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IN THIS ISSUE

DANS CE NUMÉRO

Resident-led clinics in N. Saskatchewan: A programme evaluation

Frostbite presentation and distribution of care in Ontario

The Occasional Bartholin cyst management



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EDITORIALS / ÉDITORIAUX

- 163 Meaningful rural research — *Peter Hutten-Czapski, MD*
164 Une recherche rurale porteuse de sens — *Peter Hutten-Czapski, MD*

PRESIDENT'S MESSAGE/ MESSAGE DU PRÉSIDENT

- 165 Remembering — *Gavin Gerard Parker, MD*
166 Se souvenir — *Gavin Gerard Parker, MD*

ORIGINAL ARTICLES

- 167 Family medicine resident-led clinics in northern Saskatchewan:
A programme evaluation — *Jessica Froeblich, MD, CCFP, Kristi Galloway, MD, CCFP, Daniel Ferguson, MD, CCFP, Udoka Okpalauwaekwe, MBBS, Vivian Rose Ramsden, RN, PhD, MCFP (Hon.), FCAHS, Rhonda Bryce, MD, Jeffrey David C. Irvine, MPH, MD, CCFP*
174 Understanding frostbite presentation and distribution of care in
Ontario 2010–2018 — *Yousuf Ahmed, MD, Malcolm Davidson, BScH, MD, Alex Poole, MD FRCSC FACS, Josianne Gauthier, B.Sc. Pharm, M.Sc. Pharm, Sarvesh Logsetty, MD, FRCPS, Ian Macnair, PhD, MD, Lisa Allen, PhD, Haley Golding, M.Sc., Caitlin Champion, MD, M.Sc., FRCSC, Assistant Professor*
182 Can implementation of *in situ* simulation support rural emergency
provider self-confidence and improve patient safety? A mixed-methods
study — *Sebastian Diebel, MD, Aidan Wharton, MD, Pascale King, MD, Michelle Parker, BScN*

CASE REPORT

- 189 Fournier's gangrene in remote Northern Ontario, Canada: A rare but
critical condition — *Hailey Land, RN, BScN, Sierra A. Land, RN, BScN, Steven Chen, MDCM, CCFP*

THE OCCASIONAL

- 192 The Occasional Bartholin cyst management — *Jenna Cross, Carmen Solty, MD, Sarah Giles, MD*

ERRATUM

- 196 Erratum: Recharged/Réénergisé



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*From the 'I See Mountains'
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Meaningful rural research

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We try to publish meaningful research. It must be rural of course to be meaningful to us. It should be new. We want something that would be practical for our readers and the populations we serve.

Rural is a surprisingly difficult concept to pin down. The SRPC hasn't adopted a definition. In Canada, a convenience definition of rural is areas outside those defined by Statistics Canada as urban, i.e. rural as under 10,000 population.¹ The Australian Bureau of Statistics has adopted the Accessibility/Remoteness Index of Australia (ARIA+). ARIA+ is a system that measures the remoteness of a location based on its accessibility to services, using population size as a proxy for service availability.² What is gained in precision of definition can be a loss in clarity. Communities in the largest rural 'Inner Regional' band of that system include those approximately 20,000 or more in population. Regardless of what any given paper uses as 'rural' the CJRM looks for papers about communities where the care is predominantly provided by medical generalists.

A rural origin is not always enough. You could have a case report on a patient seen at a rural setting, but unless the paper describes how the setting affects the presentation and outcomes of the case, it's not really a rural case report from the editorial perspective.

New is also a difficult concept. On one hand, every paper is new and

unique. The authors certainly think so! Whether a paper is novel comes down to the findings. How does this paper build on the literature? Are the findings new? Finally, and perhaps, the most subtle question is: Do the findings have the potential to make a significant and noticeable difference?

Not all papers have to be practical; that would preclude many fundamental areas of rural medical knowledge for which there is little that is understood. However, practical is a particular interest of mine as that makes it meaningful to the reader. Practical is why we have been running the 'Occasional' series of procedures for three decades now. Practicality also ties into the idea of the findings making a novel difference that is meaningful.

Ultimately, there are various concepts with fuzzy edges that make up the editorial decision to publish at the CJRM. It's an arbitrary process, buffered by peer review, but ultimately the scientific editor's decision. We get about 100 papers yearly to review and about a quarter make it into these pages.

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Une recherche murale porteuse de sens

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Nous cherchons à publier des travaux de recherche qui soient réellement porteurs de sens. Pour nous, cela suppose avant tout qu'ils soient ancrés dans la réalité rurale. Ils doivent aussi apporter du nouveau. Nous privilégions des articles qui soient utiles de façon concrète pour nos lecteurs et pour les populations que nous desservons.

Définir ce qu'est le « rural » n'est pas si simple. La SMRC n'a pas adopté de définition officielle. Au Canada, on utilise souvent par commodité la définition de Statistique Canada: Les régions situées à l'extérieur des zones dites urbaines, c'est-à-dire les localités de moins de 10 000 habitants.¹ L'Australian Bureau of Statistics, pour sa part, a choisi l'ARIA+, un système qui évalue l'éloignement d'une localité en fonction de son accessibilité aux services, en utilisant la taille de la population comme indicateur indirect de la disponibilité des soins.² Ce que l'on gagne en précision peut toutefois SE perdre en clarté: par exemple, certaines communautés de plus de 20 000 habitants sont classées dans la catégorie « Inner Regional », pourtant considérée comme rurale. Quoi qu'il en soit, à la JCRM, nous cherchons avant tout des articles sur des communautés où les soins sont principalement prodigués par des omnipraticiens.

L'origine rurale d'un article n'est pas toujours suffisante. On peut très bien publier une observation clinique issue d'un milieu rural, mais si l'article ne décrit pas comment ce contexte influence la présentation ou les résultats du cas, ce n'est pas, d'un point de vue éditorial, un véritable cas rural.

La nouveauté, elle aussi, est un concept difficile à cerner. D'une certaine

façon, chaque article est nouveau et unique. Les auteurs en sont d'ailleurs convaincus! Mais la question de la nouveauté réside dans les résultats: En quoi cet article fait-il progresser les connaissances? Les constats sont-ils véritablement inédits? Enfin — et c'est peut-être l'aspect le plus subtil — ces résultats ont-ils le potentiel de provoquer un changement notable et significatif?

Tous les articles n'ont pas besoin d'être pratiques. Autrement, nous écarterions des domaines fondamentaux de la médecine rurale où il reste encore beaucoup à comprendre. Mais l'aspect pratique retient particulièrement notre attention, car il rend la lecture plus significative pour nos abonnés. C'est d'ailleurs dans cet esprit que nous publions depuis des décennies la série « Occasionnel » consacrée aux procédures. Le caractère pratique rejoint aussi l'idée d'une nouveauté utile, porteuse de changements concrets.

En fin de compte, plusieurs concepts aux contours flous SE combinent pour guider les décisions éditoriales de la JCRM. Le processus reste arbitraire, enrichi par l'évaluation par les pairs, mais repose ultimement sur le jugement du rédacteur scientifique. Nous recevons environ une centaine de manuscrits par année, dont le quart environ trouve sa place dans nos pages.

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Remembering

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Rural generalists come from some amazing backgrounds and are united by a desire to serve their communities in the most fulsome way possible. We work in clinic, hospital, long-term care and other outpatient settings, often working in all these environments in a single day. Your dedication to your communities makes it possible for families to grow, for industries to operate and for learning to occur.

Most of us have fond memories of the first time we delivered a baby, casted a fracture or gave bad news to a patient in a rural community. What we often remember most is the mentorship we had from our early rural mentors and heroes. One of my earliest heroes was Dr. Jill Konkin.

As many of you know, Jill passed away recently. Jill was a giant of rural medicine and her fierce commitment to rural medical education and rural Canadians was unmatched. Jill was a former SRPC president, heavily involved in the formation of the Northern Ontario School of Medicine and helped establish many structures that support distributed medical education in this country and beyond. The SRPC had an opportunity to profile Jill as part of our "Trailblazing Women in Rural Medicine" video series¹ and I would encourage all of you to watch this video, even if you have seen it before.

Jill didn't want to be limited by specialty medicine and desired a career

with as complete a scope of medical care as possible for the patients she served. She found a way to stay connected outside of work and made a priority to spend time with family and friends, all while juggling a difficult clinical load. She encouraged many to find a way to grab onto opportunities as you never know where they might take you. She reminded us to build networks and get to know people. She built teams with people who shared her perspective and also found people to be on her team who saw things from a different perspective than she did. Jill taught us a lot about clinical courage, and I believe that trait is something for which she will be most remembered.

I did have an opportunity to speak with Jill at our last Rural and Remote Medicine conference and confided in her how anxious I was about my new role in the organisation, especially considering those who had preceded me. She calmly assuaged my worries and told me, "it will be what it is meant to be". I am very lucky to have had her in my life and told her exactly that the last time we spoke. If you still have the chance to thank one of your heroes, please do so.

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Se souvenir

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Les omnipraticiens en milieu rural viennent d'horizons remarquables et sont unis par le désir de servir leur communauté de la façon la plus complète possible. Nous travaillons en clinique, à l'hôpital, en soins de longue durée et dans d'autres contextes ambulatoires — souvent dans tous ces milieux en une seule journée. Votre dévouement rend possible la croissance des familles, le fonctionnement des industries et la transmission des savoirs.

La plupart d'entre nous gardent des souvenirs marquants, de la première fois où nous avons accouché une patiente, plâtré une fracture ou annoncé une mauvaise nouvelle à un patient dans une communauté rurale. Mais ce dont nous nous souvenons le plus souvent, c'est du mentorat reçu de nos premiers modèles et héros en médecine rurale. L'un des miens a été Dre Jill Konkin.

Comme plusieurs le savent, Jill est décédée récemment. Elle a été une véritable figure de proue de la médecine rurale, et son engagement indéfectible envers la formation médicale rurale et les Canadiens des régions éloignées était inégalé. Ancienne présidente de la SMRC, elle a joué un rôle clé dans la création de la Northern Ontario School of Medicine et a contribué à mettre en place de nombreuses structures soutenant la formation médicale distribuée au pays et ailleurs. La SMRC a eu l'occasion de dresser son portrait dans le cadre de la série vidéo¹ *«Femmes pionnières en médecine rurale»*, et je vous encourage à

visionner cette capsule, même si vous l'avez déjà vue.

Jill refusait d'être limitée par la médecine spécialisée et a choisi une carrière au champ d'exercice aussi large que possible afin de répondre aux besoins de ses patients. Elle savait préserver un équilibre en dehors du travail, en consacrant du temps à sa famille et à ses amis, tout en assumant une charge clinique exigeante. Elle a encouragé plusieurs d'entre nous à saisir les occasions, car on ne sait jamais où elles peuvent mener. Elle nous rappelait l'importance de tisser des réseaux et de faire connaissance avec les gens. Elle a bâti des équipes avec des personnes qui partageaient sa vision, mais aussi avec d'autres qui voyaient les choses autrement. Jill nous a beaucoup appris sur le courage clinique, et je crois que c'est l'une des qualités pour lesquelles elle restera le plus marquée dans nos mémoires.

J'ai eu la chance de parler à Jill lors de notre dernière conférence sur la médecine rurale et éloignée. Je lui ai confié à quel point j'étais anxieux face à mon nouveau rôle dans l'organisation, surtout en pensant à celles et ceux qui m'avaient précédé. Elle a calmement apaisé mes inquiétudes en me disant: *«ça sera ce que ça sera»*. J'ai eu la chance de l'avoir dans ma vie et j'ai eu la chance de lui dire la dernière fois que nous nous sommes parlé. Si vous avez encore l'occasion de remercier l'un de vos héros, faites-le.

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Family medicine resident-led clinics in northern Saskatchewan: A programme evaluation

Abstract

Introduction: Family medicine residents at the University of Saskatchewan's La Ronge Family Medicine Residency Training Programme provide resident-led clinics, based on community-identified needs, to serve patients who might experience barriers to care. Learners are challenged to advance their independent clinical decision-making while gaining experience providing culturally informed and sensitive care. This study aimed to determine how the La Ronge resident-led clinics could be further optimised for both resident training and healthcare delivery. **Methods:** We interviewed La Ronge Residency Training Programme graduates over the past 6 years (2018–2023). Interviews were conversational, with a semi-structured guide. Questions inquired about the impact the clinics had on participants, benefits, drawbacks and suggestions for change. Following the interviews, an inductive, reflective, thematic analysis was undertaken.

Results: Response rate was 100% ($n = 15$). Six themes emerged: building skills for practice with distant supervision; overcoming barriers and resource limitations; awareness of inequities; building culturally respectful relationships; optimising clinic utilisation; and ways of implementing change. Participants felt resident-led clinics encouraged their growth like no other opportunity in the Residency Training Programme. The level of independence in resident-led clinics came with a trade-off in supervision, as there was a desire to balance these aspects.

Conclusions: Resident-led clinics promoted professional and personal development. Additional community collaboration, along with optimising clinic utilisation, such as improved translational and booking services, could benefit patients, communities and residents.

Keywords: Community medicine, health services, Indigenous, internship and residency, rural health

Résumé

Introduction: Les résidents en médecine familiale du programme de résidence en médecine familiale de La Ronge, de l'Université de la Saskatchewan, offrent des cliniques dirigées par des résidents, en fonction des besoins identifiés par la communauté, afin de servir les patients qui pourraient rencontrer des obstacles à

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l'accès aux soins. Les apprenants sont appelés à développer leur autonomie dans la prise de décisions cliniques tout en acquérant de l'expérience dans la prestation de soins culturellement adaptés et sensibles. Cette étude avait pour objectif de déterminer comment les cliniques dirigées par les résidents de La Ronge pourraient être encore mieux optimisées, tant pour la formation des résidents que pour l'amélioration de l'offre de soins.

Méthodes: Nous avons interviewé les diplômés du programme de résidence en médecine familiale de La Ronge au cours des six dernières années (2018-2023). Les entretiens se sont déroulés sous forme de conversations guidées de manière semi-structurée. Les questions portaient sur l'impact des cliniques dirigées par les résidents, les avantages et les inconvénients perçus, ainsi que sur les suggestions d'amélioration. À la suite des entretiens, une analyse thématique inductive et réflexive a été réalisée.

Résultats: Le taux de réponse a été de 100% (n = 15). Six thèmes se sont dégagés: le développement des compétences cliniques avec une supervision à distance; le dépassement des obstacles et des limites en ressources; la prise de conscience des inégalités; l'établissement de relations respectueuses sur le plan culturel; l'optimisation de l'utilisation des cliniques; et les façons de mettre en œuvre des changements. Les participants ont estimé que les cliniques dirigées par les résidents avaient favorisé leur croissance professionnelle d'une manière unique dans le cadre du programme de résidence. Le degré d'indépendance associé à ces cliniques s'accompagnait toutefois d'un compromis au niveau de la supervision, certains exprimant le besoin de trouver un meilleur équilibre entre ces deux dimensions.

Conclusions: Les cliniques dirigées par les résidents ont contribué à leur développement professionnel et personnel. Un renforcement de la collaboration communautaire, jumelé à une optimisation de l'utilisation des cliniques — par exemple, grâce à de meilleurs services de traduction et de prise de rendez-vous — pourrait profiter aux patients, aux communautés et aux résidents.

Mots-clés: Internat et résidence; médecine communautaire; santé rurale; services de santé, autochtones

INTRODUCTION

While Canada struggles with a lack of primary care providers, rural and remote communities are particularly challenged in meeting this need. Nineteen percent of Canadians live rurally, with 12% of the Canadian population living in moderately-, more-, or most-remote municipalities.¹ However, very few specialists and only 14% of family physicians practise in rural and remote settings.² Consequently, medical educators and researchers have made great efforts to identify factors that support the entry and retention of both medical learners and established physicians in rural and remote practices. Amongst these influences, long-term, immersive training experiences and community integration have been recognised as impacting the willingness of family physicians to remain in these communities.³⁻⁷ Rural family practice additionally requires a particularly broad skill set, coupled with 'clinical courage' to manage presentations that, at times, may be at the margins of physician confidence.⁸ As such, it is important that all of these elements be introduced in rural and remote Family Medicine Residency Training Sites. One educational avenue offering an opportunity to

do so is that of community-based, resident-led primary care clinics.

Since the establishment of the University of Saskatchewan's La Ronge Family Medicine Residency Training Programme in 2012, family medicine residents have been providing medical care in network agencies, high schools and Lac La Ronge Indian Band First Nation communities through resident-led clinics. The initiative was born out of community-identified needs for bringing healthcare services directly to the community, as remote Indigenous communities often face disproportionate barriers to health and well-being due to the interaction of social and structural determinants of health.⁹⁻¹³ The resident-led clinics serve the intention to bridge the gap by having medical residents travel to various community settings to offer primary care to patients who otherwise might experience significant barriers to accessing health care. These settings include community clinics, private homes, shelters, high schools and outreach centres, hosted in three remote First Nation communities of the Lac La Ronge Indian Band. One or two learners travel to each community at a time, accompanied by the local community health nurse. Resident physicians are supported by a supervising

physician remotely, who is available by phone if time-sensitive questions arise. All clinic visit notes entered into the electronic medical record are reviewed by the supervising physician. This parallels the expectations and standards held for resident clinic visits even if the supervisor was on-site.

The CanMEDS-FM Indigenous Health Supplement discusses the importance of physicians practising in a relationship-based manner, developing an understanding of the influence of colonisation, demonstrating role flexibility and practising self-reflection to understand one's biases.¹⁴ Resident-led clinics seek to instill this and were created to facilitate the opportunity for residents to work with Indigenous patients and communities providing culturally safe care. However, a formal evaluation has never been conducted to assess how well the programme supports residents in developing independent clinical decision-making skills and delivering culturally informed, sensitive care. In understanding past resident experiences, we aimed to optimise healthcare services and training opportunities provided in these clinics. As such, our objective was to determine the impact that participation in resident-led clinics has had on learners at the La Ronge Family Medicine Residency Training Programme.

METHODS

Our study originated from conversations between members of the Lac La Ronge Indian Band Health Services Department and the resident researchers, with a desire by the First Nation to receive more insight into the healthcare needs of their outpost community members. In discussions around that goal, it was thought that the perspective from the side of the medical resident as a quality improvement initiative would also be important. The strong partnership between the First Nation and the family medicine residency programme has been developed over many years of respectful interagency coordination, with research collaborations ensuring cultural safety and self-determination. Leadership from Lac La Ronge Indian Band Health Services has approved the final report for dissemination in this journal.

The project design was deemed exempt from ethical review by the University of

Saskatchewan Research Ethics Board (ID E473) as a quality improvement study, as covered by the TCPS2 (2022).¹⁵

Names and E-mail addresses of the 6 most recent years (2018–2023) of graduates from the La Ronge Residency Training Programme were provided by the programme. Recorded virtual discussions were offered to the graduates. Interviews took place between fall of 2023 and spring of 2024. The interviewers were current family medicine residents at the La Ronge Site of the Family Medicine Residency Training Programme. Interviews were conducted in a conversational manner with a semistructured interview guide. Open-ended questions inquired about the impact the clinics had on participants, benefits and drawbacks of these resident-led clinics, and any suggestions for change. Other topics were probed as they evolved during the interview. Since the resident interviewers were themselves currently participating in the resident-led clinics, researcher reflexivity was used not only to modify the interview as needed, but it also encouraged the interviewer to reflect on what positive characteristics they could bring to the interview.¹⁶ Some participants may have had professional relationships with the interviewers, in the form of current faculty advisors and supervisors. As such, rigor was improved by member checking during data collection, and keeping an audit trail throughout the analysis. Interviews were transcribed using the Zoom Video Communications, Inc. transcription service. Transcriptions and audio data files were reviewed (by JF, KG, DF) to ensure accuracy, and identifying information was removed to improve confidentiality.

Braun and Clarke's framework was used to facilitate a reflective thematic analysis of the de-identified transcribed data.^{17,18} This method allowed researchers to draw upon their own experiences and pre-existing knowledge, as well as critically interrogate how these aspects influenced and contributed to the research process and insights. Each transcript was coded twice into key topics by independent reviewers. Coded data were then reviewed jointly by the researchers (JF, KG, DF) identifying and interpreting unifying themes from topics with shared meaning and concepts. These themes underwent multiple iterations to ensure meaningful connections to the original

data. Quotes were chosen to represent key ideas across multiple interviews. All participants had approved, during their interview, any potential de-identified use of their words for this means.

RESULTS

All 15 previous residents in the La Ronge Family Medicine programme agreed to participate in an interview. Respondents were all Canadian citizens, originally from communities ranging from remote to metropolitan across 5 provinces before entering residency. Six themes evolved from the participant interviews: building skills for practice with distant supervision; overcoming barriers and resource limitations; awareness of inequities; building culturally respectful relationships; optimising clinic utilisation; and ways of implementing change.

Theme 1: Building skills for practice with distant supervision

'If you're just physically removed from the preceptor by a hundred kilometers or so, it's easier to just take that extra breath. In those extra minutes you recognize that there's actually not an emergency, but just a difficulty in front of you, and begin to solve it on your own. That's just a tremendously important exercise'.

Remote supervision facilitated relevant personal and professional development for the residents. By providing residents with the autonomy to make decisions while safely managing uncertainty, the programme fostered growth that was distinct and significantly profound for the participants. Compared to other aspects of the residency training programme, participants reported that this experience enhanced their skills in history taking, conducting thorough physical exams, formulating improved differential diagnoses and developing specific patient plans across various patient settings. In addition, it contributed to an increased sense of responsibility, accountability and a general sense of connection to the community. However, the trade-off was fewer opportunities for direct and immediate feedback from an attending physician, requiring a balance between the learning advantages of autonomy versus supervision.

'It's such a tricky balance because part of the benefit and opportunity for growth and learning as a

practitioner is the independence that you're given. But obviously it needs to be balanced with mentorship and feeling supported'.

Theme 2: Overcoming barriers and resource limitations

'I remember one gentleman (...) he just wouldn't have gotten medical care if we weren't there. And that was the case for Elders, like the home care patients who were you know, in the last stages of their lives. Like we palliated people through our resident clinic'.

Participants believed that resident-led clinics decreased barriers to care, which fortified the learner's drive to continue providing this service. The clinics also facilitated the identification of resource gaps in remote areas, including the lack of medical supplies, inadequate translation services and limited technology.

'We always had somebody to translate but it was usually family members, or one of the staff folks at the clinic... We always had somebody to translate but the appropriateness of the translators wasn't great'.

Theme 3: Awareness of inequities

'...the resident-led clinics are unforgettable mostly because of home visits. You see how people live. You see what the social inequities are doing to whole communities. You see the impact of long-standing trauma and inequality, live. You see people's homes (...) and you see what medical comorbidities arise from a kind of social economic standing'.

Visiting the communities allowed participants to witness and encounter patients' social determinants of health, especially during the home visits. It was one thing to read about non-medical factors that influenced health outcomes, but something else completely to see how it affects daily lives. Reflecting on these led participants to confront their personal privilege.

'If I didn't do those home visits... I wouldn't even know what the... housing is like out there'.

'...makes you have a reality check of your privilege and the privilege that other places have when it comes to health care access and just like living circumstances'.

Theme 4: Building culturally respectful relationships

'...some of the biggest growth in residency was sitting

down with someone in their house, seeing their traditional medicine, or gaining a better sense of how they understand their own health'.

Participants identified that resident-led clinics provided an avenue to build trust and meaningful relationships. This was not only between the learners and patients, but also in the provision of a connection between learners, communities and traditional medical systems. Many participants identified this as being invaluable.

'...there was a relationship made there, because we were able to talk about other things that mattered first, and she was able to sense that she wasn't going to get shamed. The whole thing is about building a better relationship and trying to have more trust between the community and the medical establishment'.

Theme 5: Optimising clinic utilisation

'...if ever there was a reason to sacrifice volume as an opportunity cost it would be for something like that. You know, to get 10 [regular] clinic visits are probably worth two or three home visits where you get not just an opportunity to care for somebody who might not otherwise receive care but also just to have this little glimpse of what life ... in a house with 12 people in it and 2 bedrooms is like'.

Patient scheduling was identified as being particularly difficult in remote clinics, with poor road conditions, home visits, complex medical conditions and limited cell phone service to contact patients. It was identified that slightly lower patient volumes were preferable in these settings to provide beneficial learning experiences. There was no formalised booking process, which participants suggested could be created and optimised. This would depend on community input for their needs and preferences as to how this could best be achieved.

'To me that was not an area where I would have wanted to specifically push myself efficiency wise. It was more about gaining independence and confidence'.

Theme 6: Ways of implementing change

'It would be very nice to get the opinions of patients and staff in the communities. We're just kinda guessing their needs currently'.

Woven throughout the interviews were examples of resident-driven change initiatives that supported the clinics. This included family

medicine residents starting to offer phlebotomy in the communities, instead of asking community members to travel an hour or more to the local health centre laboratory. Learners were also able to advocate for nursing support in the communities, and for the initiation of a new clinic location. Participants expressed the desire for future changes to be more in collaboration with patients and community members, as it was felt that the ideas from the community had not yet been heard.

'If there's a better way to do it, it should be directed by the community and the people accessing the clinics'.

DISCUSSION

Resident-led clinics provided valuable professional and personal development, according to the study participants. They allowed for an environment to build independence, resourcefulness and a deeper sense of accountability to patients. This may lead to an easier transition to practice, a time often filled with uncertainty, high learning curves and increased risk of burnout in rural family medicine.^{19,20} The unique clinic environments provided exposure to peoples that were not inherent in the residency training programme otherwise and allowed for exploration of career interests. Many studies identify rural training and exposure as an important factor associated with residents entering rural practice.^{21,22} As per the World Health Organization, in rural training programmes, 'it is necessary to understand rural communities, their health service needs and the nature of rural practice'.²³ Resident-led clinics such as the one described in this study provided this desired insight.

A key component of residency training is feedback and mentorship. Face-to-face teaching time is affected by the distant supervision in this element of the training programme. This, however, does not necessarily reduce the effectiveness of the teaching, nor the safety of the patient interactions.^{24,25} In the residency training programme, the supervisor role of the resident-led clinics was previously the responsibility of a sole physician. This has recently changed. This sole physician is no longer supervising outpost clinics and has instead seen the need for multiple other local faculty members to be involved. Now each individual resident has a separate supervisor,

allowing supervisors more time to teach as they are only responsible for one learner. This change happened after the participant interviews, so it is hoped this will address some of the drawbacks of the resident-led clinics that were identified. Perspectives previously described by remote supervisors providing primary care residency training in Australia and Canada have indicated the unique supervisor-resident relationships that facilitate effective longitudinal distance mentoring.²⁶

Providing resident-led clinics decreases barriers involved in patients accessing care. Meeting patients in their home and community environments provides a more holistic sense of their context. This allows for relationship building and experiential learning by the family medicine residents about cultural practices, belief systems, patient homes and family contexts that affect medical outcomes. As over 80% of one's modifiable contributors to health are determined by their social determinants of health,²⁷ this collaboration as a teaching tool can help prepare learners to address these needs as they go into practice. It also encourages family medicine residents to reflect on their own personal perspectives and biases, as a form of behavioural change technique^{28,29} to evoke empathy, respect, humility and broadened outlook on life.

In general, there is limited published literature with which to compare our results. The positive experiences described by the participants align with results from other school-based resident-led clinics from the literature,³⁰ although evidence of longitudinal residency training programmes using non-school-based resident-led clinics is minimal. Student-led clinics have been in existence for decades and offer medical students a degree of independent patient interaction, but supervisors generally are in close proximity.³¹ Although greater preceptor distancing might be expected as post-graduate learners advance towards independent practice, in the relatively few available published descriptions of 'resident-led' clinics across medical disciplines, in-clinic supervision by attending physicians remains or is incompletely described.^{30,32,33} Additional research is needed to further understand how the level of responsibility, independence and available resources offered by resident-led clinics such as ours relates to future rural/remote practice decisions.

Recommendations

1. Learn from community partners about their thoughts on the clinics and their healthcare needs to tailor services to the community
2. Optimise translational services for patient encounters to ensure appropriate, culturally safe care
3. Create standard procedures for booking so that the clinics are optimised both for volume and intended patients
4. Continue to offer resident-led clinics with communities as a valuable mutual learning opportunity for family medicine residents.

Limitations

A limitation of our study design is that participants were required to recall events that occurred up to 6 years prior. Topics were therefore subject to memory biases and attrition. In addition, our programme evaluation was limited to the perspectives of previously graduated residents only. Any thoughts of current residents based on any recent programme changes have not been captured, nor was the perspective of the supervising physician examined. Understanding the patient experience with resident-led clinics is essential, which was not a part of this study. Evaluation of this is currently being done by some of the authors, in partnership with the First Nation.

CONCLUSIONS

The resident-led clinics in the University of Saskatchewan's La Ronge Family Medicine Residency Training Programme are indispensable in providing primary care to remote communities, as well as professional and personal development for learners. A balance between autonomy and mentorship is required. Improved translational and booking services, as well as additional community collaboration, would further optimise benefits. This novel approach to remote community care may be useful in other rural jurisdictions.

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Understanding frostbite presentation and distribution of care in Ontario 2010–2018

Abstract

Introduction: Frostbite is a cold-weather injury presenting a significant risk of functional morbidity due to amputation. There is a paucity of studies investigating the epidemiology and regional distribution of frostbite. We describe the characteristics of frostbite patients and their care in Ontario.

Methods: Data were collected from the Institute of Clinical and Evaluative Sciences for adults over 18 years presenting to an Ontario emergency department from 1 January 2010 to 31 December 2018. Patients were followed for 30-day readmission and additional treatments within 180 days of presentation.

Results: Five thousand three hundred and eleven patients presented with unique episodes of frostbite in Ontario. Most cases were classified as unspecified ($n = 3775$) or superficial ($n = 1379$) frostbite of the extremities, primarily in male patients with a mean age 40 and few comorbidities. Cases were seen across all income and marginalisation quintiles, with a trend towards more cases in greater Ontario Marginalization indices and a higher proportion of homelessness seen in deep frostbite presentations (10%) compared to superficial (4.4%) or unspecified (5.6%). Most cases (75%) presented to small or medium-sized non-academic hospitals. An increase in cases was seen in extreme cold winters in 2014 and 2015.

Conclusion: Frostbite patients presented to small and medium non-academic hospitals with increased cases during extreme cold weather. While there was a trend towards more cases in lower-income and marginalised populations, frostbite impacted all segments of society. Frostbite education initiatives involving patients and providers have the potential to positively impact patient outcomes.

Keywords: Amputation, comorbidities, frostbite, knowledge dissemination

Résumé

Introduction: L'engelure est une blessure liée au froid qui comporte un risque important de morbidité fonctionnelle en raison d'amputations possibles. Peu d'études se sont intéressées à l'épidémiologie et à la répartition régionale des engelures. Nous décrivons ici les caractéristiques des patients atteints d'engelures et leur trajectoire de soins en Ontario.

Méthodes: Les données proviennent de l'Institute for Clinical and Evaluative Sciences et concernent les adultes de 18 ans et plus ayant consulté à l'urgence en

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Ontario entre le 1er janvier 2010 et le 31 décembre 2018. Les patients ont été suivis afin d'évaluer les réadmissions dans les 30 jours et les traitements additionnels dans les 180 jours suivant la première consultation.

Résultats: Au total, 5 311 patients ont consulté pour un épisode unique d'engelure en Ontario. La majorité des cas concernaient des engelures des extrémités, classées comme non spécifiées ($n = 3\,775$) ou superficielles ($n = 1\,379$), principalement chez des hommes âgés en moyenne de 40 ans et présentant peu de comorbidités. Les cas ont été observés dans tous les quintiles de revenu et de marginalisation avec une tendance plus marquée dans les indices de marginalisation élevés de l'Ontario (ONMARG). Une proportion plus grande de personnes en situation d'itinérance a été relevée parmi les engelures profondes (10%), comparativement aux engelures superficielles (4,4%) ou non spécifiées (5,6%). La plupart des patients (75%) se sont présentés dans de petits ou moyens hôpitaux non universitaires. Une hausse des cas a été observée durant les hivers extrêmement froids de 2014 et 2015.

Conclusion: Les patients atteints d'engelures ont surtout été pris en charge dans de petits et moyens hôpitaux non universitaires, avec une incidence accrue lors des épisodes de froid extrême. Bien qu'une tendance à une plus grande incidence dans les populations à faible revenu et marginalisées ait été observée, l'engelure touche toutes les couches de la société. Des initiatives de sensibilisation auprès des patients et des professionnels de la santé pourraient améliorer les résultats cliniques.

Mots-clés: Engelure, Amputation, Comorbidités, Diffusion des connaissances

INTRODUCTION

Frostbite is a subtype of thermal injury resulting from cold exposure, ranging from superficial cutaneous lesions to full-thickness necrosis of the skin and underlying tissues.¹⁻³ While historically associated with military operations, frostbite injuries are becoming more prevalent among the general population, particularly in northern countries and communities.^{1,2,4-8} Older age, male sex, smoking, substance and alcohol abuse, psychiatric illness and homelessness have all been identified as risk factors for frostbite.^{4,5,9,10} Risk factors for frostbite-associated amputations include duration of exposure, lack of proper attire and remoteness of location at the time of injury.⁶ The current epidemic of homelessness, substance abuse and climate change all have the potential to further impact the landscape of cold-weather injuries.^{7,11}

Severe frostbite injuries are associated with the potential for high morbidity, including amputation.^{2,4,9} Rapid rewarming and pain management remain foundational principles of frostbite treatment, along with the introduction of vasodilator and thrombolytic therapy with the aim of digit salvage.^{3,10,12,13} Early expert consultation

and involvement of multidisciplinary teams including pharmacists, occupational therapists, nurses, physiotherapists and mental health professionals have also demonstrated positive impacts on patient outcomes.^{3,14}

Current Canadian frostbite literature is dominated by single-centre case reports or series and is lacking large population-based studies investigating the demographics, presentation and treatment of frostbite.^{8,12,15} Anticipated societal changes, including an increase in homelessness and substance abuse, may impact the epidemiology of frostbite injuries.¹⁶⁻²¹ The relationship between the location of frostbite presentation, demographics and outcomes, particularly with respect to urban and rural settings, is also poorly understood. Our study aims to describe the characteristics of frostbite patients and the distribution of frostbite presentation and care in Ontario at the population level.

METHODS

Data were provided by the Institute for Clinical and Evaluative Sciences (ICES), an independent, non-profit research institute whose legal status under Ontario's health information privacy law allows it to collect and analyse health care and

demographic data, without consent, for health system evaluation and improvement. The cohort was defined by the inclusion of all patients 18 years of age and older presenting to the emergency department (ED) with frostbite in the province of Ontario between 1 January 2010 and 31 December 2018. Individuals were excluded if they had missing demographic data. Ontario health care regional reporting changed from a local health integration network (LHIN) system in 2021 to an alternate system. Data collected and used in our study were attributed to the Ontario LHIN distribution, which was in place at that time.

Baseline descriptive data of the cohort population were reported for several variables including age, sex, region of patient residence, homelessness, location of presentation to ED and season of presentation. Incidence rates for first frostbite presentation per year were reported per 100,000 individuals at least 18 years of age or older in Ontario. All analyses were performed using SAS Enterprise Guide v7.1.

Patients were followed retrospectively within the health system for 30-day readmission and additional debridement, or amputation treatments related to frostbite within 180 days of frostbite. Open-source information was also used, including Environment Canada data, to identify environmental factors, including weather conditions.

Presentation with frostbite to the ED was defined using the Canadian Institute for Health Information's (CIHI) National Ambulatory Care Reporting System database with ICD-10 codes for frostbite. Also used were the Ontario health insurance plan claim base, Ontario mental health reporting system, Ontario Marginalization Index (ONMARG), registered persons database files, same day surgery database, Ontario Asthma Dataset, Ontario Congestive Heart Failure Dataset Ontario chronic obstructive pulmonary disease dataset (COPD), discharge Abstract database the ontario hypertension dataset (HYPER) and Ontario Healthcare Institution database (INST). These datasets were linked using unique encoded identifiers and analysed at ICES. Charlson comorbidity index was used as an established weighted index to represent patient comorbidity. Charlson scores were calculated using the Johns Hopkins

ACG®System Version 10 software, as 32 ACG® system aggregated diagnosis groups (ADGs) and combined to define a singular ADG score. Charlson scores, ADG scores, ONMARG indices, as well as the demographic information, characteristics of frostbite and characteristics of the treating hospital were determined at the time of first frostbite presentation. The variable reported as drug exposure 'at the time of injury' refers to other diagnostic codes reported concurrently with the medical record of frostbite presentation. Repeat frostbite was defined as any frostbite occurring 180 days or more after the incident frostbite.

Our study received ethics approval through the Laurentian University research ethics board (File 6020977).

RESULTS

Table 1a summarizes demographic information including age, sex, location of residence, homelessness, hospital region, hospital size and rurality index. Five thousand three hundred and eleven patients presented with frostbite in Ontario from 2010 to 2018. Most cases were classified as unspecified ($n = 3.775$), followed by superficial ($n = 1.379$) and then deep ($n = 160$). Most patients were male (68.7%–74.4%), with a mean age of 40, presenting with unspecified or superficial frostbite. Those who presented with deep frostbite were slightly older, with a mean age of approximately 48. The highest proportion of homelessness was observed among individuals presenting with deep frostbite (10% homeless) compared to superficial or undefined (4.4% and 5.6%, respectively). Urban populations had higher numbers of frostbite presentations compared to rural populations. Individuals residing in Ontario LHIN regions 9 (Central East), 11 (Champlain) and 13 (Northeast) had the highest percentage of incident frostbite cases. Most cases are presented in the winter season, followed by spring and fall, with very few presenting in the summer. Most frostbite cases (75%) presented to small or medium-sized hospitals across Ontario, with only approximately 25% of cases presenting to larger academic hospitals.

The Charlson Comorbidity Score,²² ADG scores and Marginalization Indices of frostbite patients were noted. Of patients with known

Charlson scores, most patients presenting with frostbite had low scores. Mean ADG scores for frostbite presentations were 7.61 for superficial frostbite and 7.78 for deep frostbite presentations. The number of patients with either superficial or deep frostbite trended towards greater marginalisation in ONMARG residential instability, dependency and material deprivation scores, though cases were present across all quintiles. There were no trends identified in ONMARG Ethnic Diversity scores in frostbite case presentations.

Table 1b shows the comorbidities of patients recorded at the time of frostbite presentation. The most common comorbidities were hypertension,

followed by asthma, diabetes and COPD. Peripheral vascular disease, coronary artery disease, chronic heart failure, renal failure and dementia were present in very few patients.

Table 1c shows case presentations identified as occurring with recreational activity, drug exposure or alcohol exposure. Recreational activity was identified in 549 cases, alcohol exposure in 141 cases and drug exposure in 58–62 cases with distribution across superficial, deep (exact number of cases suppressed due to low number of cases reported) and unspecified case classifications.

Table 2 shows the primary body part involved with frostbite injury. Patients presented most frequently with lower extremity injuries (42%),

Table 1a: Characteristics of patients presenting with frostbite in Ontario – demographics and location of presentation

	Superficial, <i>n</i> (%)	Deep (tissue necrosis), <i>n</i> (%)	Not specified, <i>n</i> (%)
Total patients (<i>n</i>)	1379	160	3775
Age at index			
Mean±SD	39.9±18.2	47.8±17.8	40.4±17.7
Median (IQR)	36 (23–53)	49 (33–59)	38 (24–54)
Sex			
Female	431 (31.3)	20 (12.5)	966 (25.6)
Male	948 (68.7)	140 (87.5)	2809 (74.4)
Homelessness (Y)	60 (4.4)	16 (10.0)	211 (5.6)
Distance between residence and site of index emergency visit categories (km)			
Missing	502 (36.4)	64 (40.0)	1264 (33.5)
≤20	644 (46.7)	76 (47.5)	1871 (49.6)
20–60	134 (9.7)	13 (8.1)	395 (10.5)
60–100	30 (2.2)	0	68 (1.8)
>100	69 (5.0)	7 (4.4)	177 (4.7)
Institution region			
Missing	15 (1.1)	1–5*	58 (1.5)
Central	358 (26.0)	56 (35.0)	1075 (28.5)
East	365 (26.5)	40 (25.0)	978 (25.9)
Northeast	212 (15.4)	21 (13.1)	428 (11.3)
Northwest	101 (7.3)	12 (7.5)	302 (8.0)
West	328 (23.8)	30 (18.8)	934 (24.7)
Season of frostbite			
Fall	88 (6.4)	1–5*	147 (3.9)
Spring	171 (12.4)	28 (17.5)	427 (11.3)
Summer	52 (3.8)	8–12*	91 (2.4)
Winter	1068 (77.4)	119 (74.4)	3110 (82.4)
Academic hospital (Y)	361 (26.2)	40 (25.0)	994 (26.3)
Hospital size			
Missing	47 (3.4)	6 (3.8)	141 (3.7)
Small (1–199 beds)	745 (54.0)	74 (46.3)	1965 (52.1)
Medium (200–399 beds)	475 (34.4)	74 (46.3)	1227 (32.5)
Large (≥400 beds)	112 (8.1)	6 (3.8)	442 (11.7)

*Cells with fewer than six visits were suppressed to protect patient privacy. RIO (rurality index for Ontario) score ranges from 0 to 100, where 0 is the most urban and 100 is the most rural. This score is generated for each census subdivision as the sum of a measure of population density, travel time to nearest basic referral centre and travel time to nearest advanced referral center. ONMARG: Ontario Marginalization, SD: Standard deviation, IQR: Interquartile range

followed by upper extremity (33.6%), the head (13%) and neck involvement (10%). Patients presenting with deep frostbite most commonly involved the distal extremities (wrist and hand, foot and ankle). In the small number of cases with torso involvement, none were classified as deep tissue injury. Few patients were classified as presenting with multiple or unspecified body sites.

Table 3 shows that 44.85% ($n = 2382$) of frostbite patients had at least one return visit to the ED for frostbite within 180 days of initial presentation. There was a trend towards increased number of mean return ED visits for deep frostbite (2.61) compared to unspecified (1.5)

and superficial (1.32). Overall, 12% ($n = 637$) of frostbite patients required inpatient admission, with 40% of deep frostbite presentations requiring inpatient admission. Debridement and amputation associated with frostbite cases were investigated in the databases; however, <300 cases were identified with multiple categories of suppressed data due to low numbers.

Table 4 shows annual frostbite incidence in Ontario from 2010 to 2018. Notably, 2014, 2015 and to a lesser degree 2018, had a large increase in relative incidence compared to other years. The number of frostbite cases seen in the western region, representing southwestern Ontario as

Table 1b: Comorbidities by frostbite type

	Superficial, n (%)	Deep (tissue necrosis), n (%)	Unspecified, n (%)
Total patients	$n=1379$	$n=160$	$n=3775$
Comorbidities at index date			
Coronary artery disease	32 (2.3)	1–5*	98 (2.6)
Chronic heart failure	17 (1.2)	7 (4.4)	82 (2.2)
COPD	116 (8.4)	20 (12.5)	333 (8.8)
Dementia	23 (1.7)	6 (3.8)	73 (1.9)
Hypertension	253 (18.3)	37 (23.1)	720 (19.1)
Diabetes	155 (11.2)	24 (15.0)	394 (10.4)
Peripheral vascular disease	9 (0.7)	1–5*	23 (0.6)
Asthma	289 (21.0)	21 (13.1)	698 (18.5)
Renal failure	27 (2.0)	8 (5.0)	71 (1.9)

*Cells with fewer than six visits were suppressed to protect patient privacy. COPD: Chronic obstructive pulmonary disease

Table 1c: Characteristics of patients presenting with frostbite in Ontario – exposure, substance use and repeat/previous frostbite

	Superficial, n (%)	Deep (tissue necrosis), n (%)	Unspecified, n (%)	Total
Frostbite injury during recreational activity	173 (12.5)	20 (12.5)	356 (9.4)	549
Alcohol exposure at time of injury ^a	38 (2.8)	10 (6.3)	103 (2.7)	141
Drug exposure at time of injury	11 (0.8)	1–5*	46 (1.2)	58–62

*Cells with fewer than six visits were suppressed to protect patient privacy. ^aVariables recorded 'at the time of injury' refer to other diagnostic codes reported with the frostbite record. All individuals in these categories were intoxicated at the time of injury

Table 2: Primary body part involved

Location	Superficial, n (%)	Deep (tissue necrosis), n (%)	Unspecified, n (%)	Total
Foot, Knee and Lower Leg	544 (21.0)	68 (2.7)*	1969 (76.4)	2577
Head	204 (14.8)	11 (6.9)	587 (15.5)	800
Neck	28 (2.0)	1–5*	587 (15.5)	616–620
Arm, Wrist and Hand	528 (25.7)	73 (3.5)	1390 (67.5)	2058
Unspecified body site	35 (2.5)	1–5*	370 (9.8)	406–410
Abdomen Wall/Lower Back/Pelvis	23 (1.7)	0	49 (1.3)	72
Hip and Thigh	19 (1.4)	1–5*	49 (1.3)	69–73
Thorax	6 (0.4)	0	49 (1.3)	54
Multiple body sites	39 (2.8)	8 (5.0)	79 (2.1)	*

*Note that some frostbite cases span multiple body sites

Table 3: Repeat emergency room visits and inpatient admissions to hospital within 180 days of initial frostbite

Hospital type	Overall	Superficial	Deep (tissue necrosis)	Unspecified
Any ED visit, <i>n</i> (%)	2382 (44.9)	596 (43.2)	85 (53.1)	1703 (45.1)
Number of ED visits - mean±SD	1.48±4.2	1.32±3.7	2.61±8.1	1.5±4.2
Any inpatient visit, <i>n</i> (%)	637 (11.0)	129 (9.4)	64 (40.0)	449 (11.9)

SD: Standard deviation, ED: Emergency department

the most temperate part of the province, had the greatest percentage increase in frostbite cases during 2014 and 2015 (from 22% to 28%) compared to other regions and all other years studied (2010 through 2013 and 2016 through 2019). Correlation with Environment Canada weather reports for these years identified extreme cold temperatures.

DISCUSSION

Frostbite was consistently present across Ontario over the period studied with presentations primarily in the winter and spring months and increased case numbers during years with severe cold episodes. Frostbite patients ranged in demographics and were most often middle-aged males in predominantly urban settings in southern Ontario. While patients were not highly comorbid, the most associated comorbidities were hypertension, followed by asthma, diabetes and COPD, with a low prevalence of peripheral vascular disease and cardiovascular disease. While smoking status was not identifiable within the dataset, asthma and COPD may be linked to smoking. The prevalence of HYPERTENSION, diabetes and possibly smoking in our study demonstrates the value of clinical trials in further understanding the impacts of vasodilator and antithrombotic medications in frostbite care, as vasoconstriction and small vessel disease may play more of a role than previously understood.^{16,20}

Homelessness was connected to some frostbite presentations, with a higher proportion of deep frostbite cases seen in this population. Increasing material deprivation and residential instability showed a trend toward higher numbers of frostbite cases. This may be due to the risk of prolonged cold exposure in patients experiencing homelessness, or additional social determinants of health such as limited resources for cold-weather clothing or the necessity of working in cold conditions for

prolonged periods. Recreational activity and alcohol were reported in frostbite presentations, though not in large numbers and drug use was rarely reported synchronously with frostbite presentations. Further research into social determinants of health in relation to frostbite presentation among marginalised populations including homeless, low-income and racialised communities, may prevent devastating impacts such as amputation in already vulnerable patients. Where homelessness, marginalisation, recreational activity and alcohol and drug use were present within our study population, it's important to note that frostbite was seen across all income, marginalisation and diversity quintiles. Broad public health education in frostbite prevention and treatment is needed across all segments of society to impact frostbite outcomes most effectively.

Most cases identified in this study were presented in the most populous southern and urban regions of the province, often to small and medium-sized non-academic hospitals where they may be less likely to have subspecialty multidisciplinary frostbite care, expertise or treatment protocols. Frostbite care is highly variable across Canada, and medical interventions such as tPA and Iloprost may be most beneficial when implemented early.¹⁶ Provider education and treatment availability are critical in ensuring eligible patients are appropriately identified and treated in a timely fashion, highlighting the need for regional or national frostbite care resources to support provider education and timely access to modern frostbite care.²¹

The notable increase in frostbite cases in Ontario during unseasonably cold winters in 2014 and 2015, and to a lesser degree in 2018, particularly in the warmer southwestern regions of the province, could be related to lack of preparedness or prevention in a region where severe cold conditions and frostbite risk may be less common. This highlights the potential value of frostbite prevention and treatment

Table 4: Rate of yearly frostbite incidence in Ontario from 2010 to 2018

Calendar year	New frostbite case	Individuals in Ontario	Rate per 100,000 (95% CI)
2010	302	14,177,710	2.13 (1.9–2.4)
2011	404	14,352,514	2.81 (2.6–3.1)
2012	224	14,523,795	1.54 (1.4–1.8)
2013	518	14,685,464	3.53 (3.2–3.8)
2014	1126	14,830,973	7.59 (7.2–8.1)
2015	1069	14,961,703	7.14 (6.7–7.6)
2016	478	15,078,262	3.17 (2.9–3.5)
2017	453	15,181,318	2.98 (2.7–3.3)
2018	737	15,271,350	4.83 (4.5–5.2)

CI: Confidence interval

education in warmer regions of Ontario and Canada, particularly during extreme cold events. This may become increasingly important as the frequency of extreme climate events is anticipated to increase due to climate change.^{17,18}

Limitations

The administrative data used in this study were limited to the ICD-10 codes identified by providers and administrators at the time of patient presentation. ICD-10 codes for frostbite were limited to classifications of unspecified, superficial or deep. The use of this categorisation is not reflective of modern frostbite grading systems and understanding of frostbite severity and may have contributed to the high number of cases classified as unspecified. While care was taken to holistically assess demographic factors such as comorbidities and decreased access to resources and care, the tools used, including the Charlson score or the ONMARG rankings, have their own intrinsic limitations. Limitations of hospital administrative data and billing information within the datasets were unable to clearly link frostbite presentation with procedural interventions such as debridement and amputation.

CONCLUSION

Frostbite patients presenting to EDs in Ontario, Canada, from 2010 to 2018 were seen primarily in small and medium-sized non-academic hospitals in southern Ontario, with a notable increase in cases in warmer parts of the province during extreme cold winter weather in 2014 and 2015. While

there was a trend towards more frostbite cases in lower-income and marginalised populations with a higher proportion of severe frostbite cases seen in the homeless population, frostbite impacted all segments of society. The development of broader regional and national frostbite care education and research initiatives involving both patients and providers has the potential to positively impact future patient outcomes.

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Can implementation of *in situ* simulation support rural emergency provider self-confidence and improve patient safety? A mixed-methods study

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Abstract

Introduction: Rural emergency departments across Canada face challenges such as limited access to continuing medical education and resource constraints. Our study evaluates *in situ* Simulation (ISS) as an educational tool in a small rural emergency department, focusing on participant satisfaction, clinician confidence and the identification of latent safety threats (LSTs).

Methods: Five monthly ISS sessions were conducted during active clinical hours, involving physicians, nurses and nurse practitioners selected through convenience sampling. After each session, participants anonymously completed the validated student satisfaction and self-confidence in learning survey and short-answer questions to identify LSTs.

Results: Participants reported high satisfaction with ISS, and high confidence in clinical skills post-simulation. Thematic analysis of short-answer responses identified several LSTs in clinical care systems, which were brought for review by department leadership to improve patient and provider safety.

Conclusion: ISS is a feasible and valuable educational strategy for rural healthcare providers, promoting participant satisfaction and enhancing confidence in managing acute situations. In addition, it effectively identifies safety issues, contributing to improved patient care. This model can inform similar initiatives in other rural settings facing educational and resource challenges.

Keywords: *In situ simulation*, rural emergency departments, rural simulation

Résumé

Introduction: Les services d'urgence en milieu rural à travers le Canada font face à des défis tels que l'accès limité à la formation médicale continue et les contraintes de ressources. Notre étude évalue la simulation *in situ* (SIS) comme outil pédagogique dans un petit service d'urgence rural, en mettant l'accent sur la satisfaction des participants, la confiance des cliniciens et l'identification des menaces latentes à la

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sécurité.

Méthodes: Cinq séances mensuelles de SIS ont été réalisées pendant les heures cliniques actives, réunissant des médecins, des infirmières et des infirmières praticiennes sélectionnés par échantillonnage de convenance. Après chaque séance, les participants ont rempli de façon anonyme le questionnaire validé *Student Satisfaction and Self-Confidence in Learning Survey* (SCLS), ainsi que des questions à réponses courtes visant à identifier les menaces latentes à la sécurité.

Résultats: Les participants ont rapporté un haut niveau de satisfaction à l'égard de la SIS et une grande confiance dans leurs compétences cliniques après les simulations. L'analyse thématique des réponses courtes a permis d'identifier plusieurs menaces latentes à la sécurité dans les systèmes de soins cliniques, lesquelles ont été soumises à l'examen de la direction du service afin d'améliorer la sécurité des patients et des prestataires.

Conclusion: La SIS constitue une stratégie pédagogique réalisable et précieuse pour les professionnels de la santé en milieu rural, favorisant la satisfaction des participants et renforçant leur confiance dans la gestion des situations aiguës. De plus, elle permet de cerner efficacement des enjeux de sécurité, contribuant ainsi à l'amélioration des soins aux patients. Ce modèle peut inspirer des initiatives similaires dans d'autres contextes ruraux confrontés à des défis éducatifs et de ressources.

Mots-clés: Simulation *in situ*, Simulation en milieu rural, Services d'urgence ruraux

INTRODUCTION

Rural emergency departments across Canada treat approximately four million patients annually, accounting for 30% of all emergency visits in the country, despite only 20% of Canadians living in rural areas.¹ When comparing rural populations to their urban counterparts, rural residents tend to be older, have poorer health indicators and are at greater risk for traumatic injuries.^{1,2}

Physician retention in rural areas is also challenging, often leaving patients without access to family physicians or with limited healthcare options.^{1,3} As a result, emergency departments in rural areas have been described as an 'important safety net' for these populations. Despite the recognised importance of rural emergency departments, few studies have explored the specific challenges they face or strategies to improve them compared to their urban counterparts.⁴

Northern Ontario is a vast region spanning over 800,000 square km, comprising 90% of Ontario's land area, but home to a relatively small population of about 840,000. Notably, around 60% of this population (roughly 504,000 people) live in rural and remote communities.⁵ Studies indicate that residents of Northern Ontario experience a higher prevalence of chronic disease, as well as elevated morbidity and mortality rates compared to urban populations.⁵

Although rural emergency departments are less frequently studied than their urban counterparts,

there is evidence suggesting that rural emergency physicians and nurses are requesting additional training.⁵ One potential solution for providing this training to rural emergency department physicians and interdisciplinary team members is *in situ* Simulation (ISS or *In Situ* Sim).^{1,6} ISS involves conducting simulation training in the actual clinical environment where providers typically see patients,⁶ removing the need for dedicated simulation labs or expensive simulation equipment. Training can occur while clinicians are on duty or afterwards, allowing physicians and interdisciplinary team members to practise their roles before encountering real patients with acute needs.⁷

While ISSs in rural emergency departments have been studied,⁷ to the best of our knowledge, few studies have used validated questionnaires to assess physicians' and nurses' experiences post-ISS in the context of rural emergency departments. We sought to answer the following questions:

1. Can *in situ* sim be implemented in a way that participants are satisfied with the training experience?
2. Can *in situ* sim support rural clinician self-confidence in managing acute and critical medical presentations?
3. Can *in situ* sim identify latent safety threats (LSTs) in the clinical care systems and physical equipment of a rural emergency department?

METHODS

Espanola, Ontario, a community with just over 5000 residents, is served by the Espanola Regional Hospital and Health Centre's Emergency Department (ERHHC ED), which caters to a catchment area of approximately 15,000 people.⁸ This includes many seasonal visitors who use the ED during peak times on Lake Huron's North Shore. Surrounding Espanola are the First Nations communities of Sagamok Anishnawbek and White Fish River First Nations, with Indigenous, Métis and Inuit people comprising about 30% of the population within the ERHHC service area.

Espanola qualifies as a rural community according to provincial definitions, with a population under 30,000 and a location more than 30 min away from a larger urban centre.⁹ For urgent or emergency medical care, residents of Espanola and the surrounding areas rely exclusively on the ERHHC ED. The facility includes an 11-bed emergency department and a total of 79 beds on its health campus, which provides both inpatient and long-term care services.¹⁰ In 2023, the ERHHC ED averaged 35 patient visits per day, with staffing consisting of one physician and two nurses during the day and one physician and one nurse overnight.

The convenience sampling was used to assess physicians and nurses who provide care in the emergency department at the ERHHC. In addition, any learners present in the department at the time were also invited to join the simulation. Participation was optional. Informed consent was obtained through signed consent forms from every participant.

To address common barriers to simulation training – such as participant anxiety, fear of making mistakes, fear of reprisal or negative prior experiences – a scripted pre-briefing was implemented to reinforce a culture of safe learning. Participants were informed of the general simulation topic 1 week in advance, allowing them to prepare in their preferred way if desired. In addition, instructors underwent dedicated training in simulation and debriefing through the Health Sciences North Simulation Laboratory, completing two courses, each lasting 3 h. Instructors sent a 'Simulation Recap' E-mail to all nursing and physician staff after each

session, summarising key educational topics, relevant evidence and guidelines.

A total of 5 ISSs ran from January 2024 to June 2024 [Table 1]. The simulations lasted a minimum of 10-min and a maximum of 15-min and ended if objectives of the simulation were met.

The timing of the scenarios was strategically planned to coincide with typically lower patient volumes and maximum department staffing, specifically mid-morning. Backup staffing was arranged in case a true medical emergency arose during the simulation, with a nurse available from the inpatient unit if necessary. Management was supportive of the initiative and actively participated in the delivery of ISS. To minimise the impact on ED operations, the combined duration of each scenario and debrief was planned to be 30 min. The method of delivery required at least two instructors, and in some scenarios, a standardised patient or actor. If the simulation interfered with ED operations it was postponed or rescheduled. This occurred once.

Following the simulations, a debriefing session was held in a confidential area of the hospital. Participants were able to describe and discuss the simulation in a structured debriefing facilitated by the instructors, and relevant up-to-date care guidelines on the case were also shared and discussed with participants as educational resources. At the end of the debriefing participants filled out the validated Student Satisfaction and Self-Confidence in Learning Survey (SCLS) questionnaire.¹² The SCLS questionnaire consists of 13 items that are grouped into two dimensions: (1) satisfaction with current learning and (2) self-confidence in learning during simulation. The SCLS is validated and used in multiple different regions, countries, languages

Table 1: Simulation case and the respective Canadian Triage and Acuity Scale¹¹

Simulation case	CTAS
Unstable Bradycardia requiring transcutaneous pacing	1
Ventricular Tachycardia requiring defibrillation and intubation	1
COPD exacerbation requiring intubation	2
Pediatric asthma exacerbation	2
Septic shock	1

CTAS: Canadian Triage and Acuity Scale, COPD: Chronic obstructive pulmonary disease

and settings.¹³⁻¹⁶ This is a Likert scale from 1 to 5, with 1 being 'Strongly Disagree', 3 being 'Neutral', to 5 being 'Strongly Agree'. Participants were asked three questions about safety, feedback and suggestions that were later used to complete a thematic analysis. Furthermore, specific LSTs were identified and documented for institutional review and quality improvement (QI).

Six months after completing the initial simulation case series, a digital version of the SCLS, along with supplemental questions, was sent to all ED nursing and physician staff via their hospital E-mail. This survey aimed to gather additional anonymous feedback on self-confidence and satisfaction with simulation long after the intervention.

All anonymous SCLS questionnaires were scanned, and the data were digitised and entered into spreadsheets for the subsequent analysis. Descriptive statistics were calculated to summarise the findings. The debriefing responses to the three questions underwent thematic content analysis, which was independently conducted by two authors (AW and SD). After completing their independent reviews, the two authors discussed any discrepancies in identified themes, reaching consensus through deliberation.

RESULTS

A total of 5 physicians, 9 nurses, 1 nurse practitioner and 1 medical student participated. All prospective participants agreed to participate in the simulation training sessions. All 16 participants completed the SCLS questionnaires as well as the three debriefing questions, resulting in a 100% completion rate.

Self-confidence in learning survey questionnaire results

For all five questions pertaining to satisfaction in the SCLS satisfaction section the score was 5, meaning that participants strongly agree with questions as they pertain to satisfaction with the simulation intervention.

The eight self-confidence-related questions of the SCLS had an average score of 4.78, meaning that participants were somewhere in between agreeing (score of 4) and strongly agreeing (score of 5) when it came to self-confidence in learning with

respect to the clinical subject matter presented in the simulation.

Short-answer survey response analysis

The survey short-answer responses were analysed and a total of three themes were established [Table 2].

Theme 1: Provider safety

Participants highlighted several issues related to personal protective equipment (PPE), including challenges with donning and doffing techniques, the location of PPE carts and the placement of disposal receptacles.

Another safety concern involved the physical layout of the resuscitation room, particularly the placement of equipment. For example, the location of the power cords and outlets for the video laryngoscope impeded the ability to move the bed away from the wall during intubation.

Theme 2: Available equipment, setup and use

Participants suggested improvements in equipment knowledge and setup. In addition, the absence of certain resuscitation equipment in the department was identified. Short-answer responses raised the question of whether arterial line blood pressure monitoring should be available for critically ill patients at ERHHC.

Another LST involved the availability of specific supplies for non-invasive positive pressure

Table 2: Themes identified from short answer responses, number of respondents that mentioned the theme in their feedback and representative quotes

Theme (number responding)	Representative quotes
Provider safety (3)	'PPE cart not in a good location' 'Glidescope power cords can be cumbersome'
Available equipment, setup and use (4)	'lack of PPV masks for peds' 'arterial line would help for sick patients'
Suggestions for improvement (4)	'we would benefit from ACLS and PALS courses' 'more frequent equipment training for use and setup would be helpful'

PPE: personal protective equipment, PPV: Positive pressure ventilation, ACLS: Advanced cardiovascular life support, PALS: paediatric advanced life support

ventilation (NIPPV), which was also addressed with department leadership.

Finally, concerns were raised regarding self-reported staff comfort with ventilator operation. In two separate simulations, participants indicated that they did not feel fully comfortable setting up and operating the ventilator after patient intubation.

Theme 5: Suggestions for improvement and additional training

Participants specifically highlighted the need for additional training in areas where they felt their knowledge was lacking, such as paediatrics and advanced cardiac resuscitation, which became apparent after the fourth simulation case involving paediatric asthma. Two participants made specific recommendations for additional training courses, such as ACLS (Advanced Cardiac Life Support) and PALS (Paediatric Advanced Life Support).

Topics raised during verbal debriefing

During the verbal debriefing, participants provided positive feedback about their experience, highlighting several key aspects. They appreciated the high yield of the training, noting its effectiveness in fostering team building, improving teamwork and ultimately enhancing patient care. In addition, the calm and comfortable learning environment was well-received. The simulations were praised for their high quality and for providing valuable opportunities for professional development, particularly in practising crisis resource management (CRM). Specific CRM topics raised by participants included effective leadership, followership and closed-loop communication.

The follow-up survey sent 6 months after the initial case series had only three responses, which precluded any meaningful analysis of attitudes towards satisfaction and self-confidence.

DISCUSSION

For all 5 questions pertaining to satisfaction in the SCLS satisfaction section, the score was 5. This is in keeping with simulation research that has shown that participants typically enjoy the

simulation experience and overall feel satisfied.¹⁶ However, it is unclear if satisfaction with ISSs has previously been measured in a rural emergency department context.

Self-confidence with ISS was high with a SCLS average score of 4.78. It has previously been established in the literature that participants typically feel more confident following simulations¹⁷ and our results support those findings.

The use of simulation to identify LSTs has been previously investigated.^{18,19} These studies assessed various form of LSTs, involving equipment, personnel and resources.

A number of LSTs identified in our study related to provider safety, especially power cords and outlet locations related to equipment such as video laryngoscopy. Previous simulation studies¹⁸ in emergency departments have identified equipment-related challenges, although not specifically related to laryngoscopy. Consistent with existing simulation literature, a safety threat identified in our ISS was the improper use of PPE and the failure to place the PPE cart in a prominent location in front of the trauma bay.¹⁸

Previous studies in larger centres^{18,19} have also used ISSs to assess overall preparedness and to identify the significant equipment gaps. Similar to our results, these studies reported missing or improperly functioning equipment.^{18,19}

Prior to the project's commencement, some participants expressed anxiety about their performance during simulation training, stemming from both inexperience and previous negative experiences. This phenomenon has been noted in earlier studies involving simulations in larger emergency departments.¹⁹ As with those previous findings, participants' tensions eased once they were informed during the pre-brief that the goal was to practise and improve by simulating challenging cases, leading to greater buy-in.¹⁹ Anecdotally, within our institution, participants became less anxious as each simulation session progressed, with a culture of educational safety being established over time.

Specific departmental outcomes

The QI component of this study led to several changes aimed at enhancing patient care and

safety. Paediatric-sized masks for NIPPV were purchased to improve airway management for paediatric patients. The placement of PPE was reviewed and reorganised to ensure better accessibility and efficiency. In addition, the arrangement of stretchers and video laryngoscopes in the resuscitation room was optimised to facilitate safer movement around the patient during critical interventions.

As part of monthly ISS days, dedicated equipment review sessions are now scheduled during shifts. These sessions provide staff with hands-on opportunities to review and practise using critical care equipment, such as NIPPV, ventilators and defibrillators. Our results have allowed authors to secure dedicated educational funding to bring in instructors and facilitators to provide task-and topic-specific training in areas identified as needing improvement.

While not directly a result of this study, the results support the decision to implement ACLS and PALS training for all emergency departments' nursing staff since the project's completion.

Anecdotal evidence highlights the direct impact of ISS on patient care. For example, after an ISS case focused on managing unstable bradycardia requiring transcutaneous pacing, a real patient with the same condition presented within the same week. Several members of the care team who had participated in the simulation felt well-prepared to manage the case, attributing their confidence to the ISS training. While this phenomenon was not captured in the study's surveys or quantitative results, it underscores the practical benefits of ISS in enhancing clinical readiness and response.

Limitations

Our study may be affected by response and researcher bias, as participants had prior relationships with the instructors, potentially influencing their responses. Despite anonymity of surveys, this relationship could lead to skewed feedback.

Surveys and questionnaires were administered only post-intervention, which limits our ability to directly attribute changes in satisfaction and self-confidence to the ISS experience. This decision was made for practical reasons, to avoid overburdening participants, many of whom were already managing busy clinical shifts and to

minimise the risk of discouraging participation. This approach highlights a broader structural challenge in researching the impact of ISS, particularly in the setting of rural emergency departments.

The results of our study may not be generalisable to rural emergency departments with a higher average daily patient volume. The feasibility of implementing ISS would need to be adapted to the specific care systems and operational factors of each department.

The sample size of 16 is small and reflects staffing limitations in rural emergency departments. While this represents a significant percentage of our hospital's total staff complement, the sample size is overall quite low and may impact the generalisability of the findings. This highlights a challenge across all small, rural hospital-based research. In addition, participants' behaviour might differ in the real-life situations versus simulation, known as the 'simulation effect'. Larger studies in rural settings are necessary to validate these findings.

Further research may focus on whether high acuity – low occurrence procedure-specific training can be successfully implemented in a rural hospital emergency department via ISS, as well as examining the downstream impacts of *in situ* Sim on patient safety and health outcomes.

CONCLUSION

ISSs are increasingly used to support training for rural emergency department physicians and interdisciplinary teams. However, research specific to rural settings remains limited. This study assessed participant satisfaction, self-confidence and key themes from debriefings.

Participants reported high satisfaction and strong self-confidence. Debriefings highlighted the value of CRM practice and revealed LSTs, including equipment challenges, PPE placement and training gaps.

These results suggest ISS is a feasible and low-cost strategy for ongoing education and clinical QI in rural emergency care.

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Fournier's gangrene in remote Northern Ontario, Canada: A rare but critical condition

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INTRODUCTION

Fournier's gangrene (FG) is a rare yet devastating form of necrotising fasciitis, with mortality rates reaching approximately 40% despite medical intervention.¹ The most recent analysis of FG cases in the United States reported an approximate incidence of 1.6/100,000 males.² In Canada, data are limited, but a 12-year retrospective study at a hospital affiliated with the University of Montreal identified only 26 cases, underscoring its rarity and the likelihood that many rural or remote physicians may never encounter it in their careers.³ It predominantly affects the perineal, genital and anal regions and can present with non-specific symptoms, often leading to initial misdiagnosis, as seen in this case.⁴ Early clinical manifestations, including diffuse perineal pain, erythema, swelling and systemic symptoms such as fever and tachycardia, should raise the suspicion for FG.⁵ Rapid progression to necrosis, crepitus, purulent discharge and systemic instability necessitates immediate intervention.⁶ Diabetes mellitus, immunosuppression and chronic alcohol use are

amongst the strongest risk factors predisposing individuals to FG.⁷ The pathophysiology often involves polymicrobial infection with aerobic and anaerobic organisms, leading to tissue ischaemia and widespread necrosis.⁸ Definitive management requires emergent surgical debridement to excise necrotic tissue, alongside broad-spectrum antibiotic coverage targeting Gram-positive, Gram-negative and anaerobic bacteria.¹ Supportive measures such as fluid resuscitation and haemodynamic stabilisation are critical in managing septic shock.⁴ However, even with optimal intervention, FG carries a high risk of mortality, particularly in elderly patients with multiple co-morbidities.⁵

CASE REPORT

A 75-year-old male presented to the emergency department with complaints of progressive rash, severe perineal pain and urinary retention. He initially developed erythema and oedema of the perineum, genitals and scrotum, followed by worsening suprapubic pain, fever, nausea and urinary retention. Clinical examination

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Figure 1: Anterior view of Fournier's gangrene affecting the perineum, genitals and scrotum in a 75-year-old male.

revealed diffuse oedema, patchy erythema, extensive tissue necrosis with black discoloration and bulla formation [Figure 1]. Purulent discharge and gangrenous tissue were evident, alongside the systemic signs of sepsis, including tachycardia and fever [Figure 2]. His medical history was significant for uncontrolled diabetes mellitus, coronary artery disease, dyslipidaemia, macular degeneration, heart failure (ejection fraction 37%), prior lower limb amputations, chronic kidney disease, stroke and chronic alcohol use disorder. Of note, the patient was diagnosed with balanitis 1 day before presenting with overt gangrene. This emphasizes how quickly this disease progresses and how hard it is to diagnose it early enough for successful treatment.

Due to the extent of the infection and his deteriorating haemodynamic status, surgical debridement was indicated. However, given his critical prognosis and the logistical challenges of transferring him from a remote fly-in community in Northern Ontario to Southern Ontario, his family opted for palliative care. Despite broad-spectrum antibiotic therapy and aggressive supportive management, the patient was deceased within 6 h, with family present at his bedside.

DISCUSSION

This case highlights the challenges of managing FG in resource-limited rural settings, where access to surgical intervention and critical care transport may be constrained. In this case, uncontrolled diabetes and chronic alcohol use



Figure 2: Lateral view of Fournier's gangrene affecting the perineum, genitals and scrotum in a 75-year-old male.

likely contributed to the rapid disease progression. Surgical access in remote settings is often limited due to geographic isolation, lack of specialised medical personnel and logistical challenges associated with timely patient transfers.⁵ In Northern Ontario, many communities rely on fly-in medical transport, and there are significant disparities in access to surgical care, with some patients requiring transfer to tertiary centres such as Thunder Bay, Sudbury, Timmins or Kingston for definitive surgical management.¹ These factors can lead to delays in definitive surgical management, worsening prognosis and increased reliance on conservative or palliative measures. Early recognition, aggressive treatment and multidisciplinary collaboration are essential to improving patient outcomes.⁴ In addition, preventative strategies, particularly in high-risk individuals, should focus on stringent glycaemic control, personal hygiene and prompt management of minor skin infections.⁶ Palliative care considerations in FG are particularly relevant in patients with extensive disease and poor prognostic factors, especially in remote settings where surgical intervention may not be feasible.³ In such cases, symptom management, pain control and psychosocial support become the primary focus, ensuring dignity and comfort for the patient and their family.² Greater integration of palliative care protocols in the acute surgical settings may help optimise patient-centered decision-making and improve end-of-life care for those with advanced FG.¹

CONCLUSION

FG requires rapid recognition and emergent surgical debridement, where delays, especially in the remote settings, can be fatal. This case of

a 75-year-old male with multiple co-morbidities illustrates how initial misdiagnosis and limited access to surgery precluded definitive management, culminating in rapid decline despite antibiotics and supportive care. Improving outcomes include clinician vigilance, early broad-spectrum therapy and protocolised transfer pathways from fly-in communities to surgical centres, alongside prevention focused on modifiable risk factors.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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The Occasional Bartholin cyst management

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INTRODUCTION

Bartholin cysts and abscesses are common vulvovaginal conditions, affecting approximately 2% of individuals with vulvas at some point in their lives.¹ These typically occur after puberty when the Bartholin glands become functionally active. Infection can lead to a painful abscess requiring prompt drainage. In rural or resource-limited settings, access to specialist gynaecologic care may be limited. Rural generalists are well-positioned to manage these cases effectively when equipped with appropriate tools and procedural knowledge.²

ANATOMY AND FUNCTION

The Bartholin glands [Figure 1] are located in the vulvar vestibule at approximately the 5 and 7 o'clock positions.² Each gland is oval-shaped, averaging 0.5 cm in size.² They become functional after menarche and secrete mucoid lubrication during sexual activity via an efferent duct at the distal end of the vagina.² Obstruction of this duct may cause mucus accumulation, resulting in cyst formation. Secondary infection can lead to abscess formation.

DIAGNOSIS AND DIFFERENTIAL

A correct diagnosis is essential before intervention. Ultrasound can help

distinguish solid from cystic lesions and confirm an abscess, but diagnosis is usually clinical.² The lack of a fluid-filled structure rules out a Bartholin cyst or abscess and should lead the provider to rethink their diagnosis.

TYPICAL PRESENTATION

- Cyst: Soft, non-tender mass near the 5 or 7 o'clock position of the vestibule
- Abscess: Tender, erythematous, fluctuant swelling, often painful with walking, sitting, or sexual intercourse.

Differential Diagnoses Include:

- Bartholincyst–Over-accumulation of mucus due to duct occlusion; often sterile.¹ Figure 2
- Bartholin abscess – Infected cyst with pain, redness and swelling¹
- Labial cyst – Typically non-tender, mobile¹ Figure 2
- Benign Bartholin gland tumour – Includes nodular hyperplasia, adenomas, hamartomas; usually mobile and well-circumscribed³
- Bartholin gland carcinoma – Very rare; consider in patients over age 40 or with firm, fixed, non-tender masses.⁴

INDICATIONS FOR DRAINAGE

Drainage should be considered when:

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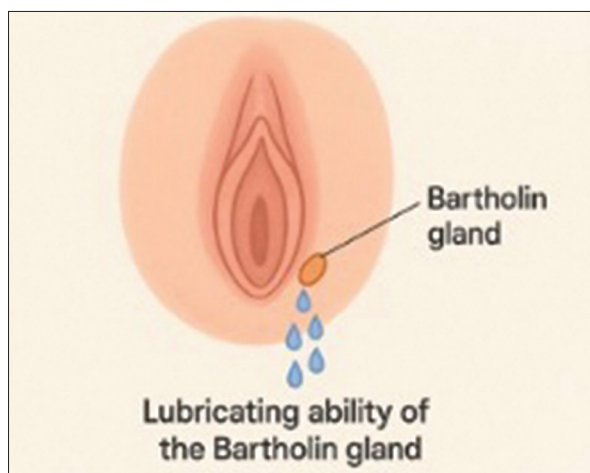


Figure 1: Anatomy of the Bartholin gland. Based on Lee *et al.* 2024.

- Lesion is fluctuant and painful (suggestive of abscess) OR
- Rapid enlargement or suspected infection OR
- Conservative management has failed OR
- Patient is high risk (immunocompromised, diabetic and pregnant).

Note: It is important to avoid incising a non-fluctuant Bartholin lesion. Early cysts or indurated swellings should be managed conservatively with sitz baths and analgesia until the abscess points, as premature incision may increase the risk of complications.¹ Furthermore, simple lancing or incision and drainage is discouraged due to higher recurrence rates, potential creation of false tracts and the risk of complicating subsequent Word catheter or marsupialisation procedures.¹

PAIN MANAGEMENT

- Local anaesthesia – Usually sufficient (lidocaine 1%–2%)
- Procedural sedation and general anaesthesia – May be required for severe pain and patient comfort.

MANAGEMENT

A. Conservative Treatment

- Analgesia
- Warm compresses
- Sitz baths.²

B. Procedural Drainage.

1. Word Catheter: Word catheter placement is effective, minimally invasive and well-suited

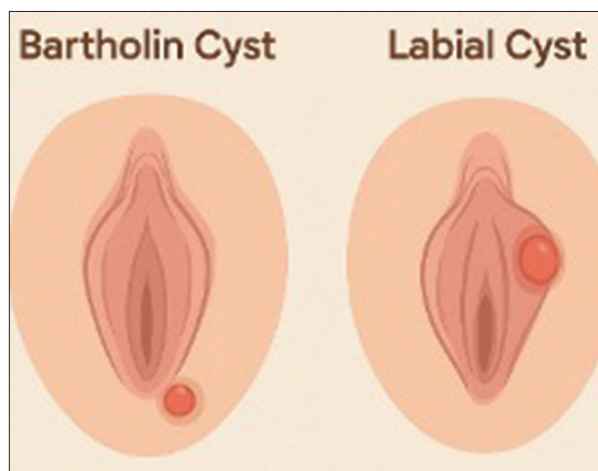


Figure 2: Typical Bartholin cyst versus labial cyst presentation. Based on Omole *et al.* 2019.

for rural practice.¹ Contraindication to Word Catheter placement is latex allergy; if no Latex-Free Word catheters are available, the loop technique is preferred (see below).

Required equipment: Figure 3.

- Non-sterile gloves, eye protection
- Antiseptic solution (povidone iodine 10%)
- Local anaesthetic (1%–2% lidocaine with epinephrine)
- 30G needle with 5 mL syringe (lidocaine injection)
- Word catheter (or Penrose drain if unavailable)
- No. 11 scalpel
- Gauze pads, small forceps, haemostats
- Bacterial swabs (if indicated).

Steps:¹

1. Test Word catheter balloon with 3 mL saline, then deflate but leave syringe attached [Figure 4]
2. Place the patient in the dorsal lithotomy position
3. Prep area with iodine
4. Infiltrate local anaesthetic at the planned incision site (5 or 7 o'clock position)
5. Make a 5 mm vertical incision into the cyst/abscess at the most fluctuant point [Figure 5]
 - *Tip:* Keep the incision small to reduce the risk of catheter falling out.
6. Insert deflated catheter into cyst cavity. Inflate balloon with 2–4 mL saline [Figure 6]

7. Tuck the catheter into the vagina for comfort⁵
2. Loop (Penrose) Drain: If Word catheter is unavailable or if patient has a latex allergy, a Penrose or Foley drain can be used [Figures 7 and 8].
Steps:¹
 1. Make two small (<1 cm) mucosal incisions within the abscess. One incision medially, over the point of fluctuance and the other slightly lateral. Stay within the soft tissue of the vaginal mucosa rather than venturing into the tougher external vaginal skin
 2. Pass the drain through the tunnel with haemostats
 3. Tie ends together or use suture to secure the ends and form a loop

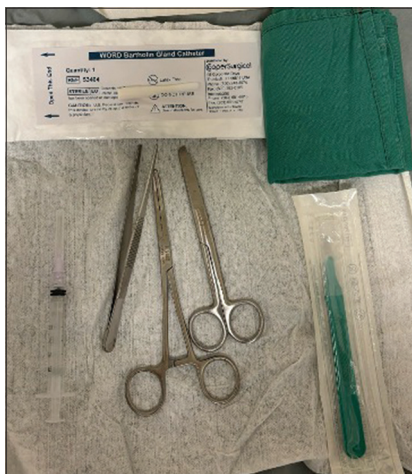


Figure 3: Bartholin drainage and Word catheter supplies.

FOLLOW-UP AND AFTERCARE

- The catheter typically remains in place for approximately four weeks to allow for epithelialisation of the new tract.¹ Earlier expulsion is acceptable if it falls out on its own before this
- Avoid sexual activity until healed
- Return in 4 weeks for removal and assessment
- Monitor for cellulitis; antibiotics may be considered for Gram-negative and anaerobic coverage.^{6,7}

ADDITIONAL CONSIDERATIONS

- Antibiotics – Not routinely required unless cellulitis, immunocompromise, methicillin-resistant *Staphylococcus aureus* risk factors or systemic symptoms present^{6,7}



Figure 4: Testing the Word catheter.



Figure 5: Vertical 5 mm incision into Bartholin gland abscess.

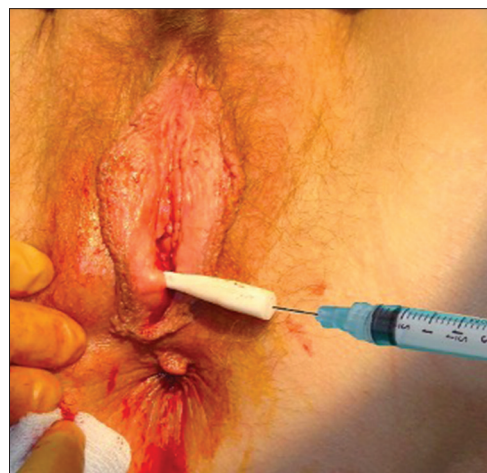


Figure 6: Word catheter placement and insertion.

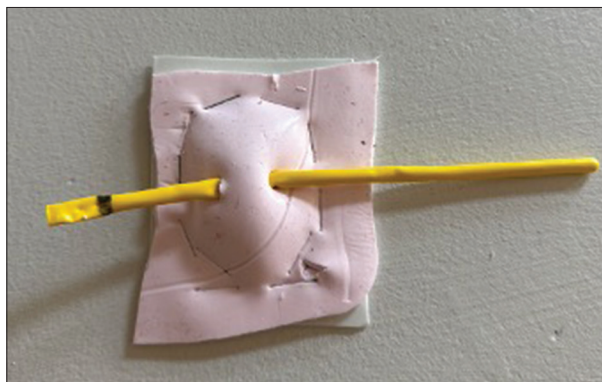


Figure 7: Insertion and placement of a Word catheter substitute.

- Sexually transmitted infection testing – Urine testing for gonorrhoea/chlamydia recommended
- Marsupialisation – For recurrent cases (≥ 3)
- Biopsy – If malignancy suspected (OB/GYN referral)
- Complete excision – For persistent or complicated cases⁴
- Pregnancy or antiplatelet agents – pregnant patients have increased vascularity and thus higher bleeding risk.⁸ People on antiplatelet agents also have increased bleeding risk, and the provider should be equipped to deal with this before pursuing treatment.⁹

WHEN TO REFER (CRISP CRITERIA BY LEAD AUTHOR)

Refer to gynaecology or rural generalist surgeon when:

- Complicated: The case is complicated or non-resolving infection⁵
- Recurrences: Recurring ≥ 3 times^{1,7}
- Intervention: Additional intervention (such as surgery/marsupialisation) is warranted^{2,8}
- Suspicion: Suspicious of malignancy¹
- Procedure: Procedure required that cannot be completed in the clinic/requires specialist care.^{2,8}

CONCLUSION

This protocol highlights a cost-effective, evidence-based approach to Bartholin's abscess management that is particularly well-suited to rural and emergency care settings where resources may be limited. Word catheter placement remains one of the most effective methods for managing Bartholin abscesses in the short and long term.¹ When performed with proper technique and accompanied by appropriate patient education,

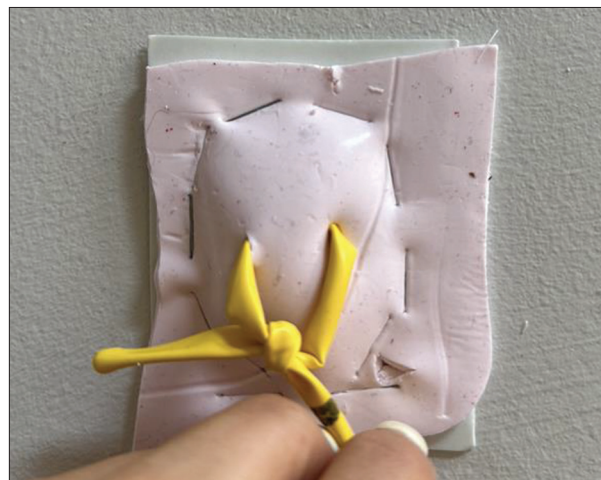


Figure 8: Closed ring and final placement of Word catheter substitute.

this procedure significantly reduces recurrence. Empowering rural physicians with this practical skill not only ensures timely symptom relief but also decreases the need for specialist referral, ultimately providing care closer to home.

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Erratum: Recharged

In the article titled Recharged, published on page 117, Issue 3, Volume 30 in Canadian Journal of Rural Medicine,^[1] there was an error: the name of Dr. Sarah Giles, co-chair of Rural and Remote Medicine 2025 was written incorrectly as Dr. Sarah Lesperance on page 117, 1st column, 5th line of 1st paragraph.

The correct name of the co-chair should be read as “Dr. Sarah Giles”

Réénergisés

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Dans l'article intitulé Réénergisés, publié sur la page 118, numéro 3, volume 30 de la Revue canadienne de médecine rurale,^[1] il y avait une erreur : le nom de la Dre Sarah Giles, coprésidente de Rural and Remote Medicine 2025 était écrit incorrectement comme étant Dre Sarah Lesperance à la page 118 première colonne, 7^e ligne du premier paragraphe

Le nom correct de la coprésidente doit être lu comme « Dr Sarah Giles »

REFERENCE

1. Parker GG. Recharged. Can J Rural Med 2025;30(3):117-8

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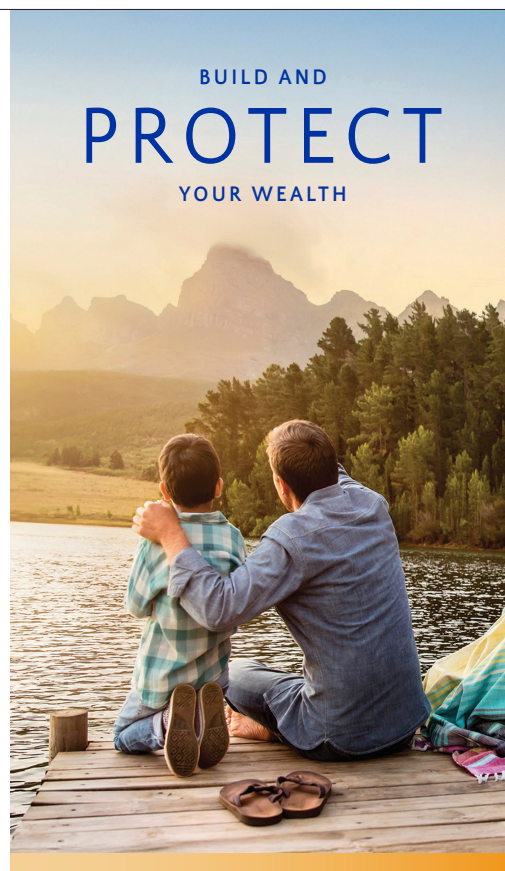
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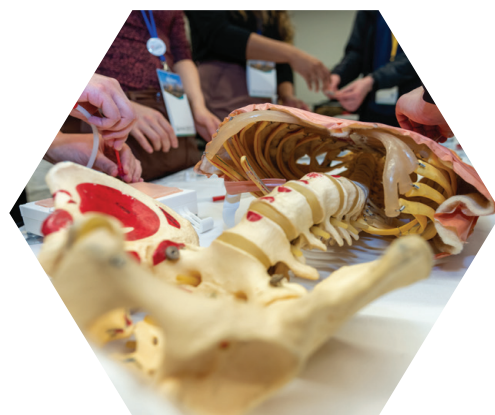
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