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## DANS CE NUMÉRO



# Open up to a new LAAC option in COPD

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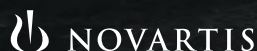
LAAC: long-acting anticholinergic; COPD: chronic obstructive pulmonary disease; LS: least square; SGRQ: St. George's Respiratory Questionnaire; measures health-related quality of life in symptoms, activities and impact on daily life;<sup>5</sup> FEV<sub>1</sub>: forced expiratory volume in 1 second.

† 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) FEV<sub>1</sub> 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 FEV<sub>1</sub> (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.

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### Forest Pattern # 5

*Acrylic on canvas, 22" x 28",  
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*Forest Pattern # 5 depicts the rug-  
gedness of old growth forest and  
the pattern it suggests within the  
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## Competency in rural practice

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In response to the Cochrane report,<sup>1</sup> which arose from a situation where diagnostic images were being interpreted by a physician who did not have the necessary training, the BC government has proposed a new profession-wide quality assurance (QA) process.<sup>2</sup> A minimum number of hours performing anesthesiology, babies delivered, cesarean deliveries performed and so on, will be expected. Although we fully support a QA system, this particular approach has the potential for unintended consequences that could damage family practice in rural settings.

Rural family practice is substantially different from urban family practice by virtue of its generalism. The rural family physician may run a clinic, deliver a baby, give an anesthetic, manage the oncology outreach program and cover the emergency department within a single day. In rural practice, generalism is the norm. Because so many facets of medicine are involved, the numbers of specific procedures performed are typically low compared with those of a physician with a single area of expertise. Despite these low numbers, the outcomes of rural health care have been consistently shown to be good in obstetric and surgical reviews.<sup>3-5</sup>

The proposed use of numbers to determine whether rural physicians are current or competent has no evidence to support it in the literature. There is, however, evidence to show that use of numbers for a QA system has done substantial damage to rural health care services historically.<sup>6-9</sup>

Some years ago, The Society of Obstetricians and Gynaecologists of Canada (SOGC) recommended that a minimum of 25 deliveries per year was

necessary for a physician to remain competent in obstetrics.<sup>10</sup> The College of Physicians and Surgeons of Saskatchewan introduced this requirement, with the consequence that most rural physicians left maternity care. Saskatchewan went from 80% of births being attended by family physicians to less than 20% of births (JANUS database of The College of Family Physicians of Canada: unpublished data).<sup>11-13</sup>

Most important, despite the SOGC subsequently reversing its position and explicitly stating that there is no minimum number of deliveries required to remain competent,<sup>14,15</sup> the damage was done, and the number of deliveries by family physicians in Saskatchewan never recovered.

Rural physicians are generalists. Attempting to measure specific skills using a numbers-based QA system ignores the realities of the broad scope of rural practice, the teamwork and the transference of skills among procedures. Such a system has the effect of shutting down services rather than enhancing and expanding the services provided to rural populations. The loss of any part of a rural medical community has consequences for the entire population that are not seen in the urban environment.<sup>16,17</sup> In the risk-averse climate that now exists, to be advised that your numbers have not reached an arbitrary threshold will be sufficient to cause many rural physicians to cease providing that service, as was seen in Saskatchewan.

There is no evidence that numbers support QA in rural Canada, and numbers-based QA systems have the potential to cause substantial damage. There are other very successful models for continuous quality improvement, such as the MORE<sup>OB</sup> Program (Managing

Obstetrical Risk Efficiently; moreob.com) and The CARE Course (The Comprehensive Approach to Rural Emergencies; thecarecourse.ca), which should inform governments if they intend to protect and promote rural health care.

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## Compétences en pratique rurale

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**E**n réponse au rapport Cochrane<sup>1</sup> issu d'une enquête sur une situation où les images de diagnostic ont été interprétées par un médecin qui n'avait pas la formation nécessaire, le gouvernement de la Colombie-Britannique a proposé un nouveau processus d'assurance-qualité (AQ) pour l'ensemble de la profession<sup>2</sup>. Les médecins devront cumuler un nombre minimum d'heures en anesthésiologie, d'accouchements, de césariennes et ainsi de suite. Bien que nous soyons entièrement en faveur d'un système d'AQ, cette approche risque d'avoir des conséquences imprévues qui pourraient nuire à la médecine familiale en milieu rural.

La médecine familiale en milieu rural est nettement différente de la médecine familiale en milieu urbain en raison de son caractère généraliste. Le médecin de famille en milieu rural peut, dans une même journée, diriger une clinique, pratiquer un accouchement, administrer un anesthésique, gérer le programme de sensibilisation au cancer et travailler à l'urgence. En milieu rural, le généralisme est la norme. Comme le travail de ces médecins est très varié, le nombre d'interventions précises effectuées est généralement faible par rapport à celles pratiquées par un médecin spécialisé dans un seul domaine. Malgré ces faibles taux, les résultats des soins de santé en milieu rural sont bons, comme l'indiquent les études en obstétrique et chirurgie<sup>3-5</sup>.

Il n'existe aucune preuve dans la littérature qui appuie le recours à des seuils quantitatifs pour déterminer si les médecins en milieu rural sont compétents ou si leurs connaissances sont à jour. Il y a, cependant, des preuves indiquant que l'utilisation de tels seuils

pour un système d'AQ a nui substantiellement à des services de soins de santé en milieu rural<sup>6-9</sup>.

En effet, il y a quelques années, la Société des obstétriciens et gynécologues du Canada (SOGC) a recommandé qu'un médecin fasse au moins 25 accouchements par année pour maintenir ses compétences en obstétrique<sup>10</sup>. Le Collège des médecins et chirurgiens de la Saskatchewan a appliqué cette exigence, ce qui a eu pour conséquence que la plupart des médecins ruraux ont cessé d'offrir des soins de maternité. Le nombre d'accouchements pratiqués par des médecins de famille dans cette province est passé de 80 % à moins de 20 % (base de données JANUS du Collège des médecins de famille du Canada : données non publiées)<sup>11-13</sup>.

Plus important encore, lorsque la SOGC a inversé sa position et précisé explicitement qu'il n'y avait pas de nombre minimum d'accouchements nécessaires pour maintenir ses compétences<sup>14-15</sup>, le mal était déjà fait, et le nombre d'accouchements pratiqués par les médecins de famille en Saskatchewan n'est jamais remonté.

Les médecins ruraux sont des généralistes. Tenter de mesurer des compétences particulières à l'aide d'un système d'AQ fondé sur des nombres ne tient pas compte du vaste champ de pratique en milieu rural, du travail d'équipe et du transfert de compétences d'une intervention à l'autre. Un tel système entraîne la fermeture de services plutôt que le renforcement et l'élargissement des services offerts aux populations rurales. La perte de n'importe quelle partie de la communauté médicale en milieu rural a des conséquences pour l'ensemble de la population qui ne

consulte pas de médecins en milieu urbain<sup>16-17</sup>. Dans le climat actuel d'aversion au risque, se faire dire que l'on n'a pas atteint un seuil arbitraire sera suffisant pour que de nombreux médecins en milieu rural cessent de fournir le service en question, comme on l'a vu en Saskatchewan.

Il n'existe aucune preuve que les seuils quantitatifs appuient l'AQ dans le Canada rural, et des systèmes d'AQ fondés sur de tels seuils peuvent avoir de graves répercussions. Par ailleurs, il existe d'autres modèles très efficaces pour l'amélioration continue de la qualité, notamment le Programme AMPRO<sup>OB</sup> (Approche multidisciplinaire en prévention des risques obstétricaux; amproob.com) et le cours CARE (Comprehensive Approach to Rural Emergencies; thecarecourse.ca), qui devraient guider les gouvernements, s'ils ont l'intention de protéger et de promouvoir les soins de santé en milieu rural.

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## President's message. *Acta non verba*\*

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Over the last 20 years, many words have been spoken by a great number of experts about having a sufficient, well-trained rural workforce. Much has been discussed and written on how to achieve this, and some programs in Canada and abroad (especially in Australia) have made great practical progress.

All of this has given us a good idea of the hurdles and the solutions (most of the solutions have been proven in rural areas). Recently, the Cairns Consensus† (a working document from the first World Summit on Rural Generalist Medicine, held in Australia in 2013) has summarized the current situation (the successes and failures) and the necessary actions.

Some major hurdles are the need for socially accountable admissions to medical schools (e.g., rural, Aboriginal, minorities); the need to train students and residents rurally and keep them rural; the need to allow re-entry positions for rural doctors who want to enhance their skills in an area of need for their community; the need for enough rural preceptors who are well-trained, motivated and remunerated; the lack of a national accredited rural curriculum; the maldistribution of doctors in larger centres (the “trickle-down effect” has not worked); the question of how to train generalists; and the question of how to define a generalist.

Some of the solutions are to build the pipeline to practice, engaging rural interest from high school to premedical education to medical school and beyond; to establish admission processes that are socially accountable; to provide rural learning experiences in all years for all students to foster rural interest; to establish rural training pathways that provide

rural focus (i.e., knowledge, skills, attitude and competencies); to support rural practice functionally and financially so rural practice is a reward and not a penalty; to engage many more rural physicians as mentors and teachers; and to build a rural curriculum.

In February 2014, the SRPC and The College of Family Physicians of Canada (CFPC) had a very successful meeting on rural family medicine education. A joint task force was created that will report directly to the SRPC and CFPC executives. The job of this task force is to turn words into action.

Where does “actions, not words” come in for us as rural doctors?

Increased numbers of medical students in expanded rural pathways and the Triple C Competency-based Curriculum will lead to more rural input into the education of students and residents. The general feeling is that rural teachers will more and more be playing a major role in teaching the curriculum and, more important, teaching the competencies of all medical students and residents.

As I mentioned previously,<sup>1</sup> we should not shy away from the larger role of educating Canada's doctors-to-be, especially the rural ones. They are our future.

We can make the difference. Let the action begin!

### REFERENCE

1. de Klerk B. President's message. *Per aspera ad astra*. *Can J Rural Med* 2014;19:5.

\*Actions, not words.

†Copies of the Cairns Consensus are available on request from SRPC administration (admin@srpc.ca).

## Message du président. *Acta non verba*\*

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**A**u cours des 20 dernières années, bien des experts ont parlé de la nécessité d'avoir en milieu rural suffisamment de médecins bien formés. On a beaucoup discuté et écrit sur la façon de parvenir à cet objectif, et certains programmes au Canada et à l'étranger (en Australie p. ex.) ont fait de grands progrès concrets.

Cela nous a donné une bonne idée des obstacles et des solutions (la plupart des solutions ont fait leurs preuves en milieu rural). Récemment, le Consensus de Cairns† (document de travail du premier Sommet mondial de la médecine générale en milieu rural, tenu en Australie en 2013) résume la situation (les réussites et les échecs) et les actions nécessaires.

Voici les principaux obstacles : des admissions socialement responsables dans les facultés de médecine (p. ex., milieu rural, Autochtones, minorités); la formation et la fidélisation des étudiants et des résidents en milieu rural; les possibilités de réintégration pour les médecins ruraux voulant perfectionner leurs compétences dans un domaine prioritaire dans leur collectivité; la présence de suffisamment de précepteurs ruraux bien formés, motivés et rémunérés; l'existence d'un programme rural national agréé; la mauvaise répartition des médecins dans les grands centres (l'effet « de retombée » n'ayant pas fonctionné); le mode de formation des généralistes et la définition de cette profession.

Pour surmonter ces obstacles, on suggère notamment de bâtir le « pipeline » vers la pratique : susciter l'intérêt pour le milieu rural de l'école secondaire à la faculté de médecine et au-delà; établir des processus d'admission socialement responsables; offrir des expériences d'apprentissage en milieu rural à tous les étudiants de toutes les années pour catalyser l'intérêt; établir des voies de

formation en médecine rurale axées sur ce milieu (connaissances, aptitudes, attitudes, compétences); soutenir la pratique rurale fonctionnellement et financièrement afin qu'elle soit perçue comme une récompense et non une sanction; mobiliser davantage de médecins ruraux comme mentors et enseignants; créer un programme d'études rurales.

En février 2014, la SMRC et le Collège des médecins de famille du Canada (CMFC) ont tenu une réunion très fructueuse sur la formation en médecine familiale rurale. Un groupe de travail mixte chargé de transformer les paroles en actions rendra compte directement aux dirigeants de la SMRC et du CMFC.

En quoi l'expression « des actions et non des paroles » s'applique-t-elle à nous, en médecine rurale ?

Un nombre croissant d'étudiants en médecine qui suivent des voies de formation rurale étendues et le cursus Triple C apportera une plus grande dimension rurale à la formation des étudiants et des résidents. On estime que, de plus en plus, les enseignants ruraux joueront un rôle important dans l'enseignement des compétences du cursus à tous les étudiants en médecine et résidents.

Comme je l'ai déjà dit<sup>1</sup>, nous ne devrions pas hésiter à assumer un plus grand rôle de formation des futurs médecins du Canada, en particulier des médecins ruraux. Ils sont notre avenir.

Nous pouvons changer les choses. Agissons !

### RÉFÉRENCE

1. de Klerk B. Message du président. *Per aspera ad astra*. *Can J Rural Med* 2014;19:6.

\* Des actions et non des paroles.

† Des copies du Consensus de Cairns sont disponibles sur demande auprès de l'administration de la SMRC (admin@srpc.ca).



## The modified medical office assistant role in rural diabetes care

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**Introduction:** Diabetes care in Canada is usually provided in family practice offices, which may not have nurses to provide planned, proactive care as recommended by guidelines. The use of medical office assistants (MOAs) to do key tasks in diabetes care may improve the effectiveness of care and reduce costs. We sought to determine whether an expanded MOA role in a rural practice was beneficial to patients and the practice.

**Methods:** We systematically evaluated the provision of diabetes care as measured by key indicators, patient and provider satisfaction, and use of health care services.

**Results:** Involvement by MOAs improved adherence to selected aspects of guideline-based care, and patient and provider satisfaction was high. The actual outcomes of the surrogate markers measured in care and downstream use of acute care services appeared to be unchanged during this study.

**Conclusion:** Use of MOAs to help provide team-based diabetes care in family practice resulted in improved performance of key indicators for diabetes care.

**Introduction :** Les soins aux personnes atteintes de diabète au Canada sont habituellement fournis par des pratiques de médecine familiale qui ne disposent pas nécessairement d'infirmières pour dispenser les soins proactifs planifiés recommandés par les lignes directrices. Le recours aux adjointes de bureau médical (ABM) pour effectuer des tâches clés en soin du diabète peut améliorer l'efficacité des soins et réduire les coûts. Nous avons cherché à déterminer si un rôle élargi pour les ABM dans une pratique rurale était bénéfique pour les patients et la pratique.

**Méthodes :** Nous avons évalué systématiquement la prestation de soins aux personnes atteintes de diabète telle que mesurée par des indicateurs clés, par la satisfaction des patients et des fournisseurs et par l'utilisation des services de santé.

**Résultats :** L'intervention des ABM a amélioré l'observation de certains aspects des soins basés sur les lignes directrices, et la satisfaction des patients et des fournisseurs était élevée. Les résultats concrets au niveau des marqueurs substitués mesurés pour les soins et l'utilisation en aval des services de soins actifs n'ont pas semblé changer au cours de l'étude.

**Conclusion :** Le recours aux ABM pour aider à fournir les soins du diabète en équipe dans une pratique de médecine familiale a amélioré le rendement d'indicateurs clés en soin du diabète.

### INTRODUCTION

Given the major burden of diabetes in Canada, it is vital to improve health outcomes through improved care.<sup>1-7</sup> Diabetes care in Canada is largely provided by family doctors.<sup>5,6</sup> In a busy family practice, following guidelines and providing optimal planned, proactive care is difficult.<sup>5-9</sup> Although health care provided by teams has been proven to decrease

complications from diabetes,<sup>2,6,7,10-13</sup> traditional nurse-led teams may be inaccessible, particularly in rural areas. Rural practice thus poses particular challenges in implementing evidence-based diabetes care, and methods of addressing these obstacles to quality diabetes care are not well known.<sup>14-16</sup>

System redesign has been proposed to improve primary care management of chronic diseases like diabetes.<sup>17-29</sup> The

Practice Support Program in British Columbia began in 2007 as a joint initiative between the British Columbia Medical Association and the BC Ministry of Health. It was intended to provide education and support for redesign of primary practice systems in both rural and urban settings. The Practice Support Program encourages physicians to adopt strategies for quality improvement in their offices and to delegate tasks to appropriate members of the health care team. This allows physicians more time for guideline-directed care of complex chronic conditions during regular appointments.<sup>25,30,31</sup>

Team-led diabetes care allows nurses, dietitians and diabetes educators to take on planning, measurement, data recording and patient education for self-management.<sup>10,22,28-31</sup> Rural access to these services may be limited: resources and health care professionals may be scarce, and fee-for-service family physicians may not be able to afford to employ nurses. However, all physician offices have office staff. A medical office assistant (MOA) is a staff member with clerical skills who typically answers telephones, organizes the front office and manages patient flow and records. Although some have attended a course to teach those tasks, they typically do not have specific skills related to health care. The Practice Support Program has encouraged family physicians to use their MOAs more effectively to support planned, proactive care. Less complex aspects of chronic disease management, such as recall, ordering laboratory tests and measuring vital signs can be capably carried out by MOAs after appropriate training. Such delegation has the potential to improve both efficiency and quality of care, because more information is then available at physician appointments.<sup>30,31</sup> British Columbia's Medical Services Plan has incentive fees for obtaining guideline-based measurements in patients with diabetes according to the Diabetes Patient Care Flow Sheet, based on the clinical practice guidelines of the Canadian Diabetes Association.<sup>6,7</sup> Delegation of tasks to office staff, done with physician guidance, helps in the completion of these measurements. This use of office staff can be funded using these incentive fees.

Our study was an in-practice analysis of a system redesign in a small group practice in Creston, BC. The impetus came in 2005 when a physician reviewed clinic diabetes care and found that only 37% of patients with diabetes in her practice had undergone a glycosylated hemoglobin (HbA<sub>1c</sub>) test in the preceding 4 months. This was average<sup>8,10</sup> but not optimal care. In response to this in-house audit, changes were made. Over a 2-year period an electronic medical record (EMR) was implemented, a registry of

patients with diabetes was created with automatic electronic reminders,<sup>23,32</sup> and an expanded MOA role was developed to support care for the patients in this group practice. We undertook this study to determine whether the expanded MOA role was beneficial to patients and the practice.<sup>33,34</sup> We hypothesized that offering patients with diabetes appointments with MOAs could improve delivery of high-quality, efficient diabetes care as measured by guideline-based care indicators, patient and provider satisfaction, and measures of health care use.

## METHODS

Creston (population 5000, area population 12 000) is located 115 km from a regional hospital and 425 km from a tertiary hospital. Mountain roads make travel difficult, particularly in winter. The study took place within a clinic consisting of 3 full-time practices: 1 practice shared by 2 family physicians (practice 1, intervention) and 2 separate practices of 2 family physicians (practices 2 and 3, control). Early in the study, one of the full-time family physicians died unexpectedly; his practice was thereafter managed by different locum tenentes.

Patients with diabetes were identified using the search function of the clinic's EMR. Letters of invitation were sent to adult patients who were cognitively intact and able to attend clinic appointments. Letters were followed up by a telephone call within 4 weeks. After a full explanation of the study, respondents voluntarily signed informed consent.

The expanded MOA role involved an MOA seeing patients in separate 20-minute appointments for measurement of height, weight, body mass index (BMI), waist circumference and blood pressure; a screening diabetic foot examination; and ordering of routine laboratory tests as per the BC guideline for diabetes care.<sup>7</sup> Influenza and pneumococcal vaccine, emergency department visits and hospital admission were also noted. The intervention group (from practice 1) had been attending MOA visits 2 to 4 times a year for 2 years before the study began, and continued to attend as usual throughout the 12 months of the study. The control group (from practices 2 and 3) received only usual care from their family doctors until the 6-month point of the study, when they began attending MOA appointments. For the final 6 months of the study, all participants attended MOA appointments. Normal care from each family physician was available as usual at all times.



Appointments with MOAs were scheduled at 0, 3, 6, 9 and 12 months in the intervention group and at 6, 9 and 12 months in the control group. Data from the 2 groups, including physical and laboratory observations (e.g., weight, blood pressure, waist circumference, HbA<sub>1c</sub>, metre calibration and lipid panel) were recorded at 0, 3, 6, 9 and 12 months. To prevent repetition of services, data in the patient record for 3 months preceding the study were used to compare the groups initially and were included in the data at 0 months. We compared the frequency of measurements in the 2 groups for the 6 months before the control group started MOA appointments (0–6 mo) and at 6, 9 and 12 months when all patients were receiving the same care. We hypothesized that the 2 groups would differ initially but would become more similar by the end of the study, based on assessment of these aspects of diabetes care.

We used qualitative surveys to measure patient and provider satisfaction. We measured use of health care by recording the number of office visits, emergency department visits and hospital inpatient days. Deaths and their causes were noted.

We used a 2-sample *t* test of means and the Mann–Whitney rank test (because the distribution of counts was strongly skewed). For numerical measures, the number of measures in the first part of the study (0–6 mo) was compared with the number of measures in the second part of the study (6–12 mo).

The University of British Columbia Ethics Review Board gave ethical approval for the study.

## RESULTS

Practice 1 had 76 patients with diabetes, 55 (72%) of whom were women. Practices 2 and 3 had a total of 111 patients with diabetes, 45 (40%) of whom were women.

We recruited 100 patients. Four patients were later excluded from the study results: 3 did not attend appointments and 1 had impaired glucose tolerance, not diabetes. A total of 46 participants in the intervention group from practice 1 received care from both MOAs and family physicians throughout the study year. A total of 50 control participants from practices 2 and 3 received usual family physician care for the first 6 months of the study with MOA appointments added for the second 6 months. The participants in each group were similar to the total group of patients with diabetes in the practice they belonged to with respect to sex, age, number of days since last HbA<sub>1c</sub> and blood pressure measurement, and the value of the last HbA<sub>1c</sub> and blood pressure measurement. Thus, the participants fairly represented the total group of patients with diabetes in each practice (Table 1). Patient age in the control and intervention groups were not statistically different, with a mean age of 65 ( $\pm 12$ ) years for the control group and 67 ( $\pm 12$ ) years for the intervention group (*t* test *p* = 0.6). However, the 2 groups were significantly different with respect to sex; in the control group, 38% (19/50) were female, whereas in the intervention group, 70% (32/46) were female (*p* = 0.002). Patients in the intervention and control groups were also significantly different with respect

**Table 1. Characteristics of participants and total groups of patients with diabetes in intervention and control practices at baseline**

Characteristic	Mean (SD)*			
	Intervention (practice 1)		Control (practices 2 and 3)	
	Participants, <i>n</i> = 46	Total group, <i>n</i> = 76	Participants, <i>n</i> = 50	Total group, <i>n</i> = 111
Age, yr	67.0 (12.0)	66.4 (14.1)	65.0 (12.0)	65.3 (11.2)
Female, %	70	72	36	40
Time since last HbA <sub>1c</sub> measurement, d	120.4 (104.3)	100.2 (83.0)	207.5 (231.3)	214.3 (231.6)
HbA <sub>1c</sub> value, %	7.1 (1.0)	7.1 (1.1)	7.3 (1.5)	7.3 (1.5)
> 6 mo since HbA <sub>1c</sub> measurement, no. (%)	5 (10.9)	7 (9.2)	19 (38.0)	44 (39.6)
Time since last BP measurement, d	77.5 (66.6)	72.4 (58.0)	138.2 (112.6)	153.9 (142.0)
Last systolic BP value	131.3 (15.6)	132.2 (16.7)	128.3 (17.8)	132.9 (16.9)
Last diastolic BP value	74.9 (8.5)	75.8 (8.4)	78.3 (8.7)	79.3 (8.7)
> 6 mo since last BP measurement, no. (%)	1 (2.2)	2 (2.6)	16 (32.0)	35 (31.5)

BP = blood pressure; HbA<sub>1c</sub> = glycosylated hemoglobin; SD = standard deviation.

\*Unless stated otherwise.

to the number of days since last HbA<sub>1c</sub> and blood pressure measurement and diastolic blood pressure value. There was no significant difference in HbA<sub>1c</sub> or systolic blood pressure value. Patients in the intervention group had measurements done significantly more recently (Table 2).

The frequency of some measurements increased with MOA involvement. During the first 6 months, significantly more participants in the intervention group than in the control group had a foot examination, meter calibration, pneumococcal vaccination, and measurement of blood pressure, weight, BMI, waist circumference and HbA<sub>1c</sub>. No significant differences were seen with respect to frequency of eye examinations, flu vaccination, lipid panel or urine albumin to creatinine ratio (ACR) (Table 3). After the control group began MOA appointments in the second part of the study (6–12 mo), the frequency of all measures improved in both groups, with foot and eye examinations approaching optimal rates.

Meter calibrations improved in frequency, but most patients in both groups had not had one by the study's end. All participants in each group had blood pressure, weight, BMI and HbA<sub>1c</sub> measurements. Waist circumference measurements, lipid panel and urine ACR also approached optimal rates (Table 4). In the first part of the study, the intervention group had, on average, significantly more frequent assessments of blood pressure and HbA<sub>1c</sub>. After both groups received MOA appointments, the differences in means were no longer significant.

Because the Mann–Whitney and the 2-sample *t* test of means showed very similar *p* values, only the 2-sample *t* test results are shown (Table 5). Although MOA involvement increased the frequency of assessments being done and recorded, there were no statistically or clinically significant differences in the numerical values of blood pressure, weight, BMI, lipid panel results, or urine ACR measures in either group during the study. Too few waist circumference measurements

**Table 2. Comparison of participants and total groups of patients with diabetes in intervention and control groups at baseline**

Variable	Mean (SD)*						Participants: intervention v. control, <i>p</i> value
	Intervention			Control			
	Participants	Total group	<i>p</i> value	Participants	Total group	<i>p</i> value	
Time since last HbA <sub>1c</sub> measurement, d	118.9 (105.0)	100.2 (83.0)	0.2	207.5 (231.3)	214.3 (231.6)	0.9	0.02
HbA <sub>1c</sub> value, %	7.1 (1.0)	7.1 (1.1)	0.7	7.3 (1.5)	7.3 (1.5)	> 0.9	0.4
Time since last BP measurement, d	75.9 (66.4)	72.4 (58.0)	0.7	138.2 (112.3)	153.9 (142.0)	0.5	0.002
Last systolic BP value	131.2 (15.7)	132.2 (16.7)	0.8	128.3 (17.8)	132.9 (16.8)	0.1	0.4
Last diastolic BP value	74.8 (8.6)	75.8 (8.4)	0.6	78.3 (8.7)	79.3 (8.7)	0.5	0.06
BP = blood pressure; HbA <sub>1c</sub> = glycosylated hemoglobin; SD = standard deviation. *Unless stated otherwise.							

**Table 3. Performance of guideline-recommended tasks during the first part of the study (0–6 mo)**

Task	% (no.) of participants		<i>p</i> value	95% CI for difference (intervention – control), %
	Intervention, <i>n</i> = 46	Control, <i>n</i> = 50		
Foot exam	61 (28)	0 (0)	< 0.001	46 to 74
Eye exam	54 (25)	56 (28)	0.9	–21 to 18
Influenza vaccination	67 (31)	60 (30)	0.4	–12 to 26
Pneumococcal vaccination	74 (34)	40 (20)	< 0.001	14 to 51
Meter calibration	20 (9)	0 (0)	0.001	11 to 33
BP measurement	100 (46)	82 (41)	0.003	10 to 31
Weight and BMI measurement	98 (45)	60 (30)	< 0.001	24 to 52
Waist circumference measurement	65 (30)	0 (0)	< 0.001	51 to 77
HbA <sub>1c</sub> ordered	100 (46)	78 (39)	0.001	13 to 35
Lipid panel ordered	70 (32)	60 (30)	0.3	–10 to 28
Urine ACR ordered	50 (23)	54 (27)	0.7	–23 to 16

ACR = albumin to creatinine ratio; BMI = body mass index; BP = blood pressure; CI = confidence interval; HbA<sub>1c</sub> = glycosylated hemoglobin.

were performed in the control group for comparison.

The mean number of physician appointments in each period (0–6 mo and 6–12 mo) and during the entire study duration did not differ significantly between groups (Table 6). The control and intervention groups were also similar in the percentage of patients who had any emergency department visits or inpatient days in hospital, with no differences at any of the time points (Table 7).

Five participants died during the study period, 2 in the control group and 3 in the intervention group. One from each group died from diabetes complications:

pneumonia/chronic kidney disease (1), cerebrovascular accident (1). The other deaths were from malignancies (2) and alcoholic liver disease/gastrointestinal bleed (1). No statistical inferences could be made.

Physician responses to surveys at the beginning and end of the study indicated that all physicians thought diabetes care could be improved in the clinic. At the completion of the study, 2 physicians commented that they appreciated the increased communication from MOAs who saw patients.

Interactions with MOAs were well accepted by patients. The electronic reminder system alerted office

**Table 4. Performance of guideline-recommended tasks at any time during the study**

Task	% (no.) of participants		<i>p</i> value	95% CI for difference (intervention – control), %
	Intervention, <i>n</i> = 46	Control, <i>n</i> = 50		
Foot exam	87 (40)	88 (44)	0.9	–15 to 13
Eye exam	85 (39)	90 (45)	0.4	–20 to 8
Influenza vaccination	74 (34)	66 (33)	0.4	–11 to 26
Pneumococcal vaccination	78 (36)	48 (24)	0.001	11 to 47
Meter calibration	57 (26)	24 (12)	0.001	13 to 50
BP measurement	100 (46)	100 (50)	> 0.9	–8 to 7
Weight and BMI measurement	100 (46)	100 (50)	> 0.9	–8 to 7
Waist circumference measurement	80 (37)	86 (43)	0.5	–21 to 10
HbA <sub>1c</sub> ordered	100 (46)	100 (50)	> 0.9	–8 to 7
Lipid panel ordered	98 (45)	96 (47)	0.6	–6 to 14
Urine ACR ordered	94 (43)	94 (47)	0.9	–12 to 11

ACR = albumin to creatinine ratio; BMI = body mass index; BP = blood pressure; CI = confidence interval; HbA<sub>1c</sub> = glycosylated hemoglobin.

**Table 5. Frequency of blood pressure and glycosylated hemoglobin measurement in the first part (0–6 mo) and second part (6–12 mo) of the study**

Measurement; study period	No. of measurements, mean (SD)		<i>p</i> value
	Intervention*	Control	
BP: 0–6 mo	3.41 (2.78)	2.16 (1.98)	0.01
BP: 6–12 mo	4.91 (3.69)	3.92 (2.56)	0.1
HbA <sub>1c</sub> : 0–6 mo	2.02 (0.80)	1.30 (0.91)	< 0.001
HbA <sub>1c</sub> : 6–12 mo	2.72 (1.21)	2.32 (1.17)	0.1

BP = blood pressure; HbA<sub>1c</sub> = glycosylated hemoglobin; SD = standard deviation.

\*The intervention group had statistically more BP and HbA<sub>1c</sub> measurements during the first part of the study. This significance was lost after appointments with medical office assistants were started for the control group.

**Table 6. Frequency of physician appointments in the first part (0–6 mo) and second part (6–12 mo) of the study**

Study period	No. of appointments, mean (SD)		<i>p</i> value
	Intervention	Control	
0–6 mo	7.26 (5.39)	7.64 (5.95)	0.8
6–12 mo	9.41 (7.68)	7.74 (7.61)	0.3
0–12 mo	16.67 (12.50)	15.38 (16.67)	0.6

SD = standard deviation.

**Table 7. Hospital use at any time during the study**

Hospital use	Group; % (no.) of participants		<i>p</i> value
	Intervention, <i>n</i> = 46	Control, <i>n</i> = 50	
Any visits to local ED	50 (23)	56 (28)	0.6
Any visits to other ED	6 (3)	6 (3)	0.9
Any days in hospital	20 (9)	32 (16)	0.2

ED = emergency department.



staff to call patients in for an MOA appointment when diabetes care was due. Acute problems were not dealt with during MOA appointments, and the tests recommended to monitor patients' progress received the necessary priority. Results of these measurements were then available for the physician at the follow-up appointment to aid medical management.

Patient satisfaction surveys showed that patients in both groups were satisfied with their care before and after MOA appointments were initiated, as rated on a numerical scale. Patient comments about the program were largely positive and included descriptions of MOAs as "friendly," "helpful," "sensitive," "caring," "supportive," "good at making sure I get regular laboratory work done" and "keeping a close eye on my feet." The most common comment thread in both groups both at the beginning and the end of the study was, "Overall, I would not change anything about the care I am receiving." Most patients enjoyed the involvement of the MOAs, but some were satisfied without it. Two patients commented, "Enjoy the staff but my doctor does a good job of looking after my diabetes on his own."

## DISCUSSION

Clinical practice guidelines are intended to systematize, standardize and improve complex clinical tasks and streamline management. The guidelines of the Canadian Diabetes Association and the BC Ministry of Health–British Columbia Medical Association recommend optimal specific measurement intervals and indicator values for key markers known to improve diabetes outcomes.<sup>2,6,7</sup> For complex reasons, many patients with diabetes do not receive the recommended frequency of clinical measurement or laboratory testing.<sup>2,6,8,9</sup> During a traditional office visit, priorities must be set, and physicians are trained to respond to the patient's clinical concerns or priorities, which may result in decisions about chronic conditions being postponed while acute conditions are attended to.<sup>12,21,35,36</sup> Developing and organizing planned, proactive care for chronic health conditions requires a major shift in a physician's focus in the examination room because it involves performing clerical tasks and clinical measurements that may not be a priority for the patient at that time. Rural physicians, who are both highly trained and constrained for time, are a resource that is poorly invested in performance of these important but simple tasks. Recalling patients to the physician simply for ordering tests and performing guideline recommendations can result in longer waiting lists for appointments.

Team-based care offers an opportunity to address some of these challenges.<sup>2,6,7,10,12,13,15,25,26,28,33</sup> To meet this need, the role of MOAs in our clinic was expanded to enhance diabetes care. Medical office staff already have a relationship with the patients they see and are often trusted members of the care team as the first contact for patients reaching out for medical care. The use of MOAs to assist in team-based care required freeing time from the other myriad duties they perform on a regular basis. This was made possible by improving office efficiencies and using less experienced staff for less complex tasks, allowing the most capable MOAs to expand their role to be part of the diabetes care team.

How can the improvements resulting from a system change like MOAs be assessed? Guidelines recommend an ideal frequency of measures known to aid in diabetes management. If the performance of routine blood tests and measurement of vital signs at recommended frequency is considered improved care, then the MOA appointments improved care substantially because all participants had more frequent measurements with MOA involvement. It is accepted that good diabetes management cannot occur without adequate measurement, which should positively affect the treatment process and eventually result in improved outcomes.<sup>2,6,7</sup> However, even when results of measurements such as HbA<sub>1c</sub> and blood pressure are available, the phenomenon of clinical inertia means that clinicians may not take appropriate action to lower abnormal readings. Appropriate action cannot be taken if measurements have not been done, but appropriate action is often not taken even when the physician is aware that results are suboptimal. The best way to influence physician management is uncertain and needs further study.<sup>34–40</sup>

Appointments with MOAs did not appear to affect diabetes control or use of acute care services during this study. The appointments did have a positive effect on office organization and patient and physician experience within this small group practice.

Training and use of existing office staff to track results, manage clerical details, and provide time to obtain diabetic measurements is a practical system change to improve measurement and information gathering within a rural family practice. Much research has been done on system redesign for improved diabetes care, both in terms of broad-spectrum change within health regions and smaller system changes. Large system redesign programs imposed by external influences may be unsustainable over time as competing clinical priorities come and go. Sustainable small system changes are often

untested. This study considers those issues in actual practice, and the results are positive enough to continue. Momentum for quality improvement and system redesign in family practice requires ongoing time, energy, support and funding. Current fee-for-service payment models require physicians to be creative and efficient in how they use their staff time and resources. Movement toward different funding models to support use of office personnel for appropriate tasks has the potential to improve the quality of diabetes care in rural practices.

## Limitations

One practice involved in this study was managed by several locum tenentes for the year, with considerable variability in care. The intervention and control groups differed significantly in patient sex, possibly owing to the sex of the physicians (practice 1 was shared by 2 female physicians, and practices 2 and 3 had male physicians).<sup>41</sup> It was not possible to measure what effects these factors had on the results. In addition, this study did not measure the opportunity costs of diverting MOA time (at \$20/h) to providing diabetes care, and conversely, the economic and clinical benefits of supporting physicians to use their time for tasks other than measuring and recording diabetes markers. Care by MOAs resulted in increased frequency of diabetic measurement, such as HbA<sub>1c</sub> and blood pressure. The frequency of measures is a surrogate marker for better-organized care, long thought to mean higher-quality diabetes management.<sup>36-40</sup> Appropriate physician reaction to an abnormal result with patient recall, a change in therapy and a follow-up plan would indicate a better marker for improved care.<sup>38</sup> Improvement in intermediate markers such as HbA<sub>1c</sub> and blood pressure values may have been seen if the study had continued longer, with decreased long-term diabetes complications the eventual result. A crossover study with a larger sample over a longer period would have given more data.

## CONCLUSION

This study's aim was to evaluate the benefits of a system change in a rural family practice. The results show that inclusion of MOAs in the diabetes care team improved the frequency of measurements recommended by guidelines for diabetes care.

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## CORRECTION

In the article "Industrial wind turbines and adverse health effects," reference 41 should be "Correspondence from the Honourable Rona Ambrose. June 30, 2009."

## REFERENCE

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## The effect of clinical teaching on patient satisfaction in rural and community settings

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**Introduction:** Few studies have examined the effect of clinical teaching on patient satisfaction in rural and community-based settings. We sought to examine whether patient satisfaction differed when patients were seen by a physician alone or by a physician and medical student in these settings.

**Methods:** We conducted a cross-sectional study in rural and community-based settings in southern Ontario (3 obstetrician–gynecologist offices and 4 family medicine clinics). Patients seen by a physician with or without a medical student present completed satisfaction and attitudes questionnaires about their experience.

**Results:** Patient satisfaction was high across both groups and did not differ when segregated by patient age, sex or employment status. Satisfaction scores were similar for patients seen by a physician with or without a student present. Satisfaction scores did not differ based on practice location. Patients' reasons for agreeing to be seen by a medical student included helping to teach students about medical concerns and helping to train future doctors.

**Conclusion:** Patients in rural and community-based outpatient settings were satisfied with their care when a medical student was involved.

**Introduction :** Peu d'études ont analysé l'effet de l'enseignement clinique sur la satisfaction des patients en milieu rural et communautaire. Nous avons cherché à déterminer si la satisfaction des patients différait lorsqu'ils étaient accueillis par un médecin seul ou par un médecin et un étudiant en médecine dans ces contextes.

**Méthodes :** Nous avons réalisé une étude transversale en milieu rural et communautaire du sud de l'Ontario (3 bureaux d'obstétriciens-gynécologues et 4 cliniques de médecine familiale). Les patients reçus par un médecin accompagné ou non d'un étudiant en médecine ont rempli des questionnaires sur la satisfaction et les attitudes au sujet de leur expérience.

**Résultats :** La satisfaction des patients était élevée dans les deux groupes et ne différait pas lorsqu'elle était distinguée selon l'âge et le sexe du patient ou le statut d'emploi. Les scores de satisfaction étaient semblables pour les patients reçus par un médecin accompagné ou non d'un étudiant. Les scores de satisfaction n'ont pas différé en fonction du lieu de pratique. Les raisons pour lesquelles les patients ont accepté d'être vus par un étudiant en médecine comprenaient le fait d'aider à donner aux étudiants de la formation au sujet de problèmes médicaux et d'aider à former de futurs médecins.

**Conclusion :** Les patients reçus en clinique externe dans les milieux rural et communautaire étaient satisfaits des soins reçus lorsqu'un étudiant en médecine était présent.

### INTRODUCTION

The provision of medical education is increasingly being distributed away from large urban centres toward rural and community-based settings.<sup>1</sup> However,

there are limited data on the effect of medical students on patient satisfaction in rural and community-based settings.

There is evidence that most patients will accept student involvement in their care in urban ambulatory care settings.<sup>2-8</sup>

Patient consent to medical student involvement in their care is affected by the specific information given to patients and at what point leading up to the clinical encounter they are asked, the nature of the visit, the degree of doctor supervision and prior experience with medical students.<sup>8,9</sup>

Supervision of medical students increases physician satisfaction and improves medical practices.<sup>10</sup> However, concerns expressed by physicians about supervising medical students include patient fatigue, disruption of the doctor–patient relationship, pressured patient consent and interference with patient comprehension.<sup>9,11</sup> Physicians tend to underestimate the effect of teaching encounters on patient satisfaction.<sup>9,11–13</sup> Patients report a number of advantages when involved in the teaching of medical students, including feelings of altruism, enhanced patient education and improved care.<sup>2,3,14–18</sup> Patient age, sex, employment status and practice type have been previously found to influence patient satisfaction.<sup>19</sup>

We sought to determine whether the presence of a medical student in a rural or community-based clinic consultation affected patient satisfaction and which factors influenced patients' decision to consent to medical student involvement in their care.

## METHODS

We used a modified version of the American Board of Internal Medicine Patient Satisfaction Questionnaire (ABIM PSQ)<sup>20</sup> to assess patients' general satisfaction with their consultation. The questionnaire contains 9 questions and is scored on a 5-point Likert scale that ranges from "strongly agree" to "strongly disagree." Questions are intended to measure the quality of physicians' communication skills, humanistic behaviour and the appraisal of professionalism in medicine.<sup>21</sup>

As well, patients who attended a teaching consultation were given a second questionnaire to determine their expectations of student involvement and reasons for participating in teaching. This questionnaire was also scored on a 5-point Likert scale and ranged from "strongly agree" to "strongly disagree." Because there were no pre-existing questionnaires that met the study needs in this area, we created a survey using themes from other research on the expectations of involvement and reasons for agreeing to participate in teaching. To help counteract the expected ceiling effect of high satisfaction ratings, we framed the questionnaire to encourage critical responses.

## Study setting and participants

The McMaster Community and Rural Education Program (Mac-CARE) arranges educational opportunities for third-year medical students in communities and rural areas in the southern Ontario regions of Niagara, Brantford and Waterloo–Wellington. Preceptors affiliated with Mac-CARE were contacted by email and invited to take part in the study over a 2-month period. Physicians who expressed interest were enrolled in the study. Study locations included obstetrician–gynecologist (OB-GYN) offices and family medicine clinics, and all were in communities throughout southern Ontario. Participants were patients of the preceptors who were visiting their doctor with a wide variety of medical inquiries. Only patients aged 18 years or older were asked to participate.

## Data collection

Sampling was carried out on a single morning or afternoon in each clinic by the primary investigator. When patients arrived at the office, the receptionist explained the study and directed patients to the investigator, who explained the nature of the research and obtained consent. At this time, patients were asked if they would consent to the experimental group where they would be seen by a medical student and the physician. If they did not agree, they were asked for their participation in the study's control group, where they were seen only by the physician and would fill out the modified ABIM PSQ. This study did not lend itself to random sampling because patient consent was required to allow a medical student to be present. Following their appointments, patients in the experimental group completed the modified ABIM PSQ and the questionnaire that assessed their reasons for engaging with a medical student. Participants in the control group completed only the modified ABIM PSQ. Participants completed the surveys in or near the waiting room, and the investigator remained in the room to answer questions. To increase the response rate among patients unable to read the survey, patients were given the option of having the investigator read the questions aloud and record their responses.

The goal was to obtain an equal number of patients who were involved in a teaching encounter and those who interacted with the doctor alone.

## Ethical considerations

The research ethics board of Hamilton Health Sciences and McMaster University gave ethical approval.

Patients were assured that the study was completely voluntary, and the investigator was identified as independent of the clinical staff. Consent to participate was verbal, so no identifying information was recorded from patients. Participants who did not have enough time following their consultation to complete the survey were given a blank questionnaire and return envelope.

## Statistical analysis

Analysis was performed using SPSS statistical software. The reliability of the modified ABIM PSQ was determined to be 0.96 using Cronbach  $\alpha$  analysis, indicating that the variance in satisfaction scores was due to variation in true differences between individuals, rather than an inaccuracy in the measurement tool. All questionnaires were properly completed and scores for the modified ABIM PSQ were expressed as a summed total, with 45 being the highest obtainable score. Higher scores indicate higher levels of satisfaction among participants. Differences were considered statistically significant at  $p < 0.05$ . We used the Student  $t$  test to detect differences in mean satisfaction ratings between the groups. To ensure our data were normally distributed, we used the nonparametric Wilcoxon rank-sum test to verify these results. Because a control group was not available for the results from 1 clinic, the data were removed and the analysis repeated with the remaining participants to ensure consistency. We compared demographics (sex, age and employment status) between groups to ensure similar populations. We used the Mann–Whitney  $U$  test for continuous comparisons and the Fisher exact and  $\chi^2$  tests to compare categorical variables between groups.

Because patient age, sex and employment status, and practice type were previously found to influence patient satisfaction,<sup>19</sup> we analyzed pooled satisfaction scores using regression analysis. Clinical teaching questions on the second survey were analyzed using descriptive statistics. For the purposes of analysis, the responses “agree” and “strongly agree” were combined, as were “disagree” and “strongly disagree.” We used  $\chi^2$  tests to compare proportions.

## RESULTS

We contacted 13 preceptors affiliated with MacCARE. Seven doctors were enrolled from 7 clinics; 3 were OB-GYN offices and 4 were family practices. For 1 practice, we were unable to obtain a control group because most of the patients had been previously involved with medical students and agreed to be involved in this type of consultation.

The primary investigator distributed surveys for 45 patients at the 7 locations and all were returned, yielding a 100% response rate. Of the surveys, 44 were completed immediately after the consultation and 1 was submitted by mail.

## Patient characteristics

Table 1 shows the characteristics of patients in both groups. Of note, the sample consisted of a higher proportion of female than male patients (86.7% women: 83.3% women in the group seen by a physician only; 88.9% women in the group seen by a physician and medical student). There were no notable differences in demographic characteristics between the groups.

## Level of satisfaction

Patient satisfaction scores were high across both groups and were not affected by the presence of a medical student ( $t_{43} = 0.23$ ,  $p = 0.1$ ) (Table 2). In the group who had students present during their visit, the mean satisfaction score was 43.07 out of 45; participants who saw their doctor alone had a mean score of 42.72 out of 45. One site lacked a control group and these patients had more experience with medical students, which raised the concern that this group may not accurately reflect the general population. However, removal of these patients from the analysis revealed no difference in the satisfaction scores (data

**Table 1. Characteristics of 45 patients seen by a physician with or without a medical student present**

Characteristic	Group; no. (%) <sup>*</sup>		<i>p</i> value
	No student present, <i>n</i> = 18	Student present, <i>n</i> = 27	
Age, mean (SD), yr	50.2 (18.7)	47.6 (20.1)	0.6†
Female sex	15 (83.3)	24 (88.9)	0.6‡
Employment status			0.5†
Employed	9 (50.0)	11 (40.7)	
Retired	8 (44.4)	8 (29.7)	
Looking after home	1 (5.6)	4 (14.8)	
Looking after family	0	1 (3.7)	
Student	0	2 (7.4)	
Unable to work	0	1 (3.7)	

SD = standard deviation.

<sup>\*</sup>Unless stated otherwise.

†Mann–Whitney  $U$  test.

‡ $\chi^2$  test.



not shown). We also compared satisfaction ratings within individual practices and found there was no statistical difference between patients seen by physicians with and without students present (Table 2).

### Factors affecting satisfaction

Patient satisfaction ratings did not differ when segregated by patient age, sex or employment status. Our study identified no significant differences in patient satisfaction at OB-GYN clinics compared with family practice settings (Table 2). Similarly no significant differences were seen in patients' satisfaction ratings in rural practices versus community-based locations (Table 2).

### Patient engagement in student teaching

Table 3 shows the results from the second questionnaire given to patients who saw a medical student.

## DISCUSSION

Medical student involvement during outpatient visits did not adversely affect patient satisfaction in these rural and community-based settings. Patients who met with medical students reported doing so to help further the students' education and to help train future doctors. Of the patients who saw a medical student, 93% would recommend participating in medical teaching to friends and family, which further highlights patient acceptance of students in these settings.

These findings are in line with previous studies on this topic done in community-based settings.<sup>2,3,14-18</sup>

According to previous findings, the intimate nature of OB-GYN examinations makes women less likely to consent to involvement by medical students.<sup>8,22-24</sup> In contrast, this study found that women reported a higher level of satisfaction with teaching appointments at OB-GYN clinics than patients at family medicine practices. Another unexpected finding was that patients were willing to allow student participation even if they were not comfortable with the encounter. In addition, the presence of a medical student during a sensitive procedure is enough to make some patients feel uncomfortable, yet it does not deter them from participating in clinical teaching, as seen in Table 3. This finding is important for preceptors in rural medicine to ensure that they ask for patient consent to student involvement in gynecologic examinations and in discussing sexual or emotional topics.

Research has shown that patients in rural and small communities often give more value to continued care from the same physician, building trust and forming personal relationships,<sup>25</sup> which stresses the importance of examining satisfaction in these settings. As in the rest of Canada, rural and small communities have been facing a shortage of family physicians and specialists.<sup>26</sup> One interpretation of our study group's willingness to take part in clinical teaching may stem from the belief that by exposing more medical students to their practice, they will have a better chance of attracting them to work in their community.

**Table 2. Satisfaction ratings of patients seen by a physician with or without a medical student present**

Measure	Group; mean satisfaction rating*			p value	
	No student present	Student present	Total	Within groups	Within locations
Overall	42.72	43.07	42.93	0.8	
Setting					0.1
Rural	41.44	41.75	41.62	0.9	
Small community	44.00	44.13	44.08	0.9	
Practice type					0.2
OB-GYN	45.00	43.69	44.06	0.07	
Family practice	41.85	42.50	42.19	0.8	
Clinic					0.008
1	NA	41.75	41.75	NA	
2	45.00	45.00	45.00	> 0.9	
3	44.00	45.00	44.50	0.4	
4	44.25	42.75	43.50	0.6	
5	45.00	44.20	44.43	0.6	
6	42.50	45.00	44.00	0.3	
7	35.33	36.33	35.83	0.9	

NA = not applicable; OB-GYN = obstetrician-gynecologist.

\*Out of a possible score of 45.

The finding of extremely high levels of patient satisfaction across all consultations may lead some to believe that the study surveys were unable to detect a difference in satisfaction due to low sensitivity.<sup>4</sup> However, because this study was able to show a statistical difference in patient satisfaction ratings between individual clinics, the study instruments would have revealed a student-induced change in patient satisfaction if one existed. We believe that the perfect response rate was influenced by the fact that the survey was noninvasive and people were happy to participate.

This study provides information on patient satisfaction in rural and community-based settings. It offers a Canadian perspective to the literature on clinical teaching in rural and community-based settings, which otherwise comprises mostly American or Australian studies. Qualitative reporting from

patients offers a glimpse into their opinions about clinical teaching and their desire to ensure an adequate supply of health care providers in their communities. It also highlights patients' altruistic motives in consenting to student involvement in their care, which extends to procedures that make them feel uncomfortable.

## Limitations

One limitation of the study is that we were unable to use randomization to eliminate bias from patients who may have positive feelings toward students in general, which are then reflected in their satisfaction scores. Replication of this study using patients randomly assigned to student groups would aid in validating our findings, but this would involve logistics and ethical considerations.

**Table 3. Questionnaire responses of 27 patients seen by a physician and medical student**

Question	Response; % of patients				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I agreed to participate in medical student involvement because:					
I wanted to help in the training of future doctors	81.5	18.5	0	0	0
I wanted to teach the student about my medical concerns	51.9	25.9	18.5	3.7	0
I feel I help the development of professional skills and attitudes	63.0	25.9	11.1	0	0
My doctor asked me to	33.3	22.2	33.3	7.4	3.7
I understand my illness/treatment much better after hearing the doctor teach the student	18.5	44.4	37.0	0	0
Meeting with the student reinforced my feelings of ill health	3.7	3.7	14.8	40.7	37.0
I worry that the student will discuss me after my visit	3.7	3.7	11.1	40.7	40.7
I prefer to see my doctor alone	3.7	0	51.9	18.5	25.9
I was told exactly what activities the medical student would be helping with	55.6	37.0	3.7	3.7	0
I would agree to allow the medical student to take part in the following situations:					
Taking medical history	66.7	33.3	0	0	0
Gynecological or internal exams	33.3	37.0	18.5	11.1	0
Emotional issues	40.7	33.3	14.8	7.4	3.7
Sexual problems	29.6	25.9	33.3	7.4	3.7
I would feel comfortable if the medical student was involved in the following situations:					
Taking medical history	70.4	29.6	0	0	0
Gynecological or internal exams	33.3	22.2	18.5	25.9	0
Emotional issues	40.7	33.3	11.1	11.1	3.7
Sexual problems	29.6	33.3	22.2	11.1	3.7
I would agree to be examined by a student with my doctor present	55.6	37.0	7.4	0	0
I would agree to be examined by a student without my doctor present	18.5	33.3	11.1	33.3	3.7
I would recommend participating in these medical teachings to family and friends	55.6	37.0	7.4	0	0

Another limitation is the disproportionate representation of female patients. Even after we controlled for OB-GYN clinics, women still outnumbered men in the study. However, women have been found to use medical services more often than men, so having more women is not surprising.<sup>27</sup> In addition, previous research has disputed the claims that patient sex has any significance in overall patient satisfaction ratings.<sup>28,29</sup>

Finally, prior experience with a medical student is a facilitating factor in allowing student involvement in appointments<sup>22</sup> and having a higher level of satisfaction.<sup>8,9,17,28,30–33</sup> The practices involved in our study often serve as teaching sites; it is unclear whether new teaching sites would have similar satisfaction ratings or if patient satisfaction with student involvement takes time to develop.

## CONCLUSION

To ensure the continued success and growth of distributed education, a better understanding is needed of how clinical teaching affects the patient experience. Results of this study provide a more in-depth understanding of patients' satisfaction with the teaching of medical students during family physician visits, specifically in rural and community settings, together with an understanding of why they would agree to this type of teaching encounter. Patient satisfaction ratings remained consistent with student involvement, and patients outlined their role in contributing to medical student development. These findings can help to inform the preceptor physician in rural and community-based settings to understand the benefits of student engagement in their practice and the ways to avoid adverse effects on patient satisfaction.

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## Oral health and access to dental care: a qualitative exploration in rural Quebec

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**Introduction:** We sought to explore how rural residents perceive their oral health and their access to dental care.

**Methods:** We conducted a qualitative research study in rural Quebec. We used purposeful sampling to recruit study participants. A trained interviewer conducted audio-recorded, semistructured interviews until saturation was reached. We conducted thematic analysis to identify themes. This included interview debriefing, transcript coding, data display and interpretation.

**Results:** Saturation was reached after 15 interviews. Five main themes emerged from the interviews: rural idyll, perceived oral health, access to oral health care, cues to action and access to dental information. Most participants noted that they were satisfied with the rural lifestyle, and that rurality per se was not a threat to their oral health. However, they criticized the limited access to dental care in rural communities and voiced concerns about the impact on their oral health. Participants noted that motivation to seek dental care came mainly from family and friends rather than from dental care professionals. They highlighted the need for better education about oral health in rural communities.

**Conclusion:** Residents' satisfaction with the rural lifestyle may be affected by unsatisfactory oral health care. Health care providers in rural communities should be engaged in tailoring strategies to improve access to oral health care.

**Introduction :** Nous avons voulu vérifier comment les résidents des milieux ruraux perçoivent leur santé buccale et leur accès aux soins dentaires.

**Méthodes :** Nous avons effectué une étude de recherche qualitative dans le Québec rural. Nous avons utilisé un échantillonnage déterministe pour recruter les participants à l'étude. Des enregistrements sonores d'entrevues semi-structurées, effectuées par une personne dûment formée, ont été colligés jusqu'à atteinte de la saturation. Nous avons procédé à une analyse thématique pour dégager les enjeux. Cela a inclus un compte-rendu des entrevues, l'encodage des transcriptions, la présentation des données et leur interprétation.

**Résultats :** La saturation a été atteinte après 15 entrevues. Cinq grands thèmes ont émergé des entrevues : idylle rurale, perception de la santé buccale, accès aux soins dentaires, déclencheurs de l'action et accès aux renseignements dentaires. La plupart des participants se sont dits satisfaits du mode de vie rural et à leur avis, la ruralité en soi ne menaçait pas leur santé buccale. Toutefois, ils se sont plaints d'un accès limité aux soins dentaires dans les communautés rurales et se sont dits inquiets de l'impact sur leur santé buccale. Les participants ont noté que la motivation à chercher des soins dentaires venait principalement de la famille et des amis plutôt que des professionnels des soins dentaires. Ils ont rappelé la nécessité d'une meilleure sensibilisation à la santé buccale dans les communautés rurales.

**Conclusion :** La satisfaction des résidents à l'endroit d'un mode de vie rural peut être affectée par des soins de santé buccale insatisfaisants. Les professionnels de la santé des communautés rurales devraient participer à des stratégies adaptées pour améliorer l'accès aux soins dentaires.

## INTRODUCTION

It is widely recognized that the rural environment is a potentially challenging social, cultural and geographical context for health outcomes,<sup>1–5</sup> including those related to oral health. Problems with oral health have been cited as sentinel events, which may be prevented by a supporting environment, adequate access to primary care resources, adequate financial resources, lifestyle and health behaviours, and oral health knowledge.<sup>6–17</sup> Studies have shown that environmental and cultural factors affect health behaviours, and rural culture is considered a health determinant.<sup>18–20</sup> Characteristics of rural residents, such as close and stable social networks, interpersonal relationships, resilience and sufficiency, may promote healthy behaviours and empower well-being. In contrast, contextual factors, such as deficient infrastructures, underprovided public services and unequal distribution of health services may negatively influence health perception, health behaviours and access to care in rural areas.<sup>11–15,21–34</sup>

Rural disparities in oral health and underuse of dental care have been reported in both developing and industrialized countries.<sup>5,7,10,12,14,18,35–46</sup> In 2009, in Canada, the dentist–population ratio was 3.5 times lower in rural than in urban areas.<sup>47</sup> According to the 2001 Canadian Community Health Survey, significantly more urban than rural residents used dental insurance coverage and emergency dental services.<sup>48</sup> Rural residents were also less motivated to use the services of dentists and orthodontists.<sup>48</sup> Moreover, the use of dental services declined substantially from zones with strong metropolitan influence to zones with weak or no metropolitan influence.<sup>49</sup> Two publications of the same study highlighted poor quality of life related to oral health and a high level of need for dental treatment among the Canadian rural population.<sup>50,51</sup>

However, there is still minimal research on the oral health of rural populations in Canada. To our knowledge, no studies have examined how rurality can influence people's perception of oral health and their experiences with access to dental care. The purpose of this exploratory qualitative study was to examine the experiences and perceptions of rural residents in regard to oral health and access to oral health care.

## METHODS

We chose a qualitative methodology and phenomenological approach for this study. This powerful research method produces rich data and a holistic view of the phenomena that quantitative methods cannot explore in as much depth.<sup>52–54</sup> The phenom-

enological approach is presented as a narration of the essence of the experience, allowing for the uncovering of people's perceptions and lived experiences commonly shared by, or predominant in, communities, cultural settings or subpopulations.<sup>53,54</sup>

### Study setting, participants and sampling

We conducted this study in a rural region of western Quebec. This region includes 18 municipalities, 65% of which have fewer than 1000 inhabitants. This region's demographic features (i.e., 28% of the population aged  $\geq 65$  yr, 57% anglophone, 41% francophone, mixed ethnicity), and socioeconomic and environmental diversity made it suitable for this study.

We adopted a maximum variation sampling technique to recruit participants from zones with moderate metropolitan influence (according to the Census Metropolitan Area and Census Agglomeration Influenced Zones classification system) in Quebec, as defined by Statistics Canada.<sup>55,56</sup> Our goal was to identify “information-rich” data from individuals living in different rural communities (with respect to geographic location and distance from urban areas); we were also looking for people with various social, economic and demographic profiles. Our main inclusion criteria were residence in a rural area and age 18 years or older.

The community schools' dental hygienist agreed to collaborate in this study as a research assistant. We recruited participants through flyers placed within communities, word of mouth and personal contacts of the research assistant. We also promoted the study by contacting physicians in the main community hospital, and directors and staff members in the primary care clinics, long-term care facility and retirement housings.

The interviews lasted 60–90 minutes and were audio-recorded. They took place in various settings (e.g., personal residences or public places) according to the preference of participants. The researcher used an interview guide that was inspired by the Health Belief Model<sup>57,58</sup> and the McGill Illness Narrative Interview.<sup>59</sup> The Health Belief Model is the conceptual framework that has been used extensively to understand health behaviours. The McGill Illness Narrative Interview is a theoretically driven, semi-structured interview protocol designed to explore meaning and experience of any health problem or behaviour in a sociocultural context.

Each interview began with general questions about rural life, followed by more specific questions relating to beliefs, knowledge and perceptions about oral health and oral diseases; experiences and concerns

regarding the barriers and facilitators surrounding oral health in rural area; and cues to decision-making. The interview guide also incorporated questions about educational and occupational history, family status, use of medical care and insurance coverage.

The researcher continued conducting interviews until saturation. Saturation means that the last interviews did not bring any new information and just reiterated what was mentioned in previous discussions.<sup>52</sup>

## Data analysis

The thematic analysis proceeded in 2 phases. In the first phase, interviews were transcribed verbatim and edited for accuracy. Then, the transcripts were examined for thematic coding; the transcripts were carefully reviewed several times and were broken into different segments until surface themes emerged. Case summaries were then developed for each participant. This involved summarizing the findings under thematic heading and providing summary tables for description of key points. Interview quotations supporting the interpretation of textual data were selected and added to case summaries. Similarities and differences across cases were identified and interpreted. In the second phase, complete transcripts, case summaries and surface themes were reviewed, interpreted and refined by a second researcher. The surface themes and interpretations were then reviewed and major themes were identified.<sup>60</sup>

The institutional review boards of the Université de Montréal and McGill University gave ethical approval. Each participant gave informed written consent before enrolment in the study.

## RESULTS

### Participant characteristics

Table 1 presents the sociodemographic characteristics of the participants. In total, 15 interviews with 13 women and 2 men were conducted, after which saturation was reached. Seven were interviewed at their home, 1 at church housing, 1 at the participant's workplace, 2 at the dining room of a seniors' residence, 3 at local health service centres and 1 at a hospital long-term care unit.

### Themes

Five main themes emerged from the interviews: rural idyll, perceived oral health, access to oral health care, cues to action and access to dental information.

### Rural idyll

We use the term "rural idyll" to describe the positive image surrounding many aspects of rural lifestyle. In this study, participants mostly had a positive image about residence in a rural location in terms of health-enhancing properties, social support and positive impact on oral health. Participants did not see rurality overall as a threat to their oral health: "I am planting a garden, having healthy fruits and vegetables ... you are doing more healthy things and having to eat more healthy foods; healthy food is good for your teeth."

Participants mentioned several benefits of living in rural areas. They highlighted the effect of supportive social relationships (e.g., solidarity, community caring, strong family ties) on access to health care. There was an inherent trust in general health care services in this county: "I think because it is a smaller community and people are closer together, they have more understanding and are more caring."

### Perceived oral health

When asked about the meaning of oral health, participants had mostly a biomedical perspective. They insisted on the importance of oral health to general health, and they were aware of the risk of having poor oral health on their overall well-being. "If your teeth are not good and they are causing you problems, it is going to go through your system, your blood system, infection." "Oral health, it means a doctor here, a hospital."

**Table 1. Sociodemographic characteristics of participants (n = 15)**

Characteristic	No. participants
Sex	
Male	2
Female	13
Age, yr	
25–45	4
46–65	7
66–85	3
86–95	1
Household living status	
Alone	3
With family/others	12
Education	
Elementary and high school	9
College/university	6
Income, \$	
< 40 000 (social welfare)	9 (4)
≥ 40 000	6

Some of them also mentioned that poor oral health was an indicator of family care: "If you look at the smile of a schoolchild and his/her teeth are not beautiful, it raises questions about what is happening at that child's home."

#### *Access to oral health care*

The characteristic of rurality that participants criticized most in terms of oral health was lack of access to oral health services, as defined by Penchansky and Thomas.<sup>61</sup>

In regard to accessibility, transportation issues were perceived as primary barriers to access to oral health care. Transportation was more commonly a problem for those without a car who needed support to consult a dental professional: "There [are] lots of people that are living up [in] the countryside; they would have difficulties for transportation." "I don't have a vehicle; I don't have my licence at the moment. We do rely on family members to help us get around." "I prefer that dentists be closer, since it can take time and my children need [babysitting]."

This issue was particularly acute for elderly people, especially those with physical disabilities, who emphasized the lack of appropriate transportation and accommodation facilities. For instance, a woman with a disability explained the kinds of challenges that she faced: "I try to get the bus to come up here, I had fought so hard. The seniors need to get out themselves, since the children are away." "They only had a little ramp, no handicapped stickers (parking). I feel like I had to fight. ... there was nothing for handicapped. They build handicapped bathrooms, you have to turn like this [participant showed a position], they're not building them properly."

In terms of availability, participants indicated they had fewer resources than people living in cities. They felt somewhat isolated and deplored the scarcity of dental professionals in their area. "The fact that we are isolated and that there is nobody telling us to look at your teeth, my family doctor looked at my teeth." "We are 20 minutes away from a dentist that I am not pleased with and we have to drive to X. There is nothing here for oral health. "

Furthermore, most participants had experienced long waiting times for necessary dental visits. Some of them were even anxious about the impact of "waiting for treatment" on their oral health. "They told me that your name will be in our waiting list. I had to wait 6 months for a tooth decay ... I saw the

spot getting bigger every month." "I was angry, anxious. I was frustrated by the waiting list. I think we had to wait for a year and a half or 2 years."

Some rural residents also raised the question of acceptability. Some of them experienced dentists' unwillingness to accept them because they were new patients or because they were receiving welfare. "The new patients are not taken here, that's why you have to go out in town." "It can be more accommodating if they take new patients." "Dr. Y does not accept the patients on welfare but I wanted to go to his office anyway."

As a consequence, some participants mentioned their limitations in their choice of dentists. They also mentioned the lack of specialists and thus the need to travel to urban areas to be satisfied with quality of care or treatment cost. "Here, you have only one choice. And, if you were not happy with your dentist, then you have to go to X." "I think it would be a great help to have a specialist, even a general dentist, close by in the community."

Then I went to a dentist in X; Y pulled rest of my top teeth, made me a full plate; I was in pain for 2.5 years. Y did the same thing with the bottom and left 6 teeth. I went several times and I said they were not working. Y said that I need implants and then it will cost you \$\_\_\_\_. I went to a doctor in Montréal, which he did the surgery and it cost me half of what they told me.

The issues of availability, acceptability and accommodation were particularly important for parents of young children, uncooperative children or children with developmental disabilities, such as autism. They reported a myriad of problems, mentioning that there was a lack of pediatric dentists in rural areas, and that general dentists were unwilling to treat these young children. Furthermore, lack of access to nearby general anesthesia for dental treatment was highlighted: "There was a long waiting list and many children on the list and the machine (anesthetic) was out of order."

... because they don't have the equipment for autistic people. I ended up going to X, somewhere near Montréal. I cannot remember the name of the place. There, they were excellent. To me it is inconvenient to go to X, but to be capable to go to a dentist who is capable to work with a child with autism and who was scared of a dentist chair.

"Worth every penny it cost for transport and the night we had to spend there. Rural areas are not equipped for children or anyone that has a disability or is scared of a dentist chair. It was a horrible experience." "But I was so glad that he could have the surgery and it would not cost me \$5000 to \$6000. As far as the travelling and sleeping in X, I paid for it."



In terms of quality of dental care, some participants felt that dental professionals sometimes lacked compassion. This comment also applied to the other members of the dental clinics; some participants experienced disrespectful treatment by the clinic staff. "I have a problem with my grandson. He has problem with his teeth and when I took him to dentist and he is of course autistic, they were not very nice to him. I can't say it was the dentist but her staff." "I wanted the compassion that I did not receive. We need people who could have compassion." "The newer dentist we have in X, I am sorry but they don't make you feel comfortable."

Facing those issues, participants felt somewhat powerless. A few of them, particularly dissatisfied with the provided dental care, avoided taking legal action due to their link to the small community and possible stigmatization. "Recently, I had a problem. Even, I thought, I should file a complaint, but I was afraid of repercussions. I was perplexed with health services. I was not afraid of being judged but maybe about my confidentiality." "In general, as I said, this is a small community; confidentiality would not be at the same level as urban areas. Here everyone knows the ambulance driver that will get you, it may be your cousin; the nurse, it can be your auntie."

In terms of affordability, participants reported financial restriction and lack of insurance coverage as main barriers to oral health care. Lack of insurance was a greater issue for younger people with a low income. "So we can't afford to mainly go to regular visits to dentist." "If I have to have false teeth, I do, but I also have to watch my money." "I might ask if there was an alternative, anything cheaper." "Being again on the welfare system, it doesn't help financially to keep up with taking care of ourselves ... we think more for the children than ourselves."

#### *Cues to action*

Participants expressed that several factors such as severity of oral disease, financial resources, oral health knowledge, and values such as family respect and self-esteem could act as cues to action. "I would like to go more often, but unfortunately whenever I do get pain that's when it is an emergency." "Because when you work with the public your smile means a lot for yourself and your appearance. You want to look good."

They highlighted that family and friends, rather than health care providers, were the main source of motivation for oral health care. "If [my aunt] would cooperate, I would grab her, stick her in a car and bring her to the dentist." "Actually my fiancée has

influenced me a lot. She helped me quite a bit. She has been a role model for me." "It was not my dentist who provided me with the information. Mr. Y informed me about oral health care."

#### *Access to dental information*

Elderly participants explained that they lacked accessible, appropriate information and educational programs about oral health that could help them to improve their knowledge about oral health. "It is just that people have more access in the city because the information is there wherever you turn around." "There's about 15 of us in daycare. We get the latest news, not so much on dental, mostly on medical care."

Few participants perceived that rural regions were less sensitive than urban areas to language barriers: "A lot of us don't speak French. People who talk French won't talk to you."

Most participants recommended that oral health education should be better provided and advertised. Flyers, pamphlets, and presentations in public places and schools were suggested to be as effective as knowledge transfer tools. In particular, elderly participants added that educational activities should be offered at nursing homes.

## **DISCUSSION**

This study offers an overview of the numerous challenges that residents of rural areas face in terms of access to dental services. Although participants enjoyed various aspects of rural life, they encountered barriers to oral health, mainly owing to the limited availability and accessibility of dental professionals in rural areas. Other factors that explained the rural disparity in oral health were acceptability, accommodation and affordability of dental care. These issues were more problematic among people with specific needs and limitations, such as elderly people, people receiving social assistance or parents of children with special needs, and represent a serious public health problem. We hope that our findings will lead to the development of effective policies based on the perceptions and needs of rural communities.

In Canada, our policies, services and infrastructures focus on urban problems and discriminate against rural residents, because the Canadian rural population is small, diffuse and geographically isolated.<sup>62-70</sup> The problems of widening inequalities in health and health care access across rural Canada were recognized by the 2002 Commission on the Future of Health Care in Canada.<sup>70</sup> This commission

noted that geography is a determinant of health, and recommended that rural health policies promote equitable health outcomes and equitable access to health care.<sup>70</sup> The commission also supported research expansion to provide necessary information regarding the performance of health care systems in rural and remote areas.<sup>70</sup> However, not all health research domains heeded this recommendation, and almost a decade later, there are still no research initiatives regarding rural oral health. This is mainly attributable to challenges faced in conducting rural research in term of organization and implementation.<sup>71</sup>

The overall success in conducting this community-based qualitative study lies in part in its collaborative nature. Our experience supports the literature on the importance of proactive, collaborative, multifaceted approaches in community studies. These include developing an expert research team in the field, building a community–university partnership, creating and maintaining trust within the community, providing information about the research to local stakeholders and ensuring benefits to the community.<sup>72</sup>

In this study, we used a qualitative methodology.<sup>73–75</sup> The choice of approach or measurement tools depends on several factors, including the experience and personal training of researchers, the audience, the type of outcome and, most importantly, the type of research question.<sup>73–75</sup> Qualitative and quantitative research studies follow completely different approaches and design elements, including data collection and data analyses. In brief, qualitative research allows the researcher to generate a hypothesis, whereas quantitative research generates questions to test a hypothesis.<sup>73–75</sup> One of the major differences between qualitative and quantitative research is that qualitative approaches usually involve purposeful sampling, whereas quantitative approaches involve probability sampling.<sup>54,73–77</sup> Qualitative research values the deep understanding permitted by the information-rich cases without any generalization, and quantitative research values the generalization to larger populations permitted by random and statistically representative samples. Qualitative methods require different minimum sample sizes.<sup>76,77</sup> It is recommended that phenomenology include about 6 participants, and that ethnographies and grounded theory include about 30–50 interviews.<sup>76,77</sup>

We identified a number of problems related to access to dental care in rural areas in western Quebec. These included limitation in the choice of dentists, lack of specialized dentists for patients with special needs, lack of general anesthesia in dental care, and unwillingness of dentists to accept new patients or patients

receiving welfare. These results suggest that there is a disparity in oral health care in rural areas, and this inequality may lead to poor oral health and dissatisfaction with care. Therefore, as academics, we should attempt to implement strategies that will promote dental practice in rural settings. These could include the following: undergraduate and postgraduate rural training programs;<sup>78–80</sup> recruitment of rural applicants; use of teledentistry, dental camps and mobile dental units to improve delivery of oral health care;<sup>81</sup> use of methods such as financial incentives and loan repayment programs to encourage dentists to establish practice in rural communities;<sup>79</sup> and provision of oral health training to other health care professionals.<sup>67</sup> There is growing evidence that interprofessional collaboration in health care positively influences outcomes in practice and education, and can be a solution for challenges related to human resources.<sup>82</sup>

We found that populations in remote areas need to be provided with adequate knowledge about oral health, especially older populations and populations with low levels of health literacy. Therefore, community health care providers and dentists should be involved actively in tailoring dental educational materials and programs. Furthermore, given the importance of families in promoting healthy behaviours and their role in decision-making about health care, their involvement in dental education could positively affect oral health outcomes and could decrease the financial and biological costs associated with poor oral health, such as caries or periodontal disease.

The results of this study, although limited, could be useful in the development of programs for oral health promotion for rural residents and in the development of collaborative rural research activities in the field of oral health.

## Limitations

A key limitation of this study was the recruitment of participants from a single rural region in Quebec. Other rural and remote communities may have different experiences and needs owing to different environmental and cultural backgrounds. Thus, our findings cannot be generalized to all rural regions, and future studies are needed to explore rural and remote diversities.

## CONCLUSION

Our results indicate that access to dental services is problematic in rural areas. We thus urge several sectors of society — academia, the government,

dental professionals and rural communities — to develop and implement strategies to improve access to oral health services.

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## The occasional pes anserinus bursitis injection

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**T**he pes anserinus (Latin for “foot of the goose”) is the conjoined tendon of (in anterior to posterior direction) the sartorius, gracilis and semitendinosus muscles. It inserts into the proximomedial tibia. There is a bursa directly underneath the conjoined tendon, appropriately termed the pes anserinus bursa.

Overuse of, injury to or inflammation of this bursa leads to the entity pes anserinus bursitis (also known as anserine bursitis) and should be considered in patients with medial knee pain. Its incidence may be underestimated. Because of the superficial nature of (and consequent ease of injection into) the bursa, corticosteroid injection into the pes anserinus bursa is the accepted first-line treatment for pes anserinus bursitis.<sup>1</sup>

### ANATOMY AND PATHOPHYSIOLOGY

The knee is the body’s most complicated joint, with many bursae.

As mentioned, the pes anserinus tendon (the name reflects its Web-like structure) is the conjoined tendon of the 3 above-named muscles. It inserts into the proximomedial tibia, about 5–7 cm below the anteromedial joint margin of the knee, directly overlying the distal insertion of the medial collateral ligament of the knee. The sartorius, gracilis and semitendinosus muscles collectively flex and internally rotate the knee.

The pes anserinus bursa is located between the conjoined tendon and the distal insertion of the medial collateral ligament, and facilitates movement of

the tendon. Pain localized to this area constitutes the clinical entity pes anserinus bursitis<sup>2</sup> (Fig. 1).

There is also a small bursa between the sartorius muscle and the conjoined tendon of the gracilis and semitendinosus muscle. Bursitis of this bursa is also classified as pes anserinus bursitis because these entities cannot be separated clinically.<sup>2</sup>

Although pes anserinus bursitis has been described for at least 80 years,

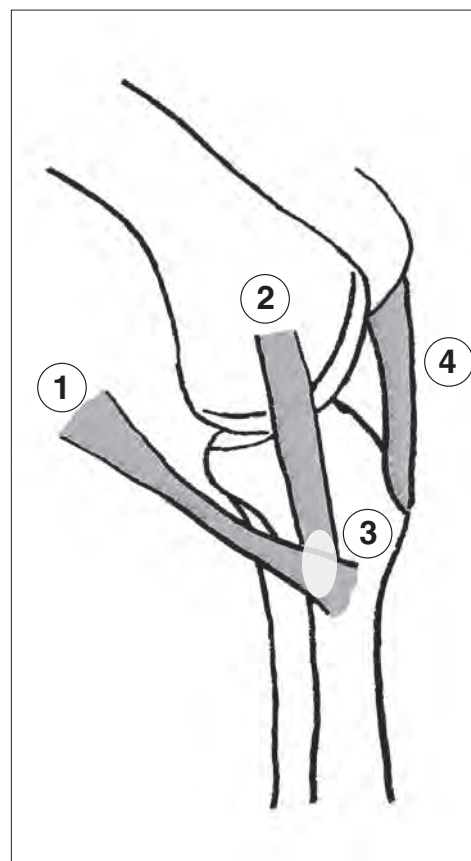


Fig. 1. Anatomy of the knee showing areas where bursitis can occur. (1) Semitendinosus, sartorius and gracilis muscles; (2) medial collateral ligament; (3) pes anserinus bursa; (4) patellar ligament.

the exact pathology (whether it is tendinitis, bursitis or fasciitis) is not clear.<sup>3</sup> It is associated with the following:

- sports that require side-to-side movement of the knees, such as racquet sports, basketball, soccer and swimming (breaststroker's knee);
- obesity (especially in middle-aged women);
- anatomic abnormalities, such as valgus knees, pes planus or tight hamstrings;
- local trauma;
- knee osteoarthritis or medial meniscus tear, the presumed mechanism being additional stress on the hamstring muscles.

## INCIDENCE

The exact incidence is not known, but 2.5% of patients who had magnetic resonance imaging (MRI) for possible internal derangement of the knee had evidence of pes anserinus bursitis.<sup>2</sup>

## SYMPTOMS

The patient usually reports pain that is relatively well localized to the medial upper tibia and may be able to point with one finger to the site of pain.<sup>4</sup> The condition may be bilateral. The pain is usually worsened by activities that flex the knee: getting up from a sitting position, ascending stairs and lying in bed. It may be minimal on walking slowly on level ground.<sup>2</sup>

## SIGNS

The hallmark is finding mild-to-moderate point tenderness in the area of insertion of the pes anserinus tendon onto the proximomedial tibia.

## DIAGNOSIS

Diagnosis is mostly clinical, but the first part is being aware of this as a possible diagnosis. The diagnostic paradigm includes the following:<sup>4</sup>

- local tenderness in the area of insertion of the anserine tendon;
- a negative valgus stress manoeuvre (indicating an intact medial collateral ligament);
- normal radiography of the tibia (i.e., no underlying bony pathology).

## 72 DIFFERENTIAL DIAGNOSIS

The differential diagnosis includes the following:<sup>2,4</sup>

- **Medial collateral ligament sprain:** the area of tenderness will be more extensive, further over the joint line and reproduced by valgus stretch;
- **Medial meniscal tears:** there will be tenderness along the medial joint line and a history of locking and knee collapse;
- **Osteoarthritis of the medial knee compartment:** this relatively common diagnosis may co-exist with, and is a risk factor for, pes anserinus bursitis;
- **Spontaneous osteonecrosis:** pain will be more severe and will be prominent day and night;
- **Tumours:** possible tumours include osteochondromatosis, sarcoma and villonodular cysts;
- **Other types of knee bursitis:** there are at least 12 bursae in each knee, so familiarization with the anatomy is important;
- **Stress fractures of the proximal tibia:** pain and point tenderness will be more severe than with pes anserinus bursitis;
- **Saphenous nerve compression or trauma:** this more often follows surgery to the knee, and pain is reproduced by a Tinel sign (i.e., light tapping) over the nerve;
- **Medial synovial plica syndrome:** the plica, a redundancy of the joint synovium medially, can become inflamed with repetitive overuse, which results in point tenderness over the medial femoral condyle;
- **Semimembranosus tendinitis:** this results in tenderness over the posteromedial tibia.

If any of the above is suspected, radionuclide isotope scanning or MRI may be indicated. Ultrasonography plays little role in the diagnosis of pes anserinus bursitis in a clinical setting.

## TREATMENT

Depending on patient preferences, initial treatment may be medical or by injection.

Medical treatment includes rest with ice application, physiotherapy stretching exercises and anti-inflammatory drugs (although penetration of anti-inflammatory drugs into the bursa may be relatively low).<sup>3</sup>

Injection is both therapeutic and diagnostic. As with all injections, infection or cellulitis over the site is a contraindication.

1. Prepare the equipment you will need:<sup>5</sup>
  - skin preparation agent;
  - 40 mg of methylprednisolone and 1–3 mL of 1% lidocaine;
  - a plastic syringe;

- a large-bore needle to draw up the methylprednisolone and lidocaine and a #21 or #23 needle to inject it;
  - lidocaine to anesthetize the skin if preferred.
2. Position the patient in the supine position, with a towel underneath the slightly flexed knee (Fig. 2).
  3. Prep the skin using your usual product.
  4. Palpate the point of maximal tenderness and mark it if you wish (Fig. 3).
  5. Insert the needle perpendicular to the skin, into the point of maximal tenderness until you feel the bone, and then withdraw the needle slightly (2–3 mm) to avoid injecting directly into the conjoint tendon. Inject the contents of the syringe, which should flow easily (Fig. 4).
  6. Apply a bandage.



Fig. 2. Position the patient.



Fig. 3. Determine the area of tenderness.

7. Postinjection therapy is important. Advise the patient to
  - rest for 2–3 days with application of ice 4 times daily;
  - take 1000 mg of acetaminophen twice daily;
  - do minimal squatting, kneeling and bending for 3–4 weeks;
  - do straight-leg raising exercises, beginning on day 4.

The injection may be repeated in 6 weeks. Failure to respond to 2 injections may prompt either further investigations, as described above, or orthopedic consultation.<sup>4</sup> No more than 3 injections per year should be done, partly owing to the risk of weakening the tendons.

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Fig. 4. Perform the injection.

## Country cardiograms case 50

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**A**n 84-year-old man is brought to the emergency department in a remote BC community with a history of episodes of dizziness for the preceding several hours. A week previously he had been in a car crash in which he lost consciousness while driving. His previous electrocardiograms have shown first-degree

atrioventricular block and right bundle branch block. The following electrocardiogram is recorded (Fig. 1). What is your interpretation, and what needs to be done?

**For the answer, see page 77.**

**Competing interests:** None declared.

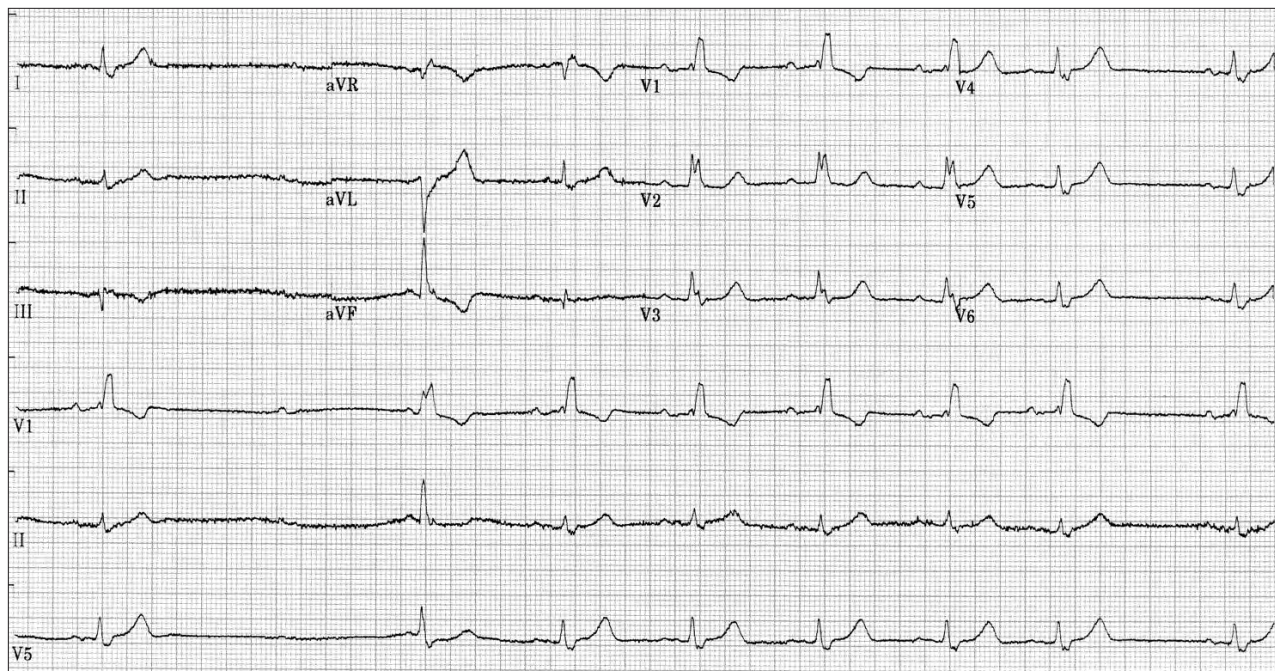


Fig. 1. Electrocardiogram of an 84-year-old man with episodes of dizziness.



## Running the supermarket gauntlet

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**“A**nd now, ladies and gentlemen, it's time for another thrilling episode of ... Supermarket Gauntlet! Watch as our hapless rural physician tries to shop for groceries anonymously! Will he succeed? Of course not! But it's fun to watch him try! Take it away, Dr. Gray!”

### Parking lot:

When I arrived I was pleased to see the parking lot was only about one-quarter full. I pulled into a stall and scanned the area. The coast looked clear. I disembarked, ducked my head down low and started speed-walking toward the main entrance. I hadn't got more than 5 paces when a loud voice behind me boomed, “Hey, there's Dr. Gray! Hi, Dr. Gray!”

Aargh! Parking lot ambush!

I turned around. It was one of my patients, of course. Like Savoir Faire, they're *everywhere*.

“Hi, Mr. Snodgrass.”

“Gotta love this weather, eh, Doc?”

“Absolutely.”

“How's your family doing?”

“They're well, thanks. And yours?”

“Great! Say, I'm running low on my little white pills, and I was wondering if I could get a refill.”

“Your little white pills?”

“Yeah, you know the ones, they're about *this* big ...”

“What do you take them for?”

“Geez, that's a good question! I think they're for my cholesterol. No wait, they might be for my blood pressure! Or gout, maybe? What colour are gout pills?”

To my credit, I didn't roll my eyes. I hardly ever do that anymore.

“How about you check the name on the bottle when you get home and leave a message for me at my office? Then I'll

be able to fax a refill to the drug store for you.”

“Sounds like a plan, Doc! You have yourself a great day!”

### Pharmacy:

I bolted inside. As I passed the tiny drug store near the entrance, Fred, the pharmacist, waved at me.

“Hi, Dr. Gray!”

“Hi, Fred. How's it going?”

He motioned me over and dropped his voice to a clandestine whisper.

“Hate to bother you, but would you happen to recall if you told Mr. Johnson you'd phone in a Viagra refill for him yesterday?”

“Oh yes, I did, but then things kind of went sideways on me and I forgot. He can have eight 100-mg tabs with 3 repeats.”

“Thanks!”

“No problem!”

### Shopping cart:

I went to get a shopping cart. One of the women from the hospital auxiliary was sitting at a makeshift desk strategically located right beside the trolley corral.

“Hi, Dr. Gray! Care to buy a raffle ticket to support the Disease-of-the-Week Foundation?”

“I'd love to!” I paid my trolley tax, selected a cart that didn't squeak too much and wheeled it into the store.

### Bakery:

Aside from a few nods and waves, my trip down the produce aisle was completely uneventful. Next up was bread. After scoping out some candidates, I leaned over and began covertly squeezing loaves. I had a firm grip on a promising loaf of Wonder Bread when I got the distinct feeling someone was watch-

ing me. I looked over my shoulder guiltily, expecting to encounter a frowning store clerk. Fortunately, it was just some flaxen-haired, gappy-toothed kid.

"Hey! Dr. Gray! Remember me?"

"Er, no. What's your name again?"

"Ralph! You put a cast on my leg when I broke it last summer."

"Hi, Ralph. How's your leg feeling?"

"Great! I can rollerblade and skateboard and everything now!"

"Awesome."

"So, what are you doing?"

"Shopping."

"How come you're not at work?"

How come you're not at school?, I thought.

"My office hasn't started yet."

"Oh. What's the matter with that loaf of bread?"

"Nothing."

"So then why were you squeezing it just now?"

"I, uh ..."

"Come along, Ralphie," his mother called from the far end of the aisle. Leave the peculiar, bread-squeezing doctor alone ...

#### Cereals:

"Hi, Dr. Gray!"

"Hi, Mrs. MacLeod!"

"Did you get the results of that ultrasound I went for last week?"

"Not yet."

"How about my diabetes test?"

"Um ..."

"My cholesterol test?"

"I don't remember."

"My —"

"Usually no news is good news, but if you want you can call my office and they'll look up the results for you."

"Okay, thanks!"

#### Eggs:

"How's it going, Dr. Gray?"

"Just great, Mr. Polokov. And you?"

"I'm fine. Will your office be open this afternoon? I need to get some travel grants signed."

"We'll be open until about 6 o'clock."

"I also need some Workers' Compensation forms filled out. How long do you think it'll take you to do them? We're going on a cruise next week and I'd really like to mail them in before we leave."

"If you speak to my receptionist, she'll let you know."

"Thanks!"

#### Toiletries:

I needed some bathroom supplies, but a cranky ex-patient I recently had to jettison from my practice was parked in the middle of the aisle. Oh, well, who needs soap, anyway? It's so overrated. Detour, detour ...

#### Meat:

"Hey, Doc! Thanks for stitching up my finger last week."

"My pleasure."

"It's almost healed already! Do you want to see it?"

"No, that's okay."

"You sure?"

"Positive."

"Actually, would you mind taking a quick peek at it just to make sure it's not getting infected?"

"Okay, let's see ... Uh-huh ... Looks fine to me."

"Thanks! Say, can you write me a note to give the wife saying I won't be able to do the dishes for the next couple of weeks? Har-har!"

#### Dairy:

My last stop. I was reviewing the expiry date on a carton of Lactaid when someone tapped me on the shoulder.

"Dr. Gray, am I ever glad to see you!"

Oh no! The Kiss of Death!

"Hi, Mr. Runciter. What's wrong?"

"I've been having one heck of a time with my bladder lately!"

"I see ..."

He started pulling up his shirt.

"I think maybe it has to do with my prostate."

"Uh-huh ..."

He began fumbling with his belt buckle.

"The last time I got this you ended up having to send me to the urologist."

"Ah ..."

He started unbuttoning his pants.

"Mr. Runciter, *what are you doing?!*"

"I figured I'd show you —"

"Not here!"

"Oh, okay, Doc. Do you want me to drop by your office later?"

"Sure! Five o'clock!"

I skedaddled.

Clearly this incognito *sbtick* isn't working out for me. I wonder if it's possible to order my groceries online and have them delivered to my house instead.

Competing interests: None declared.

## Country cardiograms case 50: Answer

Charles Helm, MD,  
CCFP  
Tumbler Ridge, BC

**O**n examination of the electrocardiogram (Fig. 1, page 74), the striking feature that is immediately apparent is the long RR interval near the beginning of the recording. P waves are best seen in this tracing in lead VI, and it is evident that close to the middle of this long RR interval there is a P wave that is not followed by a QRS complex (a “blocked” P wave).

The morphology of the next QRS complex is different than the other QRS complexes. This is a ventricular escape complex, and there is transient atrioventricular (AV) dissociation. The PR interval is otherwise constant at 0.225 seconds.

The remaining RR intervals are not constant because marked sinus arrhythmia (with a mean rate of 58 beats/min) is present, a not uncommon finding in the elderly. The distinctive features of right bundle branch block are present, with secondary ST and T wave changes in lead VI. Equivocal Q waves are present in leads III and aVF, which prompts consideration of an inferior myocardial infarction of undetermined age.

This electrocardiogram shows second-degree AV block. Given the constant PR interval when conduction through the AV node does occur, Mobitz type I block is ruled out. Mobitz type II block is strongly suspected, but cannot be diagnosed with certainty based on this tracing alone. Why not? A diagnosis of Mobitz type II block

requires the presence of 2 or more consecutive constant PR intervals preceding the blocked P wave. Because the blocked P wave is seen fairly early in this electrocardiogram, there is only 1 preceding PR interval to examine. Therefore, it is conceivable that 2:1 AV block, rather than Mobitz type II block, is present.

Regardless of these theoretical considerations, there is cause for concern. The right bundle is blocked, and the documented high-grade block suggests that conduction through the left bundle is in jeopardy. Given this patient’s history of dizziness and a recent near-catastrophic probable syncopal event, pacing must be urgently considered.

The presence of a ventricular escape complex following this episode of high-grade block is a potentially reassuring sign in the event that complete heart block develops. There is some evidence that an innate pacemaker may take over, although the RR interval is long at 2.6 seconds.

In this case, a glance at the monitor screen confirmed Mobitz type II block. Shortly thereafter, the patient’s rhythm changed to third-degree AV block, with a rate of 36 beats/min. Syncope and shock ensued. Resuscitation and pacing were required, with an eventual good outcome.

**For the question, see page 74.**

**Competing interests:** None declared.

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Have you encountered a challenging ECG lately?

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

On another page, the case is discussed and the answer is provided.

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](mailto:cjrm@cjrm.net)

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

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

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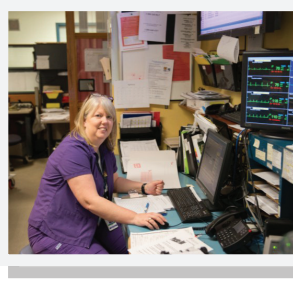
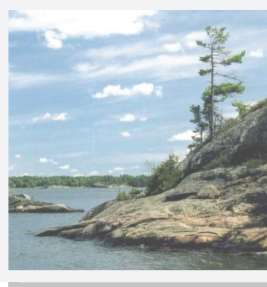
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**Asthma-related death:** Increased risk of asthma-related death is considered a class effect with LABAs, including indacaterol maleate. ONBREZ\* BREEZHALER\* is not indicated for asthma.

### **Other relevant warnings and precautions:**

- Not indicated for acute episodes of bronchospasm
- Increased risk of cardiovascular effects
- Caution in patients with cardiovascular disorders
- Caution in patients with convulsive disorders, thyrotoxicosis and patients who are unusually responsive to  $\beta_2$ -adrenergic agonists
- Risk of hypokalemia and hyperglycemia
- Paradoxical bronchospasm
- Immediate hypersensitivity
- Should not be used in patients with acutely deteriorating COPD
- Should not be used concomitantly with other LABAs
- May inhibit labour

### **For more information:**

Please consult the Product Monograph at [www.novartis.ca/asknovartispharma/download.htm?res=onbrez%20breezhaler\\_scrip\\_e.pdf&resTitle=482](http://www.novartis.ca/asknovartispharma/download.htm?res=onbrez%20breezhaler_scrip_e.pdf&resTitle=482) 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.

FEV<sub>1</sub>: forced expiratory volume in 1 second; LS: least square; TDI: transition dyspnea index.  
† B2355: 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=318).

‡ From a subset of 239 patients in B2355, FEV<sub>1</sub> data shown is ONBREZ\* BREEZHALER\* vs. placebo, respectively: **5 min:** 1.56 vs. 1.39; **30 min:** 1.57 vs. 1.38; **1 hr:** 1.56 vs. 1.38; **2 hrs:** 1.56 vs. 1.37; **4 hrs:** 1.51 vs. 1.35; **6 hrs:** 1.48 vs. 1.33; **12 hrs:** 1.43 vs. 1.29; **16 hrs:** 1.39 vs. 1.24; **22 hrs:** 1.44 vs. 1.27; **24 hrs:** 1.48 vs. 1.34.

§ 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).

¶ Comparative clinical significance has not been established.



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Product Monograph available on request.  
Exp: 05/2014  
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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.



Once-daily  
**Pr onbrez\*  
breezhaler\***  
(indacaterol maleate inhalation powder)