.fr/atlascolpo.php>. [Last accessed on 2021 Feb 24].
15. Kim K, Lee B, Park Y, Suh DH, No JH, Kim YB. Factors affecting pain during outpatient clinic based surgical procedures in gynecologic oncology. *Medicine (Baltimore)* 2018;97:e11721.
 16. Galaal K, Bryant A, Deane KH, Al-Khaduri M, Lopes AD. Interventions for reducing anxiety in women undergoing colposcopy. *Cochrane Database Syst Rev* 2011;2011:CD006013.
 17. Wongluecha T, Tantipalakorn C, Charoenkwan K, Srisomboon J. Effect of lidocaine spray during colposcopy-directed cervical biopsy: A randomized controlled trial. *J Obstet Gynaecol Res* 2017;43:1460-4.
 18. Karaman E, Kolusarı A, Alkış İ, Çetin O. Comparison of topical lidocaine spray with forced coughing in pain relief during colposcopic biopsy procedure: A randomised trial. *J Obstet Gynaecol* 2019;39:534-8.
 19. Zutshi V, Seshan V, Yadav A. Comparison of lignocaine spray versus lignocaine gel for pain relief during colposcopic directed cervical biopsy. *Indian J Gynecol Oncol* 2020;18:115.
 20. Bogani G, Serati M, Cromi A, Di Naro E, Casarin J, Pinelli C, et al. Local anesthetic versus forced coughing at colposcopic-guided biopsy: A prospective study. *Eur J Obstet Gynecol Reprod Biol* 2014;181:15-9.
 21. Kiviharju M, Kalliala I, Nieminen P, Dyba T, Riska A, Jakobsson M. Pain sensation during colposcopy and cervical biopsy, with or without local anesthesia: A randomized trial. *J Low Genit Tract Dis* 2017;21:102-7.
 22. World Health Organization. WHO Guidelines for Screening and Treatment of Precancerous Lesions for Cervical Cancer Prevention. Geneva: World Health Organization; 2014.
 23. Bentley J. SOGC/SCC Clinical Practice Guideline: Colposcopic Management of Abnormal Cervical Cancer Screening and Histology; 2017. <https://secureservercdn.net/160.153.138.53/o4s.970.myftpupload.com/wp-content/uploads/2017/10/Colposcopy-Guidelines-FINAL-2012-02-19.pdf>. [Last accessed on Feb 19].
 24. Gage JC, Hanson VW, Abbey K, Dippery S, Gardner S, Kubota J, et al. Number of cervical biopsies and sensitivity of colposcopy. *Obstet Gynecol* 2006;108:264-72.
 25. Nakamura Y, Matsumoto K, Satoh T, Nishide K, Nozue A, Shimabukuro K, et al. Optimizing biopsy procedures during colposcopy for women with abnormal cervical cancer screening results: A multicenter prospective study. *Int J Clin Oncol* 2015;20:579-85.
 26. Baasland I, Hagen B, Vogt C, Valla M, Romundstad PR. Colposcopy and additive diagnostic value of biopsies from colposcopy-negative areas to detect cervical dysplasia. *Acta Obstet Gynecol Scand* 2016;95:1258-63.
 27. Hilal Z, Reznicek GA, Tettenborn Z, Hefler LA, Tempfer CB. Efficacy of monsel solution after cervical biopsy: A randomized trial. *J Low Genit Tract Dis* 2016;20:312-6.

CALL FOR PAPERS

The Canadian Journal of Rural Medicine (CJRM) is a quarterly peer-reviewed journal available in print form and open access online. It is the first rural medical journal in the world indexed in Index Medicus, as well as MEDLINE/PubMed databases.

The CJRM seeks to promote research into rural health issues, promote the health of rural and remote communities, support and inform rural practitioners, provide a forum for debate and discussion of rural medicine, provide practical clinical information to rural practitioners and influence rural health policy by publishing articles that inform decision-makers.

The material in the following categories will be considered for publication.

- Original articles: research studies, case reports and literature reviews of rural medicine (3500 words or less, not including references)
- Commentary: editorials, regional reviews and opinion pieces (1500 words or less)
- Clinical articles: practical articles relevant to rural practice. Illustrations and photos are encouraged (2000 words or less)
- Off Call articles: a grab-bag of material of general interest to rural doctors (e.g., travel, musings on rural living, essays) (1500 words or less).
 - Cover: artwork with a rural theme

For more information, please visit www.srpc.ca/cjrm

Why COVID-19 could be a boon for rural patient transfers

Carolyn Ruth Wilson,
MD, CCFP, FCFP¹

¹Department of Family
Medicine, Queen's
University, Kingston,
Ontario, Canada

Correspondence to:
Carolyn Ruth Wilson,
ruth.wilson@fm.queensu.ca

The COVID-19 pandemic has led to an escalated need to transfer patients for intensive care, even between provinces. Pre-existing barriers to transfer such as licensing requirements and policies prohibiting air transport across provincial boundaries have fallen.¹ This unprecedented flexibility must be leveraged to address long-standing issues for rural patients requiring transfer. Crisis brings opportunity.

This is an equity issue for the Canadian health care system. It disproportionately affects Indigenous remote communities and is one element of systemic racism within our health care system.

This issue is also a health workforce issue. Barriers to timely and safe patient transfer are a source of stress and burnout for rural physicians. For some, they contribute to a decision to leave rural practice.

What practical strategies will work to improve rural patient transfers? The first is to implement 'no refusal' policies. When I call to transfer a patient, either I know what I'm doing, in which case my transfer request should be accepted, or I do not know what I'm doing, in which case my transfer request should also be accepted!

Air transport of patients is

expensive. In 2018, patient transfers in the Northwest Territories (NWT) cost about \$20000 per occurrence, numbering about 100–120 transfers per month. Triaging transfer requests for reasons of putative cost containment can lead to barriers to care for patients and frustration for physicians and nurses in rural and remote communities. In 2018, a 'no refusal' policy was implemented for transfers within the NWT to the regional hospital in Yellowknife following some outcomes for patients which contributed to staff burnout and attrition. The number of medivacs did not increase, and an added benefit was the reduction of stress for emergency room physicians who no longer felt the need to be cost gatekeepers for the health care system.²

Second, tertiary care centres must implement formal agreements between referring and accepting regional, provincial and territorial health care institutions. The maitre d' of a fine restaurant pays attention to the ambience, the menu and the quality of the experience while not worrying about all those who cannot get a reservation at their highly acclaimed establishment—the reputation of the first-class business is accolade enough for the maitre d'. Hospitals which focus only on the quality of care

Received: 11-01-2021 Revised: 10-01-2022 Accepted: 12-01-2022 Published: 26-03-2022

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Wilson CR. Why COVID-19 could be a boon for rural patient transfers. Can J Rural Med 2022;27:77-8.

Access this article online

Quick Response Code:



Website:
www.cjrm.ca

DOI:
10.4103/cjrm.cjrm_71_21

within their walls without taking responsibility for their catchment area are arguably in a similar situation, the obvious difference being that these institutions have a social accountability that a fine dining establishment does not.

Rural patient transfers constitute a two-way journey. Health sciences centres, under pressure for beds and personnel, need to return stable patients to their home communities in a timely way. Formal policies between referring and receiving centres, rather than a reliance on collegial relationships alone, can make a difference in the ease of arrangements for patient movement between facilities.

Lack of understanding of the context of care and resource limitations in referring communities also contributes to transfers being declined.³ Unfortunately, refused transfers are difficult to track. According to recent media reports, Alberta can report the number of surgical procedures cancelled due to COVID. However, despite an interjurisdictional transfer agreement between NWT and Alberta, no data can be produced regarding how many patient transfers from NWT to Alberta for non-urgent surgeries have been deferred due to COVID-19.⁴ As a third strategy, we must collectively use data to evaluate, improve and reduce the need for patient transfers. We can create measurable benchmarks to promote continuous quality improvement, perhaps using Accreditation Canada's required organisation practices as a lever. What we measure matters.

What else can be done? Proper policies and infrastructure are crucial for timely transfers and appropriate consultations between rural health facilities and tertiary hospitals. For example, trauma patients must be transferred to the nearest trauma centre, even if this means crossing a provincial boundary—unusual in the past, and now necessary during COVID times.

We can leverage the use of virtual care technologies to support more care close to home. Enhanced broadband capacity is essential for advancements in technology that can support point-of-care, urgent and real-time consultations between locally based health care practitioners

and regional specialists. Lack of local diagnostic services has recently been shown to be a major reason for interfacility transfers and delayed care. As an example, this has led to an argument in support of improving local access to computed tomography scanners.⁵ Let's improve access to diagnostic technology in rural hospitals.

The Society of Rural Physicians of Canada and the College of Family Physicians of Canada, along with other partners, have issued a Call to Action on rural patient transfers.⁶ These transfers will continue to be a necessity in Canada long after the headlines about COVID-19 intensive care unit aeromedical transport have disappeared. Only concerted collaborative action will make a difference to ensure equitable access to health care for rural and Indigenous communities. If we can do it for COVID-19 patients, our rural patients deserve no less.

Financial support and sponsorship: Nil.

Conflicts of interest: There are no conflicts of interest.

REFERENCES

1. Ghanian Y. 6 Saskatchewan ICU Patients with COVID-19 Being Transferred to Ontario Canadian Broadcasting Corporation; 2021. Available from: <https://www.cbc.ca/news/canada/saskatchewan/ontario-covid-icu-patients-transfer-1.6215022#:~:text=236-,Saskatchewan%20will%20be%20transferring%20six%20COVID%2D19%20patients%20to%20Ontario,number%20of%20intensive%20care%20patients>. [Last accessed on 2022 Feb 18].
2. Pontin D. Personal Communication. Yellowknife, Northwest Territories: Area Medical Director, Northwest Territories Health and Social Services Authority; 2021.
3. Wilson MM, Devasahayam AJ, Pollock NJ, Dubrowski A, Renouf T. Rural family physician perspectives on communication with urban specialists: A qualitative study. *BMJ Open* 2021;11:e043470.
4. Woo A. Alberta's dire Health Situation has Reverberations in the North. *Globe and Mail*; 2021. Available from: <https://www.theglobeandmail.com/canada/article-albertas-dire-health-situation-has-reverberations-in-the-north>. [Last accessed on 2022 Feb 18].
5. Fleet R, Brochu P, Blanchard PG. Is it time for a CT scanner in every Canadian rural hospital? *Can J Emerg Med* 2021;23:579-80.
6. Rural Road Map Implementation Committee. Call to Action: An Approach to Patient Transfer for those Living in Rural and Remote Communities in Canada Mississauga, ON: College of Family Physicians of Canada and Society of Rural Physicians of Canada; 2021. Available from: <https://www.cfpc.ca/CFPC/media/PDF/Rural-Road-Map-Call-to-Action-EN-final.pdf>. [Last accessed on 2022 Feb 18].



Health PEI is seeking
**Family Medicine
 Physicians**
*for a variety of
 full-time and
 locum opportunities*

HealthJobsPEI.ca

Up to \$90,000
 for return-in-service grants &
 reimbursement of moving
 expenses **up to \$10,000**

For more information, contact us:
healthrecruiter@gov.pe.ca
902-368-6302



Health PEI

**YOUR IDEAL PRACTICE AWAITS IN
 KENORA, ONTARIO**

Permanent and locum opportunities in
 Family Medicine, Emergency and
 Specialty medicine!



Competitive base salary, attractive bonuses
 plus relocation incentives!
 Full-service, fully accredited teaching hospital with
 opportunities for diverse practice portfolio
 and local specialist supports!

Contact us today!
kenorarecruitment@anhp.net
807-464-0697
www.anhp.net



ALL NATIONS
 HEALTH PARTNERS

St. Joseph's Hospital
 A Welcoming Healing Place

St. Joseph's Hospital | Estevan, Saskatchewan

Family Physician Opportunities

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!

Contact Greg Hoffort, Executive Director at St. Joseph's Hospital
 greg.hoffort@saskhealthauthority.ca

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



Family Physicians • Nisga'a Valley Health Authority

Locum opportunities and 0.5 to 1.0 FTE positions available

Beautiful British Columbia



- | | |
|---------------------|---|
| Remuneration | <ul style="list-style-type: none"> Clinical Services Contract; Alternative Payment Program (APP) Average > \$11,000 per week; no overhead |
| Additional bonuses | <ul style="list-style-type: none"> Signing bonus: up to \$20,000 Relocation allowance: up to \$15,000 Annual retention bonus: up to \$36,000 Travel reimbursement at flat rate (no receipts required); easy access to community through Terrace airport Free accommodation, car & gas provided |
| Services | <ul style="list-style-type: none"> Clinic daily – travelling to each of 4 Indigenous communities by car Emergency coverage, no obstetrics or inpatient care Call usually 1:3, RN first on call |
| Available resources | <ul style="list-style-type: none"> Home care, mental wellness (including counsellors & therapy groups), OT/PT, monthly visiting specialists – all covered services |
| Highlights | <ul style="list-style-type: none"> Natural hot springs, mountain biking trails, world-class salmon and steelhead fishing, snowshoe/hiking and much more easily accessible after clinic! |

Contact: Medical Director, Dr. Jeremy Penner, md@nisgahealth.bc.ca

4926

Experience the North at Weeneebayko Area Health Authority in Moose Factory, ON

The Weeneebayko ("Two Bays" - James Bay and Hudson's Bay) Area Health Authority (WAHA) provides all facets of medical care within 6 predominantly First Nation's communities along the west coast James Bay and Hudson's Bay. Population served—12,000



Moose Factory, Moosonee, Fort Albany, Kashechewan, Attawapiskat and Peawanuck

Position: Full-time permanent family practitioner with ER/OB experience

Weeneebayko Area Health Authority
19 Hospital Drive, P.O. Box 664,
Moose Factory, ON

For more information contact:
Jaime Kapashesit
Physician Services Coordinator
jaime.kapashesit@waha.ca
705 658-4544 ext. 2237

Skills Requirement: Must hold a medical degree and be licensed or eligible for licensure through the College of Physicians and Surgeons of Ontario

Language of work: English

Remuneration:

- Generous compensation package with yearly travel allowance and remote medicine funding bonuses
- Housing in Moose Factory provided with all amenities included

Job Duties

- Examine patients and take their histories, order laboratory tests, X-rays and other diagnostic procedures and consult with other medical practitioners to evaluate patients' physical and mental health
- Prescribe and administer medications and treatments
- Provide acute care management
- Advise patients on health care including health promotion, disease, illness and accident prevention
- Coordinate and manage primary care to remote First Nations communities
- Faculty appointment at Queen's, NOSM, U of T, U of O, with a well developed teaching practice program
- Become a member of a multidisciplinary team with full-time surgical and Anaesthesia



CAEP
QUEBEC CITY 2022

#CAEP22

REGISTRATION IS OPEN

MAY 29 - JUNE 1

THIS YEAR WE WILL BE MEETING
IN PERSON!

caepconference.ca

HELP US - HELP YOU

ADVERTISE IN THE NEXT CJRM



FULL-COLOUR - STARTING AT \$500.
PLAIN TEXT - STARTING AT \$120.

DISCOUNT FOR SRPC
MEMBERS AND MULTI
PLACEMENTS.



DETAILS ONLINE
WWW.SRPC.CA/CJRM

Interactive, virtual case-based learning for your healthcare team



What is ECHO?

- ✓ Primary care providers are linked with an interprofessional specialist team
- ✓ Each Session includes:
A short didactic & real (de-identified) patient case discussions.
- ✓ CPD hours granted
- ✓ No cost (funded by the Ontario Ministry of Health)
- ✓ Online, convenient
- ✓ Open to all healthcare providers

To register for any of these ECHOs at UHN, visit us at

<https://uhn.echoontario.ca>

Learn More at www.echoontario.ca.

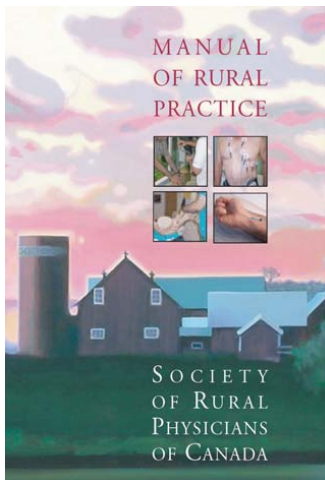
Concussion	Wednesdays	4:30 - 6:00PM	*EST
Chronic Pain/Opioid	Thursdays	12:30 - 2:00PM	
Rheumatology	Fridays	12:00 - 1:30PM	
Liver	Mondays	12:00 - 1:30PM	

Manual of Rural Practice – The Second Printing

A text for all seasons

The Manual of Rural Practice is written for rural doctors, by rural doctors who understand the context of rural practice in which we are called upon to do a wide variety of procedures. These procedures can sometimes be lifesaving, and occasionally are required in stressful, difficult and isolated conditions. The Manual of Rural Practice provides clear practical directions for 40 rural practice procedures, ranging from rapid sequence intubation to ingrown toenail removal, with more than 320 illustrations. The articles are adapted in part from the "Occasional" series, published regularly in the Canadian Journal of Rural Medicine. The book is divided into 6 sections:

- Airway (e.g., management, laryngeal mask airway)
- Cardiac/Pulmonary (e.g., arterial lines, chest tube insertion, cardioversion)
- Nervous system (e.g., lumbar puncture, Bier block)



- Integument (e.g., extensor tendon repair, fishhook removal, breast cyst aspiration)

- Musculoskeletal (e.g., Colles' fracture, casting, knee aspiration)

- Genitourinary/Maternity (e.g., shoulder dystocia, suprapubic catheterization)

The format for each procedure is quick and easy to grasp, starting with an equipment list, step-by-step instructions and ending with a procedure summary. The text is clearly written, and the illustrations are helpful.

This book is especially recommended for both practising rural doctors and rural doctors in training. Every rural hospital and training program should make a copy easily accessible. Rural doctors will also find the equipment lists (there is even an appendix that details part numbers and suppliers) valuable in ensuring that their hospital and clinic procedure rooms have

the required equipment readily available when needed.

Edited by P. Hutten-Czapski, G. Magee and J. Wootton. November 2006. Society of Rural Physicians of Canada. Hardcover, 280 pp. Illust. ISBN 10: 0-9781620-0-5.

ORDER YOURS ONLINE - WWW.SRPC.CA

Shipping: **\$15.00 + \$6.00** per additional copy
(USA & International - Additional fee will be quoted)

SRPC Members @ **\$44.95**
or Non-members @ **\$54.95**

x _____ copies = _____

Shipping +\$ _____ Name: _____

Sub-total =\$ _____ Address: _____

Taxes +\$ _____ Town: _____ Province: _____ Postal Code: _____

Total =\$ _____ Phone: _____ Fax: _____

Applicable taxes
All of Canada 5%

Email: _____

Payment by: ☐ Cheque ☐ Invoice ☐ MC, Visa, Amex, Diners

Card #: _____ Exp Date: _____

Order the Manual of Rural Practice by sending this form to
SRPC - Books Box 893, Shawville QC, J0X 2Y0 or by faxing it to (819) 647-2485

STRENGTHEN RURAL HEALTHCARE JOIN THE SOCIETY OF RURAL PHYSICIANS OF CANADA

- Rural Shouldn't Mean Limited
- Rural Healthcare Providers Restore and Renew Communities
- Unite with the SRPC in Advocating for Rural Healthcare



For a full list of member benefits visit
SRPC.ca

 @THESRPC

 @SRPCANADA



Always Keep Learning

Saegis, a subsidiary of the CMPA, offers practical and accredited online professional development for physicians.

- **Communication Skills Workshops**
Strong interpersonal skills result in positive outcomes for both patients and providers, and reduce medical-legal risk.
- **Programs for Healthcare Teams**
Effective teamwork and a healthy organizational culture improve safety, reduce negative outcomes and increase morale.
- **Online Education to Avoid Privacy Breaches**
Cybersecurity and privacy e-learning is the best defence against a cyber-attack.

Find out how
we can help:



1-833-435-9979



info@saegis.solutions



saegis.solutions

saegis
A MEMBER OF THE CMPA FAMILY

Saegis offers professional development programs and practice management solutions to physicians, healthcare professionals, teams, clinics, and hospitals.

Could it be Celiac?



Sonia, Age 40

I hope no other Canadian has to go through the experience that I did.

After being a relatively healthy person throughout my life, I started getting sick. I had trouble speaking. My balance was off. And I had numbness and tingling on the left side of my body.

Numerous tests ruled out a potential stroke or migraines. The symptoms grew worse. I had constant vertigo, fatigue, facial numbness, memory recall issues, and sometimes headaches, ear pain, blurred vision, stuttering, confusion, nerve pain in my jaw and even sores on my body.

For four years, I made multiple trips to the hospital. I saw so many doctors and did so many tests, that I felt like a human science experiment.

At my lowest point, my neurologist referred me to a psychiatrist, believing that maybe this was all in my head. I felt so frustrated and unheard. Luckily, my GP suggested I get a second opinion. The new neurologist ran the tests for celiac disease, and I finally had my answer. It was celiac disease that was attacking my body and causing these debilitating symptoms. Within two weeks on a gluten-free diet, I felt like my old self again. Sonia came back.

Celiac.ca

CANADIAN
CELIAC
ASSOCIATION



L'ASSOCIATION
CANADIENNE
DE LA MALADIE
COELIAQUE

30TH ANNUAL CONFERENCE

Niagara Falls

SCOTIABANK CONVENTION CENTRE

RURAL & REMOTE MEDICINE COURSE

APRIL 20-22 2023



SRPC.ca

@SRPCANADA

#SRPC2023