

Referring patients with chronic noncancer pain to pain clinics

Survey of Ontario family physicians

S. Fatima Lakha MSc Balaji Yegneswaran MD Julio C. Furlan MD Veronica Legnini MD
Keith Nicholson PhD Angela Mailis-Gagnon MD MSc FRCPC

Abstract

Objective To examine the factors associated with FPs' referrals of patients with chronic noncancer pain to a tertiary care pain clinic.

Design A questionnaire-based survey; data were analyzed using univariate methods.

Setting A tertiary care pain clinic in Toronto, Ont.

Participants All FPs who referred patients to the clinic between 2002 and 2005.

Main outcome measures Variables explored included FPs' sex, age, and ethnic background, ethnicity of patient groups seen, and FPs' rationale or barriers influencing referrals to specialized pain clinics.

Results The response rate was 32% (47 of 148 FPs). There were no statistically significant differences between respondents and nonrespondents in sex, age, duration of practice, and university of graduation, or between the variables of interest and the referral patterns of those who did respond. The mean age of respondents was 50 years; 47% of the FPs identified themselves as Canadian; and one-third of the respondents indicated that they referred more than 30 patients to pain clinics each year. The 3 most frequently cited reasons prompting referral to pain clinics were requests for nerve blocks or other injections, desire for the expertise of the program, and concerns about opioids; the 3 most prevalent barriers were long waiting lists, patient preference for other treatments, and distance from the clinic.

Conclusion Although the results of our survey of FPs identify certain barriers to and reasons for referring patients to pain clinics, the results cannot be generalized owing to the small sample of FPs in our study. Larger studies of randomly selected FPs, who might or might not refer patients to pain clinics, are needed to provide a better understanding of chronic noncancer pain management needs at the primary care level.

EDITOR'S KEY POINTS

- Chronic noncancer pain is a considerable health issue, and primary care physicians report that they do not have the expertise, time, or appropriate remuneration necessary to manage chronic pain adequately. Thus, many FPs refer patients to pain clinics, as this study demonstrates: about half of the FPs surveyed referred more than 10 patients a year to pain clinics.
- One of the main reasons for referring patients to pain clinics was for nerve blocks, even though the evidence does not support the effectiveness of this therapy. Further, patients can become reliant on these injections and fail to address the underlying causes of chronic pain. In addition, the cost to provincial health plans and third-party payers for these treatments is substantial.
- Concern about prescribing opioids was another common reason for referral. Although it seems that FPs often turn to pain clinics for their expertise in managing patients taking opioids, respondents also identified concern that some pain clinics would prescribe high-dose opioids as a barrier to referral.

This article has been peer reviewed.
Can Fam Physician 2011;57:e106-12

Diriger les patients souffrant de douleur chronique non cancéreuse vers les cliniques de la douleur

Enquête auprès des médecins ontariens

S. Fatima Lakha MSc Balaji Yegneswaran MD Julio C. Furlan MD Veronica Legnini MD
Keith Nicholson PhD Angela Mailis-Gagnon MD MSc FRCPC

Résumé

Objectif Déterminer les facteurs qui font que les MF dirigent des patients souffrant de douleurs chroniques non cancéreuses vers des cliniques de la douleur des soins tertiaires.

Type d'étude Enquête sous forme de questionnaire; les données ont fait l'objet d'une analyse univariée.

Contexte Une clinique de la douleur des soins tertiaires à Toronto, Ontario.

Participants Tous les MF qui ont dirigé des patients à la clinique entre 2002 et 2005.

Principaux paramètres à l'étude Les variables étudiées comprenaient le sexe, l'âge et l'origine ethnique des MF, l'ethnicité des groupes de patients vus et les raisons favorables ou défavorables au fait de diriger des patients à une clinique spécialisée pour la douleur.

Résultats Le taux de réponse était de 32% (47 sur 148 MF). Il n'y avait pas de différence statistiquement significative entre répondants et non-répondants pour ce qui est du sexe, de l'âge, de la durée de pratique et de l'université fréquentée, ni entre les différents niveaux d'intérêt des non-répondants et leur façon de diriger les patients aux cliniques de la douleur. L'âge moyen des répondants était de 50 ans; 47% des MF ont déclaré être canadiens; et un tiers des répondants ont dit avoir dirigé plus de 30 patients par année à des cliniques de la douleur. Les 3 raisons les plus fréquemment citées pour avoir recours aux cliniques de la douleur étaient les demandes de blocs nerveux ou d'un autre type d'injection; vouloir profiter de l'expertise du programme; et les préoccupations au sujet des opiacés. Les 3 obstacles les plus souvent cités étaient les longues listes d'attente; la préférence des patients pour d'autres traitements; et la distance de la clinique.

Conclusion Même si cette enquête auprès de MF identifie certaines raisons et certains obstacles au fait de diriger des patients aux cliniques de la douleur, le petit nombre de MF consultés nous empêche de généraliser ces résultats. Des études plus larges avec des MF choisis au hasard, qui pourraient ou non diriger des patients à des cliniques de la douleur, seront nécessaires pour mieux comprendre les besoins de traitement de la douleur chronique non cancéreuse au niveau des soins primaires.

POINTS DE REPÈRE DU RÉDACTEUR

- La douleur chronique non cancéreuse est un important problème de santé et les médecins de première ligne disent n'avoir ni l'expertise, ni le temps, ni la rémunération qu'il faut pour bien traiter la douleur chronique. C'est pourquoi plusieurs MF dirigent leurs patients vers des cliniques de la douleur, comme le montre cette étude: environ la moitié des MF consultés ont dirigé plus de 10 patients par année à des cliniques de la douleur.
- Une des principales raisons pour diriger des patients à des cliniques de la douleur était pour y recevoir des blocs nerveux, même s'il y a peu de preuves de l'efficacité de ce type de traitement. En outre, les patients risquent de trop compter sur ces injections, négligeant alors de s'attaquer à la cause responsable de la douleur chronique. Ajoutons que ces traitements imposent des coûts importants aux programmes de santé provinciaux et aux tiers payeurs.
- Une autre raison fréquemment invoquée pour diriger les patients à ces cliniques était une inquiétude à propos de la prescription d'opiacés. Même s'il semble que les MF ont souvent recours aux cliniques de la douleur pour leur expertise avec les patients traités aux opiacés, les répondants ont aussi mentionné comme obstacle à l'envoi de patients à ces cliniques la crainte que certaines cliniques de la douleur prescrivent de fortes doses d'opiacés.

Cet article a fait l'objet d'une révision par des pairs.
Can Fam Physician 2011;57:e106-12

Chronic pain in the Western world is a considerable health issue, not only associated with the individual suffering of those afflicted, but also affecting health care providers and the community at large. Between 18%¹ and 29%² of Canadian adults experience chronic pain, and more than 40% to 50% of chronic pain patients seen in routine practice fail to acquire adequate relief.³

It has been shown that patients with chronic conditions prefer to receive services in primary care settings.⁴ However, primary care physicians find management of chronic noncancer pain (CNCP) difficult.⁵ Reasons include inadequate training in chronic pain management,⁶ lack of time, and lack of remuneration. Furthermore, primary care physicians lack resources for more complex cases and might refer patients to pain clinics for comprehensive care.

Studies have shown that there are inequalities in how patients are referred to specialists in general.⁷ Barriers emanating from physicians themselves relate to patients' socioeconomic status, race, ethnicity, and sex.⁸⁻¹² Barriers originating from patients include fear of hospitals, operations, medical tests, and diagnostics, as well as a lack of knowledge about treatment options or what the referral actually means.¹³

Currently there is a dearth of research examining factors influencing primary care physicians' referrals to pain clinics. Our survey-based study focused on Ontario FPs' attitudes toward and perceptions of the types of patients they see and the reasons why they refer or do not refer their patients to chronic pain clinics.

METHODS

All FPs working in Ontario who referred at least 1 CNCP patient to the Comprehensive Pain Program (CPP), a tertiary care pain clinic at the Toronto Western Hospital of the University Health Network, between January 2002 and December 2005, were included. The study was approved by the Research Ethics Board of the University Health Network.

Subjects were invited to participate in this cross-sectional study by completing a concise questionnaire examining their experiences with pain clinics and attitudes about referrals to such pain clinics in general. The questionnaire included questions on the physicians' identification with particular ethnic groups; demographics (age and sex); their estimate of the proportion of various ethnic groups among their patients; perceptions about which patient groups appeared to complain more of pain; reasons for referring patients to chronic pain clinics in general; and the barriers and obstacles encountered in making such referrals. Survey subjects were also asked to estimate the number of

CNCP patients they had cared for in the past year and how many patients they referred to chronic pain practitioners or pain clinics in a year. Physicians were asked to select the ethnic group that they "principally identify" with from a list of ethnic identifiers derived from country classifications from the *2005 World Population Data Sheet*.¹⁴ Details of the classification have been published elsewhere.¹⁵ Of note, ethnic identification is not equivalent to country of birth but encompasses a wider concept. Demographic characteristics of the surveyed physicians were additionally retrieved from the College of Physicians and Surgeons of Ontario (CPSO) website and included sex, university of graduation, year of graduation, medical degree, field of practice, and university appointments.

A consent form was mailed with the questionnaire, explaining the goals of the study and the reasons for participation. Each subject was contacted by regular mail and had the option of returning the questionnaire in an enclosed prepaid envelope or filling out the questionnaire online. A follow-up telephone call to each physician's office was made as a reminder and to confirm that the correct mailing address had been used.

The questionnaire was developed by the authors based on previous research, clinical experience, and published studies. Face validity and appropriateness of the questionnaire were confirmed with pretesting among a small number of FPs at the Toronto Western Hospital.

Data were analyzed using 2-sided Fisher exact tests, 2-sided Mann-Whitney *U* statistics, and ANOVA (analysis of variance) with Bonferroni post hoc method. All data analyses were carried out using Statistical Analysis System software, version 9.1.

RESULTS

Of the 148 FPs who were invited to participate, 47 responded to our survey (response rate of 32%). Most of the FPs (58%) worked in the greater Toronto area, which is the most populous metropolitan area in Canada; only 37% worked outside the greater Toronto area, with a maximum driving distance of 452 km from the CPP. Of note, the number of responses for each question is not identical, as not all questions were answered by all physicians.

Respondents versus nonrespondents

Based on the information obtained from the CPSO, we did not find statistically significant differences between the 47 respondents and the 101 nonrespondents in sex distribution (women comprised 45% of respondents and 35% of nonrespondents), time since graduation (mean [SD] time in clinical practice 22.4 [1.1] years for

respondents vs 21.1 [1.5] years for nonrespondents), and proportion of FPs who graduated from a Western university (79% of respondents vs 87% of nonrespondents).

Respondent characteristics

Of the 47 respondents, 26 were men (55%) and 21 were women (45%). The age of the respondents ranged from 29 to 73 years (mean age 48.6 years), and two-thirds of the FPs were between 36 and 55 years of age. More than half of respondents (26 of 47) had been practising for at least 20 years. A total of 47% of the FPs (22 of 47) identified themselves as Canadian, and the remainder identified themselves with other ethnic groups, particularly European (28%, 13 of 47) and Asian (13%, 6 of 47). There was no apparent association between the number of CNCP patients seen yearly and FPs' ethnic identification. Based on information from the CPSO physicians' directory, 41 of 47 (87%) respondents had graduated from Western (almost exclusively Canadian) universities, despite the fact that less than half identified themselves as Canadian.

Patient characteristics

A total of 70% of respondents (33 of 47) identified Canadian patients as the group they saw most frequently, irrespective of the FPs' own ethnic identification. Only a minority of FPs indicated that the most prevalent ethnic patient group attending their practices was other than Canadian, ie, British (3 of 47 respondents, 6%), and Portuguese, Greek, Italian, Caribbean, Bangladeshi, or Indo-Pakistani patients (1 of 47 responders for each ethnic category for a total of 13%).

Less than one-third of FPs responded to the questions about which patients (based on sex, age group, or ethnic group) they thought were more or less prone to developing chronic pain. The number of respondents varied from 8 to 18 for each question and identified female patients of Canadian origin, 40 to 60 years of age, as more vulnerable to developing chronic pain, while Asian men were identified as the patient group least susceptible to developing chronic pain.

Factors associated with number of referrals

Only 13% of the respondents (6 of 46) indicated that they had fewer than 10 chronic pain patients in their practices yearly. More than half of the physicians (52%, 24 of 46) had 11 to 30 CNCP patients in their practices yearly; 15% (7 of 46) had 31 to 50 CNCP patients; and 20% (9 of 46) had more than 50 CNCP patients in their practices yearly. The more CNCP patients a physician saw, the less he or she tended to refer them to pain clinics: 76% of FPs seeing 11 to 30 CNCP patients yearly, 57% of those with 31 to 50 CNCP patients yearly, and 44% with more than 50 CNCP patients yearly, referred fewer than 10 of those patients to pain clinics. This trend did not,

however, reach statistical significance. The number of CNCP patients referred to pain clinics was not associated with FPs' age ($P=.616$), sex ($P>.99$), ethnicity ($P=.238$), university of graduation ($P=.096$), or length of time in practice ($P=.996$).

Preferences for types of pain clinics or practitioners

More than half of respondents to this question (23 of 41, 56%) ranked university-based hospital pain clinics as their preference, while 37% (15 of 41) ranked individual pain clinicians or community clinics first. The vast majority of physicians ranking university-based clinics as their preference (93%, 21 of 23) seemed to refer their CNCP patients exclusively to such clinics.

Reasons and barriers influencing referrals

The respondents were asked to identify the reasons that prompted them to refer their CNCP patients to chronic pain clinics in general. Each respondent could mark more than 1 answer. The 3 most frequently cited reasons that prompted referral to the CPP and other pain clinics (cited by the overwhelming majority of the responders) were requests for nerve blocks or other analgesic injections (46 of 47), desire for the expertise of the program (44 of 47), and concerns about prescription of opioids (38 of 47). Additional reasons included considering clinics "the last resort" for complex patients (26 of 47) and miscellaneous reasons (12 of 47) such as specialists' recommendations for pain clinic referral, medicolegal concerns, and patients' own requests for referral to pain clinics.

Barriers to referral of CNCP patients to pain clinics identified by the FPs included primarily long waiting lists (41 of 47), followed distantly by patient preferences for specialized treatments outside the context of formal pain clinics (16 of 47), and the distance from the pain clinic (15 of 47). Additional factors included patients' inability to communicate owing to language barriers (12 of 47), the perception that pain clinics were of no help (12 of 47), and miscellaneous reasons (10 of 47), such as the inability of pain clinics to offer frequent follow-up visits, the tendency of some clinics to relinquish the care of the patient back to the FP after 1 pain clinic visit only, or the perception that some pain clinics prescribed high doses of opioids, which the physicians were not comfortable continuing.

DISCUSSION

This is the first Canadian study we know of that attempts to determine how FPs view pain clinics. Our study was unable to demonstrate any particular associations between the numbers of CNCP referrals to our

pain clinic or other clinics and FPs' age, sex, ethnicity, university of graduation, or duration of practice. In other words, we were unable to demonstrate any obvious biases affecting patient referrals to chronic pain clinics.

Our study has several limitations. The number of respondents was small and was in all likelihood responsible for the lack of associations observed. Further, the study sample consisted only of FPs who had referred CNCP patients to the CPP. Therefore, the results are not generalizable, as they might not apply to FPs who have never referred patients to our own clinic or any pain clinic. The FPs surveyed also identified Canadians as their primary patient group. While 44% of Toronto residents and 41% of our own patients are born outside Canada (as shown in a previous study of our population¹⁵), the ethnic identification used in this study was not synonymous with the country-of-birth identification used in our previous study.¹⁵ Therefore, we are not sure how representative our sample was of the general population of FPs and FP practices. Finally, the study did not ask questions about FPs' expertise in dealing with CNCP or what kind of patients physicians consider suitable for referral to pain clinics; it also did not attempt to detect possible differences between FPs located close to pain clinics and those from more remote areas with less access to such clinics.

Despite its limitations, this study is a first attempt to define the CNCP landscape for FPs in Toronto and Ontario. Our results indicate that pain clinics or pain clinicians seem to be of value to FPs, as more than a quarter of the primary care respondents referred between 11 and 30 CNCP patients a year to pain clinics. The study was also able to identify reasons for and barriers influencing referral of CNCP patients seen in primary care settings to specialized pain clinics or pain clinicians.

Interestingly, some FPs identified women as more vulnerable to developing chronic pain, while male and Asian patients were considered less prone to chronic pain. Our sample of respondents is too small to draw conclusions; however, this perception is partially supported by Statistics Canada data from a survey of 100 000 households.¹

Reasons for referral

Primary reasons for referral included the perceived need for nerve blocks as a treatment, seeking the expertise of the clinic in diagnosis or management in general, and physicians' concerns about the administration of opioids. A recent high-quality systematic review¹⁶ of the effectiveness of trigger point injections (TPIs) (corresponding to the popular name *nerve blocks*) showed that TPIs as the sole treatment of patients with myofascial pain, regardless of the injectant used, were not more effective than other less invasive treatments such as laser

and ultrasound therapies.¹⁶ Of note, TPIs with botulinum toxin (another common injectant for myofascial pain) were not more effective than TPIs with saline or local anesthetics, but they were up to 500 times more expensive than the latter. The authors stressed that when TPIs are used as the primary therapy, patients might become dependent on them for pain relief and can be distracted from dealing with underlying factors that cause and perpetuate pain¹⁷; physicians should be aware of the dangers of relying on TPIs as the sole treatment of CNCP. The rising popularity of nerve blocks is not surprising, given the fact that they are easy to obtain from hospital- and community-based pain clinic and are a quick way to address pain. Nerve blocks, additionally, constitute one of the very few income-generating sources in care of CNCP patients, costing the Ontario Health Insurance Plan \$24.3 million in 2003 and \$33.1 million in 2005¹⁸ in addition to substantial amounts of money paid by third parties such as the Workplace Safety and Insurance Board. In another study of ours,¹⁹ 48% of injured workers referred to the CPP by the Workplace Safety and Insurance Board as "management problems" were receiving or had received numerous sessions of TPIs despite persistence of considerable pain, high doses of opioids, and lack of functional improvement.

Seeking the expertise of the staff in a particular pain setting to diagnose and manage CNCP patients is, in our view, the reason why FPs refer more often to academic pain clinics than community clinics or solo pain practitioners (as shown by their preference rankings in our study). Academic pain clinics seem to see more complex patients than community clinics do, such as patients with multiple comorbidities; those who have failed all kinds of treatments, including high doses of opioids; and patients with substantial psychosocial issues. The recognition of the value and expertise of pain clinics has evolved over the course of the 28 years our program has existed. In an internal audit of the CPP 20 years ago, most referrals related to the desire of referring physicians to transfer the care of difficult pain patients. More recently, seeking the program's expertise for diagnosis and management has resulted in earlier referrals to our clinic.

Concerns about opioid administration (the third most cited reason why FPs refer patients to pain clinics) is an issue that, in our experience, has increased in magnitude substantially over the past 5 to 7 years, given the increased number of prescriptions for opioids and the recognition that abuse is not rare. A very recent study from our program²⁰ found that 63% of a cohort of 455 consecutive patients referred to our clinic were already taking opioids prescribed primarily by their FPs, with 1 in 5 patients already exceeding 200 mg of morphine or equivalent (which has been defined as a "watchful dose" by the recently published Canadian guideline for safe

and effective use of opioids for CNCP).²¹ Our impression (though this question was not specifically addressed in the current study) is that physicians who refer patients already receiving opioids to pain clinics do so because they are worried about continuing to prescribe opioids to patients who do not seem to respond, or they have inherited patients taking high doses of opioids from other practices.


Barriers to referral

Waiting lists, identified as the main barrier to pain clinic referrals, are a well-known issue that has been thoroughly explored in Canada,²² with some waiting lists as long as 3 to 5 years. Most issues recognized by our respondents as barriers in general reflected limitations of access (waiting lists, distance from the clinic, etc) and availability of treatments, and arose from the system, the referring physicians, or the patients themselves. Interestingly, some physicians believed that a barrier to referral was that certain pain clinics prescribed high-dose opioids; management of such patients was also cited as a *reason* for referring patients to some pain clinics.

Family physicians lack resources to help them navigate the system and know where to refer their CNCP patients. As of November 2010, the Canadian Pain Society listed 50 pain clinics in Ontario on its website (23 in Toronto, 9 in the greater Toronto area, and 18 elsewhere in the province).²³ These clinics are all characterized as “multidisciplinary” because they include more than one kind of health care provider, but the philosophy, types of treatments offered, funding systems, and types of patients seen might be different. Unfortunately, there are no rating systems, standards, outcome measures, or other performance metrics to allow FPs to make appropriate choices when they need assistance with CNCP management. Family physicians are important gatekeepers of the Canadian health care system. When it comes to chronic pain management, FPs lack education, time, and financial resources, as the current fee-for-service system is inadequate for managing chronic pain.²⁴ On the other hand, a lack of regulated and unified training for pain practitioners, standards for the operation of pain clinics, and specialized funding from the public health care system results in pain clinics or pain practitioners who might have diametrically different philosophies and management approaches. Additionally, the absence of a comprehensive approach to chronic pain in Ontario all the way from the primary care level to the specialized pain clinic setting further adds to the inherent difficulties in CNCP diagnosis and management. Fortunately, there is a movement toward recognition of a subspecialty in pain management in Canada by the Royal College of Physicians and Surgeons of Canada, while the College

of Family Physicians of Canada’s Section of Family Physicians with Special Interests or Focused Practices has recently approved such a focus in CNCP management. Additionally, several provinces have established a comprehensive strategy for CNCP (Alberta, Nova Scotia, and Quebec), while British Columbia and Ontario seem to be moving in this direction as well.

Conclusion

This study is a first step toward understanding the perceptions of FPs about referrals to pain clinics and practitioners. Larger well-organized studies conducted using randomly selected samples of FPs throughout Ontario and other provinces (who might or might not refer patients to pain clinics) will provide a much better understanding of the landscape of the CNCP management needs at the primary care level. 

Ms Lakha is a researcher for the Comprehensive Pain Program at Toronto Western Hospital and the Centre for the Study of Pain at the University of Toronto in Ontario. **Dr Yegneswaran** is a research assistant in the Comprehensive Pain Program at Toronto Western Hospital. **Dr Furlan** is a researcher in the Comprehensive Pain Program at Toronto Western Hospital, Associate Research Scientist in the Division of Genetics and Development of Toronto Western Research Institute, and Adjunct Scientist at the Toronto Rehabilitation Institute of the University of Toronto. **Dr Legnini** is a research assistant in the Centre for the Study of Pain at the University of Toronto. **Dr Nicholson** is a consultant for the Comprehensive Pain Program at Toronto Western Hospital. **Dr Mailis-Gagnon** is Director of the Comprehensive Pain Program, Senior Investigator for the Krembil Neuroscience Centre and Toronto Western Hospital Research Institute, and Professor in the Department of Medicine at the University of Toronto.

Competing interests

None declared

Contributors

All authors contributed to the concept and design of the study; data gathering, analysis, and interpretation; and preparing the manuscript for submission.

Correspondence

Dr Angela Mailis-Gagnon, Toronto Western Hospital, 4F811, 399 Bathurst St, Toronto, ON M5T 2S8; telephone 416 603-5380; fax 416 603-5725; e-mail angela.mailis@uhn.on.ca

References

1. Meana M, Cho R, DesMeules M. Chronic pain: the extra burden on Canadian women. *BMC Womens Health* 2004;4(Suppl 1):S17.
2. Moulin DE, Clark AJ, Speechley M, Morley-Forster PK. Chronic pain in Canada—prevalence, treatment, impact and the role of opioid analgesia. *Pain Res Manag* 2002;7(4):179-84.
3. Cherny NI, Portenoy RK. The management of cancer pain. *CA Cancer J Clin* 1994;44(5):263-303.
4. Wagner EH, Austin BT, Von KM. Improving outcomes in chronic illness. *Manag Care Q* 1996;4(2):12-25.
5. Darer JD, Hwang W, Pham HH, Bass EB, Anderson G. More training needed in chronic care: a survey of US physicians. *Acad Med* 2004;79(6):541-8.
6. Chen JT, Fagan MJ, Diaz JA, Reinert SE. Is treating chronic pain torture? Internal medicine residents’ experience with patients with chronic nonmalignant pain. *Teach Learn Med* 2007;19(2):101-5.
7. Linnala A, Aromaa A, Mattila K. Specialist consultations in primary health care—a possible substitute for hospital care? *Health Policy* 2006;78(1):93-100. Epub 2005 Nov 28.
8. Kee F, Gaffney B, Currie S, O’Reilly D. Access to coronary catheterisation: fair shares for all? *BMJ* 1993;307(6915):1305-7.
9. Petticrew M, McKee M, Jones J. Coronary artery surgery: are women discriminated against? *BMJ* 1993;306(6886):1164-6.
10. Lear JT, Lawrence IG, Burden AC, Pohl JE. A comparison of stress test referral rates and outcome between Asians and Europeans. *J R Soc Med* 1994;87(11):661-2.
11. Black N, Langham S, Petticrew M. Coronary revascularisation: why do rates vary geographically in the UK? *J Epidemiol Community Health* 1995;49(4):408-12.
12. Hawker GA, Wright JG, Coyte PC, Williams JJ, Harvey B, Glazier R, et al. Differences between men and women in the rate of use of hip and knee arthroplasty. *N Engl J Med* 2000;342(14):1016-22.

13. Gardner K, Chapple A. Barriers to referral in patients with angina: qualitative study. *BMJ* 1999;319(7207):418-21.
14. Population Reference Bureau. 2005 world population data sheet. Washington, DC: Population Reference Bureau; 2005. Available from: www.prb.org/pdf05/05WorldDataSheet_Eng.pdf. Accessed 2011 Feb 10.
15. Mailis-Gagnon A, Yegneswaran B, Nicholson K, Lakha SF, Papagapiou M, Steiman AJ, et al. Ethnocultural and sex characteristics of patients attending a tertiary care pain clinic in Toronto, Ontario. *Pain Res Manag* 2007;12(2):100-6.
16. Scott NA, Guo B, Barton PM, Gerwin RD. Trigger point injections for chronic non-malignant musculoskeletal pain: a systematic review. *Pain Med* 2009;10(1):54-69. Epub 2008 Nov 5.
17. Borg-Stein J, Simons DG. Focused review: myofascial pain. *Arch Phys Med Rehabil* 2002;83(3 Suppl 1):S40-9.
18. Donovan K LJ. OHIP billings escape scrutiny. *Toronto Star* 2006 Oct 26.
19. Arvantaj A, Mitrovic B, Lakha SF, Mailis-Gagnon A. Characteristics of injured chronic pain workers identified by Workers Safety and Insurance Board (WSIB) as management problems. *Pain Res Manag* 2008;13(2):131.
20. Mailis-Gagnon A, Yegneswaran B, Lakha SF, Louffat A, Deshpande A. Pharmaco-epidemiology of chronic non cancer pain (CNCP) patients assessed at the point of entry to a tertiary care pain clinic. *Pain Res Manag* 2010;15(2):59.
21. National Opioid Use Guidelines Group. *Canadian guideline for safe and effective use of opioids for chronic non-cancer pain*. Hamilton, ON: National Pain Centre; 2010. Available from: <http://nationalpaincentre.mcmaster.ca/opioid/>. Accessed 2010 May 18.
22. Peng P, Choiniere M, Dion D, Intrater H, Lefort S, Lynch M, et al. Challenges in accessing multidisciplinary pain treatment facilities in Canada. *Can J Anaesth* 2007;54(12):977-84.
23. Canadian Pain Society [website]. *Pain clinics—Canada—listed by province*. Oshawa, ON: Canadian Pain Society; 2010. Available from: www.canadianpainsociety.ca/pdf/PainClinicListing.pdf. Accessed 2011 Feb 14.
24. Mailis-Gagnon A, Yegneswaran B, Lakha SF, Nicholson K, Steiman AJ, Ng D, et al. Pain characteristics and demographics of patients attending a university-affiliated pain clinic in Toronto, Ontario. *Pain Res Manag* 2007;12(2):93-9.

* * *