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"I created this pastel painting in 2000 for a limited edition giclee (archival inks — no fading, 1400 dpi) print on canvas. I wanted to convey a nostalgic feeling for our rural past and heritage. The image is 13" × 18" and can be purchased framed or unframed from my gallery."

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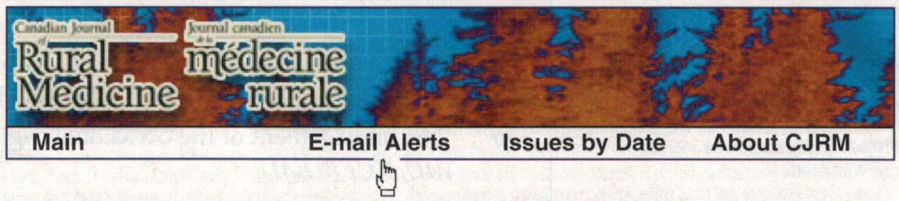

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520 words

Peter Hutten-Czapski, MD

Scientific editor, CJRM

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Answering a request for applicants. Talking to Dr. John Wootton about the job. An interview with the Council of the Society of Rural Physicians, and then: Congratulations. Discussions with the president. Meeting with the people who take the *CJRM* to press, articles to solicit for the occasional series, screening articles not ready for peer review, and now I am reminded to write "the" editorial, my first editorial for the *CJRM*. Five hundred and twenty words … or less.

Let me introduce myself. My name is Dr. Peter Hutten-Czapski and I'm the new guy on the masthead — scientific editor. It hasn't fully sunk in yet — there is so much to learn. I'm really glad that I have Suzanne Kingsmill, the managing editor, to help. Although I've edited the "Rural News," the "Rural Road" and the *Manual of Rural Practice*, it's not the same. Perhaps my most relevant qualification may be that I'm a rural doctor. It's a strange place to start, but you probably know why it is important. That's grist for several editorials of 520 words, but not today, not for a beginning.

Mind you, it is not a beginning for the journal. The *CJRM* has been around since 1996, almost as long as the society. Dr. Wootton, our first scientific editor, oversaw significant increases in circulation and prestige as we became recognized as a quality peer-reviewed journal.

We remain the only journal in the world of rural medicine indexed by Index Medicus. Dr. Wootton maintained certain traditions, such as the excellent occasional series that highlights aspects of our art.

My beginning as editor starts with this issue and the articles we have coming in. The material that we get continues to be important for rural physicians. Articles in the occasional series continue in this issue with a piece on "The management of the occasional trigger finger," (page 136) teaching and refreshing skills that must not be lost to rural medicine. Articles about our history, such as the piece on 156 years of physicians in Fort Simpson (page 111), grace these pages. Some of our best articles are written by rural doctors like you about our current challenges of adapting urban evidence to rural reality. Read on in the journal about rural treatment of acute cardiogenic pulmonary edema (page 121). Sometimes in these pages we may find some insight into our future with an article about "Physician satisfaction and practice intentions in Northwestern Ontario" (page 129).

This is what I've signed on for. As far as the future of the journal, well it's as simple and as complex as continuing to make the journal rurally relevant. Traditions built up over the years will continue.

Oh, I imagine I will eventually make my mark, but that doesn't matter. When people share the same vision, the same training, the same challenges and the same goals, it's just a progress note on the chart. John, you can go off call for the *CJRM* now and know that I have our community's journal covered. Just let me call you in if I feel overwhelmed or have a question. Otherwise here we go, 520 words at a time.

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520 mots

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Réponse à un appel de candidatures. Discussion au sujet du travail avec le Dr John Wootton. Entrevue avec le conseil de la Société de la médecine rurale et ensuite : Félicitations. Discussions avec le président. Rencontre avec les responsables de l'impression du *JCMR*, articles à solliciter pour la série occasionnelle, filtrer les articles qui ne sont pas prêts pour la critique par les pairs et on me rappelle maintenant de rédiger «mon» éditorial, mon premier pour le *JCMR*. Cinq cent vingt mots … ou moins.

Permettez-moi de me présenter. Je suis le Dr Peter Hutten-Czapski et je suis le nouveau nom qui figure au cartouche — le rédacteur scientifique. Je n'ai pas encore tout absorbé — il y a énormément à apprendre. Je suis vraiment heureux d'avoir l'aide de Suzanne Kingsmill, directrice de la rédaction. Même si j'ai été rédacteur de « Rural News », de « Rural Road » et du *Manual of Rural Practice*, ce n'est pas la même chose. Ma qualité la plus importante, c'est peut-être d'être médecin rural. C'est étrange comme point de départ, mais vous savez probablement pourquoi c'est important. Il y a là l'essentiel de plusieurs éditoriaux de 520 mots, mais pas aujourd'hui, pas pour un début.

Ce n'est pas un début pour le journal. Le *JCMR* existe depuis 1996, soit depuis presque aussi longtemps que la Société. Le Dr Wootton, notre premier rédacteur scientifique, a piloté des augmentations importantes du tirage et du prestige à mesure qu'on a commencé à reconnaître la qualité de notre journal critiqué par les pairs.

Nous demeurons le seul journal de médecine rurale au monde à figurer dans Index Medicus. Le Dr Wootton a maintenu certaines traditions, comme l'excellente série occasionnelle qui met en vedette des aspects de notre art.

Je commence comme rédacteur avec ce numéro et les articles qui arrivent. Le matériel que nous recevons demeure important pour les médecins ruraux. La série occasionnelle continue de paraître dans ce numéro (page 136) avec de la formation et une actualisation des compétences que la médecine rurale ne doit pas perdre. Des articles sur notre histoire, comme celui qui porte sur 150 ans de médecine à Fort Simpson (page 111), ornent ces pages. Certains de nos meilleurs articles sont rédigés par des médecins ruraux comme vous et portent sur les défis que pose actuellement l'adaptation de données probantes urbaines à la réalité rurale. Vous lirez plus loin dans le journal des textes sur le traitement rural de l'œdème pulmonaire cardiogène aigu (page 121). Il arrive aussi parfois que nous trouvions dans ces pages un aperçu de notre avenir, comme cet article sur la satisfaction des médecins et les intentions de pratique dans le Nord-Ouest de l'Ontario (page 129).

Voilà pourquoi j'ai accepté cette mission. En ce qui concerne l'avenir du journal, il est aussi simple et aussi complexe que de faire en sorte que le journal conserve son caractère rural. Les traditions accumulées au fil des ans seront maintenues.

J'imagine bien que je finirai par faire ma marque, mais cela importe peu. Lorsque des gens ont la même vision, la même formation, les mêmes défis et les mêmes buts, il s'agit simplement d'une note de progrès au tableau. John, vous pouvez maintenant cesser d'être de garde pour le *JCMR*, sachant que je m'occupe de notre journal communautaire. Permettez-moi simplement de faire appel à vous si je me sens débordé ou si j'ai une question. Sinon, c'est un départ, 520 mots à la fois.

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President's message. May 2008

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Our 16th annual Rural and Remote Medicine Conference in Halifax was a big success, combining high-quality CME with the opportunity to make and renew friendships and to have some fun. There was a lot of CME. More than 100 offerings over 3 days, with topics ranging from ethics to infections to psychotherapy, and, of course, the highly acclaimed Rural Critical Care workshops. Beyond CME, participants could learn teaching skills, leadership skills or how to give workshops. And there was fun: 3 big social events, a bridge tournament and the 8th annual East–West Hockey Challenge, plus informal get-togethers and reunions.

Speakers included CMA President Dr. Brian Day, Australian College of Rural and Remote Medicine (ACRRM) President Dr. Dennis Pashen, former provincial Minister of Health Dr. Dennis Furlong and Memorial University Faculty of Medicine Dean Dr. James Rourke. Leaders from the College of Family Physicians of Canada, the Royal College of Physicians and Surgeons and the Association of Faculties of Medicine of Canada (representing Canada's 17 medical schools) participated in discussions about rural health care, education for rural practice and specialist care for rural Canadians.

The SRPC Section of Specialists was formed. Rural specialists voiced their concerns about long hours on call, poor recognition and support for a broad scope of practice, inadequate access to CME and professional isolation. These are issues shared by all rural Canadian physicians, and we are pleased that our rural specialist colleagues have found a home at the SRPC.

The Keith Award was presented to the Dalhousie University Family Medicine Residency Program for having the most graduates practising in rural Canada 10 years after completion of their residency. The Rural Education Award for the undergraduate medical school that matched the most students to a rural family medicine residency was won by Memorial University. The winner of the Student Essay Contest was Keith Huber from the University of Alberta. His essay was titled "How time spent in rural medicine can shape a CaRMS decision."

Dr. John Wootton received the Rural Leadership Award for his significant contribution to rural medicine in Canada. John, among many achievements, was the scientific editor of *CJRM* from its beginning in 1996 until this year. Thank you, John, for a job well done. Dr. Peter Hutten-Czapski has been selected as the new scientific editor.

Thank you to the conference organizing committee, led by Dr. David Howe, along with all the volunteers, presenters, staff and participants for making this our largest conference to date, with an attendance of over 400 rural doctors, students and residents.

On behalf of the SRPC, I want to thank Dr. Michael Jong, who has completed his term as president, for his leadership and for his tireless work on behalf of our society. As the torch is passed, the mission continues: to promote equitable access to health care for rural Canadians through an adequate supply of physicians with appropriate skills in sustainable working conditions.

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Message du président. Mai 2008

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Notre 16e Congrès annuel de la médecine en milieu rural et éloigné, qui s'est tenu à Halifax, a remporté un grand succès, conjuguant activités d'EMC de grande qualité à la possibilité de nouer et de renouer des amitiés et de s'amuser un peu. Il y a eu beaucoup de séances d'EMC. Plus de 100 en trois jours sur des sujets allant de l'éthique aux infections en passant par la psychothérapie, sans oublier, bien entendu, les ateliers très populaires sur les soins intensifs en milieu rural. Les participants ont pu acquérir aussi des compétences en enseignement, en leadership ou en animation d'ateliers. Et les divertissements ont été à la hauteur : trois grandes activités sociales, un tournoi de bridge et la huitième édition annuelle du Défi hockey Est-Ouest, sans compter les réunions et les rencontres informelles.

Les délégués ont pu entendre notamment le président de l'AMC, le Dr Brian Day, le président de l'Australian College of Rural and Remote Medicine (ACRRM), le Dr Dennis Pashen, un ancien ministre provincial de la Santé, le Dr Dennis Furlong, et le doyen de la Faculté de médecine de l'Université Memorial, le Dr James Rourke. Des dirigeants du Collège des médecins de famille du Canada, du Collège royal des médecins et chirurgiens du Canada et de l'Association des facultés de médecine du Canada (représentant les 17 facultés de médecine du Canada) ont participé à des discussions sur les soins de santé en milieu rural, la formation à la pratique rurale et les soins spécialisés pour les populations rurales du Canada.

On a mis sur pied la Section des spécialistes de la SMRC. Des spécialistes ruraux ont fait part de leurs préoccupations au sujet des longues heures de garde, de la reconnaissance et du soutien médiocres pour un champ d'exercice si vaste, de l'accès inadéquat à l'EMC et de l'isolement professionnel. Tous les médecins ruraux du Canada s'intéressent à ces enjeux et nous nous réjouissons de voir que nos collègues spécialistes ruraux ont trouvé un foyer à la SMRC.

On a présenté le Prix Keith au Programme de résidence en médecine familiale de l'Université Dalhousie, qui compte le plus de diplômés pratiquant en milieu rural au Canada 10 ans après leur résidence. Le Prix d'éducation rurale, accordé au programme du premier cycle de la Faculté de médecine qui a jumelé le plus d'étudiants à une résidence en médecine familiale en milieu rural, a été décerné à l'Université Memorial. Keith Huber, de l'Université de l'Alberta, a remporté le concours de dissertation des étudiants pour son texte intitulé « Comment le temps passé en médecine rurale peut orienter la décision au moment du CaRMS. »

Le Dr John Wootton a reçu le Prix de leadership rural pour sa contribution importante à la médecine rurale au Canada. John a notamment été le rédacteur scientifique du *JCMR* depuis ses débuts en 1996 jusqu'à cette année. Merci, John, d'un excellent travail. Le Dr Peter Hutten-Czapski est le nouveau rédacteur scientifique.

Nous remercions le comité organisateur du congrès dirigé par le Dr David Howe, ainsi que tous les bénévoles, conférenciers, membres du personnel et participants qui ont contribué à faire de notre congrès le plus important jusqu'à maintenant : plus de 400 médecins ruraux, étudiants et résidents y ont participé.

Au nom de la SMRC, je remercie le Dr Michael Jong, qui a terminé son mandat à la présidence, de son leadership et de son travail inlassable pour le compte de la société. Au moment où on passe le flambeau, la mission continue : promouvoir un accès équitable aux soins de santé pour les Canadiens ruraux par une offre suffisante de médecins dotés des compétences appropriées et œuvrant dans des conditions de travail viables.

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Message du président. Mai 2008

Karl Stobbe, MD, CCFP(EM), FCFP

CJRM 2008;13(3):110

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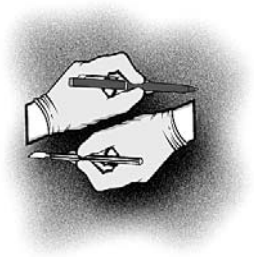

Original Article
Article originale

"Industrious, submissive, and free of diseases": 156 years of physicians in Liidlii Kue/Fort Simpson, Northwest Territories

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This article has been peer reviewed.

Introduction: Physician recruitment to rural and remote communities poses a major challenge to health care delivery in Canada. Rather than focusing solely on the politics and policies that contribute to the shortage of family physicians in Canada's North, we argue that more attention should be paid to the reasons that lead, and have led, family physicians to the North, and also to the factors that contribute to physician retention.
Methods: We used archival research and semi- and unstructured interviews to provide a history of medicine in Liidlii Kue/Fort Simpson, NWT, and to describe the features of physicians who have served and continue to serve this Northern community.
Results: Results show that medicine in Liidlii Kue/Fort Simpson can be divided into 4 distinct eras: the prehospital era (1848–1916), the early hospital era (1917–1925), the middle era (1926–1972) and the government era (1973–present). Thirty-eight physicians were identified as having worked in Liidlii Kue/Fort Simpson. Of those, 19 were contacted. Nine physicians and the offspring of 1 deceased physician were interviewed. We found physicians fell into 1 of 4 categories: new graduates, those seeking midcareer (or midlife) change, those about to retire and international medical graduates.
Conclusion: By examining Liidlii Kue/Fort Simpson as a case study, this research fills the dearth of knowledge in the factors that contribute to physician recruitment and retention in Canada's North.

Introduction : Le recrutement des médecins dans les communautés rurales et éloignées pose un défi majeur à la prestation des soins de santé au Canada. Au lieu de nous concentrer uniquement sur la politique et les politiques qui contribuent à la pénurie de médecins de famille dans le Nord, nous sommes d'avis qu'il faut accorder plus d'attention aux raisons qui y attirent et y ont attiré des médecins de famille, ainsi qu'aux facteurs qui contribuent à les y garder.
Méthodes : Cette communication est fondée sur une recherche effectuée dans des archives et sur des entrevues semi-structurées et non structurées afin de présenter un historique de la médecine à Liidlii Kue-Fort Simpson (T.N.-O.) et de décrire les caractéristiques de médecins qui ont servi et servent toujours dans le cette communauté du Nord.
Résultats : Les résultats montrent qu'il est possible de décrire la médecine à Liidlii Kue-Fort Simpson à quatre époques distinctes : l'époque préhospitalière (1848–1916), les débuts de l'époque hospitalière (1917–1925), la période intermédiaire (1926–1972) et l'époque gouvernementale (1973 à aujourd'hui). On a déterminé que 38 médecins avaient travaillé à Liidlii Kue-Fort Simpson et on a communiqué avec 19 d'entre eux. Nous avons interviewé neuf médecins et un descendant d'un médecin décédé. Nous avons constaté qu'il y avait quatre catégories de médecins : les nouveaux diplômés, ceux qui cherchent un changement en milieu de carrière (ou en milieu de vie), ceux qui sont sur le point de prendre leur retraite et les diplômés de facultés de médecine étrangères.
Conclusion : En analysant Liidlii Kue-Fort Simpson comme étude de cas, cette recherche comble les lacunes du savoir sur les facteurs qui aident à recruter des médecins dans le Nord du Canada et à les garder en poste.

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Introduction

In recent years, the federal, provincial and territorial governments in Canada, along with the media, have focused a great deal of attention on physician shortages in rural and remote communities, particularly in northern regions.[1,2] According to the Society of Rural Physicians of Canada, 22.2% of Canada's population lives in towns of less than 10 000 residents, but only 10.1% of physicians practise in such environments.[3] Clearly, there is a shortage of rural physicians. Despite the current heightened interest in this issue, physician shortages have plagued Canada's North for well over 100 years. Rather than focusing solely on the politics and policies that contribute to the shortage of family physicians in Canada's North, we believe that more attention should be paid to the reasons that lead and have led family physicians to practise in the North, and also to the factors that contribute to physician retention.

The Canadian context

The European project of colonization extended far beyond inhabiting Northern communities and exploiting their resources. Early Europeans, in what is now called Northern Canada, brought with them ideologies pertaining to "civilization"; certainly, European notions of health played a prominent role in the physical and ideological colonization of the North. While Aboriginal residents practised their own forms of medicine, European explorers and fur traders often brought with them their own doctors and their own understandings of medicine when travelling to and in the North.[4] The practice of bringing doctors to the North from the South continues to this day. Despite 17 Canadian medical schools, the current demand for doctors in Canada's North is so high that many Northern Canadians rely on international medical graduates (IMGs) for the provision of their health care.[5] This foreign solution to a Canadian problem is over 100 years old; indeed, even the Hudson's Bay Company (HBC) sought foreign-trained physicians to treat its Northern-based employees at trading posts and forts.[4] Despite the influx of foreign-trained physicians, physician retention in the Northwest Territories (NWT) has been, and remains, very low.[6] The ongoing difficulties associated with attracting and retaining family physicians — Canadian or otherwise — makes it imperative that health care administrators develop an understanding of the personal and demographic characteristics that can be used as predictors for the type of physician who might have an increased likelihood of choosing a long and satisfying career in Canada's North.

James Rourke[7] succinctly summarized the findings of the Canadian Medical Association's report of the advisory panel on the provision of medical services in underserviced regions. He listed professional factors contributing to the decision to leave rural practice as including "work hours, professional backup, specialty services, additional training, hospital services, continuing medical education and earning potential." Among family and personal reasons for leaving were "children's education, spousal job opportunities, recreation, cultural opportunities and retirement." Mayo and Mathews[8] expanded the literature on the spousal influence in the decision for a physician to live in an underserviced area by identifying 2 factors that directly affected spousal happiness in rural Newfoundland communities: 1) physician workload and 2) community integration (which relies on employment opportunities, having a rural background or experience in rural communities, proximity to family and friends, maturity, cultural differences and children).

In terms of finding solutions to these problems, Duplantie and colleagues[9] suggest that telehealth consultations with specialists might make working in rural and remote environments easier on physicians by providing them with timely access to backup and second opinions.

Most of the literature on the recruitment and retention of physicians in rural and remote Canadian locations has involved asking physicians from across the country to reply to surveys rather than looking to see whether there are characteristics unique to specific regions, towns or physicians. This paper seeks to explore the personal characteristics of physicians who worked in Liidlii Kue/Fort Simpson† over the last 156 years and to determine whether previously identified factors hold true for this group of individuals.

Methods

Situating the community and its residents

Liidlii Kue/Fort Simpson is a community located at

†Liidlii Kue is the South Slavey name for the community that was later given the name Fort Simpson. By providing both names for the community, we acknowledge the multiple identities and attachments of the residents of the land upon which this research was conducted.

the confluence of the Mackenzie and Liard Rivers (Fig. 1). Historically, the community has served as a gathering and trading place for Aboriginal peoples in the Dehcho (District of Mackenzie) region of the NWT. Aboriginal residents of this region are Dene, specifically Slavey and Métis. According to Abel,[11] the Slavey are "found along the Mackenzie [River] between Great Slave Lake and Fort Norman [now Tulita], along the Liard River to Fort Nelson, and through northern British Columbia and Alberta to Hay River." Though long important for Aboriginal peoples, Liidlii Kue/Fort Simpson gained prominence for Europeans when it became a location for a fur-trading post for the North West Company, and later the HBC. The North West Company built "Fort of the Forks" in 1803, though the Fort's name was changed to Fort Simpson when the HBC absorbed the North West Company in 1821.[11] Today, Liidlii Kue/Fort Simpson is a village of about 1200 Aboriginal and non-Aboriginal residents that is accessible by both road and air. It has offices for branches of local and regional Aboriginal governments, the territorial government and a municipal government, and it is home to the regional high school and, notably, to a health centre.

Prior to commencing this research project, the requirements for ethical approval as set out by Dalhousie University's research ethics board were satisfied. In addition, a research licence was obtained from the Aurora Research Institute, the institution that issues research licences on behalf of the government of the NWT. To obtain a research licence in the NWT, community consultation must be conducted with the Aboriginal and non-Aboriginal governments located within the research area. As a result, we conducted community consultations with the Village of Fort Simpson, Liidlii Kue First Nation, Dehcho First Nations, and Metis Nation Local #52. All organizations granted permission for the research to take place.

Fig. 1. Canada's Northwest Territories.[10]

Archival research

Through interviews and the examination of patient files, church records and a photographic archive, we identified those physicians who had practised in Liidlii Kue/Fort Simpson for a duration of at least 4 months during the period from 1848 to 2002.

Initially, it was hoped that most physicians would be identified through the examination of old patient files. About 100 files belonging to deceased or inactive patients were located in a storage closet at the current health centre. Unfortunately, the physicians' handwriting and signatures in the old files were difficult to decipher and thus did not aid in the identification of physicians. Nevertheless, the prevalence of tuberculosis in Canada's North during the middle of the last century generated a tremendous number of pathology specimens: fortunately, the pathology reports from sputum samples were typed and included the legible names of the physicians requesting the tests. These pathology reports generated the names of most of the physicians identified by this research.

While the lack of a complete set of formal hospital records presented a challenge, the Catholic and Anglican Churches' records were useful for the purposes of identifying physicians who had practised in the community. The Village of Fort Simpson's visitor information centre houses several historical documents, including 2 centenary papers: 1 produced by the Sacred Heart Mission[12] and 1 produced by St. David's Anglican Church parish.[13] The Sacred Heart document identified several doctors who worked at the hospital in the first half of the 20th century and provided their arrival and departure dates. A search of the NWT online photographic archives yielded labelled photographs of 2 doctors who practised in Liidlii Kue/Fort Simpson. Short-term locum physicians who filled in for physicians while they were out of town were not included in this research. This decision was made to restrict our focus to physicians who made a more significant time commitment to the region. We arbitrarily chose 4 months of work in Fort Simpson/Liidlii Kue as the cut-off for inclusion in this project.

Interviewing community members

Snowball sampling, a form of purposeful sampling, was used to locate interview participants. Cresswell[14] notes that snowball sampling "identifies cases of interest from people who know people who know what cases are information-rich." Through this process, 6 Liidlii Kue/Fort Simpson residents were asked whether they would be willing to be interview participants, and all agreed to participate. Each of the participants in this study was provided with a participant information letter and consent form to ensure free and informed consent.

It should be noted that it was at times culturally unacceptable to seek written consent. In such cases, a verbal explanation of the contents of the participant information letter was provided either in English or, with the help of an interpreter, in South Slavey, the local Dene dialect, and the potential participant's response of giving consent was recorded in detail in field notes. If a participant wished to withdraw from the study, he or she was able to do so at any time without consequence, and information based on interviews or observations would have been removed and destroyed by the researcher on request. Happily, this situation did not arise.

Both semistructured and unstructured/informal interviews were conducted with local residents to gather data about physicians who had worked or were working in Liidlii Kue/Fort Simpson. Interviews ranged in length from 5 to 60 minutes. Questions included but were not limited to the following:

1. Do you know the names of any of the doctors who have worked in Liidlii Kue/Fort Simpson?
2. Do you know the approximate date when each of the above-listed physicians started work in Liidlii Kue/Fort Simpson?
3. Do you recall the approximate date that they left Liidlii Kue/Fort Simpson?
4. Do you know why the doctor left town?

Six townspeople were interviewed.

Community members were able to physically describe many of the former physicians who had worked in Liidlii Kue/Fort Simpson; however, they were only able to provide the names of 4 former physicians, an ambulance driver and a physician's assistant who had worked in Liidlii Kue/Fort Simpson over the years. A local resident who had run the ambulance service for many years was particularly helpful in providing accurate names and key information concerning physicians. These names were then added to a list that had been generated through the aforementioned archival research.

Once the names of physicians had been identified, an internet search of their names was conducted with the Google search engine (google.com). The results helped to create leads as to where surviving physicians might be practising or to their medical school of origin. The website for each province's College of Physicians and Surgeons was searched. This provided contact information for physicians who were still in

practice as well as several retired physicians. Some of the physicians identified through the research were difficult or impossible to track down because of the common nature of their surnames, for example, Dr. Clark. It often took several attempts to connect with the physician who was the target of the research. Physicians with the same name as the target who were accidentally contacted were extremely helpful in redirecting the investigator.

Interviewing the physicians

Questions posed to the physicians were piloted on 2 physicians and the interview questions were then refined. Two types of questions were asked: closed-ended questions concerning basic demographic data (e.g., sex, medical school, year of graduation, marital status) and open-ended questions pertaining to why physicians had chosen to practise in Liidlii Kue/Fort Simpson as well as the factors that ultimately led to their departure (Why did you choose to leave Liidlii Kue/Fort Simpson? What might have been done that would have convinced you to continue to practise in Liidlii Kue/Fort Simpson?). Physicians were interviewed in person and via email, fax and telephone. Though there was a limited response to requests for interviews, it should be noted that those physicians who did participate in the project were extremely enthusiastic and often went above and beyond the scope of the interview by contributing photos, videotape footage and personal documents.

Results

Historical data: the 4 eras

Through the examination of archives and interviews with physicians and townspeople, 4 distinct eras of family medicine were identified in Liidlii Kue/Fort Simpson: the prehospital era (1848–1916), the early hospital era (1917–1925), the middle era (1926–1972) and the government era (1973–present).

Prehospital era (1848–1916)

From its inception, the HBC realized that it needed skilled physicians to provide health care to its workers in remote, Northern communities.[15] The HBC understood that it needed to acquire the services of physicians whom it believed were suited for work in the relative isolation and harsh climate found in Canada's North. As a result, the HBC targeted residents of the Orkney Islands as potential physician recruits because it believed the Orcadians to be "industrious, submissive, and free of diseases."[15] HBC physicians hailing from abroad, along with missionaries, provided basic medical services before the establishment of a hospital in Liidlii Kue/Fort Simpson.

During the early prehospital period in Liidlii Kue/Fort Simpson, physicians were often at the Fort only during the winter months as they waited for the ice to break up so that they could continue their scientific adventures. These physician–adventurers included such notable men as surgeon and biologist Sir John Richardson, who was in the region studying ichthyology and searching for the lost Franklin expedition in 1848,[16] and Dr. John Rae. Dr. Rae was a surgeon from the Orkney Islands who acted as Chief Factor for the HBC in Liidlii Kue/Fort Simpson in 1849 but left the post to join the search for Franklin and his men.[16] Known as Canada's "Great Pedestrian," Rae covered over 21 000 km on foot and mapped 2800 km of Canada's northern coastline.[16] Though both Richardson and Rae were in Liidlii Kue/Fort Simpson chiefly as explorers, it is reasonable to hypothesize that they used their medical skills to help those in need.

The prehospital years in Liidlii Kue/Fort Simpson also saw medical care being provided by missionaries with a variety of skills. Ministers and their spouses, who were in residence at St. David's Anglican Church in Liidlii Kue/Fort Simpson, were occasionally pressed to provide medical care. In the Anglican Church's centenary document[13] it is noted that the minister's wife, Rose Spendlove, who had limited medical knowledge and expertise, provided medical services that saved the lives of more than 1 parishioner. During her tenure in Liidlii Kue/Fort Simpson, Rose Spendlove is said to have performed 2 successful surgical amputations and to have nursed many back to health during the epidemics of influenza and measles in 1881.

Early hospital era (1917–1925)

Missionaries were also involved in the care of local residents in the early hospital years. Hospital service in Liidlii Kue/Fort Simpson began on Sept. 7, 1916, when the Grey Nuns, working with the Sacred Heart parish of the local Catholic Church, opened St. Marguerite's Hospital.[12] The Grey Nuns, part of the order of the Sisters of Charity of Montreal, provided medical care in Liidlii Kue/Fort Simpson from 1916 to 1990. They were both lay and professional nurses who travelled great distances to provide health care to poor and underserviced patients.

The Nuns' contribution to the health of Northerners cannot be overstated and is well-documented elsewhere, for example in Sutherland's (1996) text *Northerners Say: "Thanks, Sisters."* For the first 10 years of the hospital's existence, the Sisters acted as medical officers and performed minor operations[12] without the help of a permanently appointed physician: itinerant physicians were rarely available.

The middle era (1926–1972)

The first permanent doctor, Dr. A.W.M. Truesdell, arrived in Liidlii Kue/Fort Simpson in August 1926. He began his work at St. Marguerite's Hospital and stayed for a record 23 years (Don Truesdell, son of A.W.M. Truesdell: personal communication, 2003). Unfortunately, St. Marguerite's Hospital burned to the ground in 1930;[12] it was quickly replaced by St. Margaret's Hospital in 1931. St. Margaret's served mainly as a tuberculosis hospital, with some patients staying for up to 8 years (Ed Lindberg: personal communication, 2003). Though the hospital became the primary residence for many patients with tuberculosis, the Sacred Heart Mission's archives reveal that many residents of Liidlli Kue/Fort Simpson were eager to avoiding spend time there:

> Unfortunately, a relatively large number of patients have died at the Hospital during the first quarter century of its operation ... an opinion began to spread in the early 30s that admission at the St. Margaret's Hospital meant for the patients admission to the cemetery.[12]

The facilities at the early hospitals in Liidlii Kue/Fort Simpson were modest and likely did not instill confidence in local residents or physicians. For instance, surgery at St. Margaret's Hospital was often postponed until the late afternoon when the operating room was best illuminated by sunlight (Micheal Thain, former Liidlii Kue/Fort Simpson physician: personal communication, 2004). Indeed, the shortage of basic equipment, such as adequate lighting, likely disappointed southern-trained physicians who were accustomed to having such things as electricity at their disposal.

Government era (1973–present)

In 1973, the federal government took over management of St. Margaret's Hospital from the Grey Nuns, closed it, and subsequently opened Fort Simpson Hospital.[17] The federal government found that it was impossible to run Fort Simpson Hospital with paid employees on the same budget that the nuns had used at St. Margaret's: this eventually culminated in the downgrading of the Fort Simpson Hospital to a health centre on Sept. 1, 1997. The health centre, unlike the hospital, did not provide acute care beds.[18] From this point on, acutely ill patients in need of hospitalization have been medically evacuated to Stanton Territorial Hospital in Yellowknife, NWT, or to 1 of several hospitals in Edmonton, Alta. While the current Liidlii Kue/Fort Simpson Health Centre does not have acute care beds, it does feature a 14-bed long-term care facility for elders and individuals living with severe physical or mental disabilities, or both.

Physicians

Our research with living doctors resulted in a total of 19 doctors and the offspring of 1 deceased physician, all of whom were contacted. Of the 19 physicians who were contacted, 9 physicians and 1 descendant participated in the project. With the 10 physicians who had practised in Liidlii Kue/Fort Simpson for 4 months or more and responded to requests for interviews (or a descendent responded on their behalf), the years 1925–2003 were represented by at least 1 physician per decade, with the exception of the 1950s (Table 1). On average, physicians stayed in Liidlii Kue/Fort Simpson for 49 months (range 4–276 mo). That number, however, is skewed by 1 physician who stayed for 276 months (23 yr). The median length of physician stay was 18 months. Upon examination of the physicians' employment experiences before working in Liidlii Kue/Fort Simpson, we found that the physicians had a mean of 7.1 years post–medical school graduation before they accepted their posting in the community. Eight of the physicians had experience working with First Nations, Métis or Inuit populations, and 7 of them had previously practised in the North. Five of the physicians interviewed had recently graduated

Table 1. Physician sex and time period spent in Fort Simpson/Liidlii Kue

Physician sex	Time period
Male	1926 to 1949
Male	Aug. to Nov. 1942
Male	Fall 1964 to spring 1966
Female	Feb. 1966 to Sept. 1967
Male	July 1967 to July 1968
Male	Sept. 1968 to July 1969
Male	July 1971 to Apr. 1974
Male	June to Oct. 1985
Male	1991 to 1995
Male	July 1998 to July 2002

from medical school when they ventured north. Five doctors were recent graduates when they practised in Liidlii Kue/Fort Simpson and 4 were in midcareer. Data analysis revealed 4 subcategories of physicians who ventured to Liidlii Kue/Fort Simpson: new graduates, those seeking midcareer (or midlife) change, those about to retire and IMGs. A long-time physician in Liidlii Kue/Fort Simpson shared his understanding of the first 3 groups:

> 1) You get the young guys, the young new grads that are looking for adventure, who are willing to try anything. And some of them are very good. Some of them, though, I can say that I don't think that this would be the place for a new grad. Experience really helps — working in a small group; 2) The midlife crisis guys, as I call them, of which I'm one. You sort of get tired of what you're doing and want a change and have the experience and stability to look around. I personally think they're a good group to grab — and they're not common. And, unfortunately, when those docs say that they want to change jobs, there's so much out there available that they're usually snagged by someone else long before they phone up here; 3) The almost gonna retire guys who want to do something different for the last few years of their practice [and] pay for the kids' university.

The categorizations provided by this physician aligned extremely well with this study's findings. Five of the physicians interviewed had recently graduated from medical school and had not had much experience. One physician remarked:

> I was very naive. I knew I'd have to do obstetrics. By the time I got to obstetrics in my training, I knew I was going to Fort Simpson and they gave me extra training. Now knowing how much trouble you can get into I think I'd be less likely to go now.

Four physicians either identified themselves as experiencing a "midlife crisis" or were middle-aged and reported that they were seeking adventure, a change of routine or both. One physician practised in Liidlii Kue/Fort Simpson at the end of his career. Members of 1 final category, IMGs, were not interviewed as none could be located despite considerable effort.

One physician provided us with a perhaps unorthodox framework for categorizing physicians who have travelled north:

> These categories have long been used to describe any person working in the North, and while they may have negative connotations for some they have become part of the rural vocabulary. You know about the 3 Ms — the 3 types of people who live in the North: mercenaries, missionaries and misfits. I was a bit of all 3. A mercenary because I was there to earn money, a missionary because I was there to work at my goal (seeing if I could hack it as a doctor) and a misfit because I didn't fit into traditional modes and didn't join a GP practice in TO [Toronto] right after internship.

Reasons for coming

Physicians who practised in Liidlii Kue/Fort Simpson stated various reasons for deciding to work in the community. Three physicians said that they were approached directly by Northern Health Services, a federal government body that recruited physicians for Canada's North. Two physicians contacted Northern Health Services themselves, while 2 other physicians answered an advertisement recruiting physicians to the North. A desire for adventure was the reason 2 other physicians gave for coming north, and the final 2 physicians identified the challenge of remote medicine as their reason for moving to Liidlii Kue/Fort Simpson. One respondent described his reasons for working in the community as follows:

> By pure luck and circumstance, I ran into L.L. who said she was looking at working in the North and that the pay was really good. If there had been the equivalent job in Vancouver, say something 9–5, then I would have done that but ... the monetary incentive was good enough to come up here that I would not have to work full-time which would then give me lots of time off. So that was the big reason for coming up here. I didn't have a burning desire to come to the Northwest Territories. In fact, I had not even thought of it until talking to L.L.

Economic factors influenced physicians' tenure in Liidlii Kue/Fort Simpson. For instance, 8 of the physicians felt they were adequately financially compensated for their work, especially when they considered that their housing was provided. All but 1 of the physicians had their travel to and from Liidlii Kue/Fort Simpson funded. Seven of the physicians felt that the vehicle with which they were provided while in the community was safe and adequate. All the physicians agreed that their lodgings were reasonable. Physicians were not motivated solely by remuneration: 4 physicians indicated that the desire to work with an underserviced population factored into their decision to practise in the community. Currently, Liidlli Kue/Fort Simpson locum physicians are offered a competitive salary, housing and the use of a minivan (Shane Barclay, medical director, Dehcho Health and Social Services: personal communication, 2003).

Reasons for leaving

For various reasons, none of the living physicians interviewed were interested in making a long-term commitment to practise and live in the community. The 2006 NWT Physician Survey revealed that 17 of the 38 physicians practising in the NWT stated that it was "unlikely" or "very unlikely" that they

would be practising in the NWT in 5 years.[6] While remuneration certainly played a role in attracting physicians to the community, it was apparently not enough to retain their services. Physicians cited several different reasons for leaving their practice in Liidlii Kue/Fort Simpson. Four reported that they never intended to stay longer than their initial contract. Two cited the 24 hours per day, 7 days per week call schedule as factoring into their decision to leave. One left after being offered a promotion, and 1 other physician left his practice because his spouse could not cope with the isolation of living in Liidlii Kue/Fort Simpson. Four physicians cited the lack of access to continuing medical education (CME) as a reason for leaving. A sense of professional isolation, moving to another area of Canada with a perceived greater need for a physician and the desire to live with one's family on a full-time basis (it is not uncommon for physicians who work in remote regions of Canada to work in a community far from home and periodically return to their home community and family) were other reasons cited for leaving Liidlii Kue/Fort Simpson.

Another factor that is both controversial and difficult to measure directly, the perceived poor quality of the educational system in town, caused at least some of physicians to leave before their children reached school age. Four of the physicians interviewed stated that they did not want their children to attend the schools in Liidlii Kue/Fort Simpson and that this was one of the most important factors influencing their decision to leave. One physician noted that "we left partly because we couldn't see having children reach school age in Simpson." Only 1 physician said that he believed that his children received an adequate education in the community.

Finally, physicians noted that a lack of locums to fill in for them while they were away prevented them from attending CME events and caused them to feel that they were falling behind in their practice of medicine. Four physicians explicitly stated that the lack of access to CME was one of the reasons why they left Liidlii Kue/Fort Simpson. One physician stated, "it became hard to sustain the belief that someone else with more training could not have done better." One doctor succinctly stated the problems of working in Liidlii Kue/Fort Simpson in response to the question: Why did you leave Fort Simpson?

> 1) Professional isolation and 2) the government had promised me a certain amount of educational leave but there always seemed to be a reason why I couldn't get out. During that time we founded the NWT Physician's Association. I had good holidays and I used to take them in one big lump in the summer and they always had difficulty replacing me. Some of the locums trashed the house we were living in. There was some frustration with what the government had promised and didn't happen.

While there were clearly benefits and enjoyable features for family physicians practising in Liidlii Kue/Fort Simpson, for this small sample size they did not seem to be enough to outweigh some of the negative aspects that the physicians described.

Discussion

Employing physicians from each career stage identified previously can be associated with various benefits and drawbacks. As noted, 5 of the physicians interviewed had recently graduated from medical school. While new graduates certainly have up-to-date skills, it is possible that they lack experience and may not have the skills needed to work as a solo physician. Four of the physicians interviewed were placed in the midcareer category. Physicians in this category usually possess good practical experience and solid technical skills; however, their mobility is often hampered by school-aged children and spouses who are looking for employment. Only 1 of the physicians interviewed was at the end of his career in medicine.

The final category identified was IMGs. As mentioned above, though many IMGs have worked in Liidlii Kue/Fort Simpson, unfortunately none could be located for interview. These physicians help to fill the need for physicians in the North and, indeed, throughout Canada: it has been calculated that 23% of practising physicians in Canada are foreign-trained.[19] The foreign-trained doctors who came to Liidlii Kue/Fort Simpson did not necessarily have to have a Canadian medical license. Many foreign graduates who worked in the North served the minimum amount of time that was once required to allow them to move on to the next phase of licensing. Like physicians in any rural community, some foreign graduates will go to a Northern community with the intention of staying for the minimum period of time and end up spending their entire career there. In fact, Thind and colleagues[20] revealed that IMGs were "more likely than Canadian-trained medical graduates were to be serving in small towns and rural and isolated communities." While it is difficult to determine whether this geographic phenomenon is by choice or as a result of licensing restrictions, foreign-trained physicians are vital to the Canadian health care system as they fill positions in communities that would otherwise be without a physician.

The 3 Ms categories — missionaries, mercenaries

and misfits — merit some discussion. As mentioned in the results section, missionaries made considerable contributions to medicine in Canada's North. The contributions of the other 2 categories, mercenaries and misfits, require further elucidation.

The *Oxford English Dictionary*[21] defines "mercenary" as an adjective meaning "primarily concerned with money or other reward" and as a noun meaning "hired soldier in foreign service." Both terms are apt for partially describing the motivation of the wave of physicians that followed the adventurers and missionaries to Liidlii Kue/Fort Simpson in the middle and government eras. While all doctors work for payment, money is not necessarily the driving force behind their decision to work in a particular community. Some physicians chose to work in Liidlii Kue/Fort Simpson when the rate of pay was less than they could have earned in the South because they were looking for adventure and the challenge of rural and remote medicine.

Years later, physicians were lured to Liidlii Kue/Fort Simpson by a salary that was higher than they could earn in the South. These men and women were doctors for hire — they had no particular loyalty to the community or the North. They were seeking financial gain and exciting medicine, and they were willing to travel to achieve their goals. Though perhaps the word "misfits" is harsh, it describes an eclectic group of people who were scattered throughout the entire 156-year period this study examined. There is an abundance of anecdotes about a physician who was said to have removed an appendix from the same person more than once, another who wore safari gear and a third who was so scared of the locals that she would not walk in the community. These sorts of tales, however, are more legend than good research and, certainly, every community has a few eccentric characters.

Future physician recruitment

Strikingly similar to the findings of the Canadian Medical Association's report of the advisory panel on the provision of medical services in underserviced regions (as previously quoted from Rourke[7]), there are several changes that the physicians interviewed suggested could be made to entice more doctors to practise in Liidlii Kue/Fort Simpson. These include guaranteeing locum coverage for vacations and CME, and funding accommodation for those who sign permanent contracts. One important change has already taken place: Liidlii Kue/Fort Simpson was designated as a 2-physician community in April 2005 (Hazel Isiah, Dehcho Health and Social Services: personal communication, 2006). Designating the community as one requiring 2 doctors means that physicians are able to take call every other night as opposed to every night. Further, the community can be covered by a physician when the second physician is away holding clinics in the neighbouring communities. Issues that remain include providing guaranteed locum coverage for CME and vacations so that physicians can continue to maintain and upgrade their medical skills and take much needed rest without having to worry about finding a replacement. Finally, the current locum contract provides physicians with accommodation and a vehicle, while the permanent contract does not offer such perks — thus there is little incentive to sign a permanent contract. Though the above-mentioned changes would likely be costly, the medical care and resident satisfaction with that care in the Dehcho would likely improve with the ensuing continuity, and as a result, other costs, such as those associated with recruitment and arranging constant locums, might decrease.

Physicians with certain personality traits were found to be more likely to travel north. Physicians interviewed for this study stated that they possessed a sense of adventure, and enjoyed the outdoors and the challenge of independent practice. Thus our findings suggest physician recruiters should focus on doctors with personality features similar to those described above to increase their chances of successful recruitment and retention.

Limitations

There were a number of limitations to this study. Drawing conclusions is hampered by the small sample size. The lack of response from our targeted subjects may be due in part to the busy nature of the life of family physicians — they often simply lack the time to participate in anything other than work related to their practices. Further, the research was conducted through summer months and some physicians may have been on holiday. Finally, we were unable to locate and interview IMGs.

Conclusion

The different types of physicians who ventured north reveal that there is no ideal physician demographic: every group has its own benefits and drawbacks. There are, however, several strategies that might improve the quality of physicians being recruited and the chance that some physicians

might stay for longer periods of time. To some extent, it is true that the government of the NWT is taking any physician it can recruit; the young physicians who are fresh out of residency may lack the experience required to work as a solo physician, while the foreign graduates may not be licensed to work in Canada and, though generally good physicians, there is no guarantee that they have the skills possessed by Canadian graduates. Physicians at the end of their careers provide a wealth of experience but are sometimes only putting in time until they can start their retired life elsewhere.

The key to successful recruitment in the remote Canadian North seems to be locating individuals within each of the demographics who enjoy working with Aboriginal people, who enjoy the challenge and adventure of remote medicine and who take pleasure in the outdoors. Finally, guaranteeing locum coverage for CME and vacations, and providing accommodation for permanent physicians might improve recruitment and retention. Liidlii Kue/Fort Simpson's new designation as a 2-physician community will likely have a large and beneficial impact on recruitment.

If one views the recruitment and retention problems of Liidlii Kue/Fort Simpson as being similar to those found elsewhere in Canada and, indeed, the world, then it is likely that system-wide reforms are needed. Rourke[7] suggested several strategies for making rural practice a more popular choice for practitioners: promoting medicine to rural high school students, exposing undergraduate medical students to rural practice, increasing financial support for rural doctors to attend CME, updating hospital equipment at small rural hospitals and increasing locum support for rural doctors who are burdened by unreasonable on-call schedules. Though he proposed these remedies in 1993, the majority of them were never implemented to the extent that they actually made a difference.

Based on current data and an examination of 156 years of physician recruitment and retention, the dream of having full-time resident physicians in a community like Liidlii Kue/Fort Simpson may be just that — a dream — unless the current challenges can be addressed.

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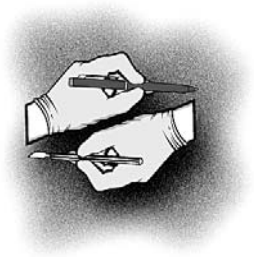

Rural treatment of acute cardiogenic pulmonary edema: applying the evidence to achieve success with failure

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Rural management of acute cardiogenic pulmonary edema should be based on avoidance of adverse outcomes such as in-hospital mortality, the need for intensive care unit care, and the need for intubation and mechanical ventilation. Current evidence suggests that early noninvasive continuous positive airway pressure and early aggressive preload reduction with intravenous nitroglycerin are first-line interventions. Afterload reduction with sublingual captopril, with or without nitroglycerin, improves outcomes and is a second-line intervention. Furosemide is associated with adverse outcomes when used alone and should be given only after vasodilator therapy as a third-line intervention. Inotropes should be used only with demonstrably poor perfusion as they do not improve outcomes and may indeed be associated with increased mortality. Concurrent vasodilator therapy should be considered as soon as possible. Morphine should not be used as it is associated with adverse outcomes. If sedation is desirable, benzodiazepines should be considered.

La prise en charge en milieu rural de l'œdème pulmonaire cardiogène aigu devrait viser avant tout à éviter les résultats indésirables comme la mortalité à l'hôpital, le besoin de traitements aux soins intensifs et le besoin d'intubation et de ventilation mécanique. Les données probantes actuelles indiquent que l'intervention rapide par pression positive continue non effractive dans les voies aériennes et la réduction agressive rapide de la précharge par l'administration de nitroglycérine intraveineuse constituent des interventions de première intention. La réduction postcharge par administration sublinguale de captopril, avec ou sans nitroglycérine, améliore les résultats et constitue une intervention de deuxième intention. Le furosémide est associé à des résultats indésirables lorsqu'il est utilisé seul et il faudrait l'administrer seulement après une thérapie au moyen d'un vasodilatateur comme intervention de troisième intention. Il faut utiliser les agents inotropes seulement lorsqu'il est démontré que la perfusion est médiocre, car ils n'améliorent pas les résultats et ils sont en fait associés à une augmentation du taux de mortalité. Il faudrait envisager le plus tôt possible une thérapie simultanée au moyen d'un vasodilatateur. Il ne faut pas administrer de morphine, car elle est associée à des résultats indésirables. Si une sédation est souhaitable, il faudrait envisager d'utiliser des benzodiazépines.

Background

The improved management of patients with acute myocardial infarction and the management of chronic congestive heart failure using evidence-based guidelines has met with great success, to the extent that patients are living longer with impaired cardiac function.[1,2] This accumulation of older patients will eventually present to the emergency department with acute decompensation, often with pulmonary edema. Heart failure has become the major admitting diagnosis for patients over 65 years old, and there is a 50% chance of hospital readmission of these patients within 6 months.[3] The development of

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cardiogenic pulmonary edema (CPE) portends a particularly high mortality, approaching 15%–20% in hospital.[4]

Contrary to the situation with chronic heart failure, existing guidelines for the management of CPE can give only minimal evidence-based advice.[1,5–7] Much guideline content is based on anecdotal practice and expert opinion.[8] As subsequent discussion and documentation will show, there is outstanding evidence for the early use of noninvasive respiratory support for the patient who might otherwise go on to intubation. Vasodilator therapy is receiving increasing investigational support. At the same time, clear evidence for harm has to be considered with the use of morphine, inotropes and even diruetics.

Rural emergency departments and hospitals do not often have the funding or personnel to staff an intensive care unit (ICU) or to manage more complex monitoring such as central venous catheters or prolonged intubation. Fortunately, the most beneficial evidence-based interventions involve medications and equipment readily available in a rural setting. Also, most patients presenting with acute pulmonary edema have well-preserved perfusion and are symptomatic mainly because of pulmonary congestion ("warm and wet;" Fig. 1).[9] Although this type of presentation engenders anxiety in both patients and physicians, there is a great deal of satisfaction in watching the dramatic clinical improvement when fluid distribution, preload and afterload are properly managed.

Pathophysiology

As cardiac function becomes inadequate, the left ventricle can no longer handle pulmonary venous return, which increases cardiac preload. Hydrostatic pressure builds in the pulmonary capillaries resulting in transudation of fluid into the alveolar space with the beginning of acute CPE. Thus begins a self-reinforcing cycle whereby physiologic attempts at compensation beget further decompensation (Fig. 2).

Alveolar fluid buildup leads to hypoxia, which increases catecholamines, producing increased systemic vascular resistance and blood pressure and raising cardiac afterload. Myocardial oxygen demand is increased, producing myocardial ischemia, reduced cardiac output and increased left ventricular (LV) end diastolic pressure. This again reinforces alveolar fluid buildup aggravating hypoxia. Dyspnea and increased respiratory effort produce anxiety, release further catecholamines, and further raise systemic vascular resistance and blood pressure.

Increased LV end diastolic pressure produces a further self-reinforcing cycle, with the activation of the renin-angiotensin-aldosterone system leading to increased sympathetic tone and rise in afterload. The result is a heart with already reduced contractility pumping against a markedly elevated systemic vascular resistance (afterload) and the inability for the heart to handle continued right-sided filling; this further increases pressures in the pulmonary circuit (preload). Cardiac output falls and alveolar fluid increases unless there is intervention at some level. The options are to

1. reduce preload;
2. reduce afterload; or
3. improve contractility.

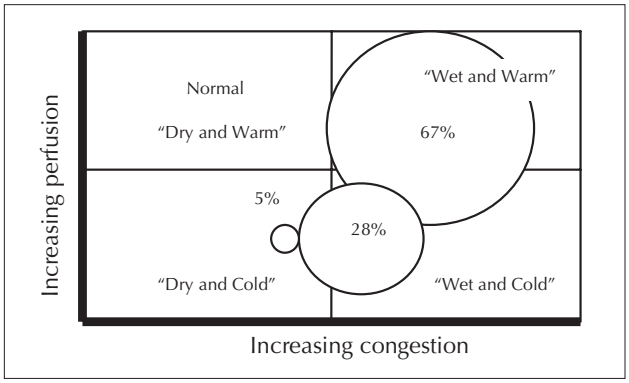

Fig. 1. Clinical spectrum of hemodynamic profiles in 486 patients with reduced left ventricular ejection fraction and presenting with heart failure. Increased ventricular filling pressures produce pulmonary edema (wet lung). Decreased output and vasoconstriction produce poor perfusion (cold extremities). Adapted from Nohria et al.[9]

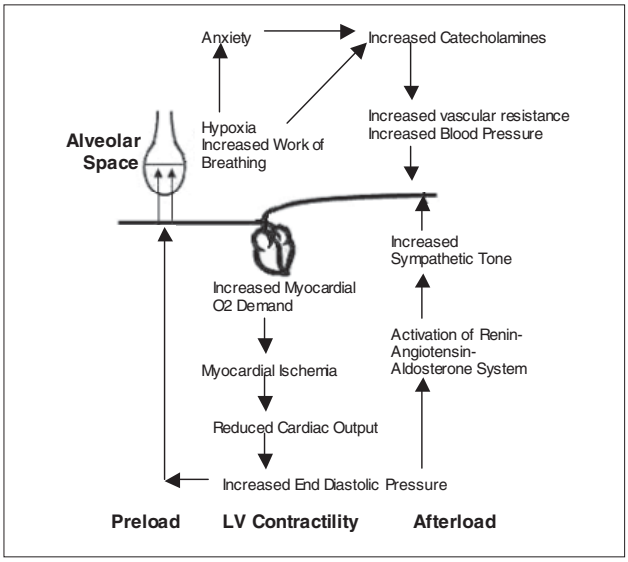

Fig. 2. Pathophysiology of acute cardiogenic pulmonary edema. The cycle begins when the left ventricle (LV) can no longer handle pulmonary venous return. Hydrostatic pressure in the pulmonary capillaries increases until it exceeds alveolar interstitial pressure.

By the time the patient presents, impairment of all 3 processes is usually well advanced.[4]

The clinical spectrum of patients seen with heart failure relates to the degree of congestion and the quality of perfusion (Box 1). Dyspnea on exertion is the most sensitive symptom, whereas paroxysmal nocturnal dyspnea is most specific. Elevated jugular venous pressure (JVP) is the best physical indicator, but it has poor clinical accuracy.[10] Blood pressure is the most accessible measure of perfusion.[9] Two-thirds of presenting patients will be congested but well-perfused, while 28% will be congested and poorly perfused, and 5% will demonstrate no congestion and be poorly perfused (Fig. 1). Successful outcomes are almost always achieved through reduction in LV filling pressures through reduction in preload or afterload. In poorly perfused patients, inotropes have to be considered to improve contractility, but agents to improve preload and afterload need to be added as soon as possible.[3,8,9,11] The 5% of patients in the last category rarely present acutely, as they are not congested.[4]

Precipitating causes

The possible precipitants of CPE will sometimes mandate alternative therapies that are beyond the scope of this discussion. Sometimes, as with hypertension, the treatment may not differ. At other times, as with myocardial infarction, treatment follows another path. The "MADHATTER" mnemonic (Box 2) is a useful memory aid.[7]

Box 1. Signs and symptoms of acute cardiogenic pulmonary edema

Congestion (volume overload)
- Dyspnea on exertion
- Orthopnoea
- Paroxysmal nocturnal dyspnoea
- Satiety, nausea, vomiting
- Edema
- Increased jugular venous pressure
- Hepatojugular reflux
- Ascites
- Hepatosplenomegaly
- S3 gallop
- Rales

Hypoperfusion
- Fatigue
- Altered mentation
- Narrow pulse pressure
- Hypotension
- Cool extremities
- Worsening renal function

Differential diagnosis

As will be discussed, misdiagnosis is the possible reason for evidence for harm with the use of some of our time-tested therapies. In a study of prehospital treatment of CPE, Hoffman and Reynolds[12] found a 23% incidence of alternative diagnoses, possibly accounting for adverse outcomes in patients given morphine if respiratory disease was the actual cause of symptoms. We will never be exact in all our diagnoses in a rural emergency department, so we must think of the differential diagnosis (Box 3) and avoid therapies that can make an alternative condition worse.

THERAPY

Respiratory interventions

There is now outstanding evidence for the benefit of noninvasive airway interventions in the treatment of CPE. There is sound data from multiple meta-analyses[13–15] indicating improvement in preload, afterload and outcomes. This intervention is now considered to be a nonpharmacologic treatment measure, rather than a supportive measure,[13] and a first-line intervention in treatment of CPE.[11] Evidence for the benefit of noninvasive airway interventions in CPE includes the following:

Box 2. Precipitating causes of acute cardiogenic pulmonary edema. MADHATTER mnemonic.

Myocardial infarction
Anemia
Drugs, diet (salt)
Hypertension
Arrhythmia
Thyroid disease
Toxic (infection)
Embolism (pulmonary), endocarditis
Renal failure

Box 3. Differential diagnosis of acute cardiogenic pulmonary edema

- Bronchospasm or asthma
- Chronic obstructive pulmonary disease exacerbation
- Pneumonia
- Pulmonary embolism
- Adult respiratory distress syndrome
- Myocardial ischemia or infarction
- Pulmonary fibrosis
- Other cause of pulmonary edema (altitude, etc.)

- Most of the evidence originally existed for nasal continuous positive airway pressure (CPAP). There is now ample evidence that bilevel positive airway pressure (BIPAP) is as effective.[16,17]
- The most common CPAP setting is 10 cm H_2O. BIPAP settings are 10 cm H_2O expiratory positive airway pressure (EPAP) and 15 cm H_2O inspiratory positive airway pressure (IPAP).[16]
- This intervention should be instituted early in the course of treatment,[4,11] preferably on arrival in the emergency department.
- This intervention is one of the least likely to produce adverse effects when the diagnosis is uncertain as it can also be of benefit in respiratory disease.
- Devices for administration of positive airway pressure are becoming less expensive and more available to rural emergency departments. The 10-cm CPAP setting is easy to set up.
- Most studies show significant reduction in ICU admission, need for intubation and mortality in patients given this intervention. In one prehospital study, intubation was reduced by an odds ratio of 4.04 and mortality was reduced by an odds ratio of 7.48.[18]
- If it is not possible to maintain oxygen saturation above 90 with this intervention, intubation and mechanical ventilation is required. Other intubation indications include a Glasgow Coma Scale score of 8 or less, partial oxygen pressure of less than 60 and a partial carbon dioxide pressure greater than 5 over baseline despite noninvasive treatment. Failed noninvasive ventilation and cardiogenic shock are also indications.[4] If intubation is necessary, CPAP of 10 cm should be maintained.

Reducing preload

Morphine

Although morphine seems to have reliably improved dyspnea in patients with CPE over many years, there are major concerns regarding outcomes in these patients. The assumption that it functions by venodilation, and therefore preload reduction, is also questioned. Major concerns with morphine use include the following:

- Venodilation in the extremities has been demonstrated, but the volume of blood sequestered by this mechanism is trivial.[19]
- Patients with acute myocardial infarction and pulmonary edema were studied by measurement of pulmonary artery end diastolic pressure[20] and no benefit was found following morphine administration. It was concluded that the action of morphine in relieving dyspnea (all patients improved in this regard) was not explained by venous pooling, but that action on the central nervous system produced the benefit.
- Retrospective studies have now shown increases in ICU admission and intubation rates in patients treated with morphine in the emergency department.[21,22] The largest study from the Acute Decompensated Heart Failure National Registry (ADHERE) also links morphine use with significantly increased mortality.[22]
- Two small prehospital treatment studies have been done. Wuerz and Meador[23] observed that of patients treated with nitroglycerin, furosemide and/or morphine, the ones with final diagnoses of asthma, chronic obstructive pulmonary disease, pneumonia or bronchitis had a higher than expected mortality. Hoffman and Reynolds'[23] prehospital study patients received the same drugs in different combinations. Of these patients, 23% were subsequently found to have a diagnosis other than pulmonary edema. Subsequent adverse events or worsening of the clinical condition was seen significantly more often in patients treated with morphine. There is clearly major concern with the use of morphine when the diagnosis is uncertain, which is often the case in a rural setting.
- Morphine has side effects, including myocardial depression, which can reduce perfusion, and nausea and vomiting, which produce catecholamine release and increased afterload. Even morphine's acknowledged beneficial effect of sedation is a side effect. Sedation might be more safely achieved with a benzodiazepine that causes no nausea or hypotension.[11]

In summary, while morphine can produce a dramatic reduction in symptoms, it is a demonstrable risk in patients with respiratory diagnoses who are often thought to have CPE. In addition, the outcomes of ICU admission, intubation and death are significantly increased in patients treated with morphine. Sedation can be achieved more safely with benzodiazepines if desired. Morphine probably has no place in the modern treatment of CPE.[11]

Nitroglycerin

Of the vasodilators capable of reducing pulmonary capillary wedge pressure (PCWP) and preload,

nitroglycerin is the drug available in Canada. Nesiritide, available in the United States, is heavily promoted as being superior to nitroglycerin based on the VMAC (Vasodilation in the Management of Acute CHF) study,[24] which was a randomized trial involving 489 patients with CPE. This trial, supported by the manufacturer, compared nesiritide with an inadequate dose of nitroglycerin (42 µg/min at 3 hours), and, although there was a trend toward superiority for nesiritide, the difference was not significant. Unfortunately, most drug trials involving vasodilators are now reported by clinicians with links to the manufacturer of nesiritide and it is difficult to find new data on nitroglycerin. Because nesiritide is unavailable, is associated with a significant risk of renal dysfunction[10] and shows a trend toward increased mortality,[25] its use cannot be recommended, and nitroglycerin becomes the vasodilator of choice at one-fortieth of the cost. It is a first-line intervention.[11] Advantages of using nitroglycerin include the following:

- Early aggressive vasodilator therapy has been shown to be important.[26]
- Sublingual nitroglycerin is easy to give early, with a 0.4-mg dose every 5 minutes being bioequivalent to 60 µg/minute intravenously. Thereafter, early aggressive advancement of intravenous (IV) dosing to 60–100 µg/minute is important to achieve optimal effect.[11] At higher doses, some afterload reduction is achieved.[27]
- Nitroglycerin is shown to have superior outcomes in comparison with furosemide in patient survival to hospital discharge[28] and reduction in PCWP.[29] One prospective study shows reduced mortality using high-dose nitroglycerin, compared with high-dose furosemide.[30] When it is considered that furosemide is used in 88% of CPE treatment and that 75% of patients receive no vasodilators,[31] we need to review our priorities with respect to these 2 types of therapy.
- Furosemide given alone takes 45–120 minutes to diuresis owing to initial marked vasoconstriction. Vasodilators given early to reduce preload help reverse this initial increase in PCWP and promote early diuresis.[27]
- Because most patients with CPE present with well-preserved perfusion ("warm and wet"), nitroglycerin is usually well tolerated. It should be used with caution or along with inotropic support if systolic blood pressure is below 100 mm Hg.[1] It should be avoided in mitral regurgitation, aortic stenosis, pulmonary hypertension, right ventricular infarction and in patients using agents for erectile dysfunction. Tolerance can develop after 12 hours of use.[11]

Loop diuretics

Furosemide is a time-tested intervention in CPE. It is often used alone as therapy[31] under the assumption that it is a vasodilator and that along with diuresis it will reduce preload. Best evidence does not entirely support this, and there is evidence for harm that must be taken into account if we are to make best use of this medication. It is probably a third-line intervention.[27] Potential problems with the use of loop diuretics include the following:

- The Studies of Left Ventricular Dysfunction (SOLVD) database indicates that non–potassium sparing diuretic use is associated with an increase in fatal arrhythmias in patients with systolic LV dysfunction.[32]
- Forty to fifty percent of CPE patients have euvolemia or hypovolemia.[11,33,34] These are the patients who develop hypotension the day following initial treatment with diuretics. The problem is one of fluid maldistribution rather than of fluid overload.[11]
- Administration of furosemide produces diuresis after 45–120 minutes. The immediate effect is vasoconstriction with increased afterload, increased PCWP and much-reduced renal perfusion.[27,35] PCWP only falls over time and after diuresis. This delay in effect may be significant in gravely ill patients.
- A prospective study by Kraus and colleagues[27] demonstrated that these adverse effects of furosemide were mediated by the neurohumoural axis, and that immediate diuresis could be achieved by venous or arterial vasodilators given before diuretics. Several authors now recommend use of high-dose nitroglycerin, sublingual captopril or both before diuretic administration.[4,27,35,36]

Reducing afterload

Angiotensin-converting-enzyme inhibitors

There are several heterogenous prospective studies to show benefit for both sublingual captopril and IV enalapril in reducing afterload and improving outcomes in CPE. Captopril is inexpensive and easily administered in a small emergency department, while the availability of IV enalapril is problematic. Although there is accumulating evidence, there is no

definitive meta-analysis, and given the generic nature of the medications, funding for such studies is more difficult to obtain. With appropriate caveats, however, sublingual captopril can be presented as a second-line intervention.[11] Available evidence, outlined below, suggests it is safe and effective — certainly much more so in terms of outcomes than morphine and diuretics, which were the previous mainstays of therapy:

- Angiotensin-converting-enzyme (ACE) inhibition can often be given as a single dose in the emergency department and need not be repeated until a decision for chronic dosing is made.[4,37]
- Sublingual captopril has been compared with sublingual nifedipine in acute hypertension and found to be effective, with less flushing, headache and tachycardia. Onset of action was within 5 minutes.[38]
- A sublingual captopril tablet is dipped in water for more rapid absorption. For systolic blood pressures less than 110 mm Hg, the dose is 12.5 mg. For pressures greater than 110 mm Hg, the dose is 25 mg. Captopril can be used in combination with nitroglycerin if systolic blood pressure remains high or side effects of nitroglycerin limit adequate dosing. Combination with nitroglycerin exceeds the benefits of either used alone.[11,27,39] Captopril produces benefit later in onset than nitroglycerin, but the improvement is more pronounced and prolonged.[40]
- Early use of captopril will often produce diuresis without furosemide.[41] There is a reduction of preload and afterload after 10 minutes,[40–44] and it is recommended that diuretics be delayed for 30 minutes after vasodilators are given to allow for an increase in renal blood flow.[11,27,35]
- ACE inhibitors have been administered in acute decompensated heart failure in several trials with good hemodynamic stability and few adverse effects.[41,42,45–47]
- Improved outcomes include fewer ICU days[21,47] and reduced rates of intubation with mechanical ventilation.[21,41,48]

Improving contractility

Digoxin

Digoxin likely has no place in the emergency treatment of CPE. Some sources still suggest it as an alternative for reducing ventricular response if rapid atrial fibrillation is present; however, amiodarone is now more often used for this indication.[1]

Other inotropes

The catecholamine inotropes and milrinone, a phosphodiesterase inhibitor, are capable of improving blood pressure and cardiac output in the poorly perfused patient. Although numbers are improved, outcomes are of concern, with evidence of longer length of stay and increased in-hospital mortality for patients taking inotropes, compared with vasodilators. These agents are best reserved for patients with impaired LV function and hypotension, and should not be used if perfusion is adequate. The following caveats should be kept in mind with the use of inotrpoes:

- Dobutamine is potentially the most beneficial of the catecholamine inotropes because it is capable of slightly reducing preload and afterload. Activity is blocked, however, in patients on chronic β-blockade, and higher doses may have to be used. In the event of increasing hypotension, the α-adrenergic activity of dopamine or norepinephrine may be required. These agents not only improve blood pressure but also increase myocardial oxygen demand, dysrhythmias and ischemia. Vasodilators should be added as soon as possible to further reduce preload and afterload, and to improve congestion.[4]
- Milrinone is an "inodilator" and is unaffected by chronic β-blockade. It is superior to dobutamine in measured cardiac output, PCWP and systemic vascular resistance. Despite this, it has not been shown to improve hospital length of stay or mortality.[4]
- Dobutamine is generally available in small emergency departments. Milrinone, at 7 times the cost, is likely to be difficult to stock in departments that are not associated with an ICU.

Recommendations for rural facilities

1. Recognize alternate diagnoses and precipitating factors early.
2. Early institution of CPAP at 10 cm H_2O is a first-line intervention.
3. Early sublingual nitroglycerine followed by IV administration in high doses (60–100 μg/min) is a first-line intervention.
4. Sublingual captopril is a second-line intervention and should be considered at 12.5 mg if blood pressure is less than 110 mm Hg, or 25 mg if blood pressure is greater than 110 mm Hg in the following situations:
   - Nitroglycerine is contraindicated.

- Nitroglycerine does not produce improvement and the patient remains hypertensive.
- Congestion is resistant to the other usual therapies and perfusion is adequate.
- The patient presents with intense sympathetic overactivity (the most common presentation), with hypertension, vasoconstriction and poor urinary output (given along with nitroglycerine).
- If a dialysis patient presents out of hours with volume overload, hypertension and pulmonary edema (given along with nitroglycerine).[11]

5. Furosemide should be given 30 minutes after institution of vasodilator therapy if there is no initial diuresis in nonurgent situations. Subsequently, it will sometimes not be needed at all, or it can be used in lower doses. This is a third-line intervention.
6. Dobutamine can be given in cases of poor LV function and hypotension. Vasodilators should be initiated or continued if there is a good response. This intervention will not improve mortality rates.
7. Morphine should not be used as it produces poorer outcomes. If sedation is needed, consider a benzodiazepine.
8. Critically scrutinize new studies promoting use of new and expensive drugs as methodologies may skew results in favour of newer products. The lack of large studies on outcomes from older therapies usually reflects a lack of funding by industry.

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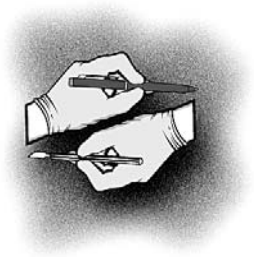

Original Article
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Physician satisfaction and practice intentions in Northwestern Ontario

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Objective: The goal of this research was to understand factors that affect future practice intentions of physicians who practise in rural and underserviced areas. The following 2 research questions are answered: "How many physicians in Northwestern Ontario intend to leave their practice in 5 years?" and "What is the association between professional, personal/family and community factors in physician satisfaction and intention to stay in practice?"
Methods: Between September and October 2004, physicians practising in Northwestern Ontario were mailed a survey measuring professional, personal/family and community satisfaction as well as future practice intentions. Future practice intention (question 1) was analyzed through a frequency distribution, while the factors that influenced intention (question 2) were analyzed using a 3-step process: a factor analysis, the creation of scales and a logistic regression. The themes of the scales emerging from the factor analysis were family/community, time, professional support and efficacy, and sense of belonging and appreciation. The means of these 4 scales were entered into a logistic regression model along with demographic variables that were independent predictors of future practice intention.
Results: Three hundred and twenty-eight physicians were sent the survey. After 3 consecutive mailings, the response rate was 61.3% (n = 201). Over two-thirds of Northwestern Ontario physicians intended to remain in practice in 5 years; however, most of these physicians were from Thunder Bay, the only city (100 000+ population) in Northwestern Ontario. Physicians were significantly more likely to intend to stay in practice if they were younger, practised in Thunder Bay and scored higher on the family/community scale.
Conclusion: These findings underscore the importance of addressing family and community factors, as opposed to strictly professional factors, in future retention initiatives.

Objectif : Cette recherche visait à comprendre les facteurs qui ont une incidence sur les intentions professionnelles futures des médecins actifs dans des régions rurales et mal desservies. On répond aux deux questions de recherche suivantes : « Combien de médecins du Nord-Ouest de l'Ontario ont l'intention de quitter leur pratique dans cinq ans » et « Quel est le lien entre les facteurs professionnels, personnels–familiaux et communautaires dans la satisfaction des médecins et leur intention de continuer à pratiquer? »
Méthodes : Entre septembre et octobre 2004, on a envoyé aux médecins actifs dans le Nord-Ouest de l'Ontario un questionnaire postal pour mesurer leur satisfaction professionnelle, personnelle–familiale et communautaire, ainsi que leurs intentions de pratique future. On a analysé l'intention de pratique future (question 1) en établissant une distribution statistique, et on a analysé les facteurs qui ont une influence sur l'intention (question 2) en suivant un processus en trois temps : une analyse des facteurs, la création d'échelles et une régression logistique. L'analyse factorielle a dégagé les thèmes suivants pour les échelles : la famille et la communauté, le temps, l'appui professionnel et l'efficacité, ainsi que le sentiment d'appartenance et d'appréciation. On a entré les moyennes des quatre échelles dans un modèle de régression logistique, avec des variables démographiques qui constituaient des prédicteurs indépendants de l'intention de pratique future.

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Résultats : On a envoyé le questionnaire à 328 médecins. Après trois envois consécutifs, le taux de réponse a atteint 61,3 % (n = 201). Plus des deux tiers des médecins du Nord-Ouest de l'Ontario avaient l'intention de continuer à pratiquer dans cinq ans, mais ils étaient en majorité à Thunder Bay, la seule ville (100 000 habitants et plus) du Nord-Ouest de l'Ontario. Les médecins étaient beaucoup plus susceptibles d'avoir l'intention de continuer à pratiquer s'ils étaient plus jeunes, s'ils pratiquaient à Thunder Bay et s'ils avaient de meilleurs résultats sur l'échelle familiale–communautaire.
Conclusion : Ces constatations soulignent l'importance de tenir compte des facteurs familiaux et communautaires, plutôt que des facteurs rigoureusement professionnels, dans les initiatives futures portant sur la conservation des effectifs.

Introduction

For most of rural and remote Canada the shortage of physicians is a persistent challenge. Although nearly one-quarter of the population resides in rural and remote areas, less than 10% of physicians practise in these communities. Despite the investment in recruitment and retention efforts, these figures have remained relatively stable over the past decade.[1]

The primary strategy for recruitment and retention of physicians in rural Canada has continued to be financial incentives even though the evidence would indicate that this method alone is insufficient.[2] One example is given by the Underserviced Area Program (UAP) in Ontario, which provides free tuition to medical students in exchange for return-of-service in underserviced areas of the province as well as financial incentives to doctors who practise in these areas.[3] Evaluations of the UAP have reported that financial incentives alone have not been successful in alleviating rural physician shortages and that broader issues such as quality of life should also be addressed.[4] A similar conclusion was drawn by Pong and Russell[2] in their review of 53 provincial and national reports on physician retention. Their analysis revealed that financial incentives were the most frequently used retention initiative but that these incentives on their own did not have a sufficient impact on retention, and that personal and community factors should receive further study.

It may be that financial incentives are more successful as a means to attract physicians to rural practice than as a means for keeping them in practice. Support for this conclusion was provided by Yang[5] in a study of physicians who had moved from urban to rural areas. Yang found that financial incentives were necessary in the short term but unsuccessful over the longer term. This is consistent with the results of a survey conducted by Kazanjian and Pagliccia[6] in British Columbia that revealed the relatively low value of financial incentives as a way to potentially retain physicians. In Kazanjian and Pagliccia's study, both rural and urban physicians who reported an intention to leave their practice listed personal/family factors, followed by professional factors, then community factors and last financial factors as the reasons influencing their decisions. A qualitative study by Cutchin[7] offers further insight into the importance of personal and professional issues for practice satisfaction. Data collected through in-depth, open-ended interviews with rural physicians and key informants in rural Kentucky revealed 3 dominant themes: 1) dimensions of security (e.g., confidence in medical abilities, degree of on-call coverage, social and cultural networks, etc.); 2) dimensions of freedom (e.g., challenge and diversity in practice, involvement in community affairs, ability to develop health care resources, etc.); and 3) dimensions of identity (e.g., roles played and responsibilities taken, seeing the self as belonging to the community, etc.). Cutchin concluded that for continuing satisfaction a process of community integration is required to give physicians and their families meaning, purpose and subsequent ties to their community of practice.

These findings highlight the need to further explore the role of personal and community issues in addition to professional and financial factors as factors that may contribute to the retention of physicians in underserviced areas. The goal of this study, therefore, was to examine the association between professional, personal/family and community factors and the future practice intentions of physicians who practise in rural and underserviced areas.

Method

Sample

The sample consisted of physicians in Northwestern Ontario whose names were obtained from the

Ontario Medical Association's membership list, updated May 2004. Northwestern Ontario includes the following communities: Thunder Bay, Fort Frances, Red Lake, Sioux Lookout, Pickle Lake, Atikokan, Kenora, Geraldton, Marathon, Manitouwadge, Vermillion Bay, Keewatin, Nipigon, Emo, Dryden, Terrace Bay, Rainy River, Schreiber and Longlac. After the list was reviewed by key informants, names of physicians who were retired, gravely ill or had recently located to an urban area were removed from the sample. Physicians were mailed the survey up to 3 times, with 2 weeks separating each mailing. Surveys were coded to avoid duplicate responses.

Instrument

Kazanjian and Pagliccia's study[6] provided a guide for questionnaire development and was adapted for application to physicians practising in Northwestern Ontario. Physicians from the Thunder Bay Medical Society along with 2 family medicine residents assisted with question design and pretesting of the instrument. The resulting mail-out survey consisted of a mixture of closed- and open-ended questions that assessed professional, personal/family and community satisfaction as well as physicians' future practice intentions. The satisfaction questions were logically divided for clarity and ease of response into the 3 subfactors used by Kazanjian and Pagliccia,[6] namely, professional, personal and community factors. Several Likert scale questions provided a measure of satisfaction and dissatisfaction for each factor. The survey was structured to answer 2 research questions: "How many physicians in Northwestern Ontario intend to leave their practice in 5 years?" and "What is the association between professional, personal/family and community factors in physician satisfaction and intention to stay in practice?"

Analysis

Quantitative data were analyzed with SPSS version 11.5 (SPSS Inc.). Future practice intentions were analyzed using a frequency distribution, while the factors influencing intentions were analyzed using a 3-step process: a factor analysis, the creation of scales and a logistic regression. The themes of the scales emerging from the factor analysis were family/community, time, professional support and efficacy, and sense of belonging and appreciation. The means of these 4 scales were entered into a logistic regression model along with demographic variables that were independent predictors of future practice intention (Table 1).

Results

Of the 328 physicians who were sent the survey, 201 physicians responded, which resulted in a response rate of 61.3%. The sample was equally divided between urban Thunder Bay and the surrounding region, that is, the smaller rural communities. Overall, almost 70% of respondents stated an intention to stay in practice in the next 5 years. Of those who did not intend to stay in practice, approximately two-thirds were from the region. When Thunder Bay and regional data were analyzed separately, 18% of physicians in Thunder Bay intended to leave practice, compared with 44% in the region. The mean scores of the satisfaction scales all fell into the neutral category. Physicians displayed the lowest mean satisfaction score on the "time" scale and the highest mean satisfaction score on the "sense of belonging and appreciation" scale. The components of these scales are shown in Table 2. When satisfaction scores by location (Thunder Bay v. the surrounding region) were examined, physicians in the

Table 1. Variables used in logistic regression

Predictor variables	Mean (and SD) no. of respondents*	
Age, yr (n = 191)	46.6	(11.9)
Size of childhood community, % (and frequency) (n = 195)		
Up to 10 000 people	34.4	(67.0)
> 10 000 people	65.6	(128.0)
Location of present practice†		
Surrounding region (population ≤ 10 000)	45.6	(89.0)
Thunder Bay (population > 100 000)	54.4	(106.0)
Satisfaction scales (n = 201)		
Family and community	2.5	(0.8)
Time	2.1	(1.0)
Professional support and efficacy	2.7	(0.7)
Sense of belonging and appreciation	2.7	(0.8)
Outcome variable, % (and frequency)		
Intention to stay in practice 5 yr (n = 193)		
No	30.6	(59.0)
Yes	69.4	(134.0)

*Unless otherwise indicated.
†Thunder Bay city encompasses 52% of the population of Northwestern Ontario while the remaining communities are depicted as "the surrounding region."

surrounding region displayed significantly lower family/community satisfaction.

Forty-three Likert-style questions were entered into a factor analysis using the principle axis factoring extraction method and varimax rotation. Items were eliminated if they had correlations lower than 0.4, or if they loaded similarly into more than 1 factor. Taking these rules into account, we removed 8 variables from the analysis, leaving 35 variables that converged into 4 factors. These 4 factors made up the new satisfaction scales and were subsequently tested for reliability using Cronbach α reliability analysis. On the basis of the variables in each scale, the scales were named family/community, time, professional support and efficacy, and sense of belonging and appreciation.

Table 2. Factor analysis

Factors*	Item loadings
Family and community (0.8511α)	
Availability of cultural events	0.83
Availability of recreation	0.71
Size of community	0.69
Partner/spouse's contentment in community	0.67
Ease of travel in and out of community	0.67
Geographic location	0.62
Weather/climate	0.58
Quality of life for children	0.57
Quality of education for children	0.53
Access to relatives/extended family	0.44
Employment opportunities	0.42
Time (0.9141α)	
Time for family life/relationships	0.84
Time for personal recreation/leisure	0.82
Amount of uninterrupted free time from work	0.81
Length of working hours	0.80
Patient volume	0.72
Workload in relation to income	0.67
Amount of on call	0.62
Friendships/social relationships	0.53
Professional support and efficacy (0.8233α)	
Availability of professional support	0.74
Clinical consultation/referral system	0.64
Relationship among physicians	0.54
Relationship with health care/hospital administration	0.50
Your compatibility with the medical community	0.48
Opportunity for group practice	0.47
Teaching and academic medicine opportunities	0.47
Opportunity for involvement in professional associations	0.46
Degree of professional autonomy	0.45
Challenge and variety of practice	0.42
Sense of belonging and appreciation (0.7951α)	
Sense of being appreciated by the community	0.69
Feeling of belonging in the community	0.54
Possibility for community involvement/ leadership	0.51
Access to religious groups/churches	0.49
Relationship with your patients	0.48
Degree of respect/esteem you experience	0.46

*Cronbach internal consistency α for the factor.

The Cronbach α level for each of the 4 scales was over 0.8, which demonstrates high reliability (Table 2).

The variables were entered into a logistic regression in 2 blocks. The first block contained demographic variables (Table 3).These demographic variables were chosen because they were statistically significant predictors of future practice intention when tested independently. In the second block, the mean satisfaction scores of each of the scales were entered. Table 3 outlines the final logistic regression model containing all of the variables. The significant predictors are indicated with an asterisk.

Physicians have greater odds of intending to stay in future practice if they are younger, if they practise in Thunder Bay and if they are more satisfied with aspects related to their family and community. The overall model is statistically significant at the p = 0.01 level according to the model χ^2 statistic and predicts 76.1% of the responses correctly. In other words, this model correctly predicts future practice intentions of physicians in this sample over three-quarters of the time.

Nonsignificant predictors

Although not statistically significant, physicians have greater odds of intending to stay in practice if they are from a childhood community of 10 000 people or more. This finding contradicts other research that has demonstrated a connection between physicians' rural background and an increasing likelihood of remaining in rural practice.[8] Since this analysis included Thunder Bay (population of over 100 000) and the surrounding region (where populations are mostly 10 000 or less), a separate analysis of regional physicians was conducted. Even then, there was no difference in intention to stay according to size of childhood home town. Also unexpected was the finding that physicians were more likely to intend to stay in practice if they had a lower mean satisfaction score on the "time" scale and "professional support and efficacy" scale. As predicted, physicians who scored higher on the

"sense of belonging and appreciation" scale were more likely to remain in practice.

Discussion

"How many physicians in Northwestern Ontario intended to leave their practice in 5 years?"

Thirty-one percent of physicians, the majority of whom practised in the region surrounding Thunder Bay, intended to leave practice in 5 years. This signifies a particularly acute retention problem in the smaller-populated communities in Northwestern Ontario. Since our study examined the future practice intentions of physicians, one may ask, "How does this relate to the actual retention of physicians?"

The connection between intention and action (retention) is conceptualized in Ajzen and Fishbein's Theory of Reasoned Action (TRA).[8] This widely used conceptual framework was developed in 1975 and postulates that intention is the precursor to action. Two main factors influence intention: attitude toward the behaviour (the person's positive and/or negative attitudes about the behaviour) and subjective norms (the person's perception of whether or not the behaviour will be acceptable). One weakness of the theory is that the relationship between intention and retention is not always simple because people are generally free to act as they choose regardless of prior intentions. This may be a result of personal choice, or other constraints that get in the way of achieving the desired action.

The complexity of the connection is evident in an Australian study[9] in which 49% of physicians who intended to leave practice had stayed after 10 years, while one-quarter (24%) who intended to stay had left. Those who had left were unable to solve the problems related to professional and personal aspects. Despite the limitations of this model, a literature review conducted by Feeley[10] demonstrates that the TRA is a useful conceptual framework in understanding the link between intention and physician retention. Feeley demonstrates that the relationship between physicians' attitudes concerning rural practice and rural life, along with the perception of others (e.g., the physicians' spouses) shape intentions and subsequent behaviour. Thus understanding intention can predict (to a certain degree) outcomes (behaviour). A proactive solution to physician retention requires an understanding of factors that influence a physician's decision to remain in future practice.

"What is the association between professional, personal/family and community factors in physician satisfaction and intention to stay in practice?"

Significant predictors of future practice intention are age, location of current practice and satisfaction with family/community.

Age

Younger physicians are more likely to intend to stay in practice in 5 years. Although this trend is partly attributable to an aging physician workforce, almost two-thirds of the study sample were under the age of 50, suggesting that factors outside of retirement appear to be influencing future practice intention.

Location of current practice

The majority of physicians intended to remain in practice in 5 years; however, most were practising in Thunder Bay. Twice as many physicians in the region intended to leave, compared with their urban

Table 3. Logistic regression model ($p < 0.01$)

Variable	β coefficient	Odds ratio	95% CI	*p* value
Age	–0.52*	0.95*	0.92–0.98*	0.002*
Size of childhood community	0.34	1.41	0.65–3.04	0.384
Location of present practice	1.65*	5.20	2.25–12.0*	0.000*
Family/community satisfaction	0.57*	1.77*	1.05–2.98*	0.032*
Time	–0.28	0.76	0.51–1.12	0.167
Professional support and efficacy	–0.13	0.88	0.44–1.77	0.719
Sense of belonging and appreciation	0.26	1.29	0.71–2.36	0.409

CI = confidence interval.
*Significant predictors.

counterparts. The researchers of this study plan to follow up with study participants in 2009 (the 5-year mark from the study's inception) to examine the relationship between intention to leave practice and action (whether or not the physicians actually leave). The follow-up will also determine whether or not physicians who planned to leave practice relocate within Northwestern Ontario or move outside the region entirely.

Satisfaction with family/community

Physicians who displayed a higher mean satisfaction score on the family/community scale were more likely to intend to stay in future practice. The importance of family factors is consistent with Kazanjian and Pagliccia's study[6] conducted in British Columbia. The variables in the family/community scale (with the exception of community size, geographic location and weather/climate) represent target areas for future retention strategies. Availability of cultural events and recreation, partner/spouse's contentment in community and their access to employment, ease of travel in and out of the community, quality of life and education for children, and access to relatives/extended family are the components that make up this scale.

The fact that size of childhood community was not significant suggests that community and family factors with immediate social impact on day-to-day life are more influential.

Although not statistically significant, Northwestern Ontario physicians are more likely to stay in practice if they are satisfied with their sense of belonging and appreciation within the community. This is consistent with Cutchin's research[7] on experiential place integration and future practice intentions of physicians. Surprisingly, Northwestern Ontario physicians who intended to stay were more dissatisfied with the professional aspects of rural medicine (time and professional support/efficacy). This suggests that professional factors on their own do not affect future practice intentions. Perhaps it is when professional dissatisfaction coalesces with personal/family dissatisfaction that future practice intention is affected. From this perspective, a certain degree of professional dissatisfaction may be persistent among rural physicians and family/community dissatisfaction may act as the "tipping point" in future practice decisions.

This would suggest that future retention initiatives should incorporate a more "balanced" approach to reflect the interplay of professional, personal and community factors, which affect the physician's experience in rural practice. Goertzen's[11] conceptualization of the "4-legged" kitchen stool captures the importance of balance. Each leg of the stool represents different elements of a physician's life: personal interests and background, appropriate training, community attributes and working conditions. The findings from our paper add to this evidence base. Understanding the intentions of Northwestern Ontario physicians to stay or leave practice along with sources of dissatisfaction is necessary to alleviating the retention problem.

Conclusion

It must be remembered that a job will bring someone to Northwestern Ontario, but it is personal life that will keep them here. If employment hampers personal life, then people will seek satisfaction elsewhere.

— quote from spouse/partner of a Northwestern Ontario physician

Our research has generated knowledge useful for health human resource planning in Northwestern Ontario. It has also contributed to the understanding of rural physician retention in a number of ways. First, it provides empirical evidence to support previous contentions that financial compensation and other professional factors are not primary in physician retention. Rather, family and community factors dominated as predictors of retention in this study. Many of these identified family and community factors could be addressed through interventions to improve community integration. Second, the study emphasizes the complexity and multifactorial nature of physicians' decisions to leave rural practice. The implication is that we need a complex and multifactorial approach to physician retention that is individualized and attends to issues of family/community satisfaction, time issues, and professional support and efficacy. Finally, it lends support to the notion of a "tipping point" in a physician's life that results in a decision to leave rural practice. Factors such as dissatisfaction with the availability of culture and recreation, a spouse's discontent or the distance from extended family, when added to professional frustrations, can become catalysts for making a decision to move. Future research is needed to explore the dynamics of the "tipping point," with a view to prediction and prevention of leaving rural practice. Retention efforts may involve supporting physicians on an ongoing basis to manage the dynamic interplay between personal, community and professional factors and to maximize their satisfaction with rural life.

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The management of the occasional trigger finger

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Introduction

Patients will frequently see their family physician with an "occasional trigger finger," or a finger or thumb that gets intermittently stuck in a flexed position. By attempting to extend the digit, it will often suddenly pop out to length. In some cases, the trigger finger is painful. Trigger finger usually occurs in the third or fourth digits, but it can occur in the thumb. Excessive gripping, as with a power tool or musical instrument, can increase the risk. Usual age of onset is in the 50s and 60s. Women are at higher risk, as are those with conditions such as rheumatoid arthritis (RA), diabetes, hypothyroidism and gout.[1]

It is believed that recurrent tenosynovitis will lead to narrowing of the synovial sheath below the A1 pulley, as noted in Figure 1. In some cases, the tendon enlarges and forms a nodule distal to the pulley. As the finger is flexed, the thickened section of tendon becomes trapped proximal to the narrowing at the level of the pulley. With persistence or manual extension, using the other hand, the nodule pops through the stenotic section of tendon sheath.[2] In severe cases, however, the finger can become stuck in the flexed position, resulting in a flexion contracture.

Fig. 1. Illustration of a trigger finger showing the narrowing of the synovial sheath below the A1 pulley.

On examination there is often tenderness to palpation in the area of the A1 pulley just proximal to the metacarpal–phalangeal (MCP) joint. There may also be a palpable nodule distal to this area, and this nodule will generally move with finger flexion and extension.

The differential diagnosis of trigger finger includes other conditions such as dupuytrens contracture, a thickening of the palmar fascia, which over time pulls the finger into flexion but does not cause triggering. Additionally, abnormalities of the MCP joint such as osteophytes, loose bodies or chronic subluxation can lead to triggering.

Conservative treatment

In many cases, rest and avoidance of gripping activities will alleviate symptoms. Nonsteroidal anti-inflammatory drugs can be used to reduce swelling and pain. Splinting of the distal interphalangeal (DIP) joint with the proximal interphalangeal (PIP) joint left mobile can also be used.[3,4] In this technique, a sandwich composed of 2 layers of Coban wrap (Emergency Medical Products Inc.) enclosing a paper clip is placed on the dorsal aspect of the DIP.

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Corticosteroid injection

Patients with symptomatic trigger fingers who do not respond to conservative therapy are candidates for an injection of corticosteroid into the tendon sheath. In 1990, Newport and colleagues[5] published a retrospective study of 235 patients with 338 trigger fingers. Seventy-seven percent of all fingers showed resolution or improvement — 49% after a single injection, 23% after 2 injections and 5% after 3 injections. Lambert and coauthors[6] subsequently published a prospective study that showed a 60% response to steroid injection versus 16% for placebo ($p < 0.05$). Anderson and Kaye[7] confirmed a similar response rate of 61% to an initial injection, but they also showed that with recurrent injections only 12% of cases were treatment resistant. Patients with RA or diabetes are considered to be at higher risk of treatment failure.[1] Nimigan and coworkers[8] reported a 32% success rate in patients with diabetes, compared with 57% in those without.

The procedure

1. The equipment required to perform an injection into the tendon sheath is outlined in Box 1.
2. Informed consent should be obtained following a discussion of the risks and benefits. The success rate of an initial injection can be summarized as being 30% in those with diabetes and 60% in those without. Complications of this procedure include localized infection, bruising and stiffness at the injection site. Localized atrophy of subcutaneous tissue may occur but has not been found to be a significant impairment. Additionally, patients with diabetes may experience a transient rise in blood glucose readings.[8,9] Tendon rupture is a theoretical risk, especially in RA patients, but studies have not shown this to be a common complication.[10,11]
3. The area of the affected digit is prepped with chlorhexidine and draped in a sterile manner.
4. The area of the pulley is palpated just proximal to the MCP joint. As shown in Figure 2, the proximal border of the A1 pulley is proximal to the interdigital crease by approximately the same distance (A) as measured between the proximal digital crease and the interphalangeal crease. The average length of the pulley is 1.2 cm, and using these landmarks, a pen can be used to mark out the location of the pulley.[12]
5. The corticosteroid used in most studies was either methylprednisolone (Depot Medrol) 40 mg (1 mL) or triamcinolone (Kenalog) 20 mg (0.5 mL). The steroid is drawn up in a 3-mL syringe and diluted with 1% lidocaine plain (no epinephrine) to a total volume of 2–3 mL.[6] The syringe, with a 25- or 27-G 5/8-inch needle attached, is inserted obliquely at a 45° angle over the tendon sheath either proximal, over or distal to the A1 pulley.
6. The needle is then advanced until it meets the resistance of the tendon.
7. The patient is asked to flex and extend the finger gently. If the needle is in fact embedded in the tendon, the needle will move with the finger. If the needle is gently "kissing" the tendon a sharp grating palpable and audible crepitus will be encountered with finger movement and there will be no movement of the needle.
8. This is the best time to gently inject the medication as this grating crepitus will give you a good chance of injecting it into the sheath but not into the tendon sheath. This very helpful sign is caused by the presence of transverse bands along the surface of the tendon. Studies have in fact

Box 1. Equipment required for a corticosteroid injection of a trigger finger

- Sterile dressing tray
- Sterile gloves
- Chlorhexidine
- 4 × 4 gauze
- 3 mL syringe
- 27 G 5/8 inch needle
- Corticosteroid — methylprednisolone (Depot Medrol) 40 mg/mL or triamcinolone (Kenalog) 40 mg/mL
- Adhesive bandage

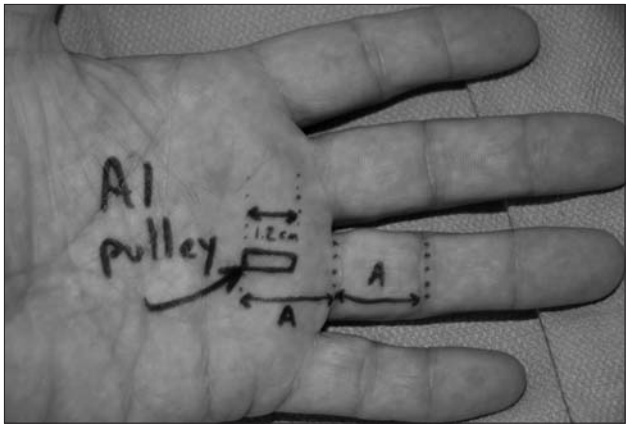

Fig. 2. Surface landmarks and the location of the A1 pulley. The proximal border of the A1 pulley is proximal to the interdigital crease by approximately the same distance (A) as measured between the proximal digital crease and the interphalangeal crease.

shown that corticosteroids will be efficacious even if injected alongside the sheath, but ideally the majority should be injected into the sheath.

9. The needle is then withdrawn and a dressing is applied.
10. Over 5 minutes, the distal finger will become frozen from diffusion down the sheath despite the fact that the local anesthetic was not injected laterally near the interdigital nerves. This confirms correct location of the injected medication. The patient can expect an improvement within 2 weeks. Partial- or nonresponders can be considered for a second or third injection.

Surgical therapy

In patients who do not respond to conservative therapy combined with corticosteroid injections, surgical release may be indicated. Some authors recommend repeated injections, while others such as Benson and Ptaszek[13] have postulated that it may be more cost-effective in the long term to offer surgery after 1 failed injection. A hand surgeon can release the A1 pulley either percutaneously or following an open surgical procedure.

Conclusion

Patients with trigger finger can be initially managed with conservative measures, including modification of activities. If this fails, approximately 60% of patients will respond to a corticosteroid injection of the tendon sheath. Additional patients will respond to a second or third injection. Patients with diabetes have a lower response rate of approximately 30%. The presence of a palpable grating as the needle touches the tendon in combination with a lack of association between the movement of the finger and the needle confirms proper needle placement. Corticosteroid injection of the tendon sheath can be performed safely and effectively in a family physician's office.

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Reminder: palliative care *is* a rural medicine issue

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Canada's aging population is on the rise, resulting in a greater demand for palliative care services.[1,2] This is particularly pronounced in rural communities. Specifically, demographic trends such as the increasing number of people relocating to rural areas upon retirement[3] and the process of aging-in-place in such communities[4] are amplifying the need for palliative care in these settings. At the same time, defining elements of health service provision in Canada, including the lack of tertiary and some forms of secondary care in rural settings,[5] has decreased the capacity to provide quality palliative care in nonurban areas.[6] Thus, as we emphatically state in our title, palliative care *is* a rural medicine issue.

Of course, the problem we have outlined above is not a surprise to *CJRM* readers. This is especially true of those in clinical practice in places where the trend of an increasing demand for palliative care in rural communities is most pronounced. We know that primary care practitioners in rural communities take primary responsibility for delivering palliative care in such areas[7] — something for which they have often not received specialty training.[8] For example, the Canadian Institute for Health Information reports that the smaller the community size, the greater the likelihood that a general practitioner (GP) will be involved in delivering palliative care; the national average indicates that 38.8% of GPs report practising palliative care, while up to 56.6% of rural and small-town family doctors report doing the same.[9] Our concern is that those "in the trenches" providing front-line health services to residents of rural communities are highly aware of the pressing need to address this service gap while, at the same time, this issue has yet to make it onto the agendas of most health care researchers and policy-makers.

Consider 2 recent policy initiatives that illustrate our previous point. First, British Columbia's Ministry of Health recently released its framework for palliative and end-of-life care. It is stated at the outset that "it is clear that the time is right to enhance end-of-life care."[10] Second, this call is also echoed in Health Canada's Canadian Strategy on Palliative and End-of-Life Care, which outlines that more knowledge regarding access to and the availability of palliative care is essential for shaping a national strategy.[11] Of note, neither document reviews (or even mentions) the unique nature of palliative care provision in rural communities. Furthermore, Wilson and colleagues[5] contend that there is minimal evidence about the availability and effectiveness of nonurban palliative care in Canada. These publications assist us in making our point that palliative care in rural areas is simply not on the agenda.

To move this agenda forward, or to even get this pressing issue onto the agenda, we must urge researchers and policy-makers to move beyond simply calling for different models of palliative care designed with rural areas in mind and actually create them. It is well-documented that health service delivery must be developed to meet the unique health care demands of

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nonurban communities.[12] We know that relocating palliative care recipients to urban areas is inconsistent with the wishes of most dying individuals and their families,[13] and so is not a viable solution to this health service problem. Other solutions designed to address this service need vary widely, both within and between countries (see the systematic reviews undertaken by Evans and colleagues[8] and Wilson and coauthors[5]). Because of our current need to address this pressing problem, Canada has the potential to become a world leader at developing palliative care models designed specifically to meet the needs of rural communities.

Revisiting the title of our commentary, what is it that we must consider about the unique nature of palliative care medicine in rural and remote Canada? Such consideration must move beyond the demographic factors we have alluded to (but not outlined in full) above. We suggest that initiatives such as service centralization,[7] integrated team practice and information systems,[10] and the shift toward providing care in the community[14] are shaping the ways in which we can effectively deliver quality health care, including palliative care, in rural areas and thus must be considered. Factors further influencing the delivery of palliative care, specifically in rural areas, include the presence or absence of existing infrastructure, qualified medical practitioners, funding and user volume. Such factors shape the ability to deliver palliative care and are important to consider. It must also be considered that while most people prefer to die at home,[15] more than 70% of Canadians spend their final days in inpatient settings.[16] However, home deaths are more common in rural areas than in urban centres.[5] We suggest that these issues must — at least partially — guide our thinking about how best to deliver palliative care in rural Canada.

Certainly, other important issues need to be brought to the fore. The clinical, research and policy-making communities each play a central role in identifying factors that must be considered in developing models of palliative care for rural Canadian communities. The task is that we must now remind ourselves and others to address this issue before the service need becomes so overwhelming that it places undue stress on those practising rural medicine and compromises the quality of life/death of palliative care patients and their families.

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As researchers and physicians working in surgical service delivery in British Columbia, we would like to share some of the highlights of an Invitational Meeting on Rural Surgical Services (June 22–23, 2007, Vancouver, BC), hosted by the Centre for Rural Health Research. The goal was to share research, policy and educational initiatives among key stakeholders in rural surgical care delivery. Attendees included representatives from BC Health Authorities, the BC Medical Association (BCMA), the University of British Columbia (UBC), Researchers, general practitioner (GP)–surgeons and the BC Reproductive Care Program (BCRCP).

All participants agreed with the urgency and fundamental need to address rural surgical service delivery. The delivery of rural surgical care is an urgent priority both because of vanishing local access to surgical care for rural residents and its integral link with emergency, acute and maternity services. GP–surgeons support small volume rural programs in communities typically of 5 – 15 000 residents. Mixed models of specialist surgeons and GP–surgeons typically service communities of 15 000 – 25 000. The current crisis in rural human health resources is an immediate and central threat to all of these small-volume surgical programs.

The meeting began with both poster and slide presentations by most participants. Large quantities of published and nonpublished literature pertaining to small-volume surgical program demographics, models, scope and outcomes, as well as future research, were summarized. Health authorities were particularly interested in models that could cost-effectively sustain rural recruitment and retention, and maternity and surgical care in small-volume rural hospitals. Academic institutions were open to implementing a sustainable GP–surgical training program. This could stabilize the delivery of surgical services in communities too small to sustain specialist surgical care but that have traditionally been and are currently served by GP–surgeons.

The meeting finished with 8 recommendations for rural surgical service delivery:

1. **Current services need to be sustained.** Considering the inextricable links between sustainable maternity care and the current evidence of safety in outcomes, there is enough evidence to currently support and sustain small-volume rural surgical programs where they now exist.
2. **There is a need for a rural surgical skills program for family physicians.** Academic institutions have a social responsibility to train physicians to meet the needs of rural residents. UBC should offer a formal accredited training program in surgery for rural family physicians. This should include a standardized, portable skill set and a formal certificate of completion of a training program suitable for credentialling. Training programs of family practice anesthesia provide a working template for both the training and credentialling of such a program.
3. **Curriculum should be rurally relevant.** Graduates should be able to competently assess, manage and treat common surgical conditions already identified in the literature for low-risk patients. Graduates

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should further extend their knowledge of risk stratification for rural patients and the differences in rural and urban patient care.

4. **There is a need for a broad scope of practice.** Low-volume programs need a broad scope of practice, which has traditionally been part of a GP–surgeon skill set and what we know to be safe with available literature, to both meet the needs of the community and maintain surgical volumes.
5. **Ongoing professional support is integral to sustainable small-volume surgical programs.** Recognizing that a significant factor in the sustainability of these low-volume surgical programs is ongoing professional support, a formal support program addressing recruitment, retention, matching communities with GP–surgeons, vacation relief and a rural surgical support network should be funded.
6. **Different models need to be incorporated into service delivery.** Local access by low-risk patients to low-risk surgical services performed by GP–surgeons and regional access to specialist services for higher risk patients is a model that has existed for decades and is an extension of the health care delivery system that already exists in many other areas of rural medicine. Both models should be integrated into future health care planning.
7. **Multidisciplinary teams are essential.** The success of rural surgical programs relies on multidisciplinary teams, including nursing, laboratory and transport personnel. Recruitment is positively affected by the presence of a rural surgical program. Specialist surgeons play an important role in mentorship, continuing education, itinerant surgery, consultation and case reviews. Strong relationships between regional surgeons and GP–surgeons are imperative for the survival of small-volume programs.
8. **The need to build research capacity.** There is a need for an interdisciplinary team of key stakeholders to build and direct research capacity as well as facilitate knowledge translation to policymakers.

Consequently, plans were made to further develop a curriculum to train GP–surgeons, to locate an appropriate training site and to continue to develop future research that will provide an evidence base for the design and provision of safe, sustainable surgical services in rural communities.

We are eager to share the outcome of this important meeting, which signifies a crucial step in sustaining rural surgical services. We remain committed to continuing to define and implement the necessary steps to provide quality sustainable rural surgical care.

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