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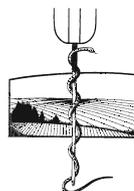
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Credential creep and rural generalist practice

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Do you need a CCFP(EM) to work in a rural emergency department? Yes, you do, is the unwritten curriculum that our undergraduates and family medicine residents receive at the foot of ivory towers.

No wonder, as, over the last 30 years, most Canadian urban emergency departments have become staffed entirely with CCFP(EM)s or Royal College Fellows. And yet neither of those 2 classes of specialist are the predominant provider seen in rural and remote parts.

The vast majority of physicians working in rural and remote emergency departments have always been rural generalist physicians. In Canada, that represents thousands of doctors. Even if most emergency medicine graduates locate in rural areas for the next 30 years, it is unlikely that the majority provider for rural emergency medicine will be anything other than the generalist physician. That's a good thing. The predominant rural provider needs to be a generalist.

There is nothing quite like generalism to support continuity of care, with known outcome benefits to patients, physicians and the system (with attendant reduced costs). We need more people trained in this mode, and preferably in rural settings.

Whatever the strengths CCFP(EM)s may offer for an urban emergency department, they may not be confident in the resource-poor rural emergency department (what, no magnetic resonance imaging machine?) or be able to

deal with other aspects of rural generalist practice. This would include looking after the patient they admitted, after the patient has been sent to an inpatient bed (what, no internist to take over care?). These might be some of the reasons why the vast majority of emergency medicine graduates work urban and near urban.

Yet there is the fact that new family practice graduates, and particularly urban ones, may have limited training or confidence to work in a rural practice of any type. Are they safe? Probably, although without having a family practice curriculum that specifies and tests for rural competencies, it's hard to know. We need that curriculum, and soon, to support our assertion that rurally trained generalists are qualified to undertake the scope of practice that our communities need.

I suspect that the challenge of entering practice has always been a challenge for new graduates, regardless of credentials; that when you became a new rural doctor (unless you lacked insight), you were unsure, you were slow, and you frequently asked for help from more experienced colleagues and allied health care professionals. It's that support, that mentorship, that has been informally present that allows for safe practice until the new doctor gets up to speed.

My experience is that credentials are, regrettably, poor proxy for competency. Mentorship and the ability to work with a supportive team is what makes you safe in rural practice.

La médecine générale rurale et la tyrannie des titres

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Avez-vous besoin de détenir un CCMF(MU) pour travailler aux services d'urgence en milieu rural? Oui, c'est le message implicite que nos étudiants et résidents en médecine familiale reçoivent à l'ombre des tours d'ivoire.

Ce n'est pas étonnant puisque depuis 30 ans, les effectifs médicaux de la plupart des services d'urgence urbains canadiens détiennent désormais leur CCMF(MU) ou sont Associés du Collège Royal; or, dans les faits, les principaux fournisseurs de services en régions rurales et éloignées n'appartiennent ni à l'une ni à l'autre de ces deux classes de spécialistes.

En effet, la grande majorité des médecins qui travaillent dans les services d'urgence des régions rurales et éloignées ont toujours été des médecins généralistes ruraux. Au Canada, cela représente des milliers de médecins. Et même si une majorité de diplômés en médecine d'urgence s'installait en région rurale pendant les 30 prochaines années, il est peu probable que la majeure partie des médecins des services d'urgence ruraux soient autre chose que des généralistes. Et c'est très bien comme ça, car le principal fournisseur de services en milieu rural doit être un généraliste.

Il n'y a rien comme la médecine générale pour assurer la continuité des soins, avec les avantages que cela comporte sur le plan des résultats pour les patients, les médecins et le système (et tout cela à moindre coût). Il nous faut plus de gens formés de cette façon et préférablement en milieu rural.

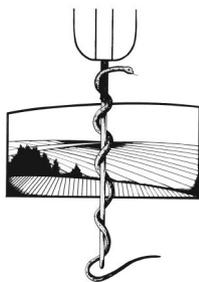
Peu importe l'aura du titre de CCMF(MU) dans un service d'urgence urbain, la confiance risque de ne pas être au rendez-vous dans un service d'urgence rural aux maigres ressources (« Quoi, pas d'appareil à résonance magnétique? »), ou

alors d'autres aspects de la pratique généraliste en milieu rural poseront problème, par exemple, le fait de devoir s'occuper du patient hospitalisé une fois admis (« Quoi, pas d'interniste pour la suite? »). Voilà quelques-unes des raisons qui pourraient expliquer pourquoi la grande majorité des diplômés en médecine d'urgence travaillent en milieu urbain ou périurbain.

Bien sûr, les nouveaux diplômés en médecine familiale, particulièrement des milieux urbains, ont peut-être une formation limitée ou moins d'aisance lorsqu'il est question d'exercer en milieu rural, quel que soit le type de pratique. Mais sont-ils dignes de confiance? Probablement, mais faute d'un programme de médecine familiale axé spécifiquement sur les compétences rurales, examens à l'appui, on peut difficilement le savoir. Nous avons besoin dans les meilleurs délais d'un programme qui s'harmonise à notre prémisses selon laquelle les généralistes formés en milieu rural sont qualifiés pour répondre à l'ensemble des besoins de nos communautés.

Selon moi, peu importent les titres et les formations, c'est toujours un défi de commencer à pratiquer la médecine pour les nouveaux diplômés; et lorsque vous commencez à exercer en milieu rural (à moins d'être totalement incapable d'introspection), vous manquez d'assurance, vous êtes lent et vous demandez souvent l'aide de vos collègues et autres professionnels de la santé plus expérimentés. C'est cet esprit d'équipe, ce mentorat, qui ont toujours existé et permettent une pratique sécuritaire jusqu'à ce que le nouveau médecin ait pris de l'assurance.

Selon mon expérience, les lettres qui s'ajoutent au bout d'un nom ne sont pas gages de compétences. Le mentorat et le travail d'équipe, c'est ce qui rend la pratique en milieu rural sécuritaire.



President's message. Worth the price of admission?

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The Society of Rural Physicians of Canada (SRPC) celebrates 25 years of existence in 2017. However, our membership is shrinking. We currently have roughly 3000 members on our roster, 2000 of whom are students and residents, and the remainder, practising rural physicians. Only half of the physicians registered as members have paid their fees for 2017.

To continue our work we need to expand our paying membership. Here is where your membership money goes:

- Administration: We have a skeleton administrative staff of 4, which is augmented as needed (e.g., Rural and Remote [R&R] Medicine course). The staff manage all society communications, organize and run continuing medical education (CME) events, keep track of the finances and support the work of the following programs:
 - CME events: R&R Medicine course, Critical Care courses and mini R&R course, which provide practical, acclaimed CME for rural physicians.
 - Student and Resident Committees: Promote interest in rural medicine at a university level and keep their membership informed about initiatives across the country.
 - Specialist Committee: Works to defend the provision of specialty services in rural Canada. There are about 1000 specialists in rural Canada; our membership is only a fraction of that.
- ER Committee: Has collected data to defend against those who advocate for all emergency department physicians in Canada to have EM or FRCP certification. This includes the College of Physicians and Surgeons of Ontario, who are contemplating implementing "change of scope" regulations that would require all but "grandfathered" physicians working in Ontario emergency departments to have EM or FRCP designations.
- International Committee: Projects in Afghanistan, Zimbabwe, Ethiopia, Nepal and the Philippines. In the last 2 countries, our efforts have been instrumental in the formation of rural medical schools.
- Maternity and Newborn Care Committee: Recently rebutted an article in *CMAJ* that suggested that rural physicians were missing pregnancy-induced hypertension in their populations.¹
- Research Committee: Promotes acquisition of data to dispel myths about maintenance of competency, scope of practice and other threats to the level of care that we can provide our patients.
- *CJRM*: If you read it, you will know why.
- RuralMed ListServ: An open internet forum providing mentorship, moral support, advice and practice tips to rural docs who connect from across rural Canada through email.
- Collaborations: Rural Surgery and Operative Delivery (Enhanced

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Surgical Skills) initiative; Advancing Rural Family Medicine, Rural Road Map for Action; Postgraduate Medical Education Collaborative Governance Council; Canadian Medical Forum.

These activities all require funding from the SRPC. Our coffers are rapidly running dry. The SRPC plays an important role in defending rural doctors and medical services on regional, provincial and

national levels. I ask: Is this worth the price of admission (membership)?

www.srpc.ca/secure/srpc_membership_apply.cfm

REFERENCE

1. Lespérance S, Miller K, Dworkin R, et al. Maternal morbidity and perinatal outcomes in rural versus urban areas [letter]. *CMAJ* 2016; 188:1261-2.

Message du président. Cela vaut-il le prix de l'adhésion?

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La Société de la médecine rurale du Canada (SMRC) célèbre ses 25 années d'existence en 2017. Or, le nombre de membres diminue. Nous comptons actuellement environ 3000 adhérents, dont 2000 sont des étudiants et des médecins résidents, et les autres, des médecins exerçant en milieu rural. Seulement la moitié des médecins inscrits comme membres ont acquitté leurs droits d'adhésion pour 2017.

Pour poursuivre notre travail, nous avons besoin d'élargir notre base d'adhérents. Voici où vont les droits d'adhésion :

- Administration : Notre personnel administratif ne comprend que 4 personnes; ce nombre peut augmenter au besoin (p. ex., cour de médecine en régions rurales et éloignées [RRÉ]). Le personnel gère toutes les communications de la Société, organise et encadre les activités de formation médicale continue (FMC), gère les finances et appuie le travail des secteurs suivants :
 - Activités de FMC : Cours de médecine RRÉ, cours de soins intensifs et mini-cours RRÉ, qui fournissent une FMC concrète et très appréciée des médecins en régions rurales.
 - Comités des étudiants et des

médecins résidents : Stimulent l'intérêt pour la médecine en milieu rural au niveau universitaire et tiennent leurs membres informés des initiatives les concernant partout au pays.

- Comité des spécialistes : Travaille à promouvoir l'offre de services de médecine de spécialité au Canada rural. On dénombre environ 1000 spécialistes en région rurale au Canada; nos membres n'en constituent qu'une fraction.
- Comité pour la médecine d'urgence : A recueilli des données afin de s'opposer à ceux qui militent pour que tous les médecins des services d'urgence au Canada acquièrent une certification MU ou CCMF. Cela inclut le Collège des médecins et chirurgiens de l'Ontario, qui envisage l'application de règles visant un « changement de portée » exigeant de tous les médecins exerçant dans les services d'urgence ontariens (sauf ceux qui ont des droits acquis) d'acquérir leur certification MU ou CCMF.
- Comité international : Projets en Afghanistan, au Zimbabwe, en Éthiopie, au Népal et aux Philip-

pines. Dans ces 2 derniers pays, nos initiatives ont contribué à la formation d'écoles de médecine rurale.

- Comité pour les soins obstétricaux et néonataux : A récemment répliqué à un article du *CMAJ* selon lequel les médecins en milieu rural passaient à côté de certains cas d'hypertension gravidique dans leurs populations¹.
- Comité pour la recherche : Encourage l'acquisition de données pour déboulonner certains mythes entourant le maintien des compétences, la portée de la pratique et autres menaces à la qualité des soins que nous pouvons offrir à nos patients.
- *CJRM* : Si vous le lisez, vous savez pourquoi.
- RuralMed ListServ : Forum ouvert en ligne qui offre par courriel du mentorat, un soutien moral, des conseils et des trucs pratiques aux médecins en milieu rural dans tout le Canada rural.
- Collaborations : Initiative portant sur la chirurgie

et l'accouchement par césarienne en milieu rural (compétences chirurgicales avancées); avancement de la médecine familiale rurale, *Rural Road Map for Action*; Conseil de gouvernance collaborative en éducation médicale postdoctorale; Forum médical canadien.

Ces activités dépendent toutes du financement de la SMRC. Nos coffres se vident rapidement. La SMRC joue un rôle primordial dans la défense des médecins et des services médicaux en milieu rural à l'échelle des régions, des provinces et du pays entier. Je vous le demande : est-ce que tout cela vaut le prix de l'adhésion?

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RÉFÉRENCE

1. Lespérance S., Miller K., Dworkin R. et coll., Maternal morbidity and perinatal outcomes in rural versus urban areas [lettre]. *CMAJ* 2016;188:1261-2.

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

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

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Factors influencing choice to practise in rural and remote communities throughout a physician's career cycle

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This article has been peer reviewed.

**For complete affiliations, see the end of the article.*

Introduction: Although a large portion of the Canadian population lives in rural areas, there remains a deficit in the number of family physicians serving these populations. We explored the factors that influence a family physician's decision to work in rural/remote communities in order to identify strategies that may aid in the recruitment and retention of family physicians to such communities.

Methods: Qualitative study using a participatory research approach. Interview questions were developed based on a literature search of factors influencing family physicians' decisions to practise in a rural/remote location. Semistructured interviews were conducted with rural physicians from across Canada to identify influential factors, and subsequent thematic analysis was performed. Responses to the interview questions were categorized into 3 main themes: factors influencing physicians to work in rural locations, factors influencing physicians to leave or avoid rural practice, and strategies for improving recruitment and retention.

Results: Seventeen interviews were conducted; saturation was achieved after 12. A wide scope of practice and rural training exposure were important factors in encouraging physicians to practise in rural/remote areas. The biggest challenges were issues relating to family and spousal support, ability to attend continuing professional educational opportunities and ability to connect with specialists and tertiary care centres.

Conclusion: Effective strategies are required to increase family physician recruitment to rural communities. Our results provide several strategies for addressing low rates of recruitment and retention of family physicians in rural/remote communities, including, but not limited to, providing opportunities for professional development and having a supportive work environment.

Introduction : Bien qu'une partie importante de la population canadienne vive en milieu rural, il y a un nombre insuffisant de médecins de famille pour servir cette population. Nous avons tenté de déterminer les facteurs qui incitent les médecins de famille à travailler en région rurale et éloignée afin de proposer des stratégies susceptibles de favoriser le recrutement et le maintien en poste de médecins de famille dans ces localités.

Méthodes : Nous avons procédé à une étude qualitative à l'aide d'une approche de recherche participative. Les questions d'entrevue ont été élaborées à la suite d'une recherche documentaire sur les facteurs qui incitent les médecins de famille à exercer en milieu rural et éloigné. Des entretiens semi-structurés ont été menés auprès de médecins de régions rurales partout au Canada afin de cerner les facteurs d'influence et soumettre ensuite ces derniers à des analyses thématiques. Les réponses aux questions d'entrevue ont été divisées en 3 thèmes principaux : facteurs qui incitent les médecins à travailler en milieu rural; facteurs qui incitent les médecins à quitter la pratique en milieu rural ou à l'éviter; et stratégies d'amélioration du recrutement et du maintien en poste.

Résultats : Dix-sept entretiens ont été réalisés et la saturation a été atteinte après 12 entretiens. Le vaste champ de pratique et l'exposition à la formation rurale étaient des facteurs importants de la décision des médecins d'exercer en région rurale et éloignée. Les principales difficultés étaient liées au soutien de la famille et du conjoint ou de la conjointe, à la capacité de participer à la formation continue, et à la capacité de contact avec des spécialistes et des centres de soins tertiaires.

Conclusion : Nous avons besoin de stratégies efficaces pour accroître le recrutement de médecins de famille dans les localités rurales. Nos résultats offrent plusieurs stratégies pour s'attaquer aux faibles taux de recrutement et de maintien en poste, notamment le fait de bénéficier d'occasions de formation continue et de milieux de travail favorables qui offrent du soutien.

INTRODUCTION

Considering that over a third of Canada's population lives in rural areas,¹ it is assumed that the proportion of family physicians in these areas reflect the same statistic. However, according to a 2012 Canadian Institute for Health Information report, less than 15% of Canada's family physicians are practising in rural towns.² Although the ratio of physicians to patients in this country is remarkably low (2.1 per 1000 in 2013),³ the ratio is approximated to be much lower for rural Canadians (0.8 per 1000).³ The proportion of rural Canadians without access to a family physician is very high. Attracting family physicians to practise in rural locations is a challenge worldwide and is not just a Canadian problem.⁴

There are several factors that influence the recruitment and retention of physicians to rural communities. Factors that are most often cited include pay factors, professional factors and work factors.⁵⁻⁹ However, the relative importance of these factors is not consistent throughout the literature.^{9,10} Given these discrepancies, it is important to investigate the reasons behind why and when certain factors become more influential than others. As the first Canada-wide qualitative study, this project investigated the influence of factors by speaking directly with physicians who have rural experience from across the country. Although qualitative research has been performed within specific provinces, this Canada-wide perspective will add more depth to the current level of research and will assist with the development of multiple strategies that can be targeted to specific and appropriate circumstances in order to optimize the number of family physicians working in rural and remote communities of Canada.

The objective of this study was to explore factors that influence Canadian family physicians' decisions to work in rural and remote communities through qualitative analysis. We interviewed family physi-

cians with experience in such communities and analyzed their responses to identify themes that are associated with the benefits and disadvantages of practising in a remote or rural location.

METHODS

We employed a qualitative study design using a participatory approach. An iterative feedback process was used to ensure consensus was reached among study team members (researchers and stakeholders) with regard to interview guide development and participant recruitment as well as data collection and interpretation. Stakeholders in this study included rural family physicians and the Advancing Rural Family Medicine Canadian Collaborative Taskforce, comprised of representatives from the College of Family Physicians of Canada and the Society of Rural Physicians of Canada. Once the data were collected and interpreted, we performed member checking to validate the findings.

Interview guide development

We carried out a comprehensive literature search, guided by a librarian, to collect information regarding factors influencing family physicians' decisions to practise in a rural and remote location (see Box 1 for a sample of search terms used in electronic databases of indexed citations). Based on these themes, we developed a list of relevant interview questions. A common agenda was established between stakeholders and researchers by sending a draft of the interview materials (interview guide, introductory email, accompanying documents) to the study team to review. We used a Delphi method to achieve consensus with regard to the content, composition and length of the interview materials. This involved 4 rounds of telemeetings and multiple interview guide revisions before all groups were satisfied with the finished product.

Interview guide testing and interviewer training

The interview guide was initially tested on 2 rural physicians. After the pilot interviews were completed, these participants were asked to provide feedback on the question order and content. The pilot interviews also allowed for the interviewers to familiarize themselves with the interview flow and adjust its structure as necessary.

Participant recruitment and data collection

A list of rural family physicians was generated via purposeful sampling by regions of Canada (West, East, North and Quebec), sex (male, female) and career phase (early [< 5 yr], mid [5–15 yr] and late [> 15 yr]). Physicians were deemed eligible for the study if they had experience working as a family physician in a rural area (population less than 10 000)⁸ or remote area (an area where there is no road access or where road access to a hospital is more than 6 hours by road) location which was defined by the study team.

We sent eligible physicians the introductory email a maximum of 6 times at 2-week intervals or until a response was received. The email consisted of a consent and confidentiality form and a document requesting availability and contact information. As participants were recruited, we used a snowballing technique to identify other physicians that might be eligible for the study.

Interviews and data analysis

Two investigators with extensive experience in qualitative interviews performed telephone inter-

views. Each interview was transcribed verbatim with the use of Express Scribe by 2 research assistants. The transcriptions were then reviewed for themes independently by 3 members of the research team, who later compared their results. Any discrepancies among the 3 reviewers were discussed and resolved through consensus.

Collaborative interpretation

Once common themes were identified through thematic analysis, we used the Delphi method in a series of weekly teleconferences with stakeholders. The purpose of these teleconferences was to clarify and organize themes and subthemes, and to ensure key focus areas were accurately identified and organized. Any disagreements between the stakeholders and researchers were addressed by reviewing and reorganizing the themes and key focus areas during teleconferences. Consensus was achieved after 3 rounds.

Member checking

To ensure the accuracy and completeness of the thematic analysis and that key information was not missed, we emailed participants a summary of the study's main findings. The email was sent to participants 3 times, and it was requested that they review the material and provide feedback if anything was inaccurate or missing.

Ethics approval

The study was approved by the Newfoundland and Labrador Health Research Ethics Board.

RESULTS

From the literature review a total of 150 factors were identified, which were subsequently categorized into 11 themes: personal factors, health factors, family factors, training factors, practice factors, work factors, professional factors, pay factors, community factors, regional factors and system/legislation factors.

Overall, 17 interviews were conducted; saturation was achieved after 12. Five additional interviews were conducted after saturation to make sure all key informant groups were included (Table 1) and to further examine the differences found in the participants' responses.

Of the 68 family physicians who were contacted, 17 (25%) participated in the interview. Most of the

Box 1. Search terms used in PubMed search engine for literature review.

(((((factor OR factors OR decision OR decisions OR incentive OR incentives OR influenc* OR motivation)) OR (((("Attitude of Health Personnel"[Mesh]:NoExp) OR "Motivation"[Mesh]) OR "Career Choice"[Mesh]))) AND (((((retention OR recruitment OR retain* OR turnover OR "turn over" OR selection) OR (((("Personnel Selection"[Mesh]) OR ("Physician Incentive Plans"[Mesh] OR "Health Manpower"[Mesh]))) AND (((("Rural Population"[Mesh] OR "Rural Health Services"[Mesh] OR "Rural Health"[Mesh] OR "Hospitals, Rural"[Mesh]) OR "Medically Underserved Area"[Mesh])) OR (remote OR rural OR isolated))) AND ((((((Physicians, Family"[Mesh]) OR "General Practitioners"[Mesh]) OR "Family Practice"[Mesh]) OR "General Practice"[Mesh])) OR ("family physician" OR "family physicians" OR GP OR "general practitioner" OR "general practitioners" OR "family doctor" OR "family doctors" OR "family practitioner" OR "family practitioners"))))

physicians who participated had a full licence ($n = 16$), were married ($n = 10$), had children ($n = 13$) and lived where they practised ($n = 15$). About half ($n = 9$) of the participants grew up in a rural community/region (Table 2).

After analysis of the interviews, responses to the interview questions were categorized into 3 main themes: attractive factors influencing physicians to work in rural locations, deterring factors influencing physicians to leave or avoid rural practice, and strategies for improving recruitment and retention.

Attractive factors influencing physicians to work in rural locations

Physicians identified several reasons for choosing rural over urban practice, including the ability to practise a wide scope of skills, opportunities to work in both hospital and community health settings, and the possibility of continuity of care throughout a patient's life. It was also mentioned that previous educational or life experiences in rural locations had an influence on their decision to practise rurally.

"The reason I like rural is because I grew up with it. I like the independence of it."

Those who enjoyed nature and being outdoors found rural practice to be attractive. However, the importance of spousal agreement to settle rurally and the possibility of spousal employment were noted. There was some disagreement surrounding

Table 1: Purposeful sampling information

Variable	No. of participants ($n = 17$)
Region	
East	5
Quebec	2
North	2
West	8
Sex	
Female	8
Male	9
Career phase	
Early (< 5 yr)	6
Mid (5–15 yr)	4
Late (> 15 yr)	7
Age group, yr	
< 40	5
40–65	9
> 65	3

financial incentives, as some physicians were enticed by these benefits, but others stated that pay incentives alone were not enough to encourage a move to a rural location.

"I think a lot of people when they think of recruitment they think of the money that comes attached to it. ... Which ... don't get me wrong ... it doesn't hurt ... but I don't think that people who do not have it in their hearts to work rurally will ... be swayed to come rurally just because of money."

Attractive factors mentioned that related to success and retention in rural practice included access to continuing education and professional development opportunities as well as being reimbursed for associated travel expenses, collegial support in a positive working environment, a strong practice team and an accommodating health care system.

In addition, participants indicated that factors associated with the community itself can have a profound impact on a physician's decision to practise rurally. Community traits that participants considered attractive included being very welcoming and appreciative of the services a physician provides and having members who respect the workload and responsibilities of a rural family physician.

Table 2: Demographic characteristics of the participants

Characteristic	No. of participants
Licence type	
Full	16
Provisional	1
Marital status	
Single	4
Married	10
Divorced	3
Children	
Yes	13
No	4
Childrens' age at time of interview*	
Young	2
Adolescent	1
Adult	11
No children	4
Grew up in rural region	
Yes	8
No	9
Live in community of their practice	
Yes	15
No	2

*One physician had both young and adolescent children.

“The vast majority of people are very caring and supporting of other people within that community, and that’s something ... I’ve never perceived living in the larger cities.”

A community that provides a good level of security and privacy, while at the same time maintaining a sense of intimacy, were other factors that participants expressed as being attractive traits for a community.

Deterring factors influencing physicians to leave or avoid rural practice

Study participants mentioned that, although proximity of amenities (e.g., clinic, grocery store, school, arena) within the community itself was sometimes considered to be a benefit, travelling long distances to visit family and access large-centre amenities (e.g., hospitals, entertainment centres) was expensive and difficult (owing to weather, airport location, remuneration for travel).

“So I think that’s a challenge for sure, especially for docs who live in the country and may be a little distance from the hospital and have to get on a bad highway in the winter.”

As a result of being far from tertiary care centres, access to specialists and allied health care professionals was also discouraging when contemplating rural practice. Similarly, being far from training sites made attending continuing medical education sessions difficult.

It was also mentioned that specialists often assume that rural family physicians do not have the skill set that is required to perform certain procedures or to resolve certain issues, which can be disheartening. Burnout and feeling overburdened were mentioned as symptoms that occur when working in rural practice, where physicians said they are often exposed to high staff turnover and long work hours.

Participants who had experience practising in a rural location voiced their struggles with maintaining a social life, losing anonymity and maintaining healthy personal–professional boundaries. In addition, the lack of extracurricular activities and entertainment in rural locations was a challenge for physicians and their families. Participants who had left rural practice stated that their primary reasons for leaving were related to their personal life, specifically spousal employment, education and personal development opportunities for their children, dissolution of marriage/relationships and distances from other family members. Another reason for leaving rural practice involved cultural or language barriers,

which made it difficult for physicians to communicate with or understand their patients. Finally, 1 participant mentioned that the lack of spiritual or cultural centres available in a rural community made it difficult to celebrate religious ceremonies with the family.

Strategies for improving recruitment and retention

Participants noted a number of strategies that they felt could help improve recruitment and retention in rural practice (Fig. 1). Enhancing collegial and personal support systems was mentioned as a possible strategy to improve both recruitment and retention of rural physicians. Participants considered having a supportive team of physicians that help manage the workload often found in underserved areas as being fundamental in rural practice. Having support from a fellow physician to help with community integration and navigation was also mentioned as a means of making the transition into rural practice less jarring.

“We also have a very supportive hospital and a supportive hospital board. I know of other communities where the hospital boards can be very antagonistic towards their medical staff ... and we don’t have situations like that at all. ... We get along well with our staff and we are well supported.”

Other strategies mentioned addressed recruitment and retention independently. Rural exposure during medical school and residency was one strategy mentioned to improve recruitment, along with selecting medical students who are originally from rural and remote areas on medical school enrolment (Table 3). A few participants felt that exposing trainees to rural medicine early, through undergraduate

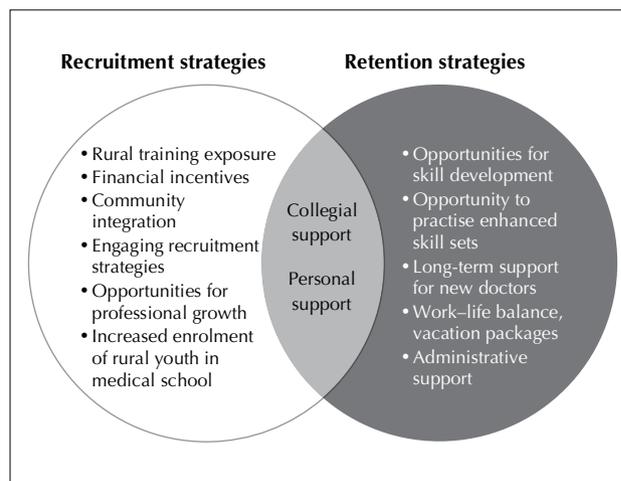


Fig. 1. Strategies that participants felt could help improve recruitment and retention in rural practice.

Table 3: Strategies mentioned for training residents and medical students to be a rural physician

Strategy	Description
Early rural exposure	Undergraduate training is important
Community integration	Find ways to involve learners in the community during training
Competencies	Specific competencies that target rural and remote skills
Supportive training environment	Encouraging preceptors; supportive faculty

training, was vital in increasing the number of students who consider rural practice as a career.

“We need to train physicians in the location that best approximates their future practice. So, if it’s a rural-remote, then you train in a rural-remote setting.”

Similarly, a few physicians felt that mandatory rotations in rural areas were beneficial to rural physician recruitment, since they exposed rural medicine to those who had not previously considered it. However, 1 participant disagreed with the concept of mandatory rotations, feeling that it could lead to animosity.

Some participants recommended selecting trainees who demonstrate specific skills required for rural practice, which may lead to a more positive experience during a rural rotation. Other training factors that encourage rural recruitment mentioned by participants included a supportive training environment with encouraging mentors and involving trainees in the social aspects of rural life such as community events and activities.

Although financial remuneration was considered beneficial for recruitment, participants indicated that it does not often promote retention to the area.

“Communities don’t want physicians who are there for the money. They want physicians who will come and who will stay.”

Some participants stated that having someone who actively recruits physicians to the community would attract more physicians to rural and remote areas. This person could help the physician become integrated into the community and could be available for ongoing support. The recruitment process should engage more trainees, rather than using a passive approach, in the hopes of building relationships and improving recruitment opportunities. Participants also mentioned that health agency websites and provincial registries should ensure that job postings are current and up-to-date.

“I think the people that end up being the recruiters don’t really get the personal factors that are going to get someone to move to a community. I think they waste a lot of time on flashy adverts and this and that, but what they really need to do ... [is], they just need to sit down ... and develop a personal relationship with each of the [physicians].”

A few participants mentioned that, similar to having a recruitment coordinator, having temporary housing arranged for them before their arrival would help reduce the stress of moving to a new community.

Retention strategies that were mentioned by participants that are focused toward their professional needs were opportunities for skill development, support through mentors and a working environment that promotes teamwork and mutual support. In addition, quality administrative support in clinic was also deemed a beneficial retention strategy.

“I think collaborative colleagues who sit down together on a regular basis and make decisions together so you don’t have a physician or two that’s isolated ... [that] can make retention very difficult so I think a cohesive group of physicians is a huge retention factor.”

Enabling enough time for personal leave, having a healthy work–life balance, providing adequate education for children and providing employment opportunities for spouses were all factors considered to play a crucial role in long-term physician retention. Several recruitment and retention strategies are summarized in the following quote:

“A stable physician group would help to keep people there. ... Colleagues who will support you and mentor you. Certainly, having a spouse that’s happy here and the kids are happy. A hospital that it’s easy to work in, that there’s not a lot of politics.”

Member checking

Member checking resulted in 4 physicians’ providing positive feedback in response to an email sent to all participants that included a 2-page summary of the study and its findings.

DISCUSSION

The interviews conducted with Canadian family physicians showed that personal and community support as well as rural exposure during training were important factors in encouraging physicians to spend their career in a rural location. Furthermore, having a supportive work environment can help prevent burnout and ultimately staff turnover.

Personal factors such as family and spousal support and having a personality conducive to a rural lifestyle were also found to contribute to physician retention. There was some level of disagreement regarding financial incentives such as recruitment bonuses or higher salaries: some participants found these to be appealing, whereas others thought they would not solve long-term retention problems. The distance to larger centres was found to be one of the bigger obstacles for physician retention since all aspects of a physician's life, including maintaining relationships with family members, professional development and connecting with specialists and tertiary care centres, are affected by this distance. Lack of anonymity and having difficulty maintaining a social life outside of work were also cited by participants as being challenges associated with rural practice. Participants felt that problems with recruitment and especially retention can be mitigated through efforts made by the community to make physicians feel welcomed, integrated and respected.

Our results are in agreement with those of other investigators. The 3 most commonly cited factors found in the literature deal with issues related to salary and whether it can be used as an effective tool for both initial recruitment and long-term retention,¹¹ opportunities for professional development¹² and working environment.¹⁵ These factors were also identified by the 2013 National Physician Survey, which showed that rural family physicians are less likely than their urban counterparts to be satisfied with their work-life balance and that the top 6 improvements to motivate rural family physicians are opportunities for continuing medical education/continuing professional development (52%), availability of locums (46%), more reasonable workloads (46%), access to hospital facilities/services (45%), ability to reduce on-call duties (38%) and more multidisciplinary support (10%),¹⁴ all of which were highlighted by our participants. Other research on the effectiveness of pay incentives also shows that if such incentives were offered independently of other factors, money alone would not persuade physicians to practise rurally.^{15,16} Opportunities for professional development and a positive work environment were both well-documented factors influencing a physician's decision to work in a rural location in our literature review¹⁷ and were also noted as being important by our participants. The influence of being raised in a rural area has also been highlighted in the literature.⁹ This factor was identified in 25% of the articles included in our literature review. In our qualitative interviews, some physicians agreed that being raised

in a rural town was somewhat important, but this was not one of the most influential factors mentioned.

Limitations

Our results should be interpreted in light of the limitations associated with qualitative research, particularly when extending its implications to physicians across Canada. However, value and validity were added through the use of a participatory approach, collection of data until saturation and member checking. In future research, the application of quantitative analytical methods and random sampling of physicians from a national database would add to the information on rural recruitment and retention strategies collected in our study.

CONCLUSION

Our findings highlight a number of factors that influence recruitment and retention of family physicians to rural practice. A wide scope of practice, exposure to training in a rural setting, family and spousal support, and enjoyment of a rural lifestyle were considered very important factors for the recruitment and retention of family physicians by our participants. A supportive working environment was also influential, as it helps with initial community orientation and limits the possibility of burnout and turnover. Strategies that enable accessible and frequent continuing education opportunities, in addition to challenging work environments where the necessary tools and amenities are available to successfully complete tasks, are essential to physicians considering rural practice. Future research should investigate these strategies and evaluate their influence on family physician recruitment and retention to rural practice. This approach will ensure that successful strategies are implemented in order to initiate an upward trend in rural practice.

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Country Cardiograms

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Rates of diabetes-related lower-limb amputation in northwestern Ontario: an incidence study and introduction of a standardized diabetic foot ulcer management protocol

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Introduction: First Nations populations in Canada have higher incidence rates of type 2 diabetes mellitus than the general population and also incur more frequent complications, including lower-leg amputation. Patients with diabetes who present with a foot ulcer are at high risk for macrovascular events, with a 5-year mortality rate of up to 50%.

Methods: Using census and health administrative data, we reviewed the incidence of diabetes and rates of diabetes-related lower-limb amputation in 2010–2013 in the catchment area of the Sioux Lookout Meno Ya Win Health Centre in northwestern Ontario, which serves a largely First Nations population. We also describe a novel protocol for the management of diabetic foot ulcers.

Results: The rate of lower-limb amputation was 7 times the Ontario average and was 3 times higher than in other areas of the province. The Sioux Lookout Diabetic Foot Ulcer Protocol supports timely vascular assessment for concurrent peripheral vascular disease in patients with diabetic foot ulcers.

Conclusion: Patients with diabetes in the Sioux Lookout Meno Ya Win Health Centre catchment area appear to undergo below-knee amputation at a rate 3 times greater than in other Ontario regions. Patients with diabetic foot ulcers should be identified as being at high risk for other atherosclerotic events (e.g., myocardial infarction, cerebrovascular accident) and require aggressive risk-management strategies.

Introduction : Au Canada, les peuples des Premières Nations présentent des taux d'incidence de diabète de type 2 plus élevés que la population générale et ils en subissent également davantage les contrecoups, notamment les amputations des membres inférieurs. Les patients diabétiques qui souffrent d'ulcères pédiens sont exposés à un risque élevé de complications macrovasculaires, et à un taux de mortalité à 5 ans pouvant atteindre 50 %.

Méthodes : À partir des données du recensement et des données administratives sur la santé, nous avons établi l'incidence du diabète et les taux d'amputation des membres inférieurs liée au diabète de 2010 à 2013 dans la zone desservie par le Centre de santé Meno Ya Win de Sioux Lookout, dans le nord-ouest de l'Ontario, qui répond aux besoins d'une population en majeure partie autochtone. Nous décrivons aussi un nouveau protocole de prise en charge des ulcères pédiens diabétiques.

Résultats : Le taux d'amputation des membres inférieurs a été 7 fois plus élevé que la moyenne ontarienne et 3 fois plus élevée que dans d'autres régions de la province. Le protocole de Sioux Lookout pour l'ulcère pédiens diabétique permet une évaluation rapide de possibles maladies vasculaires périphériques concomitantes chez les patients présentant des ulcères pédiens diabétiques.

Conclusion : Les patients diabétiques de la région desservie par le Centre de santé Meno Ya Win de Sioux Lookout semblent nécessiter une amputation sous le genou 3 fois plus souvent que les patients d'autres régions de l'Ontario. Les patients qui présentent des ulcères pédiens diabétiques devraient être reconnus comme exposés à un risque élevé à l'égard d'autres complications athéroscléreuses (p. ex., infarctus du myocarde, accident vasculaire cérébral) et ont besoin de stratégies dynamiques de gestion des risques.

INTRODUCTION

A diabetic foot ulcer may at first glance appear to be a limited foot issue, but it may herald a more serious vascular problem and identify patients with diabetes at higher risk for mortality.

The lifetime risk for development of a foot ulcer in patients with diabetes is estimated at 15%–25%.¹ Patients with diabetic foot ulcers constitute a high-risk atherosclerotic population with significant overall death rates, generally acknowledged to be around 50% at 5 years. The risk of mortality generally increases as the patient progresses through the need for amputation and hemodialysis (Table 1).^{2–11} These patients often have underlying peripheral vascular disease, with a prevalence of 50%–70%.^{12,13} Neuropathic changes further expose their lower limbs to risk of amputation¹⁴ (Fig. 1).

First Nations populations in Canada are acknowledged to have an incidence of type 2 diabetes mellitus up to 5 times that of the general population.¹⁶ What is less well documented is that First

Nations populations also incur more frequent complications, including rates of lower-leg amputation up to 18 times those among the general population.¹⁷

We examined the incidence of type 2 diabetes and rates of lower limb amputation in the catchment area of the Sioux Lookout Meno Ya Win Health Centre (SLMHC) in northwestern Ontario, which serves a largely First Nations population. We also describe a novel diabetic foot ulcer protocol to encourage aggressive management and risk stratification of patients at risk for amputation and increased mortality.

METHODS

Aggregate data for diabetes and lower limb amputations in patients with type 2 diabetes were retrospectively accessed for a 4-year period (2010–2013) for the catchment area of the SLMHC. Data were collected from the Decision Support Office at the Northwest Health Alliance, a shared health care data service organization. We used data from the

Table 1: Mortality rates for patients with diabetes with foot ulcers, amputation and hemodialysis

Investigator	Diabetes plus	No. of patients	Mortality rate, %
Moulik et al., ² 2003	Diabetic foot ulcer	30	44 (5 yr)
Iversen et al., ³ 2009		155	37 (5 yr)
Søndergaard et al., ⁴ 2015		43	36 (1 yr)
Wölfle et al., ⁵ 2000	Diabetic foot ulcer, amputation	70	54 (3 yr)
Wölfle et al., ⁶ 2001		312	27 (1 yr) 70 (5 yr)
Moulik et al., ² 2003		30	44 (5 yr)
Fortington et al., ⁷ 2013		299	47 (1 yr) 77 (5 yr)
Wiessman et al., ⁸ 2015		174*	33.1 (1 yr)
Wiessman et al., ⁸ 2015		142†	45.1 (1 yr)
Hertzer et al., ⁹ 2007		29	83 (4 yr)
Leers et al., ¹⁰ 1998	Diabetic foot ulcer, amputation, hemodialysis	31	48 (2 yr)
Orimoto et al., ¹¹ 2013		234	44.8 (1 yr) 74.5 (3 yr) 76.6 (5 yr)

*Below-the-knee amputation.

†Above-the-knee amputation.

Statistics Canada population census, the Ontario Health Insurance Program diagnoses database and provincial hospital surgical codes to identify catchment population, numbers of adult patients with type 2 diabetes and incidence of below-knee amputation. Provincial statistics record all lower-limb amputations (both minor and major). Trauma- and cancer-related amputations were excluded.

We estimated the adult diabetic population from a 10-year analysis of province-wide physician billing for diabetes or related complications for the population of Sioux Lookout and the 31 northern First Nations communities served by the SLMHC.

Rates of diabetes and amputation were also calculated for 3 relevant provincial Local Health Integration Networks: Central Toronto, North West and North East.

We focused on patients with type 2 diabetes who had undergone below-knee amputation as they are the most common major amputation patient. It seemed more clinically relevant to focus on this major amputation than assessing the provincially tabulated rates of all lower-limb amputations, which include patients who might have repeated toe surgeries, eventually leading to a major amputation. We were able to access data for this single procedure for our catchment area and various Local Health Integration Networks in the province.

RESULTS

The population of the identified catchment area for the SLMHC from the 2013 census data was 22 776, 85% of which was First Nations.¹⁸ The adult (age ≥ 18 yr) population with a diagnosis of diabetes was estimated to be 1585, 11% of the adult population.

The average rate of lower-limb amputation in the adult diabetic population in Ontario over the study period (2010–2013) was 146.5 per 100 000, compared to 1078.5 per 100 000 for the Sioux Lookout diabetic population.

The rate of diabetes-related below-knee amputation was 5.68 per 1000 adult patients, 3 times greater than the rates for other Local Health Integration Networks (Table 2).

The average age at below-knee amputation in the Sioux Lookout diabetic population was 50.2 (standard deviation [SD] 8.7) years, compared to 64.0 (SD 2.3) years in the Central Toronto, North West and North East Local Health Integration Networks.

The sex distribution was predominantly male (75.0%), as in other provincial regions.

DISCUSSION

The rate of lower-limb amputation in the adult diabetic population in the SLMHC catchment area in

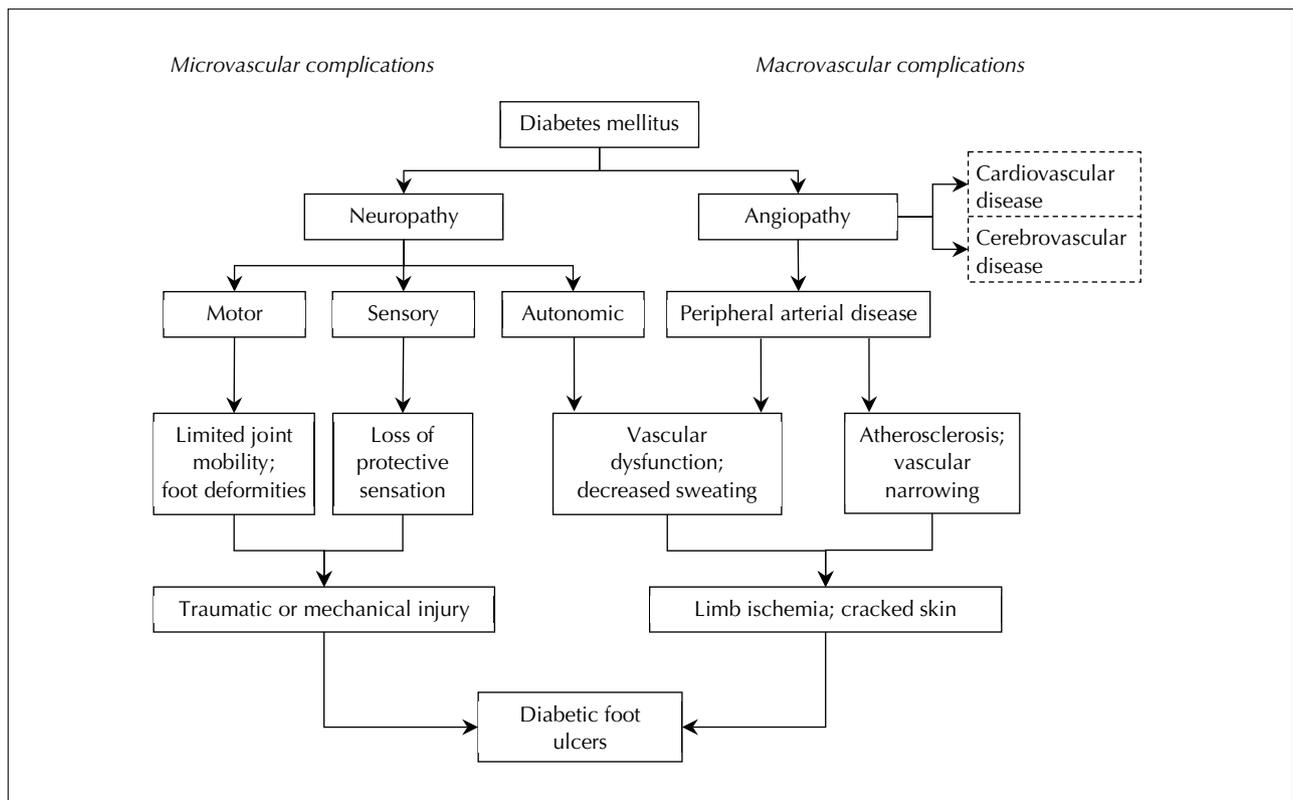


Fig. 1. Pathogenesis of diabetic foot ulcers (adapted from Alavi and colleagues¹⁵).

2010–2013 was 7 times the provincial rate and was 3 times that in other areas of the province.

This high rate does not appear to be an anomaly. A 2012 Institute for Clinical Evaluative Sciences study also showed that northwestern Ontario had the highest regional rate of diabetes-related total lower-limb amputations (major and minor) in the province between 2006 and 2010.¹⁹

Lower-limb amputation occurred at an earlier average age in our studied population than in the general Canadian population²⁰ (50.2 [SD 8.7] yr v. 67 [SD 13] yr). Multiple factors may be at play: potentially more aggressive disease (peripheral vascular disease, type 2 diabetes), late presentation of diabetic foot ulcer, limited access to foot care services including inadequate monitoring, and variable investigation and treatment plans owing to limited resources and/or lack of clear clinical guidelines. Host susceptibility (e.g., cardiovascular risk factors, including smoking, and nutritional status) and broader social determinants of health are all relevant, potentially contributing factors.

Interestingly, geography may be protective. In a 2007 study of Manitoba First Nations, Martens and colleagues¹⁷ identified a rate of type 2 diabetes 4 times that among the general population. They described population-based amputation rates 18 times those of the rest of the province. They also found that the more remote First Nations communities fared better, with lower amputation rates and more medical referrals. Those authors postulated that the system of integrated community-based and visit-

ing health care providers (i.e., J.A. Hildes Northern Medical Unit) lowered barriers to accessing care and improved care for patients with diabetes.

Most of the Canadian literature on diabetic foot ulcers in Canadian Aboriginal populations comes from Manitoba.^{21–23} Two retrospective reviews showed that Aboriginal Manitobans experienced higher rates of type 2 diabetes and a higher mean number of foot ulcers per patient and of diabetes-associated lower-extremity amputations than their non-Aboriginal counterparts.^{21,23} A cross-sectional study of patients with diabetes from 1 First Nations community showed a disproportionately high rate of emergency department visits for complications of foot ulcers and relatively low availability of preventive foot and wound care services.²²

Reid and colleagues²² 2006 study of 169 northern Manitoba Aboriginal patients showed an incidence of diabetic foot ulcers of 5% and the startling fact that 64% of the patients they studied were unable to perform their own foot surveillance. The patients received an average of 0.7 foot examinations annually over a 7-year period. In 2008, Rose and colleagues²¹ concluded that the absence of home care services on reserve, inadequate footwear and limited access to foot care services contributed to foot ulcer development.

Similar trends are seen internationally. A 10-year retrospective study of diabetes-associated major amputations at a hospital in northern Queensland, Australia, showed disproportionately high amputation rates among Indigenous

Table 2: Population data, rate of amputation and characteristics of patients with type 2 diabetes mellitus in the Sioux Lookout Meno Ya Win Health Centre catchment area and in 3 Ontario Local Health Integration Networks (LHINs), 2010–2013

Variable	Sioux Lookout Meno Ya Win Health Centre catchment area	3 Ontario LHINs ¹⁹
Population*	22 776	–
Population aged ≥18 yr, no. (%)	14 384 (63)	–
Population aged ≥18 yr with type 2 diabetes mellitus, no. (%)	1585 (11)	Central Toronto (7) North East (10) North West† (9)
Rate of below-the-knee amputation per 1000 adult patients with diabetes	5.68	Central Toronto 1.81 North East 1.45 North West 3.13
Age at below-the-knee amputation, mean ± SD, yr	50.2 ± 8.7	64.0 ± 2.3 for all 3 LHINs
Male/female ratio of patients who underwent below-the-knee amputation	75/25	74/26 for all 3 LHINs

*2013 population census.

†The population of the Sioux Lookout Meno Ya Win Health Centre catchment area is a subpopulation of the North West LHIN and contributes to the latter's rate.

Australians.²⁴ Indigenous patients were, on average, 14 years younger than their non-Indigenous counterparts at the time of amputation. Our study reproduced this pattern, with below-knee amputation occurring 10–14 years earlier in our studied population. A US study of 1074 Aboriginal patients showed lower-limb amputation rates to be 3 times the national rate, with a hemoglobin A_{1c} level of 9.5% or higher.²⁵

We found a male predominance (75%) in patients undergoing below-knee amputations. This is a common finding, for unknown reasons. A similar pattern exists in Canada-wide data, where males were more than twice as likely as females to undergo below-knee amputation.²⁰

Sioux Lookout Diabetic Foot Ulcer Protocol

In response to such high amputation rates, we examined guidelines for management of diabetic foot ulcers, the common precursor to a diabetes-related lower-limb amputation. The International Working Group on the Diabetic Foot (<http://iwgdf.org/guidelines/guidance-on-pad-2015/>) guidelines were the most evidence-based and recommend early vascular assessment in patients with foot ulcers, especially patients whose ulcers fail to heal over 6 weeks.¹³ Unfortunately, most of the working group's strong recommendations were supported by weak evidence.

We searched MEDLINE and Embase (January 2005–May 2016) for the MeSH search term “diabet-

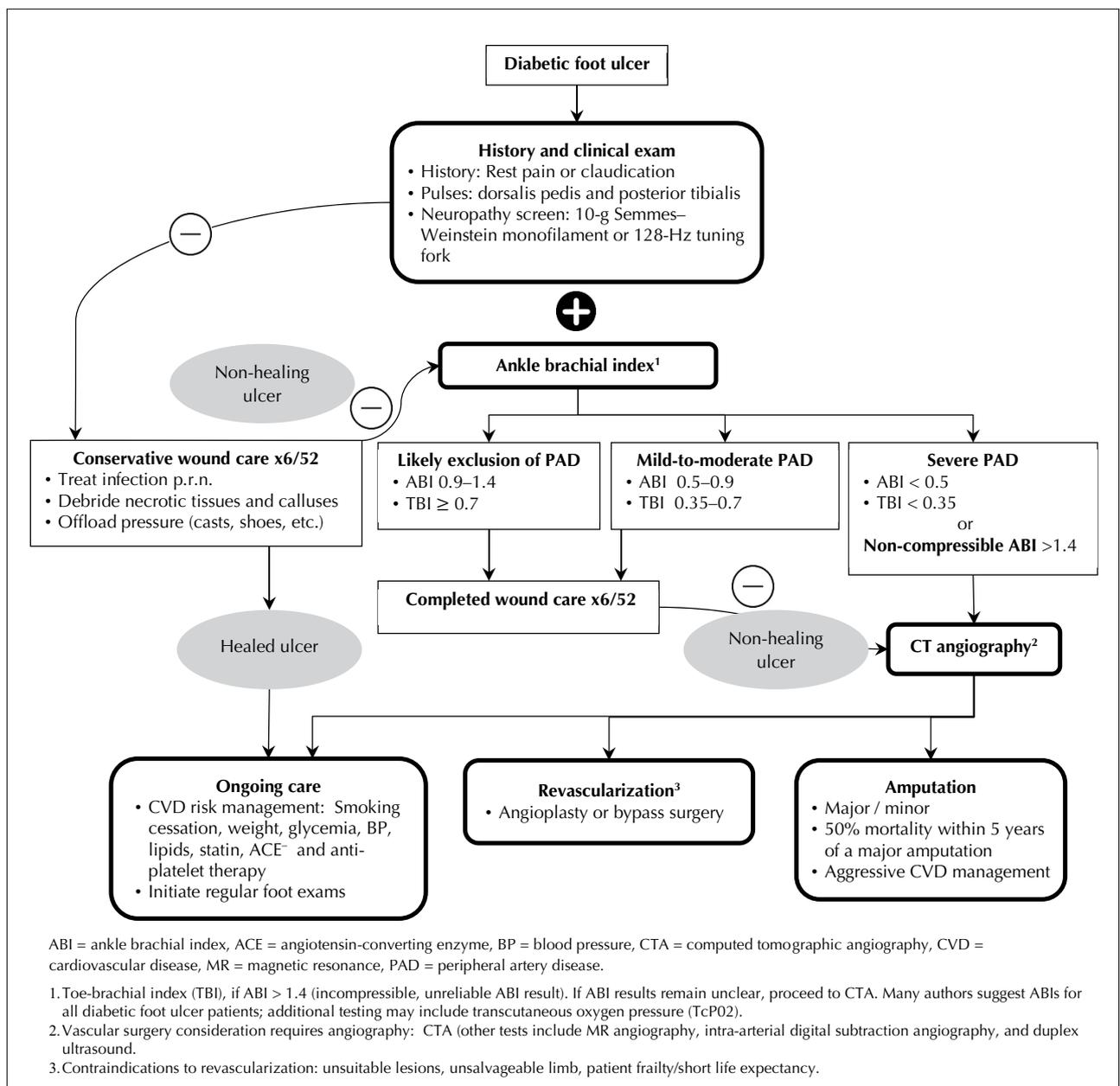


Fig. 2. Sioux Lookout Diabetic Foot Ulcer Protocol.

ic foot” combined with “arterial occlusive diseases” or “peripheral vascular disease”). We found 63 citations but none that described evidence that aggressive management of foot ulcers prevented amputation or conclusive evidence that any specific diabetic foot ulcer protocol improved outcomes. On discussion with clinicians, we were struck by the variety of approaches taken with patients with foot ulcers. Even in focused tertiary care centre “diabetic foot clinics,” clinicians had different thresholds for ordering imaging investigations for concomitant peripheral arterial disease. We felt that describing a reasonable approach that organized investigations for concomitant peripheral vascular disease and coronary artery disease would at least standardize management of diabetic foot ulcers.

The purpose of the Sioux Lookout Diabetic Foot Ulcer Protocol (Fig. 2) is 2-fold. The first is to identify a time frame for conservative wound management (6 wk), after which vascular assessment is suggested. The second is to identify the patient with a foot ulcer as being at high risk for other, extensive arterial disease. Patients who have comorbid peripheral, coronary or cerebral arterial disease would likely benefit from a risk-management approach. The protocol includes clinical history-taking, physical examination and risk-management components as well as vascular imaging, treatment of peripheral vascular disease and referral suggestions.

A history of claudication or pain at rest may indicate vascular compromise, whereas an easily

palpable pedal pulse likely excludes serious arterial disease.¹⁵ Many authors, however, recommend that all patients with diabetic foot ulcers receive an ankle-brachial index test at presentation.²⁶ This easy bedside Doppler examination uses the ratio of arm and leg pressures measured with a blood pressure cuff (Fig. 3); a small cuff can also be attached to a toe to perform a toe-brachial index test, which can correct for a false-negative result of an ankle-brachial index test (e.g., an ankle-brachial index > 1.4 suggests incompressible ankle arteries).²⁷ Any ankle-brachial index outside the normal range (0.9–1.4) necessitates further assessment (toe-brachial index test and/or computed tomography angiography). A low ankle-brachial index identifies vascular compromise, and a value above the normal range denotes a calcified and incompressible vessel; both necessitate further vascular assessment.

Patients with abnormal clinical findings or ankle-brachial index, or delayed foot ulcer healing require anatomic imaging. Computed tomography angiography may be the most readily available in some rural Canadian locations. Other angiographic imaging includes digital subtraction angiography or magnetic resonance angiography, both of which require contrast medium and may be nephrotoxic.¹² The sooner poor vascularization is identified, the better, as nutrient-deprived ulcers heal poorly (Fig. 4).

Macrovascular risk management is also suggested for all patients with diabetic foot ulcers. In a recent Ontario study, 791 patients with peripheral



Fig. 3. Bedside Doppler examination uses ratio of arm and leg pressures measured with blood pressure cuff.

vascular disease (25% of whom were diabetic) were followed for 7 years.²⁸ The authors focused on 8 management categories: use of statins, angiotensin-converting-enzyme inhibitors and antiplatelet medications, and attention to smoking, weight, blood pressure, and lipid and glycemic control. They showed a 40% relative reduction in death, myocardial infarction and cerebrovascular accidents (adjusted hazard ratio 0.63, 95% confidence interval 0.13–0.54) and a 53% relative reduction for major amputations (adjusted hazard ratio 0.47, 95% confidence interval 0.29–0.77).

Wound management at our facility consists of measurement of the ulcer and débridement of both callus and devitalized tissue. Since there is such an array of wound care products, we have standardized ulcer management to the use of medical honey (Medihoney, Derma Sciences) under a dressing.²⁹ The Society for Vascular Surgery recommends expected healing as a 50% reduction in ulcer size after 4 weeks of conservative management.³⁰ Off-

loading with full-contact casts or boot/inserts may further benefit healing of plantar foot ulcers.³⁰

This protocol may help standardize vascular assessment in patients with diabetic foot ulcers and, it is hoped, serve as a reminder that acetylsalicylic acid, statins and blood pressure control would benefit these patients even if they are not applied directly to the foot!

Limitations

Census data are not always accurate, particularly when enumerating numerous remote communities. Although other estimates of the population exist, we used census data in this study as it allowed us to make reliable comparisons to other regions of Ontario. We believe the population estimate may be underreported, owing to occasional community nonparticipation in census activity and remoteness. This would overestimate amputation rates to some degree but would not alter the underlying message

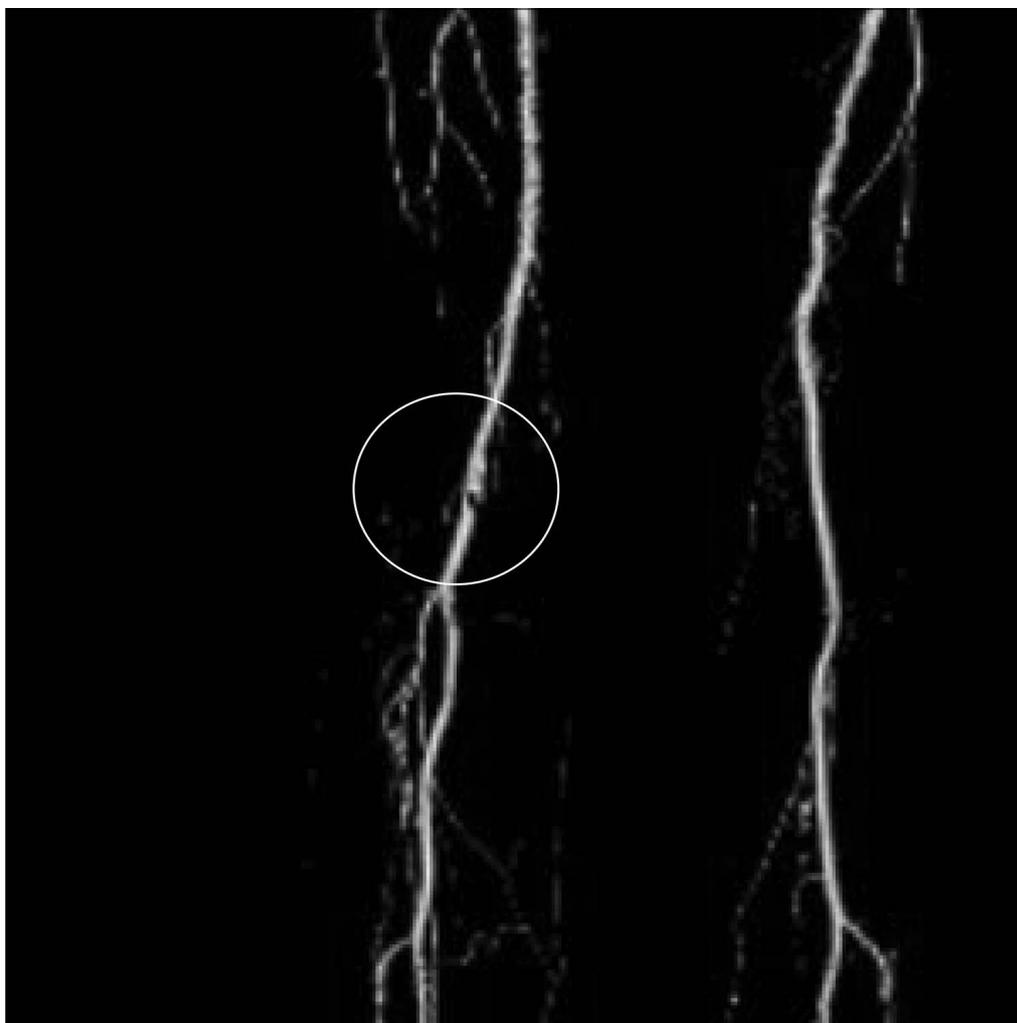


Fig. 4. Computed tomography scan showing 90% narrowing of right superficial femoral artery proximal to knee.

that the rate of major amputation is very high in adult patients with diabetes in our catchment area.

CONCLUSION

Patients with diabetes in the SLMHC catchment area appear to undergo major below-knee amputation at a rate 3 times greater than in other Ontario regions. Patients with diabetic foot ulcers are at high risk for arterial disease in the affected limb as well as for cardiac and cerebral events and death.

Poorly healing diabetic foot ulcers may be the first indication that a patient needs vascular assessment and aggressive management of cardiovascular disease risk.

We have developed a protocol that we hope will increase early detection of vascular compromise and assist in healing of diabetic foot ulcers and limit amputation. A prospective study to evaluate the application and outcomes of the protocol is planned.

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Competing interests: None declared.

Update on the occasional suprapubic catheter

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This article has been peer
reviewed.

INTRODUCTION

Inserting an adult suprapubic catheter in the rural setting is a straightforward procedure. Performing it locally can save your patient a transfer out of the community.

We recently had 2 cases in which performing this procedure locally avoided a patient transfer. One was in a patient with acute urinary retention, and the other was in a patient with multiple sclerosis for whom travel outside of the community was very challenging. No local practitioner had previously performed this procedure. With telephone support from a urology colleague at our referral centre, the first try at this procedure went surprisingly smoothly.

An article on the occasional suprapubic catheter was previously published in this journal in 2000.¹ Since that publication, the kits have improved, and the technique is simpler.

Below we share our experience.

INDICATIONS

Suprapubic bladder catheterization is most commonly indicated in the case of male patients with prostatic hypertrophy presenting with acute urinary retention in whom attempts at transurethral catheterization have been unsuccessful. It can, of course, be performed in patients with acute urinary retention of any cause. The patient must have a distended, full bladder; this should be confirmed by bedside ultrasonography or by percussion and suprapubic needle bladder aspiration (see the first bulleted item under “Technique”).

CONTRAINDICATIONS

- Absolute contraindication: bladder cancer.
- Relative contraindications:²
 - Inability to visualize a distended bladder on bedside ultrasonography
 - Pelvic cancer (increased risk of adhesions)
 - Anything that may increase the risk of bowel adherence to the bladder or anterior abdominal wall (e.g., previous lower abdominal or pelvic surgery)
 - Uncorrected coagulopathy.

EQUIPMENT

- Suprapubic balloon catheter set (Fig. 1). The kit generally consists of a balloon catheter that fits over a trochar, a 5 mL syringe and a connecting tube with a stopcock and



Fig. 1. Equipment.

drainage bag connector. We use the Rutner Suprapubic Balloon Catheter Set (Cook Medical), which has a simple catheter-over-trochar design, but any set will do the trick.

- 2% chlorhexidine or 10% povidone iodine.
- 1% or 2% lidocaine with epinephrine for skin and fascial infiltration.
- Appropriate syringe and needle for anesthetic.
- No. 11 blade.
- 22-gauge spinal needle or 18-gauge needle for aspiration of bladder. Note that an 18-gauge needle is really suitable only for thin patients. In most instances a 22-gauge spinal needle is needed because of its extra length.
- 10 to 20 mL syringe for needle.
- Urine bag.

TECHNIQUE

Before starting the procedure, visualize the full bladder with bedside ultrasonography (Fig. 2) and/or by percussing the full bladder and performing needle aspiration of urine from the bladder. We are more comfortable doing both procedures. However, both are not necessary, especially when bedside ultrasonography is unavailable.

- Lay the components of the suprapubic catheter kit on a sterile field.
- Place the trochar inside the balloon catheter and secure its position with the Luer lock.
- Fill the syringe with 4 mL of sterile saline or water, or as specified by the kit you are using. Expand the balloon 3–4 times with the sterile solution to make it easier to expand once in place.
- Mark the intended insertion spot about 3–4 cm (roughly 2 fingerbreadths) above the upper border of the pubic bone in the midline (Fig. 3).



Fig. 2. Bladder visualization with ultrasonography.

- Using sterile technique, prep the suprapubic area with the antiseptic solution (Fig. 3).
- Infiltrate the skin and subcutaneous tissues of the anterior rectus sheath with lidocaine at the site marked (Fig. 4).
- Apply sterile drapes, leaving the suprapubic area free so that the pubic bone can be palpated and visualized (Fig. 5).
- Using the no. 11 blade, make a 3 to 4 mm incision in the skin and dissect down into the rectus sheath (Fig. 5).
- Aspirate urine from the bladder using a 10 mL syringe attached to a 22-gauge, 7.5 cm spinal needle. The needle should be advanced at a 10°–20° angle off the vertical, directed toward the pelvis, until urine is aspirated (Fig. 6).
- Hold the trochar/catheter unit at the same angle as for urine aspiration. With the palm of the dominant hand behind the trochar unit and the



Fig. 3. Intended insertion spot about 3–4 cm above the upper border of the pubic bone in the midline.



Fig. 4. Infiltration.

nondominant hand holding the trochar at skin level, carefully advance the trochar through the subcutaneous tissues until urine flows from the trochar/catheter unit, and then continue for another 4–5 cm. This ensures that the entire balloon of the catheter is within the bladder.

- If you think you have inserted the trochar/catheter unit to the same distance where the aspirating needle detected urine but no urine flows, do not continue to advance the needle. Low bladder pressure may prevent spontaneous flow of urine through the unit. In this case, you can attach a syringe to the unit and attempt to aspirate urine. Repeatedly check for urine by aspiration as you slowly advance the catheter as above (Figs. 7 and 8) (see also the second point in the “Suggestions” section).
- Expand the balloon with 4 mL of sterile solution.
- Remove the trochar.
- Attach the connector tube.
- Pull the balloon catheter back until the balloon meets the resistance of the bladder wall.



Fig. 7. Spontaneous urine flow through the trochar unit.

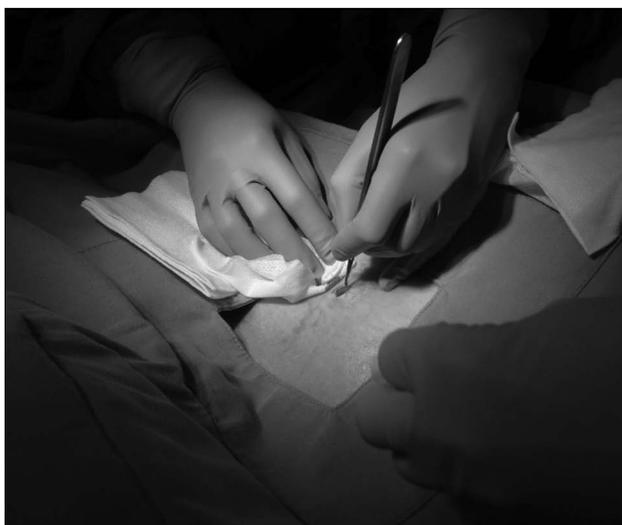


Fig. 5. Dissection to rectus sheath.



Fig. 6. Urine aspiration from bladder.



Fig. 8. Using syringe to aspirate for urine.

- Attach the drainage bag.
- Suture the catheter in place by putting 1 suture through the skin at the base of the catheter and tying it with 2 long ends. Loop the ends around the catheter at least 5 times and then tie a second knot to hold the loops firmly against the catheter, without compromising the lumen of the catheter (Fig. 9). Note that the catheter does not have to be sutured in place; it can be held in place with a gauze dressing.
- Cover with a sterile dressing and tape in place. Add a second piece of tape on the abdomen such that it creates some slack in the tubing and prevents constant tension on the catheter (Fig. 10).

POTENTIAL COMPLICATIONS²

- Bowel perforation and intraabdominal visceral injuries are possible. Ensuring the bladder is distended will minimize the risk of this.
- Hematuria: this is generally transient.
- Infection: sterile technique will minimize risk.

SUGGESTIONS FOR THE “OCCASIONAL PRACTITIONER”

We offer the following suggestions for the occasional practitioner from our limited personal experience.

- Ensure you dissect down through the fascia. If you do not, you may have to use an uncomfortable amount of force to push the trochar through into the bladder.
- You may not feel a significant “pop” as you penetrate the bladder. If you have reached your spinal needle depth without spontaneous flow of urine, aspirate for urine before continuing to advance the trochar.

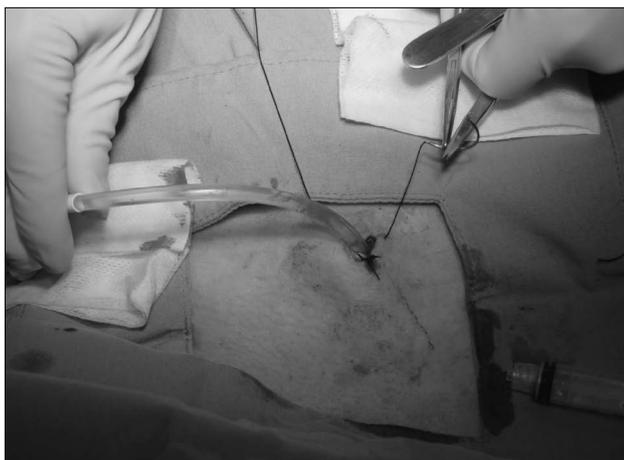


Fig. 9. Suturing catheter in place (optional).

- Be sure to advance the catheter 4–5 cm into the bladder after urine is aspirated.
- Suprapubic catheterization can be painful. Make sure you give the patient adequate local anesthesia with or without procedural sedation.

CONCLUSION

Back to our 2 patients. At the time of writing, our patient with acute urinary retention was doing well. He had his catheter in for 2 weeks and then underwent transurethral resection of the prostate. From performing suprapubic bladder catheterization in this patient, we learned the importance of dissecting right down into the rectus sheath. We did not do this and were surprised at the amount of force required for the trochar to enter the bladder. We did not make this mistake with our second patient.

Our patient with multiple sclerosis was also doing well at the time of writing and was very happy to have a suprapubic catheter rather than a transurethral catheter. The procedure had to be redone 1 week later as his catheter was leaking.



Fig. 10. Dressing.

We were never clear why this happened. Urology suggested that it may have been due to bladder spasms secondary to multiple sclerosis. However, the second procedure went smoothly, and his catheter has been functioning well for several months. Our home care nurse is now managing and changing his catheter.

In conclusion, adult suprapubic catheterization is infrequently performed in the rural/remote setting. It is, however, a straightforward procedure, and performing it locally can save the patient

unnecessary discomfort and a transfer out of the community.

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Competing interests: None declared.

Cardiogrammes ruraux

Avez-vous eu à décrypter un ECG particulièrement difficile récemment?

Dans la plupart des numéros du *JCMR*, nous présentons un ECG assorti de questions.

Les réponses et une discussion du cas sont affichées sur une autre page.

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

Country cardiograms case 60

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This article has been peer
 reviewed.

Concern erupts in a rural emergency department when the following electrocardiogram (ECG) (Fig. 1) is recorded in a 64-year-old woman who has become unresponsive. What is the

ECG diagnosis, and what is the most likely clinical diagnosis? What must you do? What must you not do?

For the answer, see page 119.

Competing interests: None declared.

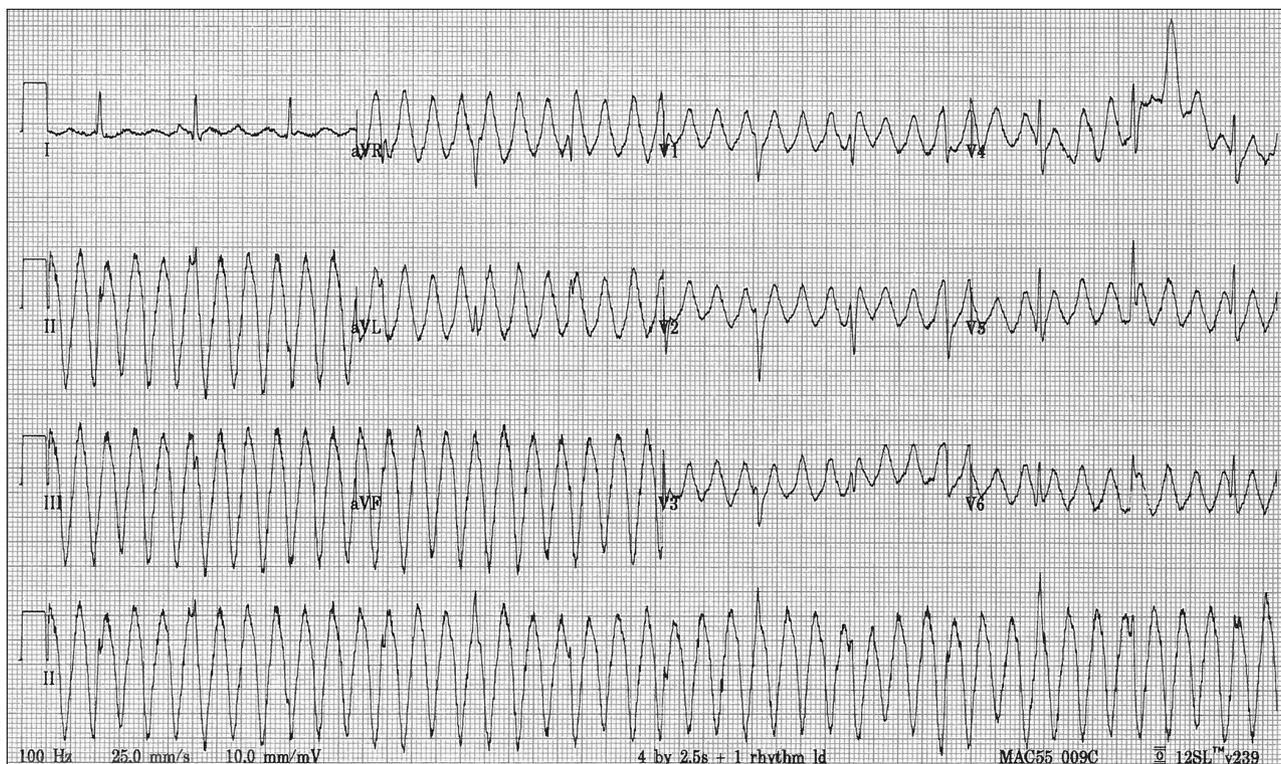


Fig. 1. Electrocardiogram of a 64-year-old woman who has become unresponsive in a rural emergency department.

“Country cardiograms” is a regular feature of *CJRM*. We present an electrocardiogram and discuss the case in a rural context. Please submit cases to Suzanne Kingsmill, *CJRM*, 45 Overlea Blvd., P.O. Box 22016, Toronto ON M4H 1N9; manedcjrm@gmail.com.

The splayed rib: a painful condition with a surgical solution. A report of 5 cases of overstretched intercostal tissue

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INTRODUCTION

Blunt trauma to the chest can result in rib fractures, pneumothorax, pleural effusion or lung contusion. All these conditions are well described and are treated in major trauma centres as well as in community hospitals, if the appropriate expertise is available. The recent addition of the surgical repair of severely displaced rib fractures seems to promise improved respiratory function as well as comfort.

This report presents the cases of 5 patients who experienced linear trauma to the rib cage, especially to the intercostal tissue or chondrocostal junction, with resulting tissue sprain (splayed = stretched). With this condition, patients can suffer from severe pain after movements that exert a pull on the intercostal areas. In the 5 patients this discomfort persisted over several months after their accidents and prevented them from pursuing their usual daily activities. The surgical repair of the sprained tissue resulted in dramatic clinical improvement. This procedure can be done in even the smallest rural hospital with a surgical practice. Patients like these would usually not be treated in tertiary care centres, since the radiologic reports were normal and the patients' conditions seemed to be stable (until they started strenuous work or sport).

The common feature of the 5 patients was that the thoracic trauma was blunt and linear. Their radiographs or computed tomography (CT) scans, if available,

were normal. Magnetic resonance imaging is associated with long waiting lists in remote community hospitals.¹ Therefore, patients with rib cage trauma easily "fall through the cracks" of our strained medical system. They tend to end up in pain clinics, with equally long waiting lists.² On physical examination of the 5 patients, local widening of the intercostal or costochondral areas on compression was noted. Local pressure was painful and showed the connective tissue to "give," although it recoiled.

Much has been reported about painful cesarean delivery scars.³ The consideration to repair overstretched intercostal tissue surgically resulted from my previous experience with ventral abdominal hernias observed in a small community hospital. At times, the patients described locally painful abdominal walls, especially after cesarean delivery, and reported discomfort when straining. There was usually no hernia sac or bulge but, rather, a localized weakening or tenderness of the abdominal wall. CT showed the musculofascial layer to be intact. A simple surgical intervention for these ventral hernias consists of reinforcing the external oblique fascia or underlying muscle layer with gathering nonabsorbable mattress sutures, which alleviates the discomfort.⁴

This principle was now applied to the intercostal tissue. In some cases, the external thoracic fascia was torn (Fig. 1); in another case the intercostal muscles were partially separated from the ribs

(Fig. 2). In the case in which the costochondral junction was splayed (Fig. 3), simple mattress sutures with nonabsorbable material through the cartilage stabilized the area.



Fig. 1. Stretched external thoracic fascia.



Fig. 2. Splayed intercostal muscle.

CASE REPORTS

Case 1

A 39-year-old sailor slipped on a fishing boat and hit his right chest wall against a barrel. He described persisting localized chest wall pain associated with certain movements. He felt unable to continue his work, as the discomfort was too severe. Localized tenderness was found at the cartilage junction of the sixth to the seventh rib at the right chest wall. He went to see his local doctor. His chest radiographs were normal. He was treated with nonsteroidal anti-inflammatory drugs and took a temporary rest. The local discomfort did not settle over the next few months. Eventually he was referred to me.

On examination, faint instability was noted. Our community hospital did not have a CT scanner at the time. Ultrasound findings did not explain the tenderness.

Exploration under general anesthesia showed the connection of the cartilage junction of the eighth and ninth ribs to be torn. This was approximated with 2-0 nonabsorbable sutures. The patient's condition improved, and he returned to light duties after 3 weeks. After another 3 weeks he resumed his regular heavier duties.

Case 2

A 74-year-old woman presented for laparoscopic cholecystectomy and reported 2 types of pain, one after eating greasy food and the other with movement. While roaming the woods, she had fallen onto a sharp rock, bumping the back of her right rib cage. The discomfort with activity prevented her from being the usually active person she was before the accident.

On examination, local weakness and tenderness were found in the intercostal space of the 9th to the 10th rib. Originally, she had sustained a rib fracture and had a small pleural effusion, which resolved with conservative measures. Consequently, radiographs were normal, as was a CT scan. Gallstones had been diagnosed. The patient underwent laparoscopic cholecystectomy and exploration of the tender area. A spread of the external intercostal fascia was found (Fig. 1) as well as a loosened junction of the seventh to the eighth rib; 2-0 nonabsorbable mattress sutures on a cutting needle were used to reapproximate and stabilize the cartilage, and 3-0 resorbable sutures were used for the repair of muscles and fascia. The patient reported great relief postoperatively and was more grateful

for the intercostal repair than for the removal of her gallbladder. When she was admitted for bowel resection surgery 5 years later she did not mention any chest wall pain.

Case 3

A 55-year-old man had undergone reoperative surgery for an anastomotic leak of a Billroth II gastrectomy performed 1 year earlier, when he was emaciated and septic. At the time of reoperation, firm retractors were set in place, which in hindsight might have spread his ribs. He now presented with bilateral tenderness at the anterior junction of the 9th to the 10th rib. This was aggravated by movements when playing golf or tennis (moving his trunk sideways). Local weakness and a gap were felt. The chest radiograph and CT scan were normal. The surgical repair resulted in the disappearance of his symptoms (Fig. 4).



Fig. 3. Splayed chondrochondral junction.



Fig. 4. Preoperative splayed rib showing the rim of the rib cage with the dent between the 9th and 10th ribs.

Case 4

A 36-year-old woman had fallen against the edge of a staircase at work. She was unable to return to work and attended the local pain clinic. No rib fractures had been diagnosed, and her chest radiographs and CT scan were normal. On examination, instability was palpated at the anterior rib cage between the seventh and eighth ribs.

During the surgical repair, overriding of the eighth rib cartilage was noted, with the tip of the cartilage piercing into the tissue. Part of the tip was removed, and the chondrochondral junction was stabilized (Fig. 3). The surgical repair resulted in improvement but only partial resolution of the chest wall pain. The patient, who was severely overweight, requested a breast reduction procedure in addition to the repair of her cartilage. She was advised to first lose weight and did not return.

Case 5

A 50-year-old man fell while painting his shed. He landed on his bicycle and hit his right rib cage. He presented to me again after several months of treatment in the pain clinic. Several intercostal spaces were tender and could be compressed more deeply than would be expected. This was associated with severe pain. He had difficulty sleeping, as he could not turn in his bed without agonizing discomfort.

He underwent sequential repair of 3 intercostal spaces and repair of an additional one 1 year later. After the last operation he stated that he could now turn at night without discomfort and had the best sleep in years (Fig. 2).

MAIN CHARACTERISTICS

These cases are rare, painful and difficult to diagnose. The characteristics are as follows:

- History of linear trauma to the chest wall (e.g., edge of barrel, edge of staircase) hitting the intercostal space and sometimes the chondrochondral junction.
- Local tenderness, decreased turgor of the tissue and mild instability of the ribcage, although radiographs and CT scans are normal.
- Often occurs at the chondrochondral junction.
- Pain persists for months or years.

Previously, similar discomfort was described in the upper abdomen or rib cage due to a rare configuration or movement of ribs.⁵⁻⁸ Excision of a painful

rolling rib or, in milder cases, treatment with local anesthesia was suggested.

INTRAOPERATIVE FINDINGS

We have to remember that the intercostal muscles are a miniature display of the lateral abdominal muscles: external oblique and internal oblique (both the same direction as the lateral abdominal muscles) (Fig. 5). The innermost intercostal muscle equivalent to the transverse abdominal muscle spreads its muscle fibres in a similar way to the internal oblique. The intercostal nerves travel on the top of the innermost intercostal and dive under the chondrochondral junction to continue their course in the more medial fields of the abdomen. It should be mentioned that the interchondral or chondrochondral junction and the intercartilagenous junction refer to the same structure: a firm ligament or the connective tissue between costal cartilages.

Trauma can stretch the inner or outer thoracic fascia, spread muscle and tear muscle from its attachment to the rib, but most often it can tear the intercartilagenous connections, which results in more instability.

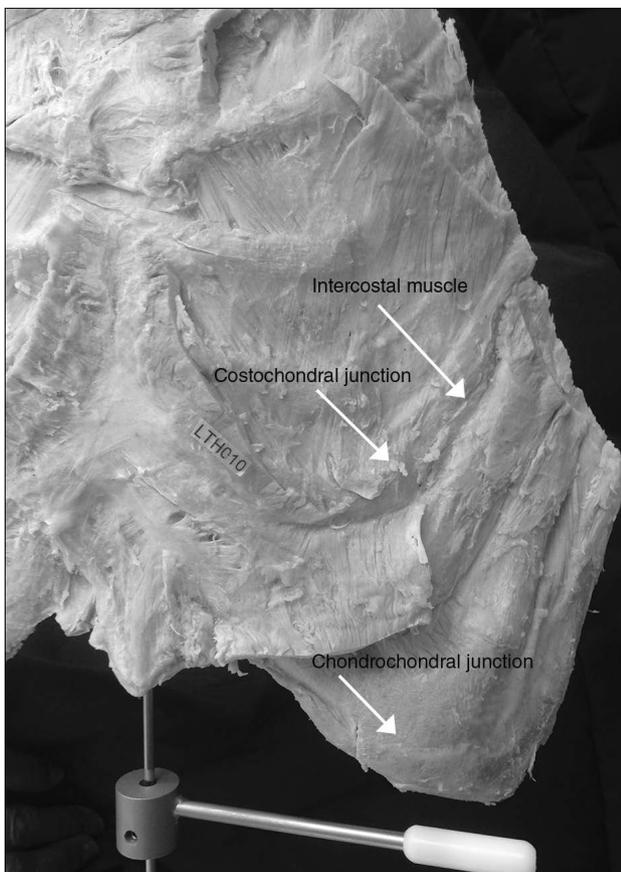


Fig. 5. Anterior chest wall showing costochondral junction and chondrochondral junction.

In several of these patients, the pain was localized at the cartilagenous junction. This was the area hit. The intercostal nerves travel underneath these firm connections and will be affected by the inflammatory events surrounding the injury. As cartilage has a certain elasticity, it does not easily tear; the structures around it take the insult. The external aponeurosis was seen to be stretched out in 1 case, and, in another instance, part of the internal oblique muscle was torn off the rib. At the same time it was noted that the semi-elastic interchondral ligament seemed overstretched.

If the connection felt unstable, strong 2-0 nonabsorbable nylon or Ti-Cron sutures on a cutting needle were passed through the cartilage, which was tied not too firmly to its neighbour. It is important not to make this repair too tight, as this would be just as uncomfortable as too loose (Figs. 1-3).

The cartilage can be penetrated by a cutting needle, but bony ribs cannot always. Yet a good bite into the periosteum of the bony rib was adequate to approximate torn muscle. These repairs could be seen in the same light as inguinal hernia repairs, in which the most medial stitch often gets anchored at the periosteum of the symphysis of the pubic bone. Sutures through an inadequately folded auricular cartilage are used in otoplasties in plastic surgery. Once the interchondral connection is stabilized with sutures through the cartilage, the rest of the tissue easily gets approximated without tension. Simple or mattress sutures reapproximate the muscles. (Remember the closure of an open appendectomy.) The internal and transverse oblique muscles get closed with simple or mattress sutures that are not too tight. It is necessary to repair the connection between cartilages first to get a stable frame.

There is no standard prescription for the operative repair. The repair needs to stabilize what seems to be loosened up (interchondral ligament).

DISCUSSION

When should this repair take place? It is useful to remember a similar condition, such as an ankle sprain. In the case of a complete ligament tear and instability, a referral to an orthopedic surgeon is indicated. The role of operative versus nonoperative treatment is still being debated.^{9,10}

MRI holds promise for the diagnosis and prognosis of disruption of syndesmosis of the ankle. One can only conclude that it would be quite a useful tool for the splayed rib as well.

The postoperative course could also be compared with that of a hernia repair. Limited motion, with the omission of strenuous activity, was recommended and seemed appropriate. Ligaments should be healed sufficiently by 6 weeks. Also, patients who have undergone hernia repair return to work after 6 weeks, provided a satisfactory follow-up visit takes place. This time frame would make sense for the splayed rib.

If the pain persists, further investigations seem justified if the disability is severe enough. When should the patient be referred? Narvani and colleagues¹¹ described a subgroup of patients with medial collateral ligament injury. Those with a persistently painful deep portion of the medial collateral ligament were eventually referred for surgery after initial conservative treatment. An average of 23 weeks had passed since the time of the injury to presentation to the specialist. After the surgical repair, at a mean of 48 weeks, all the patients returned to their sport and remained asymptomatic. The patient is referred early for surgical repair when a joint is unstable or severely painful, as in a knee ligament injury. A similar approach could be considered for the splayed rib. Possibly after 6 weeks, if no significant improvement has happened and if the functionality of everyday life is disturbed, a surgical option appears logical.

Why is this condition not better known or reported? The primary reason is that it is rare. Most blunt injuries heal over time. There may be quite a spectrum of severity of cases. Often, the absence of findings on radiographs or CT scans leads to the conclusion that nothing else needs to be done apart from prescribing painkillers. If this fails, physiotherapy helps restore the connective tissue. Finally, the degree of injury of knee ligaments can be shown with stress views; however, this would be difficult to achieve with rib splay. MRI is reserved for the most severe ligament injuries. Three grades have been distinguished on MRI, but often this grading system does not go hand in hand with the clinical severity.²

It might be difficult to arrange for a prospective study comparing surgical repair of the splayed rib to conservative surgical treatment considering that the condition is rare. I performed the repairs several

months after the patients were followed in medical clinics, pain clinics, or in 1 case, by a physiatrist, who made the referral. Although the number of cases is small, there was complete resolution in 4 cases and partial resolution in 1. This might serve as a stimulus for surgical repair in another institution. The internal thoracic fascia was never transected; therefore, no pneumothorax ensued.

This repair has not been reported in the literature. It is not too difficult for a motivated surgeon familiar with the anatomy to perform and could easily be done in a small peripheral hospital.

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Country cardiograms case 60: Answer

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This article has been peer
reviewed.

At first glance, this tracing looks like regular wide complex tachycardia, possibly ventricular tachycardia, at a rate of 264 per minute. However, lead I clearly shows narrow QRS complexes, at a rate of 76 per minute, and similar narrow complexes can be seen “marching” through the rest of the tracing (most obviously in leads V2 and V5).

These 2 rhythms cannot coexist, and the important electrocardiographic (ECG) diagnosis to make is therefore pseudoventricular tachycardia. The fact that P waves cannot be reliably identified is trivial in the initial assessment, and an audible sigh of relief may be heard when you confidently state “normal rate, with prominent artefact masquerading as ventricular tachycardia.” Go to the bedside, check the patient’s pulse and consider the most likely cause for a person’s becoming unresponsive and exhibiting such an ECG: seizure.

Pseudoventricular tachycardia is most often caused by movement by the patient or by improperly attached leads.¹⁻³ The distinction is vital: treating genuine ventricular tachycardia as “artefact” may well be fatal, whereas treating pseudoventricular tachycardia as genuine ventricular tachycardia is hazardous.

Pseudoventricular tachycardia might be considered in a patient

unlikely to have structural heart disease, in a patient who remains asymptomatic during such an episode or in a patient with obvious tremor or seizure. However, the presence, as in this case, of the patient’s normal rhythm marching through what looks like a fast wide complex rhythm is the ECG sign that conclusively establishes the diagnosis. This may be more evident in some leads than others. In this case, the narrow QRS complexes in lead I are obvious.

Not everything that looks like ventricular tachycardia is ventricular tachycardia. Do not instinctively reach for pads, paddles or amiodarone. Take a few seconds to calmly examine the ECG and first treat the patient, not the monitor or the ECG.

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For the question, see page 113.

Competing interests: None declared.

Newfoundland's tuberculosis ship

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Tuberculosis posed an incredible burden on the early Newfoundland health care system. With the vast majority of the population inhabiting remote areas with limited access to health care, how could the spread of this disease be curbed? In 1947, the total number of active cases of tuberculosis was estimated at about 12 000, with an additional 7000–8000 people who would benefit from treatment in an institution.¹

Tuberculosis remained rampant in Newfoundland long after its spread had been under control in mainland Canada and Europe. Perhaps this was a reflection of malnutrition or of close confines during the winter months. Certainly the lack of consistent medical care was a compounding factor.

Ingenuity provided the answer to this medical conundrum. A US fishing vessel was purchased and renamed the *MV Christmas Seal*. It was retrofitted to serve the needs of the medical community. This vessel could provide a mobile medical service that could access the isolated communities and screen a population that otherwise would be overlooked. Without this floating clinic, whole populations would be in jeopardy of contracting and falling victim to tuberculosis. With long, cold winters and incredible isolation for months on end, families were confined to spending their time in overcrowded housing. This too often resulted in everyone in the household contracting tuberculosis. Who would be left to help with convalescence if every family member was battling tuberculosis? Far too often, children became orphaned and were

forced to move into the homes of anyone willing to assist.

To pay homage to this important part of Newfoundland and Labrador's medical heritage, a historical mural was created and placed on permanent display in Dover, Nfld., an isolated community that was serviced by the floating clinic. In addition, research was done and families were identified who had stories surrounding tuberculosis and the *MV Christmas Seal*.

RESOURCES

I completed an extensive search for information at the provincial archives (The Rooms) in St. John's using "tuberculosis" and "MV Christmas Seal." This was expanded to find further information in historical databases provided by Memorial University's heritage collection. I searched visual recordings of the *MV Christmas Seal* in the CBC archives. I collected information surrounding the extent of tuberculosis in Newfoundland and the impact of the *MV Christmas Seal*. Finally, I collected local stories, as told by people who attended the unveiling event, in an effort to preserve the oral heritage surrounding this important medical event.

THE PAINTING AND STORIES

Historical images were obtained from the CBC archives and from personal collections in Dover. Roseann Collins combined these images into a mosaic showing a snapshot of life in Dover during the time of the *MV Christmas Seal*.

During the unveiling of the mural, some spoke of the arrival of the MV *Christmas Seal* as a positive occurrence. This was a memorable event in such a small community. “And there we were, taken out of school for the day, with children lined up by age, walking hand in hand down to the *Christmas Seal* boat at the government wharf to get our scratches” (E. Collins: personal communication, 2013). Screening for tuberculosis became an important mechanism to curb the spread of the disease. Having a mobile x-ray laboratory that would service these isolated communities became a vital tool to help the underserved patients. With the advent of immunization through bacille Calmette–Guérin vaccination, the *Christmas Seal* could not only identify positive cases but also help protect those who potentially could contract the disease. This vaccination became known as “scratches,” and many children received these on the floating clinic.

Of course, there were people who had a positive screening result for tuberculosis. This meant travelling to the sanatorium in St. John’s for treatment. For these people, the arrival of the MV *Christmas Seal* was seen as a heartbreaking event. “What was I to do. ... I had a family of six to care for, with three of my boys having a mental disability, and a brand new baby. ... I was forced to go to ‘The San’ for treatment. How could my husband care for everyone? We had no choice but to give up the baby” (F. Keats: personal communication, 2013). Harrowing stories such as these were far too fre-

quent in the battle against tuberculosis. Coming from a close-knit community, this baby was raised by a neighbouring couple who were unable to have children of their own. It was only years later, as an adult with a young family of her own, that this person learned her heritage.

COMMENT

The purchase of the mobile clinic served as an ingenious way to curb the spread of this communicable disease. It is perhaps the perfect marriage of traditional Newfoundland culture and state-of-the-art medical care.

The information gathered during this project has preserved a rapidly changing way of life. This cultural heritage may have otherwise been lost. The project allowed open communication around a medical condition that is still seen in our province today. Some of the stories shared during the unveiling had not previously been discussed, but now this “burden” has been shared by the whole community. A mural was chosen as the medium for this project so that the event would have a lasting legacy and serve as a visual reminder for visitors and residents alike.

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Competing interests: None declared.

Country Cardiograms

Have you encountered a challenging ECG lately?

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Dr Jan Christilaw, OBGYN, BC Womens Hospital
And others

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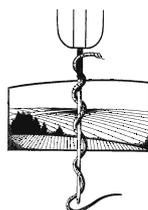
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 - Rural Critical Care courses provided throughout the country
- Key Partner in the Cairns Consensus on Rural Generalist Medicine

As an active member of this organization you are helping to support the above initiatives. Added benefits to membership include:

- Discounted registration fees for the annual Rural and Remote Conference, Rural Critical Care and other SRPC CME
- Subscription to the Canadian Journal of Rural Medicine
- Access to the lively and informative RuralMed and its archives

How to Join

Membership is free to students and MDs in their first year of practice in a rural or remote area of Canada.

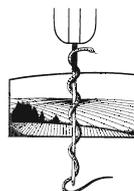
Call us toll free at **1-877-276-1949** or visit **www.srpc.ca** to join online.

Complete a membership form and fax to **(819) 647-2485** or mail to the address below.

Learn More

Visit **www.srpc.ca/srpc_about.html**. Our website provides secure transactions for membership renewals/applications, conference registrations as well as book orders and donations.

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