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The Rounds platform offers a wide range of member benefits. We encourage you to sign up and join the official SRPC group here: www.therounds.ca

Medical publishing is broken

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The *Canadian Journal of Rural Medicine* was founded in 1996. In that halcyon era, the pages were glossy, and advertisements gleamed in full colour between every article. Authors submitted their work on paper with an accompanying diskette. The journal itself was a bit thicker around the middle and published more articles. Furthermore, we could afford to mail the journal to anyone we thought could be a rural doctor, on the off chance that he or she might open the pages and read something that might inspire. After all, we were making money.

Today, times have changed. You are probably not reading this issue on paper. Advertisements are few, postage has gone up, cultural subsidies for Canadian publishing are gone ... and we, along with a large number of quality periodicals around the world, are losing money.

We hope you still find the pages inspiring, but we are mindful that the journal costs money. Where are we to get the money? For strategic reasons, we do not charge authors (yes, the emails asking you to submit papers are from “predatory” journals that will publish you ... for a fee). Many of our authors are first-timers and do not have a grant to offset this. We also do not want to charge readers. We want to

remain open access. The rural studies in our issues are not available elsewhere, and the data have policy implications. The findings should be a gift to the world, not a “gotcha” hiding behind a paywall.

Ultimately, the people paying for the journal right now are dues-paying members of the SRPC. That is sobering; we are spending your money. The august members of the editorial board have struggled with this, as we have had stellar service from our current publisher. On the other hand, costs are unpredictable year to year, except in that they are constantly increasing.

We have long done the sensible things. Our journal’s print run is now very small, and we have moved the vast majority of subscribers online. But it is not enough. Our editorial board has formally undertaken the process to review our publishing options to ensure that the membership is getting good value for their dues.

We are shopping around for other options. We are asking for quotes from other medical publishers, both in Canada and around the world. In the past, making money and a quality publisher were enough to keep us satisfied. Now, times have changed, and staying with any particular publisher is no longer a given.

Les publications médicales ne vont pas bien

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Le *Journal canadien de la médecine rurale* a vu le jour en 1996. En ces temps bénis, la revue était publiée sur du papier glacé, et les publicités colorées étaient nombreuses entre les articles. Les auteurs soumettaient leur travail sur un support papier, accompagné d'une disquette. La revue elle-même était un peu plus coûteuse et renfermait plus d'articles. Nous pouvions aussi nous permettre de la poster à quiconque était selon nous susceptible de devenir un jour médecin rural, après s'être entiché de cette branche de la médecine simplement en tournant les pages. Après tout, c'était une entreprise rentable.

Mais, les temps ont changé. Vous ne lisez probablement pas ce numéro sur papier. Les publicités se font rares, les frais postaux ont augmenté, les subventions pour le milieu de la diffusion ont fondu et nous, comme beaucoup de périodiques de qualité sur la planète, nous perdons de l'argent.

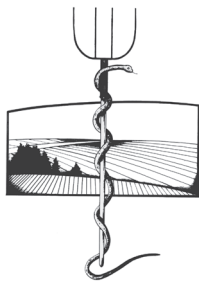
Nous espérons que ces pages continuent de vous inspirer, mais nous ne pouvons ignorer que le *JCMR* coûte de l'argent. Où allons-nous le trouver? Pour des raisons stratégiques, nous n'imposons pas de frais aux auteurs (oui, les courriels qui vous invitent à soumettre des articles proviennent de revues « prédatrices » qui vous publieront moyennant des frais). Plusieurs de nos auteurs en sont à leur première publication et ne disposent d'aucune subvention compensatoire. Nous ne voulons pas non plus imposer de frais aux lecteurs. Nous

tenons à ce que la revue reste en libre accès. Les études sur la médecine rurale publiées dans nos pages ne sont accessibles nulle part ailleurs et les données ont des implications sur le plan des politiques. Le contenu devrait être un cadeau, non un piège ou une embuscade pour faire payer les gens.

Au bout du compte, ceux qui paient actuellement pour la revue, ce sont les membres, par le biais de leurs droits d'adhésion à la SMRC. C'est la dure réalité : nous dépensons votre argent. Les augustes membres du comité éditorial ont longuement débattu à ce sujet, car notre diffuseur actuel nous a offert un service cinq étoiles. Par ailleurs, les coûts sont difficiles à prévoir d'une année à l'autre, si ce n'est qu'ils augmentent sans cesse.

Nous avons toujours agi de manière rationnelle. Le tirage de notre revue est maintenant très faible et la majeure partie de nos abonnés nous lisent désormais en ligne. Mais ça ne suffit toujours pas. Notre comité éditorial a officiellement enclenché un processus de révision de nos options en matière de diffusion pour nous assurer que nos membres en aient pour leur argent.

Nous examinons les options possibles. Nous demandons des devis à d'autres diffuseurs du domaine médical, au Canada et ailleurs. Autrefois, rentabilité et diffuseur de qualité suffisaient pour faire notre bonheur. Mais les temps ont changé et garder le même diffuseur n'est pas toujours possible.



President's message. Advancing rural medicine

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In 2012, only 14% of family practitioners and 3.1% of specialists served the 18% of Canadians in rural Canada.¹ The inequity in medical services provided to rural and remote populations has not improved substantially since then.

The SRPC and the College of Family Physicians of Canada hope to address this problem with the formation of a Rural Road Map (RRM) Implementation Committee, intended to improve health care access and equity for rural communities. Plans for action aimed at improving the quality of health care that rural Canadians receive close to home include:

- Advocate for accreditation standards that promote timely transfer of patients both to and from referring physicians and institutions; approach groups such as the Canadian Institute for Health Information and Canadian Foundation for Healthcare Improvement and governments for transfer data to identify ways to improve efficiency and patient outcomes.
- Request a meeting with the National Liberal Rural Caucus to share the RRM and discuss a national rural health care research strategy; promote rural/remote medical training programs such as the Nunavut Family Medicine Residency Program involving Memorial University and the government of Nunavut.
- In collaboration with Infection Prevention and Control Canada, with an invitation to the Canadian Indigenous Nurses Association, consider

a meeting with the federal Liberal Indigenous Caucus to discuss initiatives to further educate medical students and residents about health and social issues facing the Indigenous population and culturally safe care (outlined in the Truth and Reconciliation Commission report).

- Enhance the SRPC Rural Collaborative Research group with an invitation to others interested in rural research to meet at the Rural and Remote Medicine Course in April. Rural research initiatives illustrating the importance of research and how it can assist governments in forming policies that will address gaps in access to services in rural/remote communities will be presented to the Rural Caucus. Dialogue to explore funding opportunities will also occur.
- Approach the federal Committee on Health Workforce to emphasize the importance of medical education and of leveraging the RRM as part of their health human resource planning in the rural environment.
- Use the RRM at all available opportunities to stimulate conversation about ways to further promote rural health care for Canadians.

Our conversation is just beginning. We need support and participation from each of you!

REFERENCE

1. Supply, distribution and migration of Canadian physicians, 2012. Ottawa: Canadian Institute for Health Information (CIHI); 2013.

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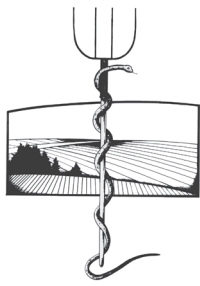
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Message du président. Faire avancer la médecine familiale rurale

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En 2012, seulement 14 % des médecins de famille et 3,1 % des spécialistes ont desservi les 18 % de la population du Canada qui vivent en milieu rural¹. Les inégalités sur le plan des services médicaux dispensés aux populations des régions rurales et éloignées ne se sont guère améliorées depuis.

La Société de la médecine rurale du Canada (SMRC) et le Collège des médecins de famille du Canada (CMFC) espèrent régler ce problème avec la création du Comité de mise en œuvre du Plan d'action pour la médecine rurale, destiné à améliorer l'accès aux soins de santé et l'équité en la matière pour les communautés rurales. Parmi les stratégies proposées pour améliorer la qualité des soins de santé dispensés aux Canadiens des régions rurales, mentionnons :

- Militer en faveur de normes d'agrément propices à un transfert rapide des patients entre les médecins traitants et les établissements; approcher des groupes comme l'Institut canadien d'information sur la santé et la Fondation canadienne pour l'amélioration des services de santé et les gouvernements pour obtenir des données sur les transferts afin d'identifier des façons d'en améliorer l'efficacité et les résultats cliniques chez les patients.
- Demander une rencontre avec le Caucus rural national du Parti libéral pour faire connaître le Plan d'action et discuter d'une stratégie nationale de recherche sur la santé rurale; promouvoir les programmes de formation médicale en région rurale et éloignée, comme le programme de résidence en médecine familiale du Nunavut en collaboration avec l'Université Memorial et le gouvernement du Nunavut.
- En collaboration avec Prévention et contrôle des infections Canada (PCIC), accompagnée d'une invitation à l'Association des infirmières et

infirmiers autochtones du Canada (AIIAC), envisager une rencontre avec le Caucus autochtone national du Parti libéral pour discuter d'initiatives qui permettront de mieux renseigner les étudiants et les résidents en médecine au sujet des enjeux médicaux et sociétaux auxquels sont confrontés les populations autochtones et d'offrir des soins culturellement adaptés (préconisés dans le rapport de la Commission de vérité et réconciliation du Canada).

- Consolider le groupe de recherche axé sur la collaboration en milieu rural de la SMRC, avec une invitation lancée à d'autres groupes ou individus intéressés par la recherche en médecine rurale pour une rencontre en marge du cours de médecine rurale qui se donnera en avril. On présentera au Caucus rural des initiatives de recherche en médecine rurale témoignant de l'importance de la recherche et de sa capacité d'aider les gouvernements à établir des politiques pour combler les lacunes dans l'accessibilité des services pour les communautés rurales et éloignées. On axera également le dialogue sur les capacités de financement.
- Approcher le Comité fédéral sur l'effectif en santé pour souligner l'importance de la formation médicale et le rôle potentiel du Plan d'action dans la planification des ressources humaines en milieu rural.
- Utiliser le Plan d'action à chaque occasion pour susciter le dialogue sur les façons de promouvoir davantage les soins de santé en milieu rural pour la population canadienne.

Le dialogue vient de débiter. Nous avons besoin de l'appui et de l'implication de chacun et chacune d'entre vous!

RÉFÉRENCE

1. Nombre, répartition et migration des médecins canadiens. 2012. Institut canadien d'information sur la santé (ICIS). 2013.

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Maternal opioid use disorder and neonatal abstinence syndrome in northwest Ontario: a 7-year retrospective analysis

Introduction: Opioid use in pregnancy is increasing globally. In northwest Ontario, rates of neonatal abstinence syndrome (NAS) are alarmingly high. We sought to document the increasing rates of opioid exposure during pregnancy and associated cases of NAS over a 7-year period in northwest Ontario.

Methods: We conducted a retrospective chart review at the Sioux Lookout Meno Ya Win Health Centre catchment area (population 29 000) maternity program in northwest Ontario of mother–infant dyads of live births from Jan. 1, 2009, to Dec. 31, 2015. The Integrated Pregnancy Program provides maternal, neonatal and addiction care for obstetrical patients at the health centre. We collected data on prenatal opioid exposure due to illicit and opioid agonist therapy (OAT) from patient/prescription histories and urine toxicology reports. Rates of NAS (diagnosed as a Finnegan score > 7) were recorded retrospectively from neonatal hospital charts.

Results: There were 2743 live births during the study period. Opioid exposure occurred in 672 pregnancies (335 OAT, 337 illicit). The incidence of prenatal opioid exposure increased significantly between 2009 and 2012 (11.1% to 28.5%, $p < 0.001$) but remained relatively constant at around 30% thereafter. Despite this, absolute rates of NAS remained relatively stable, with an average of 22.2 cases per 1000 live births over the study period. In comparison, the North West Local Health Integration Network (LHIN) experienced an average of 52.8 cases of NAS per 1000 live births in 2009–2012. The incidence of NAS in our centre decreased significantly over the study period (17.6% of opioid-exposed pregnancies in 2009 v. 4.0% in 2015, $p = 0.001$). There was a gradual transition toward a preponderance of OAT- versus illicit-exposed pregnancies, increasing from 0% in 2009 to 76.9% in 2015 ($p < 0.001$).

Conclusion: Despite our continually increasing rates of opioid exposure in pregnancy, rates of NAS decreased annually and were substantially lower than those of our regional LHIN. In contrast to 2009, most opioid exposure in our region is now iatrogenic as a result of OAT. These improvements may be attributable in part to the rural community-based prenatal and addictions services developed in our catchment area.

Introduction : La consommation d'opioïdes pendant la grossesse est à la hausse dans le monde entier. Dans le nord-ouest de l'Ontario, le taux de syndrome de sevrage néonatal est alarmant. Nous avons tenté de documenter les taux croissants d'exposition aux opioïdes pendant la grossesse et les cas associés de syndrome de sevrage néonatal sur une période de sept ans dans le nord-ouest de l'Ontario.

Méthodes : Nous avons mené une étude rétrospective des dossiers des patientes du programme obstétrical de la région desservie par le Centre de santé Meno Ya Win de Sioux Lookout (population de 29 000), dans le nord-ouest de l'Ontario, et des naissances vivantes de la dyade mère–nourrisson pour la période du 1^{er} janvier 2009 au 31 décembre 2015. Des soins maternels, néonataux et de traitement de la toxicomanie sont offerts aux patientes en obstétrique du Centre de santé dans le cadre d'un programme de soins intégrés pendant la grossesse. Nous avons obtenu des données sur

l'exposition prénatale aux opioïdes due à la consommation d'opioïdes illégaux et aux traitements par agonistes opioïdes dans les antécédents des patientes, l'historique des médicaments prescrits et les rapports de toxicologie des dépistages urinaires. Le taux de syndrome de sevrage néonatal (diagnostiqué selon un score de Finnegan > 7) a été obtenu et consigné de manière rétrospective à partir des dossiers néonataux d'hôpitaux.

Résultats : Il y a eu 2743 naissances vivantes pendant la période de l'étude et 672 grossesses exposées aux opioïdes (335 aux traitements par agonistes opioïdes, 337 aux opioïdes illégaux). L'incidence de l'exposition prénatale aux opioïdes a augmenté de façon importante entre 2009 et 2012 (11,1 % à 28,5 %, $p < 0,001$), mais est ensuite demeurée relativement constante à environ 30 % par la suite. Malgré cela, le taux absolu de syndrome de sevrage néonatal est demeuré relativement stable, soit une moyenne de 22,2 cas par 1000 naissances vivantes pendant la période de l'étude. Par comparaison, le Réseau local d'intégration des services de santé (RLISS) du Nord-Ouest a enregistré une moyenne de 52,8 cas de syndrome de sevrage néonatal par 1000 naissances vivantes entre 2009 et 2012. L'incidence du syndrome de sevrage néonatal dans notre centre a diminué considérablement au cours de la période de l'étude (17,6 % de grossesses exposées aux opioïdes en 2009 contre 4 % en 2015, $p = 0,001$). Nous avons observé une transition graduelle vers la prépondérance des grossesses exposées aux traitements par agonistes opioïdes par rapport aux grossesses exposées aux opioïdes illégaux. Leur taux est passé de 0 % en 2009 à 76,9 % en 2015 ($p < 0,001$).

Conclusion : Malgré la croissance continue de l'exposition aux opioïdes pendant la grossesse, notre taux de syndrome de sevrage néonatal a diminué annuellement et était nettement inférieur au taux du RLISS de la région. Par comparaison à 2009, la plupart des cas d'exposition aux opioïdes dans notre région sont maintenant d'origine iatrogène et liés aux traitements par agonistes opioïdes. Ces améliorations pourraient s'expliquer en partie par la création de services communautaires de soins prénataux et de traitement de la toxicomanie en régions rurales dans notre circonscription hospitalière.

INTRODUCTION

Opioid use disorder is an increasing Canadian health and social issue. In 2014, 1 in 6 Canadian residents aged 15 years or more reported using opioid analgesics, 5.2% of whom reported abusing them.¹ In a 2015 report by the Canadian Centre on Substance Abuse, 15.7% of females aged 15 years or more had used prescription opioids in the previous year.² According to the 2009 Canadian Maternity Experiences Survey, 6.7% of pregnant women had used street drugs in the 3 months before conception, with 1% continuing to use throughout their pregnancy.³

Although a national concern, opioid abuse is not evenly distributed across Canada. Ontario and Nunavut have remarkably high rates of perinatal opioid abuse.³ Remote First Nations communities in northwest Ontario have been particularly affected, experiencing an "epidemic" of opioid-related problems in recent years.⁴

Opioid use in pregnancy is particularly challenging clinically and is increasing globally. The rate of prenatal opioid abuse in the United States increased from 1.19 cases per 1000 deliveries in 2000 to 5.63 cases/1000 deliveries in 2009.⁵ In northwest Ontario, opioid exposure has been documented to occur in up to 28.6% of pregnancies in

the Sioux Lookout Meno Ya Win Health Centre (SLMHC) catchment area.⁶ As a result, neonatal abstinence syndrome (NAS) is encountered in this postpartum patient population.^{7,8} Neonatal abstinence syndrome refers to the varied constellations of withdrawal from maternal substances and medications, including opioid use in pregnancy. Its severity and monitoring are evaluated with a signs and symptom scoring system, commonly the Finnegan scoring system.⁹ A broad set of symptoms involving the central and autonomic nervous systems, gastrointestinal system and respiratory system may be present, necessitating pharmacological treatment. Maternal opioid use increases complications of pregnancy, including pregnancy loss, poor growth and premature labour. Subsequent neonatal withdrawal requires treatment to manage poor feeding and irritability and to prevent seizures. It is unclear whether long-term pediatric neurodevelopment is affected.¹⁰

In Ontario, the incidence of NAS increased from 0.9 cases per 1000 deliveries in 2002/03 to 5.1 cases per 1000 deliveries in 2011/12¹¹ and has continued to increase since then, with an incidence of 7.0 cases per 1000 births reported in 2013. In northwest Ontario, the rates are alarmingly high. The incidence of NAS in the North West Local

Health Integration Network (LHIN) averaged 52.8 cases per 1000 deliveries from 2009 to 2012,¹⁰ over 50 times the incidence in southern Ontario urban centres and 10 times the provincial rate.¹²

The SLMHC, a major centre of obstetrical care, serves 31 remote First Nations communities with a catchment population of 29 000 (1/10th of the population of the North West LHIN) in a rural geographic area of 385 000 km². This study examines the 7-year incidence of opioid use in pregnancy and subsequent NAS rates in the context of development of rural hospital and community programs that make opioid agonist treatment (OAT) and opioid tapering available to pregnant patients.

METHODS

Background

Since 2012, prenatal care at SLMHC has been delivered via a comprehensive, generalist model of care, known as the Integrated Pregnancy Program. In the program, rural physicians, nurses and counsellors provide prenatal, addiction, postnatal and whole-family care in a single setting. The same caregivers attend the deliveries and provide postnatal maternal and neonatal care. In addition, male partners are often involved in the program and are offered concurrent treatment for addiction-related concerns at prenatal visits. This integration of prenatal and addiction care was unique in Canada when introduced and has become the mainstay of our consistent approach to addiction care in pregnancy. It has required the local development of a standardized protocol for the delivery of prenatal care for opioid-exposed pregnancies, which includes increased ultrasonography monitoring and prenatal visits.¹³ Postpartum patient care in the Integrated Pregnancy Program is coordinated with community-based programs, to which the family transitions on returning home.

Community programs for opioid use disorder were in place in over 20 of the 31 remote First Nations communities in the SLMHC catchment area throughout the study period. These programs combine traditional Indigenous healing practices and counselling with OAT treatment in an attempt to foster community involvement. The programs have been well received by the communities and have resulted in positive community-wide changes, including decreases in criminal charges and drug-related medical evacuations and increased school attendance.¹⁴ The programs have a strong cultural

presence, and aftercare includes traditional land-based activities and elder teachings where available.¹⁵ A recent study of 6 of these programs showed high OAT retention rates (83.5% at 6 months) and high rates of negative results of urine drug screening (85%).¹⁵

Design and data sources

We conducted a retrospective chart review of all live births at the SLMHC from Jan. 1, 2009, to Dec. 31, 2015. Opioid exposure was recorded throughout pregnancy and was classified as exposure due to illicit drug use versus exposure due to OAT. Illicit exposure included nonprescribed opioids and street drugs, and OAT exposure included buprenorphine, buprenorphine–naloxone and methadone treatment. Data on prenatal opioid use were gathered from a combination of patient histories, electronic prescription records and urine toxicology results. The point at which women were started on an OAT program ranged from preconception to second trimester. Women on an OAT program who had positive urine test results for illicit opioids were included in the illicit-exposed group.

Neonatal abstinence syndrome was diagnosed with the Finnegan scoring system, in which neonatal pharmacological treatment is considered following 3 consecutive scores greater than 7.⁹ We calculated rates of prenatal opioid exposure (illicit, OAT and total) for each of the 7 years from 2009 to 2015. Rates of NAS were also calculated and expressed relative to opioid-exposed deliveries as well as all live births regardless of exposure. We derived comparative Ontario rates from hospital discharge “most responsible diagnosis” data sources. We used the Pearson χ^2 test to compare rates of prenatal opioid exposure and NAS across time using IBM SPSS V.23 for Windows.

Ethics approval

Ethics approval for this study was obtained from the Sioux Lookout Research Review and Ethics Committee.

RESULTS

There were 2743 live births at the SLMHC during the study period. Rates of OAT and illicit drug use throughout pregnancy and associated cases of NAS across the study period are summarized in Table 1. Opioid exposure occurred in 672 cases, 337 of

Table 1: Incidence of prenatal opioid exposure and neonatal abstinence syndrome among live births at the Sioux Lookout Meno Ya Win Health Centre from 2009 to 2015

Variable	Year; no. (%) of live births							p value
	2009 n = 307	2010 n = 356	2011 n = 424	2012 n = 425	2013 n = 411	2014 n = 406	2015 n = 414	
Opioid exposure*	34 (11.1)	63 (17.7)	103 (24.3)	121 (28.5)	108 (26.3)	117 (28.8)	126 (30.4)	< 0.001
Type of exposure								
Illicit	34 (11.1)	58 (16.3)	93 (21.9)	61 (14.4)	35 (8.5)	27 (6.6)	29 (7.0)	< 0.001
OAT	0 (0.0)	5 (1.4)	10 (2.4)	60 (14.1)	73 (17.8)	90 (22.2)	97 (23.4)	< 0.001
OAT exposure in exposed neonates	0 (0.0)	5 (7.9)	10 (9.7)	60 (49.6)	73 (67.6)	90 (76.9)	97 (77.0)	< 0.001
Neonatal abstinence syndrome								
All neonates	6 (2.0)	7 (2.0)	12 (2.8)	14 (3.3)	12 (2.9)	5 (1.2)	5 (1.2)	0.3
Exposed neonates	6 (17.6)	7 (11.1)	12 (11.6)	14 (11.6)	12 (11.1)	5 (4.3)	5 (4.0)	0.001

OAT = opioid agonist therapy.

* $p < 0.001$ for comparison between 2009 and 2012; $p = 0.6$ for comparison between 2012 and 2015.

which were due to illicit drug use and 335 of which involved patients receiving OAT. In our region, buprenorphine is the main OAT medication used, and it accounted for 94% of cases of OAT exposure, with methadone accounting for the remaining 6%. Oxycodone and morphine accounted for 62% and 26%, respectively, of illicit exposures. After a rapid increase in rates of total opioid exposure between 2009 and 2012 (11.1% to 28.5%, $p < 0.001$), the incidence remained unchanged thereafter, remaining stable around 30% ($p = 0.6$) (Fig. 1).

There was a significant transition toward OAT over the study period ($p < 0.001$). In the initial year of the study, 2009, all cases of opioid exposure during pregnancy were as a result of illicit drug use (Fig. 1). From 2009 to 2011, the proportion of OAT-exposed pregnancies gradually increased, and OAT accounted for over 50% of exposed pregnancies from 2013 onward. In 2015, the final year of the study, 76.9% of prenatal opioid exposure was due to OAT.

Despite increasing rates of prenatal opioid exposure, our incidence of NAS relative to all live births remained relatively constant over the study period. The 7-year average rate of NAS was 22.2/1000 live births. Neonatal abstinence syndrome occurred in 2.2% (standard deviation 0.83%) of all live births over the study period (range 1.2% in 2014 and 2015 to 3.3% in 2012). When considering only the 672 opioid-exposed pregnancies, our rates of NAS decreased significantly over the study period (Fig. 2). In 2009, 17.6% of opioid-exposed infants received pharmacological treatment for NAS, compared to 4.0% by 2015 ($p < 0.001$) (Table 1). Over the study period, NAS occurred in 9.1% (standard deviation 4.7%) of all narcotic-exposed pregnancies.

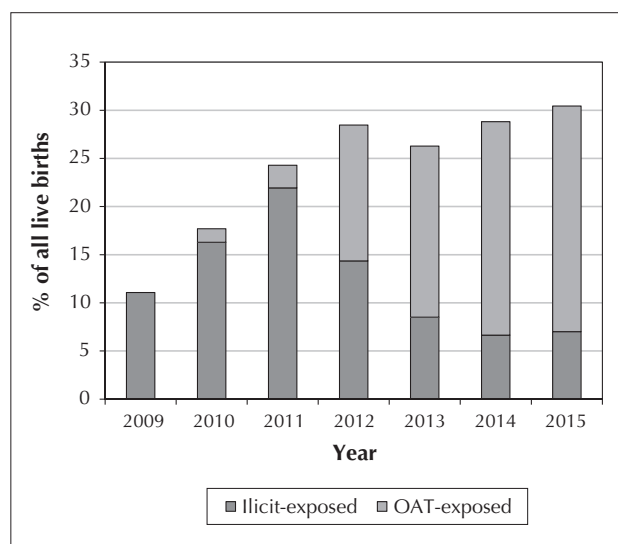


Fig. 1. Annual incidence of prenatal opioid exposure (illicit and opioid agonist therapy) as a proportion of all live births from 2009 to 2015. OAT = opioid agonist therapy.

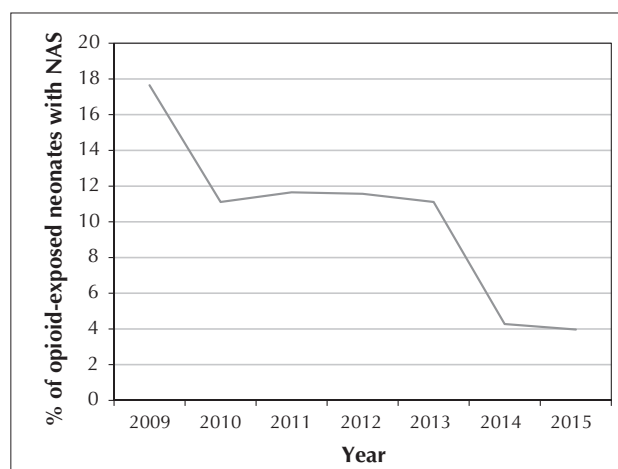


Fig. 2. Annual incidence of neonatal abstinence syndrome (NAS) as a proportion of opioid-exposed neonates from 2009 to 2015.

DISCUSSION

The incidence of opioid exposure during pregnancy in northwest Ontario is staggeringly high, remaining relatively stable at around 30% of all deliveries in 2012–2015. Despite the consistently high rates of prenatal opioid exposure, the incidence of NAS relative to opioid exposure decreased significantly over the study period, from 17.6% in 2009 to 4.0% in 2015.

The incidence of prenatal opioid exposure in our catchment area is notably higher than that in other regions of Canada and the US. In 2009 in the US, 5.63 per 1000 live births were complicated by opioid exposure.⁵ According to the Canadian Maternal Experiences Survey, 1% of women nationwide use street drugs during pregnancy.³ Nunavut had the highest reported incidence of prenatal street drug use, at 8.7%.³ The incidence of opioid exposure, excluding other street drugs such as cannabis and cocaine, in our catchment area is 30 times that of the nation and 3.5 times that of the province with the highest rate (Ontario). What is of interest is the gradual change in our catchment population from opioid exposure due to illicit opioid use to prescribed, managed OAT exposure and a subsequent decline in NAS rates among opioid-exposed pregnancies. These findings parallel the development of local hospital and community programs that make OAT and opioid tapering available to pregnant patients.

Rates of NAS are increasing in most constituencies. In the US, the incidence increased from 1.2 cases per 1000 deliveries in 2000 to 5.8 cases per 1000 deliveries in 2012.^{5,12} The highest incidence of NAS documented in the US was 16.2 cases per 1000 live births in Kentucky, Tennessee, Mississippi and Alabama.¹⁶ In a 2012 report, the incidence of NAS in Canada was documented as 3.8 cases per 1000 live births.¹⁷ Increasing rates of NAS have been reported in Ontario, from 0.28 cases per 1000 deliveries in 1992 to 5.1 cases per 1000 deliveries in 2011/12.^{11,18} Rates of NAS in Ontario in 2012 were estimated at 5.1 cases per 1000 live births,¹⁸ versus our incidence that year of 33 per 1000. The 7-year average incidence in our study was 22.2 per 1000 live births, high, but significantly lower than the regional average of 52.8 in the North West LHIN.¹⁰

Despite the decreasing rates of NAS in our opioid-exposed population over the study period, prenatal opioid use (and opioid use in general) remains a major public health concern. We believe that local community and hospital initiatives in our region have contributed to the significant reduction

in the incidence of NAS and the transition to managed opioid exposure through OAT.

Buprenorphine–naloxone is a common first-line agent in community-based OAT programs in our region. This is due to both the unavailability of methadone in northern Indigenous communities and the increasing body of evidence supporting buprenorphine–naloxone as a better alternative to methadone.^{19–21} Given the frequency of use of buprenorphine–naloxone in addiction treatment, women commonly conceive while they are receiving it. We found that women exposed to buprenorphine–naloxone had obstetrical outcomes (preterm delivery, congenital abnormality, cesarian delivery, postpartum hemorrhage, Apgar scores, NAS and birth weight) superior to those of women with ongoing illicit opioid use and equivalent to those for non-opioid-exposed pregnancies.^{19–21}

Opioid agonist tapering in the third trimester became common practice in the Integrated Pregnancy Program in 2012. An 18-month study examining this practice conducted at our centre showed a significant reduction in the incidence of NAS, from 29.5% to 18.1% of opioid-exposed pregnancies ($p = 0.003$), as a result of the tapering protocol.¹⁹ About half of the patients on the OAT program agreed to opioid dosage tapering in the third trimester and successfully stopped or decreased their total opioid dosage. OAT tapering in pregnancy is standard practice at SLMHC and is done with patient consent and close outpatient monitoring for withdrawal symptoms.

Limitations

Urine drug screening in patients receiving OAT has limitations. If a patient is already receiving methadone or buprenorphine–naloxone OAT, additional use of street methadone or buprenorphine–naloxone cannot be detected, as the test result will already be positive. In addition, we did not include the few pregnant patients who were prescribed narcotic medications for medical reasons in our analysis.

Many different NAS scoring systems exist, including the Finnegan, modified Finnegan and Lipsitz scores, which makes comparison of NAS rates between studies difficult. In the literature, the incidence of NAS is reported in several different ways, such as cases with a Finnegan score greater than 7, cases with NAS as the most responsible diagnosis and the presence of any NAS symptoms. Many studies did not identify their criteria for diagnosing NAS, which limited our ability to reliably compare our rates with provincial, national and global rates.

We limited our estimates of NAS to cases with a Finnegan score greater than 7, in which pharmacological treatment is indicated, which is a common definition and likely best aligns with “most responsible diagnosis,” used in many hospital discharge analyses. We avoided including the many neonates with lower scores, as such scores are more prone to interobserver variability and over- and underreporting. Our method allowed our estimates to be compared with those of studies that included only neonates who received pharmacological treatment.

A major limitation of this study is that it was not designed to determine the cause of the reduction in NAS rates. It was an observational study of the parallel development of rural hospital and community programs and decreasing rates of NAS in opioid-exposed pregnancies, documenting a temporal association.

CONCLUSION

Narcotic abuse continues to be a major health care concern in northwest Ontario, especially in the Indigenous population. Despite high rates of prenatal opioid exposure in the SLMHC catchment area, the incidence of NAS remains relatively low compared to regional rates. This may be due in part to our integrated, generalist approach to treating opioid use during pregnancy, use of buprenorphine–naloxone OAT and tapering OAT dosages in the third trimester. Our findings highlight the importance of a patient- and family-centred approach to treating opioid abuse during pregnancy, both in hospital and in the community, and the value of developing innovative rural programming.

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A quantitative day in the life of a Saskatchewan rural physician

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Introduction: Rural family physicians are often required to meet a wide variety of medical service demands that are otherwise the responsibility of specialty physicians in urban centres. However, many rural physicians enjoy the practice variety and ability to meet patients' medical needs through this wider spectrum of care. We aimed to quantify and summarize the workload and clinical disorders seen by rural family physicians in Saskatchewan relative to urban family physicians.

Methods: We used Saskatchewan Ministry of Health billing data for 2015/16 to compare rural and urban care provision. The data were summarized in a graphic 1-month format to portray a typical month in the life of a rural physician in the province.

Results: In the office setting, rural family physicians saw 16.8% more cardiac presentations in adults over 65 years of age than did urban family physicians; otherwise, there were no significant differences in the top office diagnosis categories seen by the 2 groups. Differences were apparent, however, in the hospital setting: urban family physicians saw more patients presenting with pain and, reflective of centralization of obstetric delivery services, performed more deliveries than did rural physicians.

Conclusion: There are differences in the clinical presentations seen by rural and urban family physicians, and these need to be considered by new physicians considering rural practice. Our simple visual depiction of average workload, vacation and activity levels of rural physicians can further inform medical residents on the realities of working in rural Saskatchewan as a family physician. A more complete understanding of clinical workload expectations may promote recruitment of resident physicians.

Introduction : Les médecins de famille en milieu rural sont souvent appelés à fournir des services médicaux très variés qui sont par ailleurs la responsabilité des médecins spécialistes, en milieu urbain. Cela dit, beaucoup de médecins en milieu rural apprécient la variété et la capacité de répondre aux besoins médicaux des patients dans ce contexte de soins plus étendu. Nous avons tenté de quantifier et de résumer la charge de travail ainsi que les troubles cliniques des patients reçus par les médecins de famille en milieu rural en Saskatchewan par rapport aux médecins de famille en milieu urbain.

Méthodes : Nous avons utilisé les données de facturation du ministère de la Santé de la Saskatchewan pour 2015–2016 afin de comparer la prestation des soins en milieu rural et urbain. Les données ont été résumées sous forme de graphique représentant un mois typique dans la vie d'un médecin exerçant en milieu rural dans la province.

Résultats : En cabinet, les médecins de famille en milieu rural ont reçu 16,8 % plus de patients de 65 ans atteints d'une cardiopathie que les médecins de famille en milieu urbain. Par ailleurs, il n'y avait pas de différences significatives dans les principales catégories de diagnostics en cabinet entre les deux groupes. Toutefois, des différences étaient évidentes en milieu hospitalier : les médecins de famille en milieu urbain ont reçu plus de patients présentant une douleur et ont pratiqué un nombre plus élevé d'accouchements que les médecins en milieu rural, ce qui reflète la centralisation des services obstétriques.

Conclusion : Les troubles cliniques des patients reçus par les médecins de famille en milieu rural et urbain diffèrent et doivent être pris en compte par les nouveaux médecins qui envisagent la pratique en milieu rural. Notre représentation visuelle simple de la charge de travail, des vacances et du taux d'activité moyen des médecins en milieu rural peut éclairer les médecins résidents sur les réalités de la pratique du médecin de famille en région rurale en Saskatchewan. Une compréhension plus complète des attentes en matière de charge clinique pourrait favoriser le recrutement des médecins résidents.

INTRODUCTION

The average physician in a rural environment is required to meet varied medical demands that are otherwise the responsibility of specialty physicians in urban centres.^{1,2} To meet community demands, rural family physicians often use their skills as hospitalists in such areas as emergency care, anesthesia, obstetrics and minor surgery.² Although responsibility is generally greater in rural medicine than in urban centres, many rural family physicians enjoy the practice variety and ability to meet the diverse needs of their patients through a wider spectrum of care provision.^{3,4} Promoting broad-scope family medicine and comprehensive patient care may be an effective tool for attracting physicians to rural areas facing physician shortages.^{1,5,6}

We attempted to quantify and summarize the workload and clinical disorders seen by rural family physicians in Saskatchewan relative to urban family physicians and to present the data in a novel graphic 1-month format. Our aim was to further inform medical residents on the realities of working in rural Saskatchewan as a family physician. A more complete understanding of clinical workload expectations may promote recruitment of resident physicians who may have an incomplete understanding of the clinical workload in rural areas of the province.

METHODS

We performed a secondary review of family physician billing information for 2014/15 from the Saskatchewan Ministry of Health for annual workload and diseases observed. We separated the billing entries provided based on urban/metropolitan and rural family physicians. Billing was categorized by diagnosis, and procedures were ranked in a list of the 20 most common diagnostic categories. We then further subdivided the diagnoses by patient age group (birth to 11 yr, 12–18 yr, 19–35 yr, (36–65 yr and > 65 yr) and setting (office or hospital).

In the data analysis of emergency department visits, we used hospital classifications defined by the government of Saskatchewan⁷ to determine “district” and “community” rural hospitals. The district classification includes hospitals as small as Tisdale Hospital in Tisdale (2011 population 3180) and as large as St. Joseph’s Hospital in Estevan (population 11 054).⁸ The community classification includes hospitals as small as the Arcola Health Centre in Arcola (population 649) to as large as Southeast Integrated Care Centre in Moosomin (population 2485).⁸

We condensed the 20 most common office and hospital diagnoses for both urban and rural family physicians in 2015/16 into discipline-specific categories and then compared these categories between urban and rural family physicians. Within the total sample population, as well as in the various age categories, we arbitrarily identified relative differences of 10% between diagnostic categories as significant.

Data sources

The Saskatchewan Ministry of Health provided unidentified family physician billing information submitted through their Medical Services Branch claims processing system by all fee-for-service physicians in 2015/16. Data are for in-province patients submitted by in-province physicians. Data are based on diagnosis. The International Classification of Diseases, 9th revision⁹ is used for disease classification. We obtained information regarding transfer of patients from a rural hospital to a higher level of care in 2014/15, including emergency medical air transportation data, from the Saskatchewan Ministry of Health.

Statistical analysis

Data analysis was completed in Microsoft Excel 2013.

Ethics approval

The University of Saskatchewan Research Ethics Board gave ethics approval for this study.

RESULTS

There were 1652 active physicians (those licensed and billing more than \$60 000 in the fiscal year) in Saskatchewan in March 2015: 251 rural general practitioners, 434 metropolitan-area (Regina and Saskatoon) general practitioners, 208 urban general practitioners and 759 specialists residing in urban, regional or metropolitan areas.

Of all 2015/16 fee-for-service billing claims for rural physicians, 65% were from the office and 35% were in hospital. The corresponding values for urban/metropolitan physicians were 79% and 21%.

In the office setting, rural family physicians saw 16.8% more cardiac presentations in adults over 65 years of age than did urban family physicians. Otherwise, there were no significant differences in the top office diagnosis categories seen by the 2 groups.

Table 1 displays inpatient rural hospital admissions with the major clinical categories of significant

Table 1: Average rural inpatient hospital admissions with a major clinical category of significant trauma, injury, poisoning or toxic effects of drugs, 2010/11 to 2015/16

Variable	Year; mean no. of admissions \pm SD*					
	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16†
All rural hospitals						
No. of all-cause admissions	1604	1506	1329	1246	1202	1153
No. of hospitals	48	47	46	47	44	48
Annual	33.4 \pm 0.6	32.0 \pm 0.6	28.9 \pm 0.6	26.5 \pm 0.4	27.3 \pm 0.5	24.0 \pm 0.5
Monthly	2.8 \pm 0.1	2.7 \pm 0.1	2.4 \pm 0.1	2.2 \pm 0.1	2.3 \pm 0.1	2.0 \pm 0.1
Community hospitals						
No. of all-cause admissions	1009	930	778	827	783	738
No. of hospitals	39	38	37	38	35	39
Annual	25.9 \pm 0.5	24.5 \pm 0.5	21.0 \pm 0.5	21.8 \pm 0.5	22.4 \pm 0.6	18.9 \pm 0.5
Monthly	2.2 \pm 0.1	2.0 \pm 0.1	1.8 \pm 0.1	1.8 \pm 0.1	1.9 \pm 0.1	1.6 \pm 0.1
District hospitals						
No. of all-cause admissions	595	576	551	419	419	415
No. of hospitals	9	9	9	9	9	9
Annual	66.1 \pm 4.1	64.0 \pm 3.8	61.2 \pm 3.1	46.6 \pm 2.1	46.6 \pm 2.2	46.1 \pm 2.5
Monthly	5.5 \pm 1.3	5.3 \pm 0.3	5.1 \pm 0.3	3.9 \pm 0.2	3.9 \pm 0.2	3.8 \pm 0.2

SD = standard deviation.

*Except where noted otherwise.

†Data do not reflect a complete data cycle.

trauma, injury, poisoning and toxic effects of drugs. Average rural hospital inpatient admissions are shown in Table 2. We used these data to populate a graphic 1-month summary (Fig. 1).

In the hospital setting, urban family physicians saw 10.3% more presentations for pain management than did rural family physicians. Urban/metropolitan family physicians also had 34.8% more baby deliveries and 13.0% more pediatric pain management consultations than their rural counterparts. However, the latter had 19.3% more consultations for acute respiratory infections in pediatric patients than did urban family physicians. Compared to rural family physicians, urban family physicians had 12.6% more pain management consultations in adolescents, 15.4% more pain management consultations in adults aged 19–35 years, 15.4% more obstetrics/gynecology consultations and 11.6% more pain management consultations in adults aged 36–65 years (data not shown).

The average daily number of road ambulance trips for injury/trauma with a destination to a rural hospital in 2014/15 was 0.2; the patient care record count was 4437. The corresponding values for district and community hospitals were 0.4 (1432) and 0.2 (3005), respectively.

Table 3 shows the average number of transfers out of rural hospitals to a higher level of care in 2014/15, both annually and monthly, by acuity. These data were also used to populate the graphic summary (Fig. 1).

We compared the community and district hospital emergency department visits of 2014/15 with the

population sizes of their respective community using 2011 census data. A total of 52 communities were included; 20 communities were omitted owing to lack of data. Their relation showed a linear trend of $R^2 = 0.574$. Communities outside of 2 standard deviations of the trend line were noted. The emergency departments of St. Joseph Hospital (Estevan) and Weyburn General Hospital (Weyburn) had comparatively fewer visits per capita, and the emergency departments of Kamsack District Hospital and Nursing Home (Kamsack), La Ronge Health Centre (La Ronge) and Rosthern Hospital (Rosthern) had comparatively more visits per capita.

Table 2: Average rural hospital inpatient admissions and hospital length of stay in Saskatchewan, 2013/14 and 2014/15

Variable	Year; mean \pm SD	
	2013/14	2014/15
All rural hospitals		
No. of separations*	519.3 \pm 401.4	510.7 \pm 407.9
Daily census	8.9 \pm 6.9	9.2 \pm 7.2
Length of stay, d	6.7 \pm 2.9	7.0 \pm 2.4
Community hospitals		
No. of separations*	439.6 \pm 283.0	409.4 \pm 278.0
Daily census	7.3 \pm 4.5	7.3 \pm 4.8
Length of stay, d	7.4 \pm 3.2	7.7 \pm 3.2
District hospitals		
No. of separations*	1047.1 \pm 331.7	1049.4 \pm 361.8
Daily census	18.1 \pm 6.5	19.1 \pm 6.6
Length of stay, d	6.3 \pm 1.5	6.8 \pm 1.6

SD = standard deviation.

*Include death, discharge, sign-out and transfer.

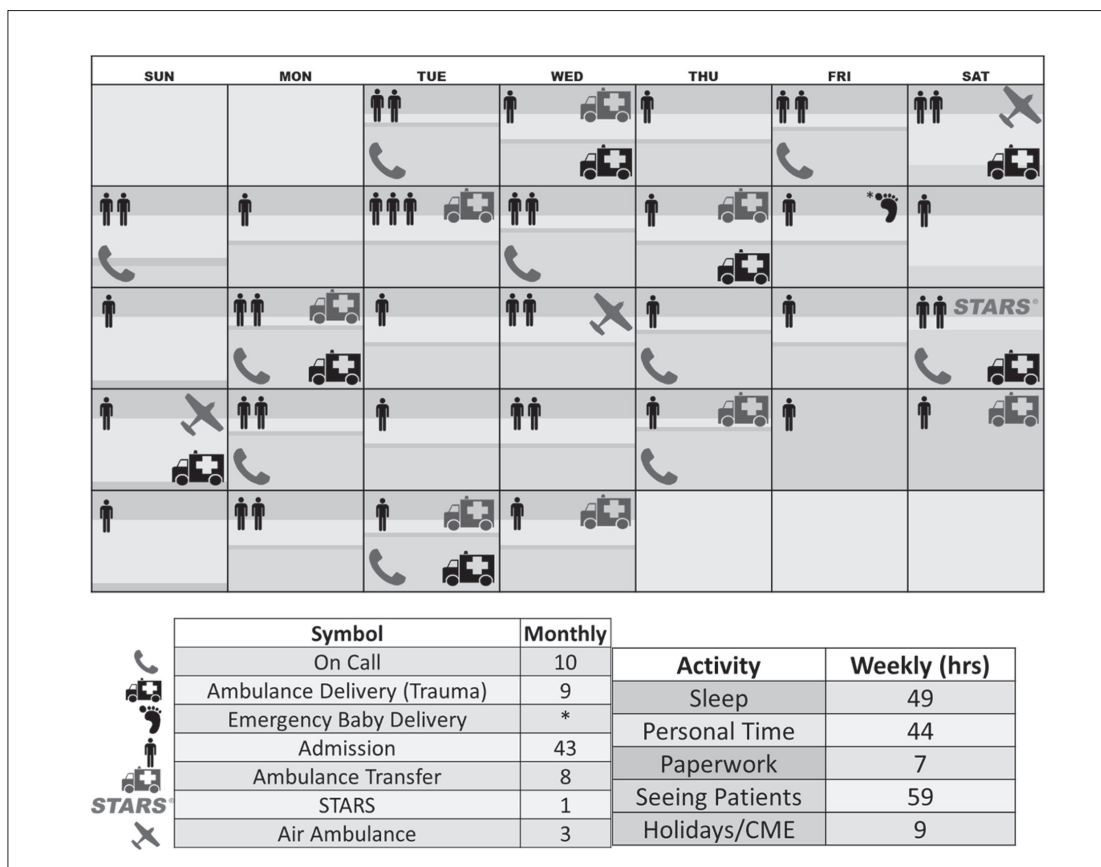


Fig. 1. Typical month for a rural family physician in Saskatchewan in 2015. The average length of stay per admission was 6.5 days. *Emergency baby delivery is infrequent and highly site specific. CME = continuing medical education, STARS = Shock Trauma Air Rescue Service.

Table 3: Average number of transfers out of rural hospitals in 2014/15

Frequency	Mode of transfer; mean \pm SD		
	Road ambulance	Shock Trauma Air Rescue Service	Air ambulance
All rural hospitals			
Annual	116.0 \pm 101.7	12.1 \pm 6.8	33.4 \pm 25.1
Monthly	9.7 \pm 8.5	1.0 \pm 0.6	2.8 \pm 2.9
District hospitals			
Annual	213.0 \pm 90.8	11.2 \pm 5.9	41.3 \pm 33.1
Monthly	17.7 \pm 7.6	0.9 \pm 0.5	3.4 \pm 2.8
Community hospitals			
Annual	94.0 \pm 91.7	12.5 \pm 7.4	30.6 \pm 36.3
Monthly	7.9 \pm 7.6	1.0 \pm 0.6	2.6 \pm 3.0

SD = standard deviation.

We also compared the community and district hospital emergency department visits of 2011/12 with the population sizes of their respective community using 2011 census data. A total of 53 communities were included, and 19 communities were omitted owing to lack of data. This comparison serves as a control given that the population data are from 2011. Emergency departments operating outside 2 standard deviations of the trend line were identical to those in 2014/15 with the addition of Melfort Hospital (Mel-

fort), which had comparatively fewer visits per capita, and Meadow Lake Hospital (Meadow Lake), which had comparatively more visits per capita.

DISCUSSION

We found that some anecdotal considerations about rural practice were reflected in the data and that others can be safely debunked. For example, billing data show that the chances in modern rural Saskatchewan

of having to do an emergency unplanned delivery are small. This should be reassuring to rural physicians in that, although they need to be prepared for this possibility, it should not be an overriding clinical concern.

Other than the higher proportion of cardiac presentations to the office in rural areas, the office diagnoses were similar between rural and urban family physicians. Differences were apparent, however, in the hospital environment. Urban physicians saw more patients presenting for pain and, reflective of centralization of obstetric delivery services, performed deliveries.

Physicians in rural centres must be able to stabilize the condition of sick patients and those with trauma so they can be transferred. This aspect of rural care is nicely illustrated in the graphic format (Fig. 1), which allows for easy understanding of the clinical workload that might be expected. Optimally, a graphic such as this would be available for any rural hospital in the province, and this could aid in resource planning and in allowing new physicians to the community to consider whether the community would be a good fit. We hope the graphic will allow medical students and residents to gain an accurate picture of the clinical workload that might be expected in rural Saskatchewan. This could aid in personal training efforts and decrease stress in relation to realistic expectations of clinical practice.

Limitations

There are a number of limitations to this study and the format of data presentation in the form of a graphic. First, billing data encompass only family physicians who operate by a fee-for-service payment schedule in Saskatchewan; they exclude any out-of-province or out-of-country billing and workers compensation board treatments. In certain communities near borders with adjoining provinces, this could affect the data submitted to the Saskatchewan Ministry of Health. Furthermore, limitations exist within the data set itself, as billing data are not audited by the government. Physicians may incorrectly categorize or summarize similar diseases, may choose to exploit billing codes that are more lucrative or may lump multiple presenting problems under a single billing code. Finally, the 20 most common diagnoses represent only 35%–78% of these fee-for-service billings, depending on the setting and patient age, which limits the generalizability of the findings. A limitation of the data analysis used to determine the trend between emergency department visits and community populations in 2014/15 is that we compared 2011 census figures to emergency department

visits in 2014/15. Statistics from the government of Saskatchewan show that the population of the province was 1.06 million in January 2011, 1.11 million in January 2014 and 1.13 million in January 2015.¹⁰ The 2011 population may underestimate the population of some communities, or migration may overestimate the population of others.

CONCLUSION

There are differences in the clinical presentations seen by rural and urban family physicians, and these need to be considered by new physicians considering rural practice or urban practice. A simple, easy to understand visual depiction of average workload, vacation and activity levels of rural physicians may be an avenue through which a clear picture of rural family medicine can be built and then disseminated to future rural physicians, even at an individual community level.

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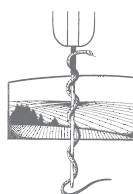
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Country cardiograms case 62

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*This article has been peer
reviewed.*

A 49-year-old woman presents to a remote Canadian emergency department with recent onset of palpitations and a sense of a racing heart. She has had 6 such episodes over the past 4 years. On 4 occasions, she found that she could terminate these events with coughing or bearing down. This is the second time that she has presented to the emergency department because of persistent symptoms; on the first occasion, her symptoms abruptly and spontaneously resolved

soon after arrival. A 12-lead electrocardiogram (ECG) is obtained (Fig. 1) and is essentially identical to the ECG that was obtained the previous time she presented. The computer interpretation reads: "Atrial fibrillation with rapid ventricular response, rate 157 per minute." What is your interpretation, and what are the implications for management?

For the answer, see page 56.

Competing interests: None declared.

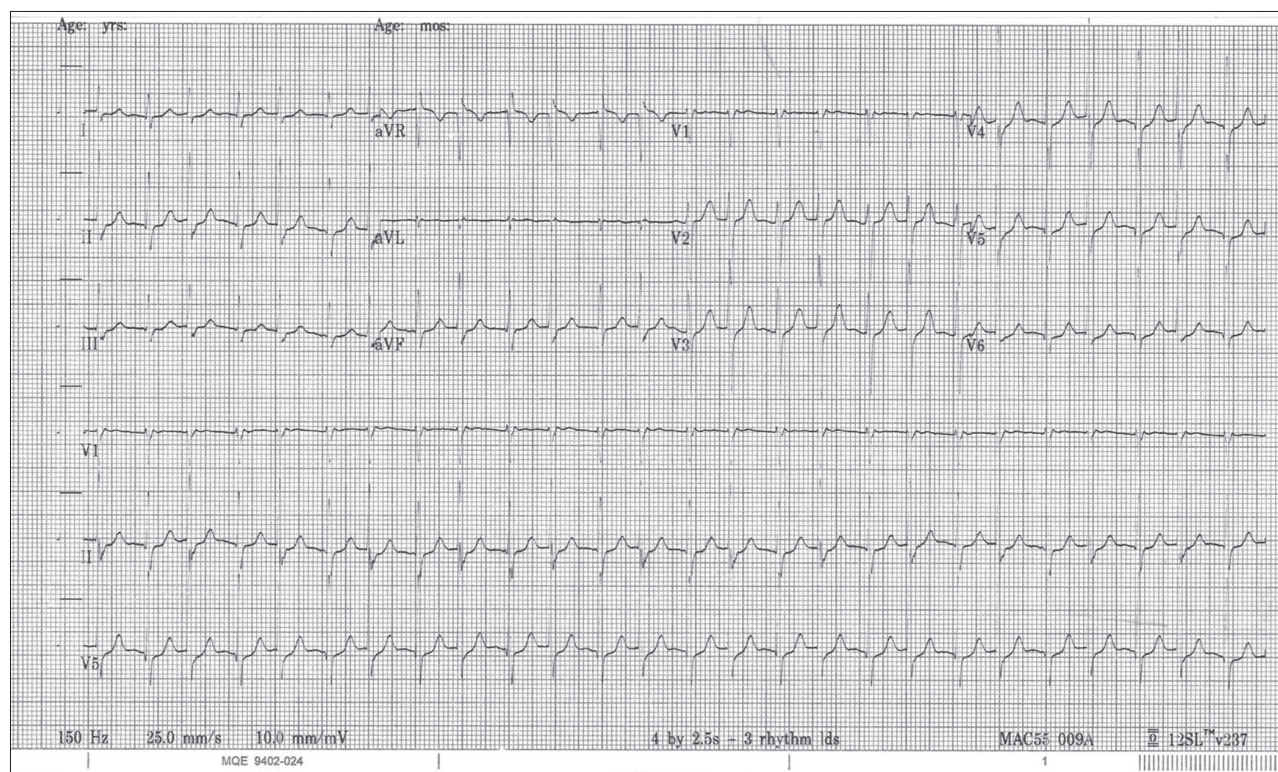


Fig. 1. Electrocardiogram of 49-year-old woman who presents to emergency department with recent onset of palpitations and sense of a racing heart.

"Country cardiograms" is a regular feature of *CJRM*. We present an electrocardiogram and discuss the case in a rural context. Please submit cases to Suzanne Kingsmill, *CJRM*, manedcjr@gmail.com.

The fine points of taping

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INTRODUCTION

The rural physician has several choices available for wound closure: sutures, staples, tissue tape and tissue adhesive (“glue”).¹ Patient, wound and physician factors must all be considered when deciding on the method for closure of any given wound (Box 1).² Each closure method has its own advantages and disadvantages, wounds to which it is well suited and wounds to which it is less well suited.^{3,4}

In this article, I discuss tissue tape, of which there are a large variety available, the most popular likely being Steri-Strips (3M).

Each brand of tape differs slightly in such factors as adhesiveness, breathability, breaking strength and stretchiness. An early comparative study showed Steri-Strips to have “better overall performance” than a competing brand,³ and, in another study, Steri-Strips were among the top 3 brands of tape tested.³ However, the true degree to which differences among the various brands are clinically important is not known.

ADVANTAGES

Tissue tape is inexpensive and quick to apply and can be applied by nonphysician personnel. It works best for superficial linear lacerations under minimal tension, where there is little risk of further bleeding and when the deep tissues do not have to be approximated.^{3,5} Taping offers:³

- Fast and painless application, without the need for local anesthesia or suture removal.

- Creation of even distribution of wound tension across the entire length of the wound.
- Avoidance of the risk of “railroad track” suture scars.
- Breathability that creates a favourable environment for wound healing, which lowers the risk of infection compared to sutures or tissue adhesive: 3.8% with tape versus 14% for sutured wounds in 1 study,⁴ and 1.4% with tape compared to “a historical rate” of 4.57% in another.⁶

Tape can be used as an adjunct after staples or sutures have been removed or in addition to deep dermal sutures.^{3,5} Although many physicians apply tape in conjunction with subcuticular sutures, Kolt⁷ argued that there was “no evidence in the scientific literature to justify or support the practice of closing a surgical wound with both subcuticular suture and adhesive surgical tape.”

Box 1: Factors that can influence the choice of wound-closure method

Patient factors

- Age
- Immune status
- Obesity
- Ability to provide postrepair care and to return for suture removal
- Vascular supply to wound area

Wound factors

- Site
- Type (e.g., bite, puncture, cut, stellate)
- Wound tension present
- Presence of ongoing bleeding or discharge

Physician factors

- Experience
- Preference
- Availability of material

Wounds that are well suited for tape and wounds less well suited are described in Box 2 and Box 3, respectively.^{3,4,8}

DISADVANTAGES

Proper wound taping is highly operator-dependent, more so, in my experience, than the application of tissue adhesive. Other disadvantages of tape^{4,5} include the following:

- If the wound edges are irregular, proper tissue approximation and edge eversion may be difficult to achieve with taping.⁴
- The skin must be dry before the tape is applied, and there must be complete hemostasis afterward.
- The tape may lose its adhesiveness over time and wound dehiscence may occur, especially if there is poor operator technique, or continuing bleeding or exudate.
- Unlike with tissue adhesive, the patient must keep the area dry until the tape is removed.
- The tape may injure the epidermis on application or removal.
- Young children may pull the tape off.

COSMETIC RESULTS

Assuming proper wound selection, tissue taping produces equivalent cosmetic results to adhesive³ and subcutaneous sutures.^{9,10} In a randomized study among children aged 1–18 years presenting with “simple low tension lacerations of the face,” Zempsky and colleagues¹¹ found that Steri-Strips

and Dermabond produced similar cosmetic outcomes. There was 1 wound complication in the Steri-Strips group and 8 wound complications in the Dermabond group. Similarly, in children with “suitable lacerations,” Mattick and colleagues¹² found that “both tissue adhesives and adhesive strips are excellent ‘no needle’ alternatives for the closure of suitable pediatric lacerations” and felt that the choice as to which is used “may come down to economics and operator preference.”

CONTRAINDICATIONS

Again, assuming proper wound selection, tape is contraindicated in patients with tape sensitivity in general or a known sensitivity to any of the components of that particular tape.

Tape should not be applied circumferentially around a limb or digit, as swelling may lead to a tourniquet effect.

TECHNIQUE

Important factors for successful wound closure include accurate apposition of the edge, hemostasis, dry skin and use of a tissue adhesive adjunct.^{3–5} Assuring skin dryness may include application of a drying agent (tincture of benzoin) or one of several sprays marketed for such, although tincture of benzoin is superior.⁴

Generally, the 6-mm tape size is adequate for wounds 4–5 cm in length; the 12-mm size may be used for longer wounds.

APPLICATION^{3–5}

1. Clean the wound as you would otherwise, and ensure hemostasis.
2. Dry the skin and apply a drying agent.⁴
3. Cut the tape to the desired length while it is still attached to the backing sheet, leaving an overlap of 2–3 cm for either side of the wound.
4. Gently remove one of the end tabs, being careful not to twist or deform the tape.
5. Remove the tape from the backing with forceps by carefully pulling away.
6. Apply the tape in the centre of the wound: place one-half of the length of the tape on one side of the wound and use a finger of the other hand to appose the opposite wound edge, then secure the tape. Do not pull or stretch the tape to close the wound, as this may cause unequal distribution of wound tension or skin blisters (Fig. 1).

Box 2: Wounds and cases for which tissue tape is well suited

- Superficial straight lacerations with little skin tension, such as wounds to the forehead, malar area, chin, thorax and nonjoint areas of the extremities
- Flap lacerations
- Lacerations at high risk for infection
- The thinned skin of older or steroid-dependent patients
- As support for lacerations after staple or suture repair, or in conjunction with deep dermal sutures

Box 3: Wounds for which tissue tape is less well suited

- Gaping wounds under tension, or when there is extreme tissue laxity
- Wounds in hairy, intertriginous or moist areas (e.g., axilla)
- Wounds on the scalp or convex areas, or joint-surface wounds
- Wounds where there is liable to be ongoing bleeding or discharge
- Wounds in young children

7. In a similar way, apply further pieces of tape adjacent to the original piece, at sufficient intervals to keep the edges apposed (Fig. 2). Allow at least 2–3 mm between the individual pieces of tape to allow any exudate to escape, thus helping to prevent premature loss of adhesion.
8. Place “cross-stays” to prevent premature elevation of the tape ends and skin blistering caused by tape tension (Fig. 3).

POSTOPERATIVE CARE

A dressing may be applied over the tape if additional protection is desired. The patient should be cautioned to keep the area as dry as possible and to avoid applying ointment over the tape, as this may cause loss of adhesiveness. The patient may shower but not bathe.

Tape that loses its adhesiveness may be replaced. The tape should be left in place for the same length of time as sutures would be left in. If the distance to return to a health care facility is long, patients may be instructed to remove the tape themselves at the appropriate time.

Proper technique is important when removing the tape as well, to avoid further skin injury.¹³

1. Free a corner of the tape.
2. Stabilize the skin with a finger.
3. Remove the tape by gently pulling it off over itself. Do not remove it at an angle, as this may cause further skin injury.



Fig. 1. Tape is applied in centre of wound.

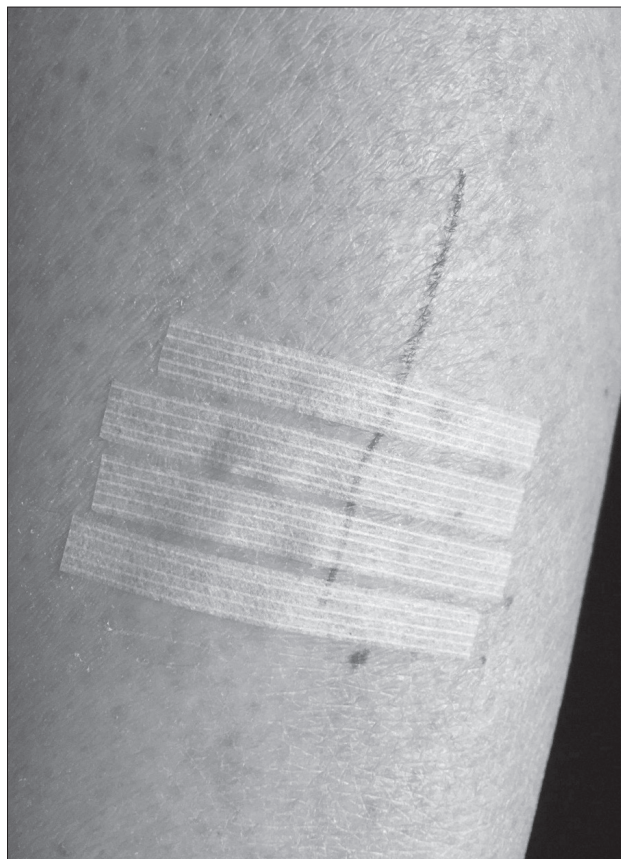


Fig. 2. Further pieces of tape are applied adjacent to original piece, at sufficient intervals to keep edges apposed.

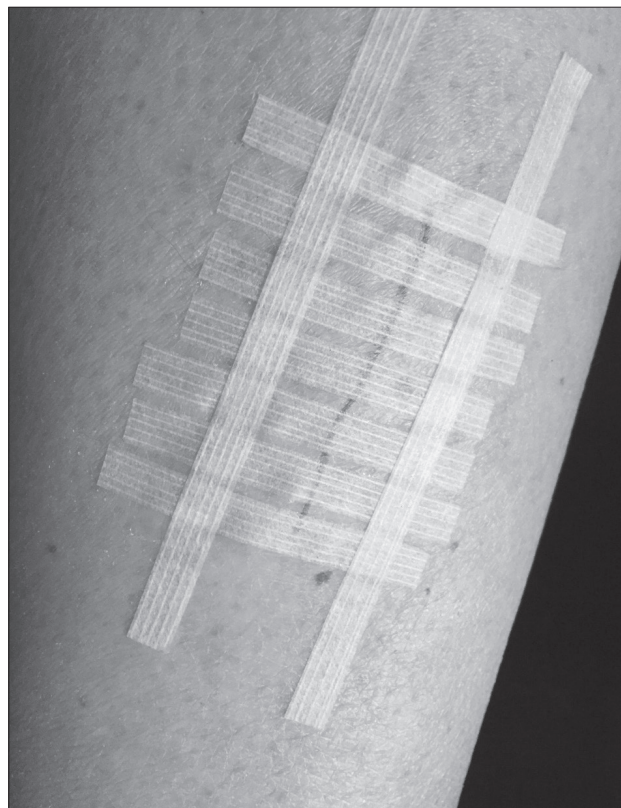


Fig. 3. “Cross-stays” are placed to prevent premature elevation of tape ends and skin blistering caused by tape tension.

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Competing interests: None declared.

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Country cardiograms case 62: Answer

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*This article has been peer
reviewed.*

Irrregular narrow-complex tachycardia is present, with a mean rate of 157 per minute. The QRS duration is 0.085 seconds. Some form of atrial activity may be present but cannot reliably be identified. The axis, QRS morphology, ST segments and T waves are within normal limits. In this situation, atrial fibrillation might indeed be the first rhythm that comes to mind, but a closer examination of the tracing reveals that this cannot be the case.

Atrial fibrillation is an irregularly irregular rhythm in which there is no pattern and it is impossible to predict when the next QRS complex will occur. (There is 1 exception to this, when, at slow rates, the ventricular response becomes regular: this represents a high degree of atrioventricular block and the emergence of a junctional or ventricular escape rhythm.) In this case, although the rhythm is irregular, a predictable pattern is clear: repeatedly, a short R–R interval (0.34 s) is followed by a longer R–R interval (0.42 s). The QRS complexes following the shorter R–R interval are subtly different, likely representing a mild degree of the Ashman phenomenon.

This pattern indicates that some form of organized atrial activity is present and that atrial fibrillation can be excluded. Sinus tachycardia with premature atrial complexes in a bigeminal pattern is very unlikely because of the absence of normal P waves, as well as the history of abrupt termination with vagal manoeuvres. Atrial flutter must be considered and perhaps cannot be fully excluded but is very unlikely given the absence of any discernible flutter waves. Far more likely is supraventricular tachycardia, and the patient's experience of being able to terminate these episodes with vagal manoeuvres supports this rhythm diagnosis.

Why, then, the alternating long and short R–R intervals, giving rise to paired complexes?

We can note that the long R–R intervals are less than twice the length of the short R–R intervals, which is one of the “footprints” of Wenckebach block. Indeed, Wenckebach block, with 3:2 atrioventricular conduction as the impulse travels down through the atrioventricular node, may be the likeliest explanation of this pattern (Fig. 1). This can be considered a protective brake rather than an abnormality, as, without it, the ventricular rate would be just under 240 per minute.

In this case, the arrhythmia again terminated spontaneously soon after the electrocardiogram (ECG) was recorded. Had it not, adenosine would have been the preferred drug. The follow-up ECG showed a PR interval of 0.13 seconds, toward the lower limit of normal (Fig. 2).

The perils of mistakenly diagnosing paroxysmal atrial fibrillation in this case include unnecessary treatment with anticoagulants or other medica-

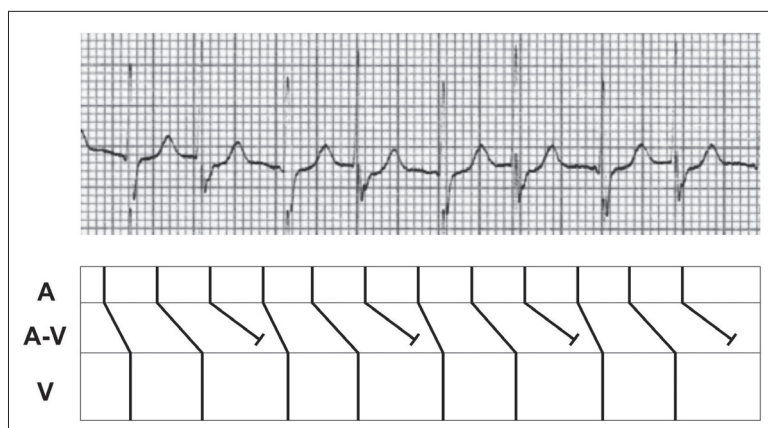


Fig. 1. Ladder diagram showing atrial rate of 236 per minute, 3:2 Wenckebach block in atrioventricular node and resulting ventricular rate of 157 per minute.

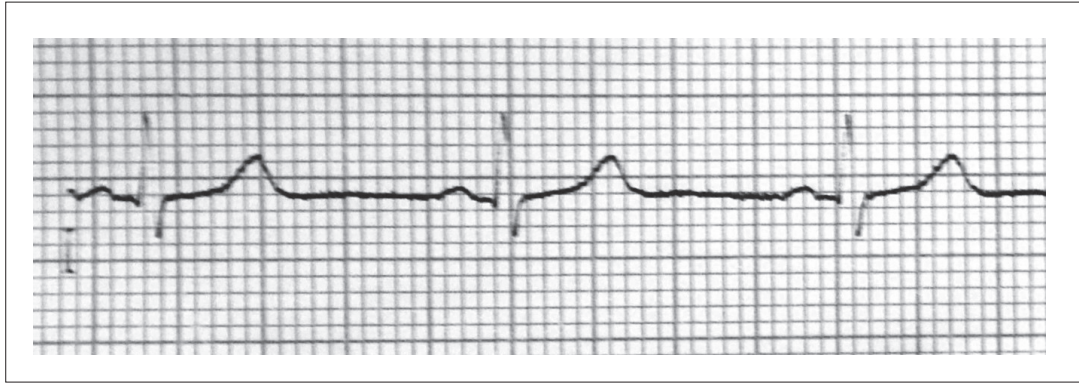


Fig. 2. Follow-up electrocardiogram showing PR interval of 0.13 seconds, toward lower limit of normal.

tions with potential adverse effects, as well as missing an opportunity for definitive treatment. Once the potential options were explained to the patient, she readily agreed to referral to an electrophysiology laboratory for testing, in the hope that an ablation procedure might be feasible.

In summary, not everything that at first glance looks like atrial fibrillation *is* atrial fibrillation.

In this case, supraventricular tachycardia with Wenckebach block is the most likely diagnosis. Making the distinction has important consequences for management.

For the question, see page 51.

Competing interests: None declared.

A step in the right direction: continuous mentorship programs as part of a multidimensional credentialing and privileging process for rural surgery and obstetrics

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In the fall of 2016, the *Canadian Journal of Rural Medicine* published an article on volume-based privileging programs for physicians working rurally in Canada.¹ The authors warned of the threat to medical services of an already at-risk Canadian rural patient population. They outlined numerous examples of the consequences of volume-based programs, such as the decrease in rural maternity care in Saskatchewan years ago.² Owing to the reductionist nature of such programs, they fail to recognize holistic risk when one is planning for service delivery in rural settings. We propose that a continuous mentorship program, although not the sole answer, might be a step in the right direction toward a multidimensional credentialing and privileging program for surgical and maternal care in rural Canada.

Nowhere do the problems outlined in the *CJRM* article affect care more than in rural maternity care and surgery. Rural operating rooms are the foundation of safe maternity care.³ They unfortunately have been hit hardest by the low-volume debate, and, consequently, their numbers have dwindled over time. There is often the assumption that low volume equates to decreased safety. However, there is a growing body of evidence that surgical and maternal care can be safely done in small-volume centres.⁴ In addition, there is growing evidence that travel is detrimental to patients. For example, major maternal morbidity increases by

0.1% per minute of travel.⁵ Thus, it is imperative for patient safety that surgical and operative delivery services be maintained in smaller centres.

Continuous mentorship programs are still in their infancy. In British Columbia, they are being piloted in several rural hospitals both for general practitioner anesthetists and general practitioners with Enhanced Surgical Skills.⁶ Continuous mentorship programs are formal partnerships between rural practitioners and their specialist counterparts in regional centres. They involve site visits, side-by-side work in operating and delivery rooms, and continuing professional development. Within the program, evaluation and education occur side by side in real time. This ensures that rural practitioners are kept up to date and confident in their skills. Most important, these programs foster important relationships between family practitioners with enhanced skills and their specialist counterparts.

Credentialing is the practice of establishing the authenticity and credibility of a practitioner's skills. This has traditionally been done by a local or regional committee that determines whether a practitioner's training program was legitimate. However, there is often no way to validate training because the committee members may not actually witness the practitioner at work. A mentorship, because it involves real-time observation, would

be helpful in determining the legitimacy of a practitioner's training program. Moreover, any identified areas in which improvement is needed could be addressed by the coaching component of the program.

Initial privileging is the process of granting a practitioner's right to perform his or her skill set within a specific institution and geographical location. Validating a practitioner's credentials is part of initial privileging. This could occur with enrolment in a mentorship program. Privileging is also about regional planning of delivery to patients by the right practitioner in the right place. The formal partnerships between rural practitioners and specialists in a mentorship program would foster collaboration for planning of surgical and maternal services in rural areas. Within this partnership, both parties can ensure that patients safely receive as much care as possible close to home, provided by physicians living and working in their community.

Continuous privileging takes into account a practitioner's currency and competency. Currency and competency are not synonymous, nor are they mutually inclusive. Currency is the volume of specific work a practitioner is doing. Competency is the level of care being provided by that practitioner. Currency has been shown to be an inconsistent, if not poor, marker of competency.¹ Unfortunately, low-volume centres have insufficient data for statistical significance when enrolled in continuous quality-improvement programs such as the National Surgical Quality Improvement Program. Thus, the determination of competency remains nebulous. A mentorship program for surgery and maternal care could contribute to the overall solution. Side-by-side work not only allows direct observation but also provides coaching and education for the skills required by rural practitioners. Such mentorship allows identification of competencies needing improvement and immediate education and coaching in those areas.

There is currently a lack of a formal modality by which any practitioner acquires new skills in surgery or maternity care. Traditionally, a practitioner would be taught by his or her peers in an informal setting. Alternatively, short courses in new procedures and emerging technologies were offered by firms involved in manufacturing equipment or academic centres. However, when such courses are

taken without additional training, higher complication rates have been reported.⁷ A mentorship program is an ideal avenue for acquisition of new skills. The mentor and mentee can work together to identify an area of need, as well as work with their university's continuing professional development department to determine how to acquire the required experience in that area. Once the skill is learned, the mentorship then allows for continuous monitoring of confidence in the skill, which falls back into continuous privileging.

Continuous mentorship programs hold many possibilities for ensuring that rural patients receive surgical and maternity care as close to home as possible, provided by competent and confident practitioners. Considerable work still needs to be done to determine the particulars of these programs, but they promise to be part of a multidimensional modality for credentialing and privileging. The ability of continuous mentorship programs to foster relationships between rural practitioners and their urban counterparts will allow us to move away from isolated practice toward integrated practice. This collaboration, we hope, will ensure that rural patients in Canada continue to receive the highest-quality maternity and surgical care as close to home as possible.

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