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IN THIS ISSUE

DANS CE NUMÉRO

The Occasional Ring Removal

Multidisciplinary Chronic Pain Management

Novel Rural Obstetrics Model

When a Community Hospital Becomes an AHC



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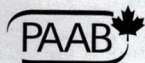
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VOL. 15, NO. 1, WINTER / HIVER 2010

EDITORIALS / ÉDITORIAUX

- 3 "A sea change is upon us" — *Gordon Brock, MD, FCFP, FRRMS*
- 4 «Changement radical imminent» — *Gordon Brock, MD, FCFP, FRRMS*
- 5 President's message. National rural health strategy: lessons from Oz — *Karl Stobbe, MD, CCFP(EM), FCFP*
- 6 Message du président. Stratégie nationale de santé rurale : leçons de l'Australie — *Karl Stobbe, MD, CCFP(EM), FCFP*

ORIGINAL ARTICLES / ARTICLES ORIGINAUX

- 7 Multidisciplinary chronic pain management in a rural Canadian setting — *Robert Burnham, MSc, MD, FRCPC; Jeremiah Day, MD, CCFP; Wallace Dudley, PhD*
- 14 Evaluation of a novel model for rural obstetric care — *Eliseo Orrantia, MD, MSc, CCFP, FCFP; Heather Poole, BScH; Jessica Strike, BSc, MD; Barbara Zelek, MD, CCFP*
- 19 When a community hospital becomes an academic health centre — *Maureen Topps, MBChB, BMedSci, FCFP; Roger Strasser, MBBS, BMedSci, MCIsc, FRACGP, FACRRM*

THE PRACTITIONER / LE PRATICIEN

- 26 The occasional ring removal — *Ava Baker, BArts Sc(Hons); Kristen Rylance, BSc(Hons); Sarah Giles, BSc(Hons), MD, CCFP*

CASE REPORT / OBSERVATIONS DE CAS

- 29 Getting to the heart of the problem: a case report on the use of emergency department ultrasonography in a patient with shortness of breath — *Shaun A. Marshall, MD, CCFP; Mark S. Moores, MD, CCFP; Rose Eelman*

PODIUM: DOCTORS SPEAK OUT / LA PAROLE AUX MÉDECINS

- 33 Rural maternity practice: How can we encourage family physicians to stay involved? — *Jude Kornelsen, PhD; Stefan Grzybowski, MD, MCIsc, CCFP*



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OUT BEHIND THE BARN / DANS LE FEU DE L'ACTION

36 Email etiquette — Barry McCombs, MD, FCFP

37 SERVICE INFORMATION

42 CAREER / CLASSIFIED ADVERTISING ANNONCES SUR LES CARRIÈRES ET ANNONCES CLASSÉES

INSTRUCTIONS FOR AUTHORS / DIRECTIVES AUX AUTEURS

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Januvia/Janumet Outside back cover

PRESCRIBING INFORMATION

Januvia/Janumet 38-41



“A sea change is upon us”

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When I arrived (as an R2 family medicine resident) at my first “rural rotation” in August 1978, rural medicine in Canada appeared to have changed little since my great-uncle had taken up practice in a small town in 1929: most rural practitioners practised in their own community office and “took call” 24 hours a day for their own patients. Allied health professionals such as physiotherapists, dieticians and psychologists (not to mention family medicine residents!) were seen in rural areas only slightly more frequently than Martians, and patient care was for the most part done by solo family physicians. Not much existed in the way of multidisciplinary teams or even teamwork. There was little rural content or input into the medical school or family medicine residency curriculum, and the seemingly prevailing logic of the time was that if you were trained in the city to practise in the city you were good enough to practise in a rural area.

The 3 research articles in the present issue highlight major new and bold initiatives in patient care, use of physician human resources, and rural physician education.

An article by Burnham and colleagues (page 7) highlights the “development and 18-month outcomes of a small multidisciplinary chronic pain management program run out of a physician’s office in rural Alberta.” In these patients, whose care is often difficult to manage, the team was able to achieve “clinically and statistically significant improvements in pain and disability.”

The article by Orrantia and colleagues in northern Ontario (page 14) presents their “new model of obstetric care” that involved “local obstetric

providers” each taking “1 month of the year in rotation and following up any women due in that month for prenatal and intrapartum services,” as opposed to physicians following up and performing deliveries for their own patients. They found that the new model “meets patient expectations and provides patient satisfaction” and “provides practitioners with an increased quality of life [italics mine] through more predictable work.”

The article by Topps and Strasser of the Northern Ontario School of Medicine (NOSM) (page 19) discusses the “new educational model of distributed community-engaged learning” under development at NOSM, and their collaborative efforts to implement changes in medical student training. This movement of medical education from academic, big-city hospitals into community facilities ranging from small remote health units to nonacademic tertiary care hospitals represents the greatest change in medical education since the 1910 publication of the Flexner report that determined the course of medical education for the 20th century.¹

We thank these authors for allowing us to publish in the *Canadian Journal of Rural Medicine* their work in developing new methods of patient care, rural physician training and (critical in these days of shortages) use of human resources.

As Topps and Strasser point out, “A sea change is upon us.” Let us all take pride that Canadian rural family physicians are at the cutting edge of the 21st-century changes in the way physicians train, practise and work.

REFERENCE

1. Flexner A. *Medical education in the United States and Canada: a report to the Carnegie Foundation for the Advancement of Teaching*. Bull 4. New York (NY): The Carnegie Foundation; 1910.



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«Changement radical imminent»

À mon arrivée (comme médecin résident en médecine familiale R2) à mon premier «stage rural» en août 1978, la médecine rurale au Canada semblait avoir peu changé depuis 1929, année où mon grand-oncle avait commencé à pratiquer dans une petite ville. À cette époque, la plupart des médecins ruraux pratiquaient dans leur propre bureau communautaire et «étaient de garde» 24 heures sur 24 pour leurs propres patients. D'autres professionnels de la santé, notamment les physiothérapeutes, les diététistes et les psychologues (sans parler des médecins résidents en médecine familiale!), faisaient leur apparition en milieu rural à peine un peu plus souvent que des Martiens et le soin des patients était assuré surtout par des médecins de famille travaillant seuls. Il n'y avait pas grand-chose sur le plan des équipes multidisciplinaires ou même du travail d'équipe. Il y avait peu de contenu rural ou d'apport des régions rurales dans le programme d'études en résidence en médecine familiale ou des facultés de médecine et l'on semblait croire à l'époque que quelqu'un qui avait reçu une formation en ville pour pratiquer en milieu urbain était assez bon pour pratiquer en région rurale.

Les trois articles de recherche publiés dans ce numéro décrivent de nouvelles initiatives audacieuses d'envergure en soin des patients, en utilisation des effectifs médicaux et en formation des médecins ruraux.

Un article de Burnham et de ses collaborateurs (page 7) décrit «l'élaboration et les résultats après 18 mois d'un programme multidisciplinaire de gestion de la douleur chronique de modeste envergure administré à partir du bureau d'un médecin en milieu rural en Alberta». Chez ces patients, qui sont souvent difficiles à soigner, l'équipe a pu «atténuer de façon cliniquement et statistiquement significative la douleur et l'incapacité».

Dans leur article, Orrantia et ses collaborateurs, qui pratiquent dans le Nord de l'Ontario (page 14), présentent leur «nouveau modèle de soins obstétriques» mettant à contribution «des fournisseurs locaux de soins obstétriques» dont cha-

cun prend en charge «un mois de l'année à tour de rôle et suit toutes les femmes qui doivent accoucher au cours du mois pour leur fournir des soins prénataux et périnataux» au lieu que des médecins suivent leurs propres patientes et procèdent à l'accouchement. Ils ont constaté que le nouveau modèle «satisfait aux attentes des patientes, *donne satisfaction aux patientes [et] assure aux médecins une meilleure qualité de vie* [italiques de l'auteur] en rendant leur travail plus prévisible.»

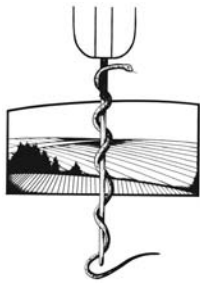
L'article de Topps et Strasser de l'École de médecine du Nord de l'Ontario (EMNO) (page 19) porte sur le «nouveau modèle d'éducation en apprentissage communautaire distribué» que prépare l'EMNO et ses efforts de collaboration qui visent à instaurer des changements dans la formation des étudiants en médecine. Ce virage de l'éducation en médecine, qui délaisse les grands hôpitaux urbains universitaires en faveur d'établissements communautaires variant de petites unités sanitaires éloignées aux hôpitaux de soins tertiaires non universitaires, représente le changement le plus important de l'éducation en médecine depuis la publication, en 1910, du rapport Flexner qui a orienté l'évolution de l'éducation en médecine au XX^e siècle¹.

Nous remercions ces auteurs de nous permettre de publier dans le *Journal canadien de la médecine rurale* les travaux qu'ils ont effectués pour mettre au point de nouvelles façons de soigner les patients, de former des médecins ruraux et (ce qui est crucial en notre époque de pénurie), d'utiliser les ressources humaines.

Comme le signalent Topps et Strasser, «Un changement radical est imminent». Soyons fiers de voir les médecins de famille ruraux du Canada à l'avant-garde des changements au chapitre de l'apprentissage, de la pratique et du travail des médecins au XXI^e siècle.

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1. Flexner A. *Medical education in the United States and Canada: a report to the Carnegie Foundation for the Advancement of Teaching*. Bull 4. New York (NY): The Carnegie Foundation; 1910.



President's message. National rural health strategy: lessons from Oz

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I attended "Rural Medicine Australia 2009," Oct. 30–Nov. 2, along with 250 rural doctors from across that country. I was able to meet with present and former leaders of the Australian rural doctor movement. Our countries have similar sizes, populations, political structures and health care systems; we have much to learn from each other.

THREE LESSONS

Lesson 1: It's important to be heard

Rural doctors in Australia are sometimes overlooked by media and government in favour of numerous other national medical organizations that claim to represent rural. In contrast, the Society of Rural Physicians of Canada has established itself as the credible voice of rural medicine in Canada. We have accomplished this by collaborating with the other national organizations, and by our participation on key committees of the College of Family Physicians of Canada, the Royal College of Physicians and Surgeons of Canada, and others. We are a member of Canadian Medical Forum, the twice-yearly gathering of our national medical organizations.

Lesson 2: We need resources to be successful; resources such as staff with experience and training in policy, research, writing and lobbying

When government wants our advice, we must provide it quickly, in a form that constitutes an overview for political leaders plus a roadmap for bureaucrats. To be effective, our good ideas require implementation by government policy advisors who have many voices clamouring for their attention. The Australian College of Rural

and Remote Medicine has been very successful using this approach. Its staff are able to research and write credible, action-oriented policy papers for government, including the harms of inaction, the recommended actions and implementation pathways. We would do well to have staff with expertise in the areas of policy, research, media relations and government relations. Of course rural doctors must provide direction, but our skills are best suited to caring for patients, not writing policy papers and preparing briefing notes.

Lesson 3: We must broaden our voice

Rural doctors represent a marginal special interest group to governments. To deal with this, the Australians formed the National Rural Health Alliance about 15 years ago. Comprising 29 members (national rural health and community organizations) the alliance has considerable influence on rural health policy. We too must work with nurses, midwives, pharmacists, indigenous doctors, other health workers and rural citizens to establish a national voice for rural health. Without such collaboration we will continue to have limited effectiveness in influencing government policy. Properly resourced, this could begin to solve a 140-year-old problem: the need to bridge the political gap between federal and provincial health ministries. Although neither side can be seen to be influencing the other, all have much to gain from working together.

Can we collaborate with others, increase our size and budget, and work more closely with government, yet not lose our direction and our vision? The Australian experience suggests not only that it's possible, but that we have no choice.

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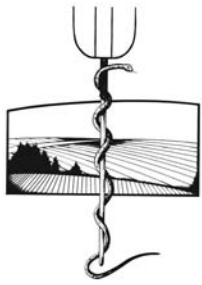
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Message du président. Stratégie nationale de santé rurale : leçons de l'Australie

J'ai assisté à *Rural Medicine Australia 2009*, congrès auquel 250 médecins ruraux de partout en Australie ont participé du 30 octobre au 2 novembre. J'ai eu l'occasion de rencontrer les anciens et les nouveaux chefs de file du mouvement de la médecine rurale en Australie. Le Canada et l'Australie ont bien des choses en commun : superficie, population, structures politiques et système de santé. Nous avons beaucoup à apprendre les uns des autres.

TROIS LEÇONS

Première leçon : il importe de se faire entendre

Les médecins ruraux sont souvent oubliés par les médias et les gouvernements, qui préfèrent plutôt porter leur regard sur les autres organisations nationales de la médecine qui prétendent représenter la ruralité. En revanche, la Société de la médecine rurale du Canada est reconnue comme porte-parole crédible des médecins ruraux du Canada. Nous avons réussi à atteindre ce rang important en collaborant avec d'autres organismes nationaux et en siégeant aux comités clés du Collège des médecins de famille du Canada, du Collège royal des médecins et chirurgiens du Canada et de plusieurs autres organisations. Nous sommes membres du Forum médical canadien, tribune qui se réunit deux fois l'an.

Deuxième leçon : pour réussir, il nous faut des ressources, telles que des employés qui ont de l'expérience et de la formation en élaboration de politiques, en recherche, en rédaction et en lobbying

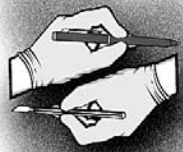
Lorsque les gouvernements nous demandent conseil, nous devons répondre rapidement en donnant un aperçu aux chefs de file politiques et un plan détaillé aux bureaucrates. Afin d'être efficaces, nos bonnes idées doivent être mises en œuvre par des conseillers en politiques, qui sont souvent sollicités de toutes parts. En utilisant cette approche, le Australian College

of Rural and Remote Medicine a bien réussi. Son personnel est en mesure de faire de la recherche et de rédiger, à l'intention des gouvernements, des documents de politiques qui sont convaincants et axés sur les mesures à prendre, et qui énoncent les préjudices que causerait l'inaction, les actions recommandées et les moyens d'implantation. Il serait à notre avantage d'avoir des employés possédant de bonnes compétences en politiques, en recherche et en relations avec les médias et les gouvernements. Nos médecins ruraux doivent orienter le mouvement, mais leurs compétences se prêtent mieux à traiter les patients qu'à rédiger des documents de politiques et à préparer des notes d'information.

Troisième leçon : nous devons élargir notre portée

Les médecins ruraux représentent un groupe d'intérêt marginal aux yeux des gouvernements. Il y a environ 15 ans, les Australiens ont formé la National Rural Health Alliance. Cette alliance se compose de 29 membres (organismes nationaux ruraux et communautaires) et a une importante influence sur les politiques touchant la santé en milieu rural. Nous devons, nous aussi, collaborer avec les infirmières, les sages-femmes, les pharmaciens, les médecins autochtones, les autres professionnels de la santé et les habitants des milieux ruraux. Sans ce genre de collaboration, l'efficacité de nos efforts visant à influencer les politiques gouvernementales sera limitée. Avec de bonnes ressources, nous pourrions commencer à résoudre un problème qui dure depuis 140 ans : le besoin de combler l'écart politique entre les ministères de la santé provinciaux et fédéraux. Même si ces deux paliers de gouvernement ne veulent pas donner l'impression de s'influencer mutuellement, ils ont tous deux intérêt à unir leur efforts.

Est-il possible pour nous de collaborer avec les autres, d'élargir notre portée, d'augmenter notre budget et de travailler plus étroitement avec les gouvernements, sans perdre notre orientation et notre vision.



ORIGINAL ARTICLE ARTICLE ORIGINAL

Multidisciplinary chronic pain management in a rural Canadian setting

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*This article has been peer
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Introduction: Chronic pain is prevalent, complex and most effectively treated by a multidisciplinary team, particularly if psychosocial issues are dominant. The limited access to and high costs of such services are often prohibitive for the rural patient. We describe the development and 18-month outcomes of a small multidisciplinary chronic pain management program run out of a physician's office in rural Alberta.

Methods: The multidisciplinary team consisted of a family physician, physiatrist, psychologist, physical therapist, kinesiologist, nurse and dietician. The allied health professionals were involved on a part-time basis. The team triaged referral information and patients underwent either a spine or medical care assessment. Based on the findings of the assessment, the team managed the care of patients using 1 of 4 methods: consultation only, interventional spine care, supervised medication management or full multidisciplinary management. We prospectively and serially recorded self-reported measures of pain and disability for the supervised medication management and full multidisciplinary components of the program.

Results: Patients achieved clinically and statistically significant improvements in pain and disability.

Conclusion: Successful multidisciplinary chronic pain management services can be provided in a rural setting.

Introduction : La douleur chronique est un problème fréquent et complexe qui répond mieux à une approche pluridisciplinaire, surtout en présence de composantes psychosociales importantes. L'accès limité à de tels services et leur coût élevé empêchent souvent leur application chez les patients en milieu rural. Nous décrivons ici la mise en œuvre et les résultats à 18 mois d'un petit programme de prise en charge pluridisciplinaire de la douleur chronique dans un cabinet de médecine albertain en milieu rural.

Méthodes : L'équipe pluridisciplinaire réunissait les éléments suivants : médecin de famille, physiatre, psychologue, physiothérapeute, kinésithérapeute, personnel infirmier et diététiste. Les professions paramédicales participaient à temps partiel. L'équipe a procédé au triage à partir des renseignements figurant dans les demandes de consultation et les patients ont subi un examen de la colonne vertébrale ou une évaluation de leurs soins médicaux. Selon les résultats de l'examen, l'équipe prenait les patients en charge selon l'une de quatre méthodes, soit consultation seulement, intervention pour la colonne vertébrale, pharmacothérapie supervisée ou prise en charge pluridisciplinaire complète. Pour les volets pharmacothérapie supervisée et approche pluridisciplinaire complète du programme, nous avons consigné de façon prospective des séries d'automesures de la douleur et de l'invalidité.

Résultats : Les patients ont connu une amélioration cliniquement et statistiquement significative de leur douleur et de leur invalidité.

Conclusion : Il est tout à fait possible de prendre efficacement en charge la douleur chronique avec une équipe pluridisciplinaire en milieu rural.

INTRODUCTION

Rural practitioners are frequently called upon to manage complex chronic pain problems. It is estimated that 21.5% of patients who see their primary care physician suffer from persistent pain.¹ In adult populations, epidemiological studies have estimated the prevalence of chronic pain to be between 2% and 40%.² In Alberta, it is estimated that about 11% of residents have chronic pain and about one-quarter of them classify their pain as severe.³ For the solo rural practitioner, the care of the patient with complex chronic pain is challenging and burdensome. Research has confirmed that the most clinically and cost effective treatment for complex chronic pain is through a coordinated multidisciplinary team. Interestingly, the best outcomes have been recorded when individual treatment is in excess of 100 hours.^{4,5} Unfortunately, access to such programs is limited, particularly for the rural chronic pain sufferer. Such programs are labour-intensive, expensive and, to be affordable, often require third-party funding. They typically are located in large urban settings. Establishment of rural multidisciplinary pain management programs is uncommon, which is possibly related to the lack of qualified and accessible team members, financial and infrastructure issues, and the lack of a functional, proven rural model.

The purpose of this report is to describe the development and results of a multidisciplinary chronic pain management program over its first 18 months of operation, which was established in a rural setting in central Alberta.

METHODS

Finding and funding the team

The David Thompson Health Region is located in rural central Alberta and has a population of about 300 000 people. In 2006, the health region administration provided partial funding for the development of a multidisciplinary chronic pain management program (Central Alberta Pain and Rehabilitation Institute [CAPRI]). The program philosophy and mandate were to provide pain management services to patients in the public health care system (patients in the private health system often had funding available for the large urban programs) that involved active participation and personal responsibility on the part of the patient, using evidence-based techniques in a practical and cost-effective manner.

The clinic was located in Lacombe, Alta., a rural

community of about 12 000 people. A physiatrist and 2–3 physiotherapists were already practising musculoskeletal pain management in the community. At that time, the existing pain management services included fluoroscopically guided spinal injections and nerve ablations, which were performed in the local hospital. To complement those services, a primary care physician was recruited, who was involved in the CAPRI program 4 days per week. His role was to coordinate medication management and assist with intake assessments. A part-time psychologist, nurse, dietician and kinesiologist were also recruited and were involved 1–2 days per week. Alberta Health and Wellness accredited the assembled team as a multidisciplinary chronic pain management program, which allowed the physicians to bill for their services on a timed basis and to be reimbursed for team and patient conferences. This was imperative, as most patients required lengthy comprehensive medical evaluations and there were frequent team conferences. The health region provided remuneration of the other team members through an annual budget of about \$130 000. A one-time startup grant of \$62 000 from the pharmaceutical industry also supplemented the initial funding. It was used primarily for staff and patient education.

The CAPRI program care path

Figure 1 outlines the CAPRI program care path.

Referral documentation review

Patients accessed the CAPRI program by physician referral. The CAPRI program director triaged referral information and assigned patients to 1 of 2 initial assessment paths: spinal or medical. During the first 18 months of the program, the team accepted 1905 patient referrals.

Initial assessment

1. Spine care assessment was selected for patients with primarily axial skeletal pain with or without radiculopathy, with concordant spinal imaging and minimal apparent medication management or psychosocial issues. The spinal intervention assessment involved a medical, neuromusculoskeletal and spine fitness screening examination performed jointly by the physiatrist and physical therapist. These assessments generally took about 1.5 hours to complete. The team provided advice regarding, and often referral to, community

physical therapy for a customized and supervised active spine fitness exercise program for each patient. Physical therapists within the community referral network had undergone training so that the spine fitness assessment, individualized exercise prescription and reporting format were standardized.

2. Medical care assessment was selected for patients with chronic pain complicated by significant medication management, psychosocial and/or comorbid medical illness issues. These patients underwent comprehensive medical evaluation by the primary care physician. The medical care assessments were generally 2 hours in duration.

Regardless of the care path, each patient received in the mail a questionnaire that they completed within 1 week of the initial consultation. The questionnaire included questions regarding patient demographics; pain character, including onset, intensity, frequency, exacerbating/remitting factors and a pain diagram; general family history and medical functional inquiry, including sleep quality; red flags (symptoms suggestive of sinister disease); yellow flags (psychosocial factors associated with pain and disability chronicity); opioid risk assessment; previous investigations; previous and current treatments and their effects; perceived disability (Patient-Specific Functional Scale⁶); and depression (Beck Depression Inventory short form⁷). Assignment to the initial assessment paths did not preclude secondary assessment by the alternate path.

Treatment

Following initial assessment, the team selected 1 of 4 treatment modes:

1. Consultation only: the initial assessment included a detailed history and physical examination. Patients who underwent spine care assessment and were deemed to have a condition that could be self-managed through education, activity modification and a customized home exercise program received these services at the time of the initial assessment or received a referral to a community physical therapist. The team provided a consultation report to the referring physician and discharged the patient back to the referring physician's care. For patients who underwent medical care assessment and were deemed to have relatively uncomplicated conditions, the team provided the referring physician with detailed instructions for further management including recommendations for which medications to try, and the recommended therapeutic dosage and titration schedule. The referring physician had the option to send the patient back for a reassessment if the recommended treatment plan did not achieve satisfactory results.
2. Interventional management: in addition to the active exercise program, the team performed diagnostic local anesthetic blocks to identify the axial skeletal pain generator and/or localized treatment of the suspected pain generator (i.e., facet joint injection or medial branch blocks, sacroiliac joint or epidural injection; facet and sacroiliac joint radiofrequency sensory ablation). The CAPRI program physiatrist performed these in the operating room of the Lacombe Hospital. The primary purpose of the interventions was to control pain adequately to allow the patient to more successfully participate in his or her rehabilitation program.

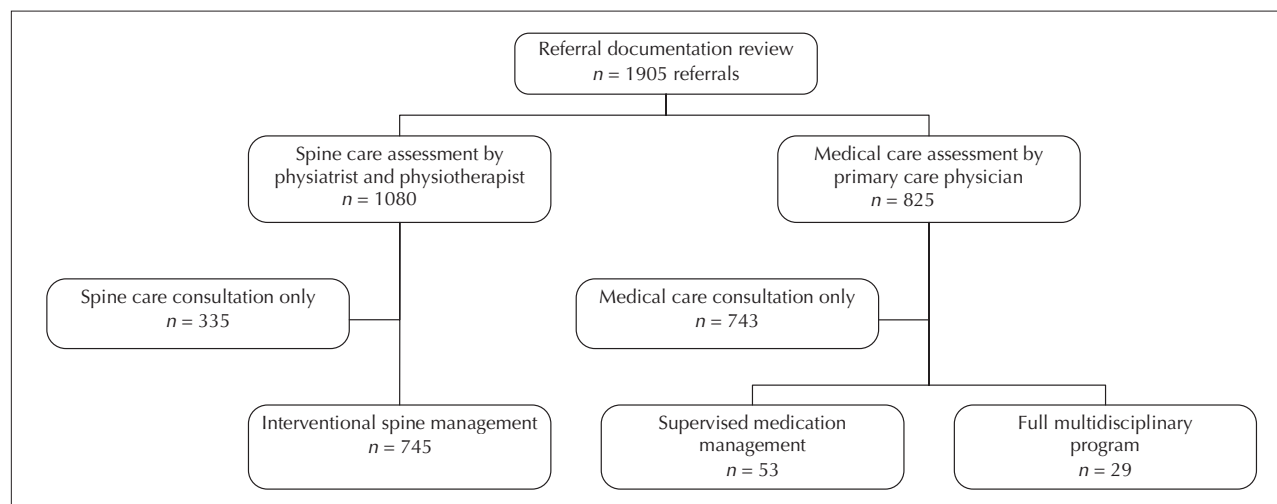


Fig. 1. The care path of the Central Alberta Pain and Rehabilitation Institute Program.

3. Supervised medication management: in circumstances where the complexity of the medical or medication issues was high, the CAPRI program primary care physician personally managed the care of the patient until the pain was deemed satisfactorily controlled and stable. The physician then returned the care of the patient back to the referring physician for ongoing care. In some cases, patients were transitioned into the full multidisciplinary management treatment mode (see no. 4 below). A full review of medication management of chronic nonmalignant pain is beyond the scope of this article but has been recently reviewed.⁸ Some important principles are as follows:
 - classify and specifically treat the type of pain (i.e., nociceptive, neuropathic or nonspecific)
 - optimize the use of simple analgesics and adjuvants (e.g., antidepressants, antiepileptics)
 - optimize the dosing of long-acting opioids, including adjusting the dose to effect and increasing the frequency of dosing as necessary in order to provide consistent analgesia without the need for “as required” doses of short-acting opioids
 - eliminate, if possible, the use of short-acting opioids
 - avoid the use of opioids and benzodiazepines in the same patient
 - identify and treat comorbidities commonly associated with chronic pain such as sleep disturbance, anxiety and depression
 - carefully screen for contraindications in the use of each of the various pain control medications
 - use opioids judiciously employing “universal precautions” to minimize the risks of misuse such as screening all patients for addiction risk; setting boundaries around opioid use (opioid contract); using urinary drug screening; identifying drug misuse behaviours early and intervening; introducing opioids as a trial of therapy with pretreatment agreed-upon goals that include both pain control and improvement in function; tapering off opioids if goals not achieved⁹
 - introduce new medication at a low dose, with slow upward titration to effect (improved pain control and function)
 - anticipate and proactively treat side effects including aggressively starting on a bowel routine at the introduction of opioids
 - be aware of drug interactions, including checking for cytochrome P-450 interactions before the introduction of a new medication
 4. Full multidisciplinary management: select patients with complex chronic pain problems were initially assessed by the CAPRI team primary care physician and psychologist followed by the other allied health professionals (physical/exercise therapy, nursing, dietary). If it was perceived that the patient would likely benefit from each of the services available and the patient made a commitment to attend and comply with the program (program contract), the team developed in consultation with the patient a comprehensive problem and goal list, and treatment plan. The patient attended once weekly as a part of a group of 4–6 patients for about 5 hours per session. The initial half-hour consisted of a group meeting to troubleshoot challenges patients encountered during the week and to review and discuss their homework assignment. Each week, the patients were assigned a chapter to study in the workbook *Managing Pain Before it Manages You* by Dr. Margaret Caudill.¹⁰ The psychologist or nurse facilitated this group session. Then, a 1-hour group education and psychotherapy session was held. A didactic presentation followed by discussion was presented by the team member most expert in the area. For example, the physician presented lectures on pain pathophysiology and medications. The physical therapist spoke on the dynamics of pain and maintaining a healthy spine. The exercise specialist discussed the adverse effects of deconditioning and the benefits and components of healthy exercise. The dietician discussed healthy eating, weight management and constipation prevention. The psychologist explored the topics of sleep hygiene, coping strategies, stress and mood management.
- Over the following 2 hours, each patient had a one-on-one consultation with each of the individual CAPRI team members. Each team member was housed in a separate examining room of the clinic. During the individual consultation time, the team member reviewed the patient’s progress, treatment program adherence, concerns and goal attainment pertinent to his or her area of expertise. Team members made modifications and upgrades to the patient’s treatment plan and home program, and established new clearly defined goals for the upcoming week. Once the patient completed the consultation, each rotated to the next room and visited with the next health professional. Following the consultations,

patients took a nutrition break/rest while the CAPRI team conferenced together to discuss the progress and plans for each patient. Then, each patient individually met with one of the team members to summarize the progress and reinforce the updated home program for the upcoming week. At the end of the day, patients had the opportunity for additional services, as required, such as individual psychotherapy or an individualized exercise session. The number of weeks each patient was in the full multidisciplinary program depended on his or her individual progress. The mean duration of involvement was 2–3 months. Patients were discharged when the goals of the patient and the team were met, progress plateaued or the patient was noncompliant.

Analysis

Outcome measures for patients treated by consultation only are not available. The outcomes for interventional spine management have been published elsewhere.^{11,12} We compared demographic data of the supervised medication management and full multidisciplinary program groups using unpaired *t* test for all variables except the educational level which we analyzed using χ^2 analysis. We used 2-way repeated-measures analysis of variance to analyze initial, midprogram and discharge pain intensity and interference scores. We quantified pain intensity using a numerical rating scale of 0–10, where 0 indicates no pain and 10 indicates worst imaginable pain. Using the Pain Interference Questionnaire, patients quantified their perception of how much pain interfered in 7 separate domains (0/10 = no interference at all; 10/10 = complete interference). The domains were general activity, mood, walking ability, normal work, relations with others, sleep and life enjoyment.

RESULTS

1. Consultation services: 335 patients received spine care consultation only, and 743 patients received medical care consultation only. The mean age of patients was 51 (range 20–91) years and 60% were female. A review of the medical care consultation patients revealed that all received some form of medication management. Of those prescribed medication as a result of the consultation, 61% received a tricyclic antidepressant, generally to help restore sleep hygiene and/or to treat soft tissue pain sensitization; 41% received an antiepileptic drug, typically for

neuropathic pain control; 35% received opioid management for pain control; and 7% received an anti-inflammatory medication. Additionally, 41% were prescribed or were receiving physical therapy treatment and 15% were referred for psychological services.

2. Interventional management: 745 patients with chronic spine pain underwent at least 1 interventional spinal procedure. We performed about 2100 fluoroscopically guided spinal procedures (injections/neuromoties). The outcomes of these interventions have been published.^{11,12} Essentially, the spinal pain generator was identified by local anesthetic blockade of selected joints. When most of the patient's pain resolved following facet or sacroiliac joint block, radiofrequency neurotomy of the symptomatic joint resulted in a mean reduction of pain intensity, frequency and disability of about 50% that lasted 6–9 months and then gradually dissipated. Additionally, there was a significant reduction of analgesic intake, direct financial cost of spine care and dissatisfaction.
3. Supervised medication management: 53 patients received medication-oriented pain management services by way of serial visits with the CAPRI program primary care physician. Patient demographics are described in Table 1. The diagnostic categorization of patients in this group was as follows: 35% mechanical spine pain; 22% soft tissue pain (myofascial or fibromyalgia); 29%

Table 1. Demographic characteristics of chronic pain patients enrolled in the medication management program and the full multidisciplinary management program

Characteristic	Mean (SD)*		<i>p</i> value
	Supervised medication management	Full multidisciplinary program	
Age	47.9 (15.7)	45.2 (10.0)	> 0.05
Sex, % female	73	62	> 0.05
Pain duration, yr	8.1 (9.2)	8.4 (8.3)	> 0.05
Pain intensity score	7.6/10 (1.6)	7.8/10 (1.4)	> 0.05
Pain frequency score	9.1/10 (1.6)	9.2/10 (1.2)	> 0.05
Employed, %	43	31	> 0.05
Educational level†	1.1 (0.8)	2.4 (0.9)	< 0.05
Beck Depression Inventory score	9.8 (7.0)	14.1 (7.5)	< 0.05
Pain Interference Questionnaire score	47.1 (13.8)	49.3 (11.6)	> 0.05

SD = standard deviation.

*Unless otherwise indicated.

†Highest level of formal education: 1 = did not complete high school; 2 = high school graduation; 3 = 2 years or less postsecondary education; 4 = more than 2 years of postsecondary education.

neuropathic pain; 14% other (e.g., headache, peripheral joint pain). Significant reductions in pain intensity occurred over the course of the medication management (Table 2). In terms of magnitude, the pain intensity reduction was about 3 points on the 0–10 numerical rating scale, which constituted about 40% less pain overall. This was statistically significant and certainly clinically significant.¹³ There was also significant reduction in disability as measured by the Pain Interference Questionnaire overall. The drop was significant in each of the 7 domains measured by this questionnaire.

4. Full multidisciplinary management: 29 patients were enrolled. Demographics are described in Table 1. Four patients left the program prematurely (3 because of psychosocial/noncompliance issues; 1 because of illness). The diagnostic categorization was as follows: 34% mechanical spine pain; 48% soft tissue pain (myofascial or fibromyalgia); 18% neuropathic pain; 0% other. Statistically, there was a higher proportion of patients with soft tissue pain in this group compared with the medication management group. Additionally, at the time of initial assessment they had significantly higher Beck Depression Inventory scores and had attained a significantly higher educational level compared with the medication management group (Table 1). Over the course of the program, there was significant reduction in pain intensity comparable to that documented in

the medication management group. There was also significant reduction in disability as measured by the Pain Interference Questionnaire overall and for each of the 7 domains individually. The reduction of disability was significantly greater in this group compared with the medication management group (Table 2).

DISCUSSION

The purpose of this report was to describe the development and results of a multidisciplinary chronic pain management program that was established in a rural setting during its first 18 months of operation. The CAPRI program has generally been considered a success by the staff, health region and patients. Our experience suggests it is feasible to establish a rural multidisciplinary chronic pain management program, but it is not without challenges.

Attracting interested and qualified staff to a rural area can be a challenge. We acknowledge it is unusual to have a physiatrist with expertise in interventional spinal pain management in a rural setting. However, as demonstrated by the success of the care paths of the program that did not involve spinal intervention services, significant improvements in pain and disability can still be achieved. Primary medical care, nursing, dietary and physiotherapy are often available in rural communities. Psychology services may be less available. If not, social work or occupational therapy may be available to provide similar services. The challenge is to pull the available services together as a functioning team. For example, the CAPRI program had staffing problems during the inaugural 18 months in that there were periods when the team did not include a nurse or physical therapist. Team flexibility and innovation are necessary. We concede that working with these patients is labour-intensive. Physicians are often working under significant time constraints. It is helpful to use the allied health professionals as physician extenders as much as possible. For example, the CAPRI program has now added a pharmacist to help the physician with day-to-day medication management issues, thus leaving the physician more time for medical consultations.

Our experience has been that the integrated multidisciplinary team model is an attractive working environment for the allied health professionals and has been a selling point in their recruitment. The biggest challenge is funding their services. Without the support of the health region, and in the absence of third-party funding, establishing a multidisciplinary pain

Table 2. Pain intensity and pain interference questionnaire scores for the medication management and full multidisciplinary program groups

Measure of pain; program	Mean (SD) score			
	Initial	Midprogram	Discharge	
Pain intensity (0–10)				
Supervised medication management	7.8 (1.5)	5.2 (2.0)	4.5 (2.0)*	
Full multidisciplinary program	7.7 (1.4)	5.4 (1.6)	4.7 (1.9)*	
Pain interference (0–70)				
Supervised medication management	47.1 (13.8)	37.1 (16.1)	30.6 (17.0)†	
Full multidisciplinary program	49.3 (11.6)	36.7 (12.2)	23.4 (13.3)†	

*Significant reduction in pain intensity scores over the course of both the medication management and full multidisciplinary programs ($F = 89.7$). Not significantly different between programs.

†Significant reduction in pain interference questionnaire scores for both the medication management and full multidisciplinary programs ($F = 75.4$). The reduction was significantly greater in the full multidisciplinary program group ($F = 3.7$).

management program would be virtually impossible. The other big challenge our team has encountered is trying to keep up with the demand for service. As the program has become more widely known, the referral base and wait list have also expanded.

We are now exploring the feasibility of offering off-site full multidisciplinary and medication management services via telemedicine. Preliminary work in this area suggests it is feasible and acceptable to both the service provider and recipient.^{14,15} It remains to be seen if it is equally effective. Telemedicine has the potential advantage of providing a greater number of services to patients who may not otherwise be able to access them, at a lower cost both in terms of time and dollars.

Another challenge has been how to decide which care path a patient should be allotted. For example, the only guideline we gave our team for enrolment in the full multidisciplinary program was that patients were to be able to benefit from the services of each discipline represented on the treatment team and patients needed to be able to comply with the program. This treatment mode is the most expensive and labour-intensive. Pain reduction achieved in the full multidisciplinary program was comparable to the less expensive supervised medication management care mode; however, the disability reduction was greater. Interestingly, it appears that the team naturally selected a different cohort of patients to enter into the full multidisciplinary program. Specifically, they were a more highly educated group and scored higher on the intake Beck Depression Inventory Questionnaire. The latter factor suggests a higher level of psychosocial complication. Accordingly, it was appropriate that they be treated by the entire team, which included psychology. The difference in education level is interesting and may reflect the team's perception that a patient with higher education would be more adept at learning the skills taught in the full multidisciplinary program.

CONCLUSION

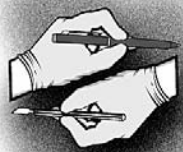
We have presented our experience of establishing a rural multidisciplinary pain management program and are of the opinion that, with the proper support

and staff, such programs can function in a rural setting and offer a useful service.

Competing interests: None declared.

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ORIGINAL ARTICLE ARTICLE ORIGINAL

Evaluation of a novel model for rural obstetric care

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Introduction: The group practice physicians in Marathon, a small rural community in northwestern Ontario, discovered general lifestyle dissatisfaction with the traditional model for obstetric practice. The old model of doing the follow-up and delivery for one's own patients created perceived onerous on-call responsibilities. The providers created a new model of obstetric care. This involved the local providers of obstetric care each taking 1 month of the year in rotation and following up any woman due in that month for prenatal and intrapartum services. This study is an investigation of patient and provider satisfaction with this model.

Methods: Patient survey: We surveyed all 73 women who received obstetric care under the new model during its first 14 months of implementation. We collected data on patient demographics and patients' satisfaction with their obstetric experience using Likert scale, yes/no and short-answer questions. Physician survey: We surveyed the 9 physicians of Marathon Family Practice using Likert scale, yes/no and short-answer questions. We collected information on demographics, history of involvement with obstetric service, and comparison of old and new models with regard to patient care, and professional and personal issues.

Results: Patient survey: The response rate was 56%. Of the respondents, 97% reported their expectations for their obstetric care were met, if not surpassed, and 100% were satisfied with their obstetric care. Physician survey: All the physicians responded and found the new model to cause less disruption of their family practice (Wilcoxon signed rank test, $p = 0.041$), to improve scheduling of personal activities ($p = 0.017$) and to improve their satisfaction with on-call hours ($p = 0.027$). Overall, the physicians were satisfied with the new model and preferred it to the old model.

Conclusion: This obstetric care model meets patients' expectations and provides patient satisfaction. It provides practitioners with an increased quality of life and greater satisfaction. It is a viable paradigm for the provision of obstetric care in the appropriate setting.

Introduction : Les médecins d'une pratique de groupe de Marathon, petite communauté rurale du Nord-Ouest de l'Ontario, a constaté une insatisfaction généralisée vis-à-vis du style de vie que lui imposait le modèle de pratique obstétricale classique. Les médecins percevaient comme très lourd sur le plan des heures de garde ce modèle où chacun assure le suivi et l'accouchement de ses propres patientes. Les médecins ont donc imaginé un nouveau modèle de soins obstétricaux dans lequel les médecins de la localité qui font de l'obstétrique assument à tour de rôle un mois de garde pour faire le suivi des femmes dont l'accouchement est prévu au cours du mois en question. Pour ces patientes et durant ce mois, les médecins fournissent les services prénataux nécessaires et veillent aux accouchements. La présente étude s'est penchée sur le degré de satisfaction des patientes et des médecins à l'endroit de ce modèle.

Méthodes : Sondage auprès des patientes : nous avons interrogé les 73 femmes qui ont reçu des soins obstétricaux selon le nouveau modèle durant ses 14 premiers mois d'application. Nous avons recueilli les données démographiques des patientes et mesuré leur degré de satisfaction à l'endroit de leur expérience obstétricale au moyen de

l'échelle de Likert et de questions brèves à réponse oui ou non. Sondage auprès des médecins : nous avons interrogé les neuf médecins de la clinique de médecine familiale de Marathon en utilisant l'échelle de Likert et des questions brèves à réponse oui ou non. Nous avons recueilli des données démographiques et des données sur leur expérience en obstétrique, et nous avons ensuite comparé le nouveau modèle à l'ancien pour ce qui est des soins aux patientes et des enjeux d'ordre professionnel et personnel.

Résultats : Sondage auprès des patientes : le taux de réponse a été de 56 %. Parmi les répondantes, 97 % ont déclaré que leurs attentes en matière de soins obstétricaux avaient été comblées sinon dépassées et 100 % se sont dites satisfaites de leurs soins obstétricaux. Sondage auprès des médecins : tous les médecins ont participé et ont noté que le nouveau modèle perturbait moins leur pratique en médecine familiale (test de Wilcoxon pour observation appariée, $p = 0,041$), facilitait la planification de leurs activités personnelles ($p = 0,017$) et améliorait leur degré de satisfaction vis-à-vis des heures de garde ($p = 0,027$). Dans l'ensemble, les médecins se sont dits satisfaits du nouveau modèle et l'ont préféré à l'ancien.

Conclusion : Ce modèle de soins obstétricaux répond aux attentes des patientes et les satisfait. Il offre aux professionnels de la santé une meilleure qualité de vie et un degré de satisfaction plus élevé. Dans un contexte approprié, il s'agit d'un modèle viable pour assurer les soins obstétricaux.

INTRODUCTION

A clear trend in Canada is the ongoing decline of family practice physicians, including rural doctors, providing comprehensive obstetric care (prenatal care, delivery and postpartum care).¹⁻³ Various factors have been implicated in this ongoing attrition including the negative impact of obstetric practice on physician lifestyle,⁴⁻⁶ the risk of complications and litigation,⁶ rising malpractice insurance fees,^{6,7} inadequate remuneration^{6,7} and insufficient exposure during training.^{4,6,7} Furthermore, the number of rural hospitals offering obstetric services has decreased substantially.^{3,8}

It has been recognized that continued provision of rural obstetric care is important to maximizing birth outcomes. Nesbitt and colleagues⁹ found that women who must travel for delivery because their community no longer provides labour and delivery services have poorer outcomes.

A variety of approaches have been tried in rural areas to reduce the negative impacts of practising obstetrics on physician lifestyle and to improve the retention and recruitment of physicians into this service. Shared care models either linking obstetric coverage to emergency department on-call duties,¹⁰ or having 1-week blocks of being responsible for managing both antepartum clinics and any deliveries¹¹ have been developed in rural Ontario. Both models have shown reasonable patient satisfaction with obstetric care and enhanced physician satisfaction with the practice of obstetrics.

Marathon, a small rural community in north-

western Ontario, reopened its previously closed obstetric service in 1996 and now provides low-risk deliveries without cesarean delivery capabilities. Marathon has a population of 3863 (2006 census) and an obstetric catchment population of about 7000. Its tertiary referral centre for obstetric care is Thunder Bay, Ont., 300 km away. Before 2002, the local model of obstetric care was a typical one, with physicians following up and performing deliveries for the patients of their own practice. Discussions ensuing after the attrition of an obstetric care provider determined that the remaining providers were dissatisfied with the model. It was perceived as too onerous on their lifestyle, as remaining on call for their obstetrics patients was a time commitment that had an adverse impact on their family life, time off and holiday planning. It also caused an uneven distribution of obstetrics patients among providers, which for some meant minimizing the opportunities to maintain skills. The provision of obstetric services was again in jeopardy.

The group practice physicians in Marathon developed a new paradigm designed to maximize patient continuity, create parity in obstetrics patient loads and minimize the difficulty of being on call for extended, unpredictable periods. The model devised was for obstetrics providers to each take 1 month of the year in rotation. Any woman enrolled in the practice who became pregnant was assigned to the physician on call for the month of her due date. To integrate the important element of continuity of care,¹² this physician would then follow up the woman throughout her pregnancy, providing prenatal care and intrapartum

services. After delivery and hospital discharge, the care of the patient and the newborn would be resumed by the regular family physician. The group had hoped that the implementation of this model would provide patients a satisfactory prenatal and birthing experience while improving the lifestyle and satisfaction of the providers, ultimately enhancing their obstetrics program's viability. This paper is an investigation of those goals through examining patient satisfaction with the new model and provider satisfaction and preference between the old and new obstetrics models.

METHODS

Patient surveys

We created 2 surveys, one for women who had received prenatal care and had delivered in Marathon, and the other for women who had received prenatal care in Marathon, but had delivered elsewhere. The surveys were identical, except that the latter had no questions pertaining to delivery satisfaction. A large component of the surveys came from a previously validated questionnaire, created by Omar and colleagues,¹³ entitled the Patient Expectation and Satisfaction with Prenatal Care instrument.

Women were asked to respond to a series of questions, using a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree), on their expectations and satisfaction with respect to a variety of aspects of their obstetric care. Questions also explored demographics, obstetric history, complications in birth outcomes, Marathon as a choice for future deliveries, complaints and any suggestions for improvement of the obstetric services.

Physician survey

Physicians were asked about their demographics and history of involvement in obstetric service. They were asked questions contrasting the old and new obstetrics model with regard to patient care, as well as questions pertaining to professional and personal issues. Yes/no questions, with opportunities to comment, explored quality of life, obstetrics model preference, satisfaction with the new model and suggestions for improvement.

Participants

We mailed surveys to all patients who had received obstetric care under the new system in Marathon

who had delivered during the first 14 months of its implementation.

Nine physicians of the Marathon Family Practice participated.

The Lakehead University Research Ethics Board reviewed and approved this study and all the survey instruments.

Analysis

We analyzed the results using SPSS 10.0 (SPSS Inc.). We used χ^2 test and Wilcoxon signed rank test, for nonparametric data, to evaluate for statistical significance.

RESULTS

Patient surveys

Of the 73 women surveyed, 41 returned completed questionnaires. Nineteen of the 34 (56%) women who had delivered their babies in Marathon responded to the survey. Similarly, 22 of the 39 (56%) women who had delivered their babies elsewhere responded.

Of the respondents, 40 (97%) reported that their obstetric care expectations were met if not surpassed. All respondents agreed (somewhat agree 8%, agree 15%, strongly agree 77%) that they were satisfied with their obstetric experience in Marathon (Table 1).

Of the 22 women who delivered elsewhere, 50% were forced to do so because of underlying or pregnancy-related health concerns that were considered too high risk for delivery locally, and the other 50% chose to do so for personal reasons, such as wanting better access to other medical options or family support.

Of the women who delivered elsewhere, 55% stated they would choose to deliver in Marathon with future pregnancies. Of the group that did deliver in Marathon, 90% indicated that they would choose to deliver there again.

Table 1. Patient responses to Likert question of being satisfied with overall obstetric care experience in Marathon

Likert category	Response frequency (%)	Cumulative %
Strongly agree	30 (77)	77
Agree	6 (15)	92
Somewhat agree	3 (8)	100
Somewhat disagree	0 (0)	—
Disagree	0 (0)	—
Strongly disagree	0 (0)	—

Physician survey

All 9 physicians of the Marathon Family Practice participated and returned a completed survey. We excluded from the survey analysis data from 2 physicians because neither had worked in the new obstetrics model.

Of the 7 physicians who had worked in both systems, all agreed that obstetrics patients were comfortable with them as obstetric care providers, even when they were not the patient's regular family doctor (mean score of 5, standard deviation 0.58, on Likert 6-point scale). They also replied affirmatively when asked if they believed that patients were satisfied with the new model of care (mean score of 5, standard deviation 0).

Physicians perceived the new model to cause significantly less disruption of their family practice compared with the old model ($p = 0.041$) as indicated by a Wilcoxon signed rank test analysis of questions requiring Likert 6-point scale answers. The new obstetrics system was seen as significantly improving the ease of scheduling personal activities ($p = 0.017$). As well, there was a significant difference in the increased level of satisfaction with the number of on-call hours going from the old model to the new ($p = 0.027$). There was no statistically significant difference found in the physician perception between the 2 systems in the following: how frequently they would perform deliveries to maintain competence ($p = 0.52$), the medicolegal risk involved ($p = 0.32$), the level of organization ($p = 0.10$), or the level of work-related stress encountered ($p = 0.34$).

Six of the physicians saw the quality of their personal life improve under the new system (yes/no question). Reasons cited (written comments) included increased predictability, decreased time on call, greater freedom and flexibility, less cancellation of clinics due to obstetrics, as well as missing fewer of the deliveries of their obstetrics patients. The same 6 preferred the new system to the old (yes/no question) for the same reasons listed above as well as the greater assurance of being involved regularly with obstetrics patients. These 6 were also satisfied with the length of the on-call sessions with the new system (yes/no question).

In this study, 1 physician was equivocal with regard to an improvement in their quality of life (yes/no question and comments). The physician perceived the new system as cramming the stress and inconvenience of doing deliveries into 1 month, making it much more physically challenging (written comments). For the same reason this physician

did not prefer one system to the other (yes/no question and comments) and was not happy with the length of sessions on call, but stated that there was no ideal length of time to be on call for obstetrics. Overall, this physician was somewhat satisfied with the new model (Likert 6-point scale, score of 4).

DISCUSSION

This satisfaction study has a number of limitations. It was carried out during the use of the new model when preference for the status quo could have caused a bias against the old model. The small number of participants in both the patient and physician surveys limits the study's power. Though the survey's data collection was carried out by nonphysicians, it was clear that the Marathon Family Practice was the instigator of the study and this may have skewed results, particularly among patients, as there is known reluctance to criticize caregivers.¹⁴ Similarly for patients, the halo effect (a powerful positive outcome influencing retrospective perceptions) of having delivered a baby could have affected this retrospective study. Finally, given that the physicians surveyed had created the model, a sense of ownership may have influenced their responses.

The 100% level of patient satisfaction achieved by this new model of obstetric care is comparable to observed satisfaction rates of 75% to 100%^{10,11,15} from obstetric literature. Though our study did not evaluate the patient satisfaction with the old model of care, we take assurance that though the new model may differ in patient satisfaction it is nonetheless very well received and has levels of satisfaction similar to other obstetrics paradigms.

Consistent with the high satisfaction rate is the large number of respondents (97%) having had their expectations met or surpassed during their obstetric care in Marathon. It has been previously established that patients' satisfaction is influenced by their expectations of the medical care received.¹⁶

The provider arm of the study found the new system well accepted by most of the doctors. The new model was achieving its goal of creating an improved quality of life for the obstetrics providers by limiting the on-call duties and increasing their predictability. Its structure maintained a continuity of care important to both the provider and patient experience. The physicians perceived the patients as being satisfied with the system and this view was validated by the results of the patient survey.

The new model is not without its challenges. Clearly, it concentrates the stressors of doing deliv-

eries over a focused period. Depending on the number of deliveries per month, either too high, or too low, this system could become untenable. Presently, the small numbers of deliveries that occur per year in Marathon help make this system viable. As well, the number of physicians involved in obstetrics in our community contributes to the model's success. With many less, or more, physicians the frequency of a physician's on-call duties in a month could be correspondingly too much, or too little. Given that this new model's success is dependent on both the number of deliveries and number of providers, it is likely best transferable to situations with similar-sized patient populations and physician groups. Adoption of such a model ultimately depends on the value system of the physicians involved, as the benefits of collaboration in this new approach may not outweigh the benefits they perceive in their present approach to obstetric care.

With consumers and providers satisfied, the ultimate test of the model will be its ability to maintain a sufficient number of providers over time to keep the obstetrics program functioning and healthy.

CONCLUSION

The new model devised and implemented by the physicians of the Marathon Family Practice meets patients' expectations and provides a good degree of patient satisfaction with their obstetric care. This new paradigm of obstetric care provides practitioners with an increased quality of life through more predictable work. They are more satisfied with it compared with the previously employed model. This is a novel, viable model for the provision of obstetric care in the appropriate setting.

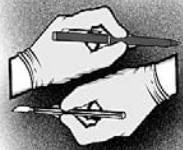
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ORIGINAL ARTICLE ARTICLE ORIGINAL

When a community hospital becomes an academic health centre

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With the burgeoning role of distributed medical education and the increasing use of community hospitals for training purposes, challenges arise for undergraduate and postgraduate programs expanding beyond traditional tertiary care models. It is of vital importance to encourage community hospitals and clinical faculty to embrace their roles in medical education for the 21st century. With no university hospitals in northern Ontario, the Northern Ontario School of Medicine and its educational partner hospitals identified questions of concern and collaborated to implement changes. Several themes emerged that are of relevance to any medical educational program expanding beyond its present location. Critical areas for attention include the institutional culture; human, physical and financial resources; and support for educational activities. It is important to establish and maintain the groundwork necessary for the development of thriving integrated community-engaged medical education. Done in tandem with advocacy for change in funding models, this will allow movement beyond the current educational environment. The ultimate goal is successful integration of university and accreditation ideals with practical hands-on medical care and education in new environments.

Compte tenu du rôle de plus en plus important de l'éducation médicale distribuée et de l'utilisation croissante des hôpitaux communautaire pour la formation, les programmes d'enseignement prédoctoral et postdoctoral ont des défis à relever pour dépasser les modèles traditionnels de soins tertiaires. Il est vital d'encourager les hôpitaux communautaires et les cliniciens enseignants à accepter leurs rôles dans l'éducation médicale au XXI^e siècle. Comme il n'y a pas d'hôpitaux universitaires dans le nord de l'Ontario, l'École de médecine du Nord de l'Ontario et ses hôpitaux partenaires en formation ont défini les questions d'intérêt et collaboré pour implanter des changements. Plusieurs thèmes pertinents se sont dégagés, pour tout programme d'éducation en médecine qui s'étend au-delà de son site actuel. Il est crucial d'accorder de l'attention notamment à la culture institutionnelle, aux ressources humaines, matérielles et financières, ainsi qu'à l'appui des activités d'éducation. Il importe d'établir et de maintenir le travail de base nécessaire à l'émergence d'une éducation médicale engagée dans la communauté, intégrée et florissante. Conjugués à la promotion de changements des modèles de financement, ces efforts permettront de dépasser l'environnement éducationnel actuel. On veut en bout de ligne intégrer avec succès les idéaux de l'université et de l'agrément aux soins médicaux pratiques et à l'éducation dans de nouveaux environnements.

The Northern Ontario School of Medicine (NOSM) is Canada's newest medical school — the first in more than 3 decades. Its innovative model, established with a social accountability mandate, presents a challenging and com-

plex, but critically important, new environment for the delivery of undergraduate (MD) and postgraduate (residency) medical education. Based entirely in northern Ontario, NOSM has a campus that spans a vast geographical area of 750 000 km². Within this area,

there are multiple clinical placement locations (> 70) varying from large urban settings to rural, remote and Aboriginal communities. A major challenge has been, and continues to be, the integration of nonacademic clinical faculty and nonacademic hospitals focused almost exclusively on patient care, into new educational and academic roles.

Since 2004, 11 satellite campuses have been introduced for undergraduate training across Canada,¹ affiliated with a number of different universities. These new campuses have opened to accommodate expanding enrolment into medical schools, and will train about 250 students per year at capacity. In the postgraduate system, family medicine has led the way nationally in the steady adoption of distributed medical education. This has developed with a spectrum of models ranging from satellite campuses of larger universities located in a variety of communities (e.g., Prince George, BC, affiliated with the University of British Columbia), which accommodate the full range of training up to the fully distributed community network model found at NOSM. However, training programs accredited by the Royal College of Physicians and Surgeons of Canada (RCPSC) are still firmly entrenched in the tertiary care model. Distribution of selected generalist RCPSC training is underway, led by NOSM; this will undoubtedly expand across the country as expansion pressures on training capacity affect the ability of current tertiary environments to accommodate more postgraduate learners and as medical students in other locations complete their programs.

The new educational model of distributed community-engaged learning² under development at NOSM germinated from the following clinical and academic components: completely independent, regional tertiary care hospitals in Thunder Bay, Ont., and Sudbury, Ont., with no academic mandate and no affiliations with any medical school or university; a variety of regional and rural community hospitals; community clinics operated with a *smorgasbord* of practice arrangements; physicians with mainly patient care responsibilities and 2 universities with no prior medical faculty and very limited medical research. Gravitating toward even loose affiliations as NOSM developed, with early agreements on integration of medical education opportunities, unearthed a multitude of areas requiring close attention. These emerged as vital, time-critical issues, because of the NOSM curriculum, as the clock ticked on from the start-up of NOSM through the acceptance of the charter medical school class, to the class's graduation (2009). In

the meantime, NOSM's residency programs continue to grow and develop.

The redesignation of 2 major regional hospitals in northern Ontario as academic health centres (AHCs) affiliated with NOSM was of particular importance in the evolution of this new model. Close collaboration of all 3 institutions is required to promote the essential changes needed for the hospitals to adopt their burgeoning role in medical education. The findings and recommendations from NOSM's experiences with this collaboration are presented in this article and are applicable to any setting in which medical education occurs.

DEFINING ACADEMIC HEALTH CENTRES

Defining what is meant by the term "academic health centre" is challenging; it varies depending on the country, location and context, and a wide variety of organizational models exists.³ These range from full integration of administration and governance to the far end of the spectrum of loose affiliations based on perceived or actual needs. All AHCs, however, embrace the academic, clinical and research components necessary to further medical education, and gain status, credibility and accreditation (in Canada) through university affiliations. In Ontario the definition is highly specific as outlined by the Council of Academic Hospitals of Ontario (CAHO) (Box 1).⁴ A working group established by NOSM's founding dean, Roger Strasser, was given the task to

Develop principles and provide best advice to the Chief Executive Officers of Thunder Bay Regional Health Science Centre and Hôpital Regional Sudbury Regional Hospital on issues

Box 1. Criteria that must be met to become a member hospital of the Council of Academic Hospitals of Ontario

First criterion — 1 or more of the following:

- University representation on hospital board of directors
- "Full" affiliation with a medical or health sciences school
- A significant proportion of geographic full-time faculty among medical staff

Second criterion — 1 or more of the following:

- Research enterprise
- Annual research revenues ≥ \$10 million

Third criterion — 1 or more of the following:

- Fellow days exceed 1000/yr and resident trainee days exceed 3000/yr
- Evidence of significant multidisciplinary teaching of senior trainees across health professions

Adapted from the Council of Academic Hospitals of Ontario Newsletter.⁴

pertaining to the development of undergraduate (MD) and postgraduate (post-MD residency) programs and services to become fully operational teaching hospitals. — Roger Strasser (unpublished observations, 2007)

This early step was aimed at identifying key areas for collaboration, integration and joint planning. This set the stage for the evolution of organizational structures embracing the new relationships necessary for educational and clinical placement requirements of the medical school and the growing academic and research missions of the hospitals. With reference to the McKinsey 7-S model,⁵ we placed more emphasis on the “soft S” elements (style/culture, staff, skills and shared values), although the “hard S” components (strategy, structure and systems) are also of great import. Truly functional integration is only possible when there are shared visions and missions, or at least those which are not in conflict with the priorities of other partners.

The following major themes emerged from a literature review and the process of the task force, including consultations and interviews:

- the culture shift
- human resources
 - in-hospital staff
 - physicians
- supports for accredited educational activities
- physical resources
- financial resources

THE CULTURE SHIFT

The community hospitals’ vision, mission and values statements may emphasize patient care, research, community support and networks.^{6,7} Although strategic plans⁸ may include a discussion of a role in provision of medical education, when compared with the vision, mission and values statements of more established AHCs^{9,10} the educational component is not yet explicit. A Council of University Teaching Hospitals paper in 1999¹¹ provides a good overview of the complexities inherent in developing the relationships necessary for the promotion of a robust academic health science network. These may include development of shared values and complementary missions, clearly defined roles and relationships, a social contract with the patient population served, and adequate financial resources organized to leverage funding and provide incentives where possible. The culture shift from a hospital that teaches to a teaching hospital

with continuous assignment of learners requires much work.

Individual physicians in nonacademic hospitals may occasionally accept residents and students for a rotation spent entirely with them. At an AHC learners are attached to the hospital, to a particular service or unit, supervised by the attending physician of the day or shift. For the hospital, this creates a need to understand the hospital’s legal liability; the nuances of supervision of learners; and, in particular, the role of residents with respect to responsibilities for patient care, writing of orders and completion of medical records. For physicians, there is a need to modify day-to-day work activities (e.g., to accommodate patient care review and hand-over with learners).

In-hospital staff requires education around learner roles, whom to call first and the hierarchy of supervision. Comfort levels develop as a result of close working relationships in smaller centres resulting in staff calling specific individuals. Addressing this in a clear and sensitive manner with provision of coaching regarding redirection of calls, when appropriate, will ensure learners are not “left out of the loop.” All staff, from switchboard staff to nurse managers, must be aware of and engaged in this process.

HUMAN RESOURCES

In-hospital staff

The addition of medical learners into a hospital environment has a large impact on personnel. This includes, but is not limited to, those in the medical staff office; clinical care areas; information technology, laboratory and diagnostic services; and supplies.

Increased requirements for staff translate into substantial financial costs in terms of salaries and benefits. Overtime requests occur when operating rooms and clinics run past designated times. Contributing factors may include larger numbers of patients booked to accommodate learner activities and the slower pace of clinical pursuits when tied to educational activities. Processing of patients may be reduced resulting in longer wait times.

Hospitals must provide credentialing, on-site orientation, workplace safety training and medical records access on multiple occasions throughout the year as learners come and go. An administrative staff member at the hospital designated as the liaison between the hospital and the medical school is invaluable.

Physicians

The 16 medical schools in Canada, before the advent of NOSM, had, as their educational mainstay, physicians with geographic full-time (GFT) faculty appointments.¹² This arrangement supports educational and research activities through reduction of clinical load. Physicians in nonuniversity settings are, in general, primarily clinicians who consider patient care as their priority and add educational and research activities to this when possible. A wide range of payment mechanisms are in place for non-GFT physicians, few of which include recognition for educational and/or administrative activities. Involvement in clinical education results in a considerable impact on availability for patient care and subsequent remuneration, particularly in a fee-for-service based system or one based on target clinical volumes to achieve patient care deliverables.

Distributed models with little or no protected or financially supported educational time must be sensitive to the scheduling pressures on physicians. Extensive discussions with hospitals, local physician groups, provincial/state organizations and/or other funding agencies about alternative methods of support, remuneration and delivery of educational services may be needed. Rae¹³ identified that funding models must change so that patient care dollars no longer subsidize education. NOSM's clinical faculty has organized into a clinical teaching association and is in the process of negotiating an alternate funding plan with the Ontario Medical Association and the Ministry of Health and Long-term Care. Hospitals must consider recruiting additional physicians for patient care services. This serves to support the time required of physicians involved in education.

A common refrain encountered is that physicians have moved to community hospitals to practise clinical medicine and get away from being involved in education and research. Certain concerns are prevalent when physicians are asked to teach and feel ill prepared to do so (e.g., "I don't have time to teach," "I don't know how to teach," "I don't know how to assess learners," "my patients won't accept learners"). Frequent contact, combined with well-timed faculty development activities, is required in nonuniversity settings to encourage buy-in from busy practitioners to participate in teaching activities.

Physicians may need to upgrade educational and technical skill requirements, to meet specialty

program-specific standards. Additional paperwork is required to comply with faculty appointments, mandated by the accrediting colleges, along with subsequent annual reviews and updates. Physician participation is required to present and facilitate enhanced hospital education rounds as the AHC mandate expands, and also for medical education committee work, accreditation review activities and more.

With a hospital's adoption of a key role in educational programming, a strategic focus and shared value must be placed on joint recruitment efforts between the hospital and its affiliated educational institution. The educational role of the medical staff must garner attention with modification of the focus of recruitment efforts to include and recognize provision of education in tandem with clinical care services.

SUPPORTS FOR ACCREDITED EDUCATIONAL ACTIVITIES

Explicit requirements are laid out in the Standards for Accreditation of Residency Training Programs by the College of Family Physicians of Canada (CFPC)¹⁴ and in the RCPSC document, General Standards of Accreditation.¹⁵ Of particular importance are standards A2 and A3: sites for postgraduate education, and liaison between the university and participating sites.¹⁵

These must be reviewed in detail with the hospital and arrangements made to ensure the requirements are met. Some of the critical areas covered under these sections and which mesh easily with the "S" concepts of *systems* and *shared values* include ensuring that

- affiliation agreements are in place with universities;
- clinical services are arranged to support education;
- medical records are accurate and complete;
- formal ongoing quality assurance programs are in effect;
- appropriate on-site policies and procedures are in place to assure resident safety;
- appropriate supervision of learners is in place;
- staff involved in teaching have appointments with both the hospital and the university.

There must be instruction in the process of accreditation to prepare hospitals and staff for visits by the CFPC and/or RCPSC. Dialogue between the postgraduate dean and the accrediting committees may obviate the need for multiple, costly external site visits. This requires development of a robust site review process by NOSM itself, which may

translate into a resource for other locations developing distributed medical education.

Clinical leaders and the hospital administration must endorse educational activities. This can be demonstrated through the promotion, support and development of committees such as a medical education committee. There must be frequent and clear communication between the individuals responsible for the educational program and the physicians on site. Specific details require emphasis including responsibilities for core content education, learner evaluation, rotation evaluation and feedback to clinical teachers. For certain residency programs, internal medicine for example, facilitation of team-based care may necessitate significant reorganization of patient care services; both the Hôpital Regional Sudbury Regional Hospital and the Thunder Bay Regional Health Science Centre have put significant resources into supporting teaching services for internal medicine.

PHYSICAL RESOURCES

Educational activities, both scheduled and informal, require classroom space adjacent to clinical care locations. With the dispersed nature of many training sites, ready access to videoconference and online computer facilities is necessary. Northern Ontario, in common with many distributed environments, has been an enthusiastic adopter of Telehealth. This uses advanced videoconference facilities within its hospitals and community clinic settings. Videoconferencing is used regularly and frequently for patient care activities; scheduling educational events at required times may be challenging. Ensuring trouble-free connections is a paper unto itself!

With respect to physical facilities, in Canada there are specific resident contract requirements⁴ that are the hospital's responsibility. These may vary somewhat from province to province since each contract is negotiated independently, but they include provision of private, secure dedicated on-call rooms; lockers; safety and other equipment as needed at work; and possibly a requirement for meal service outside of regular hours.

In Ontario, all academic hospitals and their affiliates are signatories to the Professional Association of Internes and Residents of Ontario (PAIRO)–CAHO agreement.¹⁶ The reality of regularly scheduled use by residents and students puts a considerable strain on physical facilities previously designed to allow for intermittent use by staff or learners. Regardless of general staff arrangements of provid-

ing call from home, it is extremely important from an educational perspective that students and residents be available on site in the hospital. This allows them to provide first coverage for emergent and urgent situations and to observe the natural course of events.

Community hospitals have limited space for outpatient and ambulatory clinics; these are major areas for educational activities, frequently identified as discipline-specific requirements by the RCPSC.¹⁷ These services are of great import and are in keeping with increasing moves to provide day services and care not requiring admission. These physical resources may require updating or modification to accommodate additional staff and learners.

Desk space, computers and library facilities are required. Even when small numbers of students and residents are attached to a unit, space may already be at a premium for health care staff working there. Firewall and security systems within hospitals present challenges for learners. Educational opportunities using library and Web resources are accessed rapidly online, often at the point of care. On-site use of personal laptops, personal digital assistants and other electronic media is becoming commonplace. Modifications to security systems may be required allowing use of personal equipment without compromising the security of health information. Collaboration between NOSM's Informatics Unit and hospital informatics departments has allowed significant progress with this.

FINANCIAL RESOURCES

Funding for hospitals in Canada is provided by provincial governments involving highly complex formulas beyond the scope of this article. Broadly, community hospitals are funded at lower levels than university-affiliated teaching hospitals, but the magnitude of the gap is hard to quantify.

When a hospital is recategorized from a regional community hospital to an AHC, supplementary funding is anticipated by the hospital administration. The level of this additional funding may be disappointing. This is then identified as a substantial concern when the hospital is asked to support educational activities and extra operational expenses with a limited budget, when their priorities are seen as patient care. Hospitals that remain at their previous designation may not receive any further funds in support of educational activities for residents and students. This is a major factor as distributed medical education becomes commonplace. Intensive

lobbying with funding agencies is in order to highlight the significant financial impact hospitals are asked to absorb, particularly when a balanced budget is mandatory. Regardless of the funding source, medical education comes with a substantial price tag for the supporting institutions.

DISCUSSION

Expansion of medical education into community locations is a growth area for many programs. For NOSM and its multiple affiliated hospitals, the important themes identified in the article came into sharp relief and have proven invaluable as a guide for discussions and program development. Program directors contemplating or in the early stages of community engagement can benefit from the knowledge gained by the early adopters. Sharing of information and resources allows stronger models to emerge.

Distributed medical education is no longer regarded as unusual nor as second rate; studies show outcomes on examinations to be at least as good as those of the standard tertiary care university environment.^{18,19} Current expansion of undergraduate and, by necessity, postgraduate learner numbers is reaching levels that place significant stress on existing teaching resources. This is placing the spotlight further on distributed models, encouraging educational leaders to think outside the box, explore development of rural, regional and satellite campuses and examine the overall educational milieu. Importantly, there is a move toward identifying potential training sites as educational or not versus core and distributed, highlighting the realization that delivery of medical education has entered a new era in Canada. This has not happened to any significant degree since Flexner²⁰ set the course for university-based medical education in 1910.

Most patients are treated outside of tertiary care settings as demonstrated in the model of distribution shown initially by White and colleagues²¹ in 1961. This was validated by Green and coauthors²² in 2001. Current approaches to medical learning still encompass training for the most part in tertiary care environments at large teaching hospitals affiliated with university centres. However, there is growing awareness that the case mix in these tertiary centres is not entirely suitable for medical students or for certain residency programs. The move to community hospital-based distributed medical education will have a profound impact on the functioning of traditional university AHCs. Students and residents will

increasingly be trained elsewhere, in environments that provide them access to the most appropriate clinical conditions and acuity of patients required for their education.²³ The transition will be much easier if the multiple partner organizations and communities focus on collaborative strategic planning and can develop a shared vision. This will be further enhanced if the business practices and funding models are made as open and transparent as possible. This will minimize the potential competition for scarce resources.

Current funding arrangements for both hospitals and clinicians are complex and intricate; changes to these have significant impacts on educational programs. Originating in large part as a legacy from Flexner,²⁰ current trends will force a major overhaul; separation of funding for patient care, teaching and research with recognition of the importance of each is paramount. Expansion of medical education comes with a large price tag, which presently must be negotiated piecemeal. Physical resources, capital expansion, operating dollars and changing human resource requirements are all vital components and highly relevant to a successful outcome.

Careful attention must be paid to educational initiatives for hospital staff, both administrative and within the range of health care services. Skill development for an expanded team-based environment; an emphasis on shared models and resources; and communications explaining rationales, necessities, and contractual and accreditation requirements are a few necessary steps. Collaboration and partnerships between the hospitals and educational institutions are key to realizing these goals.

A useful tool is a checklist highlighting items to explore with each hospital identifying areas of priority in moving forward with an educational program. Good starting points are the RCPSC, CFPC, PAIRO and CAHO documents, which are very explicit in terms of accreditation requirements. In many ways, these requirements are the easy aspects — they must be done if a program is to be accredited.

Barrett³ identified the concept of distributed models as a “hedge against groupthink” whereupon challenges may come forward about the expected way of doing things and healthy debate results in better decision-making. This can pose difficulties in its early stages, appearing to be overly confrontational while in fact allowing creativity and the emergence of robust processes.

The importance of repeated site visits, personal contacts, regular exchanges and updates cannot

be emphasized enough. These are highly time-consuming and resource-intensive but mandatory to ensure success. Once programs are established, regular contact must be maintained with opportunities for ongoing education and innovation.

CONCLUSION

A sea change is upon us; just as Flexner changed the world of medical education at the turn of the 20th century, distributed medical education is changing the structure in this millennium. Much work remains, particularly in the postgraduate arena, to support, validate and accept that distributed medical education is at least as good as present models. An emphasis on new, distributed AHC models embracing functional integration, fuelled by collaborative strategic planning and shared vision will maximize effectiveness.

As we explore the new, exciting realm of untapped and underused resources in the form of distributed medical education, care is needed to establish and maintain the groundwork for successful integration of university, academic and accreditation ideals with practical, hands-on front-line medical care and education — for the future of our system.

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THE PRACTITIONER LE PRATICIEN

The occasional ring removal

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INTRODUCTION

It is not uncommon for patients to present to the emergency department with the concern of being unable to remove a ring or similar item, such as a washer or nut, from their finger. Most patients only present after several attempts to remove the ring themselves — margarine, soap and vegetable oil seem to be popular home remedies for attempted removal. Rings can become stuck because of digital trauma, peripheral edema, dependent edema, insect bites or animal stings. Children have been known to jam their fingers into tiny washers and holes only to find it impossible to remove their finger from the site.

Ring removal should be considered urgent if there are any signs of vascular compromise such as mottling. Luckily, there are several techniques for ring removal, all of which are relatively safe and simple. Choice of technique depends on the age and cooperation of the patient, the patient's level of pain, the value of the ring, the nature of the injury to the digit and the physical characteristics of the ring. Some children may not be able to cooperate with attempts to remove rings and thus may require conscious sedation. In cases of fingers that are fractured, dislocated or lacerated, or of rings that are inexpensive or to which the owners are not emotionally attached, immediate removal by ring cutter should be considered. Thick bands and expensive rings should prompt the physician to try alternative techniques as described below.

EQUIPMENT

Choice of equipment depends on the

technique chosen, and may include the following:

- ice pack
- 5 mL 1% lidocaine without epinephrine
- 5-mL syringe
- 27-g needle
- povidone iodine solution or similar substitute
- water-soluble lubricant
- antibiotic ointment
- hemostat
- ring cutter and safety glasses
- 4.0 or 5.0 suture string, ribbon gauze or nylon tape
- surgical glove

PROCEDURE

Pretreatment

Before attempting to remove a stuck ring, instruct patients to elevate their hand above their head for 5–10 minutes while applying an ice pack. The preparation will reduce the local swelling and increase the chance of successful removal. If the patient is suffering considerable pain, the practitioner may consider a digital block using 3–5 mL of 1% lidocaine without epinephrine. However, if a ring cutter can be used in removal attempts, you should delay the block to allow the patient to inform you if the heat from the removal process is starting to burn the skin.

Removal by ring cutter

Manual ring cutters allow a specially designed lever to slip under the ring and protect the finger while the operator uses a thumb screw to rotate a jeweller's saw. Power cutters use the same

technique but the saw's action is powered by electricity (Fig. 1). As metal-on-metal grinding will cause the ring to become hot, frequent breaks are required to allow cooling and prevent burns.

Taylor and Boyd¹ describe a technique for ring removal in a case report in which a hard metal auto part too hard to be cut with ring cutters was used as a ring by a patient who subsequently required the ring to be removed after a hand injury. The ring was lifted off the skin by sliding strips of gauze under the ring with a surgical skin hook and the tissue under the ring was protected with a stainless steel spatula. The area surrounding the ring was covered with wet gauze to prevent thermal injuries and then the ring was cut in 2 places using a dental motor (volvere) and hard grinding disc.

String wrap technique

Occasionally, it is necessary to remove a ring without damaging the ring itself because of sentimental attachment or the value of the ring. One method for removing a ring stuck on a finger without cutting the ring is to first ensure adequate pain control, and then to compress the tissue above the ring to allow easy removal by wrapping the tissue with nylon tape or suture (Fig. 2). In this technique, the proximal end of a length of nylon tape is passed under the ring, and the finger is tightly wrapped from proximal to distal. Pulling on the proximal end of the tape moves the ring distally onto the tape overlying the compressed tissue and finally off the digit.² This technique can also be completed using ribbon gauze or suture material.^{3,4}

Case reports further describe a method in which an extremely edematous finger was wrapped tightly in 1 inch-wide elastic tape for 15 minutes. Then, a blood pressure cuff was applied to the arm as a

tourniquet to prevent the edema from returning while the finger was unwrapped. The tape was taken off the finger and rewrapped more tightly, the blood pressure cuff removed and the tape remained on the finger for a further 15 minutes. This process was repeated until the swelling in the patient's finger had subsided adequately to allow the ring to be removed.⁵

Elastic pull technique

Another technique that doesn't damage the ring, takes less time than the string wrap method and may cause less trauma to the digit is the elastic pull technique. An elastic band can be slid underneath the ring and, once the ring has been adequately lubricated, both ends of the elastic are pulled circumferentially and distally, thereby moving the ring off the finger.⁶

Glove method

When simple lubrication and the string wrap method are ineffective and the patient does not want the ring damaged, another method may be employed before a ring cutter is used. The finger of a surgical glove is cut at both ends to yield a cylinder shaped piece of latex. This piece is then placed onto the affected finger and pulled under the ring using forceps. The proximal end of the glove segment is then grasped and pulled toward the distal end of the finger in a twisting motion, pulling the ring with it.⁷

SUMMARY

Ring removal may be necessary in cases of digital trauma or edema. After pretreating the digit with ice



Fig. 1. Ring removal with a power cutter.



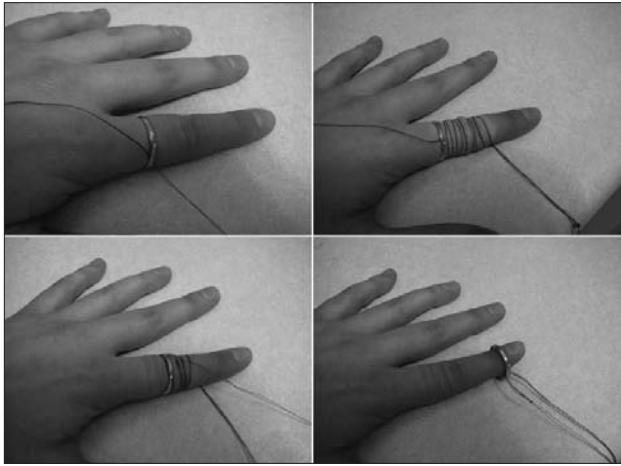


Fig. 2. Ring removal with a string wrap technique.

and elevation and after considering the appropriateness of a digital block for anesthesia, the ring can be removed using one of several methods. If the ring is not valuable and can be cut off, a ring cutter is the preferred method. In cases where the ring cannot be cut or has sentimental or other value, the ring can be

removed using the string wrap technique, the elastic pull technique or the glove method.

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Country Cardiograms

Have you encountered a challenging ECG lately?

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

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

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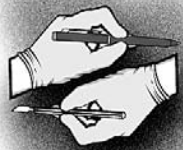
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CASE REPORT

OBSERVATIONS DE CAS

Getting to the heart of the problem: a case report on the use of emergency department ultrasonography in a patient with shortness of breath

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INTRODUCTION

Cardiac tamponade is a potentially life-threatening clinical syndrome that results from the accumulation of fluid in the pericardial space, which compromises cardiac output. The presentation of tamponade is often vague, with nondiscriminatory symptoms such as dyspnea, cough, weakness, fatigue and chest pain, and varies widely depending on the speed of accumulation and the size of the pericardial effusion. It is important to consider tamponade in one's differential diagnosis, as this syndrome is a potentially life-threatening process that responds well to early intervention. However, diagnosis of cardiac tamponade can be difficult without the proper tools. We report a case of a 55-year-old woman currently undergoing chemotherapy for ovarian cancer. We review risk factors, the often nonspecific presenting constellation of symptoms, the multiple physical and investigative findings that are classically associated with the syndrome of tamponade, and, ultimately, the definitive diagnostic examination that confirms the clinical suspicion and facilitates definitive management. This case underscores the importance of emergency physicians being trained to perform focused ultrasonography examinations.

Risk factors for an effusion include trauma, malignancy, uremia, infectious disease, myxedema and autoimmune disease, and iatrogenic processes such as recent cardiac surgery and radiotherapy.

Classic investigations include a thorough cardiac examination, electrocardiography (ECG) and chest radiography. On cardiac examination one may note tachycardia; hypotension; venous congestion; distant heart sounds as a result of muffling from the fluid in the pericardial space; pulsus paradoxus, a sign of impending collapse on blood pressure examination; and Kussmaul sign on evaluation of the jugular venous pressure (JVP). The ECG may show low QRS voltage and, rarely, electrical alternans as the heart moves within the fluid-filled space. The chest radiograph will often show an enlarged heart shadow following the slow development of an effusion; however, the shadow may appear normal if the effusion develops rapidly.

The use of ultrasonography to detect the presence of a pericardial effusion remains the diagnostic modality of choice. A positive finding of an effusion on ultrasonography confirms the investigator's clinical suspicion arising from the findings on the history, physical examination and investigations.

CASE PRESENTATION

The patient, a 55-year-old woman, was diagnosed in 2007 with ovarian cancer and recently completed 6 cycles of paclitaxel therapy. Since computed tomography in the spring of 2008 revealed no evidence of disease burden within the abdomen, no further chemotherapy was planned. The patient had recently presented to her family doctor

complaining of feeling unwell, bloated and nauseated. Her family doctor prescribed domperidone and ordered chest radiography and abdominal ultrasonography. Four days later the patient presented to a rural emergency department complaining of decreased appetite, a 5-day history of progressive shortness of breath, nausea and an occasional cough. She denied fever, chest pain and palpitations, but was dyspneic with talking.

EXAMINATION

- Vital signs at rest were as follows: 94% oxygen saturation on room air, temperature 37.1°C, heart rate 110 beats/min and regular, and blood pressure 100/60 mm Hg. The patient was alert and oriented with some perioral duskiness.
- Examination of the cardiovascular system revealed JVP elevated 4 cm above the sternal angle. No gross Kussmaul sign or edema were detected. Heart sounds were normal and a pulsus paradoxus was not appreciated as the blood pressure was taken electronically.
- Respiration was dull to percussion on the right base, and breath sounds were diminished on the right.
- The patient's abdomen was slightly protuberant with normal bowel sounds, nontender, and doughy to palpation. There was no fluid wave, no palpable masses and no hepato-splenomegaly.
- Laboratory tests revealed a normal complete

blood count, hyponatremia at 128 mmol/L (normal 137–145 mmol/L), mild transaminitis, aspartate transaminase 1.14 μ kat/L (normal 0.25–0.77 μ kat/L), alanine transaminase 1.55 μ kat/L (normal 0.15–0.87 μ kat/L) and γ -glutamyltransferase 1.28 μ kat/L (normal 0.20–0.72 μ kat/L), with negative troponin and D-dimer tests.

- The electrocardiogram showed slight tachycardia at 119 beats/min, decreased amplitude and nonspecific T wave changes inferiorly (Fig. 1).
- The chest radiograph showed cardiomegaly, pulmonary edema and moderate pleural effusions bilaterally, with the suggestion of a right basilar pneumonia (Fig. 2). Compare with the chest radiograph taken 6 months previously in December 2007 (Fig. 3) and note the enlarged cardiac shadow.

The attending emergency physician discussed the case with the gynecologist and they considered a therapeutic tap of the effusions to attempt to relieve the dyspnea. A second emergency physician was consulted to assist with the pleuracentesis. However, on review of the findings, the consulted emergency physician did not feel that the effusions were significant enough to cause the current symptoms. This physician had been trained in emergency department ultrasonography and suggested ultrasonography of the chest to evaluate the effusion. In the process of evaluating the pleural effusions, the physicians decided to examine the heart and found a very large pericardial effusion (Fig. 4).

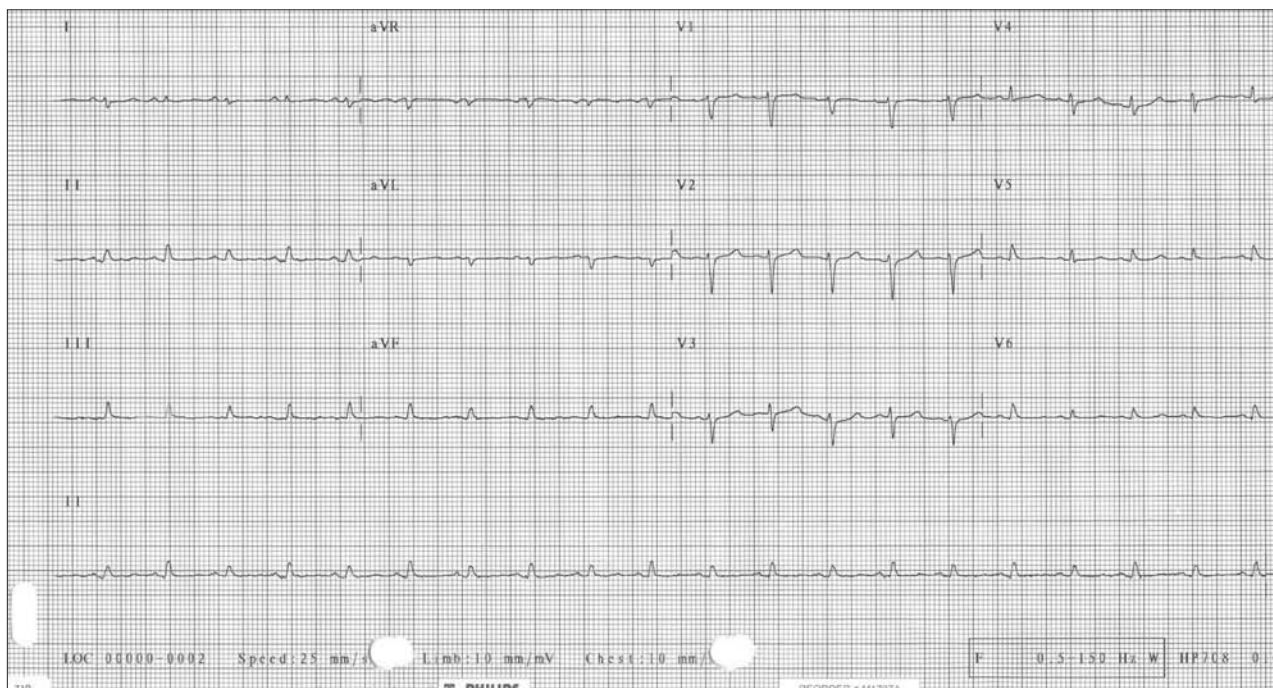


Fig. 1. Electrocardiogram on admission. Note decreased amplitude and electrical alternans in V1 and V3.

The constellation of symptoms, physical examination and investigative findings fell into place, confirming the diagnosis of cardiac tamponade. The patient was urgently transferred to a tertiary centre for definitive management of the pericardial effusion. The patient remained stable during transfer, and in the early morning hours more than 800 mL of fluid was drained from the pericardial sac with significant resolution of symptoms.

DISCUSSION

The combination of venous congestion and systemic hypotension can produce a myriad of symptomatic complaints and physical findings, resulting in a broad differential diagnosis. Venous congestion on the right side of the cardiovascular system can result in hepatic and portal congestion, peripheral edema and ascites. This congestion may result in poor gastric motility, early satiety, nausea, and feelings of being bloated, swollen and weak. Venous congestion on the left side of the cardiovascular system can result in pulmonary edema and pleural effusions, causing chest pain, pleurisy, dyspnea and orthopnea. The hypotensive effects of tamponade can include renal compromise, decreased perfusion of the central nervous system, and peripheral vascular-

ture hypoperfusion. Systemic hypotension in the affected patient may cause diaphoresis, oligouria, tachycardia, hypotension, cyanosis, confusion, chest pain, anxiety, or fatigue with minimal exertion.

Investigations can often reveal pulmonary edema, enlarged heart shadow and pleural effusions on chest radiography; venous congestion and ascites on abdominal ultrasonography; renal impairment on chemistry evaluations; impaired gas exchange on evaluation of blood gases; and potentially positive D-dimers, secondary to chronic disease processes.



Fig. 2. Chest radiograph on admission. Note the enlarged cardiac shadow, bilateral effusions, vascular redistribution and suggestion of RLL pneumonic process. Compare with the chest radiograph taken 6 months earlier (Fig. 3).



Fig. 3. Chest radiograph taken 6 months earlier in December 2007.

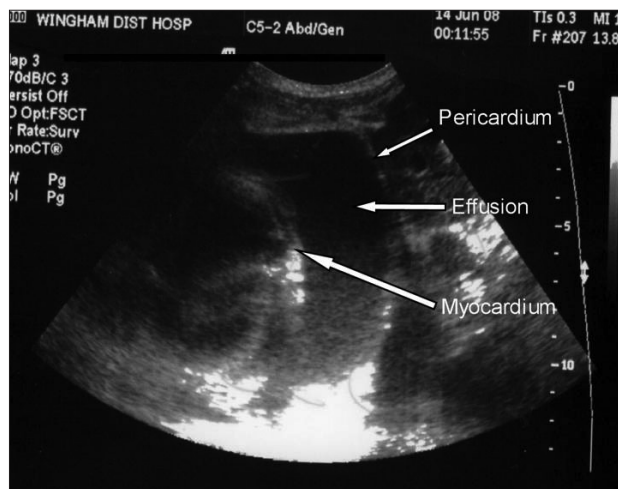


Fig. 4. Emergency department ultrasonography image showing large pericardial effusion compromising cardiac output and causing cardiac tamponade.

As a result, a physician must establish if the patient's presentation is drug induced, secondary to cancer, or the result of uremia, myxoedema, cardiac ischemia, trauma, a collagen vascular disease or infection. It is important for physicians to consider these multiple etiologies as they work with the patient to carefully eliminate the impossible or unlikely etiologies.

There are multiple historical (Box 1), clinical (Box 2) and investigative findings (Box 3) that can support the diagnosis of pericardial tamponade, yet do very little to convince a consultant that an urgent transfer is necessary. In most rural centres echocardiography is not readily available, and in our centre the technician visits 1 day per week. The availability of a trained physician to perform a focused ultrasonography examination to evaluate the presence of a pericardial effusion can improve significantly

Box 1. Historical clues and symptoms suggesting tamponade

- Weight loss, fatigue, anorexia
- Chest pain
- Oligouria
- Night sweats, fever
- Recent thoracic surgery or central venous catheterization
- History of malignant disease
- History of HIV
- Drug history

Box 2. Clinical findings of tamponade

- Beck triad: increased jugular venous pressure, hypotension, decreased heart sounds
- Pulsus paradoxus
- Kussmaul sign
- Peripheral edema
- Tachycardia, syncope
- Tachypnea, cough
- Weak peripheral pulses
- Cyanosis, anxiety, confusion

Box 3. Investigative findings of tamponade

- Electrocardiography: low voltage, electrical alternans
- Echocardiography: pericardial effusion, compression of cardiac chambers
- Chest radiography: large heart shadow, pleural effusions, pulmonary edema

physicians' ability to make a diagnosis and can facilitate patient care. When rural doctors constantly have to deal with the frustrations of bed shortages, resource limitations and ambulance restrictions, the results from this tool can facilitate discussions for urgent transfers and facilitate patient care and safety.

CASE SUMMARY

In our case, the patient presented with nausea, gastrointestinal complaints, weakness, dyspnea, orthopnea and fatigue. On examination, the patient was found to be hypoxic, hypotensive and tachycardic, with an elevated JVP and decreased air entry into the lungs. Investigations revealed tachycardia, low voltage ECG, pleural effusions, pulmonary edema, a pneumonia, normal CBC, mild renal compromise, mild transaminitis, negative troponin and negative D-dimer.

Focused investigative emergency department ultrasonography confirmed the diagnosis of cardiac tamponade and an urgent pericardiocentesis drained more than 800 mL of fluid. Following pericardiocentesis the patient felt significantly better, returned home in a few days and is awaiting follow-up on the malignant effusion.

CONCLUSION

Although cardiac tamponade is rare, it must be included in a physician's differential diagnosis of the nauseated, weak, hypoxic, tachycardic and hypotensive patient. Cardiac tamponade is potentially life-threatening, but, with early recognition and intervention, the syndrome is treatable.

Pericardial effusion diagnosis can be improved with a review of the signs, symptoms and investigative findings of cardiac tamponade syndrome. However, as shown by this case, it is important that physicians working in rural or urban emergency departments develop emergent focused ultrasonography examination skills. The use of emergency department ultrasonography in this case improved diagnostic accuracy, decreased the time to make a diagnosis and facilitated patient care.

Competing interests: None declared.



PODIUM: DOCTORS SPEAK OUT LA PAROLE AUX MÉDECINS

Rural maternity practice: How can we encourage family physicians to stay involved?

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THE CHALLENGE

During the past decade, many rural jurisdictions in Canada have witnessed precipitous closures of maternity services.^{1,2} Although reasons for closures are often location-specific, they tend to be related to human resource challenges involving nurses, general practitioner surgeons, family physicians and specialists;^{1,3-5} lack of access to specialized services (e.g., limited access to epidural anesthesia, labour augmentation or cesarean delivery back-up);^{1,5} and a trend toward centralization across the spectrum of delivery of health care services in Canada.^{1,6,7}

It is becoming clear that, among these contributing factors, the most significant challenge is the recruitment and retention of providers in rural locations and the need for appropriate incentives to improve physician participation.

Across Canada, the proportion of births attended by family physicians is diminishing and varies considerably from a low of 23.6% in Prince Edward Island to more than 77.2% in British Columbia.⁸ Many provinces have already lost most of their family physician involvement in maternity care and British Columbia is poised to experience the same decline in family doctors who practise obstetrics.

These challenges to the provision of care are characteristic of a rural context and have given rise to innovative solutions for sustaining services. One such solution is on-call remuneration agreements, as have occurred across rural Canada during the past 10 years. For

example, in British Columbia an on-call remuneration agreement was reached in 2001 between the BC Medical Association and the British Columbia Ministry of Health, which included financial support for coverage of emergency and specialist services, but not maternity care provided by family physicians.

Other provinces have implemented on-call coverage plans for emergency care in rural environments, such as the Rural On-Call Remuneration Program in Alberta, the Emergency On-Call Coverage Program in Saskatchewan and the Hospital On Call Coverage Program in Ontario, and have included support for on-call maternity services in an attempt to staunch the loss of family physician involvement in obstetrics.

A review of the Alberta Rural On-Call Remuneration Program has demonstrated high satisfaction among rural physicians with the program.⁹ In Ontario, the pilot program for the Hospital On Call Coverage Program started in 2000 and has been re-funded and expanded in response to positive pilot outcomes.¹⁰

THE MEDICAL ON-CALL AVAILABILITY PROGRAM — THE BRITISH COLUMBIA EXAMPLE

The working agreement of British Columbia's Medical On-Call Availability Program (MOCAP) specifies that payments are made "to physician(s) and physician groups who provide coverage for patients, other than their own or

their call groups', as required and approved by Health Authorities."¹¹ Coverage of the MOCAP is differentiated based on the availability and proximity of the provider, with level-1 coverage requiring availability by telephone within 10 minutes, and on site urgently, but no later than within 45 minutes; level-2 availability by telephone within 15 minutes and on site within 2 hours; and level-3 availability by telephone within 15 minutes and on site within 16 hours of receiving the call.¹¹

There are also contingencies for on site, on call and call back. The level of remuneration reflects the availability of the provider and ranges from \$70 000 to \$325 000 per call group per year,¹¹ with call groups requiring a minimum of 3 providers.¹² Other provinces with rural on-call funding provide similar levels of remuneration. In Ontario, for instance, the amount of funding a call group receives from the Hospital On-Call Coverage Program also depends on the number of care providers within the group and level of hospital services, and ranges from \$103 200 to \$172 000 per year.¹⁰

The purpose of the MOCAP initiative is to ensure that physicians providing coverage as part of an established call rotation (or physician group) are compensated for providing emergency care for patients other than their own. The MOCAP facilitates continuous, sustainable on-call service and ensures that on-call workloads do not contribute to burnout for participating physicians. Underpinning this solution was a recognition of the importance of robust health care services to rural communities within the context of rational decision-making regarding level of care based on population need. Practice areas covered in the agreement include pediatric, emergency, psychiatric and surgical call. In small communities, these call rotas rely on the participation of general practitioners who have gained expertise in 1 or more of the practice areas.

THE MOCAP AND MATERNITY CARE

In British Columbia, the only area of practice exempt from the MOCAP agreement is maternity care. This is because of a perception that some physicians cover only patients from their own practice and the on-call stipends were not intended to support doctors covering their own patients. Because of the significant number of rural service closures, however, more and more women are travelling to centralized community and referral hospitals to give birth, creating an influx of "orphaned patients" in referral centres. The burden of respon-

sibility for their care falls on the family physicians in these communities.

Perhaps more importantly, as more and more physicians retire and new physicians enter rural practice with lifestyle expectations that allow them time off call, patterns of call coverage have changed. This has led to call group formations that may cover several local practices in addition to bearing the responsibility for women from outlying communities.

DISINCENTIVES TO RURAL MATERNITY CARE

When new physicians enter rural practice, they are faced with competing opportunities to participate in call rotas and recognize that many on-call groups, emergency services for example, provide on-call remuneration and obstetric call does not. The consequences of this is a disincentive to the recruitment of physicians to maternity care, leading to increased stress for existing providers, heavier workloads, burnout and, potentially, the closure of a given maternity service altogether.

Additionally, the cascade effect of the closure of small services leads to the increased burden on physicians in referral centres who receive "orphaned patients" and the subsequent destabilization of referral services.¹³ To say that we are approaching a crisis in maternity care is to miss the fact that, in British Columbia alone, 20 services have closed since 2000 with many others on the brink of closure.¹⁴ The question that we must grapple with is, Will we prioritize best care (care closer to home)^{15,16} or will competing priorities win out?

OUR PROPOSAL

We have unintentionally created significant disincentives to rural practitioners to provide maternity care. If we want to sustain rural maternity care, we need to rectify this situation and fund on-call obstetric practice for general practitioners. To this end, we advocate for the creation of a rural primary maternity care on-call stipend paid to 1 call group of primary care providers per community, in communities that do not have full-time coverage by a specialist obstetrician.

This stipend could be based on current MOCAP payment levels, with the assumption that eligible communities will provide level-1 on-call services (\$225 000/yr/call group). Care providers would receive only 1 stream of funding per on-call shift (i.e., a physician on call for maternity care may not

also receive MOCAP payments for emergency or anesthesia call groups during that shift). In British Columbia if we restrict the application of this scheme to rural communities with maternity services (roughly 35 locations), the total cost of this initiative would be less than \$8 million annually and would assist in reversing the cascade of destabilization that we have inadvertently created.

The introduction of this on-call payment scheme for rural coverage of primary maternity care will support the retention, recruitment and repatriation of rural maternity care providers. As more practitioners take up rural maternity care and individual workloads decrease to reasonable levels, overall quality of life and sustainability of practice will improve.¹⁷ These changes will strengthen the quality of care provided to birthing women, as well as enable them to access intrapartum services closer to home.

CONCLUSION

The way we choose to resolve this health care services dilemma rests in the core values enshrined in the Canada Health Act, which include equitable access to services for all, including families in rural and remote communities.¹⁸ We can no longer afford to overlook the importance of the role of birth, not just in the health care infrastructure of rural communities, but also in the social fabric of rural communities themselves.

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OUT BEHIND THE BARN DANS LE FEU DE L'ACTION

Email etiquette

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My work-related communication with rural physicians is done mainly by email. I've noticed that many of them are still learning how to email effectively, so this article includes hints for making your own email messages more reader-friendly.

FROM FIELD

This field is usually completed automatically by your email program. It should clearly identify your full name and email address. Your name should be correctly capitalized (e.g., "John Smith," not "john smith" or "JOHN SMITH") so that recipients can save your contact information in their address book without editing. Confusion may occur if you share an email account with other family members or if you have multiple email addresses. Send yourself a test message to see how this field appears, then use your email program's "Tools" or "Help" files to learn how to update your personal information.

SIGNATURE FILES

Most email programs allow you to create a signature file that is automatically added to every outgoing message. This clearly identifies who you are and can include additional contact information such as telephone and fax numbers. Search for the word "signature" in your email program's help files.

TO FIELD

If you are sending a message to more than 1 person, all recipients can see every name and address in this field. To

avoid confusion, list only the person who is the primary target of your message in this field.

CARBON COPY (CC) FIELD

This field is also visible to all recipients. Use it for people who are not the primary target of the message but need to be aware of the contents.

MAILING LISTS

If you often send messages to the same group of people, your email program may allow you to create a mailing list so that you don't have to enter their individual addresses each time.

BLIND CARBON COPY (BCC) FIELD

Recipients listed in this field will receive your message, but their names and addresses are not visible to other recipients. Use this field if you are sending a message to a large group and wish to avoid a long list of names and addresses appearing at the top of the message.

SUBJECT FIELD

Make the text in this field short and specific, so that the recipient knows immediately what the message is about. A clear subject will also distinguish your message from the vague (or blank) subjects often found in junk mail. When replying to a message, edit the subject line to reflect the subject of your reply.

ATTACHMENTS FIELD

State the content and format of any

attachments at the start of your message text. If the file format is an uncommon one, your recipient may not have the correct software to read the file. It is common to mention an attachment but forget to actually create it, so do that step before writing any message text.

MESSAGE TEXT

The first paragraph of your message should give the recipient a clear idea of what the remainder of the message is about. This paragraph may be all that is visible if they are using their email program's "preview" feature.

REPLIES

Place your reply above any quoted material. Consider

deleting any quoted material that is not relevant to the reply. If you need to embed comments within quoted material, tell the reader at the start of the message and flag the comments to make them more visible.

FORWARDING MESSAGES

If you forward a message, it is courteous to send a copy to the original sender. Ask their permission in advance if the content is sensitive. If you express strong emotions or opinions on controversial topics, remember that the recipient might forward your message to others. Don't waste your friends' time by forwarding chain letters, even for a supposedly worthy cause.

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