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**Going Into Debt. Tuition Fee Deregulation**

**The Occasional Teacher. Part 1**



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Acrylic on canvas, 36" x 48", by  
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*This painting is a reflection on an evening sunset through a valley of landscape in British Columbia.*

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### Gone sailing

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**W**hen I was in medical school, one of my mentors advised me that when it came time to enter general practice I was to get a membership at the local golf club. “But I don’t golf?” He laughed as he explained. “If you drink at the local bar you’re a drunk, but if you drink at the clubhouse you have been working hard!”

By most definitions I have taken up neither golf nor drinking. However, there are several truths I’ve learned based on this advice. When you are engaged in a profession with the responsibility of rural practice, there is something to be said for a regular diversion. For me it’s not men’s night at the local 9-hole golf course, but sailing out of the 176-slip Haileybury marina.

Wednesday evenings are sacrosanct in the summer for me, as it is race night. It doesn’t matter if it’s pouring or if there isn’t any wind in sight; I load up the cooler and head to the boat. It is not patients or committee meetings at the hospital, or even my family that fill my mind. It’s hoisting the main, trimming the jib and wondering if I can make the mark on this tack.

I never do ER on these days, and on those occasions when I mistakenly have a beeper or cellphone with me, the problem gets handled over the phone, it waits until sundown or they get the person in ER, because I can’t get there for an hour when I’m sailing.

Yes, there are days when I break my own rules, leave the boat in a mess

and run up the dock so I can get to the hospital because someone is crowning. This is remarkable for 2 reasons: it’s been my choice to attend the birth and the deliveries that I have missed haven’t happened on a sailing Wednesday.

I have a colleague who races against me, others who golf, some who curl, some who play hockey, and others who block off time for fishing on and off the ice. It doesn’t matter what it is; what matters is that it gives people time to be a part of the community while not being the doctor. It’s a good thing for us rural doctor types who really do work hard.

I’m not saying that you need to be unavailable. If you are unavailable too frequently and unpredictably it’s a problem. If you notice it in a colleague, you start worrying about their organizational skills, their mental well-being and/or how much alcohol is being consumed. Don’t leave it to the point where the colleague is marked as unreliable by the nurses and is hauled in by the chief of staff (or by the college!).

I am making an argument for protected time. Being able to drop your “I’m the doctor” persona and walk in your community as a regular person, even for a short time, is a good thing. It’s amazing how my protected 0.5% of the year makes the other 99.5% of the year easier.

I’d write more, but it’s actually Wednesday, at the end of summer, shortly after 6 pm, and it’s been raining, so I should go and bail the bilge before the race ...



### Parti voguer

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Quand j'étais à la Faculté de médecine, un de mes mentors m'a dit de devenir membre d'un club de golf local quand je commencerais à pratiquer la médecine familiale. « Mais je ne joue pas au golf », lui ai-je répondu. Il a ri et m'a expliqué : « Si tu prends un verre au bar, tu es un ivrogne, mais si tu en prends un au club, c'est que tu as travaillé fort ! »

Je n'ai, selon la plupart des définitions, ni commencé à jouer au golf, ni commencé à fréquenter les bars. J'ai cependant tiré plusieurs enseignements de ce conseil. Lorsque vous exercez une profession dans laquelle vous êtes responsable d'une pratique rurale, ce n'est pas une mauvaise idée de pratiquer régulièrement un loisir. Ce qui fait mon bonheur, ce n'est pas la soirée des hommes au neuf trous local. C'est plutôt de me rendre à la marina à 176 places de Haileybury et de partir sur mon voilier.

L'été, les mercredis soirs sont sacrés pour moi, car c'est la soirée des compétitions. Peu importe le temps qu'il fait, je remplis la glacière et j'embarque sur mon voilier. Mes patients, les réunions de comités à l'hôpital, ou même ma famille ne m'effleurent pas l'esprit. Je ne pense qu'à hisser la grande voile et à régler le foc. La question que je me pose : « Vais-je pouvoir courir une bonne bordée ? »

Même si je ne travaille jamais à l'urgence ces mercredis, il m'arrive parfois de recevoir un appel sur mon téléavertisseur ou mon cellulaire que j'ai oublié de laisser derrière. Dans ce cas, soit que je règle le problème par téléphone, soit que je le règle plus tard en soirée, soit que je réponde de joindre le médecin responsable à l'urgence, parce que je ne peux tout simplement pas retourner à l'hôpital en une heure lorsque je navigue.

Oui, il m'arrive d'enfreindre mes propres règles, de laisser mon voilier dans le désordre et de partir en courant

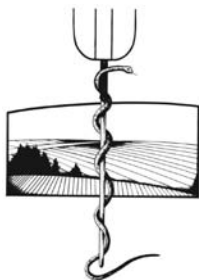
de la marina pour me rendre à l'hôpital parce qu'une patiente est sur le point d'accoucher. Ceci est remarquable pour deux raisons : premièrement, c'est moi qui ai décidé d'assister à la naissance et deuxièmement, les accouchements que j'ai manqués n'ont pas eu lieu les mercredis de voile.

Un de mes collègues prend aussi part aux courses de voiliers, d'autres jouent au golf, au curling ou au hockey, et d'autres encore se réservent du temps pour la pêche en été ou en hiver. Peu importe l'activité, ce qui compte, c'est qu'elle donne aux médecins le temps de s'intégrer à leur collectivité tout en laissant derrière leur étiquette de médecin. C'est une bonne chose pour nous, médecins en milieu rural, qui travaillons vraiment fort.

Comprenez-moi bien. Je ne dis pas que vous devez être inatteignable. Si vous êtes absent trop souvent et de manière imprévisible, c'est que quelque chose ne tourne pas rond. Si vous remarquez un tel comportement chez un collègue, vous commencerez à vous inquiéter de son sens de l'organisation, de son état psychologique ou de la quantité d'alcool qu'il consomme. N'attendez pas qu'il soit considéré comme étant peu fiable par les infirmières et qu'il soit convoqué dans le bureau du médecin-chef (ou que le collègue s'en mêle !).

Je parle plutôt de l'importance de se réserver du temps pour soi. Laissez tomber votre « personnage de médecin » et participez à la vie de votre collectivité en tant que personne ordinaire, même pour un bref moment. Vous verrez, c'est une bonne chose ! C'est incroyable à quel point le 0,5 % de temps que je me réserve durant l'année rend l'autre 99,5 % de l'année plus facile.

Enfin, je dois vous quitter, car c'est mercredi, l'été tire à sa fin, et il est passé 18 h. Comme il a plu, je dois aller vider la cale de mon voilier avant la course ...



### President's message. Where to now?

*John Wootton, MD  
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**S**herlock Holmes used logic to arrive at the conclusion that if, in solving a problem, all impossible solutions have been eliminated, leaving only the improbable, then the improbable must be the truth.

Rural medicine appears to be in this kind of quandary. In spite of more than 10 years of lobbying by the SRPC; in spite of the thoughtful recommendations of the multiple federal and provincial commissions; in spite of the fact that the problem is patently national in scope; in spite of incentives that are increasingly generous from both provincial and municipal sources — rural Canada continues to find itself in a crisis of human resources for health. Provincial deputy ministers of health might be excused to find that their hair is thinning, as little has changed in spite of their best efforts.

What other solutions might there be? Where might “thinking outside the box” get us? Clearly, we must continue to do some of the things that show promise. We must continue to organize care around teams, even though these teams risk being more expensive (both in dollars and in bodies required) than the alternative of no teams, because there is evidence that better care is provided this way. We must also continue to stress prevention strategies, but remain cognizant of the fact that the benefits of this strategy will take many years, if not decades, to realize. We must continue to decentralize medical education and recruit our future rural physicians increasingly from rural areas. We must support a differential fee structure, however this is implemented in different

jurisdictions, to acknowledge the increased level of responsibility taken on by rural physicians.

All of these are good things, but they are clearly not enough. There is a significant cohort of rural physicians in their 50s and 60s who are having difficulty finding replacements for themselves, let alone for their workloads.

Looking beyond our own sandbox involves looking beyond our shores. There are few useful models to be found in the United States, which seems to be more interested in finding alternate professionals (nurse practitioners, physician assistants) than in training and deploying more rural physicians. About the only model truly with lessons to guide us is Australia, a continent with similar geography, and similar urban concentrations and scattered rural communities.

Australia has been traditionally about 10 years ahead of Canada in the development of structures to support rural practice. They had the first full professor of rural health — Roger Strasser (whom we have since poached to be the Northern Ontario School of Medicine's founding dean), and they are far ahead of us in having rural training streams leading to licensure and accredited by a college mandated to the task — the Australian College of Rural and Remote Medicine. Canada lags behind in the development of autonomous structures dedicated to education in and promotion and support of rural medicine, and this may explain some of the difficulty we are having in making real progress.

Is it time to have this debate?

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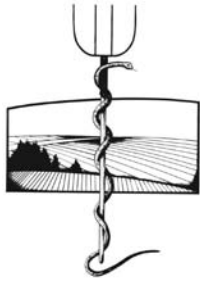
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## Message du président. Quel chemin devons-nous prendre maintenant ?

**S**herlock Holmes a usé de logique pour tirer la conclusion selon laquelle si, pour résoudre un problème, toutes les solutions impossibles ont été éliminées, ne laissant que l'improbable, c'est alors l'improbable qui doit être vrai.

La médecine rurale semble se retrouver dans un tel dilemme. En dépit de plus de 10 ans de lobbying par la SMRC, en dépit des recommandations réfléchies de multiples commissions fédérales et provinciales, en dépit du fait que le problème est d'une envergure nationale patente, en dépit des incitations actuellement généreuses offertes par les administrations provinciales et municipales, le Canada rural est toujours aux prises avec une crise des ressources humaines en santé. On pourrait excuser les sous-ministres de la Santé des provinces de constater que leurs cheveux grisonnent, car la situation a peu changé, malgré leurs meilleurs efforts.

Quelles autres solutions pourrait-il y avoir ? Où pourrions-nous aboutir en « sortant des sentiers battus » ? Il est clair que nous devons continuer à faire certaines des choses qui sont prometteuses. Nous devons continuer à structurer les soins en fonction d'équipes, même si ces équipes risquent d'être plus coûteuses (en ressources à la fois financières et humaines) que l'autre solution qui consiste à ne pas avoir d'équipe, parce que les preuves indiquent qu'elles fournissent de meilleurs soins. Nous devons aussi continuer d'insister sur des stratégies de prévention, tout en n'oubliant pas que les bienfaits de cette stratégie prendront des années, voire des décennies, à se concrétiser. Nous devons continuer à décentraliser l'éducation médicale et à recruter de plus en plus nos futurs médecins ruraux en région rurale. Nous devons appuyer une grille d'honoraires différentiels, peu importe comment elle est appliquée

dans différentes administrations, pour reconnaître que les médecins ruraux ont davantage de responsabilités.

Tous ces éléments sont bons, mais il est clair qu'ils ne suffisent pas. Il existe une importante cohorte de médecins ruraux dans la cinquantaine et la soixantaine qui ont de la difficulté à se trouver un remplaçant, encore moins un remplaçant capable d'assumer leur charge de travail.

Regarder à l'extérieur oblige à regarder à l'étranger. Il y a peu de modèles utiles aux États-Unis, qui semblent plus intéressés à trouver d'autres professionnels (infirmières praticiennes, adjoints au médecin) qu'à former et à déployer davantage de médecins ruraux. Le seul modèle qui offre vraiment des leçons pour nous guider est probablement celui de l'Australie, continent qui a une géographie semblable, ainsi que des concentrations urbaines et des communautés rurales dispersées semblables.

L'Australie a toujours été une dizaine d'années en avance sur le Canada dans la création de structures d'appui à la pratique rurale. Elle a été le premier pays à avoir un professeur titulaire en santé rurale, Roger Strasser (que nous avons depuis braconné pour en faire le doyen fondateur de l'École de médecine du Nord de l'Ontario), et elle a beaucoup d'avance sur puisqu'elle offre des couloirs de formation en médecine rurale qui aboutissent au permis d'exercice et à l'accréditation d'un collège consacré exclusivement à cette tâche, soit le Collège australien de médecine en milieu rural et éloigné. Le Canada a du retard dans la création de structures autonomes vouées à la formation en médecine rurale et à la promotion et l'appui de la médecine rurale, ce qui peut expliquer certaines des difficultés que nous avons à réaliser des progrès véritables.

Serait-ce le moment de tenir ce débat ?



## ORIGINAL ARTICLE ARTICLE ORIGINAL

# Secondary stroke prevention best practice recommendations: exploring barriers for rural family physicians

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*This article has been peer  
reviewed.*

**Introduction:** Patients' risk of having a second stroke can be substantially reduced by implementing best practice recommendations for secondary stroke prevention. However, evidence indicates that rural practitioners may face barriers to implementing these recommendations into their practices. This research project developed a workshop to increase practitioner awareness of the recommendations, and to identify barriers to the application of recommendations for secondary prevention of stroke in rural practices.

**Methods:** The workshop provided a venue for family physicians, specialists and health district representatives to discuss the recommendations. It was evaluated using a sequential explanatory mixed-methods approach using 3 methods of data collection: a questionnaire, documentation of comments made during discussion periods and post-workshop interviews.

**Results:** Participants at the workshop increased their awareness of the recommendations, and they gained an increased appreciation of how they might collaborate with other practitioners and the health district to implement the recommendations. The workshop identified barriers to implementing recommendations, such as miscommunications with the local health district, role conflict among physicians regarding health promotion and difficulties coordinating care with specialists.

**Conclusion:** The workshop was an effective venue for improving communication between physicians and the health district and for reducing barriers to the implementation of recommendations.

**Introduction :** Il est possible de réduire substantiellement le risque que des patients subissent un second accident vasculaire cérébral en appliquant les recommandations de pratique optimale pour la prévention secondaire. On constate toutefois que les médecins en milieu rural rencontrent parfois des obstacles lorsqu'ils tentent d'appliquer ces recommandations dans leurs pratiques. Le présent projet de recherche comprenait la mise sur pied d'un atelier visant à sensibiliser les médecins aux recommandations pour la prévention secondaire de l'accident vasculaire cérébral et à reconnaître les obstacles à leur application dans la pratique en milieu rural.

**Méthodes :** L'atelier a été une occasion pour les médecins de famille, les spécialistes et les représentants de la régie régionale de la santé de discuter des recommandations. Une approche séquentielle explicative faisant appel à plusieurs méthodes a servi à l'évaluation au moyen de trois types de collecte de données : questionnaire, prise en note des commentaires formulés durant les périodes de discussion et entrevues consécutives à l'atelier.

**Résultats :** Les participants à l'atelier se sont familiarisés avec les recommandations. Ils ont acquis une meilleure compréhension des façons de collaborer avec les autres médecins et avec la régie régionale de la santé pour appliquer les recommandations. L'atelier a aussi permis de reconnaître les obstacles à leur application, par exemple, problèmes de communication avec la régie régionale, désaccord quant au rôle des médecins dans la promotion de la santé et difficulté à coordonner les soins avec les spécialistes.



**Conclusion :** L'atelier a été une rencontre fructueuse qui a facilité la communication entre les médecins et la région régionale de la santé et contribué à surmonter les obstacles à l'application des recommandations.

## INTRODUCTION

In Nova Scotia, approximately 1300 strokes occur per year, resulting in more than 500 deaths.<sup>1</sup> If a person has already experienced a stroke or transient ischemic attack (TIA) the risk of recurrence is estimated at 15% within 2 years and as high as 30% after 5 years.<sup>2-4</sup> This risk can be substantially reduced through secondary prevention interventions, outlined in the best practice recommendations of the Canadian Stroke Strategy.<sup>5,6</sup> These include risk assessment, lifestyle modifications and medication management.<sup>7</sup> Unfortunately, lack of health system supports, and practitioner attitudes and beliefs toward the recommendations can hamper implementation of the recommendations in physicians' practices.<sup>8-12</sup> For example, health systems may limit access to specialized equipment for diagnostic tests, or practitioners may feel the recommendations are not applicable to their practices. Evidence indicates that in rural areas, where individuals may be at higher risk of stroke<sup>13</sup> and where health care resources may be limited, the barriers to implementation of recommendations may increase.<sup>14,15</sup>

Knowledge translation is an area of study that tries to understand how to facilitate the use of research evidence in clinical practice. For example, knowledge translation studies have shown that practitioners are more likely to use research evidence if they understand how it can be adapted to their practice,<sup>16,17</sup> and if they are actively engaged in exchanging information about research with health care decision-makers and research experts.<sup>18-20</sup> Frameworks based on the knowledge translation research can be used to design interventions for increasing the use of research in clinical practice. This research project used the Promoting Action on Research Implementation in Health Services (PARIHS) framework to create an intervention to increase the application of recommendations for secondary prevention of stroke in rural family practices. The PARIHS framework is based on the notion that the use of research in clinical practice is affected by perceptions of the quality of the research evidence, the context in which the evidence will be applied, and the application of an appropriate strategy for facilitating the use of

research in clinical practice.<sup>21,22</sup> Using the PARIHS framework as a guide, our research project assessed practitioners' perceptions of the quality of evidence supporting recommendations for secondary prevention of stroke; explored contextual barriers to applying the recommendations in rural practices; and evaluated whether a workshop that stimulated information exchange among family physicians, specialists and health district representatives was an appropriate facilitation strategy for increasing the application of the recommendations in rural family practices.

## METHODS

### Evidence

The evidence conveyed in the workshop was the recommendations for secondary prevention of stroke. These recommendations include the assessment and management of hypertension, lipids and diabetes; antiplatelet therapy; anticoagulant therapy for patients with atrial fibrillation; carotid revascularization for those with high levels of stenosis; and lifestyle modifications (i.e., smoking cessation, increased physical activity and improved nutrition).<sup>6</sup>

### Context

The workshop was offered in South West Health, a rural health district in Nova Scotia. This district is about 300 km from Halifax, where the nearest tertiary care hospital and university are located. At the time of the workshop the district had 3 local hospitals and employed 36 family physicians to provide health care services for about 62 000 residents. Family practitioners were geographically dispersed throughout the district and were required to rotate coverage for local hospital medical services. No neurologists or cardiovascular surgeons practise in the district.

The health district was chosen because of its readiness for health system change. A needs assessment, conducted 3 years before the research project, had indicated a suboptimum percentage of poststroke patients who were taking appropriate medications for their condition; 79% were taking antithrombotics,

40% were taking antilipemics and 71% were taking at least one antihypertensive medication.<sup>23</sup> These percentages should be closer to 90% for all 3 medications. The district was aware of this gap and had acknowledged the need for improvements in care for stroke patients. The health district had recently been funded as a provincial demonstration project for implementing coordinated care for stroke patients, which was based on best practice recommendations across the continuum of care. One result of this was the establishment of a new stroke clinic that employed a nurse practitioner trained in health promotion strategies and an internist trained in care for stroke patients. At the time of the study the clinic had just started, and the number of patient referrals from family physicians was lower than expected.

### Workshop facilitation strategy

The workshop was designed to facilitate a dialogue on the recommendations for secondary prevention of stroke among family physicians, specialists and representatives from the health district. To inform this dialogue, 3 specialists from the urban tertiary care hospital took part in the workshop: a stroke neurologist, a cardiologist and a nutritionist with expertise in health promotion. The stroke neurologist presented the research evidence and updated the group on current national and provincial initiatives supporting the recommendations. The cardiologist presented the current recommendations for preventing a heart attack, to stimulate a discussion about the similarities and differences between the recommendations for stroke and heart attack. The nutritionist provided examples of behavioural change strategies that practitioners could use to increase patient compliance with recommendations for health promotion post-stroke. Time was allocated in the workshop for presenters and participants to discuss the research evidence and identify ways the recommendations could be applied to rural practices.

Health district representatives were involved in the workshop to improve participants' awareness of how the health district could support implementation of the recommendations. They created a resource directory of health district services, presented case studies and participated in discussions. The administrator responsible for the district's stroke demonstration project led a discussion on what changes were being made in the district to support secondary prevention of stroke. The stroke clinic nurse practitioner provided specific information on the health promotion services being provided by

the stroke clinic. The stroke clinic internist presented local case studies illustrating how the clinic could increase evidence-based care in the district.

### Study participants

All 36 family physicians in the health district were invited to the workshop. Internists working in the district were invited when space became available. A local family physician responsible for continuing medical education championed the workshop to local family physicians. To compensate family physicians for income lost as a result of attending the workshop, they were offered an honorarium of \$500.

### Evaluation and analysis

A sequential explanatory mixed-methods approach was used to evaluate the workshop and to explore the implementation of recommendations postworkshop. This evaluation approach involves the collection and analysis of quantitative data, then uses the findings to create a qualitative tool for follow-up data gathering.<sup>24</sup> We used 3 methods of data collection: a questionnaire administered during and directly after the workshop, documentation of comments made during the discussion periods and postworkshop interviews conducted by an independent contractor.

The PARIHS framework was used by the research team to create a questionnaire that evaluated participants' perceptions of the quality and applicability of the research evidence supporting the recommendations, the context in which the recommendations would be applied, and whether the workshop facilitated an awareness and acceptance of the recommendations among participants. The questionnaire was given to all workshop attendees, to be completed and handed in anonymously. There were 2 sections. Section 1 was given at the start of the workshop, because it allowed participants to evaluate workshop presentations and discussions immediately, rather than at the end of the workshop. This section asked about technical problems (e.g., was the presentation clear), and asked them to evaluate the relevance and worth of the content. Questions were assessed using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with space for written comments. Section 2 had a similar format and was distributed at the end of the workshop. This section asked respondents to assess their acceptance of the recommendations by asking them questions about the quality of the evidence,

the existence of contextual barriers to implementing recommendations in their practices, and their future ability to implement the recommendations in their practice.

Postworkshop interviews were conducted 2 to 4 months after the workshop with family physicians, the health district administrator and the stroke clinic nurse practitioner who attended the workshop. Interviews used a structured interview guide to probe opinions of the workshop and reflections on the questionnaire results, and to explore whether the practitioners had been better able to implement the recommendations after the workshop. The interviews were conducted, recorded and transcribed by a third party.

The Dalhousie University Research Ethics Board approved the research project. All participants gave written consent to have their comments recorded and to participate in the evaluation.

### Data analysis

Quantitative data from the questionnaire were entered into an SPSS 15 database for cleaning — to check for errors that may have occurred during inputting of data — and analysis. Descriptive analyses examined the distribution of responses and calculated means and percentiles. The qualitative data were analyzed manually. Each interview was reviewed and coded by 2 researchers using an iterative content analysis. In this analysis, each researcher first identified codes that reflected emerging themes in the individual interviews, then these initial themes were grouped into broader themes that were common across the interviews.<sup>25</sup> After each researcher reviewed all the interviews, and had reached a point where no new themes were evolving, the 2 researchers compared their findings and reached consensus on common themes. These common themes were presented to family physicians on the research team to enhance the trustworthiness of the findings.

## RESULTS

### Questionnaire findings

Sixteen participants attended the workshop, including 14 family physicians and 2 general internists. All participants completed section 1 of the questionnaire, which assessed how well the workshop facilitated dissemination of the recommendations. The results indicated that respondents felt the presentations and dis-

cussions at the workshop improved their awareness of the recommendations. The mean rating for all presentations and discussions ranged from 4.3 to 4.8 out of 5.0 (between “agree” and “strongly agree”) demonstrating that respondents felt the presentations were clear, relevant, appropriate and worthwhile. The most highly rated aspect of the workshop was the stroke clinic internist’s presentation of the local case studies.

Fifteen participants completed section 2 of the questionnaire regarding respondents’ acceptance of the recommendations. Almost all respondents agreed that the practice recommendations were well-supported by the research evidence (100%), applicable to their practice (67%–100%) and reflected what they were currently doing in their practice (66%–100%). The recommendation on carotid revascularization was felt to be the least applicable to participants’ practice (67%), did not reflect what they were doing in their practice (66%), did not align with patient preferences (46%) and was felt to be less well-received by patients (54%). Participants felt that the health promotion recommendations with the lowest patient receptivity were smoking cessation (20%), increased physical activity (27%) and improved nutrition (40%). As part of the sequential explanatory mixed-methods approach, recommendations with the lowest percentages of agreement (i.e., health promotion and carotid revascularization) were further explored in the postworkshop interviews.

Most respondents (67%) expressed the opinion that the services currently available in the community, or the hospital, adequately supported their ability to follow recommended practices for the secondary prevention of stroke. The services that most respondents said were “mostly” or “very” useful were diagnostic imaging (100%), diabetes education centre (100%) and 24-hour blood pressure monitoring (93%). In contrast, 62% felt the stroke clinic and 35% felt the smoking cessation program were “mostly” or “very” useful. The health promotion services that respondents were most likely to use outside of their practice were those that educated patients on nutrition (43%) and physical exercise (36%).

### Qualitative findings

The qualitative findings are based on comments recorded during the workshop discussions, written comments from the 2 sections of the questionnaire and postworkshop interviews. Interviews were conducted with 12 family physicians (the internist

was excluded from the interviews, and 2 family physicians were unable to schedule an interview after 6 attempts). In addition, interviews were conducted with the health district administrator and the stroke clinic nurse practitioner. The following 3 themes emerged: communication issues between practitioners and the health district, implementation of the recommendations in practice and the need to coordinate services with other health professionals to implement recommendations.

*Theme 1: communication issues between family physicians and the health district*

Comments made during the workshop indicated that communications materials distributed by the health district about the stroke clinic had been misinterpreted by some of the family physicians. These physicians felt they had not been consulted when the district decided to implement a stroke clinic. However, many respondents expressed hope that over time they would have a better understanding of the clinic's value. This topic was explored in the postworkshop interview with the health district administrator. The administrator's comments reflect that it had been challenging for the district to communicate with practitioners who have very busy practices. However, she felt the workshop had stimulated practitioners to become involved in future health district changes, which she hoped would improve communications.

*Theme 2: implementation of the recommendations*

This theme represents how the workshop facilitated changes in

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<b>Synflorix<sup>™</sup></b>	Non-typable Haemophilus influenzae (NTHI) protein D <sub>2</sub> , diphtheria or tetanus toxoid	4 6B 9V 14 18C 19F 23F 1 5 7F
<b>Pneumovax<sup>®</sup></b>	Diphtheria CRM <sub>127</sub>	4 6B 9V 14 18C 19F 23F 1 5 7F 3 6A 19A

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family physicians' care of stroke patients. Although the quantitative findings indicated practitioners were already implementing the recommendations in their practice, during the interviews almost all practitioners noted that they had made further changes to their practice. The workshop was particularly effective at increasing practitioner attentiveness to the recommendations for aggressively treating high lipids and the need to treat patients with a prior TIA, as well as fostering better attitudes toward assisting patients with making lifestyle changes.

*Theme 3: the need to coordinate services with other health professionals to implement recommendations*

This theme is related to family physicians' awareness of other services and coordination with health services outside their practices to successfully implement the recommendations. Physicians indicated they had been too busy to look at the resource directory handed out at the workshop, and did not report increased awareness of services available in the health district. Concerns mentioned about coordinating services were with regard to referring patients to the stroke clinic, providing health promotion education and accessing services for patients who might need carotid revascularization. These concerns were significant enough to justify separate subthemes.

3a) Subtheme: referring patients to the stroke clinic. Comments documented during the workshop and in the comments sections of the questionnaire indicated several practitioners felt the stroke clinic might be detrimental to patient continuity of care. This perception seemed to change when the postworkshop interviews were conducted. In these interviews, family physicians said they were increasing their referrals to the stroke clinic and their patients' experiences were very positive. The quotes demonstrate that practitioners may have started to view the clinic as an asset rather than a disruption to their practice. One participant said, "I think the clinic approach is definitely something that ... we should be looking towards because our resources are becoming ... limited."

3b) Subtheme: providing health promotion education. In the interviews, almost all respondents talked about the conflict they felt around physicians' responsibilities in helping patients make lifestyle changes. For example, was health promotion within their scope of practice, or was it better handled by other professionals? They expressed frustration because they did not have the time or felt ill-equipped to do health promotion adequately. One

participant said, "Even though it would be preferable to think that you would take the time to do it with them, I don't think that I would ... I think that need can be better serviced by someone else." Some respondents were dissatisfied with available supportive services in the health district, and others talked about not being able to influence a patient's behavioural change. The administrator commented on the lack of training in health promotion provided to family physicians.

3c) Subtheme: accessing services for patients who might need carotid revascularization. In postworkshop interviews, practitioners were asked to reflect on the results from the questionnaire indicating that carotid revascularization had low practitioner support and aligned poorly with patient preferences. Comments indicated practitioners felt they could not effectively implement this recommendation because of the challenges they faced when trying to access specialized services for their patients. For example, to satisfy the best practice recommendation that a carotid revascularization be done within 2 weeks of the incident stroke (or TIA) for appropriate candidates, the practitioner needed to contact and convince both a radiologist and a vascular surgeon, who are often unaware of the recommendation and located a distance away, to squeeze their patient into an overbooked schedule. One physician noted that this process might be uncomfortable for the family physician because it could create conflict with other health professionals. The administrator expressed the opinion that this process is more comfortable for the family physician when the family physician has personal connections with these health professionals.

## DISCUSSION

### Summary of the main results

The purpose of the workshop was to create a venue where specialists, health system administrators and family physicians could discuss the recommendations for secondary prevention of stroke with the intent of helping family physicians contextualize the recommendations to their rural practice. The results indicated that the workshop increased family physician awareness, appreciation and application of the recommendations. Physicians spoke of a greater appreciation of the importance of aggressive treatment in patients who had experienced a TIA and who were suffering from hyperlipidemia, in order to prevent a second stroke. Best practice recommendations for smoking, physical exercise

and carotid revascularization were rated as less applicable to their practices, and less aligned with patient preferences and receptivity in the postworkshop questionnaire. When these results were further explored in the follow-up interviews, they seemed to be rooted in issues around communication, scope of practice and coordination with other health services. The interviews also demonstrated that participants had gained an increased appreciation of how health district initiatives, such as the introduction of a stroke clinic, could help them with implementing the recommendations. The workshop appeared to be effective for increasing an exchange of information between health care decision-makers and family practitioners, and for reducing health system barriers to implementing the recommendations.

### Explanation of the findings

Family physicians work within the context of the rural health district where they provide care. The importance of context in health care provision has been supported by other research.<sup>26-30</sup> Our results confirm the role of the rural context in the implementation of evidence into practice,<sup>31</sup> and have identified unique contextual barriers such as lack of interprofessional communication that also affect implementation. These findings demonstrate the importance of considering contextual barriers when assessing the implementation of evidence into practice.

Fewer opportunities for informal contact between rural family physicians and specialists, who are often clustered in central locations,<sup>32,33</sup> may decrease communication between health professions,

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interprofessional understanding,<sup>34</sup> coordination of health services and trust between individuals.<sup>29,35,36</sup> Trust and good communication are key to fostering social capital among professionals. Social capital is about relationship-building and is commonly assessed by the level of trust, amount of reciprocity and number of associations with other professionals. High levels of social capital have been linked to better access to care,<sup>37</sup> cooperative behaviours and information exchange across professions.<sup>38,39</sup> Low social capital can also affect a practitioner's ability to get timely access to specialist care for their patients.<sup>40</sup> Social capital may have affected family physicians' coordination with other health services and compounded miscommunications with administrators, who may have different health system priorities and use different language than practitioners.<sup>20</sup>

### Study limitations

Despite heavy recruitment efforts to enlist 100% of family physicians in the district, our participation rate was much lower, at 39%. This rate reflects the heavy workload family physicians in that health district must balance, as well as mandatory on-call hospital responsibilities and limited support staff for individual practices. Given the study setting, our response rate was relatively good. This may have been because of the honorarium, the interest generated by invited speakers and the local family physician who championed the workshop to her colleagues.

Our evaluation of the workshop and the identification of barriers were largely based on qualitative interviews with individuals from one health district. These interviews were rich and informative, but may only represent the views of our participants. To increase the credibility and trustworthiness of our study, we conducted interviews with the health district administrator and stroke clinic nurse practitioner, and we asked family physicians on our research team to review our findings. To determine whether our findings can be generalized to other rural health districts, a larger quantitative study would need to be conducted. We believe our mixed methodology (sequential explanatory mixed methods) helped us identify barriers to recommendation implementation that were not straightforward or easily quantified. Mixed methods evaluations are very applicable to assessing the implementation of recommendations in rural locations because they allow for a deeper understanding of the contextual influences specific to an area. Despite the study limitations, we believe our research has revealed important barriers family

physicians face when trying to implement recommendations in a rural setting.

### Future directions

Creating venues where recommendations can be discussed with specialists and administrators is important to facilitating their implementation. Open forums involving practitioners and health district representatives may help reduce communication barriers and optimize patient care.<sup>41</sup> In addition, interprofessional educational opportunities could improve communication between health sectors and decrease barriers to the implementation of recommendations.<sup>12</sup>

### CONCLUSION

The workshop successfully improved participants' awareness and acceptance of the recommendations, and identified challenges to implementing recommendations in rural locations that can be addressed by the health system.

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\* Data from Canadian surveillance system: Immunization Monitoring Program, Active (IMPACT).

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1. Pevnar® 13 Product Monograph, Wyeth Canada, December 21, 2009. 2. Pevnar® Product Monograph, Wyeth Canada, December 22, 2008. 3. Synflorix™ Product Monograph, GlaxoSmithKline, May 5, 2009.

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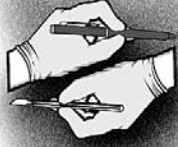


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## DOCTORS SPEAK OUT

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## ORIGINAL ARTICLE ARTICLE ORIGINAL

# Rural–urban differences in emergency department wait times

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This article has been peer  
reviewed.

**Introduction:** I sought to determine whether emergency department (ED) volume is associated with differing ED wait times.

**Methods:** I conducted a retrospective analysis of the Emergency Department Reporting System database of the Ontario Ministry of Health. I abstracted ED length of stay for patient visits to 117 hospital EDs during the second quarter of 2008, representing 89% of ED visits in the province during that period. Annual volume of ED visits, lengths of stay in the ED and acuity levels of patients were measured.

**Results:** All EDs were more efficient in managing the treatment of low-acuity patients compared with high-acuity patients. Small rural EDs in Ontario had the shortest wait times for both high- and low-acuity patients (medians 2.35 h for high-acuity and 1.46 h for low-acuity patients in small rural EDs v. 4.98 h for high-acuity and 2.85 h for low-acuity patients in teaching hospitals).

**Conclusion:** Among the hospitals studied, rural EDs had the shortest wait times for both low- and high-acuity patients.

**Introduction :** J'ai cherché à déterminer s'il y a un lien entre le volume de patients reçus à l'urgence et la variabilité des temps d'attente.

**Méthodes :** J'ai procédé à une analyse rétrospective de la base de données du Système de production de rapports sur les services d'urgence du ministère de la Santé de l'Ontario. J'ai résumé la durée du séjour à l'urgence pour les patients qui se sont présentés à l'urgence de 117 hôpitaux au cours du deuxième trimestre de 2008, ce qui représentait 89 % des visites à l'urgence enregistrées dans la province au cours de la période en cause. Le volume annuel des visites à l'urgence, la durée du séjour à l'urgence et la gravité des cas ont été mesurés.

**Résultats :** Les urgences ont réussi à gérer avec plus d'efficacité le traitement des patients dont le cas était moins grave que ceux dont le cas était plus lourd. Les petites urgences rurales de l'Ontario affichaient les temps d'attente les plus courts à la fois pour les patients dont le cas était lourd et pour ceux dont le cas était léger (médiane de 2,35 h pour les cas lourds et de 1,46 h pour les cas légers dans les petites urgences rurales c. 4,98 h pour les cas lourds et 2,85 h pour les cas légers dans les hôpitaux universitaires).

**Conclusion :** Parmi les hôpitaux étudiés, les urgences rurales affichaient les temps d'attente les plus courts à la fois pour les cas légers et les cas lourds.

## INTRODUCTION

According to one study,<sup>1</sup> 38% of Canadian respondents visited an emergency department (ED) for care during a 2-year period (2002–2004), a third more than respondents from most other countries studied (Australia, New Zealand, the United Kingdom and the United States). Emergency department wait times in Canada were found to be signif-

icantly higher than in the 4 other countries studied, with 48% of respondents waiting longer than 2 hours for care.

Anecdotally, there are increasing numbers of people from the city who travel to rural EDs because they feel that they receive better, or at least faster, service there. On the other hand, as acuity has previously been found to directly affect ED length of stay,<sup>2</sup> it could be that if high-volume EDs in

Canada have longer wait times, this is a reflection of a higher percentage of severely ill patients presenting to these centres.<sup>5</sup>

In some Ontario regions, ED efficiency has been cited as the rationale for proposals to close small EDs. The question arises, does size really matter when it comes to the efficiency of ED wait times?

## METHODS

Emergency department length of stay includes time spent by the patient waiting to see the doctor, and time spent conducting laboratory tests, radiography and so on. I abstracted ED length of stay for the second quarter of 2008 from the Emergency Department Reporting System of the Ontario Ministry of Health. Of Ontario hospitals, 117 are mandated by the province to report ED length of stay, representing 89% of ED visits in the province. There is no time data available for the 38 other Ontario hospitals for which mandatory reporting is not in effect. Of these hospitals, 31 are small community hospitals with a median community population of 4298 and a median volume of 9996 annual visits.

Emergency departments were stratified according to the annual volume of visits. Patient data from university teaching hospitals formed a category of its own. For other hospitals, low volume was defined by fewer than 20 000 annual ED visits, medium volume was 20 000–30 000 visits, high volume was 30 000–50 000 visits and very high volume was more than 50 000 visits.

Visits to the ED were also stratified by acuity level using the Canadian Emergency Department Triage and Acuity Scale (CTAS).<sup>4</sup> High-acuity patients were admitted or were classified as CTAS I–III. Low-acuity patients were classified as CTAS IV and V.

The ED length of stay was calculated by finding the difference between the “time patient left ED”

from the registration time or triage time (whichever came first, depending on the hospital’s process) resulting in a time spent in the ED that is measured in hours. The following measures were obtained:

- Median length of stay: the length of time in which 50% of patients had completed their ED visit.
- Mean length of stay: the total time spent in the ED for all ED visits divided by the total number of visits.
- 90th percentile: the maximum length of time in which 90% of patients had completed their ED visit.

Statistical significance was tested using SPSS version 12.

## RESULTS

Table 1 indicates ED length of stay in hours for 117 Ontario hospitals for the second quarter of 2008. All EDs were more timely in dealing with low-acuity patients. The length of stay for high-acuity patients in low-volume EDs approaches that of teaching hospital EDs for low-acuity patients.

## DISCUSSION

Limitations of this study include the absence of data for the very smallest EDs, and potential variations in acuity and time coding. The smallest EDs are not required to report time data and so the “low volume” category includes only 25 of a potential 63 EDs (the vast majority, 26, of the nonreporting EDs are in northern Ontario). The data from EDs with very high, high and medium volumes are based on nearly complete data and show a continuous trend that continues into the low volume category. This does not preclude a methodologic bias, but it reassures that the statistically significant results in the smallest category are real. For the hospitals studied, the 25 small rural EDs in Ontario that reported

**Table 1. Emergency department lengths of stay for patients who presented to 117 Ontario hospitals in the second quarter of 2008, by acuity level**

ED volume/ category	No. of hospitals	Median community population in 2006	Acuity level; length of stay, h					
			90th percentiles		Means		Medians	
			High	Low	High	Low	High	Low
Low	25	10 295	7.81	3.30	3.66	1.83	2.35	1.46
Medium	26	19 288	9.73	4.25	4.64	2.31	2.84	1.85
High	27	82 184	12.09	4.94	5.89	2.72	3.77	2.24
Very high	23	323 342	13.31	4.80	6.49	2.69	4.14	2.20
Teaching	16	1 130 761	17.72	6.16	7.86	3.46	4.98	2.84

ED = emergency department.

data had the lowest wait times for both high- and low-acuity patients. The absolute time differences are even greater for high-acuity patients. One has to wonder if it may be the greater availability of diagnostic testing and consultants in larger hospitals (and thus their use) that contributes to this difference in efficiency.

Other factors may be at work at the rural ED that improve efficiency. One potential factor is that the doctor in the rural ED is usually a community physician who knows his or her patients, and is passingly familiar with the sickest patients of his or her colleagues.

The most significant wait time differences for small hospitals are the times for high-acuity patients, despite the fact that most times of the day many support services (e.g., radiography) need to be called in to a rural hospital. The time required to have the technician wake up, drive to the hospital and warm up the machine will reduce rural efficiency outside of regular work hours. The rural doctor

may be better able to direct his or her limited resources to high-acuity patients, which in turn improves wait time outcomes.

## CONCLUSION

Small hospital size appears to be an advantage for efficiency in ED wait times.

**Competing interests:** None declared.

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## LES MÉDECINS S'EXPRIMENT

La parole aux médecins — Lettres à la rédaction — Éditoriaux

Nous invitons les médecins à commenter les questions qui les intéressent. Faites parvenir vos textes à Suzanne Kingsmill, rédactrice administrative, *JCMR*, 45, boul. Overlea, C. P. 22015, Toronto (Ontario) M4H 1N9; [cjrm@cjrm.net](mailto:cjrm@cjrm.net)



## ORIGINAL ARTICLE ARTICLE ORIGINAL

# What is the financial state of medical students from rural backgrounds during tuition fee deregulation?

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reviewed.

**Introduction:** We sought to examine the financial state of medical students from rural backgrounds during a time of tuition fee deregulation.

**Methods:** We surveyed incoming classes from 2007 to 2011 at the University of Calgary. Community background, expected educational debt at graduation, educational debt at entry to medical school and parental income were collected for analysis. Data were analyzed using the  $\chi^2$  test, analysis of variance and the Newman-Keuls multiple comparison test.

**Results:** The overall response rate was 95.3%. Of the 571 (93.5%) respondents who supplied data on their background and debt, 94.4% expected to have educational debt at graduation. The mean projected educational debt at graduation by medical students from both rural (\$107 226 [95% confidence interval (CI) \$98 030–\$116 423]) and regional (\$99 456 [95% CI \$91 905–\$107 006]) backgrounds was significantly greater than the debt projected by students from metropolitan (\$88 565 [95% CI \$83 607–\$93 524]) backgrounds. Medical students who came from rural backgrounds had the highest mean debt at entry to medical school (\$33 053 [95% CI \$25 715–\$40 391]) compared with their peers from regional (\$23 253 [95% CI \$16 621–\$29 885]) and metropolitan (\$22 053 [95% CI \$17 344–\$26 762]) backgrounds. Students of rural origin also had parents whose mean income (\$104 024 [95% CI \$75 976–\$132 173]) was significantly lower than the mean parental income of their peers who originated from regional (\$143 167 [95% CI \$119 898–\$166 435]) and metropolitan (\$150 339 [95% CI \$135 241–\$165 438]) centres.

**Conclusion:** Rising tuition and subsequent debt may be affecting the diversity of medical students' backgrounds. Financial programs dedicated to rural-background students and their interest in medicine may become necessary.

**Introduction :** Nous voulions étudier la situation financière des étudiants en médecine provenant de milieux ruraux en période de déréglementation des frais de scolarité.

**Méthodes :** Nous avons sondé les groupes d'arrivée de 2007 à 2011 à l'Université de Calgary. Nous avons réuni pour l'analyse leur lieu d'origine, la dette d'études qu'ils prévoyaient avoir au moment de la graduation, leur dette d'études à leur arrivée à la Faculté de médecine et le revenu de leurs parents. Nous avons analysé les données au moyen du test de  $\chi^2$ , de l'analyse des variations et du test de Newman-Keuls à comparaisons multiples.

**Résultats :** Le taux global de réponse s'est établi à 95,3 %. Sur les 571 répondants (93,5 %) qui ont fourni des données au sujet de leur origine et de leur dette, 94,4 % s'attendaient à avoir une dette d'études au moment de la graduation. La dette d'études moyenne, au moment de la graduation, des étudiants en médecine originaires des milieux ruraux (107 226 \$ [intervalle de confiance à 95 % (IC), 98 030 \$–116 423 \$]) et régionaux (99 456 \$ [IC à 95 %, 91 905 \$–107 006 \$]) était significativement plus élevée que la dette que les étudiants des régions métropolitaines prévoyaient avoir (88 565 \$ [IC à 95 %, 83 607 \$–93 524 \$]). Les étudiants en médecine provenant de

milieux ruraux étaient les plus endettés en moyenne au moment de l'arrivée à la Faculté de médecine (33 053 \$ [IC à 95 %, 25 715 \$–40 391 \$]) comparativement à leurs pairs provenant de milieux régionaux (23 253 \$ [IC à 95 %, 16 621 \$–29 885\$]) et métropolitains (22 053 \$ [IC à 95 %, 17 344 \$–26 762 \$]). Les étudiants d'origine rurale avaient aussi des parents dont le revenu moyen (104 024 \$ [IC à 95 %, 75 976 \$–132 173 \$]) était significativement moins élevé que celui des parents de leurs pairs provenant de centres régionaux (143 167 \$ [IC à 95 %, 119 898 \$–166 435 \$]) et métropolitains (150 339 \$ [IC à 95 %, 135 241 \$–165 438 \$]).

**Conclusion :** La montée des frais de scolarité et l'endettement qui en découle peuvent avoir un effet sur la diversité de l'origine des étudiants en médecine. Il pourrait être nécessaire de créer des programmes financiers visant à appuyer les étudiants d'origine rurale et l'intérêt qu'ils portent à la médecine.

## INTRODUCTION

The concern about insufficient numbers of rural physicians across Canada has been well-documented.<sup>1-6</sup> It has been shown that medical students from rural backgrounds are more likely to eventually practise in rural communities.<sup>5,7-10</sup> However, the proportion of students with rural backgrounds who apply to medical school is not reflective of the population that resides in rural Canada.<sup>11,12</sup> Getting more students from rural communities to apply to medical school has been a significant challenge. This is unfortunate because recent evidence suggests that once students of rural origin apply to medical school, they are as successful in gaining entry as other candidates.<sup>13,14</sup>

Across Canada, tuition fees for medical school have been on the rise. Although rising tuition fees have had an impact on the debt projected by first-year medical students in Ontario,<sup>15</sup> research surrounding the financial challenges faced by medical students from rural backgrounds is limited. In a study including students from 12 Canadian medical schools, Kwong and colleagues<sup>12</sup> found that a greater proportion of students from rural backgrounds not only came from families of lower socioeconomic status (parental income < \$40 000) than their nonrural peers, but also entered medical school with debt and anticipated having debt at graduation. That study, however, which included students from the University of Calgary, was conducted in 2001 and before the wave of deregulation of tuition fees that swept across universities in western Canada. For example, the final year of tuition-fee control at the University of Calgary was in 2002 (class of 2005) when medical school tuition was \$6992. Following the deregulation of tuition fees in 2003, fees increased to \$9950 (class of 2006), then to \$12 788 (classes of 2007, 2008 and

2009) and \$13 210 (classes of 2010 and 2011).

The primary aim of this study was to examine the projected educational debt at graduation of rural-background medical students during the time of tuition fee deregulation. We also investigated the educational debt at entry to medical school of rural-background medical students and how the socioeconomic status of their parents compared with that of their nonrural peers.

## METHOD

Incoming students (classes 2006–2011) to the 3-year medical program at the University of Calgary were surveyed using a paper–pencil questionnaire during orientation week, which occurs during the first week of medical school. All medical students registered in the respective incoming classes were eligible to complete the survey. Students were assured during the orientation that participation was voluntary and that the decision to participate or not participate would not affect their academic standing. To maintain confidentiality, a code number was assigned to each questionnaire. Students' decision to complete the questionnaire was accepted as indication of consent and willingness to participate.

To focus on financial measures collected during the time of greatest impact, data provided by the class of 2006 was not included, as these students didn't experience the full effect of tuition fee deregulation and were likely in the application pipeline when the deregulation was initiated. Data provided by international students were also excluded. Consequently, study participants in the group affected by tuition fee deregulation consisted of classes 2007–2011.

Demographic information collected included sex, age and community background. Financial information collected included projected educational debt at graduation, educational debt at entry and parental

income, which was used as a proxy for socioeconomic status. Educational debt was defined as “debt incurred due to educational costs that must be paid back.” Student background designation was based on the population of the community where the student was primarily raised (rural < 10 000, regional 10 000–200 000, metropolitan > 200 000). In the analysis, financial figures were treated as interval data to better understand the magnitude of both educational debt and parental income. Data were analyzed using the  $\chi^2$  test, analysis of variance and the Newman–Keuls multiple comparison test.

The Conjoint Health Research Ethics Board at the University of Calgary granted ethical approval for this study.

## RESULTS

Of the 582 (95.3%) medical students who returned a survey, 94, 143 and 344 students reported rural, regional and metropolitan backgrounds, respectively. One female student did not report the background in which she was primarily raised. The 3 groups varied slightly in the proportion of female students: rural (57.5%), regional (50.4%) and metropolitan (52.3%) ( $p > 0.05$ ). The mean age of students from both rural (25.4 [standard deviation (SD) 4.3] yr) and regional (25.3 [SD 3.6] yr) backgrounds was significantly greater than the mean age of students from metropolitan (24.2 [SD 3.5] yr) backgrounds ( $p < 0.05$ ).

Complete information on community background and expected educational debt at graduation was provided by 571 (93.5%) respondents. Nearly all ( $n = 539$ , 94.4%) of these students ex-

pected to have educational debt at graduation (97.9% rural, 97.1% regional, 92.3% metropolitan;  $p > 0.05$ ). Using data supplied by the students who expected to have educational debt at graduation, a one-way (community background) analysis of variance on projected educational debt at graduation revealed significant differences ( $F = 7.29$ ,  $p < 0.001$ ). The mean projected educational debt at graduation (Table 1) was significantly greater for rural- and regional-background medical students compared with metropolitan-background medical students.

Of the 577 (94.4%) respondents who provided complete information about their background and educational debt at entry, 228 (39.5%) were in debt on entry to medical school. The proportion of rural-background medical students with educational debt at entry (52.1%) was significantly greater than the proportion of metropolitan-background medical students with educational debt at entry (34.8%) ( $p < 0.05$ ). The proportion of regional-background medical students with educational debt at entry (42.6%) did not differ from their peers. Using data provided by 228 respondents with educational debt at entry, a one-way (community background) analysis of variance revealed significant differences ( $F = 3.22$ ,  $p < 0.05$ ). Rural-background medical students had significantly greater educational debt at entry than medical students from both regional and metropolitan backgrounds (Table 2).

A separate one-way (community background) analysis of variance on parental income using data provided by 487 (79.9%) respondents was significant ( $F = 4.09$ ,  $p < 0.02$ ). Mean parental income (Table 3) reported by students from regional and metropolitan backgrounds was significantly greater than parental income reported by students from rural backgrounds.

Of note, the median total family income of Albertans was \$78 400 in 2006,<sup>16</sup> which is when the class of 2009 began, and is the midpoint of our 5-class cohort. When reviewing parental income, 32% of respondents in this study originated from families whose income was below the provincial median.

**Table 1. Mean projected educational debt at graduation of 539 medical students, by community background**

Community background	Projected debt, \$	95% CI, \$
Rural, $n = 91$	107 226	98 030–116 423
Regional, $n = 135$	99 456	91 905–107 006
Metropolitan, $n = 313$	88 565	83 607–93 524

CI = confidence interval.

**Table 2. Mean educational debt of 228 students at entry to medical school, by community background**

Community background	Debt at entry, \$	95% CI, \$
Rural, $n = 49$	33 053	25 715–40 391
Regional, $n = 60$	23 253	16 621–29 885
Metropolitan, $n = 119$	22 053	17 344–26 762

CI = confidence interval.

**Table 3. Mean income of the parents of 487 medical students, by community background**

Community background	Parental income, \$	95% CI, \$
Rural, $n = 82$	104 024	75 976–132 173
Regional, $n = 120$	143 167	119 898–166 435
Metropolitan, $n = 285$	150 339	135 241–165 438

CI = confidence interval.

## DISCUSSION

Medical students from rural backgrounds projected high educational debt at graduation, and the income of their parents was the lowest of the 3 groups studied. Not only did a greater proportion of medical students from rural backgrounds report educational debt at entry compared with those from metropolitan backgrounds, but medical students from rural backgrounds also displayed the highest educational debt at entry of all groups. Living away from home to attain medical school entry requirements is probably the main reason why rural-background medical students have the highest educational debt at entry.<sup>12</sup> Interestingly, medical students from both rural and regional backgrounds were significantly older at entry to medical school than their peers from metropolitan backgrounds. This may suggest that it takes students from nonmetropolitan backgrounds longer to attain medical school entry requirements and the finances to proceed with medical training.

Rising tuition may not only serve as a deterrent to qualified candidates,<sup>17,18</sup> but also may limit the diversity<sup>18</sup> (i.e., background) of medical students, which ultimately has implications for the profession's ability to understand and solve major health issues.<sup>19</sup> In particular, 32% of respondents in this study reported parental income below the provincial median, suggesting that most students in this study originated from families of higher socio-economic status. As tuition fees rise, a threshold may eventually be reached whereby some students may consider the financial realities of entering medical school to be overwhelming. It is reasonable to presume that for students of lower income families, this may have already occurred. Rising tuition may be especially detrimental to students from rural backgrounds, as financial support from parents may not be as readily available to these students as it is to their nonrural peers. With regard to exit from medical school, the level of perceived debt may also prove to be a disincentive for some potential applicants. However, the actual amount of debt that may dissuade students from applying to medical school remains somewhat elusive. This may be due, in part, to tuition fee increases that, so far, have had limited impact on higher income families.<sup>15</sup>

Of particular note is that the mean projected educational debt at graduation of rural-background medical students is above \$100 000. Earlier research<sup>12</sup> found that the impact of financial stress on rural and nonrural students regarding specialty

choice and practice location is similar and relatively minor. Whether the impact of financial stress on career-related decisions will change as debt soars is an important question and worthy of future study.

## Limitations

These results reflect the financial state of students at one medical school and therefore may not generalize to students attending other schools across Canada. For example, the medical program at the University of Calgary is 3 years in duration. Medical students training in other programs, which are typically 4 years in length, will presumably assume larger debt by the time they graduate. On the other hand, students in a 4-year medical program have much more vacation time than students in a 3-year program, which allows them to earn income to cover the cost of attending medical school. How these factors interact to have an impact on educational debt of medical students training in programs of different duration is unknown.

It is also possible that students from lower income families tend to select 3-year medical programs. Examining the proportion of students from families whose income is below the median and who are attending other Canadian medical schools would clarify this and whether the projected debt reported in this study was inflated because of the students (32%) from lower income families.

Although students from rural backgrounds reported greater debt, gaining insight into the reasons for their indebtedness was beyond the scope of this study. Reported debt at graduation reflected a projected or anticipated debt that may prove to be somewhat inaccurate at the time of graduation. Additionally, several students did not report parental income, presumably because they did not know the information. This reduced the number of participants in the analysis of parental socio-economic status. It is possible that students who did not report parental income represented a particular socio-economic group (upper or lower) and simply chose not to disclose the information, thereby biasing the results. On the other hand, those who did report parental income may have done so without truly knowing the income of their parents. That is, the income they reported may be an approximation.

## CONCLUSION

The anticipated educational debt at graduation of medical students from rural backgrounds, who



come from families less affluent than those of their peers, remains high. As tuition fees increase, financial programs to support rural-background students and their interest in medicine may become necessary. In fact, several strategies to assist students from rural backgrounds have been proposed.<sup>5</sup> There is an urgent need for rural general practitioners and it is therefore important that the financial state of rural-background students maintains a prominent position on the rural human resources radar screen.

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CHAMPIX is indicated for smoking cessation treatment in adults in conjunction with smoking cessation counselling. For patients who have successfully stopped smoking at the end of 12 weeks, an additional course of 12 weeks treatment with CHAMPIX may be considered. In general, onset of adverse events occurred in the first few weeks of therapy and severity was generally mild to moderate. The most commonly observed adverse events associated with CHAMPIX (>5% and twice the rate seen in placebo-treated patients) were nausea (30%), abnormal dreams (13%), constipation (8%), flatulence (6%), and vomiting (5%). Nausea, for some subjects, persisted over several months. The incidence of nausea was dose-dependent. Initial dose-titration was beneficial in reducing the occurrence of nausea. For patients with intolerable nausea, dose reduction should be considered. CHAMPIX is contraindicated in patients who are hypersensitive to varenicline or to any ingredient in the formulation or component of the container. There have been post-marketing reports of serious neuropsychiatric symptoms in patients being treated with CHAMPIX, including anxiety, psychosis, mood swings, depressed mood, agitation, aggression, hostility, changes in behaviour or thinking, suicidal ideation, suicidal behaviour and suicide, as well as worsening of pre-existing psychiatric disorder (previously diagnosed or not). There are a number of confounding factors which may have contributed, including effects of nicotine withdrawal due to partial or complete smoking discontinuation; concomitant, or history of psychiatric conditions; and the concomitant use of other CNS drugs and/or alcohol. However, there are cases for which these confounding factors did not appear to be present, including cases where symptoms occurred within the first week of initiating CHAMPIX, prior to initiating smoking cessation. There have been other cases where symptoms developed following cessation of CHAMPIX therapy. It is not known whether these events are occurring at a rate and severity which is different from the background rate for smoking cessation in the general population or in the psychiatric population (treated or untreated), or different from the rates for other drugs in the class of smoking cessation. **Patients with concomitant psychiatric conditions, even if well controlled, or with a history of psychiatric symptoms, should be diligently monitored by a healthcare professional for new or worsened psychiatric events.** There have been post-marketing reports of hypersensitivity reactions including angioedema in patients treated with CHAMPIX. Clinical signs included swelling of the face, mouth (tongue, lips and gums), neck (pharynx and larynx) and extremities. There were rare reports of life-threatening angioedema requiring urgent medical attention due to respiratory compromise. Patients experiencing these symptoms should be instructed to discontinue treatment with CHAMPIX and contact a healthcare provider immediately. There have also been post-marketing reports of rare but severe cutaneous reactions, including Stevens-Johnson syndrome and erythema multiforme, in patients using CHAMPIX. As these skin reactions can be life-threatening, patients should be instructed to discontinue treatment at the first sign of rash or skin reaction and contact a healthcare provider immediately. **The concomitant use of NRT with CHAMPIX may result in an increase in adverse reactions. The safety and efficacy of the combination treatment with CHAMPIX and NRT have not been studied.** There have been post-marketing reports of traffic accidents, near-miss incidents in traffic, and other accidental injuries in patients taking CHAMPIX. In some cases, the patients reported somnolence, dizziness, loss of consciousness (blackouts), seizures or difficulty concentrating. Therefore, patients should be advised not to engage in potentially hazardous activities, such as driving a car or operating dangerous machines, until they know how CHAMPIX may affect them. Safety and efficacy of CHAMPIX in pediatric patients have not been established; therefore, CHAMPIX is not recommended for use in patients under 18 years of age. CHAMPIX is known to be substantially excreted by the kidney, and the risk of toxic reactions to this drug may be greater in patients with impaired renal function. Because elderly patients are more likely to have decreased renal function, care should be taken in dose selection, and it may be useful to monitor renal function. CHAMPIX is not recommended in patients with end-stage renal disease (ESRD).

### Serious Warnings and Precautions

#### Psychiatric symptoms:

There have been post-marketing reports of serious neuropsychiatric symptoms with CHAMPIX, including depressed mood, agitation, aggression, hostility, changes in behaviour, suicide-related events, including ideation, behaviour, attempted suicide and suicide, as well as worsening of pre-existing psychiatric disorder. **These events have occurred in patients with and without pre-existing psychiatric disorders.**

Some reported cases may have been complicated by the symptoms of nicotine withdrawal in patients who stopped smoking. Depressed mood may be a symptom of nicotine withdrawal. Depression, rarely including suicidal ideation, has been reported in smokers undergoing a smoking cessation attempt without medication. However, some of these symptoms have occurred in patients taking CHAMPIX who continued to smoke. All patients being treated with CHAMPIX should be observed for neuropsychiatric symptoms.

#### Important recommendations regarding psychiatric symptoms:

- The benefits and risks of all options for quitting smoking should be discussed with the patient before initiating treatment
- All patients attempting to quit smoking with CHAMPIX, as well as their families and caregivers, should be alerted about the need to monitor for depressed mood, agitation, aggression, hostility, suicidal ideation or behaviour, or changes in behaviour or thinking that are not typical for the patient
- Patients should be instructed to stop taking CHAMPIX immediately and contact their doctor if they experience, or if others observe these symptoms. In many post-marketing cases, resolution of symptoms after discontinuation of CHAMPIX was reported, although in some cases the symptoms persisted; therefore, ongoing monitoring and supportive care should be provided until symptoms resolve
- **Regarding alcohol intake:** Patients should be advised that alcohol intake may increase the risk of experiencing psychiatric adverse events during treatment with CHAMPIX
- **Regarding patients with psychiatric history:** Patients with concomitant psychiatric conditions, even if well controlled, or with a history of psychiatric symptoms, should be diligently monitored by a healthcare professional for new or worsened psychiatric events



## THE PRACTITIONER LE PRATICIEN

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### The occasional teacher. Part 1: teaching in a rural setting

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*This article has been peer  
reviewed.*

**W**ith the expansion of medical education into the community, more and more physicians will be asked to take medical students into their practices. Students bring their own rewards; they unintentionally provide continuing medical education. Their questions make us reflect and re-evaluate our practice. Students not only educate through questioning, but also alert us to new information. Having students is fun — their enthusiasm and wonder is infectious. You will have the chance to demonstrate the opportunities and benefits of rural practice, and may benefit yourself if your student returns as a colleague. In this, the first of 5 articles on the occasional teacher, we explore the rewards, challenges and solutions of taking a student into a community practice.

Space can be an issue. Do you have enough of it? Students can be very slow in their assessments. This is only to be expected, but it can cause problems with the flow in your office. What are the solutions? An extra examining room is the perfect solution but it is not always available, and you may have to be creative to find a solution.

Is there an unused corner in your office that you can set up as a temporary work station for the student? Internet access is essential now. Is it possible for the student to set up a laptop and use it to write notes and seek information? This will be temporary, so perhaps a less-used space such as the coffee room can be used while the student is in town.

Be sure your staff knows your expectations of the student, that he or she may

slow things down, and that you all will have to work with the student. Most patients are more than happy to be seen by a student; however, it is necessary to get permission. As well, the patient may be on a strict timeline, in which case they definitely should not be seen by the student. Students may actually enhance flow as they become familiar with the simpler patient presentations and procedures, but this is very dependent on the strength of each student and where they are in their education.

If you don't have students often, you may be uncertain of what expectations are realistic. Universities will provide some guidelines in the form of objectives or checklists of clinical problems to be seen. Although these guidelines are helpful, they should not be seen as rigid outlines of the clinical experience. Each practice is unique and the student's experience should reflect that. You will need to be aware of what support the student's university provides, particularly if you have concerns about the student. If, and this is a rare occurrence, you have serious concerns about the student, you must know the university's policies on remediation and failure, and whom to contact. In such circumstances, a quick telephone call can be very helpful.

Today, we have ease of communication with email. Before learners arrive in your community, contact them to let them know where to find you and what time you start. If they are to be on call, send them the call schedule so they can plan their lives. Also, if you are taking a resident, be aware of the limits to call, as set out by the agreements between

the residents' organizations and the provincial governments. These agreements can usually be found on the websites of the residents' organizations.

You are probably not the lone health care provider in your community. Your student will benefit from time spent with others. Perhaps some time in the operating room with the anesthesiologists and surgeons would be beneficial. A day with a home care nurse will educate them, not only on what others do, but also on how illness presents itself differently in other settings. A day with laboratory technicians practising venisection is often seen as very valuable by students.

Having medical learners in our communities is valuable for future recruitment, and how they spend their leisure time can go a long way to selling them on the rural lifestyle. It is a good idea to provide the student with some after-hours entertainment. A dinner invitation is always appreciated. If you participate in hobbies such as skiing or snowmobiling most students will be anxious to participate. Try to introduce the student to other young professionals

in your community. Many smaller communities have a more active social scene than urban communities. Make the student aware that life in a rural community is not a social Siberia, but is warm and "happening." This may be the student's first chance not only to suture, but also to curl!

**Competing interests:** None declared.

#### FURTHER RESOURCES

- Kelly L. Integrating family medicine residents into a rural practice. *Can Fam Physician* 1997; 43:277-86.
- Rubinstein W, Talbot Y. *Medical teaching in ambulatory care*. New York (NY): Springer Publishing Company; 2003.
- The Alberta Rural Physician Action Plan. PracticalProf. [www.practicalprof.ab.ca/](http://www.practicalprof.ab.ca/)

## RURALMED: THE SRPC LISTSERV

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Include your full name and email address. If you include a short biography it will be posted to the list as your introduction. You can also access both the RuralMed archives and a RuralMed subscription form through the SRPC home page at [www.srpc.ca](http://www.srpc.ca).

### MEDRURALE

Pour vous abonner au serveur de liste francophone, MedRurale, veuillez envoyer un courriel à l'adresse suivante : [lamarche@comnet.ca](mailto:lamarche@comnet.ca).

Donner votre nom au complet et votre adresse de courriel. Si vous ajoutez aussi une courte biographie, elle pourra être affichée sur la liste en guise de présentation. Vous pouvez aussi accéder aux archives de MedRurale et à un formulaire d'inscription au serveur de liste anglophone sur la page d'accueil du site de la SCMR, [www.srpc.ca](http://www.srpc.ca).



# THE PRACTITIONER LE PRATICIEN

## Country cardiograms case 38

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This article has been peer  
reviewed.

**A** 40-year-old female patient presents to a remote northern British Columbia emergency department with a history of sudden-onset palpitations. She has experienced similar symptoms before but has not sought medical attention for them until now, as they have been of short duration. She is hemodynamically stable, but has a very rapid pulse. Her initial electrocardiogram (ECG) is shown in Figure 1. Before

treatment can be instituted, the arrhythmia terminates spontaneously. The follow-up ECG is shown in Figure 2, which the computer report indicates as showing “inferior infarct, age undetermined.” What is the ECG diagnosis, and what further management should be considered?

**For the answer, see page 169.**

**Competing interests:** None declared.

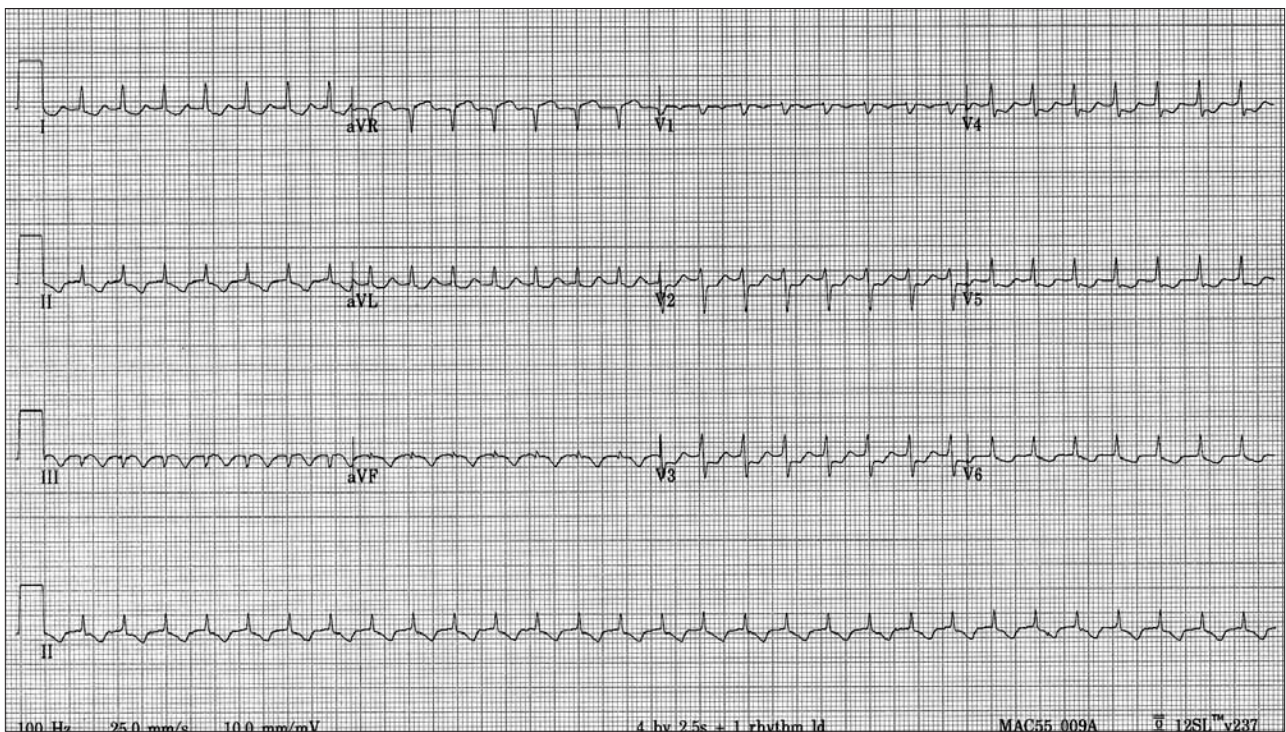


Fig. 1. Initial electrocardiogram of a 40-year-old woman who presented to the emergency department with a history of sudden-onset palpitations.

“Country cardiograms” is a regular feature of *CJRM*. We present an electrocardiogram and discuss the case in a rural context. Please submit cases to Suzanne Kingsmill, *CJRM*, 45 Overlea Blvd., P.O. Box 22015, Toronto ON M4H 1N9; cjrm@cjrm.net.

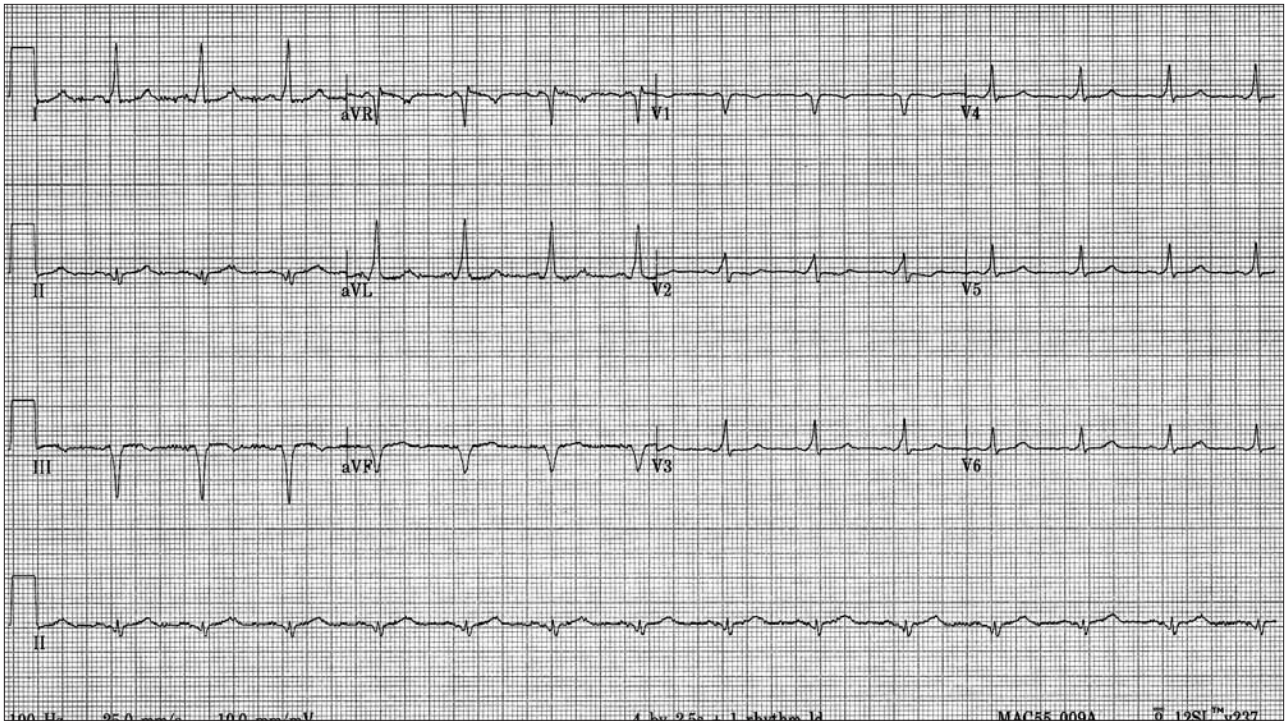


Fig. 2. Follow-up electrocardiogram, interpreted by the computer as showing “inferior infarct, age undetermined.”

## Country Cardiograms

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



## LETTERS / CORRESPONDANCE

Please send us your comments and opinions. / Nous serons heureux de recevoir vos commentaires et opinions. Letters to the editor should be addressed to: / Prière de faire parvenir les lettres à la rédaction à l'adresse suivante : *CJRM*, 45 Overlea Blvd., P.O. Box 22015, Toronto ON M4H 1N9; fax 416 961-8271; [cjrm@cjrm.net](mailto:cjrm@cjrm.net)

### RING REMOVAL

*To the Editor:*

I read with interest the article on ring removal in the Winter 2010 issue of the *Canadian Journal of Rural Medicine*.<sup>1</sup>

While working as the medical officer on a Canadian survey ship, I removed a ring from an injured crew member. The ring had been made from a hardened steel ball bearing race, so it could not be cut with a conventional ring cutter. The crew member had short-circuited a battery bank through a wrench into his ring. The heat from the current had vapourized a section of the ring and had caused a third-degree burn on the underlying skin. The dramatic tissue swelling threatened to cause an acute ischemic injury, and we were several hundred miles offshore at the time.

The ring was removed using a small hand-held inexpensive hobby tool called a "Dremel Moto-Tool." Generic variations of this tool are widely available. The attachment used was a thin abrasive disc less than a millimetre thick, which easily cut through the hardened steel.

This technique proved to be quick and was easily performed. Caution does need to be exercised to prevent thermal injuries from the cutting disc. Also, the cutting disc is thin and fragile so the operator should wear safety glasses.

**Bruce Woodburn, MD, FRCS(C)**  
Sechelt, BC

### REFERENCE

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### SCREENING MAMMOGRAPHY

*To the Editor:*

The recent article by McDonald and Sherman<sup>1</sup> about determinants of mammography use was interesting. I am concerned, however, by their recommendations for information campaigns to "boost compliance" in rural areas and for more use of mobile mammography clinics.

A screening mammogram does not save a woman from dying of breast cancer. Rather, it succeeds if, by initiating a cascade of tests, treatments and follow-ups, a cancer that would have been lethal if detected later, is found and cured. Unfortunately, this cascade is easily triggered, and the positive outcome is rare.

Of women enrolled in a screening mammography program, 99.9% will not benefit; many will be harmed. A recent editorial in the *BMJ* states, "For every 1000 women undergoing annual mammography for 10 years, 1 woman will avoid dying from breast cancer, 2–10 will be overdiagnosed and treated needlessly, 10–15 will be told they have breast cancer earlier than they would otherwise have been told, but this will not affect their prognosis, and 100–500 will have

at least one 'false alarm' (about half of these women will undergo a biopsy)."<sup>2</sup>

For rural women, each "false alarm" will require travel to a larger centre; those women unfortunate enough to be overdiagnosed will have dozens of needless trips over several years. Added to the fears and risks all women are exposed to from screening mammography, rural women and their families must also contend with significant expenses, increased risk of injury from motor vehicle collisions, and leaving their work and other responsibilities for much longer periods than their urban counterparts.

The farther away from an urban centre a woman lives, the greater the potential negative impact of screening mammography, even if the initial screening is done by a reliable mobile clinic in her hometown. Any information campaign should honestly disclose the risks and benefits of screening and respect the decisions of those who choose not to be screened.

**Shelagh McRae, MD, CCFP, FCFP**

Gore Bay Medical Centre, Gore Bay, Ont.

### REFERENCES

1. McDonald JT, Sherman A. Determinants of mammography use in rural and urban regions of Canada. *Can J Rural Med* 2010; 15:52-60.
2. Welch HG. Overdiagnosis and mammography screening. *BMJ* 2009;339:b1425.

### [One of the authors replies:]

The current recommendation of the Canadian Cancer Society, Health Canada and the US Preventive Services Task Force is that asymptomatic women aged 50–69 should undergo biennial mammography screening for breast cancer.<sup>1–3</sup> The US National Cancer Institute's current recommendation<sup>4</sup> is for biennial mammography screening beginning at age 40, though this recommendation is being reviewed based on mixed evidence about the efficacy of mammography screening for women aged 40–49.

We certainly agree that it should be the case that recommended guidelines for any form of asymptomatic screening be reviewed periodically to ensure that they reflect best practice and current research. However, the purpose of our paper<sup>5</sup> was not to evaluate these guidelines. Rather, we sought to examine the extent to which rural- and urban-dwelling Canadian women are compliant with the currently accepted recommendations regarding mammography screening and to consider possible reasons for any observed differences.

Our analysis indicates that an important reason why rural women aged 50–69 have lower compliance with recommended guidelines is not access barriers, but rather differences in the attitude of rural women about the importance of regular mammography screening. Because these guidelines have been in place for years, we do see our results as evidence that efforts to communicate information on the importance of regular screening may have been relatively less effective in reaching rural women, and this may well generalize to other forms of screening.

Furthermore, we do not specifically advocate for the increased use of mobile mammography clinics in rural areas, but rather suggest that the increased use of mobile mammography clinics in rural areas should be “accompanied by efforts to increase awareness of the importance of mammography screening among women living in those areas.” Without an effective information dissemination campaign, efforts for increasing cancer screening to recommended guidelines, *whatever those guidelines are*, may not prove to be very effective.

We also strongly agree with

Dr. McRae's concluding statement that “any information campaign should honestly disclose the risks and benefits of screening and respect the decisions of those who choose not to be screened.” Our results suggest, however, that it may be relatively more difficult to communicate effectively any information on mammography screening, including risks and benefits, to women living in rural and remote areas.

**James Ted McDonald, PhD**  
Fredericton, NB

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5. McDonald JT, Sherman A. Determinants of mammography use in rural and urban regions of Canada. *Can J Rural Med* 2010; 15:52-60.

### Correction

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### REFERENCE

1. Chauhan TS, Jong M, Buske L. Recruitment trumps retention: results of the 2008/09 CMA rural practice survey. *Can J Rural Med* 2010;15:101-7.

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**James Ted McDonald, PhD**  
Fredericton, NB

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5. McDonald JT, Sherman A. Determinants of mammography use in rural and urban regions of Canada. *Can J Rural Med* 2010; 15:52-60.

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1. Chauhan TS, Jong M, Buske L. Recruitment trumps retention: results of the 2008/09 CMA rural practice survey. *Can J Rural Med* 2010;15:101-7.





## THE PRACTITIONER LE PRATICIEN

### Country cardiograms case 38: Answer

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**F**igure 1 (on page 164) displays a regular narrow-complex tachycardia with a rate of 178 beats/min. P waves cannot be reliably identified. Diffuse ST-T changes are present, with prominent T wave inversion in the inferior leads. The differential electrocardiogram (ECG) diagnosis includes sinus tachycardia (which does not fit the clinical picture of abrupt onset and termination), atrial flutter and supraventricular tachycardia.

Atrial flutter is a notorious mimic. The ventricular rate of 178 beats/min is a little faster than the typical rate of about 150 beats/min seen in atrial flutter, but does not exclude the diagnosis. Likewise, the typical saw-tooth pattern of atrial flutter is not seen in this tracing, but it is conceivable that 2:1 atrioventricular conduction is present, and that every alternate flutter wave is masked in the QRS complexes. Atrial flutter therefore cannot be fully excluded.

Supraventricular tachycardia is the likeliest possibility. In this setting, such ST-T changes are not infrequently seen and have been termed “rate-related.” Alternately, they may reflect an ischemic process resulting from an imbalance between myocardial oxygen supply and demand. In supraventricular tachycardias, retrograde P waves are often present, and can occur a considerable time after the QRS complex. It is possible that retrograde P waves are superimposed on the T waves in this tracing, giving the erroneous impression of deep T wave inversion in the inferior leads.

It is therefore not feasible to identify the rhythm with total precision in this case. Had it persisted, vagal manoeuvres or an intravenous bolus of adenosine would have been a reasonable

diagnostic and therapeutic choice, as they may have been effective in terminating supraventricular tachycardia. Although they would have been less likely to have an effect on atrial flutter, vagal manoeuvres or intravenous bolus adenosine may be of diagnostic value in unmasking flutter waves.

Regardless, once sinus rhythm has been re-established, it is essential to obtain a follow-up 12-lead ECG. In a case such as this, one would want to look at the ST segments and T waves in particular to establish whether the changes initially seen were still present. Indeed, normal sinus rhythm is present, at a rate of 85 beats/min, and almost all the ST-T changes have resolved (Fig. 2, on page 165).

However, something else unusual is evident in Figure 2. Left axis deviation ( $-35^\circ$ ) has developed, and the QRS complexes are notably different from those in Figure 1: there are deep, abnormal Q waves in leads III and aVF, along with a q wave in lead II. This is what has given rise to the computer interpretation of inferior infarct.

A disciplined, systematic approach to ECG interpretation now reaps dividends. After noting rate and rhythm, we move on to PR interval, QRS duration and QT interval, axis, and then morphology. It thus becomes clear that the PR interval is near the lower limit of normal, at 0.125 seconds, and that the QRS duration is increased at 0.115 seconds. This combination should always prompt a consideration of pre-excitation, and, indeed, in this case delta waves are visible in most leads, including I, aVL, and V2 through V6. In fact, the negatively inscribed delta waves in the inferior leads give rise to the “pseudo-myocardial

---

infarction pattern” and the erroneous interpretation of inferior myocardial infarction.

Knowing that pre-excitation is present, it is possible to conclude that the tachyarrhythmia was almost certainly a reciprocating supraventricular tachycardia. This is the most common tachycardia associated with pre-excitation, and usually responds to standard treatment. In contrast, atrial flutter is rare in this scenario.

However, the second most common tachyarrhythmia associated with pre-excitation is atrial fibrillation. Although reciprocating supraventricular tachycardia is usually benign, atrial fibrillation in this setting is associated with significant complications and mortality. These are related to the potentially extremely rapid ventricular rate if the impulse travels down the accessory pathway rather than through the atrioventricular node. Degeneration

into ventricular fibrillation frequently occurs. Some of the medications usually used to treat atrial fibrillation, such as calcium channel blockers and digoxin, increase the incidence of this. They are therefore contraindicated when atrial fibrillation occurs in the presence of known pre-excitation, and when atrial fibrillation occurs with an unexpectedly rapid ventricular response of over 200 beats/min. In such cases, cardioversion is the treatment of choice; if cardioversion is unavailable, amiodarone or procainamide can be administered.

In this case, with a firm diagnosis established, discussion with the patient should ensue regarding the possibility of referral to an electrophysiologist and consideration of radiofrequency ablation of the accessory pathway.

**For the question, see page 164.**

### Cardiogrammes ruraux

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

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

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

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



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