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 30, NO. 2, SPRING 2025

VOLUME 30, Nº 2, PRINTEMPS 2025

IN THIS ISSUE

DANS CE NUMÉRO

Living Mino-bimaadiziwin (the good life)!

Practice medicine, embrace nature: the Kenora Region awaits you!

Learn.

Opportunities for residents and learners in a wide variety of services.

Grow.

Diverse opportunities to expand your skills and teach others.

Live.

Family medicine, emergency & internal medicine and psychiatry positions available.

Care.

Share your passion for equitable health care by joining us for a locum!

choose Kenora

Find out more!

www.anhp.net

ALL NATIONS HEALTH PARTNERS

ONTARIO HEALTH TEAM

Canadian Journal of Rural Medicine
Journal canadien de la médecine rurale

srpc.ca
https://journals.lww.com/cjrm

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 Pontiac Printshop Ltd., Shawville, QC

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
Toll Free 1-877-276-1949
fax: 819-647-2485
info@srpc.ca

ISSN 12037796

Canadian Journal of Rural Medicine / Journal canadien de la médecine rurale

Vol. 30, No. 2, Spring 2025 / Printemps 2025

Editorials / Éditoriaux

President's Message/ Message du President

Original Articles

The Occasional

What Works

"Miss Peggy's Cove", © 2024
by Anna Clarey
Acrylic, 24"x 36"
Website: https://annaclarey.com
Email: Anna@annaclarey.com
Instagram: annaclareyartist

"Miss Peggy's Cove" captures the serene beauty of Nova Scotia's iconic fishing village, featuring a tranquil harbour with docked boats, vibrant coastal architecture and the interplay of sunlight and shadow.

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?

Submit your piece to the Canadian Journal of Rural Medicine.

Send us your research papers that have been archived, dust them off and send them in!

We welcome original research studies, literature reviews (3500 words or less) and exciting case reports (1500 words or less) with a rural medicine edge.

Submissions will be peer-reviewed for potential publication.

Learn more and find instructions online.
www.srpc.ca/cjrm

Rural 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 rural G.P./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 the following groups.

RuralAnesthesia | RuralMed | MedRurale | StudentRuralMed

Learn more or subscribe online.
www.srpcportal.ca/ruralmed

Rural again!

Peter Hutten-Czapski, MD

Scientific Editor CJRM

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

I am happy to announce that I live in a rural town... again. I didn't move, but our regional municipality shrank to 9,634 people.[1]

Statistics Canada defines rural as < 10,000 people. Some researchers use a zero in a postal code to define rural. For a long time in Ontario the definition of rural was under 30,000 and over 80 km from a community of over 50,000 people. As of Nov 6, 2024 the federal government has updated the eligibility criteria for its student loan forgiveness program for family doctors and nurses to include population centres under 30,000.[2]

For the last 16 years Ontario has used the 2008 RIO score. It grades communities based on measures of community population from the 2006 census and distance to basic and advanced referral centres. The score goes from 0 (eg Toronto) to 100 (e.g. Ear Falls). Rural program assistance is usually limited to scores over 45.[3]

BC has adopted a scoring system with points between 0 and 52 based on number of specialists within 70km, number of Family Physicians within 35km, degree of latitude, community population, road distance from a major medical community, as well as air distance to Vancouver.[4]

From the provision of care perspective, rural is a community that is predominantly staffed with generalist physicians whose work crosses broadly and seamlessly between primary, secondary and some tertiary skill areas. For rural medical policy, 10,000 population may be too small to capture all those communities. With 10,000 you can support both office and hospital work for perhaps a dozen physicians, mostly generalist family doctors, and perhaps some general internal medicine physicians. However, such a community usually would require subsidy (eg a salaried position) to support even a single general surgeon, without additional catchment.

The *CJRM* does not have a preference for rural definition. We allow researchers to use the definition that best accounts for the subject matter being studied. If you are interested in rural surgical services, you may have to develop your own definition.

REFERENCES

1. Statistics Canada. Profile Table, Census Profile, 2021 Census of Population – Temiskaming Shores, City (CY) [Census Subdivision], Ontario. Available from: https://www12.statcan.gc.ca. [Last accessed on 2024 Nov 16].
2. Available from: https://www.canada.ca/en/services/benefits/education/student-aid/grants-loans/repay/assistance/doctors-nurses/eligibilityy.html. [Last accessed on 2024 Nov 16].
3. Kralj B. Measuring Rurality – RIO2008_BASIC: Methodology and Results; 2009. Available from: https://www.oma.org/siteassets/oma/media/pagetree/about-oma/expert—advice/2008rio-fulltechnicalpaper.pdf. [Last accessed on 2024 Nov 16].
4. BC Ministry of Health. Rural Retention Program (RRP) Policy; 2023. Available from: https://www2.gov.bc.ca/assets/gov/health/practitioner-pro/rrp_policy.pdf. [Last accessed on 2024 Nov 16].

Received: 18-11-2024 **Revised:** 19-03-2025 **Accepted:** 19-03-2025 **Published:** 20-05-2025

How to cite this article: Hutten-Czapski P, Rural again! Can J Rural Med 2025;30:59-60.

Access this article online

Quick Response Code:

Website: https://journals.lww.com/cjrm

DOI: 10.4103/cjrm.cjrm_81_24

À nouveau en milieu rural !

Peter Hutten-Czapski, MD

Rédacteur scientifique JCRM

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

Je suis heureux d'annoncer que je vis à nouveau en milieu rural. Je n'ai pas déménagé, mais notre municipalité régionale a vu sa population diminuer à 9 634 habitants.[1]

Statistique Canada définit le milieu rural comme une population de moins de 10 000 habitants. Certains chercheurs utilisent un zéro dans un code postal pour définir le milieu rural. Pendant longtemps, en Ontario, la définition du milieu rural était celle de moins de 30 000 habitants et de plus de 80 km d'une collectivité de plus de 50 000 habitants. Le 6 novembre 2024, le gouvernement fédéral a mis à jour les critères d'admissibilité à son programme d'exonération de prêts étudiants pour les médecins de famille et les infirmières afin d'inclure les agglomérations de moins de 30 000 habitants.[2]

Depuis 16 ans, l'Ontario utilise le score RIO de 2008. Ce score évalue les collectivités en fonction des mesures de la population du recensement de 2006 et de la distance par rapport aux centres de référence de base et avancés. Le score va de 0 (p. ex., Toronto) à 100 (p. ex., Ear Falls). L'aide aux programmes ruraux est généralement limitée aux scores supérieurs à 45.[3]

La Colombie-Britannique a adopté un système de notation avec des points compris entre 0 et 52, basé sur le nombre de spécialistes dans un rayon de 70 km, le nombre de médecins de famille dans un rayon de 35 km, la latitude, la population de la communauté, la distance routière d'une grande communauté médicale et la distance aérienne de Vancouver.[4]

Du point de vue de la prestation des soins, une communauté rurale est une communauté majoritairement composée de médecins généralistes dont le travail recoupe largement et harmonieusement les domaines de compétence primaire, secondaire et certains domaines de compétence tertiaires. Pour la politique médicale rurale, une population de 10 000 habitants pourrait être insuffisante pour englober toutes ces communautés. Avec 10 000 habitants, on peut soutenir le travail en cabinet et en hôpital d'une douzaine de médecins, principalement des médecins de famille généralistes, et peut-être quelques médecins de médecine interne générale. Cependant, une telle communauté aurait généralement besoin d'une subvention (p. ex., un poste salarié) pour soutenir ne serait-ce qu'un seul chirurgien général, sans couverture géographique supplémentaire.

Le *CJRM* n'a pas de préférence pour la définition rurale. Nous permettons aux chercheurs d'utiliser la définition qui correspond le mieux au sujet étudié. Si vous vous intéressez aux services chirurgicaux en milieu rural, vous devrez peut-être élaborer votre propre définition.

RÉFÉRENCES

1. Statistics Canada. Profile Table, Census Profile, 2021 Census of Population – Temiskaming Shores, City (CY) [Census Subdivision], Ontario. Available from: https://www12.statcan.gc.ca. [Last accessed on 2024 Nov 16].
2. Available from: https://www.canada.ca/en/services/benefits/education/student-aid/grants-loans/repay/assistance/doctors-nurses/eligibility.html. [Last accessed on 2024 Nov 16].
3. Kralj B. Measuring Rurality – RIO2008_BASIC: Methodology and Results; 2009. Available from: https://www.oma.org/siteassets/oma/media/pagetree/about-oma/expert--advice/2008rio-fulltechnicalpaper.pdf. [Last accessed on 2024 Nov 16].
4. BC Ministry of Health. Rural Retention Program (RRP) Policy; 2023. Available from: https://www2.gov.bc.ca/assets/gov/health/practitioner-pro/rrp_policy.pdf. [Last accessed on 2024 Nov 16].

Access this article online

Quick Response Code:

Website: https://journals.lww.com/cjrm

DOI: 10.4103/cjrm.cjrm_26_25

Canadian Journal of Rural Medicine
CJRM CMR
Journal canadien de la médecine rurale

President's Message

Reimagination

Gavin Gerard Parker, MD

Pincher Creek Health Centre, Pincher Creek, AB, Canada

Correspondence to: Gavin Gerard Parker, gavin.g.parker@gmail.com

Access this article online

Quick Response Code:

Website: https://journals.lww.com/cjrm

DOI: 10.4103/cjrm.cjrm_10_25

I presented on behalf of the SRPC to the Federal-Provincial-Territorial Committee on Health Workforce recently. We discussed the National Advanced Skills Training Programme and how this has been an important tool in supporting our rural workforce. Highlighted was how the programme can provide improved access to care through skills learned that provide more timely diagnosis, potential reduction of transfers and wait times, and help increase team-based interprofessional care. The programme also enhances community services and system resilience via the provision of additional services, including rural emergency, surgery, obstetrical and anaesthesia care. Recruitment and retention benefits were achieved by improving working relationships with pre-hospital and nursing staff, self-reported increased likelihood to stay in rural communities and strengthened networks of mentorship and care.

Recently, Dr Kyle Sue-Milne and I presented to the members of the Standing Committee on Social Development (Committee) at the Northwest Territories Legislative Assembly. They are looking at how healthcare in the Northwest Territories (NWT) can remain sustainable and accountable to improve the quality of care, life and well-being of residents and healthcare staff. We highlighted that one of the most impactful solutions is the implementation of Pan-Canadian Licensure that would make rural practice more attractive, boosting recruitment and retention.

Rural physicians need to know that they will easily be able to find locums to help sustain the services they are providing in their community, or to respond in times of increased community need. Many rural physicians are interested in supporting their colleagues when a community is short-staffed, working part-time as they near retirement or working in multiple regions of Canada. Pan-Canadian licensure leads to workforce mobility, and thus, stability.

A comprehensive Rural Health Workforce Strategy is critical for addressing both immediate and long-term challenges. This strategy would focus on recruitment, retention, and upskilling healthcare providers to meet the unique needs of rural and remote communities. Rural family physicians provide the majority of health services outside of urban regions. Rural health services in Canada are in crisis, with a shortage of family physicians leading to ER closures and reduced access to care. This is also having an impact on urban health systems. Urban hospitals rely on rural health services to prevent overcrowding in the city. When rural is failing, it worsens the strains on urban centres.

Future projections indicate a growing shortage of rural family physicians. There is still no national Health Human Resources plan to address this shortage. A National Rural Health Workforce Strategy is urgently needed to ensure access to care for all Canadians, including the needs of First Nations, Inuit, Métis and rural francophone communities, as part of Canada's response to the Truth and Reconciliation Commission Calls to Action. Our belief is that addressing these challenges requires collaboration between governments, healthcare organizations and communities. We continue to lead this work as we look to reimagine what an invigorated rural workforce could look like.

Received: 24-02-2025 **Revised:** 19-03-2025 **Accepted:** 19-03-2025 **Published:** 20-05-2025

How to cite this article: Parker GG. Reimagination. Can J Rural Med 2025;30:61-2.

Ré-imagination

Gavin Gerard Parker, MD

Pincher Creek Health Centre, Pincher Creek, AB, Canada

Correspondance: Gavin Gerard Parker, gavin.g.parker@gmail.com

J'ai récemment fait une présentation au nom de la SMRC devant le Comité fédéral-provincial-territorial sur l'effectif de santé. Nous avons discuté du Programme national de formation et compétences avancées et de la façon dont il constitue un outil important pour soutenir notre main-d'œuvre rurale. Nous avons souligné comment le programme peut améliorer l'accès aux soins grâce à des compétences acquises permettant d'obtenir un diagnostic plus rapide, ainsi qu'une réduction potentielle des transferts et des temps d'attente, tout en contribuant à accroître les soins interprofessionnels en équipe. Le programme améliore également les services communautaires et la résilience du système en fournissant des services supplémentaires, notamment des services d'urgence, de chirurgie, d'obstétrique et d'anesthésie en milieu rural. Le recrutement et la rétention ont été favorisés par l'amélioration des relations de travail avec le personnel préhospitalier et infirmier, l'augmentation de la probabilité de rester dans les communautés rurales et le renforcement des réseaux de mentorat et de soins.

Récemment, Dre Kyle Sue-Milne et moi-même avons fait une présentation aux membres du Comité permanent des affaires sociales (Comité) de l'Assemblée législative des Territoires du Nord-Ouest. Ce comité cherche à savoir comment les soins de santé dans les Territoires du Nord-Ouest (T.N.-O.) peuvent rester viables et responsables pour améliorer la qualité des soins, la vie et le bien-être des résidents et du personnel soignant. Parmi les solutions les plus efficaces, nous avons souligné la mise en œuvre d'un permis d'exercice pancanadien qui rendrait la pratique rurale plus attrayante et favoriserait le recrutement et la rétention du personnel.

Les médecins ruraux doivent savoir qu'ils pourront facilement trouver des remplaçants pour les aider à maintenir les services qu'ils fournissent ou pour répondre aux besoins accrus de la communauté. De nombreux médecins ruraux souhaitent soutenir leurs collègues en cas de pénurie de personnel, travailler à temps partiel à l'approche de la retraite ou travailler dans plusieurs régions du Canada. Le permis d'exercice pancanadien favorise la mobilité de la main-d'œuvre et la stabilité.

Une stratégie nationale pour la main-d'œuvre en santé rurale est essentielle pour relever les défis immédiats et à long terme. Cette stratégie serait axée sur le recrutement, la rétention et l'amélioration des compétences des prestataires de soins de santé afin de répondre aux besoins spécifiques des communautés rurales et éloignées. Les médecins de famille ruraux fournissent la majorité des services de santé en dehors des régions urbaines. Au Canada, les services de santé en milieu rural sont en crise en raison d'une pénurie de médecins de famille qui entraîne la fermeture des urgences et réduit l'accès aux soins. Cette situation a également un impact sur les systèmes de santé urbains. Les hôpitaux urbains dépendent des services de santé ruraux pour éviter l'engorgement en ville. Lorsque les services ruraux sont défaillants, les contraintes qui pèsent sur les centres urbains augmentent.

Les projections futures indiquent une pénurie croissante de médecins de famille en milieu rural. Or, il n'existe toujours pas de plan national de ressources humaines en santé pour remédier à ce problème. Par conséquent, il est urgent d'élaborer une stratégie nationale sur les effectifs en santé rurale pour garantir un accès aux soins pour tous les Canadiens, y compris les besoins des Premières nations, des Inuits, des Métis et des communautés rurales francophones, tout cela dans le cadre de la réponse du Canada aux appels à l'action de la Commission de vérité et réconciliation. Nous sommes convaincus que pour relever ces défis, une collaboration entre les gouvernements, les organismes de santé et les communautés est nécessaire. Nous continuons à mener ce travail en cherchant à réimaginer ce à quoi pourrait ressembler une main-d'œuvre rurale revigorée.

Access this article online

Quick Response Code:

Website: https://journals.lww.com/cjrm

DOI: 10.4103/cjrm.cjrm_27_25

ORIGINAL ARTICLE

Assessing the need for blood transfusion in patients with haemorrhage transported by air ambulance in Northern Ontario

Jeff Meadows[1], Jason E. Buick, PhD(c)[1,2], Brodie Nolan, MD, MSc[1,3,4,5]

[1]Ornge, Mississauga, Ontario, Canada, [2]Institute of Health Policy, Management and Evaluation, University of Toronto, Toronto, Ontario, Canada, [3]Li Ka Shing Knowledge Institute, Unity Health Toronto, Toronto, Ontario, Canada, [4]Department of Emergency Medicine, St. Michael's Hospital, Unity Health Toronto, Toronto, Ontario, Canada, [5]Department of Medicine, Division of Emergency Medicine, University of Toronto, Toronto, Ontario, Canada

Correspondence to: Brodie Nolan, bnolan@ornge.ca

This article has been peer reviewed.

Access this article online

Quick Response Code:

Website: https://journals.lww.com/cjrm

DOI: 10.4103/cjrm.cjrm_24_24

Abstract

Introduction: Haemorrhage is the leading preventable cause of death following traumatic injury, additionally affecting morbidity and mortality in a variety of other conditions. Timely intervention with blood products and definitive management is essential. In Northern Ontario, limited access to care poses challenges in managing these conditions. The objective of our study was to describe the prevalence with which patients suffering from known or suspected haemorrhage, transported by air ambulance in Northern Ontario, received a blood transfusion.

Methods: This was a retrospective cohort study of patients in Northern Ontario with known or suspected haemorrhage, transported by air ambulance to hospital. Patients included had a primary problem of trauma, gastrointestinal (GI) bleeding, obstetrical haemorrhage or vascular and other bleeding, and met pre-defined physiologic indications for transfusion. Data were abstracted from electronic patient care records.

Results: A total of 1165 patients were included, with a mean age of 48.5 years and 54.8% being male. The most common reasons for transfusion included traumatic injury (46.1%), GI bleeding (29.5%) and vascular/other etiologies (13.8%). Only 233 (20%) patients received a transfusion. Patients with GI haemorrhage most frequently received transfusion, accounting for 46.8% of patients, while those suffering from traumatic injury accounted for 28.7% of the total transfusions.

Conclusions: Eighty percent of patients who may have required a transfusion did not receive one, illustrating the importance of expanded access to blood products in rural and remote communities across Ontario. Further investigation into mechanisms that support residents of these communities who may suffer from haemorrhage is required.

Keywords: Air ambulance, pre-hospital, remote, rural, transfusion

Résumé

Introduction: L'hémorragie est la principale cause évitable de décès à la suite d'une blessure traumatique. Elle affecte également la morbidité et la mortalité dans une variété d'autres conditions. Une intervention rapide avec des produits

Received: 04-04-2024 **Revised:** 17-06-2024 **Accepted:** 20-06-2024 **Published:** 20-05-2025

How to cite this article: Meadows J, Buick JE, Nolan B. Assessing the need for blood transfusion in patients with haemorrhage transported by air ambulance in Northern Ontario. Can J Rural Med 2025;30:63-70.

sanguins et une prise en charge définitive sont essentielles. Dans le nord de l'Ontario, l'accès limité aux soins pose des problèmes pour la prise en charge de ces pathologies. L'objectif de notre étude était de décrire la fréquence avec laquelle les patients souffrant d'une hémorragie connue ou présumée, transportés par ambulance aérienne dans le nord de l'Ontario, ont reçu une transfusion sanguine.

Méthodes: Il s'agit d'une étude de cohorte rétrospective de patients du nord de l'Ontario présentant une hémorragie connue ou présumée, transportés par ambulance aérienne à l'hôpital. Les patients inclus avaient un problème primaire de traumatisme, d'hémorragie gastro-intestinale, d'hémorragie obstétricale, d'hémorragie vasculaire ou d'autres formes d'hémorragies et répondaient à des indications physiologiques prédéfinies pour la transfusion. Les données ont été extraites des dossiers électroniques des patients.

Résultats: Au total, 1165 patients ont été inclus, avec un âge moyen de 48.5 ans et 54,8% d'hommes. Les raisons les plus fréquentes de la transfusion étaient des lésions traumatiques (46,1%), des hémorragies gastro-intestinales (29,5%) et des étiologies vasculaires/autres (13,8%). Seuls 233 patients (20%) ont reçu une transfusion. Les patients souffrant d'hémorragie gastro-intestinale ont le plus souvent reçu une transfusion, soit 46,8% des patients, tandis que ceux souffrant de lésions traumatiques représentaient 28,7% du total des transfusions.

Conclusions: 80% des patients susceptibles d'avoir besoin d'une transfusion sanguine n'en ont pas reçu, ce qui illustre l'importance d'un accès élargi aux produits sanguins pour les patients des communautés rurales et éloignées de l'Ontario. Il est nécessaire de poursuivre les recherches sur les mécanismes qui soutiennent les résidents de ces communautés susceptibles de souffrir d'une hémorragie.

Mots-clés: Transfusion, rural, éloigné, préhospitalier, ambulance aérienne

INTRODUCTION

Northern Ontario comprises more than 850,000 km^2, approximately 80% of the total land mass of the province of Ontario; however, <5% of Ontario's 15.9 million residents reside in this region.[1] The population density in Northern Ontario is <1 person/Km^2, which presents unique challenges to delivering healthcare services.[1] People living in the northern part of the province experience the health system differently than those in the south and, unfortunately, suffer from inequitable care delivery due to significant access barriers such as geography and a lack of speciality care.[2-4] Northern Ontario residents have significantly more potential years of life lost due to avoidable death when compared to the provincial average.[2]

Haemorrhage is the leading preventable cause of death following traumatic injury.[5] Severe haemorrhage, however, is not limited to traumatic injury, with gastrointestinal (GI), obstetrical bleeding and vascular surgical patients having the potential to require transfusion, each resulting in significant morbidity and mortality.[6,7] It is widely accepted that early intervention with the principles of damage control resuscitation, access to blood transfusions, and rapid transport to definitive management improves care.[8] Further, it has been identified that the early transfusion of blood products is associated with a significant reduction in both mortality and trauma-induced coagulopathy.[9,10] A recent systematic review found that pre-hospital blood transfusion with simultaneous use of both red blood cells (RBCs) and plasma resulted in a significant reduction in the odds for long-term mortality for traumatic haemorrhage. However, this was based on mainly poor-quality evidence, and there were no definitive conclusions on the survival benefit for haemorrhagic trauma patients receiving pre-hospital blood transfusions.[11] Despite this, the use of pre-hospital blood transfusion continues to expand across the globe.[12] Relevant to the population in Northern Ontario, a *post hoc* analysis of the Pre-hospital Air Medical Plasma and Control of Major Bleeding after Trauma clinical trials suggested that pre-hospital plasma is associated with a survival benefit when transport times are longer than 20 min.[13] Given the transport times for patients in Northern Ontario are often well over 3 h, access to pre-hospital blood transfusion may be of benefit to these patients.[14]

In Ontario, Ornge is the sole provider of air ambulance and critical care transport and plays a vital role in the provincial health system. Given Ornge provides the only critical care and transport to rural communities and more than 30

remote Indigenous communities, it is uniquely positioned to help narrow gaps in the delivery of care for northern communities. The current practice of obtaining blood products for patients being transported by air ambulance in Northern Ontario is complex. Air ambulance paramedics do not routinely carry blood products, and when they are potentially necessary, paramedics are required to retrieve blood products from the local hospital before picking up the patient. The process of blood product retrieval introduces many logistical challenges, bringing the possibility of missed opportunities for transfusion in certain patients for whom transfusion may be beneficial. Given these logistical challenges and limitations, the objective of this study was to evaluate the prevalence with which patients suffering from known or suspected haemorrhage transported by air ambulance in Northern Ontario may require a blood transfusion. Further, we assess the frequency of blood transfusions in this cohort. The results of this study aim to provide comprehensive insights into the prevalence and clinical context of blood transfusion indications amongst individuals requiring emergent air medical transport in Northern Ontario. By examining this diverse patient population, this study can function as a gap analysis to inform future blood-on-board expansion and expected blood transfusion needs across Northern Ontario.

METHODS

Study design

This was a retrospective cohort study of patients undergoing emergent transport by air ambulance in Northern Ontario between 1 January 2018 and 31 December 2022. Our results are presented in alignment with the Strengthening the Reporting of Observational Studies in Epidemiology guidelines.[15]

Study setting

Ornge completes approximately 20,000 patient transports annually, connecting patients to resources throughout the province. In Northern Ontario, responses are carried out by both fixed-wing (airplane) and rotor-wing (helicopter) aircraft. There are 3 types of responses: a scene response is when the emergency system is activated and Ornge transports a patient directly from the location of an emergency to hospital; a modified scene response occurs when the patient might benefit from a scene response, but due to time or logistical delays, the patient is transported to a local hospital where Ornge crews rendezvous prior to patient admission; and an interfacility response which involves the transport of a patient from one healthcare facility to another.

An important contextual factor in this setting is that a proportion of interfacility responses in this region include the transport of patients from nursing stations in remote communities. Nursing stations are facilities with the capacity to provide basic services and are the primary point of access to the healthcare system for many communities in Northern Ontario. There is a lack of equivalency between these facilities and small community hospitals, with nursing stations having particularly significant resource limitations. Nursing stations, for example, are rarely staffed with a physician on-site, do not stock blood components and have limited airway interventions that can be offered.

We identified requests for air ambulance service that originated from facilities within the specific Local Health Integration Networks (LHINs) of Northern Ontario. The province of Ontario is divided into 14 LHINs that are responsible for the management of human, material and financial resources pertaining to health and social services.[16] The North East Ontario LHIN covers the geographic areas of Sudbury, Manitoulin, Parry Sound, Nipissing, Temiskaming, Algoma and Cochrane, as well as the James Bay and Hudson Bay coasts.[17] The North East LHIN is mainly serviced by the Timmins fixed-wing (19 h/day with afternoon double coverage; 600–1800 h and 1300-0100 h), Moosonee rotor-wing (24/7) and Sudbury rotor-wing (24/7) Ornge bases. The North West Ontario LHIN covers the city and district of Thunder Bay, Kenora, Rainy River and the Northern region.[18] The North West LHIN is mainly serviced by the Thunder Bay fixed-wing (2 × 24/7), Thunder Bay rotor-wing (24/7), Kenora rotor-wing (24/7) and Sioux Lookout fixed-wing bases (18 h/day with afternoon double coverage; 600–1800 h and 1200-0000 h).

Participants

Participants were included if they were emergent transfer requests, had a primary problem of trauma, GI bleeding, obstetrical haemorrhage and vascular or other bleeding and met any one of the pre-defined physiologic inclusion criteria informed by relevant pre-hospital transfusion literature.[19-25] These physiologic criteria included haemoglobin <70 mg/dL, tachycardia >120 beats per minute, hypotension with a systolic blood pressure (SBP) <90 mmHg, hypotension mean arterial pressure <65 mmHg, shock index >1 (heart rate divided by SBP), lactate >3 mmol/L or a blood transfusion initiated by the sending facility. All inclusion criteria were defined *a priori*.

Outcome measures

The primary outcome was the proportion of patients transported with known or suspected haemorrhage during the study period who received a blood transfusion. Secondary outcomes evaluated the potential geographic variation in the likelihood of blood transfusion as well as potential variation based on asset type.

Data sources

Data for this study were collected through health record review using the internal Ornge Electronic Patient Care Record (ePCR) database, manufactured by Zoll Medical (Chelmsford, Massachusetts, US). This ePCR is a comprehensive record that includes all the required clinical information such as dispatch priority, sending facility, age, sex, primary problem, treatments administered, vital signs and free text narrative. Data were extracted from pre-defined fields on the ePCR and exported into a Microsoft Excel datasheet for analysis.

Data analysis

Data analysis was performed using Microsoft Excel version 16.66.1. Descriptive statistics, including means, standard deviations and frequencies, were calculated to summarise the baseline characteristics of the study population. Implausible values were removed from the dataset as a precaution against measurement errors to ensure the accuracy and validity of the results. Excel's built-in functions and formulas were used to compute summary statistics for continuous variables and frequencies for categorical variables. For inferential analysis, the Chi-square tests were employed to examine associations between categorical variables. $P < 0.05$ was considered statistically significant.

Sample size

As this study was exploratory in nature, no formal sample size calculation was performed. A 5-year period was determined *a priori* to account for seasonal and annual variations in patient presentations representative of the Northern Ontario population.

RESULTS

Of the 48,363 emergent calls screened during data abstraction throughout the study period, 24,640 calls originated within LHIN 13 and 14, defining Northeastern and Northwestern Ontario. There were 5043 patients with primary problem codes specific to trauma, GI bleeding, obstetrical haemorrhage and vascular and other bleeding. A final cohort of 1165 patients met the physiologic criteria of the potential to require blood transfusion [Figure 1].

Table 1 indicates the patient demographics, LHINs, primary problem, physiologic inclusion, call and asset type. Table 2 indicates the transfusion by asset and location.

Of the 1165 patients included, 233 (20%) patients received a blood transfusion.

The highest frequency of transfusions received amongst the primary problem types was GI bleeding, 109 (46.8%) patients, followed by trauma, 67 (28.7%) patients; obstetrical, 30 (12.9%) patients and finally vascular/other with 27 cases, accounting for the smallest proportion of transfusions by clinical inclusion (11.6%).

Although a greater number of patients transported by fixed wing received a transfusion, there was no difference in transfusion proportions between fixed wing and rotor assets (21% vs. 18%, $P = 0.2065$). We also assessed the distribution of patients who received transfusions across different asset locations [Table 1]. Thunder Bay fixed-wing assets administered most transfusions,

Table 1: Patient demographics

Patient characteristics	Meets inclusion criteria (*n*=1165), *n* (%)	Did not receive transfusion (*n*=932), *n* (%)	Received transfusion (*n*=233), *n* (%)	*P*
Age, mean (SD)	48.5 (18.9)	46.3 (18.8)	49.4 (19.5)	
Sex				
Male	638 (54.8)	523 (56.1)	116 (49.8)	0.0824
Female	527 (45.2)	409 (43.9)	117 (50.2)	
LHIN				
Northeast	458 (39.3)	360 (38.6)	98 (42.1)	0.3372
Northwest	707 (60.7)	572 (61.4)	135 (57.9)	
Primary problem inclusion				
Trauma	536 (46.1)	469 (50.3)	67 (28.7)	<0.0001
Gastrointestinal bleeding	344 (29.5)	235 (25.2)	109 (46.8)	
Obstetrical bleeding	124 (10.6)	94 (10.1)	30 (12.9)	
Vascular/other	161 (13.8)	134 (14.4)	27 (11.6)	
Physiologic inclusion				
SBP <90 mmHg	575 (49.4)	414 (44.4)	161 (69.1)	<0.0001
MAP <65 mmHg	514 (44.1)	363 (38.9)	151 (64.8)	
HR >120/min	515 (44.2)	420 (45.1)	95 (40.7)	
Shock index >1	855 (73.4)	675 (72.4)	180 (77.3)	
Haemoglobin <70 mg/dL	149 (12.8)	77 (8.3)	72 (30.9)	
Lactate >3 mmol/L	82 (7.0)	61 (6.5)	32 (13.7)	
Call type				
Scene	133 (11.5)	130 (13.9)	3 (1.2)	<0.0001
Modified scene	145 (12.4)	107 (11.5)	38 (16.3)	
Interfacility	887 (76.1)	695 (74.6)	192 (82.5)	
Nursing station*	332 (37.4)	265 (79.8)	67 (20.2)	
Asset type				
Fixed wing	800 (68.7)	632 (67.8)	168 (72.1)	0.2065
Rotor wing	365 (31.3)	300 (32.2)	65 (27.9)	

*Nursing station responses represent a unique and specific subset of interfacility responses. LHIN: Local Health Integration Network, SBP: Systolic blood pressure, MAP: Mean arterial pressure, HR: Heart rate, SD: Standard deviation

Table 2: Transfusion by asset

Asset location	Meets inclusion criteria (*n*=1165), *n* (%)	Did not receive transfusion (*n*=932), *n* (%)	Received transfusion (*n*=233), *n* (%)	*P*
Thunder Bay fixed wing	472 (40.5)	377 (40.5)	95 (40.8)	<0.0001
Moosonee	46 (3.9)	44 (4.7)	2 (0.9)	
Kenora	98 (8.4)	90 (9.7)	8 (3.4)	
Sioux Lookout	170 (14.6)	130 (13.9)	40 (17.1)	
Timmins	158 (13.6)	125 (13.4)	33 (14.2)	
Thunder Bay rotor wing	77 (6.6)	63 (6.7)	14 (6.0)	
Sudbury	144 (12.4)	103 (11.1)	(17.6)	

95 (40.8%), followed by Sudbury with 41 (17.6%) and Sioux Lookout with 40 (17.1%).

DISCUSSION

Our study investigated the clinical context and prevalence of blood transfusion amongst emergent patients transported by air ambulance in Northern Ontario. Unfortunately, only 20% of patients who potentially required blood transfusion received a transfusion. Although the primary clinical inclusion criteria in this study were trauma, patients with GI haemorrhage were those who received transfusion most frequently. Thunder Bay fixed wing accounted for the highest number of transfusions while Sudbury accounted for the greatest proportion of transfusions. Despite the higher number

of patients transported by fixed-wing aircraft receiving transfusions, no significant difference in transfusion proportions between fixed-wing and rotor-wing assets was observed. These results underscore the diverse clinical needs and logistical challenges in delivering timely transfusion interventions in the pre-hospital setting, especially in Northern Ontario. This information can inform the anticipated transfusion needs and operational priorities for expanding the Ornge blood-on-board programme, whereby paramedics carry blood components on each mission, as opposed to the current *ad hoc* basis, a process which has been demonstrated to delay transport to definitive care.[26] In addition, knowledge gained can be used in consideration for the expansion of fixed-wing modified scene response, whereby a pilot study demonstrated a significant reduction in transport time to definitive care for trauma patients in Northeastern Ontario.[27]

Interpretation and implications

To our knowledge, this is the first study to assess transfusion prevalence in the air ambulance system, specifically within Northern Ontario. Timely access to transfusion is critical for bleeding patients. They experience significant delays to transfusion without any blood transfusion options available at nursing stations.[28] Due to regulations, cost and potential wastage, blood products are not available in nursing stations; instead, care is focused on oxygen, intravenous fluids, tranexamic acid and analgesia.[28]

Previous research has identified a need for pre-hospital blood products. In 2020, MacDonald and Ramjaun found that in Ontario, 2.5% of emergency air ambulance transports had a potential need for blood product transfusion. Only 58% of patients requiring a transfusion received one, while approximately 35% received blood products from a rural or community hospital with a limited supply. The authors concluded that there is currently a discrepancy between the need and availability of pre-hospital blood products.[29]

One potential solution is implementation of pre-hospital blood-on-board programmes. Currently, 36.6% of critical care transport bases across Canada have access to pre-hospital blood products, with ongoing work to expand these programmes.[12,30] Blood-on-board programmes

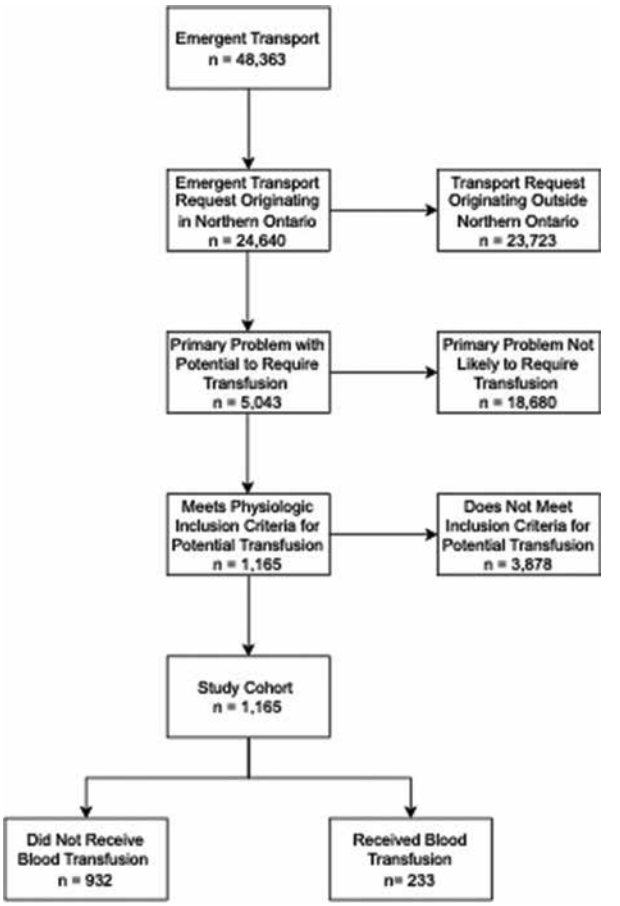

Figure 1: Flow chart of the study cohort creation (Original).

carrying packed RBCs, plasma, prothrombin concentrate complex and fibrinogen offer advantages by ensuring access to blood transfusions when indicated during medical evacuation, enhancing equitable access to care for rural communities.[31]

Strengths and future research directions

The delivery of high-quality health care in Northern Ontario is rife with challenges. The analysis of a large proportion of patients transported by air ambulance in Northern Ontario serves to benefit those living in this traditionally underserviced population. Conducting a comprehensive analysis allowed for a nuanced understanding of the transfusion needs among emergency patients in Northern Ontario transported by air ambulance. While our study focussed on transfusion rates, it also assessed the distribution of transfusion recipients across different primary problem types, geographic locations and air ambulance assets, which can be used to inform

the implementation programmes whereby blood is carried on air ambulance resources. Finally, using inclusion criteria that consider both primary problem type and physiologic criteria, our study likely captured a cohort of patients who were most likely to require, and potentially benefit from, transfusion.

Future quantitative research could investigate the impact of pre-hospital blood transfusion on clinical outcomes such as mortality rates, morbidity, length of hospital stay and long-term recovery. Research of this nature would provide valuable insights into the effectiveness of pre-hospital transfusion interventions and inform evidence-based clinical practice. In addition, investigation into potential geographic disparities in pre-hospital transfusion rates and outcomes across different regions of Northern Ontario could help identify underlying factors contributing to disparities and inform targeted interventions aimed at reducing disparities and improving access to equitable pre-hospital care. Future qualitative research may seek to investigate the unique facilitators and barriers to accessing blood products in the region with relevant stakeholders.

Limitations

While the pre-defined physiologic inclusion criteria were informed by a review of relevant literature with the intention of selecting patients most likely to require transfusion, it is acknowledged that not all patients included in the cohort necessarily required blood transfusion.[19-25] Thus, the results of this investigation may overestimate the proportion of patients requiring transfusion. Our study was also limited to data available in the pre-hospital context, and thus, in-hospital outcomes, such as mortality or whether patients received blood transfusion on arrival to the receiving facility, were not able to be assessed. Finally, our study focuses solely on the unique setting of Northern Ontario and may not be applicable to other regions with different healthcare systems, population demographics or geographic characteristics, thus limiting external validity.

CONCLUSIONS

Our study provides a comprehensive analysis of pre-hospital blood transfusion requirements amongst haemorrhaging patients transported by air ambulance in Northern Ontario. Our results underscore the significant gap in availability as well as the need for expanded access to blood components in managing haemorrhage-related emergencies in a region characterised by vast geographical expanses and sparse population density. With only 20% of patients receiving transfusion, the results highlight the need for expanded access to blood products in Northern Ontario, underscoring the unique challenges faced in delivering equitable healthcare services to remote and underserved communities.

Acknowledgements: We would like to extend our gratitude to Mahvareh Ahghari and all those involved with the Sepsis Canada and LifTING Health Research Training Platform.

Financial support and sponsorship: Nil.

Conflicts of interest: There are no conflicts of interest.

REFERENCES

1. Ontario Demographic Quarterly: Highlights of First QUARTER | ontario.ca. Available from: https://www.ontario.ca/page/ontario-demographic-quarterly-highlights-first-quarter. [Last accessed on 2024 Feb 14].
2. Measuring Up-A Yearly Report on How Ontario's Health System Is Performing. Health Quality Ontario; 2016.
3. Health and Health Care in Northern CANADA. Available from: https://books-scholarsportal-info.proxy.queensu.ca/en/read?id=/ebooks/ebooks7/upress7/2021-10-13/1/9781487514600#page=417. [Last accessed on 2024 Mar 21].
4. MacDonald RD, Lewell M, Moore S, Pan A, Peddle M, Sawadsky B. Air medical transport myths. CJEM 2020;22:S55-61.
5. American College of Surgeons. Advanced Trauma Life Support: Student Course Manual. 10th ed. 633 N. Saint Clair Street, Chicago, IL: American College of Surgeons; 2018.
6. Javaid T, Siddiqui N, Hasan S, Khan Z, Tabassum S, Khuder S, *et al*. The In-hospital Mortality Rate in Gastrointestinal Hemorrhage with Shock: A Nationwide Analysis: 966. Official journal of the American College of Gastroenterology | ACG. 2016;111:S420.
7. Escobar MF, Nassar AH, Theron G, Barnea ER, Nicholson W, Ramasauskaite D, *et al.* FIGO recommendations on the management of postpartum hemorrhage 2022. Int J Gynaecol Obstet 2022;157 Suppl 1:3-50.
8. Callum JL, Yeh CH, Petrosoniak A, McVey MJ, Cope S, Thompson T, *et al*. A regional massive hemorrhage protocol developed through a modified Delphi technique. CMAJ Open 2019;7:E546-61.
9. Brown JB, Cohen MJ, Minei JP, Maier RV, West MA, Billiar TR, *et al.* Pretrauma center red blood cell transfusion is associated with reduced mortality and coagulopathy in severely injured patients with blunt trauma. Ann Surg 2015;261:997-1005.
10. Holcomb JB, Tilley BC, Baraniuk S, Fox EE, Wade CE, Podbielski JM, *et al.* Transfusion of plasma, platelets, and red blood cells in a 1:1:1 versus a 1:1:2 ratio and mortality in patients with severe trauma: The PROPPR randomized clinical trial. JAMA 2015;313:471-82.
11. Rijnhout TW, Wever KE, Marinus RH, Hoogerwerf N,

Geeraedts LM Jr., Tan EC. Is prehospital blood transfusion effective and safe in haemorrhagic trauma patients? A systematic review and meta-analysis. Injury 2019;50:1017-27.
12. Greene A, Trojanowski J, Shih AW, Evans R, Chang E, Nahirniak S, *et al*. A descriptive analysis of the Canadian prehospital and transport transfusion (CAN-PATT) network. Resusc Plus 2023;13:100357.
13. Pusateri AE, Moore EE, Moore HB, Le TD, Guyette FX, Chapman MP, *et al*. Association of Prehospital plasma transfusion with survival in trauma patients with hemorrhagic shock when transport times are longer than 20 minutes: A post hoc analysis of the PAMPer and COMBAT clinical trials. JAMA Surg 2020;155:e195085.
14. Nolan B, Tien H, Sawadsky B, Haas B, Saskin R, Ahghari M, *et al*. Risk factors for non-optimal resource utilization for emergent interfacility transfers by air ambulance in ontario. Prehosp Emerg Care 2020;24:55-63.
15. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP, *et al*. The strengthening the reporting of observational studies in epidemiology (STROBE) statement: Guidelines for reporting observational studies. J Clin Epidemiol 2008;61:344-9.
16. Local Health Integration Networks (Operating as Home and Community Care Support Services) – Public Appointments Secretariat. Available from: https://www.pas.gov.on.ca/Home/Agency/647. [Last accessed on 2024 Feb 15].
17. North East | Home and Community Care Support Services. Available from: https://healthcareathome.ca/region/north-east/. [Last accessed on 2024 Feb 15].
18. HCCSS. North West | Home and Community Care Support Services; 2022. Available from: https://healthcareathome.ca/region/north-west./[Last accessed on 2024 Feb 15].
19. Brown JB, Sperry JL, Fombona A, Billiar TR, Peitzman AB, Guyette FX. Pre-trauma center red blood cell transfusion is associated with improved early outcomes in air medical trauma patients. J Am Coll Surg 2015;220:797-808.
20. Day DL, Anzelon KM, Conde FA. Association of prehospital shock index and trauma bay uncrossmatched red blood cell transfusion with multiple transfusion. J Trauma Nurs 2016;23:89-95.
21. Sohn CH, Kim YJ, Seo DW, Won HS, Shim JY, Lim KS, *et al*. Blood lactate concentration and shock index associated with massive transfusion in emergency department patients with primary postpartum haemorrhage. Br J Anaesth 2018;121:378-83.
22. Agrawal S, Smith M, Berg R, Hoskins IA. Serum lactate level as a predictor for blood transfusion in postpartum hemorrhage. Am J Perinatol 2023;40:1798-802.
23. Brooke M, Yeung L, Miraflor E, Garcia A, Victorino GP. Lactate predicts massive transfusion in hemodynamically normal patients. J Surg Res 2016;204:139-44.
24. Holcomb JB, Swartz MD, DeSantis SM, Greene TJ, Fox EE, Stein DM, *et al*. Multicenter observational prehospital resuscitation on helicopter study. J Trauma Acute Care Surg 2017;83:S83-91.
25. Parker ME, Khasawneh MA, Thiels CA, Berns KS, Stubbs JR, Jenkins DH, *et al*. Prehospital transfusion for gastrointestinal bleeding. Air Med J 2017;36:315-9.
26. Nolan B, Haas B, Tien H, Saskin R, Nathens A. Causes of delay during interfacility transports of injured patients transported by air ambulance. Prehosp Emerg Care 2020;24:625-33.
27. Willis N, Gagnon K, Wong K, McGowan M, Nolan B. Use of fixed wing modified scene air ambulance responses for injured patients in northern ontario: A pilot study. Air Med J 2024;43:177-82.
28. Nolan B, Ackery A, Mamakwa S, Glenn S, VanderBurgh D, Orkin A, *et al*. Care of the injured patients at nursing stations and during air medical transport. Air Med J 2018;37:161-4.
29. MacDonald RD, Ramjaun A. Blood product transfusion during air medical transport: A needs assessment. CJEM 2020;22:S67-73.
30. von Vopelius-Feldt J, Lockwood J, Mal S, Beckett A, Callum J, Greene A, *et al*. Development of a national out-of-hospital transfusion protocol: A modified RAND Delphi study. CMAJ Open 2023;11:E546-59.
31. Krook C, O'Dochartaigh D, Martin D, Piggott Z, Deedo R, Painter S, *et al*. Blood on board: The development of a prehospital blood transfusion program in a Canadian helicopter emergency medical service. CJEM 2019;21:365-73.

ORIGINAL ARTICLE

'We're racially profiled as drunk Indians' – experiences of Indigenous rural British Columbians accessing health care

Terri Aldred, MD, CCFP, BHSc, GCIPH[1,2,3,4,5], Cheryl Schweizer, BEc, Med, DFMA[1], Erika Pritchard, BSc[2], Jordan Christmas, BSc[1], James Liu, BSc, MD, CCFP(EM)[1], Dana Hubler, MD, FCFP[2], Lee Yeates, MHM, CHE, RM, BA, BHSc[1,2]

[1]Department of Family Medicine, The University of British Columbia, Faculty of Medicine, Vancouver, BC, Canada, [2]The Rural Coordination Centre of British Columbia, Vancouver, BC, Canada, [3]First Nations Health Authority, West Vancouver, BC, Canada, [4]Carrier Sekani Family Services, Prince George, BC, Canada, [5]Northern Health Authority, BC, Canada

Correspondence to: Erika Pritchard, epritchard@rcebc.ca

This article has been peer reviewed.

Access this article online

Quick Response Code:

Website: https://journals.lww.com/cjrm

DOI: 10.4103/cjrm.cjrm_15_24

Abstract

Introduction: The present study examines the experiences of anti-Indigenous racism derived from the data collected across rural British Columbia (BC) through the Rural Coordination Centre of British Columbia's Rural Site Visits Project. This study aims to demonstrate how and where people are being treated inequitably in the healthcare system and to highlight racism and its negative impact on patient care.

Methods: We used an action-oriented methodology and incorporated Indigenous methods into the analysis. Participants and focus groups were identified using Boelen's Partnership Pentagon Model, and the data were collected using an appreciative inquiry approach. The data were analysed using thematic analysis.

Results: The various forms of racism appearing in health care were identified together with their impacts on patient care. Primary care providers appeared unaware of the extent of discrimination and barriers to care affecting Indigenous community members, suggesting a disconnect between provider perception and patient experience. Finally, the steps towards culturally safe health care were proposed.

Conclusions: Anti-Indigenous racism exists and adversely impacts the care Indigenous peoples receive throughout rural BC. Our study invites healthcare providers to reflect upon their practice and become more culturally aware and humble to improve Indigenous peoples' access to care, health outcomes and experiences.

Keywords: Anti-Indigenous, British Columbia, cultural safety, equity, family medicine, general practice, health care, Indigenous health, primary care patients, qualitative research, racism, rural, rural health and medicine, safety

Résumé

Introduction: Notre article examine les expériences de racisme anti-autochtone tirées des données recueillies dans les zones rurales de la Colombie-Britannique dans le cadre du Rural Coordination Centre of British Columbia's Rural Site Visits Project (projet de visites des sites ruraux). Ce document vise à démontrer comment

Received: 08-03-2024 **Revised:** 27-09-2024 **Accepted:** 17-10-2024 **Published:** 20-05-2025

How to cite this article: Aldred T, Schweizer C, Pritchard E, Christmas J, Liu J, Hubler D, *et al*. 'We're racially profiled as drunk Indians' – experiences of Indigenous rural British Columbians accessing health care. Can J Rural Med 2025;30:71-8.

et où les personnes sont traitées de manière inéquitable dans le système de santé et à mettre en évidence le racisme et son impact négatif sur les soins aux patients.
Méthodes: Nous avons utilisé une méthodologie orientée vers l'action et intégré des méthodes autochtones dans l'analyse. Les participants et les groupes de discussion ont été identifiés à l'aide du modèle Pentagone du partenariat de Boelen et les données ont été recueillies à l'aide d'une approche d'enquête appréciative. Les données ont été analysées à l'aide d'une analyse thématique.
Résultats: Les différentes formes de racisme apparaissant dans les soins de santé ont été identifiées, ainsi que leur impact sur les soins aux patients. Les prestataires de soins primaires ne semblaient pas conscients de l'ampleur de la discrimination et des obstacles aux soins qui affectaient les membres de la communauté autochtone, ce qui suggère un décalage entre la perception du prestataire et l'expérience du patient. Enfin, les étapes des soins de santé culturellement sûrs sont proposés.
Conclusions: Le racisme anti-autochtone existe et a un impact négatif sur les soins que reçoivent les populations autochtones dans les zones rurales de la Colombie-Britannique. Notre article invite les prestataires de soins de santé à réfléchir à leur pratique et à devenir plus conscients de la culture et plus humbles afin d'améliorer l'accès aux soins, les résultats en matière de santé et les expériences des populations autochtones.

Mots-clés: Anti-autochtones, colombie-britannique, equite, medecine familiale, medecine generale, patients en soins primaires, recherche qualitative, rural, sante autochtone, sante et medecine rurales, securite culturelle, securite, racisme, soins de sante

INTRODUCTION

Previous qualitative research has documented adverse healthcare experiences amongst Indigenous peoples seeking medical care.[1] Indigenous patients have observed healthcare providers shifting from pleasant demeanour to negative attitudes as the providers transition between non-Indigenous and Indigenous patients.[2] Explicit discrimination and contempt towards Indigenous approaches to health and wellness have also been documented.[3] Fear of discrimination has resulted in care avoidance.[1] The recent In Plain Sight report documents widespread, systemic anti-Indigenous stereotypes and discriminatory experiences for Indigenous peoples in British Columbia's (BC) healthcare system.[4] The downstream effects of these discriminatory experiences are significant. For example, Indigenous patients who feel the health services they receive are not culturally appropriate face greater barriers to care that can lead to reduced access to preventative care and disease management, increasing the likelihood of diabetes prevalence.[5] Furthermore, discrimination by healthcare providers is directly associated with unmet health needs.[6]

Anti-Indigenous racism regularly occurs in a variety of healthcare settings and can impact the experience of every Indigenous patient in every healthcare encounter. Our study examines the data from the Rural Coordination Centre of British Columbia (RCCbc) Rural Site Visits Project[7] (SV Project) to offer a perspective on anti-Indigenous racism from rural BC communities. It contributes to the body of literature documenting anti-Indigenous racism by bringing the data collected systematically from rural communities across BC. Our study aims to demonstrate how and where people are being treated inequitably in the healthcare system and highlight racism and its negative impact on patient care. In addition, we invite healthcare providers to reflect upon the suggested steps towards reconciliation of culturally safe health care with the aim of improving Indigenous peoples' access to care, health outcomes and experiences.

METHODS

The SV Project engaged rural BC communities to gain insight into healthcare successes, innovations and challenges, by combining an action-oriented methodology with appreciative inquiry (AI). An action-oriented methodology with AI focused on driving positive change by identifying and building on existing strengths within a system. It encouraged collaborative engagement, leveraging previous successes and envisioning an ideal future to create actionable steps for improvement.[8] While focusing specifically on cultural safety and racism was not the SV Project's intent, thematic analysis uncovered the prevalence of anti-Indigenous racism across rural BC. Consequently, this team

came together to further analyse the contributory data.

The following Indigenous methodologies[9] were used:

- An Elder participated as a co-author. Elder Cheryl provided the following example: the Elder title is one I don't take lightly but one of respect, integrity and honour. I honour the Elders and acknowledge I am a young Elder but I do not sit alone. I had my aunties bear witness and affirm like when we are in potlatch
- Indigenous methodologies often avoid traditional thematic analysis methods as it risks non-Indigenous researchers misinterpreting Indigenous experiences. Instead, complete quotes are used to authentically preserve Indigenous voices and perspectives
- As authors, we positioned ourselves as a fundamental component of how we all worked together, sharing reflections of who we are and how the work impacts us in a sharing circle format
- Authors engaged an external Indigenous review panel to ensure harm is minimised and the review identified themes for data congruency.

Recruitment

In each community, Boelen's Partnership Pentagon Model was adapted to identify participants from the following health partner groups: Indigenous leaders, Indigenous community members, health administrators, municipality members, nurse practitioners, midwives and physicians.[10] Where relevant, academics, first responders and community health groups were also included. All participants were recruited using purposeful and snowball sampling.

Data collection

After obtaining informed consent from all participants, site visitors used an AI (appreciative inquiry) approach, supported by an iteratively refined semi-structured guide, for data collection. Interviews and focus groups lasted approximately 1 h and were audio recorded, transcribed and anonymised. In keeping with First Nations Ownership, Control, Access, and Possession principles,[11] each transcript was returned to participants for verification, alteration or withdrawal prior to analysis. The data were collected between April 2018 and March 2020 from interview meetings of Indigenous and non-Indigenous participants in rural subsidiary agreement (RSA) communities across BC.

Data analysis

The research team performed iterative thematic analysis on all SV Project data and continuously revisited, compared and modified codes to accommodate incoming data. The use of NVivo 12 (QSR International) facilitated effective data organisation.

Ethics

Harmonised ethics approval from the Behavioural Research Ethics Board of the University of BC was obtained for the SV Project. Operational approval was obtained from every BC health authority.

RESULTS

There were 44 First Nations community meetings and 24 combined partner meetings that included Indigenous partners. Three hundred and eighty-two interviews with Indigenous and non-Indigenous participants were conducted in 107 RSA communities.

Theme 1: Forms of racism appearing in health care

The data analysis revealed multiple forms of racism including systemic, epistemic and interpersonal as demonstrated by the quotes in Table 1.

Failure by healthcare providers to recognise, confront and redress racism impedes Indigenous peoples' access to high-quality, culturally safe care.

Theme 2: Impacts of racism on health care

Many participants described experiences of negative interactions when seeking health care in their respective communities [Table 2]. Negative experiences impact patient care in many ways including care avoidance and leaving against medical advice as outlined in Table 3.

Table 1: How racism is experienced in health care
Examples of systemic racism
'…You're not actually saying it out loud, it's still happening…it's much more difficult to identify and define because it's so subtle, but you can still feel that it's there. It's hard to have a conversation about it because it's really hard to catch. And when it comes to language and behaviours and stuff, I deal with this all the time…and you try and explain, no, it's about the impact. 'But I didn't', 'but I didn't', 'but I didn't' – but the impact was the same.' - Health administrator meeting
'What keeps me up at night, it's the racism people suffer. The residential school for the region was right here, and that is on the surface still and a very real experience for people that I still think we're not doing a great job of caring for. There's just so much trauma that falls from that. And then people suffer here when they wouldn't suffer if they had…easier access to healthcare. And a lot of people tell me, I'd rather stick it out and suffer and, you know, die uncomfortably here.' - Indigenous community meeting
Examples of epistemic racism
'…But we're not ignorant, we're not handicapped, we just have a different way of knowing. I believe we're very intelligent, I believe everybody's an expert and it's just when you're dealing with one of us, just treat us as such. Just because we're quiet or whatever, we're not stupid…. I don't know what it is, why they do that sometimes to first nations.' – Indigenous community meeting
'Our settler population don't really appreciate the history because they've only been given it in one form. So, we have been taught history in a certain way that is the perspective of the people who wrote the books, who were also settlers. We don't get a lot of Indigenous historical material to reflect on to get the other perspective of the same events. And so you've got a lot of potential for education there, for sure.' - Health administrator meeting
Examples of interpersonal racism
'A client came struggling with addiction and his past historical trauma was never put into any consideration at all. He told me 'I went to the hospital and they told me that I was fine. The doctor didn't even listen to my chest' So I (FN health director) went with him back to the hospital and the difference he received in service was unbelievable.' - Indigenous community meeting
'It has always been hard to go to the hospital as an Indigenous person. Ever since I've gone to the hospital we have been discriminated against.' - Indigenous community meeting

Table 2: Patient experience	
Negative Experiences When Accessing Health Care	Example
Concerns around inadequate care and unmet need	*'Just over and over, people not being properly tested for certain things. Somebody came in with kidney infections and sent home, didn't even have a urine dip test, and finally the daughter had to phone the ambulance and the Elder almost died because of sepsis… I have tons of stories.'* - Indigenous community meeting
	'…I was in and out of hospitals for years, in and out of doctors, nobody knew what was wrong with me…I went to see my own doctor…and she kept saying, well, I think it's because you're drinking…I'm not a binge-drinker…And I finally saw a naturopath and she said, you're really swollen. You need to try to cut gluten out of your diet…I was fine as soon as I cut that out of my diet. My body felt different, I wasn't as sick, and I went back to my doctor and said, I've been off gluten for this amount of time, and she said, I don't know why we did n't test you for that. And I said, well, because you've been telling me for so long that I'm just a drunk Indian…it's really frustrating. That was the experience I've had, and a lot of the experiences other people have are the same, where we're racially profiled as Drunk Indians.' - Indigenous community meeting
	'...if we had that liaison in the hospital when my cousin went in there, they would've helped them… because he went in and he was in pain, the ambulance brought him in but the doctor didn't want to know, so they just sent him home and on his way home he collapsed and he passed away because he had extensive brain injury...' - Indigenous community meeting
Culturally unsafe care	*' With my experience, someone was passing away up at the hospital and the nurses kicked everybody out and told them to go somewhere else... The family members. And when it comes to First Nations people, everybody gathers. You can't shoo them away. It's their family. It's their loved ones.'* - Indigenous community meeting
	'... Elders often don't speak but it doesn't mean they don't have an opinion. They might just not show up again, their sickness is still there, their needs are not being met.' - Indigenous community meeting

Theme 3: Disconnect between physician and community perceptions

There appears to be a disconnect between how physicians and Indigenous community members perceive Indigenous patient experience [Table 4].

Theme 4: Steps towards culturally safe health care

Participants shared numerous local initiatives and recommendations for improving culturally safe and affirming health care, as outlined in Table 5.

Table 3: Impact on patient's care (what the experiences lead to)

Impact	Example
Trust in care	*'What keeps me up at night is the fear that someday one of our people is going to be turned away from that emergency department and is going to die as a result of it.'* - Indigenous community meeting
	'So all these horrible experiences happen and it's in our community, so now you hesitate, are they even going to take me seriously? Do I have to wait until I'm half dead before they'll see me, you know?' - Indigenous community meeting
Access to care	'*Many people have felt very discriminated against at the hospital, both in an emergency – they've actually left sometimes and gone to other hospitals in the area because they felt that they weren't provided services.*' - Indigenous community meeting

Table 4: Disconnect between healthcare partners and Indigenous community members

Quote
'And you know I never saw any discrimination but he would tell me that he experienced discrimination every day and I don't see discrimination of the First Nations. But if you talk to them they perceive it constantly…' - Physician meeting
In (community X) when asked if Indigenous patients were comfortable coming into the local hospital
'I think so.' - Physician 1
'I think so too. I really think so,' - Physician 2
'Some (people) go to (another town) (to see a doctor) because they don't...They don't appreciate the way they've been treated here…' - Indigenous community meeting

Drawing from Indigenous participants' numerous suggestions for reconciliatory steps [Table 5], we created a list of actionable practices for healthcare providers [Table 6], organised using an expanded four Rs Framework: Respect, Relevant, Reciprocal, Responsibility and the fifth R added for Relationship. [12,13]

DISCUSSION

Anti-Indigenous racism permeates across multiple locations and healthcare settings, impacting the care Indigenous peoples receive in rural BC. A gap exists in Indigenous-led inquiry and literature specific to rural BC. In recognising that epistemic racism influences how scholarly work is created and communicated and affects how non-Indigenous authors engage with Indigenous lived experience, maintaining epistemic awareness and actively working to decolonise our approach was essential. Participants shared experiences highlighting numerous ways interpersonal, epistemic and systemic racism negatively impact Indigenous health and wellness and how historical events (Indian hospitals, residential schools, 60's scoop, the forced removal of Indigenous peoples from traditional lands) continue to contribute to Indigenous peoples' reluctance to engage with the healthcare system.[14,15]

Many communities identified the lack of culturally safe care as a serious concern, recounting experiences of avoidable misdiagnoses that led to harm. These experiences are consistent with previously documented findings from the In Plain Sight Report[4] and through the inquest into the death of Brian Sinclair, who died waiting to be seen in the ER of a Manitoba hospital.[16] Both explicit and implicit biases (racism) can lead to Indigenous peoples feeling unsafe accessing health care; however, implicit biases that impact the care of Indigenous peoples are insidious and can be more difficult to name and address.

Racially implicit bias may lead physicians to underdiagnose, undertreat or assign more racially stereotypical diagnoses to patients based on racial or ethnic background.[4,14,17] Table 3 demonstrates how clinician biases undermine the trust and impede access to care. The impact of racial bias on patient care in Canada warrants further investigation, as the current literature is limited.

Our study joins a larger body of literature including the In Plain Sight report, First Peoples, Second Class Treatment and the Truth and Reconciliation Commission's (TRC) Report in identifying that racism is a significant barrier to, and determinant of, health for Indigenous peoples in Canada.[4,14,15] It is time to move beyond discussing the existence of racism, to identifying how it impacts Indigenous peoples' health and, most importantly, implementing change that, as Indigenous leader Dr. Caron asserts in the 2017 TEDX talk 'The Other Side of Being First', leads to healthy, thriving Indigenous peoples and communities via self-determined health care.[18] The aforementioned reports contain significant calls to action, yet almost one decade past the TRC release, the evidence of action remains limited.

It is hoped that our suggestions for culturally safe health care in Table 6 will translate the TRC's broad recommendations into practical actions that will directly benefit patient care.

Table 5: Culturally safe health care - community proposed solutions and innovations
'We budgeted for our own traditional healer to come in because there wasn't sufficient mental health services so, although, this person is not a certified clinical counselor, they are a traditional healer and they helped our people through many difficult times.' - Indigenous community meeting
'With aboriginal communities there is a lot of historical and intergenerational trauma that plays into the care as well and it takes years to see changes but you have to be forward thinking and proactive about developing the services and programs that can help reduce the effects of trauma.' - Combined partners meeting
'I think we just need someone that's going to advocate for them...To be with them during their visit to the doctor; they're having surgery and we should do to make them feel like, you know, they're safe... - Indigenous community meeting
'What is the cultural sensitivity, it has to be eyeball to eyeball in a place for them to absorb and learn what is on the ground. Instead of them just saying we have some test on the computer…' - Indigenous community meeting
'I want to address my view on cultural safety. There's a relationship between this ambulance group particularly...they provide something unusual for a first responder agency and it really has to do with cultural safety. It has to do with relationship between the people, they're like intermediaries in a way that no other first responder agency quite, quite does it. So, there's that and that's fairly innovative... you turn up for whatever, um, acute medical or trauma, and, uh, and there's a couple, uh, firefighters who are community members that show up and they're also responders, but they're also part of the community. It's as simple as that and consequently ambulance takes their lead, you know, there's a kind of a respect, right?' – Municipal/first responder meeting
'You know, we've still got a ways to go but we have come a ways with that and a couple of years ago we started a program…in which we had ER nurses volunteer to go out to some of the communities to have a visit for the day and work with the community health nurses. That changed some perspectives.' - Indigenous community meeting

While our study focuses on anti-Indigenous racism, these actions can be applied to all forms of racism. The burden of determining how to address racism frequently falls on Indigenous Elders, knowledge keepers and community members. However, as Justice Murray Sinclair, who led Canada's TRC, reminded us, reconciliation is not an Indigenous problem. It is a Canadian problem. Addressing interpersonal, systemic and epistemic racism in health care requires a top-down and bottom-up approach, with Indigenous and non-Indigenous communities and individuals working together.

Limitations

Between 2018 and 2023, the SV team visited 128 of BC's 205 RSA communities, with 77 RSA communities remaining. This means not every BC rural community is represented in the overall dataset (see RSA 2024 list[19] here: https://www2.gov.bc.ca/assets/gov/health/practitioner-pro/rrp_points.pdf). The data presented in this study draws from 44 First Nations community meetings and 24 combined partner meetings that included Indigenous partners, occurring between April 2018 and March 2020. Although participants were not required to self-identify as Indigenous, many shared their roles as Indigenous community members, Elders, health representatives and knowledge keepers during meeting introductions.

The SV Project's scope is limited to rural BC and does not represent all Canadian contexts. The ongoing SV Project encountered a 17-month delay due to COVID-19 travel restrictions, leaving some rural and Indigenous communities unvisited at the time of this analysis. Scheduling logistics prevented full partner participation in all communities, potentially omitting some perspectives, and time constraints challenged the development of deep relationships with participants, possibly affecting response quality. Moreover, few site visitors were Indigenous and the Indigeneity of the interviewer could have affected responses from Indigenous participants. To mitigate this, an ongoing cultural safety and humility program was developed early in the project and implemented for all team members. In addition, iterative revision of the interview guide incorporated more inclusive language and direct questions asking about cultural safety, humility and racism.

CONCLUSIONS

Pre-contact Indigenous peoples were in general healthy and vibrant and self-determining.[4,20] Our study illuminates the impact of colonialism and anti-Indigenous racism across the rural BC health landscape and emphasises the urgent need for local and individual provider action based on Indigenous-identified solutions. Racism emerged from SV Project data without being explicitly sought in the original framework. Our analysis revealed pervasive anti-Indigenous racism in rural BC health care, varying cultural safety and

Table 6: Culturally safe health care – examples for providers	
The 5 Rs	What providers can do
Healthcare services need to respect Indigenous cultural knowledge, core values, and traditions	Build mutually respectful relationships with local Indigenous peoples Learn about local protocol, traditions values and traditional medicines Participate in local community events Value Indigenous ways of knowing and being Read, watch, listen to Indigenous art, music, and stories Advocate for system-change Encourage healthcare leadership to review policies to address the systems that perpetuate discrimination e.g., addressing jurisdictional barriers between federally and provincially funded programs
Adopt healthcare practices that are culturally relevant and affirming of Indigenous peoples' identities and experiences	Adopt trauma-informed practice as 'universal precautions' Invest in earning trust from patients rather than expecting trust Budget for additional time in order to facilitate communication, foster trust, and make space for complex issues Be aware of how the asymmetrical power dynamics in the patient-physician relationship affect care List local trauma-trained mental health providers (i.e. EMDR, OAI therapy, somatic experiencing, etc.) Be open Discuss if and how patients use traditional medicines and ceremonies in their wellness journeys Cultivate contextual sensitivity by learning about the experiences of Indigenous peoples Review 'reclaiming power and place: The final report of the national inquiry into missing and murdered Indigenous women and girls' https://www.mmiwg-ffada.ca/final-report/and its recommendations
Develop reciprocal connections with others that situate health care as a two-way, non-authoritarian partnership between the patient and provider	Make meaningful personal connections both inside and outside of clinical settings to deepen relationships Involve Indigenous patient liaisons and peer navigators who are trained to navigate the system and provide a buffer from unsafe care Embrace opportunities to spend non-clinical time in Indigenous communities. *Elder Cheryl notes the most rewarding time she has spent with Elders is when she learned to scrape hide. Many stories are told while participating in cultural activities. Provides an opportunity to see people in their power and strengths. Other examples include berry picking, clam digging, etc.*
Responsibility means implementing healthcare practices and policies that empower Indigenous participation and leadership in health care	Be inclusive and collaborative Find ways to integrate community members, Elders, Indigenous services and organisations into the local healthcare delivery models Education Learn about and integrate local supports for Indigenous peoples into your care provision See the Truth and reconciliation calls to action document particularly 18–24 pertaining to health https://www2.gov.bc.ca/assets/gov/british-columbians-our-governments/indigenous-people/aboriginal-peoples-documents/calls_to_action_english2.pdf Develop a critical self-reflective practice to develop cultural humility
Relationship an essential 5th 'R' in health care	Develop rapport and build trust Build relationship before developing a management plan Avoid impersonal communication styles Ensure patients feel cared for, not just that they have received care Remain cognizant that only Indigenous peoples can determine if the care they receive is culturally safe

EMDR: Eye movement desensitisation and reprocessing, OAI: Observed experiential integration

humility knowledge levels and practices amongst healthcare providers and a significant discordance between non-Indigenous clinicians' perceptions of providing culturally safe care and Indigenous peoples' lived experience of receiving care in those same communities.

Our results revealed a shared vision amongst Indigenous peoples throughout rural BC, articulated as a healthcare system where Indigenous peoples feel supported in their wellness with access to a wide range of accessible, equitable health services where providers walk alongside them in their healing journeys. The time is now, and it will take every one of us.

Financial support and sponsorship: This work was funded by the Joint Standing Committee on Rural Issues (JSC) through the RCCbc.

Conflicts of interest: There are no conflicts of interest.

REFERENCES

1. Tang SY, Browne AJ. Race matters: Racialization and egalitarian discourses involving aboriginal people in the Canadian health care context. Ethn Health 2008;13:109-27.
2. Hole RD, Evans M, Berg LD, Bottorff JL, Dingwall C, Alexis C, *et al*. Visibility and voice: Aboriginal people experience culturally safe and unsafe health care. Qual Health Res 2015;25:1662-74.
3. Monchalin R, Smylie J, Nowgesic E. I guess I shouldn't come back here: Racism and discrimination as a barrier to accessing health and social services for urban Métis women in Toronto, Canada. J Racial Ethn Health Disparities 2020;7:251-61.
4. Turpel-Lafond ME. In Plain Sight: Addressing Indigenous-Specific Racism and Discrimination in BC Health Care; 2020. Available from: https://engage.gov.bc.ca/app/uploads/sites/613/2020/11/In-Plain-Sight-Summary-Report.pdf. [Last accessed on 2024 Mar 07].
5. Beckett M, Firestone MA, McKnight CD, Smylie J, Rotondi MA. A cross-sectional analysis of the relationship between diabetes and health access barriers in an urban first nations population in Canada. BMJ Open 2018;8:e018272.
6. Kitching GT, Firestone M, Schei B, Wolfe S, Bourgeois C, O'Campo P, *et al*. Unmet health needs and discrimination by healthcare providers among an Indigenous population in Toronto, Canada. Can J Public Health 2020;111:40-9.
7. Johnston C, Belanger E, Wong K, Snadden D. How Can Rural Community Engaged Health Services Planning Affect Sustainable Health Care System Change? A Process Description and Qualitative Analysis of the Rural Coordination Centre of British Columbia's Rural Site Visit Project; 2021. Available from: https://bmjopen.bmj.com/content/11/10/e047165.
8. Stonewell F. The appreciative inquiry method – A suitable candidate for action research. Syst Res Behav Sci 2013;30:15-30.
9. Wilson, S. Research Is Ceremony: Indigenous Research methods. Nova Scotia: Fernwood Publishing; 2008.
10. Boelen C. Towards Unity for Health: Challenges and Opportunities for Partnerships in Health Development. Geneva, Switzerland: World Health Organisation; 2000.
11. Mecredy G, Sutherland R, Jones C. First nations data governance, privacy, and the importance of the OCAP® principles. Int J Popul Data Sci 2018;3:320. [doi: 10.23889/ijpds.v3i4.911].
12. Restoule JP. The Five r's of Indigenous Research: Relationship, Respect, Relevance, Responsibility, and Reciprocity [Workshop]. Wise Practices II: Canadian Aboriginal AIDS Network Research and Capacity Building Conference, Toronto, Ontario, Canada; 2008.
13. Kirkness VJ, Barnhardt R. First nations and higher education: The four Rs – re spect, relevance, reciprocity, responsibility. In: Hayoe R, Pan J, editors. Knowledge Across Cultures: A Contribution to Dialogue Among Civilizations. Hong Kong: Comparative Education Research Centre, The University of Hong Kong; 2001.
14. Allan B, Smylie J. First Peoples, Second Class Treatment: The Role of Racism in the Health and Well-Being of Indigenous Peoples in Canada. Toronto, ON: The Wellesley Institute; 2015.
15. Truth and Reconciliation Commission of Canada, United Nations, National Centre for Truth and Reconciliation Commission of Canada. Truth and Reconciliation: Calls to Action; 2015.
16. Provincial Court of Manitoba. The Fatality Inquiries Act. In the Matter of Brian Lloyd Sinclair, Deceased; 2014. Available from: https://www.manitobacourts.mb.ca/site/assets/files/1051/brian_sinclair_inquest_-dec_14.pdf. [Last accessed on 2024 Mar 07].
17. FitzGerald C, Hurst S. Implicit bias in healthcare professionals: A systematic review. BMC Med Ethics 2017;18:19.
18. Caron N. TedxUNBC Presentation: The Other Side of Being First. TED Conferences. Available from: https://www.ted.com/talks/nadine_caron_the_other_side_of_being_first. [Last accessed on 2024 Mar 07].
19. Government of British Columbia Rural Retention Program (RRP) 2024-25 List. Available from: https://www2.gov.bc.ca/assets/gov/health/practitioner-pro/rrp_points.pdf. [Last accessed on 2024 Mar 07].
20. National Collaborating Centre for Aboriginal Health. An Overview of Aboriginal Health in Canada. University of Northern British Columbia; 2013. Available from: https://www.ccnsa-nccah.ca/docs/context/FS-OverviewAbororiginalHealth-EN.pdf. [Last accessed on 2024 Mar 07].

ORIGINAL ARTICLE

Understanding the maternity care desert: A qualitative study on factors contributing to the closure of obstetrical programmes in rural northern Ontario

Iain R. Lamb, PhD[1], Nicole A. Dumonski, MD[2], Heidi Corneil, BSc[2], Chandelle C. M. Mensour, MD[2], Eliseo Orrantia, MD, MSc[1,3]

[1]Division of Clinical Sciences, Northern Ontario School of Medicine University, Marathon, Canada, [2]Undergraduate Medical Education, Northern Ontario School of Medicine University, Sudbury, Canada, [3]Marathon Family Health Team, Marathon, Canada

Correspondence to: Eliseo Orrantia, eorrantia@mfht.org

This article has been peer reviewed.

Abstract

Introduction: Northern Ontario continues to experience closures of rural obstetric programmes, forcing pregnant persons to travel for care. This reduced access is associated with poorer maternal and newborn health outcomes and creates logistical and financial barriers to care. Despite closures, factors underlying this trend are not well understood. Administrators, nurses and physicians involved in rural obstetrics at the time of programme closure are well positioned to identify factors contributing to service attrition. This qualitative study aimed to explore their perspectives regarding factors contributing to closure.

Methods: Semi-structured interviews were conducted with administrators, nurses and physicians involved in rural obstetric programmes in northern Ontario at the time of closure. Interview questions were developed from a literature scan and refined by an experienced practitioner to identify factors influencing closures. Thematic analysis of interviews identified common themes regarding factors perceived to contribute to programme closure.

Results: Twelve administrators, 6 nurses and 10 doctors were interviewed. Analysis revealed several perceived factors contributing to programme closures: (1) a decline in obstetric competence and confidence among healthcare workers attributable to inadequate obstetric exposure in schooling, low birth volumes and limited ongoing training opportunities; (2) shortage of health human resources providing obstetric care due to lack of provider reluctance and recruitment challenges and (3) limited support from the provincial government and tertiary referral centres.

Conclusions: Closure of rural obstetric programmes in northern Ontario is seen as a result of complex, multifaceted challenges. Understanding these factors can better inform strategies to sustain rural obstetric programmes and prevent further attrition of care.

Keywords: Health human resources, health service, healthcare access, healthcare sustainability, maternity care, obstetrics, rural communities, rural health

Received: 20-08-2024 **Revised:** 28-11-2024 **Accepted:** 19-03-2025 **Published:** 20-05-2025

How to cite this article: Lamb IR, Dumonski NA, Corneil H, Mensour C, Orrantia E. Understanding the maternity care desert: A qualitative study on factors contributing to the closure of obstetrical programmes in rural northern Ontario. Can J Rural Med 2025;30:79-88.

Access this article online

Quick Response Code:

Website: https://journals.lww.com/cjrm

DOI: 10.4103/cjrm.cjrm_49_24

Résumé

Introduction: Le nord de l'Ontario continue de subir des fermetures de programmes obstétriques ruraux, ce qui oblige les femmes enceintes à SE déplacer pour obtenir des soins. Cet accès réduit est associé à de moins bons résultats en matière de santé pour la mère et le nouveau-né et crée des obstacles logistiques et financiers aux soins. Malgré les fermetures, les facteurs qui sous-tendent cette tendance ne sont pas bien compris. Les administrateurs, infirmières et médecins impliqués dans l'obstétrique rurale au moment de la fermeture du programme sont bien placés pour identifier les facteurs contribuant à l'attrition des services. Cette étude qualitative avait pour but d'explorer leurs points de vue sur les facteurs contribuant à la fermeture.

Méthodes: Des entretiens semi-structurés ont été menés avec des administrateurs, des infirmières et des médecins participant à des programmes d'obstétrique en milieu rural dans le nord de l'Ontario au moment de la fermeture. Les questions ont été élaborées à partir d'une analyse documentaire et affinées par un praticien expérimenté afin d'identifier les facteurs influençant les fermetures. L'analyse thématique des entretiens a permis d'identifier des thèmes communs concernant les facteurs perçus comme contribuant à la fermeture d'un programme.

Résultats: Douze administrateurs, six infirmières et dix médecins ont été interrogés. L'analyse a révélé plusieurs facteurs perçus comme contribuant à la fermeture des programmes: 1) un déclin des compétences obstétricales et de la confiance des travailleurs de la santé, attribuable à une exposition insuffisante à l'obstétrique au cours des études, à de faibles volumes de naissances et à des possibilités limitées de formation continue; 2) une pénurie de ressources humaines en santé fournissant des soins obstétricaux en raison de la réticence des prestataires et des difficultés de recrutement; et 3) un soutien limité du gouvernement provincial et des centres de référence tertiaires.

Conclusions: La fermeture des programmes d'obstétrique en milieu rural dans le nord de l'Ontario est considérée comme le résultat de défis complexes et à multiples facettes. La compréhension de ces facteurs peut permettre de mieux informer les stratégies destinées à soutenir les programmes d'obstétrique en milieu rural et à prévenir l'attrition des soins.

Mots-clés: Soins de maternité, obstétrique, communautés rurales, santé rurale, accès aux soins de santé, durabilité des soins de santé, ressources humaines en santé, services de santé.

INTRODUCTION

Over the past two decades, rural northern Ontario has seen a persistent decline in obstetric care services.[1,2] This trend, characterised by a reduction in the number of hospitals and healthcare providers offering obstetric care, has resulted in a growing maternity care desert throughout the region, reducing access to care for pregnant persons living in these areas.[1,2]

Hutten-Czapski (1999) was among the first to describe the attrition of obstetric care in rural northern Ontario, finding that the number of hospitals without an obstetrics programme rose from 3 to 15 between 1981 and 1997.[1] A subsequent study, conducted in 2020, found that programme closures had risen to 24, with no instances of previously discontinued programmes being reopened.[2] Since publication in 2022, the region has seen the closure of two more programmes, leaving only nine rural hospitals offering obstetric care across northern Ontario.[3,4]

Closure of rural obstetric programmes has led to longer travel times for accessing care. Pregnant persons in rural northern Ontario communities where obstetric services have been discontinued now face travel times of over 1.5 h to access hospitals with basic obstetric services and more than 2 h to reach facilities with caesarean-section capability.[2] With the recent closure of two more rural obstetric programmes, it stands to reason that average travel times to access care have only increased since last reported.

The increased time required to access care is concerning given the correlation between access to obstetric services and maternal and newborn health outcomes.[5-11] Research has shown travel times between 60 and 119 min are associated with a higher incidence of stillbirth, preterm birth and other complications compared to those living closer to care.[11] For pregnant persons, delayed access to care is associated with a two-fold increase in the risk of eclampsia, amniotic embolism and uterine dehiscence or rupture compared to those living closer to care.[12] Further, the lack of access

has also been shown to negatively impact maternal psychological well-being, leading to heightened levels of stress and anxiety compared to those with local access to care.[6,7]

Beyond health implications, medical travel also creates logistical and financial barriers to care for those living in rural areas.[5,6,13,14] Coordination of travel in rural areas can be challenging as transportation options are often limited.[13] Securing overnight lodging near healthcare facilities can be expensive, and managing absences from work can place financial strain on families, especially for those without paid leave.[5,6,13] Particularly burdensome can be out-of-pocket expenses associated with travel, especially for those advised to stay near healthcare facilities weeks before their delivery date.[5-7,13,14] These logistical challenges and financial burdens can lead to further stress and anxiety, compounding existing pressures faced by pregnant persons.[7]

Sustaining obstetric programmes that remain operational in rural northern Ontario can help mitigate further disparities in access to care and the health risks associated with travel. Central to developing strategies for maintaining rural obstetric programmes is understanding factors underlying their closure. Yet, these factors remain poorly characterised, creating a knowledge gap that hinders approaches to prevent further attrition of care.

Key personnel such as hospital administrators, nurses and physicians involved in rural obstetric programmes in northern Ontario at the time of closure are uniquely positioned to provide perspectives on factors contributing to service attrition. By drawing on their experience, we can begin to develop an understanding of the challenges that contribute to programme closure. These insights may help inform strategies to prevent further closures and support the sustainability of obstetric care in the rural north. Therefore, this study aims to identify factors contributing to the closure of rural obstetric services in northern Ontario, based on the experiences of key personnel involved at the time of programme closure.

METHODS

This study used a purposeful sampling of senior hospital administrators, nurses and physicians involved in rural obstetric programmes in northern Ontario hospitals at the time of their closure. Individuals were invited to participate via phone or email. Prospective participants received a participant information letter before the interviews, which outlined the study details, the requirements of their involvement and a consent form detailing their rights as a participant.

From June 2021 to October 2021, semi-structured interviews were conducted by two researchers (ND and CCMM). Interviews were conducted via telephone or a virtual teleconference platform and were audio-recorded after obtaining verbal consent from participants. Interview questions followed a structured interview guide developed by the research team. Questions were developed based on a literature review on health service closures and with input from author EO, who has over 25 years of practising obstetrics in rural northern Ontario. Using an interview guide informed by both primary literature and personal experience ensured questions were evidence-based yet tailored to the regional context of rural northern Ontario. The semi-structured interview process allowed participants to freely respond to each open-ended question. Interviewers used prompts and follow-up questions to encourage participants to elaborate on factors contributing to obstetric programme closures at their institutions. In acknowledgement of their time, participants received $75 compensation upon completion of the interview.

Participant audio recordings were transcribed verbatim by members of the research team (ND and CCMM), and the accuracy of transcriptions was confirmed by comparing them with the original recordings. To ensure anonymity, identifiable information was redacted throughout interview transcripts. All transcripts were uploaded to qualitative data analysis software Nvivo (QSR International Pty Ltd. Version Release 1.5.1 (940) 2021). Using Nvivo software, thematic analysis was guided by the inductive coding approach outlined by Braun and Clarke.[15] In brief, one member of the research team (IRL) familiarised themselves with each interview transcript. Codes were created to capture perspectives and opinions shared by participants and organised into common themes and subthemes based on their content. A member of the research team (EO) reviewed identified themes. Through consensus among the research team members involved in

data analysis (IRL, HC and EO), key themes and subthemes were named and defined. Thematic saturation was achieved when the team concluded that no new themes were emerging from the data, indicating that all thematic elements present in the interviews had been captured.

Ethics approval for this study was granted by the Research Ethics Board (REB) at Lakehead University in Thunder Bay, Ontario, Canada (Approval No. #1468648).

RESULTS

Of the 46 participants invited, 28 (61%) participated in the study, representing perspectives from nine rural obstetrics programmes that closed between 2009 and 2018 [Table 1].

Perceived lack of confidence and competence

'*Well, the reason that nobody else is doing obstetrics up here is because I supposed they don't feel competent, and I suppose the reason for that is that they have no experience.*'

- [W4-003]

Thematic analysis reveals a compelling narrative about the competence and confidence of nurses and physicians in providing obstetric care. Participants felt a lack of comprehensive obstetric training and limited practical experience in nursing and medical education programmes hinder the confidence and competence of new graduates. Low birth volume in rural areas was thought to limit opportunities for hands-on practice and skill development, reducing confidence and competence in both new graduates and current healthcare workers. For some institutions, resource constraints were cited as limiting opportunities for continuing medical education (CME) and training needed to maintain obstetric competence and confidence. Together, these factors were perceived to undermine healthcare workers' confidence and competence in delivering care, ultimately reducing their willingness to provide obstetric care.

Table 1: Participants occupation and location of employment

	Northeastern Ontario (*n*=4 obstetric programmes)	Northwestern Ontario (*n*=5 obstetric programmes)	Total
CEO	4	3	7
CNO	0	5	5
Nurse	4	2	6
Physician	2	8	10
Total	10	18	28

CEO: Chief executive officer, CNO: Chief nursing officer

Educational gaps and their impact

Some participants felt that the lack of competence and confidence in providing obstetrical care stems from current medical and nursing education, which they believed often fails to provide adequate exposure to obstetrics. One participant said:

'*Like our new practitioners, our new physicians that are coming out of school,* (obstetrics) *is not an area that they're comfortable with at all.*'

- [E4-005]

Another participant noted the lack of exposure to obstetrics for nursing students:

'*They try in schools, but you can only learn so much in a rotation. And some will go through it* (and say), *'oh I had a week in labour and delivery, but I never seen a baby.*'

- [W1-002]

With regard to post-graduate medical education, one participant said:

'*The rural residency programs that used to have a required rotation in obstetrics don't necessarily have that anymore, so when I graduated you didn't have a choice, you had to do high volume obstetrics as one of your rotations, I don't think that's necessarily the case anymore and I think that assists in steering away new grads. Even the ones choosing to do broad scope rural medicine, are still tending to steer away from things like obstetrics and more towards doing extra training in emerg and extra training in ICU and trauma care and that, I think, has been a disservice to that whole section of care.*'

- [W5-003]

Perceived impact of low delivery volumes on competence and confidence

Low delivery volumes in rural hospitals were perceived as a challenge in maintaining competence and confidence among physicians and nursing staff. Fewer clinical encounters were believed to limit the opportunities for healthcare workers to develop and refine their obstetric skills, diminishing their sense of competence and confidence in providing care.

One participant said:
'So, the lack of deliveries does not lend way to expertise and so people didn't feel skilled enough. It's one thing to do that perfect delivery, and it's another thing to know what to do and feel confident when there's issues and to have everything you need when there are issues.'
- [W1-005]

Another participant noted that:
'I think it (low birth volume) *was definitely an actual factor in competence once our numbers went down. Like once you get down to that many births, as a nurse you can go many months without having a delivery.'*
- [E3-005]

Another participant shared this sentiment:
'They're not getting enough practice and there's not enough babies around for them to do it frequently. We all feel like there are skills that aren't necessarily (where) *they should be or what we want them to be.'*
- [E2-002]

Importantly, the negative impact of low patient volumes on provider competence and confidence was not uniformly felt. Some participants noted that their institutions implemented measures to maintain provider competence in the face of low birth volumes. One participant described:
'While I was there, we saw our numbers dropping. So, we started a practice where we had two physicians at every delivery, for a combination of reasons. One is to maintain everybody's skills, and the second was because things can go sideways in a delivery and the more experienced hands you have, the better your outcomes are going to be.'
- [W5-004]

Another noted that:
'I think sort of having a lower volume of obstetrics, people lost their confidence, and I think our hospital actually did a good job of trying to keep people up-to-date. We would have, you know, obstetrical in-services, obstetrical teaching days.'
- [E2-003]

Resource constraints hinder effort to maintain obstetric competence and confidence

Despite some institutions implementing training programmes to maintain provider competence and confidence, resource constraints hindered initiatives to help sustain competence and confidence. As one participant noted:
'We had no funds to be able to invest in (obstetric) *training.'*
- [E1-001]

This financial strain is compounded by the broad skill sets required in rural settings, making maintaining specific competencies like obstetrics particularly challenging for nurses:
'But it's the budget for making the nursing staff skilled. Yeah, and I think that probably played a role because budgets are tight and, you know, you want to have an emergency skill set for rural nurses. They have to have the skill set to work on the floor, the skill set to work with psychiatric patients, and with demented patients, and also, they delivered chemotherapy, and so there's lots of skill sets to deliver. And maintaining the obstetrics skill set is perhaps, next to emergency, the most complex and the most difficult.'
- [W5-004]

Shortage of health human resources

'We lost a physician, so between the two schedules there were only 3 of us on, we couldn't create a schedule that allowed us to cover both obstetrics and emergency, so we had to place the obstetrical service on hold.'
- [W3-003]

Obstetric programmes heavily rely on the availability of health human resources providing care. Given shortages of those providing obstetrical care, many rural hospitals found it challenging to sustain these programmes, with the burden of care often falling to a small number of healthcare workers. Participants felt these shortages stemmed from declining interest or reluctance among healthcare workers to pursue obstetrics, potentially driven by the perceived higher risks of practising in rural settings and the difficulty of recruiting healthcare professionals to rural communities. Ultimately, the shortage of health human resources was believed to negatively impact the work–life balance of those providing obstetrical care, deterring new providers from incorporating obstetrics into their practice.

Impact of health human resource shortages on the sustainability of rural obstetric care programmes

The lack of human resources often resulted in the burden of obstetrical care falling to a small

number of providers. One participant noted that:

'Because we were short-staffed in our physicians, we had to close some of our programming, and obstetrics was one of them because we didn't have the physicians that practised obstetrics.'

- [W2-002]

This perspective highlights the shortage of healthcare workers providing obstetrical care in northern Ontario's rural communities. Another participant noted that:

'Over the years, it (obstetrics program) *became really heavily dependent on two physicians.'*

- [E2-001]

The reliance on a few individuals created significant vulnerabilities in the sustainability of rural obstetric programmes as departure of key personnel often served as a tipping point, leading to programme closure. As one participant described:

'The retirement of the last physician who was willing to provide those services was the tipping point, and there was nobody else coming in who felt confident enough.'

- [E1-001]

In other cases, the departure of key personnel placed the entire burden of obstetric care on a single individual:

'I think some doctors were interested, whether that be with retirement or moving on. Of course, this leaves the strain of one provider being the sole person, you know, on call and doing the work for obstetrics.'

- [E2-001]

Perceived impact of reluctance to practice obstetrics on the shortage of healthcare workers

The shortage of rural healthcare workers skilled in obstetrics is likely influenced by multiple factors. However, participants suggested that one contributing factor could be a lack of interest or reluctance among new physicians, particularly recent graduates, to include obstetrics in their scope of practice. As one participant noted:

'Zero, there was zero so any new physicians we had over the past ten years had no interest in obstetrics. Not only just new grads, it was just like anybody moving had no interest.'

- [E4-003]

Another participant suggested that:

'While they were in medical school we had a lot of talks, and they were actually excited to get more knowledge about obstetrics and bring obstetrics back in the community because they actually all grew up in (community). *But once they were through their training and saw the risks associated, they realized that it was too risky for patients and babies to be able to do that locally. They didn't feel confident in the risk level.'*

- [E1-001]

This sentiment was echoed by another participant:

'I'm not sure it's a lack of interest. They might have wanted to do it, but the medical legal environment and the lifestyle impact made it less attractive, right?'

- [W1-001]

Challenges of recruiting healthcare workers

The challenge of fewer healthcare workers providing obstetric care is compounded by the difficulties of recruiting healthcare workers to rural areas. One interviewee noted that:

'Ruralness of the community, probably attributed to not having physicians come. It's probably where the difficulty (is) *in recruiting.'*

- [E3-005]

This sentiment was echoed by another participant:

'So, isolation plays a role in recruiting and that's an issue of manpower.'

- [W2-003]

Impact of limited human resources

The lack of human resources in rural settings has significantly impacted the work–life balance of those providing obstetrical care.

'So, physicians don't want to be on call when they're not on call. So not every physician is committed to delivering babies, that was a big burden on the final physician who was doing it because he was always on call 365 days a year.'

- [E1-001]

The demanding lifestyle that results from the limited healthcare was perceived to potentially dissuade new physicians from pursuing rural obstetrics.

'A lot of our older physicians are on call 24/7, and you're the only one with no back-up support for it. I think, as healthcare changed and you have newer

physicians in the younger generation coming in, I don't think they wanted that lifestyle, right? There's not that balance to have someone cover you off, and you're the only one person on call, and there's no support. I think that contributes to people not wanting to come to the community as well because the continuous on-call responsibilities that can be burdensome.'

- [E3-005]

Limited systemic support

'I mean I do think if the government and the ministries were more aware and more public about information from studies where data shows that local access to care improves patient outcomes then that would be helpful to people's understanding of why it's worth keeping rural programs open and that their money is well spent by doing that kind of thing.'

- [W5-003]

Interviews revealed a perceived lack of systemic support from the provincial government and regional tertiary referral centres in sustaining rural obstetric programmes. Participants highlighted challenges related to insufficient government policies and funding. In addition, limited support from tertiary referral centres was noted as a barrier to accessing consultation, training and specialised care.

Perceived lack of support from the Ministry of Health

Participants noted a perceived absence of support from the Ministry of Health. As one participant stated:

'Well, I think I just talked about the lack of a strategy. You know there is no provincial strategy for rural and northern obstetrics.'

- [E4-001]

This sentiment was echoed across various discussions, where interviewees felt the lack of clear support led to an understanding among healthcare workers in small hospitals that the government preferred them to discontinue obstetric services:

'I think most of the small hospitals had the impression that the Ministry wanted us to stop delivering. That was never the written message, but we had that because there was no support in trying to support programs. You know, we felt implicitly that they wanted us to stop doing deliveries.'

- [E1-001]

Others suggested the lack of attention to rural communities perhaps stemmed from a focus on urban centres:

'You know if they took the time to understand the small number of voters that live in rural places, that would be helpful, that's the whole political system isn't geared towards-it's all about volume right so their funding is better spent at a SickKids in Toronto than in a community that's not gonna get them a lot of votes but trying to fix the political system that's a challenge also.'

- [W5-003]

While some participants felt that the Ministry of Health played a role in the closure of their rural obstetrics programme, others were unaware or unsure of the role the provincial government had in the closure of their institution. Other participants acknowledged the challenges faced by their programmes but did not specifically attribute these difficulties to a lack of governmental support.

Lack of relationships and resources that support rural obstetrical services

Participants highlighted significant gaps in support and collaboration that affected the sustainability of their obstetric programme. A recurring theme was the availability of support programmes for other healthcare services, but that were absent for obstetrics. One participant described:

'I wasn't aware of any obstetrical support programs, so when I was scheduling there was an emerg support program, and if I thought our emerg was going to have to close down, I could access a group of people to try and find replacement positions to fill the gaps and keep the emerg open. That doesn't exist, or at the time I was aware of it, it didn't exist for obstetrics. So, at the governmental level that could've been developed.'

- [W2-004]

The importance of fostering relationships with larger, more equipped centres was also emphasised as a way to enhance the capability and confidence of rural healthcare providers, particularly nursing staff:

'I think having a formal relationship with the obstetrical program in a larger centre could have been helpful, because the problem with only one physician, or even two, being the ones that have the knowledge was that– it doesn't help the nurses. So,

from a nursing perspective, they had no one to call, um, from the same discipline to be able to get them all, you know, the feedback or direction they needed.'
- [E1-001]

Further discussions with this participant pointed to the absence of coordinated efforts with tertiary centres:

'There is no coordinated, sort of regional effort in that respect-which, you know, as far as ideas that that's a big gap as well in these rural communities, that there's not usually a formalized relationship.'

DISCUSSION

Through the thematic analysis of interviews conducted with senior hospital administrators, nurses and physicians involved in rural obstetric programmes at the time of their closure, the study sought to understand the factors perceived to contribute to closure of obstetric programmes in rural hospitals of northern Ontario. Our study identified common contributing factors, including a perceived lack of healthcare worker confidence and competence in providing obstetrical care, shortages of health human resources and a lack of systemic support to help sustain rural obstetric programmes. These insights offer perspectives that could guide and inform strategies and approaches to sustain obstetric programmes that remain operational in rural northern Ontario.

Perceived lack of confidence and competence

The perceived lack of competence and confidence among physicians and nurses providing obstetrical care was identified as a contributory factor in the closure of rural obstetric programmes. Participants felt that current undergraduate medical and nursing education, along with residency programmes, provide limited exposure to obstetrics, leading to new graduates being less confident and competent in their obstetric skills and less inclined to practise obstetrics.

Low birth volumes in rural areas were also seen as a factor further contributing to decreased competence and confidence. The infrequency of births resulted in fewer and infrequent opportunities for physicians and nurses to maintain and enhance their obstetric skills.

Some participants cited implementing ongoing training opportunities or ensuring wide involvement when births occurred in the community as a means to maintain healthcare worker competence and confidence. However, others pointed out a lack of resources to support these initiatives, with budgetary constraints cited as significant barriers. In some cases, a lack of interest or reluctance to practise obstetrics compounded the problem, making it challenging to sustain obstetric competence and confidence among healthcare workers.

Addressing the lack of competence and confidence among new medical and nursing graduates may require changes to undergraduate medical and nursing curricula to increase exposure to obstetric care. This could involve more hands-on training and clinical rotations to provide more practical experience.[6,16,17] Integrating these approaches into the medical and nursing curriculum could develop and enhance competence and confidence of new graduates. This, in turn, may increase the likelihood that those who choose to practise in rural areas possess obstetric competency, thereby strengthening the sustainability of obstetric care in the region.

Increasing obstetric CME and training opportunities is another potential solution to improve healthcare worker confidence and competence in providing care.[6,18] However, given the financial and logistical limitations cited by participants, implementing such opportunities locally may be challenging. Therefore, given resource constraints, alternative approaches may be required to build and sustain competence and confidence among healthcare workers. These could include the development of mentorship programmes where experienced obstetricians provide guidance and support to less experienced healthcare workers.[18] In addition, establishing partnerships between rural hospitals and larger, higher-volume centres could provide access to simulation-based learning and opportunities to gain hands-on experience and refine skills by assisting with births.[18] However, the success of such initiatives is dependent upon collaboration between rural hospitals and larger centres in the region.

Shortage of health human resources

Rural northern Ontario has long faced challenges with the recruitment and retention of healthcare workers.[19] Therefore, it is unsurprising that participants perceived the lack of health human resources as contributing to the closure of obstetric

programmes. For some, the lack of healthcare workers in obstetrics led to the closure or temporary suspension of these programmes. For others, the continuation of obstetric programmes fell on a small number of key healthcare personnel, requiring them to take on additional responsibilities and extended on-call periods to keep programmes operational, resulting in an unfavourable work–life balance.

Participants spoke about the challenges of addressing the shortage of healthcare workers. They cited the rurality and isolation of communities as significant barriers to recruiting healthcare workers with obstetric competence. Compounding this issue was the perceived lack of interest or reluctance among new graduates to integrate obstetric care into their practice, thought to be partly due to an aversion to the perceived risks associated with obstetrics and the lifestyle implications of practice.

The isolation of rural northern Ontario communities, coupled with the demanding nature and perceived risks of practising rural obstetrics, adds to the challenge of recruiting and retaining healthcare workers who provide obstetric care. However, studies indicate regionally tailored recruitment and retention strategies can be effective at attracting and retaining healthcare workers.[18] These strategies may include offering targeted incentives such as financial bonuses, housing allowances and competitive salaries.[18,20] Therefore, implementing regional tailored incentives may make rural practice more attractive and enhance recruitment efforts to help ensure that these communities have sufficient health human resource to sustain obstetric care.

To address the reluctance among new graduates to practise obstetrics in rural areas, it may be beneficial to increase exposure to rural obstetric care during their training. This could help mitigate the aversion to perceived risks by building confidence and competence in obstetrics. Furthermore, while the demanding lifestyle associated with obstetrics is challenging to address, increasing the number of healthcare workers through targeted recruitment could help distribute the workload, reducing clinical demands and improving work–life balance.

Limited systemic support for sustaining rural obstetrics

Participants reported varying levels of perceived support for local obstetric services from government agencies and regional care sites. Many identified limited systemic supports as a key factor contributing to the challenges in sustaining obstetric services in rural areas.

Participants' awareness and understanding of the Ontario Ministry of Health's role in the closure of their obstetric programmes varied. Those who perceived a lack of support from the Ministry of Health expressed feelings of abandonment and uncertainty about the future of rural obstetrics in northern Ontario. These perceptions may indicate the need for a government-supported regional strategy focused on sustaining rural obstetric services in the region. Such a strategy could offer clear guidance and establish defined expectations for the role of rural obstetric programmes, creating a clearer vision for the future and fostering a sense of stability and support among healthcare professionals and administrators.

Participants expressed concerns about the lack of resources and supportive relationships essential for sustaining rural obstetrics. They noted that while other areas of medical care had dedicated resources and support programmes, these were absent for obstetrics. In addition, some participants felt that the lack of formal relationships with their tertiary referral centres contributed to a sense of professional isolation, leaving those providing obstetric care without guidance and support. Consequently, establishing more formalised and standardised support mechanisms for rural obstetric programmes may be worth considering. These could include regular training and mentorship opportunities from tertiary centres and the development of a collaborative network that facilitates communication and resource sharing between rural obstetrics programmes and larger centres.

Limitations

Interviews were limited to senior hospital administrative staff, nurses and physicians involved in rural obstetric programmes at the time of closure. We recognise that perspectives from other personnel involved in rural obstetrics such as midwives, support staff and other administrative personnel may have additional insights into factors contributing to programme closure that are not represented in this study.

A potential limitation of this study pertains to the interview questions posed to senior administrative

staff regarding the role of hospital administration in the closure of obstetric programs. The nature of these questions, such as asking why a healthcare service closed, for example, may have led to biased responses that portrayed efforts to sustain the service in a more favourable light. Similarly, questions directed at physicians and nurses about the role of healthcare worker confidence and competence in programme closure could have also resulted in biased responses.

The time between obstetric programme closure and when interviews were conducted may have impacted the accuracy of participants' responses, potentially introducing recall bias. This could result in inaccuracies and an incomplete understanding of the factors contributing to closure.

CONCLUSION

Timely access to obstetric care services is crucial for the health and well-being of pregnant persons and their newborns. However, the closure of these programmes in rural northern Ontario significantly undermines access to care, putting the health and well-being of pregnant persons and their newborns at risk. Understanding the factors contributing to the closure of rural obstetric programmes provides insights that can guide the development of interventions and policies to prevent further attrition of care. By addressing issues such as the lack of healthcare worker competence and confidence, health human resource shortages and limited systemic supports, stakeholders can create and implement strategies to more effectively support and sustain the obstetric programmes that remain operational in rural northern Ontario.

Acknowledgement: The authors wish to acknowledge Lindsay Nutbrown for her assistance in managing data collection.

Financial support and sponsorship: This study was financially supported by the Northern Ontario Academic Medicine Association (NOAMA) 2021 Clinical Innovation Opportunities Fund (C-21-12) and the NOSM U Summer Medical Student Research Award.

Conflicts of interest: There are no conflicts of interest.

REFERENCES

1. Hutten-Czapski P. Decline of obstetrical services in Northern Ontario. Can J Rural Med 1999;4:72-6.
2. 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.
3. Ontario Health Coalition. Toronto: Ontario Health Coalition; c2024. Available from: https://www.ontariohealthcoalition.ca/wp-content/uploads/final-report-hospital-closures-report.pdf. [Last accessed on 2024 Aug 12].
4. Red Lake Margaret Cochenour Memorial Hospital. Red Lake: Red Lake Margaret Cochenour Memorial; c2024. Available from: https://www.redlakehospital.ca/. [Last accessed on 2024 Aug 12].
5. 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.
6. 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.
7. 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.
8. Hoang H, Le Q, Ogden K. Women's maternity care needs and related service models in rural areas: A comprehensive systematic review of qualitative evidence. Women Birth 2014;27:233-41.
9. Kornelsen J, Moola S, Grzybowski S. Does distance matter? Increased induction rates for rural women who have to travel for intrapartum care. J Obstet Gynaecol Can 2009;31:21-7.
10. Nesbitt TS, Connell FA, Hart LG, Rosenblatt RA. Access to obstetric care in rural areas: Effect on birth outcomes. Am J Public Health 1990;80:814-8.
11. Luke S, Hobbs A, Mak S, Der K, Pederson A, Schummers L. Travel time to delivery, antenatal care, and birth outcomes: A population-based cohort of uncomplicated pregnancies in British Columbia, 2012-2019. J Obstet Gynaecol Can 2022;44:886-94.
12. Lisonkova S, Haslam MD, Dahlgren L, Chen I, Synnes AR, Lim KI. Maternal morbidity and perinatal outcomes among women in rural versus urban areas. CMAJ 2016;188:E456-65.
13. Kornelsen J, Khowaja AR, Av-Gay G, Sullivan E, Parajulee A, Dunnebacke M, *et al.* The rural tax: Comprehensive out-of-pocket costs associated with patient travel in British Columbia. BMC Health Serv Res 2021;21:854.
14. Sutherns R, Bourgeault IL. Accessing maternity care in rural Canada: There's more to the story than distance to a doctor. Health Care Women Int 2008;29:863-83.
15. Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psychol 2006;3:77-101.
16. Button BL, Cheu H, Stroink M, Cameron E. Exploring rural medical education: A study of Canadian key informants. Rural Remote Health 2022;22:7061.
17. Alrashidi N, Pasay An E, Alrashedi MS, Alqarni AS, Gonzales F, Bassuni EM, *et al.* Effects of simulation in improving the self-confidence of student nurses in clinical practice: A systematic review. BMC Med Educ 2023;23:815.
18. Kornelsen J, Lin S, Williams K, Skinner T, Ebert S. System interventions to support rural access to maternity care: An analysis of the rural surgical obstetrical networks program. BMC Pregnancy Childbirth 2023;23:621.
19. Pong RW. Strategies to overcome physician shortages in Northern Ontario: A study of policy implementation over 35 years. Hum Resour Health 2008;6:24.
20. Noya F, Carr S, Freeman K, Thompson S, Clifford R, Playford D. Strategies to facilitate improved recruitment, development, and retention of the rural and remote medical workforce: A scoping review. Int J Health Policy Manag 2022;11:2022-37.

ORIGINAL ARTICLE

Rural–urban differences in wait-time to general surgical outpatient care

Sarah Cowan[1], MBChB; Edmund Leung[2], MBChB, MRCS, DMedSci, FRCS, FEBS

[1]Department of Surgery, Taranaki Base Hospital, New Plymouth, New Zealand, [2]Faculty of Medical and Health Sciences, University of Auckland, Auckland, New Zealand

Correspondence to: Edmund Leung, ed.leung@doctors.org.uk

This article has been peer reviewed.

Abstract

Introduction: The Ministry of Health aims to reduce health inequalities with particular reference to geographic and ethnic discrepancy in terms of access to health care. Our study's objectives were to identify if rurality in the region of Taranaki, New Zealand, impacts surgical care provision and to support interventions in order to minimise such inequity.

Methods: Demographic and referral data were collected for each patient referred to general surgery in a 24-month period (n = 2878) allowing allocation of rurality descriptors using both the Statistical Standard for Geographic Areas 2018 (SSGA18) and the Geographic Classification for Health (GCH). Wait-time was defined as the time from referral to the first specialist appointment. Impact of rurality and ethnicity on this wait-time was analysed using a 2-tailed Student's t-test.

Results: As per the GCH, those in urban categories (n = 1927) had a mean wait-time of 81.5 days versus those in rural categories (n = 830) which had a mean wait of 90 days. The rural classification R1 descriptor (n = 491) had a mean wait-time of 95.3 days compared with their urban counterparts of 81.5 days (P = 0.0017). Rural Māori and settler patients faced the longest wait-times with a mean of 101.2 days, especially when compared with urban European Pakeha (or white New Zealander) (P = 0.035). These results were also reflected in the statistical analysis of the median values. Similar results were seen when using the SSGA18 which categorised 1371 patients into large urban areas and these patients had an average wait-time of 79.5 days compared to their small urban (n = 836) (P = 0.052) and rural counterparts (n = 538) (P = 0.0015) who had mean wait-times of 86.2 and 92.5 days, respectively.

Conclusion: Rural patients are experiencing significantly longer wait-times to surgical care than their urban counterparts. This discrepancy is more pronounced in patients from the R1 rural category and in those who are Māori and early settlers. Interventions to improve rural surgical access are needed, for example, specialist clinics in rural areas, better hospital transport services and virtual triaging services.

Keywords: Rural general surgery, rural medicine, rural surgical care provision, rural surgical care provision inequities, wait-times

Résumé

Introduction: Le ministère de la santé vise à réduire les inégalités en matière de santé, en particulier les disparités géographiques et ethniques en termes d'accès aux soins de santé. Les objectifs de notre étude étaient d'identifier si la ruralité dans la

Access this article online

Quick Response Code:

Website: https://journals.lww.com/cjrm

DOI: 10.4103/cjrm.cjrm_12_24

Received: 03-03-2024 **Revised:** 03-11-2024 **Accepted:** 19-11-2024 **Published:** 20-05-2025

How to cite this article: Cowan S, Leung E. Rural–urban differences in wait-time to general surgical outpatient care. Can J Rural Med 2025;30:89-95.

région de Taranaki, en Nouvelle-Zélande, a un impact sur la prestation de soins chirurgicaux et dans le soutien des interventions visant à minimiser cette inégalité.
Méthode: Des données démographiques et de référence ont été recueillies pour chaque patient référé vers la chirurgie générale au cours d'une période de 24 mois (n = 2878), ce qui a permis d'attribuer des descripteurs de ruralité en utilisant à la fois la norme statistique pour les zones géographiques (SSGA18, statistical standard for Geographical areas) et la classification géographique pour la santé (GC, Geographic Classification for Health). Le temps d'attente a été défini comme le temps écoulé entre le moment où le patient est référé et le premier rendez-vous avec un spécialiste. L'impact de la ruralité et de l'ethnicité sur ce temps d'attente a été analysé à l'aide d'un test t-bilatéral.
Résultats: Selon la GCH, les patients des catégories urbaines (n = 1927) avaient un temps d'attente moyen de 81.5 jours, contre 90 jours pour les patients des catégories rurales (n = 830). Le descripteur R1 de la classification rurale (n = 491) avait un temps d'attente moyen de 95.3 jours par rapport à 81.5 jours pour les catégories urbaines (P = 0,0017). Les patients Māori/Colons vivant en milieu rural ont connu les temps d'attente les plus longs, avec une moyenne de 101,2 jours, surtout par rapport aux Pakeha (ou Néo-Zélandais blancs) vivant en milieu urbain (P = 0,035). Ces résultats se reflètent également dans l'analyse statistique des valeurs médianes. Des résultats similaires ont été obtenus en utilisant la SSGA18 qui a classé 1371 patients dans les grandes zones urbaines et ces patients avaient un temps d'attente moyen de 79.5 jours par rapport à leurs homologues des petites zones urbaines (n = 836) (P valeur = 0,052) et des zones rurales (n = 538) (P valeur = 0,0015) qui avaient des temps d'attente moyens de 86.2 et de 92.5 jours, respectivement.
Conclusion: Les patients ruraux ont des temps d'attente pour les soins chirurgicaux significativement plus longs que leurs homologues urbains. Cet écart est plus prononcé chez les patients de la catégorie rurale R1 et chez les Māori et colons. Des mesures sont nécessaires pour améliorer l'accès à la chirurgie en milieu rural, telles que des cliniques spécialisées dans les zones rurales, de meilleurs services de transport hospitalier et des services de triage virtuels.

Mots-clés: Médecine rurale, prestation de soins chirurgicaux en milieu rural, inégalités dans la prestation de soins chirurgicaux en milieu rural, chirurgie générale en milieu rural, temps d'attente

INTRODUCTION

Inequity of healthcare provision in rural areas of Aotearoa, also known as New Zealand, has been widely discussed, and the struggle to identify a true definition of 'rural' in a healthcare context has led to the challenge of accurately assessing the extent to which this inequity exists.[1-3] Therefore, the appropriate interventions to minimise this have been lacking. International literature has demonstrated this inequity in health systems similar to our own.[3-5] The Ministry of Health has stated that providing 'comprehensive, quality services for people living in rural areas is a priority for the government'.[6] This retrospective study looked to investigate the impact that rurality has on elective surgical wait-times in Taranaki Base Hospital and raises interventions which could be implemented to combat this. Despite a complement of strong rural healthcare workers, particularly in south Taranaki, an area with known need, our rural populations are not receiving equitable care from speciality services. This needs to be a focus moving forward, particularly with the opportunity that the national health reform provides.[7]

The primary objective of our study was to determine the difference between the mean and median wait-times (in days) to first specialist clinic appointment for all elective patients referred to surgical services of rural versus urban populations. The secondary endpoints were to identify factors, which impact on these wait-times, such as ethnicity and social deprivation.

METHODS

Study setting

The region of Taranaki has a complex geographical nature,[8] reaching as far north as Mokau and South to Waitootara a 127 km drive from the Base Hospital in the city of New Plymouth. Taranaki has a land mass of 7258 square km with a population of just over 125,000.

This is a large agricultural region with many small rural towns. In general, social deprivation scores are higher in these rural areas and minority

ethnicities, notably Māori and settlers are well represented in these areas.[8,9] Note that this study for rural population was a reference to early settlers including but not limited to the Maori population alone. Settlers include Pacific islanders and early immigrants from Asia. All secondary care services including all general and subspeciality surgery in Taranaki are offered only at the city hospital. General surgical services offered include general surgery, skin lesions, breast and endocrine surgery and colorectal surgery.

Using the coding system from our Health Informatics services, all patients who had been referred from primary care to the general surgical services over a consecutive 24-month period (between 7th November 2019 and 30th November 2021) were identified. Patient demographics, ethnicity, post code, date of referral, date of first specialist appointment (FSA) and type and reason of referral were collated. Rurality allocation was performed using 2 New Zealand geographical classifications; the Statistical Standard for Geographic Areas 2018 (SSGA18) and the Geographical Classification of Health (GCH).[10,11]

Two-tailed Student's *t*-test was used to assess for statistical significance between the mean wait-times for the FSA based on rurality and ethnicity.

Based on patients' post codes, SSGA18 was used to allocate each patient a rurality descriptor of large urban area (30,000–99,999 residents), small urban areas (1000–9999) or rural area (<1000 residents). The SSGA18 also includes other descriptors for larger resident bases. However, these other descriptors are not relevant to any Taranaki areas and this study. A rural area is classified as an area outside urban areas and can be further broken down into rural settlements: <200 residents and 200–1000 residents. For this study, these subgroups of rural settlements are not separated from the 'rural area'. This urban–rural classification is a flat classification in which each area is a single geographical entity with a name and numeric code.[10]

Again, using the domicile codes of each patient, the Geographic Classification for Health (GCH), a novel classification tool produced by University of Otago through a health context lens, was used to allocate rurality descriptors.[11] This classification allocates two urban classifications (U1 and U2): U1 is the largest urban category and encompasses areas of >100,000 within 25-min drive from the nearest secondary care hospital. The classification also included 3 rural classifications (R1, R2 and R3); R3 is the most rural classification with drive times of >90 min with R1, 25–60 min, and R2, 60–90 min.[12,13]

The New Zealand Deprivation Index (NZDEP) scoring system was used to categorise the levels of social deprivation.[14] The type of elective referrals are prioritised as 'immediate' (within 2 weeks), 'urgent' (within 28 days), 'semi-urgent' (within 6 weeks) and 'routine' (within 4 months). Using these data points, the length of wait-time in days to first clinical appointment was calculated.

Ethical approval was obtained using the hospital's local ethics protocols and procedures. Given the unidentifiable pooled nature of data collected for this study, individual patient consent was not required.

RESULTS

A total of 2878 patients were identified as having been electively referred to surgical services. A total of 2758 patients were included in the analysis with 120 patients excluded. Reasons for exclusion were patients whose home address was outside the Taranaki region (n = 66) and those whose first specialist assessment had not occurred at the time of analysis (n = 54).

Of those included in the analysis, 1075 (38.98%) were male and 1683 (61.02%) were female with a mean age of 57.2 years. 411 (14.9%) patients were Māori/settler and 2346 (85.06%) were non-Māori/settler. 538 patients (19.51%), 1223 patients (44.34%) and 997 patients (36.15%) were classed to have low, medium and high NZDEP scores, respectively. The breakdown of referral type was as follows: immediate 373 (13.52%), urgent 689 (24.98%), semi-urgent 805 (29.19%) and routine 890 (23.27%) [Table 1].

The mean wait-time for all patients across all types of referrals in this study was 84.4 days (median = 50, range: 0–533 days). The mean wait-time for Māori/settler patients was 90 days (median = 56, range: 0–533) compared to their non-Māori/settler counterparts which was 83.3 days (median = 49, range: 0–458, P = 0.084). The mean wait-time per referral type is demonstrated in Table 2. Those with low deprivation scores

waited the shortest period with an average of 81.3 days (median = 50, range: 0–417) [Table 3]. Those in medium and high deprivation categories had average wait-times of 84.8 (median = 49, range: 0–533) and 85.4 (median = 50, range: 0–413), respectively [Table 4].

Most patients fell into the large urban classification when using the SSGA18 (n = 1371, 49.95%) or the U2 classification when using GCH (n = 1927, 69.87%). There were 836 patients, who were classed in the small urban category and 538 who fell into the rural settlement category as per the SSGA18. The GCH categorised 491 patients in the R1 category and 339 patients in the R2 category.

Table 1: Patient characteristics

Characteristic	*n* (%)
Sex	
Male	1075 (38.985)
Female	1683 (61.02)
Age (years)	
Mean	57.2
Median	60
Range	1–99
Referral type	
Immediate	373 (13.52)
Urgent	689 (24.98)
Semi-urgent	805 (29.19)
Routine	890 (32.27)
Ethnicity	
Māori/settlers	411 (14.90)
Non-Māori/settlers	2346 (85.06)
Social deprivation	
Low (NZDEP 1–3)	538 (19.51)
Medium (NZDEP4-7)	1223 (44.34)
High (NZDEP 8–9)	997 (36.15)
Rurality (GCH)	
U2	1927 (69.87)
R1	491 (17.80)
R2	339 (12.29)
Rurality (SGA18)	
Large urban	1371 (49.95)
Small urban	836 (30.46)
Rural settlement	538 (19.60)

GCH: Geographic Classification for Health, NZDEP: New Zealand Deprivation Index, SGA: Standard for geographical areas

Table 2: Wait-time data for total population per referral type

Category of referral	Sample (*n*)	Mean (days)	Median	Range
Overall (all)	2758	84.4	50	0–533
Immediate (I)	373	12.8	11	0–121
Urgent (A)	689	26.5	23	0–211
Semi-urgent (B)	805	104.2	99	0–394
Routine (C)	890	141.2	154	0–533

First comparisons were made using the SSGA18 as a marker of rurality. This demonstrated that those from large urban areas and who were non-Māori/settlers had smaller mean and median values than rural settlements with regard to wait-times to surgical appointments (P = 0.0015). There was also a trend of shorter mean and median wait-times for large urban areas versus their small urban counterparts, but the difference was not statistically significant (P = 0.052). Māori/settler patients consistently had a significantly longer wait-time than non-Māori/settler patients in each rural category: Rural areas against large urban areas (P = 0.007) and small urban areas (P = 0.049) [Table 5].

A further comparison was made using the GCH as a marker of rurality. This demonstrated again that patients from rural categories, both R1 and R2, experienced longer mean and median wait-times than their urban counterparts: U2 patients versus those in R1 (P = 0.0017).

This discrepancy was more pronounced for Māori/settler patients across the urban–rural descriptors. There was also a statistically significant longer wait-times when comparing rural Māori/settler (mean = 97.8, median = 59) to urban European Pakeha (mean = 80.7, median = 20) (P = 0.035) [Table 5].

Further to the rurality outcomes, this study appeared to have shown longer wait-times for Māori/settler patients at all levels of social deprivation than European Pakeha patients. However, the difference is not shown to be significant at this sample size [Table 6].

DISCUSSION

Achieving equity in healthcare delivery in Aotearoa, New Zealand, is a priority of the Ministry of Health and the healthcare workforce.[2,7] Those who reside in rural areas have poorer access to healthcare services in New Zealand – this is driven by a complex interplay of environmental and social factors. Although we have an improving rural healthcare workforce, both in terms of human resource and access to resources, improvement in access to specialist services such as surgery is still required.

Table 3: Wait-time data per rurality (Statistical Standard for Geographic Areas 18) and ethnicity				
Group and ethnicity	*n*	Median	Mean	Range
Large urban area total	1371	44	79.54	0–394
Small urban area total	836	50.5	86.23	0–413
Rural settlement total	538	57	92.95	0–533
Large urban area non-Māori/settlers	1205	51.5	78.95	0–394
Small urban area non-Māori/settlers	675	49	85.89	0–378
Rural settlement non-Māori/settlers	457	57	90.61	0–533
Large urban area Māori/settlers	166	51.5	83.79	1–367
Small urban area Māori/settlers	161	56	87.94	2–413
Rural settlement Māori/settlers	81	116	106.15	2–285

Table 4: Wait-time data per rurality (Geographic Classification for Health) and ethnicity				
Group (as per GCH) and ethnicity	*n*	Median	Mean	Range
U2	1927	47	81.53	0–417
R1	491	56	95.28	0–533
R2	339	50	84.74	0–458
U2 non-Māori/settlers	1663	20	80.67	0–417
R1 non-Māori/settlers	411	7	94.13	1–533
R2 non-Māori/settlers	272	28.5	82.83	2–378
U2 Māori/settlers	264	10	86.95	0–367
R1 Māori/settlers	79	32	102.35	2–413
R2 Māori/settlers	67	17	92.48	7–458

GCH: Geographic Classification for Health

Table 5: Wait-time data per New Zealand Deprivation Index score category and ethnicity				
Deprivation and ethnicity	*n*	Median	Mean	Range
Low Māori/settlers	45	76	93	0–287
Middle Māori/settlers	151	58.5	94.57	0–458
High Māori/settlers	214	55	87.32	0–413
Low non-Māori/settlers	493	49	80.3	0–417
Middle non-Māori/settlers	1071	48	83.48	0–533
High non-Māori/settlers	782	49	84.87	0–378

Our study illustrates wait-times for all elective patients referred to the general surgical service in Taranaki.

We have identified a statistically significant difference in the wait-times to FSA experienced by rural patients compared to their urban counterparts. This difference has been shown using 2 different rurality allocation tools. Importantly, this difference is more pronounced for rural Māori/settler patients. This echoes previous studies demonstrating inequity for Māori/settler patients at all levels of healthcare delivery.[15,16]

A further discrepancy exists for patients who are in high social deprivation categories based on the NZDEP who also experience longer wait-times. This result is not unique to New Zealand; Butler *et al*. reported a very similar issue in the United States.[17] There are no comparative studies in developed countries for general surgical services. For GP appointments in rural Australia, rural populations can have an excessive wait-time of 12 weeks to get an appointment compared with their urban counterparts.[18] The subsequent secondary care referrals can only be presumed for much further delays. A longer colorectal cancer pathway is also noted in Victoria, Australia, where rural patients experience 6–85 days longer wait-times for diagnosis and treatment.[19]

Interventions to combat this discrepancy of access could include increasing specialist clinics in the region. Currently, 1 specialist clinic per month is serving a small number of patients well; however, this delivery is disproportionate to the need. The global pandemic has demonstrated the strength and efficacy of telehealth processes, which may be explored in selected cases within rural populations. Surgery is a procedural speciality and thus its full service cannot be delivered at a distance, especially since good clinical examination plays such an important role in our consultations. Since the COVID-19 pandemic, we have vastly increased telephone consultations for follow-ups, freeing more first specialist assessment appointments.

An effective, reliable and efficient hospital transport system may remedy some of the inequitable access to services that has been shown in this study. These interventions provide discussion points for the local surgical department and overall health economics in terms of delayed diagnosis and treatment. Furthermore, there are the unquantifiable emotional, physical and social burdens associated with poorer access to health care.

Table 6: Subgroup analysis and comparisons	
Comparison	*P*
Rurality comparisons utilising the SSGA18	
Large urban area versus small urban area	0.052
Large urban area versus rural settlement	0.0015
Small urban area versus rural settlement	0.15
Rurality comparisons per ethnicity utilising the SSGA18	
Large urban area non-Māori/settlers versus large urban area Māori/settlers	0.46
Large urban area non-Māori/settlers versus rural settlement Māāori/settlers	0.007
Large urban area non-Māori/settlers versus small urban area Māori/settlers	0.181
Small urban area non-Māori/settlers versus rural settlement Māori/settlers	0.049
Small urban area non-Māori/settlers versus small urban area Māori/settlers	0.772
Rural settlement non-Māori/settlers versus rural settlement Māori/settlers	0.138
Rurality comparisons utilising the GCH	
U2 versus R1	0.0017
U2 versus R2	0.49
R1 versus R2	0.073
Rurality comparisons per ethnicity utilising the GCH	
Urban Māori/settlers versus urban European Pakeha	0.234
Rural Māori/settlers versus urban Māori/settlers	0.22
Rural Māori/settlers versus Urban European Pakeha	0.035
Deprivation score comparisons	
Low versus medium	0.388
Medium versus high	0.92
Low versus high	0.49
Deprivation score comparisons per ethnicity	
Low Māori/settlers versus low non-Māori/settlers	0.29
Med Māori/settlers versus med non-Māori/settlers	0.139
High Māori/settlers versus med non-Māori/settlers	0.699
Deprivation score comparisons per rurality	
Low rural versus low non-rural	0.77
Medium rural versus medium non-rural	0.003
High rural versus high non-rural	0.27

SSGA18: Statistical Standard for Geographic Areas 18, GCH: Geographic Classification for Health

Limitations of our study include collection of retrospective data and type II error for the differential sample sizes between categories, especially in the subgroup analysis. Moreover, this study captures only 1 part of a patient's clinical journey from presentation to primary care to FSA. There are other steps in the care pathway, which can contribute further inequities for rural, early settlers and Māori populations. Further research into other aspects of patient experience is warranted in order to appreciate the wider scale of healthcare inequity to rural populations. Finally, this study for rural population was a reference to early settlers rather than the Maori population alone. Therefore, this study is not large enough to truly declare statistically significant differences between those populations.

Our study also reflects the surgical care provision for the region of Taranaki and cannot be extrapolated to represent the care of patients throughout Aotearoa New Zealand. Given the variability in geography and resource provision in other regions, a national collaborative study may provide a better reflection of the wait-times experienced by rural patients across New Zealand for nonacute surgical care.

CONCLUSION

Rural patients are experiencing longer wait-times to surgical care than urban patients in the Taranaki region. This discrepancy is more pronounced in the most rural settlements and in those who are Māori/settlers. These results are in keeping with the known unequal distribution or inadequate

focus of health resource to those living in rural areas. The cause of discrepancies is multifactorial, and the solutions are complex. Interventions to improve access and further funded national research into other areas of inequity should be a priority for the ongoing national health reform.

Financial support and sponsorship: Nil.

Conflicts of interest: There are no conflicts of interest.

REFERENCES

1. Fearnley D, Lawrenson R, Nixon G. Poorly defined: Unknown unknowns in New Zealand Rural Health. N Z Med J 2016;129:77-81.
2. Ministry of Health. Urban-Rural Health Comparisons: Key Results of the 2002/03 New Zealand Health Survey. Wellington: Ministry of Health; 2007.
3. Romanow R, editor. Rural and remote communities. In: Building on Values: The Future of Health Care in Canada – Final Report. Saskatoon: Commission on the Future of Health Care in Canada; 2002. p. 159-69.
4. Australian Institute of Health and Welfare. Australia's Health 2016. Rural and Remote Health. Available from: https://www.aihw.gov.au/getmedia/6d6c9331-5abf-49ca-827b-e1df177ab0d3/ah16-5-11-rural-remote-health.pdf.aspx. [Last accessed on 2023 Feb 22].
5. Eberhardt M, Pamuk E. The importance of place of residence: Examining health in rural and non-rural areas. Am J Public Health 2004;94:4.
6. Rural Health. Ministry of Health NZ; 2022. Available from: https://www.health.govt.nz/our-work/populations/rural-health#. [Last accessed on 2023 Feb 22, Last accessed on 2025 Apr 06].
7. Ministry of Health. Our Health and Disability System; Building a Stronger Health and Disability System that Delivers for all New Zealanders. Wellington: New Zealand Government; 2022.
8. The Taranaki Region. Taranaki Regional Council; 2022. Available from: https://www.trc.govt.nz/council/council-and-region/the-taranaki-region/. [Last accessed on 2025 Apr 06].
9. 2018 Census Place Summaries | Stats NZ; 2022. Available from: https://www.stats.govt.nz/tools/2018-census-place-summaries/taranaki-region. [Last accessed on 2025 Apr 06].
10. Stats NZ Tatauranga Aotearoa. Statistical Standard for Geographic Areas 2018. Wellington: Stats NZ; 2022. p. 14-6.
11. Nixon G, Whitehead J, Davie G, Fearnley D, Crengle S, de Graaf B, *et al*. Developing the geographic classification for health, a rural-urban classification for New Zealand health research and policy: A research protocol. Aust J Rural Health 2021;29:939-46.
12. Whitehead J, Davie G, de Graaf B, Crengle S, Fearnley D, Smith M, *et al*. Defining rural in Aotearoa New Zealand: A novel geographic classification for health purposes. N Z Med J 2022;135:24-40.
13. Rural-Urban Classification for NZ Health Research and Policy, University of Otago, New Zealand; 2022. Available from: https://blogs.otago.ac.nz/rural-urbannz/. [Last accessed on 2025 Apr 06].
14. Socioeconomic Deprivation Data and Stats. Ministry of Health NZ; 2022. Available from: https://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/socioeconomic-deprivation-data-and-stats. [Last accessed on 2025 Apr 06].
15. Hobbs M, Ahuriri-Driscoll A, Marek L, Campbell M, Tomintz M, Kingham S. Reducing health inequity for Māori people in New Zealand. Lancet 2019;394:1613-4.
16. Graham R, Masters-Awatere B. Experiences of Māori of Aotearoa New Zealand's public health system: A systematic review of two decades of published qualitative research. Aust N Z J Public Health 2020;44:193-200.
17. Butler DC, Petterson S, Phillips RL, Bazemore AW. Measures of social deprivation that predict health care access and need within a rational area of primary care service delivery. Health Serv Res 2013;48:539-59.
18. Parliament of Australia. Provision of General Practitioner and Related Primary Health Services to Outer Metropolitan, Rural, and Regional Australians; 2022.
19. Bergin RJ, Emery J, Bollard RC, Falborg AZ, Jensen H, Weller D, *et al*. Rural-urban disparities in time to diagnosis and treatment for colorectal and breast cancer. Cancer Epidemiol Biomarkers Prev 2018;27:1036-46.

The Occasional elbow reduction

Laura Harkness[1], Sabrina Slade[2], Nusha Ramsoondar[2], Tracy L Wilson[3], Sarah M Giles[4,5]

[1]Student, Dalhousie Medical School New Brunswick, Saint John, New Brunswick, [2]Resident, Northern Ontario School of Medicine, [3]Orthopedic Surgeon, Thunder Bay Regional Health Sciences Centre, Thunder Bay, Ontario and Associate Professor of Surgery, Northern Ontario School of Medicine University, Thunder Bay, [4]ER Physician, Lake of the Woods District Hospital, Kenora, Ontario, [5]Assistant Professor of Family Medicine, Northern Ontario School of Medicine University, Thunder Bay, Canada

Correspondence to: Sarah M Giles, sgiles@lwdh.on.ca

This article has been peer reviewed.

INTRODUCTION

Elbow dislocations are the second most common joint dislocation in adult and paediatric populations with a prevalence of 5/100,000.[1] Simple posterior elbow dislocations are the most common and have a good prognosis for recovering full range of motion if treated appropriately.[2,3] Compromise of the neurovascular bundles and missed elbow fractures are highly associated with reduced range of motion, subsequent surgeries and prolonged pain. Thus, physical examination and review of X-rays are critical components in treating elbow dislocations.[4] In rural settings lacking orthopaedic surgery coverage, acute dislocations are commonly treated with closed reduction and temporary stabilisation if surgery is required.

ANATOMY AND PHYSIOLOGY

The elbow is a complex joint consisting of three articulations: radiocapitellar, ulnohumeral and proximal radioulnar joint, providing pivoting motion, flexion/extension and supination/pronation respectively.[5] The elbow is stabilised through bony structures, medial collateral ligament (MCL) and lateral collateral ligament (LCL). The LCL consists of annular ligaments, radial collateral ligament, accessory LCL and lateral ulnar collateral ligament (LUCL) which provide stability to the elbow through a range of motion. The LUCL also provides resistance to varus stress and posterolateral rotatory instability.[5]

The anterior compartment of the elbow contains the brachial artery, median and ulnar nerve while the posterior compartment contains the radial artery and nerve. The brachial artery is responsible for extensive collateral circulation of the arm.[6]

Elbow dislocations are classified by the direction of dislocation, ligamentous injury and concomitant fractures. Simple dislocations have associated ligamentous injury while complex dislocations have an associated fracture. Most elbow dislocations in adults and children are posterior and posterolateral by the mechanism of force applied on an outstretched hand, also known as FOOSH, causing damage to the LUCL and MCL.[2,3,7]

Anterior and divergent elbow dislocations are rare but highly associated with fractures and neurovascular compromise. Fall on a flexed elbow should have a high index of suspicion for an anterior dislocation. In children, Monteggia fractures are the most common type of anterior dislocation with fracture to the proximal ulna and anterior radial

Received: 22-10-2024 **Revised:** 10-11-2024 **Accepted:** 10-11-2024 **Published:** 20-05-2025

How to cite this article: Harkness L, Slade S, Ramsoondar N, Wilson TL, Giles SM. The occasional elbow reduction. Can J Rural Med 2025;30:96-100.

Access this article online

Quick Response Code:

Website: https://journals.lww.com/cjrm

DOI: 10.4103/cjrm.cjrm_68_24

head dislocation.[1] Divergent dislocations are a separation of the proximal radius and ulna by the humerus, most commonly seen in children.[8]

Coronoid, radial head and head and avulsion fractures of the medial and lateral condyles are the most common fractures associated with posterior elbow dislocation in adults.[1,9] The so-called 'terrible triad' is a subtype of elbow dislocation defined by posterior dislocation with LUCL tear, radial head fracture and coronoid tip fracture.[10] Approximately 50% of paediatric elbow dislocations are accompanied by a fracture, most commonly of the medial epicondyle.[3]

DIAGNOSIS

A FOOSH mechanism, high-impact collisions and non-accidental injuries in both adults and children should raise a high index of suspicion for an elbow dislocation.[11] Patients with elbow dislocations commonly present holding their arm in 45° flexion, with forearm shortening and a prominent olecranon.[12] Disruption of the equilateral triangle between the olecranon and distal humeral epicondyles compared to the non-affected side can indicate dislocation.[13] Screen for signs of compartment syndrome of the forearm including tense, tender and swollen tissues, pain out of proportion to injury, and pain not relieved by analgesia, rest or anti-inflammatories.[14] Compartment syndrome is a surgical emergency.

Neurovascular assessment of the affected arm includes radial and ulnar pulses compared bilaterally, capillary refill, motor assessment including finger flexion, extension, abduction, adduction and thumb flexion at interphalangeal with first digit distal interphalangeal flexion and sensation over the medial and lateral palmar hand and dorsum of the hand. Collateral circulation of the forearm can account for peripheral pulses, cap refill and warm pink palms regardless of vascular injury to the elbow. Vascular injury cannot be ruled out with the presence of a pulse but complete ischaemia is infrequent.[11] In children, a pink, pulseless hand is an indication of collateral circulation with disruption to the brachial artery requiring surgical consultation.[11] Damage to the ulnar and median nerves is most common in closed dislocation, also requiring surgical consultation if suspected.[2]

IMAGING

X-rays in anteroposterior and lateral views should be done before attempted reduction for suspected elbow dislocation or undifferentiated elbow injury. X-rays are evaluated for bony cortex, fat pads and alignment via anterior humeral line and radiocapitellar line.

Anterior humeral line

A vertical line drawn from the anterior humerus should intersect the middle third of the capitellum [Figure 1].[15] Deviations from this line can indicate a lateral condyle fracture or dislocation of the radial head as in a Monteggia fracture.[16] In children under the age of 4, the anterior humeral line can intersect with the anterior or middle third of the capitellum [Figure 1].[11]

Radiocapitellar line

Radiocapitellar lines [Figure 1] are drawn horizontally from the radial neck and should intersect with one-third of the ossification centre of the capitellum regardless of the positioning of the elbow or the radiograph being assessed.[17] Radiocapitellar lines are especially useful in the diagnosis of Monteggia fractures [Figure 1].[18]

Fat pad sign

Occult radial head fractures are commonly associated with elbow dislocations but cannot be visualised using X-ray, thus, the fat pad sign can be helpful. The anterior fat pad [Figure 1] is anterior

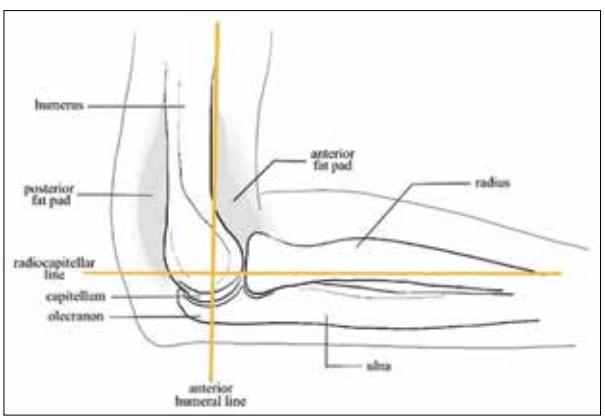

Figure 1: Illustrated anatomy of the elbow in anterior-posterior view. Anterior humeral line. Radiocapitellar line. Anterior and posterior fat pad sign.

to the coronoid and radial fossa in the radiolucent area and can be viewed in a 90° lateral X-ray. The posterior fat pad [Figure 1] lies posterior to the olecranon fossae and is not normally visible on lateral X-ray but can be visualised with flexion of the elbow.[19] Fat pad signs occur because of displacement from the joint capsule. A flailing of the anterior fat pad and visualisation of the posterior fat pad on proper lateral X-rays are indicators of disease within the joint capsule or occult non-displaced fracture.[20] The anterior fat pad sign has a sensitivity of 96%.[19] A posterior fat pad sign has a sensitivity of 87.5% for adults and 75% for paediatrics [Figure 1].[16,19]

Baumann's angle

The Baumann Angle technique is only used for paediatric elbows. Baumann's Angle is the angle between the physeal line of the lateral condyle of the humerus and the line perpendicular to the long axis of the humeral shaft. Normal Baumann's Angle ranges from 9° to 26°. A small Baumann's Angle of <9° is indicative of a paediatric supracondylar humeral fracture.[16,21] Baumann's angle has a sensitivity of 55% and specificity of 80%.[22]

INDICATIONS AND CONTRAINDICATIONS FOR CLOSED REDUCTION

Closed reductions are indicated for acute simple dislocations and recurrent instability after simple dislocation. Immediate closed reduction is also indicated for suspected neurovascular compromise to relieve stretch and impingement of the neurovascular structures.[23] If an elbow cannot be reduced in the ED or is presenting with acute instability after reduction, this suggests entrapment of soft tissue or bone within the joint requiring orthopaedic consultation. Urgent referral to orthopaedics is required for complex fracture dislocations, recurrent elbow instability, irreducible dislocations or continued signs of neurovascular compromise after reduction.

TREATMENT

The goal of a closed reduction in the emergency department is to provide timely relief to the ligaments and joint capsule of the dislocated joint and restore vascular and nerve function if affected.

Treatment of an elbow dislocation should begin with adequate analgesia and sedation. Muscle relaxation is important for this procedure. This requires informed consent, IV access, airway assessment and adequate patient monitors. The most common procedural sedation and analgesia include fentanyl and propofol.[24] Ketamine is commonly used for paediatric sedation.[24,25] If further pain management is required, intra-articular anaesthetic can be used.[1] Reduction can be performed without sedation based on patient preference, but care should be taken to reduce the number of attempts of reduction for patient comfort and risk of chondral injury.[1]

TECHNIQUES FOR CLOSED REDUCTION

Reduction of posterolateral and posteromedial dislocations should first involve correction of the lateral/medial deviation followed by traction-countertraction allowing the olecranon to pass the humeral trochlea anteriorly and distally.[2] Although rare, it is important to note the associated risk of brachial artery injury by closed elbow reduction.[26]

Supine positioning

With the patient in the supine position, several techniques can be used to attempt reduction of the elbow. Two-person traction-countertraction is done by placing the patient's arm flexed by their side [Figure 2]. One provider applies traction to the forearm or upper arm while the other provider applies traction to the distal humerus and slight downward pressure with traction to facilitate reduction. Patient-assisted reduction also can be done from the supine position. The patient lies with the affected arm flexed and towards the opposite shoulder position across the chest, with the elbow pointed upward. Provider will place traction with one hand and counter traction with the other, against the distal humerus while the patient maintains flexion.[1,27]

Prone positioning (modified Stimson technique)

Similar to that of a shoulder reduction, the modified Stimson technique requires the patient to be in the prone position with the affected arm

Figure 2: Single-provider posterior elbow reduction in the prone position.

Figure 3: Positioning for reducing a dislocated elbow.

abducted and placed over the side of the table [Figure 3]. Slow downward pressure is placed on the forearm while countertraction is placed on the distal humerus.[28] Alternatively, slow manipulation of the olecranon until reduction is achieved, with or without the use of an assistant providing traction on the humerus [Figure 2].[29] This process can take 1–10 min of slow manipulation. As it can be difficult to monitor the airway in this position, sedation is contraindicated for this technique.

POSTREDUCTION CARE AND EXAMINATION

Post-reduction range of motion assessment including varus and valgus stress and extension can be performed while the patient is sedated. All simple elbow dislocations will cause damage to the LCL and MCL making the reduced elbow vulnerable to valgus stress specifically.[2] Significant instability to range of motion may signify unstable joints that require further investigation and intervention.[2] Crepitus of the joint during the range of motion may indicate a missed fracture.[13] Post-reduction neurovascular examination and repeat X-rays are used to assess for proper reduction and missed fractures.

The arm is splinted in a posterior long arm splint, with the arm positioned at 90° flexion with slight pronation. Mobilisation of the joint can begin as soon as tolerated, preferably within 1 week of dislocation. While immobilisation provides greater pain relief, early mobilisation has been associated with less extension deficits, greater range of motion and greater fitness for work.[4]

Follow-up X-rays at day 5 and day 14 are recommended to ensure proper reduction and stabilisation of the joint. This is especially important in paediatric and elderly patients.[2]

GUIDELINES AND TIMELINE FOR REFERRAL

Elbows that are stable post-reduction have a good prognosis for recovery.[30] Immediate referral or consultation of orthopaedic surgery is recommended for complex elbow dislocations, unstable elbows post-reduction and suspected neurovascular compromise. The neurovascular compromise includes pink-pulseless hands before or after closed reduction and deficits of the median, radial or ulnar innervation.

Financial support and sponsorship: Nil.

Conflicts of interest: There are no conflicts of interest.

REFERENCES

1. Kuhn MA, Ross G. Acute elbow dislocations. Orthop Clin North Am 2008;39:155-61, v.
2. Cohen MS, Hastings H 2nd. Acute elbow dislocation: Evaluation and management. J Am Acad Orthop Surg 1998;6:15-23.
3. Hyvönen H, Korhonen L, Hannonen J, Serlo W, Sinikumpu JJ. Recent trends in children's elbow dislocation with or without a concomitant fracture. BMC Musculoskelet Disord 2019;20:294.
4. Hackl M, Beyer F, Wegmann K, Leschinger T, Burkhart KJ, Müller LP. The treatment of simple elbow dislocation in adults. Dtsch Arztebl Int 2015;112:311-9.
5. Karbach LE, Elfar J. Elbow instability: Anatomy, biomechanics, diagnostic maneuvers, and testing. J Hand Surg Am 2017;42:118-26.
6. Agur AM, Dalley AF: Grant's Atlas of Anatomy. Vol 138. 2001 Market Street, Philadelphia, PA 19103: Lippincott Williams & Wilkins; 2013.

7. Schnetzke M, Ellwein A, Maier D, Wagner FC, Grützner PA, Guehring T. Injury patterns following simple elbow dislocation: Radiological analysis implies existence of a pure valgus dislocation mechanism. Arch Orthop Trauma Surg 2021;141:1649-57.
8. Mansuripur PK, Deren ME, Lareau CR, Eberson CP. Divergent elbow dislocation and risk of compartment syndrome. R I Med J (2013) 2015;98:25-7.
9. Mühlenfeld N, Frank J, Lustenberger T, Marzi I, Sander AL. Epidemiology and treatment of acute elbow dislocations: Current concept based on primary surgical ligament repair of unstable simple elbow dislocations. Eur J Trauma Emerg Surg 2022;48:629-36.
10. Kani KK, Chew FS. Terrible triad injuries of the elbow. Emerg Radiol 2019;26:341-7.
11. Abzug JM, Russo SA, Pediatric Elbow Fractures: A Clinical Guide to Management. Gewerbestrasse 11, 6330 Cham, Switzerland: Springer Nature; 2018. Available from: https:// link.springer.com/book/10.1007/978-3-319-68004-0. [Last accessed on 2023 Oct 10].
12. Gottlieb M, Schiebout J. Elbow dislocations in the emergency department: A review of reduction techniques. J Emerg Med 2018;54:849-54.
13. Mehta JA, Bain GI. Elbow dislocations in adults and children. Clin Sports Med 2004;23:609-27, ix.
14. Bae DS, Kadiyala RK, Waters PM. Acute compartment syndrome in children: Contemporary diagnosis, treatment, and outcome. J Pediatr Orthop 2001;21:680-8.
15. Rosenwasser MP, Strauch RW, Waters PM. Elbow trauma and reconstruction. Orthop Clin North AM 1999;30:119-32. [doi:10.1016/S0030-5898(05)70056-0].
16. Shrader MW. Pediatric supracondylar fractures and pediatric physeal elbow fractures. Orthop Clin North Am 2008;39:163-71, v.
17. Kunkel S, Cornwall R, Little K, Jain V, Mehlman C, Tamai J. Limitations of the radiocapitellar line for assessment of pediatric elbow radiographs. J Pediatr Orthop 2011;31:628-32.
18. Perron AD, Hersh RE, Brady WJ, Keats TE. Orthopedic pitfalls in the ED: Galeazzi and Monteggia fracture-dislocation. Am J Emerg Med 2001;19:225-8.
19. Blumberg SM, Kunkov S, Crain EF, Goldman HS. The predictive value of a normal radiographic anterior fat pad sign following elbow trauma in children. Pediatr Emerg Care 2011;27:596-600.
20. Goswami GK. The fat pad sign. Radiology 2002;222:419-20.
21. Silva M, Pandarinath R, Farng E, Park S, Caneda C, Fong YJ, *et al*. Inter- and intra-observer reliability of the Baumann angle of the humerus in children with supracondylar humeral fractures. Int Orthop 2010;34:553-7.
22. Miura Y, Shimura H, Fujita K, Nimura A. Understanding the susceptibility to lateral condyle fracture by analyzing unaffected Baumann's angle in children with distal humeral fracture. J Orthop Sci 2022;27:211-4.
23. Burg MD, Napel SC. Chapter 19 Upper Extremity Trauma. In: Pediatric Emergency Medicine. 172-81. Amsterdam, Netheralnds. Elsevier Inc.; 2008. Available from: https://www.semanticscholar.org/paper/Chapter-19—Upper-Extremity-Trauma-Burg-Napel/82d1155a307a23c4e2d4e6878614319600ecf88e. [Last accessed on 2023 Oct 10].
24. Vinson DR, Hoehn CL. Sedation-assisted orthopedic reduction in emergency medicine: The safety and success of a one physician/one nurse model. West J Emerg Med 2013;14:47-54.
25. Salen P, Grossman M, Grossman M, Milazzo A, Stoltzfus J. A comparison of ketamine versus etomidate for procedural sedation for the reduction of large joint dislocations. Int J Crit Illn Inj Sci 2016;6:79-84.
26. Marcheix B, Chaufour X, Ayel J, Hollington L, Mansat P, Barret A, *et al*. Transection of the brachial artery after closed posterior elbow dislocation. J Vasc Surg 2005;42:1230-2.
27. Kumar A, Ahmed M. Closed reduction of posterior dislocation of the elbow: A simple technique. J Orthop Trauma 1999;13:58-9.
28. Parvin RW. Closed reduction of common shoulder and elbow dislocations without anesthesia. AMA Arch Surg 1957;75:972-5.
29. Streitz MJ. How to Reduce a Posterior Elbow Dislocation; 2022. Available from: https://www.merckmanuals.com/en-ca/professional/injuries-poisoning/how-to-reduce-dislocations-and-subluxations/how-to-reduce-a-posterior-elbow-dislocation. [Last accessed on 2023 Sep 22].
30. Josefsson PO, Johnell O, Gentz CF. Long-term sequelae of simple dislocation of the elbow. J Bone Joint Surg Am 1984;66:927-30.

Canadian Journal of Rural Medicine
CJRM CMR
Journal canadien de la médecine rurale

What Works

Rurally focussed undergraduate medical education at the Northern Ontario School of Medicine University

Brian M. Ross, PhD, Sarah Newbery, MD, MEd, Erin Cameron, PhD, Margaret French, MPH

Divisions of Medical, Clinical and Human Sciences, Northern Ontario School of Medicine University, Thunder Bay, Ontario, Canada

Correspondence to: Brian M. Ross, bross@nosm.ca

The Northern Ontario School of Medicine University (NOSM U) was founded on 2 November 2002. Its letters patent explicitly state that the purpose was to establish a medical school that is responsive to the healthcare needs of the people of Northern Ontario. These include three priority areas: those of rural, Indigenous and Francophone residents, all of whom suffer worse health outcomes and healthcare access than the median. Since admitting its charter class in 2005, the MD programme at NOSM U has prepared future physicians for the challenges and rewards of rural and remote medical practice in this sparsely populated region of Ontario. Grounded in a social accountability mandate, the programme emphasises community-engaged learning; students gain hands-on experience through community placements in rural and underserved areas, addressing the specific health needs of these populations. These include a required Indigenous community placement in Year 1, small community placements in Year 2, an 8-month longitudinal integrated clerkship in Year 3 and traditional hospital-based rotations in Year 4.[1] These are complemented by classroom-based teaching and assignments that prepare the learners for rural practice. The curriculum, therefore, integrates interprofessional education and cultural competency, ensuring that graduates are equipped to provide holistic, patient-centred care in resource-limited settings. This immersive approach not only aims to foster clinical excellence but also to cultivate a commitment to serving communities where healthcare disparities are most pronounced.

To help evaluate the success of the educational programmes, the university has 'tracked' its undergraduate (UME) and postgraduate (PGE) trainees into practice to find out where they go and what they do there.[2] For UME, the programme as of the 2022–2023 academic year has graduated 901 Doctors of Medicine, 637 of which are now in independent practice. Of those in independent practice, 321 (51.3%) have set up shop in northern Ontario (the retention rate), with 249 out of the 321 (77.6%) choosing to be family physicians. An overall retention of around 50% compares well with other geographically focussed programmes.[3] However, our detailed analysis showed that approximately half of the graduates choosing to stay in northern Ontario practise in the two largest cities, Thunder Bay and Sudbury.

Received: 28-11-2024 **Revised:** 29-11-2024 **Accepted:** 03-12-2024 **Published:** 20-05-2025

How to cite this article: Ross BM, Newbery S, Cameron E, French M. Rurally focussed undergraduate medical education at the Northern Ontario School of Medicine University. Can J Rural Med 2025;30:101-2.

Access this article online

Quick Response Code:

Website: https://journals.lww.com/cjrm

DOI: 10.4103/cjrm.cjrm_84_24

Using the 2021 Canadian census data,[4] we have calculated the per capita supply of NOSM U graduates to communities of different sizes using the Statistics Canada designations of Census Metropolitan Areas (CMAs, >100,000 population), of which there are two in the region (Thunder Bay and Sudbury), five communities termed Census Agglomerates (CAs, 10,000–100,000 population) and many smaller rural communities that make up the remainder of the region's total population of approximately 790,000 people.[5] In terms of the CMAs, there is one NOSM U graduate in practice per 1825 persons (or 55 graduates/100,000 population), and for the CAs, this is a little lower at one graduate/2226 persons (45 graduates/100,000). For the smaller communities, one graduate is practising per 4440 persons (23 graduates/100,000) which is approximately 41% of the supply rate to CMAs. The UME programme has, therefore, been successful in delivering physicians to smaller and rural communities, but this has occurred at a lower rate than to larger centres.

Statistics alone do not answer the question of whether NOSM U is meeting the physician human workforce needs of the region and, therefore, its own social accountability mandate. Communities in the region are currently recruiting 380 physicians, including 200 family doctors.[6] Seen in this light, we would, therefore, agree with the findings of Hutten-Czapski[7] that it is essential to better align education goals and practice needs. Additionally, more work needs to be done to ensure that practice settings in northern Ontario are attractive to graduates. NOSM U can train learners well, but if the practice environments into which they emerge have no contracts available, or the local care systems are neither attractive nor sustainable, they will not choose to use their rural training for its intended purpose.

Key initiatives at NOSM U are now aiming to improve alignment between education and practice. For example, NOSM U has initiated work on a longitudinal career pathway approach that mentors medical learners into becoming rural generalists all the way from admission to medical school through to postgraduate training – an approach pioneered in Australia.[8,9] There is also a robust rural stream in the family medicine training programme at NOSM U. In addition, NOSM U's longitudinal multicohort impact research study (previously known as the tracking study, now referred to as the Health Education and Workforce Impact Study [HEWIS]) is being used as a critical tool for strengthening data-informed planning, decision-making and evaluation of student progress through to independent practice.[10] HEWIS is part of a holistic evaluation process to determine the success of NOSM U's educational approaches. This is complemented by ongoing studies into the rural and northern pedagogy of early-rural placements intended to spark interest in rural medicine, the 8-month mandatory longitudinal integrated clerkship and the downstream effects of NOSM U's focus on recruitment of students from within the region. The University is also engaging with the artificial intelligence revolution and its potential to expand generalist's scope of practice in the form of the AI-North collaborative network.[11] We shall continue to modify and adapt HEWIS to evaluate the success of these initiatives to better meet the physician workforce needs of the region.

Financial support and sponsorship: Nil.

Conflicts of interest: There are no conflicts of interest.

REFERENCES

1. Ross BM, Cervin C. Northern Ontario School of medicine. Acad Med 2020;95:S588-91.
2. Hogenbirk JC, French MG, Timony PE, Strasser RP, Hunt D, Pong RW. Outcomes of the Northern Ontario School of Medicine's distributed medical education programmes: Protocol for a longitudinal comparative multicohort study. BMJ Open 2015;5:e008246.
3. Rabinowitz HK, Diamond JJ, Markham FW, Wortman JR. Medical school programs to increase the rural physician supply: A systematic review and projected impact of widespread replication. Acad Med 2008;83:235-43.
4. Statistics Canada. Census Profile, 2021 Census of Population; 2023. Available from: https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E [Last access on 2024 Oct 17].
5. Statistics Canada. Census Metropolitan Area (CMA) and Census Agglomeration (CA). 2022. Available from: https://www12.statcan.gc.ca/census-recensement/2021/ref/dict/az/Definition-eng.cfm?ID=geo009. [Last accessed on 2024 Oct 17].
6. Newbery S. Physician Workforce Strategy; 2023. Available from: https://www.nosm.ca/our-community/nosm-physician-workforce-strategy/. [Last accessed on 2024 Oct 17].
7. Hutten-Czapski P. Is Northern Ontario school of medicine there yet? Can J Rural Med 2019;24:103.
8. NOSM U. Rural Generalist Pathway. Available from: https://www.nosm.ca/our-community/nosm-physician-workforce-strategy/rural-generalist-pathway/[Last accessed on 2024 Oct 17].
9. Sen Gupta TK, Manahan DL, Lennox DR, Taylor NL. Comment on: Rural Generalism and the Queensland health pathway – Implications for rural clinical supervisors, placements and rural medical education providers. Rural Remote Health 2013;13:2765.
10. NOSM U. Health Education Workforce Impact Study (HEWIS). Available from: https://www.nosm.ca/research/dr-gilles-arcand-centre-for-health-equity/merlin/physiccian-tracking-studies/. [Last accessed on 2024 Oct 17].
11. NOSM U. AI-NORTH. Available from: https://www.arcandcentre.ca/research/merlin-research-groups/ai-north. [Last accessed on 2024 Oct 17].

MRHA
Mississippi River Health Alliance

Emergency Medicine

Almonte General Hospital

Full Time/ Part Time / Locum

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

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

Qualifications

- ACLS
- NRP (on site certification available)

Contact

Medical Affairs Coordinator Agh.info@mrha.ca

Perth and Smiths Falls District Hospital

Hospitalist Medicine Program

Smiths Falls Site

Full Time / Part Time Opportunities

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

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

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

Practice Profile

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

Remuneration

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

Contact

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

Congratulations recipients!

SRPC'S AWARDS 2025

RURAL SERVICE AWARD

Dr. James Card, Valemount, BC
Dr. Sarah Cook, Yellowknife, NT
Dr. Robin Kennie, Perth, ON
Dr. Roy Kirkpatrick, Huntsville, ON
Dr. Jason Malinowski, Barry's Bay, ON
Dr. Sean Moore, Keewatin, ON
Dr. Laura Noack, Kenora, ON
Dr. Kristy Penner, Crowsnest Pass, AB
Dr. Nicholas Potvin, Clinton, ON
Dr. Nadine Potvin, Clinton, ON
Dr. David Whittaker, Port McNeill, BC

RURAL LONG SERVICE AWARD

Dr. Jane Bishop, Sechelt/Shishalh, BC
Dr. Michael Cotterill, Wawa, ON
Dr. Joshua Greggain, Bowser, BC
Dr. Jim Halvorson, Tahsis, BC
Dr. Sharen Madden, Sioux Lookout, ON

FELLOWSHIP OF RURAL AND REMOTE MEDICINE OF THE SRPC (FRRMS)

Dr. Prean Armogam, Port McNeill, BC
Dr. Jane Bishop, Sechelt/Shishalh, BC
Dr. Norma Charrière, Picton, ON
Dr. Michael Cotterill, Wawa, ON
Dr. Sarah Gower, Elora, ON
Dr. Jim Halvorson, Tahsis, BC
Dr. Jeffrey Patterson, Fredericton, NB

LIFETIME MEMBER AWARDS

Dr. Emmanuel Abara, Richmond Hill/Matheson, ON
Dr. Garth Campbell, Beausejour, MB
Dr. Paul Cano, Grimsby, ON
Dr. Jim Harvorson, Tahsis, BC
Dr. Johann Kuschke, Penticton, BC
Dr. John O'Connor, Edmonton, AB

- **Rural Health Champion Award**
  Mr. Chuck Schmitt, Dryden, ON
- **Rural Community Impact Award**
  Dr. Carolyn Brown, Bancroft, ON
- **Rural Mentorship Award**
  Dr. Frances Kilbertus, Manitoulin Island, ON
- **Rural Specialist Merit Award**
  Dr. Peter Miles, Grande Prairie, AB
- **Rural Leadership Award**
  Inuvik, Regional Hospital (IRH) GP Surgical Team, Inuvik, NT
- **Keith Award**
  Université Laval
- **Rural Medical Education Award**
  University of Manitoba

- **Rural Student Essay Winner**
  Alanna Pullen, Atikokan, ON
- **Rural Resident Essay Winner**
  Dr. Rachel Belanger, Sudbury, ON
- **Rural Student Leadership Award**
  Aria Rezapour, Port Coquitlam, BC
  Tiana Bressan, Sault Ste Marie, ON
- **Rural Resident Leadership Award**
  Dr. Anchaleena Mandal, Sioux Lookout, ON
  Dr. Kapilan Panchendrabose, Lethbridge, AB
- **Student and Resident Research Poster Award**
  Alicia Schulz, Ottawa ON
  Dr. Taylor Jamieson-Datzkiw, Winnipeg, MB

SPECIAL MENTION
STUART IGLESIAS ESS/OSS. BURSARY AWARD - Presented In January 2025

Miss. Jessica Bennett, Wolfville, NS
Miss. Claire Poulin, Atikokan, ON
Dr. Lindey Felske, Lethbridge, ON
Dr. Sarah Hyett, Brantford, ON
Dr. Robert Greidanus, Peace River, AB
Dr. Patrick Laflèche, Inuvik, NT

Visit SRPC.CA/AWARDS-PROGRAM

For award criteria and list of past winners


island health
Join us in
Family Medicine on
Vancouver Island, BC
You're about to find your perfect place.
medicalstaff.islandhealth.ca/careers
Photo: Alberni Valley Tourism Peter O'Hara

NORTHERN HEALTH REGION

HIRING PHYSICIANS FOR NORTHERN MANITOBA

Full time positions available, plus flexible options. APPLY TODAY!

OFFERING SOME OF THE MOST COMPETITIVE PHYSICIAN SALARIES IN MANITOBA

PROFESSIONAL DEVELOPMENT & CONTINUING EDUCATION SUPPORT WORK LIFE BALANCE

Specialists - Thompson & The Pas, Manitoba

- Internal Medicine
- General Surgery
- Obstetrician/Gynecologist

Family Physicians - Multiple Locations

Earning Potential

- Specialists: $479,000 -$513,000+
- Family Physicians: $435,000+
- Retention allowance, on-call stipends, ability to bill fee for service after hours

For more information contact:

physicianrecruiter@nrha.ca

www.nrha.ca

- Visit Health Careers Manitoba
- Select Northern Regional Health Authority to view opportunities