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VOLUME 18, N° 4, AUTOMNE 2013

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DANS CE NUMÉRO

Perinatal Surgical Outcomes in BC

Procedural Sedation and Analgesia

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[§] B2354: A 12-week, multicentre, randomized, double-blind, placebo-controlled, parallel-group study assessing the safety and efficacy of ONBREZ* BREEZHALER* 75 mcg once daily vs. placebo in patients with COPD (n=323).
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References: 1. ONBREZ* BREEZHALER* Product Monograph. Novartis Pharmaceuticals Canada Inc., October 24, 2012. 2. Data on file. Novartis Pharmaceuticals Canada Inc. Study B2355. 3. Data on file. Novartis Pharmaceuticals Canada Inc. Study B2354.



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Oil on canvas, 14" x 18", by Martha Markowsky, Society of Canadian Artists
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"Coloured umbrellas was inspired when seeing children walking in the rain with their colourful umbrellas. An easy subject for me as children are very often the theme of my paintings."

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Working to the breadth of our licence

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Perhaps nowhere as much as in rural practice do physicians work to the breadth of their licence. We do more. This has been documented for general practice, in which doctors in the most remote areas have 80% greater breadth of practice than their urban counterparts,¹ and is anecdotally reported for rural specialties. We practise these skills for the joy of providing needed services. We hope to provide better outcomes for our patients and community. One of the skills within the breadth of general practice is cesarean delivery. Between 2007 and 2010, a quarter of women in rural Canada underwent cesarean delivery performed by practitioners in their communities who were not obstetrician/gynecologists.² Is this safe? We used to think it was. Now we know it is.

That proof of good outcome is buttressed by the article by Grzybowski and colleagues in the current issue.³ This well-constructed study included 9174 births in regions where cesarean delivery, when needed, was provided by general practitioners (GPs) with enhanced surgical skills. To prevent bias from more complicated cases sent to the city for delivery, the authors attributed results to the rural hospital, regardless of where the patient delivered.³

Outcomes for surgical services provided by GPs compared favourably to those provided by obstetricians.³ This study supports the joint position paper on rural maternity care published in this journal.⁴

Do not make the error of believing that safe rural maternity services can be replaced by travel, plus urban maternity services. The travel part is a problem, because humans make for fragile cargo. Data from the Canadian Insti-

tute for Health Information show that prolonged travel increases rates of prematurity.² Furthermore, a study from Washington state by Nesbitt and colleagues⁵ showed that

women from communities with relatively few obstetrical providers in proportion to number of births were less likely to deliver in their local community hospital ... Women from these high-outflow communities had a greater proportion of complicated deliveries, higher rates of prematurity, and higher rates of neonatal care than women from communities where most patients delivered in the local hospital.⁵

We have ongoing political challenges in ensuring that policy-makers are aware and accepting of the fact that closure of rural maternity units causes not only inconvenience for patients, but also poorer (and more expensive) outcomes. These poor outcomes are mostly endured by the women and their children in urban neonatal intensive care units. By publishing much-needed research on this topic, our journal is building on that awareness.

Here too, perhaps working to the breadth of our licence, it is meet and good.

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Utiliser notre permis d'exercice dans toute son envergure

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Nulle part ailleurs que dans la pratique rurale, sans doute, les médecins n'utilisent autant leur permis d'exercice dans toute son envergure. Ce fait a été documenté dans le cas de la pratique générale : l'envergure de la pratique des médecins des zones les plus éloignées dépasse de 80 % celle de leurs homologues urbains¹. Il en est de même pour les spécialités rurales, selon des rapports anecdotiques. Nous pratiquons ces compétences pour le plaisir d'offrir les services nécessaires. Nous espérons produire de meilleurs résultats pour nos patients et la collectivité. La césarienne est l'une des compétences de la médecine générale. Entre 2007 et 2010, un quart des femmes enceintes en milieu rural au Canada ont subi, dans leur propre collectivité, une césarienne effectuée par des médecins qui n'étaient ni obstétriciens ni gynécologues². Est-ce sûr ? Il est désormais prouvé que oui.

Cette preuve de bons résultats est étayée par l'article de Grzybowski et coll. figurant dans ce numéro³. Cette étude bien conçue porte sur 9174 naissances dans les régions où l'accouchement par césarienne, si nécessaire, a été pratiqué par des omnipraticiens ayant des compétences chirurgicales avancées. Pour éviter le biais lié aux cas plus complexes qui sont référés aux hôpitaux urbains, les auteurs ont attribué les résultats à l'hôpital rural, indépendamment du lieu où la patiente a accouché³.

Les résultats pour les services chirurgicaux fournis par les omnipraticiens se comparent favorablement à ceux fournis par des obstétriciens³. Cette étude confirme l'énoncé de principe conjoint sur les soins de maternité en milieu rural publié dans ce journal⁴.

Ne croyez pas que l'on puisse remplacer les services de maternité sûrs en milieu rural par des services en milieu urbain nécessitant des déplacements. Le déplacement pose problème parce que le « cargo » humain est fragile. Les don-

nées de l'Institut canadien d'information sur la santé montrent que les longs déplacements augmentent le risque d'accouchement prématuré². En outre, une étude de l'État de Washington réalisée par Nesbitt et coll.⁵ a établi que

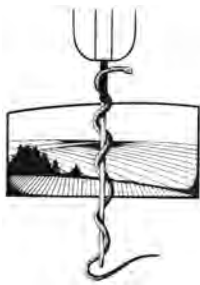
les femmes des localités où il y a relativement peu de fournisseurs de soins obstétricaux par rapport au nombre de naissances étaient moins susceptibles d'accoucher dans leur hôpital communautaire local (...). On note dans ces localités, où un grand nombre des femmes doivent se déplacer pour accoucher, une plus forte proportion de complications, de prématurité et de soins néonataux que dans les localités où la plupart des femmes ont accouché à l'hôpital local⁵.

Nous avons toujours des défis politiques à relever. Nous devons veiller à ce que les décideurs sachent que la fermeture des unités de naissance rurales ne cause pas seulement des inconvénients pour les patientes, mais entraîne aussi des résultats plus médiocres (et plus coûteux). Ce sont les femmes et les nouveau-nés qui subissent principalement ces préjudices dans les unités néonatales de soins intensifs en milieu urbain. En publiant des recherches essentielles sur la question, notre journal contribue à cette prise de conscience.

Ici aussi, il se peut fort qu'exercer dans toute l'envergure de notre permis d'exercice soit bon et bien.

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President's message. Generalism is dead: Long live generalism!

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In Canada, as in many other countries, generalism in clinical medicine has given way to medical specialization over the last 60 years. This type of specialized care is not affordable and does not serve our divergent and far-flung population well. The Canadian Medical Association (CMA) recently had its 146th annual meeting in Calgary, Alta. Dr. Louis Francescutti, the new CMA president, said at the outset of his inaugural address that health care systems in Canada and elsewhere are moving away from this model of specialized care. Patients (and payers) are demanding more patient- and family-centred care. Health care is shifting out of hospitals, the traditional power base of specialist physicians, and into the community.¹

These words should gladden the hearts of SRPC members, because community-centred medicine is our forte. People living in rural and remote areas have always depended on doctors who provide comprehensive primary care in their communities, along with hospital, emergency and population health care, and expanded-scope services (e.g., anesthesia, obstetrics and general practice surgery). However, the general practitioners of old who provided these services are in decline. We need "more doctors looking after the whole person — not in a job based on one organ or in only one clinical setting."²

There is rising awareness that the complexity of services provided by medical practitioners increases with increasing rurality or remoteness. As described by the Australian Medical Association, the practice of rural medicine

presumes an interdependent model of medical service that combines high level competency in primary, secondary and sometimes even tertiary

medical care and forms a distinct scope and method of practice.³

In Canada there are a number of medical schools doing a great job of training generalists in rural programs. However, the SRPC is advocating for a countrywide rural curriculum in medical schools. This curriculum would produce a well-trained doctor with the necessary knowledge and skills to pursue a career in rural medicine, while enjoying it and not burning out.

The World Summit on Rural Generalist Medicine is to be hosted in October 2013 by the Australian College of Rural and Remote Medicine and the Rural Doctors Association of Australia. The summit will bring together rural doctors from around the world, along with health planners, policy-makers, researchers and educators, to discuss successes, share ideas and plan for the future of generalism in health care in rural and urban areas.

A Canadian contingent will attend the summit, as well as Rural Medicine Australia 2013, the annual conference of Australian rural doctors. We hope to come back empowered with many new ideas. Expect things to happen and sparks to fly as we work together to promote generalism and community-based care in Canada (especially rural Canada) to the benefit of all Canadians.

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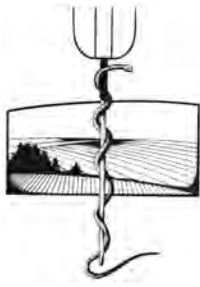
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Message du président. Le généralisme est mort. Vive le généralisme !

Au cours des 60 dernières années, au Canada comme dans beaucoup d'autres pays, le généralisme en médecine clinique a cédé la place à la surspécialisation. Ce type de soins spécialisés est coûteux et ne sert pas bien notre population diverse et dispersée sur de vastes territoires. L'Association médicale canadienne a récemment tenu sa 146^e assemblée annuelle à Calgary, en Alberta. Le D^r Louis Francescutti, nouveau président de l'AMC, a mentionné dans son discours inaugural que les systèmes de santé au Canada et ailleurs commencent à s'éloigner de ce modèle de soins spécialisés. Les patients (et les contribuables) exigent davantage de soins centrés sur le patient et la famille. Les soins de santé se déplacent hors des hôpitaux — base traditionnelle du pouvoir des médecins spécialistes, — et vers les collectivités¹.

Voilà qui devrait réjouir les membres de la SMRC, parce que la médecine centrée sur la collectivité est notre point fort. Les personnes des zones rurales et éloignées ont toujours compté sur des médecins qui dispensent des soins primaires complets, des soins hospitaliers et d'urgence et des services élargis (p. ex., anesthésie, obstétrique et chirurgie générale). Le nombre de médecins généralistes de la vieille école qui fournissent ces services diminue toutefois. Nous avons besoin de « plus de médecins qui prennent soin de la personne en son entier — et non d'un seul organe ou dans un seul cadre clinique »².

On constate de plus en plus que la complexité des services fournis par les médecins s'accroît avec l'augmentation de la ruralité ou de l'éloignement. Comme le dit l'Australian Medical Association, la pratique de la médecine en milieu rural

... suppose un modèle interdépendant de services médicaux qui combine des compétences de haut niveau en matière de soins de santé primaires, secondaires et tertiaires et parfois même

forme un champ de pratique distinct qui a ses propres méthodes³.

Au Canada, un certain nombre de facultés de médecine font un excellent travail de formation des généralistes dans des programmes ruraux. Cependant, la SMRC préconise la création d'un programme d'études en médecine rurale dans toutes les facultés de médecine du pays. Ce programme produirait des médecins armés des connaissances et compétences nécessaires pour faire carrière en médecine rurale, qui aimeraient leur travail et ne souffriraient pas d'épuisement professionnel.

Le Sommet mondial de la médecine générale en milieu rural, organisé par l'Australian College of Rural and Remote Medicine et la Rural Doctors Association of Australia, se tiendra en octobre 2013 en Australie. Il réunira des médecins des milieux ruraux de partout au monde, ainsi que des planificateurs de la santé, des décideurs, des chercheurs et des éducateurs, qui échangeront des idées et planifieront l'avenir du généralisme dans les soins de santé en régions rurales et urbaines.

Une délégation canadienne participera au sommet, ainsi qu'au congrès annuel « Rural Medicine Australia 2013 », qui réunit les médecins ruraux australiens. Nous espérons revenir la tête pleine de nouvelles idées. Attendez-vous à voir des changements et des étincelles alors que nous travaillons ensemble à promouvoir le généralisme et les soins communautaires au Canada (et surtout dans le Canada rural), pour le bien de tous les Canadiens.

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The outcomes of perinatal surgical services in rural British Columbia: a population-based study

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reviewed.*

Introduction: A substantial number of small surgical services in rural Canada have been discontinued in the past 15 years because of difficulties recruiting and retaining practitioners, health care restructuring and a lack of a coherent evidence base regarding the safety of small services. The objective of this study was to examine the safety of small perinatal surgical services.

Methods: We accessed perinatal data for singleton births that occurred in British Columbia between Apr. 1, 2000, and Mar. 31, 2007. We defined hospital service levels, population catchment areas surrounding each hospital and the postal codes linked to those catchment areas. Births were linked with specific catchment areas and amalgamated by service level. We made comparisons among service strata populations and adjusted for potentially confounding characteristics.

Results: A total of 87 294 births occurred during the study period. The births were distributed across 6 strata of services, which ranged from no local maternity services to services supported by obstetricians. Fifteen catchment areas were served by general practitioners with enhanced surgical skills (GPSSs), and 9174 births were included from this obstetric service level. Outcomes for surgical services provided by GPs compared favourably to those provided by obstetricians.

Conclusion: Our results suggest that small surgical services supported by GPSSs are a safe health services model to meet the needs of rural women and families.

Introduction : Plusieurs raisons expliquent la fermeture d'un nombre substantiel de petits services chirurgicaux en milieu rural ces 15 dernières années au Canada : difficulté à recruter et à fidéliser les médecins, restructuration des soins de santé et manque de preuves cohérentes à l'appui de la sécurité de ces services de petite taille. L'objectif de cette étude était de vérifier la sécurité des services chirurgicaux périnataux de petite taille.

Méthodes : Nous avons accédé aux données périnatales concernant les naissances simples survenues en Colombie-Britannique entre le 1er avril 2000 et le 31 mars 2007. Nous avons défini les niveaux de services hospitaliers, délimité les bassins de populations entourant chaque hôpital et identifié les codes postaux correspondants. Les naissances ont été assorties aux différents bassins de population, puis amalgamées par niveau de services. Nous avons procédé à des comparaisons entre les populations par niveau de services, puis effectué les ajustements nécessaires pour tenir compte de variables de confusion potentielles.

Résultats : En tout, 87 294 naissances ont eu lieu au cours de la période de l'étude. Les naissances ont été distribuées entre 6 niveaux de services allant de « absence de services locaux de maternité » à « services assurés par des obstétriciens ». Quinze des bassins de populations étaient desservis par des omnipraticiens ayant des compétences chirurgicales avancées et 9174 naissances ont été assorties à ce niveau de services obstétricaux. Au plan des résultats, les services chirurgicaux fournis par les omnipraticiens se sont comparés favorablement aux services offerts par les obstétriciens.

Conclusion : Nos résultats donnent à penser que les petits services chirurgicaux assurés par des omnipraticiens ayant des compétences chirurgicales avancées constituent un modèle de services de santé sécuritaire pour répondre aux besoins des femmes et des familles des milieux ruraux.

INTRODUCTION

Rural maternity services are being discontinued in British Columbia and across rural Canada, often because of the loss of local surgical services.¹ Without immediate access to operative backup, many rural care providers experience substantial stress related to the uncertainties of providing intrapartum care.² Because many rural catchment areas are too small to support specialist surgeons, yet are large enough to need local access to surgical care, general practitioners with enhanced surgical skills (GPSSs) and GP anesthetists play important roles in providing operative care in these circumstances. These practitioners can provide operative backup for perinatal surgical care, in spite of a relatively low procedural volume, because they can provide generalist primary care as the core part of their practices. The evidence base supporting GPSSs is not well defined; however, the literature published to date is supportive.³

Small surgical services in rural areas have not fared well in the past 15 years under regionalized health care management. Considerable pressure has been exerted to consolidate services in regional referral centres, which has led to the discontinuation of many smaller services. These service suspensions have had the most drastic impact on maternity care and have forced women and their families to leave their communities for care, sometimes travelling great distances to referral communities. The negative outcomes incurred by this population have been documented.^{4,5} Consequently, there is renewed interest in sustaining these small surgical services in rural areas, both at a community and a systems level.

A GPSS is a general practice physician who has undertaken advanced procedural training. Although skill sets vary depending on the physician's practice, common procedures include cesarean delivery, appendectomy, endoscopy, hand surgery, dilation and curettage, and herniorrhaphy.⁶⁻⁸ In 2011, 40 GPSSs were practising in BC; about two-thirds of these were trained outside of Canada.⁹ The lack of Canadian-trained GPSSs could be due to the limited training opportunities in Canada. Currently, Canada has only one training program, based in Saskatchewan, which graduates 2 GPSSs per year.¹⁰

Rural surgical teams are made up of GPSSs, GP anesthetists and operating room nurses. These teams have supported small community hospitals in rural BC and across northern Canada for the past

50 years. They have shown remarkable resilience in the face of challenges that include a lack of a consistent standardized and accredited training program for GPSSs, mixed support from specialty surgical disciplines,² a lack of a portable system of credentialing for GPSSs, and fiscal pressures to cut costs in small hospitals associated with regionalized governance.¹¹

To date, there have been a number of studies that have documented good outcomes for the selected populations that receive surgical services in these small communities. For example, several studies have assessed the outcomes of cesarean deliveries performed by GPSSs, and researchers have found comparable outcomes for procedures performed by GPSSs and surgical specialists.¹²⁻¹⁵ Deutchman and colleagues¹² found that family physicians met or surpassed reference standards for cesarean deliveries based on surgical complication rates, use of blood transfusion, Apgar scores and length of postoperative stay. Kriebel and Pitts¹³ concluded from a retrospective chart review that rural hospitals are indeed capable of providing high-quality obstetric services without the availability of specialist surgeons, and similar conclusions have been made by researchers in rural Australia.¹⁴ Research conducted in Ontario has illustrated that safe obstetric care was available in rural hospitals where cesarean deliveries were regularly performed, and perinatal mortality rates did not significantly differ between hospitals with specialists and GPSSs.¹⁵ Not only are the outcomes for cesarean deliveries performed by GPSSs comparable to those for specialist-led procedures, but they also allow for a higher proportion of women to deliver locally and have been associated with lower rates of preterm birth.¹⁶

Further evidence in support of small surgical services comes from a comparison of outcomes related to appendectomy. These results have also been favourable. Iglesias and colleagues¹⁷ compared appendectomies performed by GPSSs and specialists ($n = 4587$ procedures) across various outcome measures (i.e., mortality, diagnostic accuracy, perforation rate, length of postoperative stay, repeat laparotomy and transfer to another acute care facility). The authors found no significant differences between the 2 types of providers with respect to mortality, length of stay or diagnostic accuracy. They concluded that appendectomies performed by GPSSs were safe to be provided in rural hospitals.¹⁷ Another study in rural BC also concluded that there was no significant difference in outcomes

between appendectomies performed by GPESSs and specialists.¹⁸

This growing body of evidence on the safety and efficacy of practice by GPESSs supports this model of care as a reasonable health service delivery model. However, current data are largely a comparison of outcomes between selected populations as opposed to catchment areas. Research to date has partially accounted for referral bias by adjusting for patient complexity through regression analysis. However, an alternative method is to link and examine perinatal outcomes by population, based on maternal residence. This is the approach we have taken in the current study.

The purpose of this paper is to present findings from a population-based comparison of rural maternity care by level of service provided, with a focus on perinatal outcomes of women and newborns who reside in communities served by GPESSs.

METHODS

We conducted this retrospective population-based cohort study in BC. Using Perinatal Services BC's British Columbia Perinatal Data Registry, we accessed data for singleton births that occurred between Apr. 1, 2000, and Mar. 31, 2007.¹⁹ These data are systematically collected annually from each of the hospitals in BC and are supplemented by data for home births attended by registered midwives.¹⁹ The data represent 98% off all births in BC. We excluded data for women with residential postal codes of large urban centres of BC, specifically, Vancouver, Lower Mainland, Fraser Valley, Victoria and southern Vancouver Island. In addition, we excluded from the analysis newborns with congenital anomalies and multiple gestations.

The residential postal code of each mother was the defining variable for inclusion in the study. The postal code was linked with specific hospital service catchment areas using a mixed approach based on geographic information system mapping, cross-referenced with Google Maps.^{20–22} The distance between postal code centroids and nearest maternity services was the basis of the catchment area definition.

Service level for each hospital was established using Perinatal Services BC data, supplemented by telephone calls to local facility administrators to verify level of obstetric service in the community, where there was ambiguity in the data. When a facility changed its level of services during the study time frame, we assigned the affected years to the

appropriate service level. We used 6 obstetric service levels in this study: 1) no local services (> 60 min from maternity services), 2) primary care (no local cesarean delivery [maternity care provided by family physician]), 3) GPESS (cesarean delivery provided by GPESS only), 4) mixed model (cesarean delivery provided by GPESS or specialist), 5) general surgeon (cesarean delivery provided by general surgeon) and 6) obstetrician/gynecologist (cesarean delivery provided by obstetrician). Service level 6 (cesarean delivery provided by obstetrician) was the reference category for analysis of odds ratios (ORs).

We calculated *p* values for maternal characteristics, labour and delivery outcomes, and newborn outcomes across service levels, using 1-way analysis of variance for continuous variables and the χ^2 goodness-of-fit test for categorical variables.

Bivariate analysis was supplemented by logistic 2-step regression analysis to identify the odds of 1) perinatal mortality and 2) prematurity in each service level, compared with the highest level of service (i.e., cesarean delivery performed by obstetrician). We accounted for differences in maternal characteristics and risk status by controlling for maternal age, parity, lone parent status, pregnancy complications, proportion of First Nations people in the catchment area and level of social vulnerability in the catchment area. Challenges related to adjustments for socioeconomic status and ethnicity were addressed at an ecological (area) level, because case-linked

Table 1. Distribution of births and catchment areas, by obstetric service level

Service level	Definition	No. catchment areas	No. births
1. No local services	> 60 min from maternity services	55	4 672
2. Primary care	No local cesarean delivery (maternity care via family physician)	16	4 569
3. GPESS	Cesarean delivery provided by GPESS only	15	9 174
4. Mixed model	Cesarean delivery provided by GPESS or specialist	8	10 295
5. General surgeon	Cesarean delivery provided by general surgeon	2	3 870
6. Obstetrician/gynecologist	Cesarean delivery provided by obstetrician	17	54 714
Total		113	87 294

GPESS = general practitioner with enhanced surgical skills.

data were unavailable owing to privacy issues.

The Behavioural Research Ethics Board at the University of British Columbia and Perinatal Services BC gave ethics approval of this study.

RESULTS

Over the 7 years of the study, we accumulated data on 87 294 births. Table 1 summarizes the distribution of births across the service strata, as well as the number of catchment areas included at each service level. Figure 1 depicts the proportion of women from each service level who delivered in their local

hospital, and in referral hospitals with and without neonatal intensive care unit (NICU) beds. Neonatal intensive care unit beds are categorized as level 2 (low acuity) and level 3 (high acuity).²³ Only 25% of women delivered in their local hospital when no local surgical services were available. Communities supported by GPSSs supported almost 80% of the population to deliver locally. Figure 1 shows that less than 60% of women delivered in their local hospital if served by a general surgeon model.

Table 2 shows the maternal and catchment area characteristics of the 6 obstetric service levels. Table 3 presents maternal interventions and out-

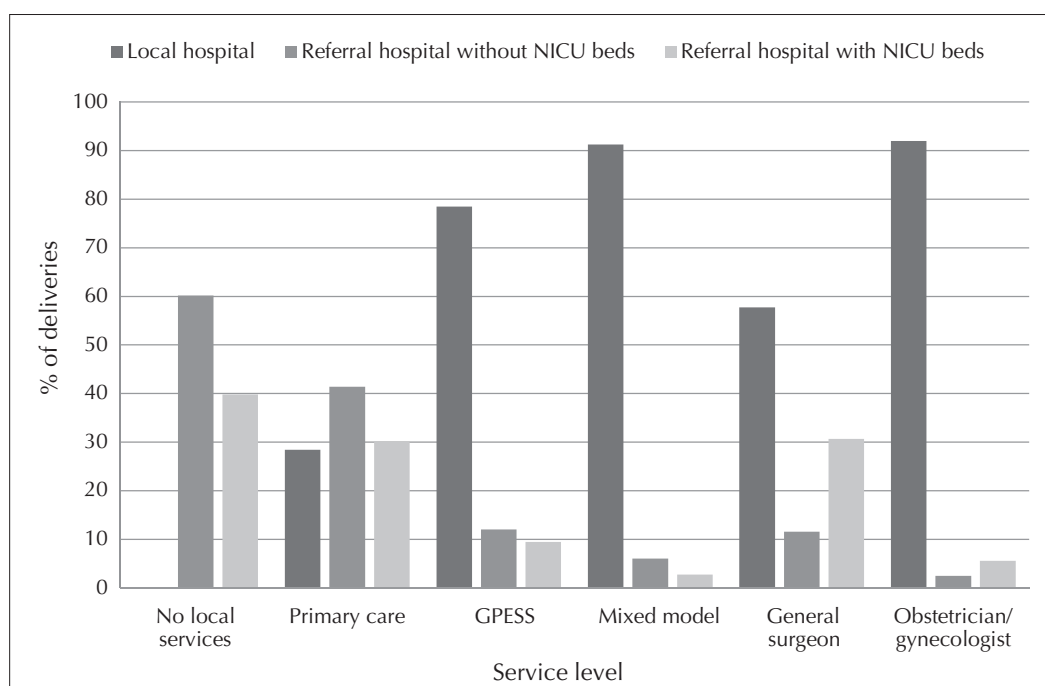


Fig. 1. Location of delivery by service level of the mother's catchment area. GPSS = general practitioner with enhanced surgical skills; NICU = neonatal intensive care unit.

Table 2. Maternal and catchment area characteristics, by obstetric service level (n = 87 294)

Characteristic	Service level						<i>p</i> value
	No local services	Primary care	GPESS	Mixed model	General surgeon	Obstetrician/ gynecologist	
Maternal							
Age, mean yr	27.71	27.93	27.54	28.74	29.94	28.71	< 0.001
Nulliparous, %	39.7	40.2	38.6	42.2	46.1	42.9	< 0.001
Pregnancy hypertension, %	4.9	4.4	4.9	5.0	5.8	4.9	0.07
Gestational diabetes, %	3.0	2.9	3.1	2.4	3.3	3.5	< 0.001
Lone parent, %	9.4	6.0	7.2	6.8	4.2	7.5	< 0.001
Catchment area							
Level of social vulnerability*	0.22	0.25	0.22	−0.04	−0.17	0.15	< 0.001
Proportion of First Nations people	0.32	0.11	0.13	0.08	0.06	0.06	< 0.001

GPSS = general practitioner with enhanced surgical skills.

*Catchment area level of social vulnerability for each service level is an average of BC Stats' weighed socioeconomic indices, calculated for each local health area in BC from 2000 to 2007. The index ranges from -1 (least vulnerable local health area) to 1 (most vulnerable local health area). Source: www.bcstats.gov.bc.ca/StatisticsBySubject/SocialStatistics/SocioEconomicProfilesIndices.aspx

comes, and shows significantly higher rates of cesarean delivery (OR 1.12, 95% confidence interval [CI] 1.03–1.22) for populations where surgical services are provided principally by general surgeons. Table 4 shows neonatal outcomes across the service levels. Perinatal mortality in this study was higher in primary care settings without cesarean delivery backup (OR 1.46, 95% CI 1.07–1.99) than in settings where cesarean delivery was provided by obstetricians. Prematurity was less frequent in the service level served by GPSSs (OR 0.87, 95% CI

0.79–0.95) than in the reference category. (Odds ratios for other comparisons are available from the corresponding author.) There was no difference in admission rates to level-3 NICUs, which support the most critically ill neonates who generally need ventilator support.

DISCUSSION

Our results demonstrate that the GPSSs included in this study provided safe maternity care to the

Table 3. Maternal interventions and outcomes, by obstetric service level (n = 87 294)

Variable	Service level; % of deliveries*						p value
	No local services	Primary care	GPSS	Mixed model	General surgeon	Obstetrician/gynecologist	
Epidural†	19.9	14.8	16.0	20.6	24.1	26.5	< 0.001
Induction†	23.6	21.7	22.6	25.2	24.6	24.1	< 0.001
Logistics as reason for induction†	1.9	0.8	0.8	0.4	0.7	0.3	< 0.001
Augmentation†	40.1	38.7	42.7	40.6	34.2	39.2	< 0.001
Cesarean delivery (all types)	23.0	23.4	24.9	25.6	31.2	27.2	< 0.001
Planned cesarean delivery	8.0	9.7	9.7	10.4	12.5	10.3	< 0.001
Emergency cesarean delivery	15.0	13.7	15.2	15.2	18.8	16.9	< 0.001
Assisted vaginal delivery	2.2	2.1	1.0	1.7	2.4	2.9	< 0.001
Episiotomy	8.7	12.0	9.5	11.9	12.0	12.1	< 0.001
Unplanned out-of-hospital birth‡	1.5	0.8	0.4	0.4	0.3	0.3	< 0.001
Postpartum length of stay, mean h	53.6	49.5	54.0	58.3	56.5	56.6	< 0.001
Postpartum length of stay (cesarean delivery only), mean h	83.3	75.4	78.1	84.2	80.8	81.9	< 0.001
Postpartum length of stay (vaginal delivery only), mean h	44.6	41.5	45.8	49.2	45.3	47.0	< 0.001
Transfer from another hospital	8.2	8.1	5.1	1.4	8.3	1.2	< 0.001
Transfer to another hospital	3.4	7.4	3.8	1.7	3.4	1.3	< 0.001
Postpartum hemorrhage	7.0	6.5	6.5	5.9	5.0	5.6	< 0.001
Postpartum wound infection	0.5	0.2	0.5	0.3	0.4	0.4	0.002

GPSS = general practitioner with enhanced surgical skills.

*Unless stated otherwise.

†Excludes planned cesarean deliveries.

‡Excludes home births attended by a registered midwife.

Table 4. Neonatal outcomes, by obstetric service level (n = 87 294)

Outcome	Service level; no. per 1000 births						p value
	No local services	Primary care	GPSS	Mixed model	General surgeon	Obstetrician/gynecologist	
Perinatal mortality	8	10	8	7	5	7	0.05
Stillbirth	6	9	6	6	4	5	0.02
Late neonatal death (age < 1 mo)	0	0	1	0	0	0	0.4
Infant death (age 1–12 mo)	3	3	3	2	1	2	0.2
Birth weight < 2500 g	36	40	36	37	34	39	0.4
Gestational age < 37 wk	87	66	68	69	68	76	< 0.001
Admissions to NICU-2	33	38	23	8	20	32	< 0.001
Admissions to NICU-3	6	4	4	3	3	4	0.3
Total length of stay in NICU-2, d*	262	260	179	83	169	225	< 0.001
Total length of stay in NICU-3, d*	71	35	38	32	34	49	0.6

GPSS = general practitioner with enhanced surgical skills; NICU-2 = neonatal intensive care unit, level 2 (low acuity); NICU-3 = NICU, level 3 (high acuity).

*n = 74 697; only births from fiscal years 2001/02 to 2006/07 are included for NICU outcomes.

populations they served. This was the case both in GPESS-only communities and in mixed-model communities where GPESSs worked alongside specialist surgeons. Rates of cesarean delivery for populations served by GPESSs were comparable to those of communities served by obstetricians only. Rates of premature birth for populations served by GPESSs were actually lower than for populations served by obstetricians. The steady erosion of GP-led surgical services over the past 5 years is difficult to understand in the context of these findings.

There was an increased rate of perinatal mortality in populations served by primary care with no local surgical capability. This finding is of concern. On careful examination of the individual communities, however, we found that a number of the deaths occurred in communities that were in crisis during the study period and transitioning into closure. Furthermore, at least 2 of the services in this situation were actually large enough to support maternity services with local capability for cesarean delivery.²⁴ This misalignment of services with population need may have contributed in part to the adverse outcomes.

Admission rates to level-2 NICUs varied because many of the newborns were admitted for short-stay transitional care. Admission often depends on the availability of an NICU-designated bed at the birthing hospital and the associated presence of a pediatrician on staff. Admission to a level-3 NICU bed is subject to more stringent admission criteria, which diminishes the variability. Statistical analysis of length of stay per 1000 births in level-3 NICU units is confounded by lack of normal distribution of data (i.e., one infant can count for a disproportionate number of days).

This population-based study included data on a large enough rural population over a sufficient period to support reasonable confidence in the comparisons. In this way, we can account for not only overt patient complexity and comorbidity, but also issues that are more difficult to measure, such as late presentation and unusual variation in clinical status.

Limitations

A weakness of the analysis is our inability to adjust for patient vulnerabilities at the case level, owing to privacy issues and data limitations. Consequently, we have used an ecological approach. There are a limited number of services in BC in which cesarean delivery is provided by general surgeons.²⁵ In these models, the surgeon provides the operative techni-

cal service, rather than an obstetric consult. Consequently, the locus of decision-making rests with the family physician or midwife, without the benefit of an obstetrically balanced consult. In our study, this model was associated with outcomes in which less than 60% of births occurred in the mother's home community, and the rate of cesarean delivery was high. Because of limited general surgery sites in BC, however, caution must be used in generalizing these findings. Although our sample was relatively large (deliveries attended by GPESSs = 9174), small differences in rare outcomes (e.g., rates of perinatal mortality in communities served by GPESSs compared with communities with cesarean delivery provided by obstetricians) are difficult to detect. Our team is currently engaged in an analysis of perinatal outcomes across service levels in 3 Canadian provinces. This amalgamation of data will result in a larger sample and may strengthen our confidence in the findings.

CONCLUSION

The population outcomes for small surgical services staffed by GPESSs were as good as the population outcomes for referral services staffed by obstetricians. These findings may help with the prioritization of health services planning.

Competing interests: None declared.

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Life, death and whatever else ... snippets from a medical life

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SPIRIT GIFT

Aurora borealis sears
Arctic night.
Illuminates a world
Pure white.
Domain to ptarmigan
To Arctic fox.
Earth's creatures silent
As silence pierced.
By newborn's cry
Fragile, precious
A spirit gift
For humankind.

RED BERRY TARTS

She is terminal within this
terminal life
A life of burned bridges
Unvoiced regrets
She seeks comfort
Not cure

Red berry tarts she offers
As a prior appeasement
Seal this deal
To manage her pain
Her anguish

Admittance is her final
admission
To life spent of all chances
Pain and anguish now less
constant
For shared time over red
berry tarts

I AM

It is time
For this form
A blueprint transcribed
From an ancient code
Born of primordial seas
Now weightless and caressed
Within a custom made universe
Of fluid comfort
Life giving rhythm

It is time
For that intangible tension
Reverberating
Ever more forceful
Through this universe
No longer weightless
Nor caressing
No longer fluid comfort

It is time
Familiar darkness now
Torn away by harsh light
Stunned gasp as
A wail splits time
It is time
And I am.

Procedural sedation and analgesia in rural and regional emergency departments

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reviewed.

Introduction: Several agents can be administered during procedural sedation and analgesia (PSA) in the emergency department (ED). The purpose of this study was to determine the PSA agents commonly used by physicians working in nontertiary EDs, and to assess the physicians' comfort level administering the agents as well as their knowledge of adverse effects of the agents.

Methods: We distributed a confidential electronic survey to physicians working in nontertiary EDs in southwestern Ontario. Using a 5-point Likert scale, ED physicians were asked to rate their use of older and newer agents used for PSA in the ED, as well as their familiarity with the agents.

Results: A total of 55 physicians completed the survey. The most frequently used drugs were fentanyl (66.0% often or always) and propofol with fentanyl (59.2% often or always). Most respondents stated that they rarely used ketofol (54.2% rarely or never) or etomidate (77.1% rarely or never). Respondents were most comfortable using midazolam or fentanyl (96.1% somewhat or very comfortable), and least comfortable administering etomidate and ketofol (36.5% and 23.1% somewhat or very uncomfortable). These differences were magnified with comparison of physicians with CCFP (Certification in The College of Family Physicians) and CCFP(EM) (emergency medicine) designations. Additionally, etomidate's adverse effects were the least astutely recognized (19%), compared with midazolam combined with fentanyl (63%).

Conclusion: Physicians practising in nontertiary EDs used more often, remained more comfortable with and were more familiar with older sedation agents than newer agents.

Introduction : On peut administrer plusieurs agents pour la sédation et l'analgésie en cours d'intervention dans les services d'urgence. Le but de cette étude était de déterminer quels sont les agents les plus couramment utilisés par les urgentologues d'établissements de soins non tertiaires, de vérifier dans quelle mesure ils se sentent à l'aise de les administrer et de mesurer leur degré de connaissances au sujet des effets indésirables de ces agents.

Méthodes : Nous avons envoyé un sondage électronique confidentiel aux urgentologues des établissements de soins non tertiaires du Sud-Ouest de l'Ontario. En utilisant une échelle de Likert en 5 points, nous les avons invités à classer leur utilisation des agents anciens et récents pour la sédation et l'analgésie en cours d'intervention à l'urgence, de même que leur degré de connaissance de ces agents.

Résultats : En tout, 55 médecins ont répondu au sondage. Les médicaments les plus souvent utilisés ont été le fentanyl (66,0 %, souvent ou toujours) et le propofol avec fentanyl (59,2 %, souvent ou toujours). La plupart des répondants ont affirmé utiliser rarement le kétofol (54,2 % rarement ou jamais) ou l'étomidate (77,1 % rarement ou jamais). Les répondants étaient le plus à l'aise avec le midazolam ou le fentanyl (96,1 % relativement ou très à l'aise) et le moins à l'aise avec l'étomidate et le kétofol (36,5 % et 23,1 % relativement ou très à l'aise). Ces différences étaient amplifiées lorsqu'on comparait les médecins détenteurs d'un CCFM (certificat du Collège des médecins de famille) et d'un CCFM(MU) (médecine d'urgence). De plus, les effets indésirables de l'étomidate étaient les moins bien reconnus (19 %), comparativement à ceux du midazolam allié au fentanyl (63 %).

Conclusion : Les médecins qui exercent dans les services d'urgence des établissements de soins non tertiaires ont utilisé plus souvent des sédatifs plus anciens; ils se sentaient plus à l'aise d'utiliser ce type d'agents et les connaissaient mieux que les agents plus récents.

INTRODUCTION

There are numerous procedures performed in the emergency department (ED) that cause pain and anxiety in patients. Procedural sedation and analgesia (PSA), an essential component of emergency medicine and considered a core skill for emergency physicians,¹ is used to relieve these patients from their pain. The American College of Emergency Physicians defines procedural sedation as

a technique of administering sedatives or dissociative agents with or without analgesics to induce a state that allows the patient to tolerate unpleasant procedures while maintaining cardiorespiratory function. PSA is intended to result in a depressed level of consciousness that allows the patient to maintain oxygenation and airway control independently.²

There are a number of potential anesthetics and analgesics that can be administered during PSA, such as propofol, ketamine, benzodiazepines (e.g., midazolam), opioids (e.g., fentanyl) and etomidate. Each of these drugs has its own benefits and risks, which need to be considered when performing PSA. In addition, the length and type of procedure, and the comorbidities of the patient should be taken into account when selecting the agent.

In urban centres, propofol with fentanyl has become the dominant medication of choice in adults,³ although ketofol (a combination of ketamine and propofol) has been gaining popularity. However, not much is known about medication preferences in rural and community EDs. We hypothesized that practitioners of rural emergency medicine would be most familiar with traditional agents for PSA. This would highlight a differential practice pattern between rural and urban practitioners in emergency medicine. Our objective was to determine the PSA medications commonly used by a small sample of physicians working in rural and community EDs, and to ascertain their comfort level administering the medications as well as their knowledge of the common adverse effects.

METHODS

We distributed a confidential electronic survey to physicians working in 9 rural and community EDs in southwestern Ontario. The EDs chosen were within

a 100-km radius of London, Ont., and were in non-tertiary centres. The communities ranged in population from 300 to 30 000. We contacted ED chiefs by telephone and email in September and October 2010 and asked them to participate in the study. We then emailed the surveys to the identified participants.

Using a 5-point Likert scale, emergency physicians were asked to rate their use of (5 = always use, 1 = never use) and comfort level with (5 = very comfortable, 1 = very uncomfortable) various drugs used for PSA. They were also asked about their knowledge of the adverse effects. We collected participants' demographic and practice characteristics, such as duration and location of practice. We recorded data into a standardized data extraction tool (SurveyMonkey) and analyzed the data using SPSS software. We calculated mean scores, standard deviations (SDs), confidence intervals and rank orders for each question within each study domain.

The Health Sciences Research Education Board at Western University gave ethics approval.

RESULTS

Of the 124 surveys distributed, 55 were returned, resulting in a response rate of 44.4%. Of the respondents, 50.0% had a CCFP (Certification in The College of Family Physicians) designation, 36.5% had a CCFP(EM) (emergency medicine) designation and 13.5% had a CCFP designation with a certification in anesthesia. Most had been in practice for up to 15 years and had performed 11 or more procedural sedations as a certified physician (Table 1). Of the respondents, 18.5% indicated that they had performed procedural sedations with no other personnel present. Among the 52 respondents who required assistance with procedural sedations, a nurse was the staff member most commonly present (Table 2).

The respondents were asked to select how frequently they used a particular medication and to rate their comfort level administering the drugs. We calculated the frequency and mean Likert scores for each. Overall, the most commonly used drugs were fentanyl (mean score 3.52), midazolam with fentanyl (mean score 3.31), propofol with fentanyl (mean score 3.18) and midazolam (mean score 3.10) (Fig. 1). Of the respondents, 42.9%, 54.2% and 77.1% stated that

they rarely or never used ketamine, ketofol and etomidate, respectively (Table 3). Only 73.1% of respondents were somewhat or very comfortable administering propofol combined with fentanyl, whereas a larger proportion were somewhat or very comfortable administering midazolam (96.1%), fentanyl (96.1%)

Table 1. Characteristics of 55 survey respondents

Characteristic	No. (%) of respondents
Sex	
Male	37 (67.3)
Female	18 (32.7)
Designation (<i>n</i> = 52)*	
CCFP	26 (50.0)
CCFP(EM)	19 (36.5)
CCFP(Anesthesia)	7 (13.5)
Years of practice	
≤ 5	22 (40.0)
6–15	20 (36.4)
≥ 16	13 (23.6)
No. of procedural sedations conducted as staff (<i>n</i> = 54)†	
1–5	4 (7.4)
6–10	4 (7.4)
≥ 11	46 (85.2)

CCFP = Certification in The College of Family Physicians;
EM = emergency medicine.

*Three respondents did not answer this question.

†One respondent did not answer this question.

Table 2. Category of personnel assisting with procedural sedation, reported by 52 respondents

Personnel	No. (%) of respondents
Another physician	15 (28.8)
Nurse practitioner	1 (1.9)
Nurse	51 (98.1)
Respiratory therapist	21 (40.4)
Resident	2 (3.8)

or a combination of the two (94.1%). The largest proportion of respondents were very or somewhat uncomfortable administering etomidate (36.5%), ketofol (23.1%) and ketamine (15.7%) (Table 4).

These differences were magnified with comparison of physicians with CCFP and CCFP(EM) designations. We used the nonparametric Mann–Whitney *U* test to compare the groups and found statistically significant differences ($p < 0.05$) in the frequency and comfort of use of certain medications. Physicians with the CCFP designation were more likely than CCFP(EM) physicians to use midazolam combined with fentanyl, and midazolam alone (mean Likert scores 3.62 and 3.35, respectively). Physicians with the CCFP(EM) designation were more likely than CCFP physicians to select propofol combined with fentanyl, or ketamine (mean scores 3.82 and 3.00, respectively) (Fig. 2). There were no significant differences in the frequency of use of the other medications. Although there were no significant differences in the comfort level of respondents when administering midazolam, midazolam with fentanyl, or fentanyl alone, physicians with the CCFP designation were much less comfortable administering etomidate, ketofol, ketamine, and propofol combined with fentanyl than CCFP(EM) physicians (Fig. 3). Furthermore, there were no differences in physicians' reported use of medications or their comfort level with administering them when compared with number of years in practice. Thus, drug preference was not likely due to the experience level of the physician, but more likely due to exposure.

The respondents' comfort level administering drugs was related to their knowledge of the drug's adverse effects. Of the respondents, 63% were able

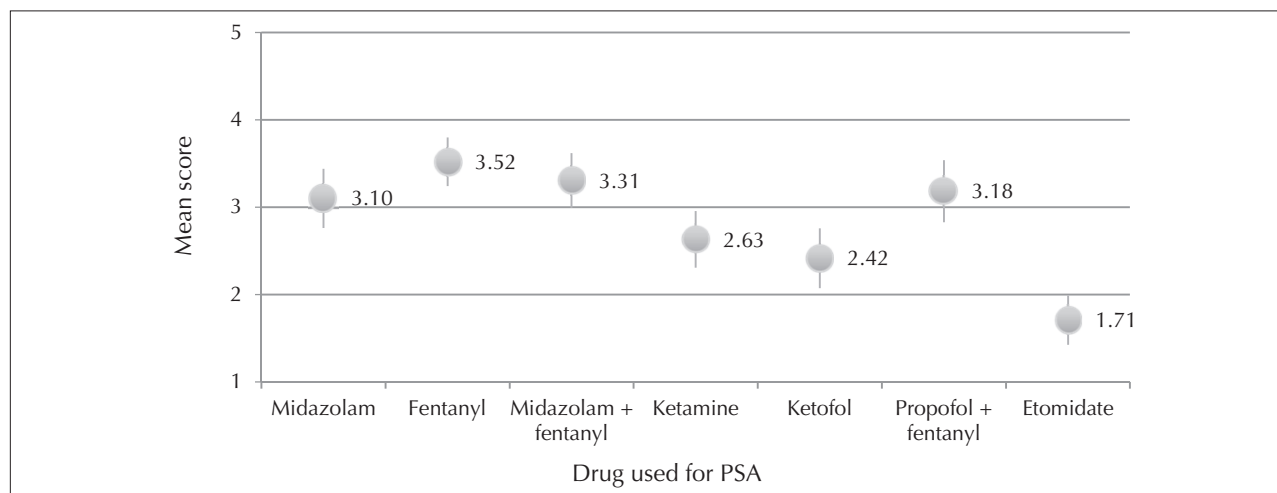


Fig. 1. Mean Likert scores and confidence intervals for frequency of medication use during procedural sedation and analgesia (PSA) in the emergency department (5 = always; 1 = never).

to correctly identify adverse effects of midazolam combined with fentanyl, such as hypoxia, apnea and respiratory depression. Only about 19% were able to identify etomidate's potential adverse effects, such as myoclonus and nausea, and only about 30% were able to identify respiratory depression as an adverse effect.

DISCUSSION

There are a number of different procedures frequently performed in the ED that require the use of PSA. Little is known about the agent(s) of choice for PSA by physicians working in rural and regional EDs. This study helps to identify some of these agents. The physicians surveyed here used medications such as fentanyl, and fentanyl with midazolam more frequently than newer medications such as propofol with fentanyl, ketamine, ketofol or etomidate. Etomidate was hardly used at all, and ketamine and ketofol were also not commonly selected. Physicians in rural and regional EDs seemed more comfortable administering more traditionally used agents.

Interestingly, propofol, which has become the dominant medication for PSA in most urban EDs in Canada,³ was only the third most popular choice. In addition, only 73% of respondents were somewhat or very comfortable administering propofol combined with fentanyl, compared with the 96% who were comfortable administering midazolam, fentanyl, or midazolam combined with fentanyl.

The benefit of propofol over midazolam and fentanyl has been demonstrated in newer studies.^{4,5} Although the degree of adverse reactions is similar, propofol has a shorter sedation time when compared with midazolam and fentanyl. In fact, studies that examined use of propofol for PSA reported recovery times from 7.6 (SD 3.4) minutes⁶ to 23 (SD 11) minutes,⁷ whereas studies of midazolam combined with

fentanyl have shown recovery times ranging from 28.5 minutes⁴ to 113.7 (SD 36.9) minutes.⁵ Thus, propofol combined with fentanyl involves a shorter procedural time, which means patients tend to have a shorter stay in hospital.⁴ This presumably translates into decreased nursing requirements and cost savings, because the total time for continuous patient monitoring is reduced in patients who are administered propofol.⁸ Additionally, propofol has other theoretically desirable characteristics. These include its high reliability as a sedative and analgesic, even in highly painful procedures, its consistent duration of action and its very low failure rate.

Although midazolam and fentanyl can be used for more painful and lengthier procedures requiring deeper sedation, such as hip reductions, their sedation effects often outlast the duration of most other procedures, leaving patients sedated longer than required. It may arguably be a preferable option to use a drug such as propofol that leaves the patient at an adequate sedation level only for the duration of procedure.⁹ Finally, although some discomfort may be associated with the initial injection, overall, propofol has been ranked high in patient satisfaction because of its euphoric and antiemetic properties.¹⁰ Hence, there may be an increased benefit to administration of newer agents such as propofol over the more traditional agents used by our survey population. However, to our knowledge, no studies directly comparing the use of these agents in rural EDs have been published.

Another PSA medication that has been gaining popularity in urban centres is ketofol. Benefits of ketofol are reported to be its deeper sedation quality,¹¹ less use of propofol, and higher physician¹² and patient satisfaction.¹³ However, in our study, 54% of respondents stated that they never or rarely used this medication, which suggests that it has not gained much traction in these nontertiary EDs. This

Table 3. Reported use of medications for procedural sedation and analgesia (n = 55)

Medication	% of respondents		
	Rarely or never	Sometimes	Often or always
Midazolam	36.7	18.4	44.9
Fentanyl	12.0	22.0	66.0
Midazolam + fentanyl	22.4	30.6	46.9
Ketamine	42.9	28.6	28.6
Ketofol	54.2	22.9	22.9
Propofol + fentanyl	26.5	14.3	59.2
Etomidate	77.1	16.7	6.3

Table 4. Reported comfort level administering medications for procedural sedation and analgesia (n = 55)

Medication	% of respondents		
	Very or somewhat uncomfortable	Neutral	Somewhat or very comfortable
Midazolam	2.0	2.0	96.1
Fentanyl	2.0	2.0	96.1
Midazolam + fentanyl	3.9	2.0	94.1
Ketamine	15.7	15.7	68.6
Ketofol	23.1	15.4	61.5
Propofol + fentanyl	11.5	15.4	73.1
Etomidate	36.5	17.3	46.2

could be because the benefits of ketofol over other medications are still being researched. Ketofol was originally reported to have a lower risk of respiratory depression compared with propofol; however, this has not been found to be the case in practice.¹² Ketofol and propofol have been associated with comparable adverse events in adults.¹³ Nonetheless, ketofol has been shown to result in decreased vomiting in children, compared with ketamine alone.¹⁴ Furthermore, recovery times were short and physician satisfaction

was high with the use of ketofol.¹³ Thus, ketofol is a viable option for PSA, but it was not commonly used in the nontertiary EDs surveyed.

Our results demonstrate a lack of propofol use in the rural and regional EDs studied. One explanation for this could be the rapid sedation onset seen with propofol. Together with its short-acting properties (compared with midazolam and fentanyl), this can result in rapid shifts in consciousness, breathing ability and blood pressure, which need to be monitored.

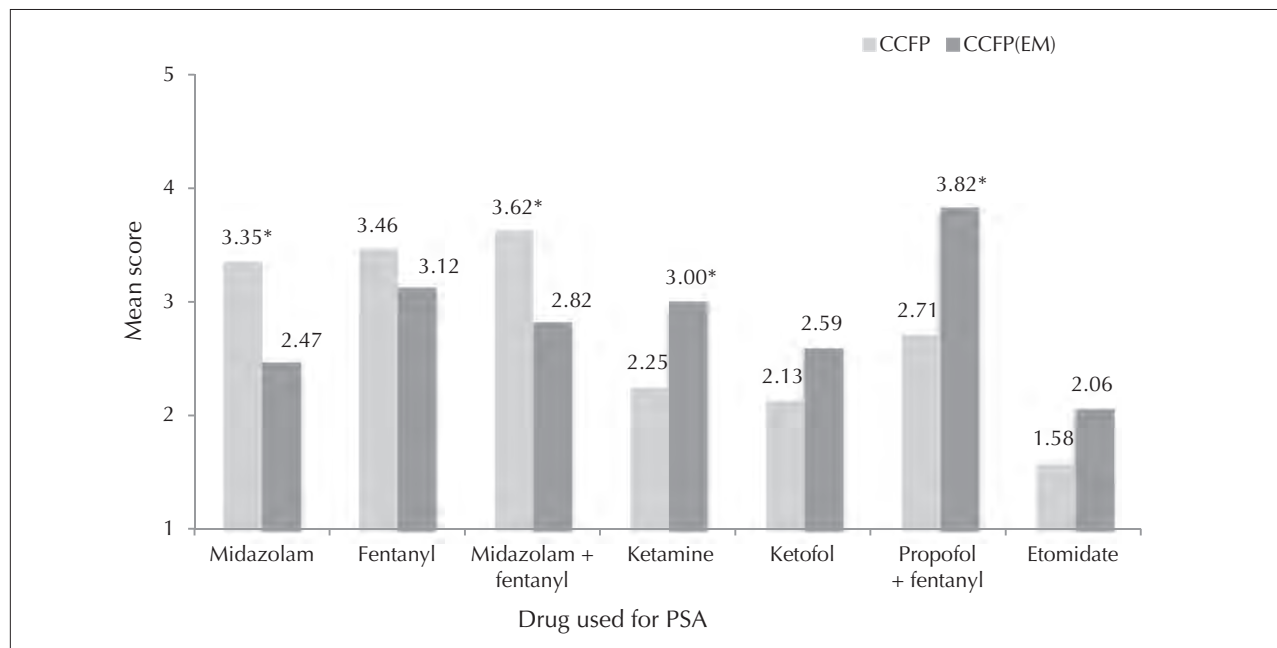


Fig. 2. Mean Likert scores for frequency of medication use during procedural sedation and analgesia (PSA) in the emergency department (5 = always; 1 = never), by CCFP (Certification in The College of Family Physicians) and CCFP(EM) (emergency medicine) designation. *Statistically significant difference ($p < 0.05$).

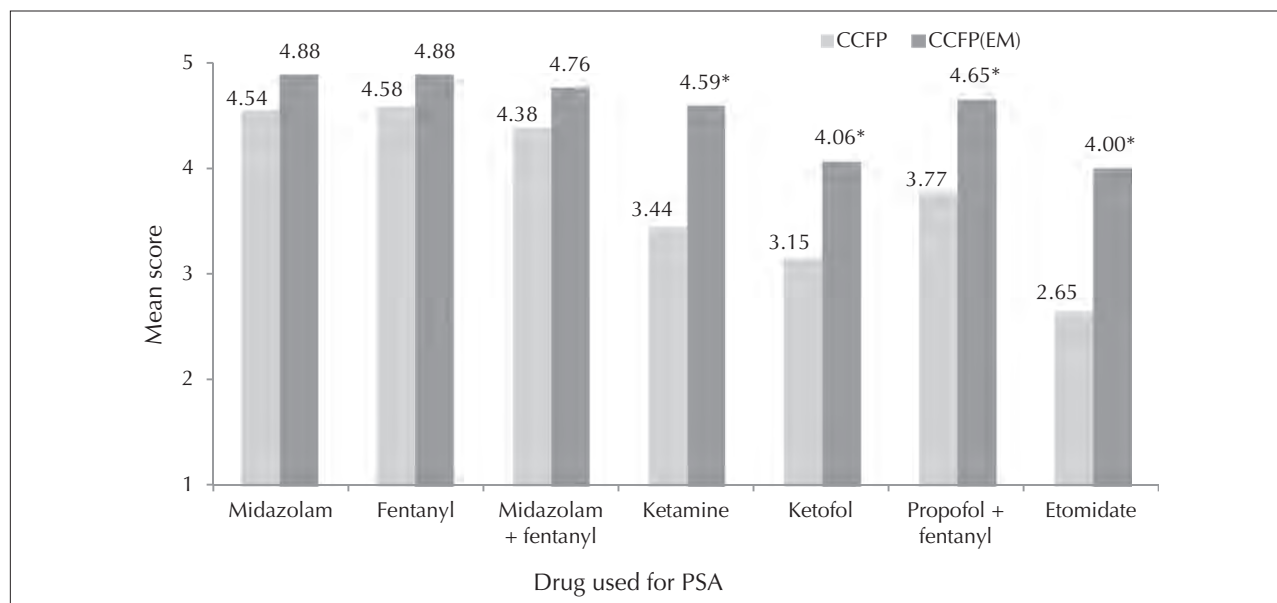


Fig. 3. Mean Likert scores for physicians' comfort level with administering medications during procedural sedation and analgesia (PSA) in the emergency department, by CCFP (Certification in The College of Family Physicians) and CCFP(EM) (emergency medicine) designation. *Statistically significant difference ($p < 0.05$).

tored carefully.¹⁵ This could make physicians in rural and regional EDs uneasy if they do not have previous exposure to such anesthetics or if they have a limited ability to closely monitor patients. Most studies on the benefits of these agents have been conducted in tertiary centres where several personnel were present.¹²⁻¹⁴ This may not be possible in smaller EDs, which could increase physicians' reluctance to use newer agents. However, a study conducted using the Procedural Sedation in the Community Emergency Department Registry illustrated that patient safety was maintained regardless of the number of physicians involved.¹⁶ Therefore, the number of physicians available theoretically should not affect the decision about whether to use propofol. However, more practical resource limitations, physician comfort levels and site-specific considerations may pose more substantial barriers in rural and regional EDs.

Pathman's evidence pipeline, which describes 4 stages for moving evidence to practice, could be another possible explanation for the limited acceptance of propofol and newer agents in rural and regional EDs.¹⁷ According to Pathman and colleagues, clinicians must be aware of the evidence, agree with it, adopt it and then adhere to it at appropriate times.¹⁷ Each subsequent step tends to have lower uptake than the previous one. Thus, only a portion of physicians who are aware of the change in evidence end up adopting and adhering to it. However, this does not fully explain the hesitation in using newer agents. If knowledge translation were the sole factor, the degree of propofol uptake would be low among physicians in urban EDs as well. Larger studies are needed to investigate this further.

CCFP versus CCFP(EM)

Differences in drug preferences were magnified with comparison of physicians with CCFP and CCFP(EM) designations. Physicians with a CCFP designation most frequently used midazolam combined with fentanyl, or fentanyl or midazolam alone, and used propofol combined with fentanyl considerably less often. Physicians with a CCFP(EM) designation most frequently used propofol combined with fentanyl, followed by fentanyl alone. Although ketamine was not used often by either group, CCFP(EM) physicians were more likely to select this medication than CCFP physicians. In addition, whereas there was no significant difference in physicians' comfort level in administering fentanyl, midazolam or their combination, CCFP(EM) physicians

felt more comfortable administering ketamine, ketofol, propofol combined with fentanyl, and etomidate. The extra training CCFP(EM) physicians gain could be one reason for comfort with the newer agents. This training could also be provided to physicians preparing for rural practice. However, the CCFP(EM) designation is relatively new and may have coincided with a temporal change in paradigm regarding use of sedation agents. Indeed, physicians without the CCFP(EM) designation may be older and may have trained at a time when older sedation drugs were the mainstay of therapy. Because their training is typically done in newer academic centres, CCFP(EM) physicians may be more likely to have been exposed to the use of newer agents. There were no differences in physicians' reported use of medications or comfort level with administering them when compared with number of years in practice, indicating that drug preference was likely not due to the experience of the physician, but more likely due to exposure. If larger studies in rural and regional EDs continue to demonstrate a benefit of newer agents for PSA, residency training programs for rural practitioners could incorporate more information on use of these newer agents, irrespective of formal training in emergency medicine.

Limitations

This study had several limitations. We studied propofol combined with fentanyl rather than propofol alone. We argue that because propofol does not have any analgesic effect, it should ideally be combined with an analgesic, the most common being fentanyl. Thus, theoretically propofol should not be used on its own, although this may not be the case in practice. In addition, we do not believe the decision to use the combination as an option biased the results, because respondents who used propofol alone would have selected propofol combined with fentanyl, and respondents who used the combination would have selected the same option.

This study had a small sample and a low response rate. We recognize that the sample size of 55 physicians and the response rate of 44% are less than ideal; however, we believe our results still represent a trend of clinical practice among surveyed physicians in this practice setting.

We used a survey method that relied on physician recall and so could have been influenced by recall bias. A future study could involve a chart review of the types of medications actually used in EDs for PSA, which would eliminate the recall bias. Alterna-

tively, many centres have a medication dispensing system that can link drug information to patients. This system can be electronically searched and can provide more details about the medications used for PSA.

We did not calculate the sample size or do a power calculation a priori. Our sample was limited in size by the geographic area we chose to investigate and was thus a convenience sample. We compared the means when determining frequency and confidence of drug use, which is an approach typically used for interval data, and not Likert scale items. However, our approach was consistent with Jaccard and Wan,¹⁸ who state, “for many statistical tests, rather severe departures (from intervalness) do not seem to affect Type I and Type II errors dramatically.”¹⁸ When comparing physicians with CCFP and CCFP(EM) designations, however, we used Mann–Whitney *U* nonparametric testing, which is suitable for ordinal Likert scale items.

Finally, we focused on physicians’ familiarity and comfort with medications used for PSA, but we did not assess safety, and we did not investigate differences in clinical outcomes between sites. Thus, future research could analyze whether PSA performed in community and rural settings using traditional agents is as safe and effective as in urban and tertiary centres using newer agents, and whether clinical outcome measures improve with the use of newer agents in rural and regional EDs.

CONCLUSION

Physicians practising in rural and regional EDs were most comfortable using traditional agents such as midazolam and fentanyl for PSA. Although propofol is one of the commonly used newer agents in urban centres, physicians in the setting studied were less comfortable administering propofol combined with fentanyl than midazolam and fentanyl. In addition, etomidate and ketofol were even less commonly used in the nontertiary EDs examined. These differences were magnified with comparison of physicians with CCFP and CCFP(EM) designations. However, there may be a temporal bias in these designations. Physicians with a CCFP(EM) designation tended to be more comfortable administering the newer medications, but this finding could reflect a newer practice pattern because CCFP(EM) is a newer designation. In addition, the CCFP(EM) group used propofol combined with fentanyl much more frequently than the CCFP group. Finally, the respondents in this survey were less likely to recognize the adverse effects of newer agents. Larger studies are

needed to confirm these trends and ascertain the relevance to clinical outcomes and training patterns.

Competing interests: None declared.

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The changing face of cellulitis and MRSA in rural Canada: a clinical update

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The empiric treatment of cellulitis in northwestern Ontario used to be relatively straightforward. The choice of antibiotic was typically cephalexin, which provided reasonable coverage for staphylococcus and streptococcus, if systemic treatment was required. However, several recent studies and regional bacterial surveillance have altered the options for empiric treatment.¹⁻⁵

Because superinfections can affect even small rural hospitals, rural clinicians have to consider their role in antibiotic stewardship. For example, do good wound hygiene and follow-up suffice? Evidence now demonstrates that incision and drainage (I&D) of uncomplicated abscesses is sufficient without concomitant antibiotic coverage.²⁻⁵ If antibiotics are needed, does our choice of medication cover for increasing rates of community-associated methicillin-resistant *Staphylococcus aureus* (CA-MRSA) seen in soft tissue infections?

COMMUNITY-ASSOCIATED MRSA

In the past 5 years, northwestern Ontario has experienced increasing rates of CA-MRSA. More than 56% of the staphylococcus isolates processed at the Sioux Lookout Meno Ya Win Health Centre were CA-MRSA in 2011; this was up from 38% in 2008.¹ This centre provides bacteriology services for a geographically dispersed population of 28 000 that mostly comprises First Nations people.

The incidence of CA-MRSA has traditionally been high in remote areas of northern Canada, particularly those with large Aboriginal populations.⁶⁻⁸ A study in northern Saskatchewan found 51% of *S. aureus* infections to be CA-MRSA.⁵ Risk factors for such high rates of CA-MRSA infections include poor housing, sanitation, overcrowding and recent antibiotic use.⁹

Our knowledge of CA-MRSA has dramatically evolved since it was first diagnosed in Canada in 1981.¹⁰ The initial classification in the 1950s used the term “community-acquired.” Since then, increasing rates of CA-MRSA are found in hospital settings, so the nomenclature now reflects less certainty about the location of the onset of infection.

COMMUNITY- VERSUS HEALTH CARE-ASSOCIATED MRSA

Community-associated MRSA differs from health care-associated (HA; previously called “hospital-acquired”) MRSA in several important ways. Community-associated MRSA affects the young and previously healthy, and is susceptible to many common antibiotics (e.g., trimethoprim-sulfamethoxazole, clindamycin and doxycycline). Developments in epidemiology and genetic testing have identified CA-MRSA as molecularly distinct from HA-MRSA.¹¹ Community-associated MRSA did not “escape” from the hospital setting; rather, it developed in the antibiotic-rich environment that community

settings now have become. Both are resistant to methicillin and oxacillin, but HA-MRSA is highly resistant to most antibiotics, is found in intensive care units (ICUs) in tertiary care centres and may require vancomycin.

TREATING CA-MRSA

In northwestern Ontario, CA-MRSA is most commonly associated with soft tissue infections, but it occasionally presents as life-threatening sepsis or community-acquired pneumonia. Our regional antibiograms show that trimethoprim-sulfamethoxazole, clindamycin and doxycycline (or tetracycline) all have 99% susceptibility rates.¹ Erythromycin susceptibility is low, at 58%.¹ All MRSA strains are, by definition, resistant to all penicillins and cephalosporins.

ERADICATION THERAPY FOR CA-MRSA

Eradication (decolonization) of CA-MRSA is not recommended by the Canadian Infectious Disease Society; however, 25% of CA-MRSA infections in northwestern Ontario are reinfections.^{1,12} The theoretical risk of eradication therapy is the development of resistant strains. First Nations communities in northern Ontario are known to have inadequate and overcrowded housing.¹³ Possible regimens for initial infections might therefore include nasal mupirocin daily for 2 weeks for all household contacts.¹⁴ The reinfected patient who requires repeat antibiotic treatment might, however, consider a 2-week course of doxycycline, together with rifampin, nasal mupirocin and daily chlorhexidine baths, as well as attention to household contacts.¹⁴

STAPHYLOCOCCUS VERSUS STREPTOCOCCUS

Along with regional changes of increasing CA-MRSA rates, several recent North American studies also contribute to the changing face of antibiotic stewardship. In 2010, Jenkins and colleagues¹⁵ found that most (65%) soft tissue infections requiring hospital admission were commonly *S. aureus* and most of those were CA-MRSA. The remaining 35% were streptococcal. Jeng and colleagues¹⁶ examined clinical presentations and culture results, and noted that nonpurulent cellulitis was typically streptococcal. Moran and colleagues¹⁷ in 2006, and Talan and colleagues¹⁸ in 2011 have statistically associated purulent cellulitis with staphylococcal MRSA infections.

Three randomized controlled trials and a 2012 meta-analysis verified that uncomplicated abscesses requiring I&D had equivalent healing and fewer recurrences if no antibiotic administration accompanied the I&D.²⁻⁵

ANTIBIOTIC STEWARDSHIP

Antibiotic stewardship is a developing awareness in rural and urban hospitals. We have just initiated a hospital committee to address it in our rural setting. With the possible exception of repatriated patients from tertiary care centre ICUs, most of the MRSA we encounter will be CA-MRSA. These can be distinguished by the resistance pattern and do not need genetic testing. Other than the rare patient with severe infection or sepsis, patients with CA-MRSA will not need vancomycin and can be safely treated with common antibiotics (e.g., trimethoprim-sulfamethoxazole, clindamycin and doxycycline). Overuse of vancomycin raises the spectre of establishing vancomycin-resistant enterococcus in rural hospitals. Infections that require antibiotics, whether staphylococcus and streptococcus, will likely respond to clindamycin. Uncomplicated abscesses requiring I&D need no antibiotic coverage.

CONCLUSION

Antibiotic stewardship and public education will be required to counter the public's expectation that effective treatment of benign upper respiratory infections and otitis media require systemic antibiotics. Treatment of infectious diseases will always be a moving target, and regional laboratory susceptibility information will be useful in guiding the use of antibiotics.

Competing interests: None declared.

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The occasional corneal rust ring removal

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This article has been peer
reviewed.

*Deceased July 17, 2015.

A rust ring may form within 3–4 hours of a small piece of iron-containing metal landing on the cornea. This typically occurs during operation of a grinding, filing or drilling machine. The iron itself is not soluble in the corneal tissue, but oxidation occurs and iron leaches into the surrounding cornea. This provokes an immune reaction, which is visible as a “rust ring.”^{1,2}

Rust rings are not in and of themselves harmful and will usually resorb gradually. If a rust ring is seen shortly after the injury, routine removal is usually not recommended because of potential damage to the eye. Removal is often easier 24–48 hours after the injury when the surrounding cornea will “soften.”^{2,3} If the rust ring is still noticeable 2–3 days after the injury, or ophthalmologic consultation is not easily available, débridement of a rust ring can be done. This is usually performed with the use of a bur, which has been

reported to be the “quickest, safest, and most precise form of treatment for corneal rust.”⁴

The instrument required is an Alger Brush II Corneal Rust Ring Remover, a low-torque bur powered by a single AA battery. This instrument is available from medical supply houses at a cost of about Can\$75 (Fig. 1).

PROCEDURE

1. Lay out the materials you will need (Fig. 2):
 - loupe, magnifier or slit lamp
 - ophthalmic anesthetic drops
 - ophthalmic homatropine drops
 - Alger Brush II Corneal Rust Ring Remover
 - fluorescein drops
2. Calmly explain the procedure to the patient; this is the best anxiolytic (Fig. 3). Position the patient lying down comfortably, because the procedure is anxiety-provoking for



Fig. 1. The Alger Brush II Corneal Rust Ring Remover.



Fig. 2. Equipment for corneal rust ring removal.

many patients. Ensure adequate lighting. If the work that produced the injury involved a potential high-velocity injury (e.g., high-speed drilling), rule out penetration of the globe by clinical examination and radiography of the globe.

3. Anesthetize the cornea with anesthetic drops, either instilled directly onto the cornea (Fig. 4) or into a pocket of the lower conjunctiva while



Fig. 3. A calm explanation of the procedure is the best anxiolytic.



Fig. 4. Anesthetize the cornea.



Fig. 5. Approach the patient's eye with the drill of the Alger instrument.

the patient looks downward. If there is ciliary spasm, you may wish to use homatropine to relieve the spasm.

4. Ask the patient to direct his or her eyes to a position that best exposes the rust ring (e.g., if the rust ring is in the inferior part of the cornea, have the patient look up).
5. Turn on the Alger instrument by twisting the base cap in the direction of the arrow on the cap. The sound of the drill may be frightening for patients, so you may choose to demonstrate the turned-on instrument to the patient before starting the procedure and explain that it will automatically shut off if the bur goes below the surface of the cornea.
6. Make yourself as comfortable as you can; reposition the gurney or bed if necessary.
7. Slowly approach the patient's eye with the drill of the Alger instrument, from laterally outside of the patient's visual field (Fig. 5).
8. As the instrument reaches the cornea, keep the



Fig. 6. Keep the bur tangential to the cornea, and slowly brush away the rust.



Fig. 7. You may want to use magnification, if available.

bur tangential to the cornea (i.e., in a horizontal position), and slowly use the instrument to “brush away” the rust. Imagine that you are brushing the rust ring away, not drilling it away. It is often helpful to brace yourself against the bed, wall or patient’s forehead, and for an assistant to lightly stabilize the patient’s head, if the patient consents (Fig. 6). Move the tip of the bur around the rust ring to remove as much of the rust as possible.

9. It is also helpful to then change position to the other side of the patient’s head to check the rust ring from another angle, and remove as much as possible any rust remaining from the first attempt. A very small amount of brownish discoloration may be allowed to remain, especially if it is at the periphery of the visual axis and doesn’t bother the patient; otherwise, it can be removed the next day when the patient returns for follow-up.^{2,3} Turn off the instrument when finished.
10. You may wish to use a magnifier, such as a loupe or slit lamp, for the procedure. The magnification changes the perspective and takes some practice (Fig. 7).
11. Apply fluorescein staining to the eye to check the size of the subsequent abrasion. Note this in the chart for subsequent follow-up visits.
12. Traditionally, an eye patch was recommended. However, recent controlled studies have shown that patients who received treatment for corneal

injuries without an eye patch had faster healing, less pain and less blurred vision.³ A patch might now be considered only for very large corneal injuries occupying more than half of the corneal surface.³

13. A topical antibiotic ointment (e.g., erythromycin) may be prescribed for 3–5 days. For pain control, options include oral analgesia (e.g., acetaminophen, codeine, tramadol), topical ketorolac and/or homatropine for cycloplegia.³
14. Ask the patient to return the next day for a follow-up examination. Most often, the cornea will heal within a day or so. Complications include corneal ulceration (visible as a whitish discoloration around the ring), corneal stromal damage and scarring.² The authors have not seen any such complications in 30 years of practice.

Competing interests: None declared.

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Country cardiograms case 49

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This article has been peer
reviewed.

A 43-year-old woman presents to a medical office in a remote BC community during a blizzard in January. She has come for suture removal, 8 days after major gynecologic surgery. She has had a few vague chest pains and some shortness of breath, neither of which have been severe enough for her to consider making an earlier appointment. She has no other significant medical history.

On examination, her pulse rate is 102 beats/min. She has a low-grade fever of 37.6°C, and her blood pressure is normal. Her respiratory rate is elevated at 26 breaths/min, but there is no respiratory distress. Oxygen saturation is 98% on room air. Her chest is clear to auscultation, and heart sounds are

normal. There is no clinical evidence of deep venous thrombosis.

Investigation results include a normal chest radiograph, a negative troponin test, a hemoglobin level of 143 g/L, a raised white blood cell count ($13.2 \times 10^9/L$), a positive D-dimer test (3.60 [normal < 0.49] $\mu g/mL$) and an electrocardiogram (ECG) shown in Figure 1. A recent preoperative ECG was normal (with upright T waves in all leads except aVL, and a QRS axis of 45°).

What is your interpretation of this ECG, and what is your approach to this patient's treatment?

For the answer, see page 147.

Competing interests: None declared.

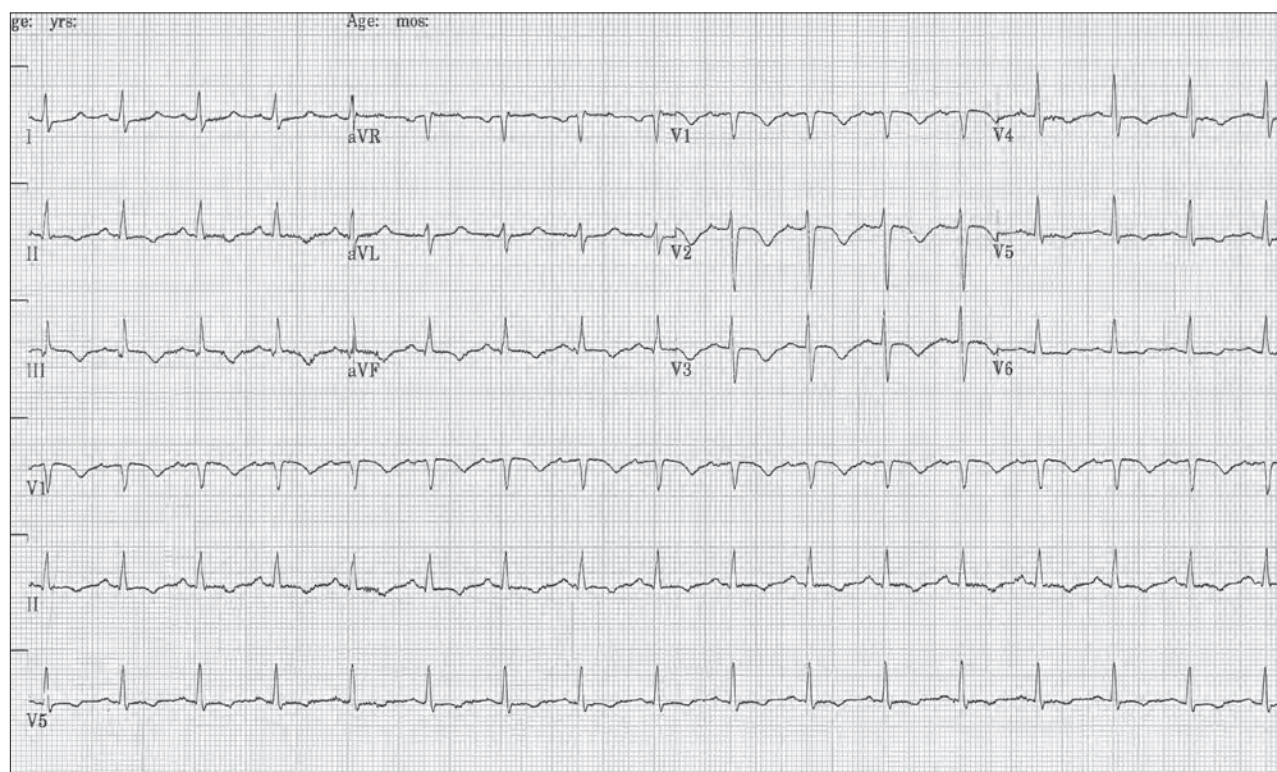


Fig. 1. Electrocardiogram of a 43-year-old woman with chest pain and shortness of breath.

OUT BEHIND THE BARN DANS LE FEU DE L'ACTION

Windows 8

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New personal computers (PCs) use the totally redesigned Windows 8 operating system. This article reviews some of the changes that PC users will encounter in this version. If you use an Apple Mac, iPod or iPad, you will already be familiar with some of these features.

NEW USER INFORMATION

My new Dell laptop was shipped with a thin, multi-language “quick start guide” that gave only basic details of how to set up the computer and connect it to the Internet. I miss the days when new computers came with thick manuals that described how to use them and how to solve problems. Now, the manufacturers provide that information in a help file on the computer or on a website. I still prefer a manual, where I can underline keywords and make marginal notes.

LOCK SCREEN

When Windows 8 starts up, it displays an initial “lock” screen that shows the time and date and some system status information. My quick start guide neglected to mention that I needed to click any key or mouse button to continue.

USERNAME AND PASSWORD

For added security, Windows forces you to provide a password each time that you restart the computer. It also insists that the primary user provide an

email address when you first register the operating system.

WINDOWS START SCREEN

The Windows Start button and Start menu have been replaced by an entire screen filled with icons (now called “tiles”) for preloaded application programs (apps). This screen is wider than most display screens, but you can use the left and right arrow keys to scroll from side to side. You can return to the Start screen at any time by clicking the Start (a.k.a. “Windows”) key on the keyboard. You can personalize the Start screen by clicking and dragging the app tiles.

APPS

When you open an app from the Start screen, it fills the entire display. If you move your mouse pointer to the lower left corner of the screen, a thumbnail icon of the Start screen appears. You may click on this icon to return to the Start screen. To see a list of all currently open apps, move the mouse pointer from this icon up along the left border of the screen. To scroll through all open apps, hold down the Windows key and repeatedly click the Tab key. To see a list of all available apps, right-click on a blank area of the Start screen then click on the “All Apps” icon that appears in the lower right corner.

DESKTOP

The Desktop is displayed by clicking on its tile on the Start screen. It is

similar to that in older versions of Windows. It displays icons for your major apps and a task bar at the bottom that includes an icon for Internet Explorer.

INTERNET EXPLORER

The version of Internet Explorer available on the Start screen is a very simple one. The icon on the Desktop toolbar opens the full version of this program.

CHARMS BAR

The Charms bar is a toolbar that allows users to control basic computer settings. The quickest way to display the Charms bar is to hold down the Windows button and press the "C" key. You can also show it by moving the mouse pointer to the upper or lower right corner of the display screen.

To turn off the computer, display the Charms bar, click on "Settings" and then on "Power." This basic information was not even mentioned in my quick start guide.

FILE EXPLORER

The File Explorer (previously "Windows Explorer") app is used to locate and organize your personal files. It replaces the previous "My Computer" and "My Documents" icons. For some reason, it is not listed among the common apps on the Start screen. The quickest way to find it is to go to the Start screen, then type the word "file" on the keyboard. This activates the Windows Search app and will display a link to File Explorer. As you gain experience with Windows 8, you will learn how to place a tile for File Explorer or other apps onto the Start screen.

THE BOTTOM LINE

Using Windows 8 is a totally new experience. Be prepared to invest time and effort in learning how to efficiently use its many new features.

Competing interests: None declared.

This will be Barrie McCombs' last Out Behind the Barn column. We want to thank him very much for the 14 years he has been writing this column, and we wish him well in his future endeavours. The Editors, *CJRM*

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Four pushes later, and not a word more

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It is 2:30 on a cold, dark, blustery February morning. I am a first-year family practice resident on my maternity rotation in Fort St. John, northern British Columbia, population 19 000.

SITUATION REPORT: an active (and hopefully uncomplicated) labour at 7 cm dilation; a 35-weeker with symptomatic pregnancy-induced hypertension, brisk reflexes and possible HELLP; a PPROM, 31 weeks and 4 cm dilated, awaiting air-evac to BC Women's Hospital; a prolonged but progressing induction we *wish to God* we never induced; 1 RN; 3 LPNs; a full patient ward ... and me. I can't remember the last time I ate or peed. I need a β -blocker. Now. Except I have asthma. Damn.

In walks a tall Russian-German Mennonite woman, 41 weeks, G5, P4, L4. She casually states in her more-Russian-than-German lilt that she is "havink za baby." She is plain but pretty, her long, mousy brown hair pulled into a French braid and contained by a carefully pinned black-lace kerchief. She is wearing nylons under her long dark-red skirt, and black Reebok walking shoes, despite the weather. Her high cheekbones are smattered with fine freckles, and her cheeks are flushed from the cold. Her eyes are framed by more smile lines than someone her age should have. Her husband is away at camp — they are trying to reach him. The kids are with her sister at the farm. She drove herself the hour and a half into town to get here. Alone. In labour. On gravel roads. In midwinter. In low visibility. With blowing snow. She is completely calm. I am pretty sure she took my β -blocker.

She is settled into the lone remaining bed on the ward. She is 8 cm dilated and wants to push. Her membranes rupture. THICK meconium. Glances are exchanged. We triple check the resuscitation equipment and suction. Another 10 minutes. Fully dilated. It is time to push.

Other than a slight sheen of perspiration on her forehead and an increased respiratory rate every 2 minutes (exactly), she has not said a word during any of this. No complaints, no analgesia, no unpleasant utterances, no bodily dysfunctions, not even a *little* vomit. She even smiles slightly when the contractions pass. Having screamed, sobbed, sworn *and* spewed my way through the birth of my 2 children, I am trying desperately not to be bitter.

The fetal heart rate falls and stays too low, too long. More glances exchanged. More hearts dropped. More lips bitten. My attending tells her gently, but firmly, that we need to get the baby out *now*. The room is silent, except for the alarms on the monitor.

Ping. Ping. Ping.

She looks at him with steely determination and suggests, in her more-Russian-than-German lilt, "My husbunt. He yoosis za chains to get za calves out."

More blinks. More pings. More silence.

And then she bursts out laughing. We all do.

Four pushes later, and not a word more, her beautiful baby boy is born.

Competing interests: None declared.

Winner of the SRPC's Medical Resident Essay Contest 2012, abridged version.

Country cardiograms case 49: Answer

*Charles Helm, MD,
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The electrocardiogram (ECG) in Figure 1 (on page 143) displays a rhythm of sinus tachycardia, with a rate of 101 beats/min. The PR interval, QRS duration and QT interval are normal. The QRS axis is 65°, a slight swing to the right compared with the previous ECG. P waves are normal. Lead III displays a Q wave of questionable significance — it is shallow but slightly widened. Minor ST segment abnormalities are evident. Abnormal T wave inversion is present in inferior leads II, III and aVF, and in precordial leads V1 through V6. T waves are particularly deeply and widely inverted in leads V1 through V3.

Given that the preoperative ECG was normal, these are clearly significant interval changes. An ischemic origin should be considered, but the negative troponin result is somewhat reassuring in this regard. The 1-week postoperative presentation prompts consideration of pulmonary embolism, which could potentially account for such ECG findings.

Prediction tools are often used to assess the pretest probability of pulmonary embolism, such as the Wells clinical prediction rule¹ in association with PERC (the Pulmonary Embolism Rule-out Criteria).² In this case, the Wells score is 4 (and would decrease to 2.5 if the heart rate were less than 100 beats/min rather than the 102 beats/min recorded). A Wells score of 4 or less makes pulmonary embolism “less likely.”³ Using PERC, D-dimer testing is indicated because of the slightly elevated heart rate and the recent surgery. However, the significance of a positive D-dimer result would have to be questioned, given the frequency with which this occurs in the postoperative phase.⁴

It is conceivable in such a scenario, given the abysmal weather and road conditions, as well as the potential risks of a long ground transfer, that a treating physician might derive reassurance from the normal chest radiograph and oxygen saturation levels, and hypothesize that the slight tachycardia is explained by the low-grade fever. In this challenging situation, without the local availability of more sophisticated tests, such as computed tomography angiogram or ventilation perfusion scan, the ECG (which is not part of the Wells or PERC models) becomes a valuable ancillary tool.

Although the ECG did not provide a specific diagnosis in this case, it did provide evidence through the substantial interval changes that something significant had occurred, which helped lead to a presumptive diagnosis of pulmonary embolism. The patient was given low-molecular-weight heparin and transferred for urgent investigations, which confirmed the presence of multiple pulmonary emboli. She was admitted to the regional hospital, where 2 days later she had a pulseless electrical activity arrest. Thankfully, extensive resuscitation and the administration of thrombolysis led to full recovery. Had she been sent home initially, the outcome would probably have been very poor.

With regard to the possible ECG findings in pulmonary embolism, it must be noted that often there are no changes at all. As with normal oxygen saturation level and chest radiography, a normal ECG does not exclude the diagnosis.

Findings on ECG may include sinus tachycardia; a swing of the QRS axis to the right; new right bundle branch

block or incomplete right bundle block; a variety of ST and T wave changes, including significant ST segment depression; and a combination of right axis deviation and T wave changes that gave rise to part of the old "S1Q3T3" terminology (a deep S wave in lead I and deep T wave inversion in lead III). In this patient, although the ECG changes were not specific, a number of the above features were present. They were substantial enough to aid in making the presumptive diagnosis and to contribute to appropriate management.

This case demonstrates the value of the ECG as an adjunct in instances of suspected pulmonary embolism. Although prediction tools are useful, their use can be enhanced by a flexible approach that considers other data.

For the question, see page 143.

Competing interests: None declared.

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Country Cardiograms

Have you encountered a challenging ECG lately?

In most issues of *CJRM* an ECG is presented and questions are asked.

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Please submit cases, including a copy of the ECG, to Suzanne Kingsmill, Managing Editor, *CJRM*, 45 Overlea Blvd., P.O. Box 22015, Toronto ON M4H 1N9; cjrm@cjrm.net

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ANESTHESIOLOGIST: BC – Cranbrook. The Rural Physicians for British Columbia are providing a one-time incentive payment of \$100,000 for a 3-year return of service for a permanent anesthesiologist for this 74-bed regional facility, serving a catchment area of approximately 80,000 people. Shared responsibility of workload within Anesthesiology Department. The hospital has on-site CT, US and traveling MRI, and offers internal medicine, obstetrics and gynecology, general surgery, orthopedics, ophthalmology, ENT, pathology, psychiatry and radiology. Hours of work are negotiable and the compensation is fee-for-service so open for discussion. Multiple incentives: recruitment incentive \$20,000; retention fee premium 14%; retention flat fee \$12,240; relocation reimbursement. Cranbrook is surrounded by stunning scenery and boasts the most sunshine of anywhere in B.C. with unlimited summer and winter activities. For more information contact: email physicianrecruitment@interiorhealth.ca or view us online at our Web site www.betterhere.ca –RM-292b

FAMILY PHYSICIAN: BC – Enderby. Interior Health is seeking a full-time physician to join a well-established clinic located in the beautiful North Okanagan. Collaborative practice in multidisciplinary setting that includes laboratory, mental health, public health and community care. Contract includes guaranteed income and no overhead; and Enderby qualifies for benefits under the Rural Incentive Program. Year-round recreation includes access to lakes in the summer and skiing in the winter. For more information contact: email physicianrecruitment@interiorhealth.ca or view us online at our Web site www.betterhere.ca –RM-284

FAMILY PHYSICIAN: BC – Nakusp. Come and live the peaceful life that you have always wanted on the shores of the pristine Arrow Lakes and surrounded by a hiker's paradise. Nakusp offers a close community and rural environment that you only read about. This friendly village of 1,524 is perfect for people who want a slower pace of life. Hiking through great cedars on the weekend, lounging on the beach with your family, taking in the spa with your partner, or visiting the local hot springs by yourself,

Nakusp offers something for everyone. Fee-for-service, approximately \$300,000 per annum. Eligible for MOCAP funding plus numerous other rural incentives: recruitment incentive \$20,000; retention fee premium 21.98%; retention flat fee \$19,216.80; and relocation reimbursement. For more information contact: email physicianrecruitment@interiorhealth.ca or view us online at our Web site www.betterhere.ca –RM-279b

FAMILY PHYSICIAN: BC – Lillooet. Five-physician, unopposed fee-for-service practice seeks sixth family physician with ER skills. Clinic group focus is on balance of work and lifestyle. Easy access to lower mainland, Whistler and interior of province. Call currently 1-in-5. Regular schedule includes one week off every fifth week. Full Rural Physician Recruitment and Retention benefits eligibility, including 38 days rural locum coverage for holidays. World-class wilderness at your doorstep for skiing, hiking, fishing, whitewater kayaking and mountain biking. Full service rural hospital with GP Surgeon and Anesthetist on staff. For more information email physicianrecruitment@interiorhealth.ca or view online at Web site www.betterhere.ca –RM-282b

FAMILY PHYSICIAN: BC – Clearwater. Family physicians wanted to join the medical team in this beautiful community. Rural setting, relaxed pace of work, newer hospital, and an amazing provincial park as your backyard. Known for world-class recreation, enriched culture, and vibrant community life, Clearwater offers the balanced lifestyle you have been looking for. Enjoy working in a single group practice with electronic medical records, a modern acute care facility, and a 21-bed residential care facility. Payment structure is fee-for-service plus multiple incentives: The Rural Physicians for British Columbia incentive provides a one-time incentive payment of \$100,000 for a 3-year return of service; recruitment incentive \$20,000; retention fee premium 21.14%; retention flat fee \$18,482.40; and relocation reimbursement. For more information contact: email physicianrecruitment@interiorhealth.ca or view us online at our Web site www.betterhere.ca –RM-281a

www.betterhere.ca



Life's better here.



Family/General Physicians

for Nelson, British Columbia, Canada

The City of Nelson is seeking Family Physicians for their vibrant, active community. There are both part-time and full-time opportunities available. With supportive colleagues to share the responsibilities of in-hospital patients, clinics operate with EMR systems, along with very efficient and friendly staff. Clinic physicians are very supportive to new colleagues establishing their practice and providing coverage for hospital inpatients. With its friendly people and scenic location among rivers, mountains, and lakes, the area offers a wide range of year-round outdoor recreational opportunities. Remuneration can be discussed when determining which clinic is a good match for you along with the multiple rural incentives.

For more information email: physicianrecruitment@interiorhealth.ca
or view us online www.betterhere.ca.



Interior Health

betterhere.ca

RM-306



Family Physicians

**It's more than a practice
.....it's a lifestyle!**

Northern Medical Services is seeking family physicians for full-time, itinerant contract and locum positions available in northern Saskatchewan. Experience practice in a remote setting and receive a competitive remuneration package (compensation in excess of **\$270,000-\$362,000** per annum depending upon qualifications and employment location) plus additional personal and professional benefits too numerous to mention. Locum rate: **\$1400-\$1765** per day plus on-call stipend.

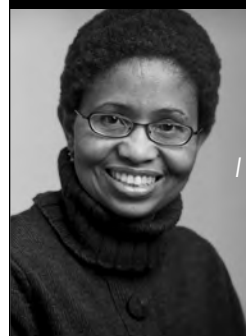
Kerri Balon, Recruitment Coordinator
Northern Medical Services
Division of Academic Family Medicine
404, 333 – 25th Street E.
Saskatoon, SK Canada S7K 0L4
Tel 306 665-2898
Fax 306 665-6077
Toll Free 1-866-NMS-DOCS
(667-3627)
Email balon.nms@sasktel.net



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RM-305

Opportunity to make a lifetime of differences



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communities we are serving.
I am grateful for this opportunity
to make a positive difference."*

Dr. Christina Mokone
Amdocs Physician

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RM-291

It's more than a practice...it's a lifestyle!

Northern Health warmly welcomes Family Practitioners to join many progressive medical teams across the diverse landscape of northern British Columbia, the most beautiful place in Canada!

Northern Health offers...

- Progressive and consultative work environments;
- Generous recruitment incentives;
- Relocation packages designed to take all the stress out of your move;
- Assistance with the immigration process.

Where else...

- Is housing so affordable?
- Does your longest drive occur on the golf course?
- Can you enjoy outdoor adventures such as hiking, kayaking and fishing only minutes from home?

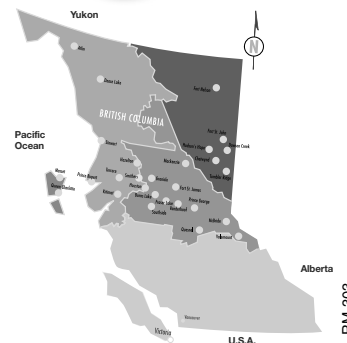
And the great news is...

There are practice opportunities in several of our beautiful northern British Columbia rural communities.

Now that you know the facts... make the most exciting move of your life!

For more information contact:

Sheilagh Wilson, Physician Recruitment Coordinator
Phone: 250-649-7117 • Toll Free: 1-877-905-1155 Ext. 1
Email: Physicians@northernhealth.ca
Visit our website: careers.northernhealth.ca



RM-303

It's the Island calling

FAMILY PHYSICIAN OPPORTUNITIES Vancouver Island, B.C.

Your career can be a demanding one...so why not consider a location where the benefits are *naturally distracting*?

Family Practice opportunities are available in rural and urban locations, including **Port McNeill, Port Hardy, Alert Bay, Lake Cowichan** and on the **Gulf Islands** of **Pender, Salt Spring** and **Gabriola**. The expansive natural beauty, access to amazing recreational activities and one of the best climates in Canada -- Vancouver Island is a mecca for outdoor enthusiasts and offers a quality of life second to none!

An Alternative Payment contract is available in some communities, and several qualify for RPs4BC - a one-time payment of \$100,000 to eligible physicians. In designated communities, a range of attractive **Rural Benefits** are also provided, including:

- | | |
|---|----------------------------|
| • \$10,000 - \$20,000 Recruitment Incentive | • Annual Retention Payment |
| • \$5,000 Relocation Reimbursement | • Annual CME Allowance |
| • Fee-for-Service Premium | • Rural GP Locum Program |

View all our current opportunities at: www.viha.ca/careers/physicians or contact us directly for more information.

Sheila Leversidge, Physician Recruitment Coordinator
Tel: 250-740-6972 • Email: physicians@viha.ca

Discover Vancouver Island ... with unlimited possibilities for your career, family & future!



RM-309

LOOKING FOR A CHANGE?

COME EXPERIENCE A DYNAMIC YOUNG GROWING COMMUNITY

INCLUDING:

THE KINDERSLEY CLINIC IS LOOKING FOR 4 - 6 FAMILY PHYSICIANS

- Transportation from your current home to your new home
- Accommodation and a vehicle for 6 months
- \$30,000 over three years
- Rural Practice Establishment Grant of \$25,000
- The ability to earn in the range of \$350,000 to \$500,000 per year
- The new Rural Physician Incentive Program will provide \$120,000 in funding over five years to recent medical graduates who establish practice in rural communities of 10,000 or less



www.KindersleyClinic.ca
306-501-8484
lwest@actyl.com



KINDERSLEY
www.kindersley.ca *Saskatchewan*

RM-298

Life's better here.

Family/General Practitioner

in Kaslo, British Columbia, Canada



Kaslo is located on Kootenay Lake and is surrounded by the Purcell and Selkirk Mountains, making the outdoor adventure options virtually limitless! We are seeking physicians for our Primary Health Care Centre, a multi-disciplinary IHA public clinic servicing a population of 2,000. Remuneration is highly competitive including multiple Rural Incentives with no overhead. Kaslo is one hour from a Regional hospital in Nelson, and supported by the High Acuity Response Team (HART) by ground and air. Please check out the detailed job postings on www.betterhere.ca.

If interested, please email physicianrecruitment@interiorhealth.ca.



Interior Health

betterhere.ca

RM-304

Rural BC, the place to be.



Smithers, The North



Harrison Lake, Fraser Valley

Meet with our team

Family Medicine Forum
Booth 719
November 7-9, 2013
Vancouver, BC

Fédération des médecins
résidents du Québec (FMRQ)
Outside Quebec Career Day
February 20, 2014
Montréal, Québec

PRACTISE MEDICINE IN BRITISH COLUMBIA Enrich your career. Enhance your quality of life.

Join the hundreds of physicians who have moved to rural British Columbia (BC) to enjoy a quality of life that is envied around the world. Our physician services team can assist you with licensing and immigration, and match your skills and interests with exciting career opportunities. **Register online today!**

PHYSICIANS

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Photo: Picture BC

Open up to a new LAAC option in COPD

IMPROVED PATIENTS' QUALITY OF LIFE

(LS mean change in SGRQ total score vs. placebo, -3.32; $p < 0.001$)^{1,2†}



Pr **SEEBRI* BREEZHALER*** NEW ONCE-DAILY DEMONSTRATED 5-MINUTE ONSET AND 24-HOUR BRONCHODILATION

- FEV₁ improvement shown 5 minutes after first dose (0.093 L vs. placebo, $p < 0.001$, serial spirometry)^{1,3‡}
- Significantly greater LS mean FEV₁ vs. placebo demonstrated at all time points over 24 hours (LS mean FEV₁ [L] vs. placebo after first dose, $p < 0.001$; time points were 5 min, 15 min, 30 min, 1 hr, 2 hrs, 3 hrs, 4 hrs, 6 hrs, 8 hrs, 10 hrs, 12 hrs, 23 hrs 15 min, 23 hrs 45 min)^{4§}

Indication & clinical use:

SEEBRI* BREEZHALER* is indicated as a long-term once-daily maintenance bronchodilator treatment in patients with chronic obstructive pulmonary disease (COPD), including chronic bronchitis and emphysema.

- ▶ Not indicated for the relief of an acute deterioration of COPD
- ▶ Can be used at the recommended dose in elderly patients 65 years of age and older
- ▶ Should not be used in patients under 18 years of age

Relevant warnings and precautions:

- ▶ Not indicated for treatment of acute episodes of bronchospasm
- ▶ Not indicated for treatment of acutely deteriorating COPD
- ▶ Worsening of narrow-angle glaucoma
- ▶ Worsening of urinary retention
- ▶ In severe renal impairment, use only if the expected benefit outweighs the potential risk
- ▶ Paradoxical bronchospasm

For more information:

Please consult the Product Monograph at www.novartis.ca/asknovartispharma/download.htm?res=seebri%20breezhaler_scrip_e.pdf&resTitleId=665 for important information relating to adverse events, drug interactions, and dosing information which have not been discussed in this piece. The Product Monograph is also available by calling the Medical Information department at 1-800-363-8883.

LAAC: long-acting anticholinergic; COPD: chronic obstructive pulmonary disease; LS: least square; SGRQ: St. George's Respiratory Questionnaire; measures health-related quality of life in symptoms, activities and impact on daily life; FEV₁: forced expiratory volume in 1 second.

† GLOW2: A 52-week, randomized, double-blind, placebo-controlled parallel-group study of 1,060 patients with COPD. Patients received either SEEBRI* BREEZHALER* (glycopyrronium 50 mcg o.d.; n=525), placebo (n=268), or open-label tiotropium (18 mcg o.d.; n=267) as an active control. Primary endpoint was 24-hour post-dose (trough) FEV₁ following 12 weeks of treatment.

‡ GLOW1: A 26-week, randomized, double-blind, placebo-controlled parallel-group study to assess the efficacy, safety and tolerability of once-daily SEEBRI* BREEZHALER* (50 mcg) in patients with COPD (n=550); placebo (n=267).

§ LS mean FEV₁ (L) after first dose; SEEBRI* BREEZHALER* (n=169) vs. placebo (n=83), respectively: 5 min: 1.39 vs. 1.30; 15 min: 1.43 vs. 1.28; 30 min: 1.44 vs. 1.28; 1 hr: 1.47 vs. 1.28; 2 hrs: 1.53 vs. 1.34; 3 hrs: 1.53 vs. 1.35; 4 hrs: 1.52 vs. 1.35; 6 hrs: 1.48 vs. 1.33; 8 hrs: 1.47 vs. 1.33; 10 hrs: 1.47 vs. 1.32; 12 hrs: 1.45 vs. 1.31; 23 hrs 15 min: 1.37 vs. 1.27; 23 hrs 45 min: 1.39 vs. 1.31; $p < 0.001$ for all time points.

References: 1. SEEBRI* BREEZHALER* Product Monograph. Novartis Pharmaceuticals Canada Inc., October 12, 2012. 2. Kerwin E, Hébert J, Gallagher N et al. Efficacy and safety of NVA237 versus placebo and tiotropium in patients with COPD: the GLOW2 study. *Eur Respir J* 2012;40:1106-14. 3. D'Urzo A, Ferguson GT, van Noord JA et al. Efficacy and safety of once-daily NVA237 in patients with moderate-to-severe COPD: the GLOW1 trial. *Respir Res* 2011;12:156(1-13). 4. Data on file. Novartis Pharmaceuticals Canada Inc. 5. Jones P. St. George's Respiratory Questionnaire Manual. Available from: www.healthstatus.sgul.ac.uk/SGRQ_download/SGRQ%20Manual%20June%202009.pdf. Accessed December 5, 2011.



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www.novartis.ca
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Once Daily
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breezhaler*
Glycopyrronium inhalation powder