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BRIEF

SUPPORTING CHRONIC PAIN MANAGEMENT ACROSS PROVINCIAL AND TERRITORIAL HEALTH SYSTEMS IN CANADA

9 DECEMBER 2009

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McMaster Health Forum

Evidence Brief: Supporting Chronic Pain Management across Provincial and Territorial Health Systems in Canada

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For concerned citizens and influential thinkers and doers, the McMaster Health Forum strives to be a leading hub for improving health outcomes through collective problem solving. Operating at the regional/provincial level and at national levels, the Forum harnesses information, convenes stakeholders, and prepares action-oriented leaders to meet pressing health issues creatively. The Forum acts as an agent of change by empowering stakeholders to set agendas, take well-considered actions, and communicate the rationale for actions effectively.

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Conflict of interest

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Merit review

The evidence brief was reviewed by a small number of policymakers, stakeholders and researchers in order to ensure its scientific rigour and system relevance.

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KEY MESSAGES

What's the problem?

- The overall problem is that provincial and territorial health systems in Canada do not adequately support the management of chronic pain.
    - In 2005, 27% of Canadians aged 65 and over reported chronic pain and this percentage rose to 37% among those living with two or more chronic conditions.
    - Little is known about the degree to which Canadians are receiving effective components of comprehensive chronic pain management (particularly outside multidisciplinary pain clinics) or about healthcare providers' beliefs about and use of different approaches to chronic pain management.
    - A variety of health system arrangements do not support chronic pain management: 1) limited support for self-management; 2) inadequate access to primary healthcare providers for some Canadians and inadequate management of chronic pain by some primary healthcare providers and specialists, which may be related to inadequate training and continuing professional development; 3) many non-physician healthcare providers (including community-based rehabilitation practitioners) are not actively engaged in chronic pain management at the primary healthcare level; 4) inequitable geographical access to regional multidisciplinary chronic pain management centres; 5) lack of a monitoring system to identify patterns of under- and over-utilization of programs, services, and drugs; 5) financial arrangements that encourage some forms of care (e.g., injections) but not others (e.g. counselling and monitoring) and that create financial barriers to access for some patients; and 6) governance arrangements that do not ensure the credentialing of chronic pain providers and clinics.
    - Numerous clinical practice guidelines exist for the management of chronic pain, yet there is no "home" for the development, updating, implementation, and monitoring of these guidelines.
    - There are limited data about the problem in relation to specific prioritized groups, including people living with mental illness and/or addiction problems and in rural and remote communities.

What do we know (from systematic reviews) about three viable options to address the problem?

- Option 1 – Create a model patient registry / treatment-monitoring system in a single jurisdiction
    - No clear message was derived from a recent (2006) medium-quality review about the effects of public reporting on effectiveness, safety, and patient-centeredness. Also, no relevant reviews were identified about privacy issues pertaining to patient registry / treatment-monitoring systems.
- Option 2 – Create a national network of centres with a co-ordinating "hub" to provide chronic pain-related decision support
    - No reviews were identified that directly relate to the concept of a hub. Reviews are available to support the use of a range of evidence-based tools and resources. For example, two high-quality reviews and one medium-quality review focused on patient education showed favourable results in terms of pain reduction. Reviews also identified some benefits and no harms from other self-management supports, interventions to support the implementation of clinical practice guidelines, and continuing professional development to support evidence-based care.
- Option 3 – Broker and support the implementation of a cross-payer, cross-discipline model of patient-centred primary healthcare-based chronic pain management
    - No recent or high-quality reviews were identified about cross-payer models of patient-centred primary healthcare. However, several reviews relate to cross-discipline models of care outside of primary healthcare. For example, three medium-quality reviews and one high-quality review on multidisciplinary approaches to pain management found medium to strong evidence for improvements in patient function. Another recent (2009) high-quality review showed no difference in patient outcomes between those receiving multidisciplinary rehabilitation and those in control groups.

What implementation considerations need to be kept in mind?

- Little empirical research evidence about implementation barriers and strategies could be identified. A preliminary assessment identified a number of potential barriers, however, these and other potential barriers (and strategies to address them) warrant further study in their own right.

REPORT

Chronic pain is a serious health problem given its prevalence, associated disability, impact on quality of life, and the costs associated with the extensive use of healthcare services by people living with chronic pain.(1) In Canada, some investments have been made to strengthen chronic pain management. For example, Alberta Health and Wellness (in partnership with the Alberta Medical Association, the Calgary Health Region, and the Capital Health Region) initiated pilot projects to evaluate the effectiveness of multidisciplinary chronic pain management programs in Calgary and Edmonton.(2) In Québec, the Ministère de la Santé et des Services Sociaux (Ministry of Health and Social Services) struck a committee to develop a national vision for the evaluation, treatment, and management of chronic pain.(1) The Nova Scotia Department of Health has provided a budget of $1 million per year since 2007 to support a province-wide system of pain clinics with regional primary- and secondary-care clinics and a central tertiary-care hub.(3) Despite these and other investments, the management of chronic pain remains a serious health system challenge.

In order to support all Canadians affected by chronic pain, a starting point for discussion is the question of how provinces and territories across Canada might individually and collectively work towards strengthening chronic pain management. The purpose of this evidence brief is to review the research evidence about problems underlying the current organization of chronic pain management in Canada, three options for addressing the problems that might enhance what is currently being done, and key implementation considerations for moving any of the options forward.

The preparation of this evidence brief was informed (but not limited) by the definition of pain used by the International Association for the Study of Pain, which defines pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.”(4) The brief’s preparation was also informed (but not limited) by the definition of chronic pain from the Canadian Pain Coalition:

> “Chronic pain is pain that persists over three months, beyond when an injury should have healed. Chronic pain can be intermittent (occurs in a pattern) or persistent (lasting more than 12

Box 1: Background to the evidence brief

This evidence brief mobilizes both global and local research evidence about a problem, three options for addressing the problem, and key implementation considerations. Whenever possible, the evidence brief summarizes research evidence drawn from systematic reviews of the research literature and occasionally from single research studies. A systematic review is a summary of studies addressing a clearly formulated question that uses systematic and explicit methods to identify, select, and appraise research studies and to synthesize data from the included studies. The evidence brief does <u>not</u> contain recommendations.

The preparation of the evidence brief involved five steps:

1) convening a Steering Committee comprised of representatives from the partner organizations (and/or key stakeholder groups) and the McMaster Health Forum;
2) developing and refining the terms of reference for an evidence brief, particularly the framing of the problem and three viable options for addressing it, in consultation with the Steering Committee and a number of key informants and with the aid of several conceptual frameworks that organize thinking about ways to approach the issue;
3) identifying, selecting, appraising, and synthesizing relevant research evidence about the problem, options, and implementation considerations;
4) drafting the evidence brief in such a way as to present concisely and in accessible language the global and local research evidence; and
5) finalizing the evidence brief based on the input of several merit reviewers.

The three options for addressing the problem were not designed to be mutually exclusive. They could be pursued simultaneously or elements could be drawn from each option to create a new (fourth) option.

The evidence brief was prepared to inform a stakeholder dialogue at which research evidence is one of many considerations. Participants’ views and experiences and the tacit knowledge they bring to the issues at hand are also important inputs to the dialogue. One goal of the stakeholder dialogue is to spark insights – insights that can only come about when all of those who will be involved in or affected by future decisions about the issue can work through it together. A second goal of the stakeholder dialogue is to generate action by those who participate in the dialogue and by those who review the dialogue summary and the video interviews with dialogue participants.

> hours daily) and can be considered a disease itself. Usually the pain results from a known cause, such as surgery, or inflammation from arthritis. Sometimes the cause of this pain is abnormal processing of pain by the nervous system as in the case of fibromyalgia."(5)

Many chronic pain conditions have been characterized and fit the above definitions, including neuropathies, pelvic pain, headaches, and back, neck, and joint pain.

The scope of this brief is limited to chronic non-cancer pain. Although poorly controlled peri-operative pain may create the conditions in which chronic non-cancer pain can develop, cancer pain tends to be given significant attention in cancer care and palliative care systems and (like peri-operative pain) is typically "self limiting." It is also important to note that while we recognize that prevention should be part of a comprehensive approach to chronic pain management, the primary prevention of chronic pain through population-based strategies are not addressed in this brief.

The following key features of the health policy and system context in Canada were also taken into account in preparation of this evidence brief:

- the Canadian healthcare system is comprised of 13 publicly funded health systems (10 provincial and 3 territorial) that are each distinguished by a long-standing private delivery / public payment agreement between government on the one hand and physicians and hospitals on the other;
- the agreement with physicians has historically meant that most healthcare is delivered by physicians working in private practice with first-dollar (i.e., no deductibles or cost sharing), public (typically fee-for-service) payment;
- the private practice element of the agreement has typically meant that physicians have been wary of potential infringements on their professional and commercial autonomy (e.g., directives about the nature of the care they deliver or the way in which they organize and deliver that care);(6)
- other healthcare providers such as physiotherapists and psychologists, and teams led by these providers, are typically not eligible for public payment (or at least not on terms that make independent healthcare practices viable on a large scale);
- the agreement with hospitals (whether operating directly or under the authority of regional health authorities) is such that a global budget is allocated each year (generally based on expenditures in the previous year), which does not specify the nature of the

Box 2: Equity considerations

A problem may disproportionately affect some groups in society. The benefits, harms, and costs of options to address the problem may vary across groups. Implementation considerations may also vary across groups.

One way to identify groups warranting particular attention is to use "PROGRESS," which is an acronym formed by the first letters of the following eight ways that can be used to describe groups†:

- place of residence (e.g., rural and remote populations);
- race/ethnicity/culture (e.g., First Nations and Inuit populations, immigrant populations, and linguistic minority populations);
- occupation or labour-market experiences more generally (e.g., those in "precarious work" arrangements);
- gender;
- religion;
- educational level (e.g., health literacy); and
- socio-economic status (e.g., economically disadvantaged populations); and social capital / social exclusion.

The evidence brief strives to address all Canadians, but (where possible) it also gives particular attention to two groups:

- people with concurrent mental illness and/or addictions; and
- people living in rural/remote communities.

Where appropriate, this brief also includes evidence about an important sub-group – people without a "third-party payer." Such individuals typically have: pain not related to injury sustained in an automobile accident (in some provinces), pain not related to injury experienced at work (in all provinces but not for all citizens of these provinces) or no private insurance coverage. Many other groups warrant serious consideration as well, and a similar approach could be adopted for any of them.

† The PROGRESS framework was developed by Tim Evans and Hilary Brown (Evans T, Brown H. Road traffic crashes: operationalizing equity in the context of health sector reform. *Injury Control and Safety Promotion* 2003;10(1-2): 11–12). It is being tested by the Cochrane Collaboration Health Equity Field as a means of evaluating the impact of interventions on health equity.

healthcare services that must be provided (e.g., physiotherapy) and which may not be clearly delineated from any supplemental funds provided for specific targeted programs for conditions such as chronic pain (so "cuts" to programs and services can be made relatively easily, leaving patients either to pay "out-of-pocket" or to rely on private health insurance plans, which are one type of third-party payer);
- prescription drugs and medical devices and supplies are often not eligible for public payment and, if they are eligible, it is typically not with the same type of first-dollar coverage provided for physician-provided and hospital-based care, and hence must also be paid for out-of-pocket or by private health insurance plans; and
- healthcare that is needed because of work-related injuries or illnesses or because of automobile accidents may be paid for by automobile accident insurance plans and workers' compensation plans (i.e., other types of third-party payers), which are not bound by the same agreements with physicians and hospitals and hence can enter into different types of agreements with these and other healthcare providers.(7;8)

Box 3: Mobilizing research evidence about the problem

The available research evidence about the problem was sought from a range of published and "grey" research literature sources. Published literature that provided a comparative dimension to an understanding of the problem was sought using three health services research "hedges" in MedLine, namely those for appropriateness, processes, and outcomes of care (which increase the chances of us identifying administrative database studies and community surveys). Published literature that provided insights into alternative ways of framing the problem was sought using a fourth hedge in MedLine, namely the one for qualitative research. Grey literature was sought by reviewing the websites of a number of Canadian and international organizations, such as the Institute for Clinical Evaluative Sciences, Ontario Health Quality Council, Canadian Institute for Health Information, Health Council of Canada, European Observatory on Health Systems and Policies, Health Evidence Network, Health Policy Monitor, and Organisation for Economic Co-operation and Development.

Priority was given to research evidence that was published more recently, that was locally applicable (in the sense of having been conducted in Canada), and that took equity considerations into account.

<u>THE PROBLEM</u>

The challenge of strengthening chronic pain management in provincial and territorial health systems can be understood by considering four sets of inter-related issues: 1) the burden of chronic pain that the healthcare system must prevent or manage; 2) the effective programs, services, and drugs that the healthcare system must provide to meet the needs of those living with chronic pain; 3) the health system arrangements that determine access to and use of effective chronic pain management programs, services, and drugs; and 4) the current degree of implementation of existing chronic pain management guidelines.

The burden of chronic pain

National and provincial data provide some insight into the burden of chronic pain in Canada for groups defined by factors such as province of residence. The most recent population-based data that we identified in preparing this brief is from a random telephone survey conducted in 2007/08, which found the following prevalence estimates for moderate to severe daily chronic pain among Canadian adults (18 and older): British Columbia (22.5%), Alberta (18%), Saskatchewan and Manitoba (17.5%), Ontario (17%), Quebec (15.5%), and Atlantic provinces (23%)(9). This same study found the prevalence of chronic pain in Canada as a whole to be approximately 18%. A smaller population-based survey of a stratified random sample of adult Canadians (weighted by age, sex, and region) 18 to 75 years of age in 2001 found that 29% of respondents reported experiencing chronic pain.(10) Data collected by Statistics Canada as part of the Canadian Community Health Survey (CCHS) also provide some insight into the problem. For example, in 2008, 9.7% of Canadians 35 to 44 years of age reported that they usually have pain or discomfort that is moderate or severe, which was higher than the 8.6% reported in 2003.(11) Among the same age group, 10.4% reported pain or discomfort that prevented activities, a figure only marginally higher than the 10.2% reported in 2003.(11) At the level of provinces/territories, the prevalence of pain or discomfort that prevents activities among those 35 to 44 years of age was as follows in 2008: Manitoba

(17.8%), Newfoundland (13.9%), Nova Scotia (13.1%), New Brunswick (12.1%), Ontario (10.8%), Alberta (10.3%), British Columbia (10.2%), Québec (8.6%), Saskatchewan (6.9%), and Prince Edward Island (6.4%).(11) The sample sizes were too small to permit reporting about the territories.

National data can also give some insight into the burden of chronic pain in relation both to age and to other chronic conditions. In regards to age, the above noted survey of adult Canadians 18 to 75 years of age found that the mean age of respondents with chronic pain (47.7) was significantly higher than the mean age of those without chronic pain (42.4).(10) Based on CCHS data from 2005, 27% of Canadians aged 65 and over and living in private households reported chronic pain (based on a response of "no" to the question: are you usually free of pain or discomfort?), compared with 16% of people aged 18 to 64.(12). The same data showed that a higher proportion of Canadians aged 75 to 84 reported chronic pain (30%) than those aged 65 to 74 (24%). Given that the prevalence of most other chronic conditions also increases with age,(13) it could be expected that chronic pain and other chronic conditions are closely related. For example, in 2005, 36.7% of Canadians who were 65 years and older and lived with two or more chronic conditions reported chronic pain, whereas the percentages were 17.6% and 7.7% for those with one chronic condition and no chronic condition, respectively.(12) Also, among Canadian adults who were 65 years and older and lived in households in 2005, 41% of those with arthritis had chronic pain, 35% of those with heart disease had chronic pain, 35% of those with cataracts had chronic pain, and 34% of those with diabetes had chronic pain.(12)

No data were identified about the incidence (i.e., new cases) of chronic pain or about how the prevalence of chronic pain in Canada compared to the prevalence in other countries (as measured using comparable methods). Although high-quality reviews of the epidemiology of adult general populations with chronic pain in other countries are available, these surveys vary in terms of sample size and definition of chronic pain used.(9) The combination of a lack of routinely collected population-based data about people living with chronic conditions (including chronic pain) and the use of one-off collections of data about unrepresentative samples of Canadians has been recognized as a barrier to evidence-informed healthcare planning for people living with chronic conditions.(14) As such, it is important to keep in mind that the variability in prevalence rates reported here may be due to differences in sample sizes, definitions, data-collection techniques, and other methodological factors.

Effective chronic pain management programs, services, and drugs are not always available or accessible to all Canadians

Effective components of comprehensive chronic pain management are available or accessible to varying degrees across Canada. For example, some self-management interventions for persons with chronic pain have been shown to be effective and cost-effective,(15;16) yet only 40% of multidisciplinary pain clinics in 2004-2005 offered programs that included support for self-management (e.g., coping strategies, neck care, yoga, medication, and stress management). Cognitive behaviour therapy (CBT) has also been shown to be an effective intervention for chronic pain,(17;18) however, a Canadian study conducted in 2005-2006 found that 24% of multidisciplinary pain clinics did not offer *any* psychological treatments.(19) In general, we know that 75% of multidisciplinary clinics offered at least one type of interventional technique (e.g., peripheral nerve block) and 78% at least one type of physical therapy (e.g., individualized exercise program). Although a review of the effectiveness of prescription drugs in managing chronic pain is beyond the scope of this evidence brief, there are high-quality systematic reviews available to support the use of the following groups of drugs in reducing pain among some patients: non-steroidal anti-inflammatory (NSAIDS), tricyclic anti-depressants (TCAs), specific anti-convulsants, and opioids.(18) There is also some research evidence to support the use of other drugs in reducing pain, including cannabinoids and topical treatments.(18) What we do not know is the percentage of Canadians receiving effective components of comprehensive chronic pain management or even whether the percentage is likely to be lower or higher in primary healthcare than in the multidisciplinary pain clinics for which we at least have some limited data.

A challenge underlying the overall availability and accessibility of effective approaches to chronic pain management is that healthcare providers have divergent approaches to practice. There is no standard "approach" to chronic pain management given the highly individualized approach to care each person requires and the beliefs that different providers have about the effectiveness of management options and about the value of practice guidelines that recommend particular management options. For example, while some healthcare providers may prescribe opioids and others employ injections as a first-line therapy, other providers may be uncomfortable with prescribing opioids or question the value of injections. Although some opioids have been identified through high-quality systematic reviews to be effective in managing chronic pain, 34% of physicians reported that they would not prescribe opioids for moderate to severe pain.(20) Providers may also differ in their beliefs about the effectiveness of psychological treatments such as CBT or alternative therapies such as acupuncture, chiropractic, massage, and naturopathy. But again, we do not know the percentage of Canadian healthcare providers who subscribe to different approaches to practice and whether the beliefs underpinning their approaches are amenable to change.

Current health system arrangements do not support chronic pain management for all Canadians

A variety of delivery, financial, and governance arrangements within health systems do not support the management of chronic pain. **Delivery arrangements** constitute one part of the problem. First, there is limited access to resources to support self-management in most provinces and territories. The Pain Resource Centre, which is a partnership between the Canadian Pain Coalition and the Education Special Interest Group of the Canadian Pain Society, is the most visible resource. However, its focus is more on providing information about pain and pain management for Canadians, and less on tools and other mechanisms to actively support self-management by those living with chronic pain (or to actively support healthcare providers who are in turn supporting self-management by their patients).

Second, chronic pain is often inadequately managed in primary healthcare because of problems associated with access to primary healthcare providers in general, and other more specific reasons. Roughly 14% of Canadians report having no regular primary healthcare provider.(21) Even Canadians with a regular primary healthcare provider may find that their provider has significant reservations about prescribing appropriate medications for pain management, such as opioids or cannabinoids (among other forms of effective chronic pain management). A sample of 100 primary healthcare physicians from across Canada identified key barriers to prescribing opioids as: the potential for addiction (33%), costs and formulary or insurance coverage (23%), constipation (15%), and potential for misuse or abuse (15%), as well as the administrative burden of associated paperwork (14%).(22) A survey of 111 US primary healthcare providers identified similar barriers.(23) Some problems in chronic pain management may be attributable to insufficient training. A recent (as yet unpublished) Canadian study of university-based health science faculties (with 34 of a purposive sample of 50 faculties responding) found that 67.5% did not have designated hours for teaching about pain content (but rather integrated this content within courses and/or clinical conferences). Among those faculties with time designated for formal pain teaching the range was 2 hours (pharmacy) to 109 hours (nursing). A survey of US primary healthcare providers found that 81.5% of them rated their medical school education about chronic pain management as insufficient and 54.7% rated their residency training as insufficient.(23)

Third, chronic pain is also often inadequately managed by specialists and insufficient healthcare provider training may again be partly responsible. For example, a survey of 542 Canadian graduates of internal medicine programs found that 33.3% rated their preparation for pain management through their training programs as poor (1 or 2 on a scale from 1=not at all prepared to 5=well prepared) and 74.4% rated the importance of pain management for practice as high (4 or 5 on a scale from 1=not at all important to 5=very important).(24) A survey of Canadian anaesthesiologists found that only 15% of all anaesthesiologists (with and without a chronic pain practice) had previous training in chronic pain management (of which 43% were a fellowship and 57% an "observership").(25)

These challenges at the primary healthcare provider and specialist levels may also relate to inadequate guidance from professional societies or regulatory colleges and inadequate continuing professional development. A survey of Canadian physicians conducted by Ipsos Reid in 2001 found that approximately 60% (n=100) of those who responded thought that physician education about opioid prescribing could improve pain management. The same survey identified the following ways in which chronic pain management could be improved: continuing professional development such as workshops (59% of respondents), clear guidelines (9%), access to information (6%), and better research (3%).(26)

Fourth, many non-physician healthcare providers (e.g., physiotherapy, psychology, and occupational therapy) are not actively engaged in chronic pain management at the primary healthcare level. Although the majority of chronic pain management happens at this level, multidisciplinary primary healthcare teams are not widely available to Canadians and typically do not include team members with special expertise in chronic pain management. With the exception of community health centres, which may have a physiotherapist on staff, the team-based models of primary healthcare that have emerged in Canada over the past decade have given greater attention to nurses, dietitians, pharmacists, and social workers.

Fifth, there is inequitable geographical access to regional multidisciplinary chronic pain management centres that can provide time-limited direct support to those living with chronic pain or longer-term indirect support to the primary healthcare providers who are working with those living with chronic pain. A study conducted in 2005-2006 identified 102 multidisciplinary pain clinics across Canada, which translates into one clinic for every 258,000 Canadians.(19) For the purpose of the study such a clinic was defined as one "that advertised specialized multidisciplinary services for the diagnosis and management of patients with chronic pain, having a minimum of three different healthcare disciplines (including at least one medical specialty) available and integrated within the facility."(19) The distribution of these clinics across Canada was as follows: Ontario (35), Québec (26), Saskatchewan (13), Alberta (12), British Columbia (7), New Brunswick (6), Nova Scotia (4), Manitoba (1), Newfoundland (1), Prince Edward Island (0), and the territories (0).(19) The majority (80%) were located in urban centres.(19) Moreover, some clinics may focus on specific pain syndromes (e.g., low back pain, fibromyalgia, neuropathic pain) or a specific population (e.g., adults or children), which further reduces the options available to patients and their primary healthcare providers.

Sixth, there is no monitoring system to identify patterns of under-utilization and over-utilization of programs, services, and drugs or to monitor and evaluate efforts to improve service delivery. Chronic disease management registries have emerged in various provinces over the past decade as a means to identify and monitor those with chronic conditions such as diabetes. For example, in Alberta the St. Albert and Sturgeon Primary Care Network and Capital Health have implemented a diabetes registry to identify and monitor patients with diabetes and pre-diabetes.(27) Local monitoring systems exist, such as the neuropathic pain-monitoring system based at the University of Western Ontario, but not province- or territory-wide systems.

Financial arrangements also constitute part of the problem. For example, both primary and specialty medical care are influenced by coverage decisions made by governments (typically in negotiation with medical associations) and third-party payers, not the objectively assessed time demands associated with delivering high-quality and efficient chronic pain management. This has meant that injections, defined treatment programs (e.g., 8-week CBT programs) and specialist assessments are well remunerated by some payers, whereas appropriate long-term episodic care is often not well remunerated. Moreover, as described in the introduction, care that is provided by physicians but deemed "not medically necessary" (i.e., not listed in medical fee schedules), care provided by many other types of healthcare providers, some or all prescription drugs, and some or all medical devices and supplies may not be eligible (or fully eligible) for public payment, and hence must be paid for out-of-pocket or by third-party payers. Patients unable to afford such payments and lacking coverage through a third-party payer may have to forego effective programs, services, and drugs.

Access to multidisciplinary pain clinics can also be influenced by financial arrangements. Only 60% of the aforementioned 102 multidisciplinary pain clinics were publicly funded through provincial health insurance plans, which means that patients would either have to pay for their care out-of-pocket or rely on third-party payers. Further exacerbating the problem, in 2004-05 the median wait time was six months (range: 2-14 months) in publicly funded multidisciplinary pain clinics but only 0.5 months (range: 0.3-1 month) in privately funded clinics.(19) A recent systematic review about the relationship between wait times, health status, and health outcomes found that patients awaiting treatment for chronic pain experience a significant decline in quality of life and well-being during the six months from the time of referral to treatment.(28) National wait-time reduction initiatives have focused on cancer care, hip and knee replacement, cardiac care, diagnostic imaging, and cataract surgeries,(29) but not on chronic pain.

Another important aspect of the problem involves **governance arrangements**. There is no official, arms-length credentialing of chronic pain providers or clinics in Canada. In other words, there are no requirements for health professionals to meet in order to identify themselves as chronic pain "specialists," and there are no requirements for clinics to meet in order to identify themselves as chronic pain clinics. Although some effort has been made by groups, including the College of Physicians and Surgeons of Ontario with regard to credentialing chronic pain specialists and the Canadian Academy of Pain Management with regard to accrediting all chronic pain providers, it is not clear to what extent these efforts may lead to the creation of a two-tiered system (i.e., credentialed versus not credentialed).

Implementation of chronic pain management guidelines is typically not supported

Numerous clinical practice guidelines exist for the management of chronic pain.(22) However, there is no multidisciplinary home (or set of homes) for the development, updating, implementation (including continuing professional development), and monitoring of clinical practice guidelines and other resources and tools to support the full range of providers and payers in using research evidence across the full continuum of care. Although small cross-sectional surveys have provided some understanding of the use of specific guidelines related to prescribing practices by physicians, less is known about the use of guidelines by other types of healthcare providers and for guidelines related to non-pharmacological interventions.

Additional equity-related observations about the problem

Largely absent from this summary of the available research evidence about the problem is information specific to prioritized groups (i.e., people with concurrent mental illness and/or addiction and people living in rural and remote communities). The lack of multidisciplinary chronic pain management centres in the territories and provinces such as Manitoba suggests a lack of access to pain management services for many Canadians living in rural and remote areas.(19) We did note that primary healthcare physicians are concerned about the potential for opioid addiction and that this fear is a barrier to prescribing opioids.(22) Although the prevalence of opioid misuse and changes in prevalence over time have not been documented, an increase in the number of visits to emergency rooms has been observed for drug abuse related issues generally.(20)

THREE OPTIONS FOR ADDRESSING THE PROBLEM

Many options could be selected to address the problem of how to support chronic pain management across provincial and territorial health systems in Canada. To promote discussion about the pros and cons of potentially viable options, three have been selected as exemplars for more in-depth review. They include: 1) a patient registry / treatment-monitoring system; 2) a decision support system for healthcare providers; and 3) a system redesign focused on patient-centred primary healthcare-based chronic pain management.

The focus in this section is on what is known about these options. In the next section the focus turns to the barriers to adopting and implementing these options and to possible implementation strategies to address the barriers.

Option 1 – Create a model patient registry / treatment-monitoring system in a single jurisdiction

This option involves creating a model patient registry / treatment-monitoring system in a single jurisdiction that:

- identifies what services are being offered to whom (i.e., what types of patients), by whom (e.g., what disciplines), and how frequently (with appropriate attention to privacy concerns);
- identifies both under-utilization and over-utilization;
- monitors efforts to improve service delivery and evaluates their impacts; and
- publicly reports opportunities for improvement.

To further understand this option, it is useful to consider it according to four key health system elements:

- patient registry
- treatment-monitoring systems;
- privacy issues pertaining to patient registry / treatment-monitoring systems; and
- public reporting of aggregated data.

Substantial uncertainty exists regarding this option's benefits and potential harms. No clear message was derived from a recent (2006) medium-quality review about the effects of public reporting on effectiveness, safety, and patient-centeredness. Also, no relevant reviews were identified about privacy issues pertaining to a patient registry / treatment-monitoring system. A summary of the key findings from the synthesized research evidence is

Box 4: Mobilizing research evidence about options for addressing the problem

The available research evidence about options for addressing the problem was sought primarily from a continuously updated database containing more than 900 systematic reviews of delivery, financial, and governance arrangements within health systems: the Program in Policy Decision-Making (PPD) / Canadian Cochrane Network and Centre (CCNC) database. The reviews were identified by first searching the database for reviews containing "chronic pain" in the title and/or abstract. Additional reviews were identified by searching the database for reviews addressing features of the options that were not identified using "chronic pain" as keywords. In order to identify evidence about costs and/or cost-effectiveness, the NHS Economic Evaluation Database (available through the Cochrane Library) was also searched using a similar approach.

The authors' conclusions were extracted from the reviews whenever possible. Some reviews contained no studies despite an exhaustive search (i.e., they were "empty" reviews), while others concluded that there was substantial uncertainty about the option based on the identified studies. Where relevant, caveats were introduced about these authors' conclusions based on assessments of the reviews' quality, the local applicability of the reviews' findings, equity considerations, and relevancy to the issue. (See Appendices for a complete description of these assessments.)

Being aware of what is not known can be as important as being aware of what is known. When faced with an empty review, substantial uncertainty, or concerns about quality and local applicability or lack of attention to equity considerations, primary research could be commissioned or an option could be pursued and a monitoring and evaluation plan designed as part of its implementation. When faced with a review that was published many years ago, an updating of the review could be commissioned if time allows.

No additional research evidence was sought beyond what was included in the systematic review. Those interested in pursuing a particular option may want to search for a more detailed description of the option or for additional research evidence about the option.

provided in Table 1. For those who want to know more about the systematic reviews contained in Table 1 (or obtain citations for the reviews), a fuller description of the systematic reviews is provided in Appendix 1.

Table 1: Summary of key findings from systematic reviews relevant to Option 1 – Create a model patient registry / treatment-monitoring system in a single jurisdiction

Category of finding	**Summary of key findings**
Benefits	• Public reporting of aggregated data: A recent (2006) medium-quality review found that publicly releasing performance data stimulates quality improvement activities in hospitals.(30)
Potential harms	• None identified
Costs and/or cost-effectiveness in relation to the status quo	• None identified
Uncertainty regarding benefits and potential harms (so monitoring and evaluation could be warranted if the option were pursued)	• Uncertainty because no systematic reviews were identified o Privacy issues pertaining to patient registry / treatment-monitoring systems: No reviews identified • Uncertainty because no studies were identified despite an exhaustive search as part of a systematic review o No “empty” reviews were identified • No clear message from studies included in a systematic review o Public reporting of aggregated data: One recent (2006) medium-quality review found mixed effects of public reporting on clinical outcomes including effectiveness, safety, and patient centredness.(30)
Key elements of the policy option if it was tried elsewhere	• Patient registry: A recent (2005) medium-quality review found that barriers to using informatics systems to improve care for chronic disease include costs, data privacy and security, and failure to consider workflow.(31)
Stakeholders’ views and experience	• None identified

Option 2 – Create a national network of centres with a co-ordinating "hub" to provide chronic pain-related decision support

This option involves creating a national network of centres with a co-ordinating hub (in partnership with and accessible to consumers, providers, community-based and healthcare organizations, and researchers) in order to:
- analyze data about treatment patterns (which can include the analysis of data from a patient registry / treatment-monitoring system, which was the focus of the preceding option);
- synthesize research evidence;
- develop and disseminate resources and tools to support self-management;
- develop and disseminate clinical practice guidelines and other resources and tools to support providers and organizations in prevention, early identification, and ongoing treatment;
- offer support to undergraduate professional training programs;
- offer continuing professional development and other strategies to support evidence-based care (both for single disciplines and multidisciplinary teams); and
- monitor efforts to improve care (across the full range of payers and the full continuum of care, including primary healthcare, post-surgical care, etc.) and evaluate their impacts.

The concept of a hub can be understood by considering two key heath system elements:
- networks models; and
- partnerships with consumers, providers, community-based and healthcare organizations, and researchers.

The hub could provide a range of tools and resources to support chronic pain management. Thus, this option can be further understood by considering the effectiveness of the tools and resources the hub would provide, including:
- tools to support self-management (e.g., patient education, decision aids, personal health records, peer support, and telephone support);
- interventions to support the dissemination of clinical practice guidelines;
- support for undergraduate professional training programs;
- continuing professional development and other strategies to support evidence-based care; and
- monitoring efforts to improve care and evaluate their impacts.

No reviews were identified that relate directly to the concept of a hub. Synthesized research evidence is available to support the use of a range of evidence-based tools and resources. For example, two high-quality reviews and one medium-quality review focused on patient education showed favourable results in terms of pain reduction, however, all reviews were at least five years old. Reviews identified some benefits and no harms with respect to other self-management supports, interventions to support the implementation of clinical practice guidelines (e.g., multi-faceted interventions), and continuing professional development to support evidence-based care. A summary of the key findings from the synthesized research evidence is provided in Table 2. For those who want to know more about the systematic reviews contained in Table 2 (or obtain citations for the reviews), a fuller description of the systematic reviews is provided in Appendix 2.

Table 2: Summary of key findings from systematic reviews relevant to Option 2 – Create a national network of centres with a co-ordinating hub to provide chronic pain-related decision support

Category of finding	Summary of key findings
Benefits	• Partnerships with consumers, providers, community-based and healthcare organizations, and researchers: One review found that involving patients in healthcare planning contributed to changes in the provision of services across a range of different settings. However, this review is not recent (2000) and is of low quality.(32) Another more recent (2006) high-quality review found little evidence about the effects of consumer involvement in healthcare decisions at the population level.(33) Another recent (2006) medium-quality review found that: involving clients as employees of mental health services led to clients having greater satisfaction with personal circumstances and less hospitalization; providers of services who had been trained by clients had more positive attitudes toward clients; and clients reported being less satisfied with services when interviewed by other clients.(34) • Tools to support self-management o Patient education: A high-quality review found a trend towards improved pain scores among patients with rheumatoid arthritis who were exposed to patient education. However, this review is from 2002.(35) An older (1998) medium-quality review found that arthritis self-management education programs resulted in small reductions in pain and disability.(36) A high-quality review from 2004 found that three of seven high-quality studies showed favourable results for information provision.(37) o Decision aids: A recent (2006) high-quality review found that patient decision aids increase people's involvement in their care and are more likely to lead to informed decisions. Decision aids also reduce the use of discretionary surgery without apparent adverse effects on health outcomes or satisfaction.(38) o Personal health records: Two medium-quality reviews found positive results for the use of personal health records,(31;39) while one high-quality review found that patient-held records did not appear to have an effect on clinical outcomes.(40) All three of these reviews were from 2005 or earlier. o Peer support: A recent (2006) high-quality review found that lay-led self-management education programs may lead to small, short-term improvements in participants' self-efficacy, self-rated health, cognitive symptom management, and frequency of aerobic exercise.(41) o Telephone support: A recent (2008) high-quality review found that home telemonitoring (compared with usual care), improved glycemic control in patients with diabetes.(42) Another recent (2007) medium-quality review found that teleconsultation programs that focused on daily monitoring of clinical data, education, and personal feedback showed the most benefit in terms of behavioural change and reducing costs.(43) • Interventions to support the implementation of clinical practice guidelines: Overall, multi-faceted guideline dissemination and implementation interventions that target health professionals were generally effective for improving the appropriateness of care, as were a number of "single-faceted" interventions.
Potential harms	• None identified
Costs and/or cost-effectiveness in relation to the status quo	• Telephone support: Cost-effective evidence was identified that relates to telephone supports, however, the focus is on diabetes rather than chronic pain. For example, a recently published high-quality review found that home telemonitoring and telephone support reduced health service use for patients with diabetes.(42) Another high-quality review concluded that uncertainty remains about the cost-effectiveness of home telehealth programs.(44) A study conducted in San Francisco about the cost-effectiveness of an automated telephone self-management support with nurse care management (ATSM) intervention (compared to usual care) for patients with type 2 diabetes found that the per-patient cost to achieve a 10% increase in the proportion of intervention patients meeting American Diabetes Association exercise guidelines was estimated to be $558 when all costs were considered and $277 when only ongoing costs were considered.(45) • Interventions to support the dissemination of clinical practice guidelines: While one study conducted in the Netherlands about the cost-effectiveness of multi-faceted guideline implementation strategies found patient-centred and professional-focused implementation strategies in secondary care to be cost-effective (relative to control),(46) another study conducted in Seattle, Washington found no changes in healthcare utilization or costs between multi-faceted interventions compared to control (usual care).(47)
Uncertainty regarding benefits and potential harms	• Uncertainty because no systematic reviews were identified o Networks models: No relevant systematic reviews were identified for networks models that

Category of finding	Summary of key findings
(so monitoring and evaluation could be warranted if the option were pursued)	could be used for the hub o Support for undergraduate professional training programs: No relevant systematic reviews were identified o Monitoring efforts to improve care and evaluate their impacts: No relevant systematic reviews were identified • Uncertainty because no studies were identified despite an exhaustive search as part of a systematic review o No "empty" reviews were identified. • No clear message from studies included in a systematic review o Partnerships with consumers, providers, community-based and healthcare organizations, and researchers: There is insufficient evidence to make conclusions about the effects of involving people affected by cancer in healthcare research, policy and planning, and practice.(48) There is also insufficient evidence about the effectiveness of community engagement approaches and methods for planning, design, or implementation of health promotion interventions.(49) o Tools to support self-management: There is insufficient evidence about the effects of interventions to promote empowerment in tuberculosis patients.(50) There is also no clear evidence about consumer-led peer-to-peer on-line communities.(51)
Key elements of the policy option if it was tried elsewhere	• Tools to support self-management: The success of empowering tuberculosis patients is dependent on context-specific elements such as the stakeholders involved, which vary from one country to another.(50)
Stakeholders' views and experience	o None identified

Option 3 – Broker and support the implementation of a cross-payer, cross-discipline model of patient-centred primary healthcare-based chronic pain management

This option will involve brokering and supporting the implementation of a cross-payer, cross-discipline model of patient-centred primary healthcare-based chronic pain management that rewards:

- quality, such as by re-balancing fee schedules away from procedures and towards payment for the time demands associated with assessment, management, support, and dealing with payers and employers, and by accrediting chronic pain "specialist" providers or centres; and
- efficiency, such as by engaging the most cost-effective providers and by providing tiered support from telecommunications to in-person interactions, and through tiered referrals from primary healthcare to accredited regional multidisciplinary pain clinics.

This system redesign has a number of health system elements that each need to be considered. These include:

- cross-payer models of patient-centred primary healthcare-based chronic pain management;
- cross-discipline models of patient-centred primary healthcare-based chronic pain management that address the full spectrum of comprehensive care (e.g., prevention, early intervention, treatment, management, and rehabilitation);
- rewards for quality and efficiency in primary healthcare;
- fee schedules that consider the time demands associated with primary and secondary prevention, treatment, management and rehabilitation, as well as dealing with payers and employers;
- accrediting chronic pain "specialist" providers or centres;
- engaging the most cost-effective providers; and
- providing tiered support from telecommunications to in-person interactions and through tiered referrals from primary healthcare to accredited regional multidisciplinary chronic pain management centres.

No recent or high-quality reviews were identified about cross-payer models of patient-centred primary healthcare. However, several reviews relate to cross-discipline models of care. For example, three medium-quality reviews and one high-quality review that relate to multidisciplinary approaches to pain management found medium to strong evidence for improvements in patient function. Another recent (2009) high-quality review showed no difference in patient outcomes between those receiving multidisciplinary rehabilitation and those in control groups. A summary of the key findings from the synthesized research evidence is provided in Table 3. For those who want to know more about the systematic reviews contained in Table 3 (or obtain citations for the reviews), a fuller description of the systematic reviews is provided in Appendix 3.

Table 3: Summary of key findings from systematic reviews relevant to Option 3 – Broker and support the implementation of a cross-payer, cross-discipline model of patient-centred primary healthcare-based chronic pain management

Category of finding	Summary of key findings
Benefits	• Cross-discipline models of patient-centred primary healthcare-based chronic pain management: One medium-quality review (52), three high-quality reviews (53-55), and one overview of reviews (56) pertaining to multidisciplinary approaches to pain management found medium to strong evidence for improvements in function. Another high-quality review found limited scientific evidence for the effectiveness of multidisciplinary biopsychosocial rehabilitation for neck and shoulder pain.(54) All of these reviews were conducted more than five years ago. • Rewards for quality and efficiency in primary healthcare: A recent (2005) medium-quality review found that physician-level financial incentives had partial or positive effects on measures of quality, and provider group-level financial incentives had similar effects.(57) An older (2003) medium-quality review found that pay-for-performance yielded no effects in all but two well-designed studies (both of which had positive effects). • Engaging the most cost-effective providers: A recent (2005) high-quality review of the effectiveness and cost-effectiveness of counselling in primary healthcare found significantly greater clinical effectiveness in the counselling group compared with usual care in the short term but not the long term.(58) An older (2002) medium-quality review found that nurse-led clinics were at least as effective as general practitioner clinics for most outcomes for adult patients diagnosed with coronary heart disease, although not all outcomes obtained statistical significance.(59) • Providing tiered support from telecommunications to in-person interactions, and through tiered referrals from primary healthcare to accredited regional multidisciplinary chronic pain management centres: A recent (2007) medium-quality review found that active local educational interventions involving secondary care specialists and structured referral sheets are the only interventions shown to affect referral rates.(60) An older (2002) medium-quality review found that sustained continuity of care is associated with patient satisfaction, decreased hospitalizations and emergency department visits, and improved receipt of preventive services.(61) A review of reviews of integrated care programs found a positive effect on quality of care. However, there is substantial variability across studies in the program components examined.(62) A recent (2005) medium-quality review on continuity of care suggests that continuity of interpersonal primary healthcare is important and beneficial.(63)
Potential harms	• None identified
Costs and/or cost-effectiveness in relation to the status quo	• Cross-discipline models of patient-centred primary healthcare-based chronic pain management: Due to low-quality evidence, an evaluation of the evidence on the cost-effectiveness of multidisciplinary pain treatment in chronic non-malignant pain patients was not able to answer whether multidisciplinary pain management in chronic pain patients is cost-effective or not.(64) • Engaging the most cost-effective providers: An economic evaluation of ambulatory care provided by specialists, non-specialists, and both specialists and non-specialists (co-care) to veterans enrolled in the Veterans Health Study with knee osteoarthritis and/or chronic low back pain found that specialist-only ambulatory care was effective at slightly higher costs compared with non-specialist care, and co-care cost substantially more and was associated with little improvement in functional status.(65) Another cost-effectiveness study of medical and chiropractic care for chronic low back pain in Oregon found that when total costs rather than practice-based only costs are considered, chiropractic care is relatively cost-effective.(66) A study conducted in Finland found that physician consultation (compared to a combination of manipulative treatment, stabilizing exercises, and physician consultation) was more cost-effective for healthcare use and led to equal improvement in disability and health-related quality of life, but less patient satisfaction.(67)
Uncertainty regarding benefits and potential harms (so monitoring and evaluation could be warranted if the option were pursued)	• Uncertainty because no systematic reviews were identified: o Cross-payer models of patient-centred primary healthcare-based chronic pain management: No relevant reviews were identified o Fee schedules that consider the time demands associated with assessment, management, support, and dealing with payers and employers: No relevant reviews were identified. • Uncertainty because no studies were identified despite an exhaustive search as part of a systematic review: o Rewards for quality and efficiency in primary healthcare: No studies were identified in a review of the effects of performance-based payments.(68) • No clear message from studies included in a systematic review: o Cross-discipline models of patient-centred primary healthcare-based chronic pain

Category of finding	Summary of key findings
	management: There is insufficient research to assess the effects of acute pain teams on postoperative outcomes of adult patients or on the processes of postoperative pain relief.(69) There is also insufficient research to assess the effects of the widespread introduction of shared care services(70) and to assess the effects of multidisciplinary chronic disease management for patients with chronic heart failure.(71) o Rewards for quality and efficiency in primary healthcare: There is insufficient research to assess the effects of target payment remuneration on improvements in primary healthcare.(72)
Key elements of the policy option if it was tried elsewhere	• None identified
Stakeholders' views and experience	• None identified

Additional equity-related observations about the three options

This research evidence suggests that little is known about the three options in relation to the prioritized groups (i.e., people with concurrent mental illness and/or addiction, and people living in rural/remote communities). Several reviews without an explicit focus on chronic pain included studies with a focus on people with mental illness(31;32;34;41;70;73-78); or people living in rural/remote communities.(35;48;49;79-81) None of the identified reviews included studies about people with addictions. The research evidence with an explicit focus on chronic pain included studies with a focus on other specific groups (e.g., working-age adults with fibromyalgia).(82) This suggests that more population-specific reviews about chronic pain are needed or that a more focused approach to identifying the available evidence is required.

IMPLEMENTATION CONSIDERATIONS

Table 4: Potential barriers to implementing the options

Levels	Option 1 – Create a model patient registry / treatment-monitoring system in a single jurisdiction	Option 2 – Create a national network of centres with a co-ordinating hub to provide chronic pain-related decision support	Option 3 – Broker and support the implementation of a cross-payer, cross-discipline model of patient-centred primary healthcare-based chronic pain management
Patient/Individual	Operational challenge in defining eligibility for a condition that lacks an "event," widely agreed diagnostic criteria, and demonstrated pathology Collection of individual-level data may compromise an individuals' privacy and lead to stigmatization.(83) Individuals often have more than one diagnosis (e.g., chronic pain and arthritis) that requires monitoring.	Resources (time and money) are required to meaningfully involve patients in the development and evaluation of medical device technology.(84)	Individuals with chronic pain may need more specialized and urgent pain management for acute exacerbations or injuries than may be feasible in primary healthcare.
Care provider	Primary healthcare providers will require training and support in how to use of the registry / monitoring system.	Primary healthcare providers may perceive decision supports as a threat to their professional authority.(83) Professional training and ongoing continuing professional development need to address how to deliver the full spectrum of comprehensive chronic pain management.	Healthcare providers, particularly physicians, have to ensure that a patient-centred primary healthcare model is integrated with speciality and community-based pain services. Chronic pain has not traditionally been considered a chronic disease(85) to be managed by primary healthcare providers. Roles and liabilities of team members need to be defined.
Organization	Organizations must be sensitive to the personal health information being collected and how it is used.(83)	All clinical and non-clinical members of healthcare teams need to be aware of the processes that need to be in place for effective use of information technologies.	Collaborative work arrangements need to be established and maintained between primary healthcare organizations, secondary and tertiary care organizations that can support these primary healthcare organizations (e.g., chronic pain management programs in academic health science centres), and payers.
System	Resources must be in place to ensure sustainability of information systems in the longer term. The need for public health surveillance must be balanced with the need for individual privacy.(83)	Accountability structures need to be in place, which satisfy the multi-institutional and cross-jurisdictional nature of a national network of centres.	There may be a lack of human resources to provide team-based care (although which professionals and healthcare setting are required would need to be assessed initially). Provincial and territorial governments may be unwilling to broaden the breadth and depth of

			public payment for primary healthcare, particularly during a recession.

In order to address many of the identified barriers, an overall approach to implementing the options could be the implementation of a national stakeholder-engagement process to raise awareness of health system issues within the chronic pain community and to raise awareness of chronic pain issues within the health policy and systems community. This approach could be informed by the work done in Australia. For example, The National Pain Summit in Australia aims to strengthen awareness of the prevalence and economic impact of chronic pain through the development of a National Pain Strategy that will be aligned with the governments' proposals for more effective, cost-effective, and accessible healthcare.(86) A similar approach in Canada might mobilize evidence from sources including (but not limited to) academic pain centres, patient and public interest groups, health provider associations, and other sources. Further research would be required to establish the benefits, harms, and costs of this or other possible implementation strategies.

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APPENDICES

The following tables provide detailed information about the systematic reviews identified for each option. Each row in a table corresponds to a particular systematic review and the reviews are organized by option element (first column). The focus of the review is described in the second column. Key findings from the review that relate to the option are listed in the third column, while the fourth column records the last year the literature was searched as part of the review.

The fifth column presents a rating of the overall quality of the review. The quality of each review has been assessed using AMSTAR (A MeaSurement Tool to Assess Reviews), which rates overall quality on a scale of 0 to 11, where 11/11 represents a review of the highest quality. It is important to note that the AMSTAR tool was developed to assess reviews focused on clinical interventions, so not all criteria apply to systematic reviews pertaining to delivery, financial, or governance arrangements within health systems. Where the denominator is not 11, an aspect of the tool was considered not relevant by the raters. In comparing ratings, it is therefore important to keep both parts of the score (i.e., the numerator and denominator) in mind. For example, a review that scores 8/8 is generally of comparable quality to a review scoring 11/11; both ratings are considered "high scores." A high score signals that readers of the review can have a high level of confidence in its findings. A low score, on the other hand, does not mean that the review should be discarded, merely that less confidence can be placed in its findings and that the review needs to be examined closely to identify its limitations. (Lewin S, Oxman AD, Lavis JN, Fretheim A. SUPPORT Tools for evidence-informed health Policymaking (STP): 8. Deciding how much confidence to place in a systematic review. *Health Research Policy and Systems* 2009; 7(Suppl 1):S8.

The last three columns convey information about the utility of the review in terms of local applicability, applicability concerning prioritized groups, and issue applicability. The third-from-last column notes the proportion of studies that were conducted in Canada, while the second-from-last column comments on the proportion of studies included in the review that deal explicitly with one of the prioritized groups. The last column indicates the review's issue applicability in terms of the proportion of studies focused on chronic pain.

All of the information provided in the appendix tables was taken into account by the evidence brief's authors in compiling Tables 1-3 in the main text of the brief.

Appendix 1: Systematic reviews relevant to Option 1 - Patient registry / treatment-monitoring system

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
Patient registry	The effects of information system design, quality, components, setting, and other factors on care processes, quality outcomes, and healthcare costs(31)	Components of systems correlated with positive results included: connection to a broad electronic health record system; order entry, especially when focused on the care team, specific to disease, and allowing longitudinal care planning (e.g., specialist or case manager referrals); and population-based reporting and feedback (e.g., reporting back unfinished care plan elements). Barriers to using informatics systems to improve care for chronic disease include costs, data privacy and security, and failure to consider workflow.	2005	4/11	Not reported	26/109 (mental illness)	Not reported
Treatment-monitoring systems	The costs and resultant charges of quality-of-care interventions(87)	Insufficient evidence exists to determine cost of implementing quality-enhancing interventions	2004	3/11	Not reported	Not reported	Not reported
Privacy issues pertaining to patient registry / treatment-monitoring systems	No relevant reviews were identified.	n/a	n/a	n/a	n/a	n/a	n/a
Public reporting of aggregated data	The effects of publicly reported performance data on quality of care and clinical outcomes(30)	Mixed results on the effect of public reporting on effectiveness, safety, and patient-centeredness. Publicly releasing performance data stimulates quality-improvement activities in hospitals.	2006	6/11	Not reported	Not reported	Not reported
	The effects of publicly disclosing information on the performance of hospitals, health professionals, and healthcare organizations(88)	In three of 21 studies that investigated the impact of publicly disclosing performance information on care outcomes, the public disclosure of performance information	1999	3/11	0/21	Not reported	Not reported

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
		was associated with an improvement in health outcomes.					

Appendix 2: Systematic reviews relevant to Option 2 – Decision support

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
Networks models	No relevant reviews identified	n/a	n/a	n/a	n/a	n/a	n/a
Partnerships with consumers, providers, community-based and healthcare organizations, and researchers	The effectiveness of community engagement approaches and methods for health promotion interventions(49)	There is insufficient high-quality evidence to make conclusions.	2007	8/11	4/21	3/21 (rural/ remote)	Not reported
	The effects of consumer involvement and a comparison of different methods of involvement in developing healthcare policy and research, clinical practice guidelines, and patient information material(33)	There is little evidence from comparative studies of the effects of consumer involvement in healthcare decisions at the population level. There is moderate-quality evidence from two studies that involving consumers in the development of patient information material results in material that is more relevant, readable, and understandable, without affecting anxiety. Some low-quality evidence suggests that telephone discussions and group meetings engage consumers better than mailed surveys and result in different priorities being set for community health goals.	2006	10/11	Not reported	Not reported	Not reported
	The effects of involving users in the delivery and evaluation of mental health services(34)	Involving clients as employees of mental health services led to clients having greater satisfaction with personal circumstances and less hospitalization. Providers of services who had been trained by clients had more positive attitudes toward users. Clients reported being less satisfied with services when interviewed by other clients.	2006	5/11	1/12	12/12 (mental illness)	Not reported

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
	The effects of interventions that promote empowerment in tuberculosis patients(50)	There is insufficient evidence about the effects of interventions to promote empowerment in tuberculosis patients. However, it was found that the success of empowering tuberculosis patients is dependent on context-specific elements, which vary from one country to another.	2006	3/11	Not reported	Not reported	Not reported
	The benefits of, and barriers to, user involvement in medical device technology development and evaluation(84)	The benefits of user involvement include increased access to user needs, improvements in medical devise designs and user interfaces, and an increase in the functionality, usability, and quality of devices. Resources (time and money) were identified as a major barrier.	2005	2/11	Not reported	Not reported	Not reported
	The effects of involving people affected by cancer in healthcare research, policy and planning, and practice(48)	There is insufficient evidence to make conclusions about the impact of involvement.	2004	6/11	Not reported	Not reported	Not reported
	The effects of involving patients in the planning and development of healthcare(32)	Involving patients contributed to changes in the provision of services across a range of different settings.	2000	5/11	2/40	14/40 (mental illness)	Not reported
Tools to support self-management							
a) Education	The effectiveness of lay-led self-management programs for people with chronic conditions(41)	Lay-led self-management education programs may lead to small, short-term improvements in participants' self-efficacy, self-rated health, cognitive symptom management, and frequency of aerobic exercise.	2006	10/11	Not reported	6/17 (mental illness)	11/17
	The effectiveness of information in preventive action and/or therapy for low back pain and which type of information is most effective(37)	Three of the seven high-quality studies showed favourable results for information	2004	6/10	Not reported	Not reported	7/13
	The effectiveness of patient	Significant effects of patient education	2002	10/11	3/62	1/50 (rural/	44/50

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
	education interventions on health status in patients with rheumatoid arthritis(35)	at first follow-up for scores on disability, joint counts, patient global assessment, psychological status, and depression were observed. A trend favouring patient education was found for scores on pain. The dimensions of anxiety and disease activity showed no significant effects. At final follow up no significant effects of patient education were found, although there was a trend favouring patient education for scores on disability.				remote)	
	The effectiveness of educational and psychosocial interventions for adolescents with diabetes(89)	Interventions have small to medium beneficial effects on various diabetes management outcomes. There is insufficient evidence to determine the cost-effectiveness of programs.	2002	9/11	Not reported	0/62	Not reported
	The effects of education programs on pain and disability among arthritis patients(36)	The summary effect sizes suggest that arthritis self-management education programs result in small reductions in pain and disability.	1998	5/11	Not reported	Not reported	17/17
b) Decision aids	To conduct a systematic review of randomized controlled trials (RCTs) evaluating the efficacy of decision aids for people facing difficult treatment or screening decisions(38)	Patient decision aids increase people's involvement and are more likely to lead to informed values-based decisions. Decision aids reduce the use of discretionary surgery without apparent adverse effects on health outcomes or satisfaction.	2006	10/11	6/22	Not reported	0/66
	To identify outcomes influenced by consumer decision aids (CDAs) and the particular effects of CDAs on relevant outcomes.(90)	Improved outcomes result from the use of CDA in some categories of outcome but insufficient evidence exists to support improved outcomes in all categories or to evaluate whether, given the considerable costs of many CDAs,	1999	5/11	Not reported	Not reported	Not reported

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
		funding for extensive ongoing development and testing can be sustained.					
c) Personal health records	The effects of information system design, quality, components, setting, and other factors on care processes, quality outcomes, and healthcare costs.(31)	Personal health records were correlated with positive experimental results.	2005	4/11	Not reported	26/109 (mental illness)	Not reported
	The effectiveness of patient-held records on patient outcomes(40)	Patient-held records did not appear to have an effect on clinical outcomes. An emerging consideration for successful use of patient-held records is their suitability for use among different patient groups.	2004	9/11	1/44	Not reported	Not reported
	The impact of automated information interventions on diabetes care and patient outcomes(39)	Home glucose records have documented benefits in improving diabetes outcomes (i.e., HbA1c and blood glucose).	Not reported	7/11	0/17	Not reported	Not reported
d) Peer support	The effectiveness of lay-led self-management programs for people with chronic conditions(41)	Lay-led self-management education programs may lead to small, short-term improvements in participants' self-efficacy, self-rated health, cognitive symptom management, and frequency of aerobic exercise.	2006	10/11	Not reported	6/17 (mental illness)	11/17
	The effects of group-based training on clinical, lifestyle, and psychosocial outcomes in people with type 2 diabetes(91)	Group-based diabetes self-management training is effective in improving fasting blood glucose levels, glycosylated hemoglobin and diabetes knowledge, and reducing systolic blood pressure, body weight, and diabetes medications.	2003	9/11	Not reported	Not reported	Not reported
	The effects of social support interventions on health outcomes in primary and outpatient care for type 2 diabetes(92)	Promising new forms of social support include: group consultations (better HbA1c and lifestyle); internet or telephone-based peer support (improved perceived support, increased	2003	6/11	0/17	Not reported	Not reported

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
		physical activity, respectively); and social support groups (improved knowledge and psychosocial functioning).					
	The effectiveness of patient, provider, and health system interventions to improve diabetes care among socially disadvantaged populations(93)	Features that appeared to have the most consistent positive effects included cultural tailoring of the intervention, community educators or lay people leading the intervention, one-on-one interventions with individualized assessment and reassessment, incorporating treatment algorithms, focusing on behaviour-related tasks, providing feedback, and high-intensity interventions delivered over a long duration.	Not reported	8/11	1/10	Not reported	Not reported
	To evaluate dimensions of diabetes self-management interventions in disadvantaged populations(79)	Community interventions (e.g., group meetings) had encouraging short-term results. However, data on adoption and implementation strategies were almost never reported.	Not reported	4/10	0/10	2/10 (rural/ remote)	Not reported
	The influences of diabetes self-management in the context of a South Asian population(94)	Culture should not be thought of as a stand-alone factor as it is one of many interacting factors, which the individual negotiates when making self-management choices.	Not reported	n/a (qualitative review)	Not reported	Not reported	Not reported
e) Web-based tools	The effectiveness of information technologies on improving care for adults with type 2 diabetes(95)	Telephone interventions showed moderate to large declines in HbA1c. However, only three were statistically significant.	2004	6/11	Not reported	Not reported	Not reported
	The effects of computer-based peer-to-peer communities and electronic self-support groups on health and social outcomes(51)	No clear evidence of consumer-led peer-to-peer communities. However, no evidence was found that suggests virtual communities harm people.	2003	6/11	3/28	Not reported	Not reported
	To review the reasons why health interventions have been	Reasons for delivering interventions over the internet included: low delivery	2003	5/10	1/44	1/28 (mental illness)	1/28

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
	delivered over the internet(74)	costs, reducing cost and increasing convenience for users, reducing health system costs, overcoming isolation of users, timeliness of information, reducing stigma, and increasing user control of the intervention.					
	The impact of automated information interventions on diabetes care and patient outcomes(39)	Home glucose records have documented benefits in improving diabetes outcomes (i.e., HbA1c and blood glucose).	Not reported	7/11	1/44	Not reported	Not reported
f) Telephone supports	The effect of telephone support for smoking cessation(96)	Telephone counselling helps smokers who are interested in quitting. The odds of quitting increases with the number of sessions.	2009	10/11	4/65	65/65 (addiction)	Not reported
	The clinical and cost-effectiveness of home telehealth for aging patients with multiple chronic conditions(42)	Compared with usual care, home telemonitoring improved glycemic control in patients with diabetes. Home telemonitoring and telephone support reduced health service use for patients with diabetes. Uncertainty remains about cost-effectiveness of home telehealth programs.	2008	10/10	1/39	Not reported	Not reported
	The benefits and deficiencies of teleconsultation and videoconferences between patients and providers on clinical and behavioural outcomes, as well as processes of care(43)	Teleconsultation programs that focused on daily monitoring of clinical data, education, and personal feedback showed the most benefit in terms of behavioural change and reducing costs. The benefits of videoconferencing were mainly related to its effects on socio-economic factors such as education and cost reduction, but also on monitoring disease and maintaining quality of care while producing cost savings.	2007	6/11	Not reported	Many studies were conducted with remote populations, but exact number is not reported	Not reported
	The clinical effectiveness of	ICT applications did not show an	2005	5/11	Not reported	Not reported	Not reported

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
	interventions using information and communication technologies (ICTs) for managing and controlling chronic diseases(97)	improvement in clinical outcomes. However, ICT systems used for improving education and social support were shown to be effective.					
	Summary of the effects of telehomecare on older patients with chronic illness(80)	Telehomecare appears to reduce healthcare costs due to savings from healthcare utilization and travel.	2005	2/11	Not reported	1/19 (rural/ remote)	Not reported
	To evaluate evidence for the feasibility, acceptability, and cost-effectiveness of diabetes telemedicine applications(44)	Telemedicine for diabetes is feasible and acceptable, but evidence about effectiveness in improving HbA1c or reducing costs while maintaining HbA1c levels, or improving other aspects of diabetes management is not strong.	2004	7/11	Not reported	Not reported	Not reported
	The effectiveness of information technologies on improving care for adults with type 2 diabetes(95)	All telephone interventions (n=16) showed moderate to large declines in HbA1c. However, only three were statistically significant.	2004	6/11	Not reported	Not reported	Not reported
	To assess the effectiveness of computer telephony system (CTS)-based medical interventions(98)	CTS-based medical interventions improved HbA1c levels and processes of care in diabetes. However, the evidence was of poor quality.	2003	6/11	Not reported	Not reported	Not reported
	The application of telemedicine in the management of heart failure(99)	Telemonitoring (used alone or as part of multidisciplinary care) may improve early detection of deterioration and reduces hospital admissions, length of hospital stays, and mortality at 6 months.	2002	5/11	Not reported	Not reported	Not reported
	The efficacy of distance medicine technologies in clinical practice on healthcare outcomes(100)	Improved outcomes were demonstrated in studies related to pain management for osteoarthritis.	1996	6/11	Not reported	Not reported	2/80
	The cost-effectiveness of an automated telephone self-	The per-patient cost to achieve a 10% increase in the proportion of	n/a (cost-effectiveness	n/a	n/a	n/a	n/a

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
	management support with nurse care management (ATSM) intervention for patients with type 2 diabetes(45)	intervention patients meeting American Diabetes Association exercise guidelines was estimated to be $558 when all costs were considered and $277 when only ongoing costs were considered.	study)				
Interventions to support the dissemination of clinical practice guidelines							
a) Educational materials	The effects of psychiatric guideline implementation on provider performance and patient outcomes(75)	Distribution of educational materials was found to be generally ineffective for improving appropriateness of care. Studies comparing multi-faceted interventions with distribution of educational materials had mixed effects.	2006	5/11	1/18	18/18 (mental illness)	Not reported
	Effectiveness and efficiency of guideline dissemination and implementation strategies(101)	The distribution of educational materials was generally effective for improving the appropriateness of care with medium effect sizes.	1998	7/11	12/235	Not reported	Not reported
	The effects of introducing clinical practice guidelines in nursing, midwifery, and other professions allied to medicine (102)	Mixed effects were observed for educational meetings.	1996	8/11	Not reported	Not reported	1/18
b) Educational meetings	The effect of guidelines on compliance with care processes, as well as clinical or economic outcomes in the treatment of pneumonia(103)	There was insufficient evidence to assess the effects of educational meetings on outcomes related to prescribing.	2006	5/11	Not reported	Not reported	Not reported
	The effectiveness of evidence-based strategies for implementing guidelines in obstetrics on quality of obstetric care(104)	Two studies found that educational meetings were generally ineffective on appropriateness of care.	2005	4/11	Not reported	Not reported	Not reported
	Effectiveness and efficiency of guideline dissemination and implementation strategies(101)	Insufficient evidence exists for educational meetings.	1998	7/11	12/235	Not reported	Not reported

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
	The effects of introducing clinical practice guidelines in nursing, midwifery, and other professions allied to medicine(102)	Mixed effects were observed for educational meetings for improving the appropriateness of care.	1996	8/11	1/18	Not reported	1/18
c) Educational outreach visits	The effectiveness of evidence-based strategies for implementing guidelines in obstetrics on quality of obstetric care(104)	Insufficient evidence exists for educational outreach visits.	2005	4/11	Not reported	Not reported	Not reported
	The effects of introducing clinical practice guidelines in nursing, midwifery, and other professions allied to medicine(102)	Insufficient evidence exists for educational outreach visits.	1996	8/11	1/18	Not reported	1/18
d) Local opinion leaders	The effectiveness of evidence-based strategies for implementing guidelines in obstetrics on quality of obstetric care(104)	Insufficient evidence exists for local opinion leaders.	2005	4/11	Not reported	Not reported	Not reported
	The effects of introducing clinical practice guidelines in nursing, midwifery, and other professions allied to medicine(102)	Insufficient evidence exists for local opinion leaders.	1996	8/11	1/18	Not reported	1/18
e) Local consensus processes	No relevant reviews were identified.	n/a	n/a	n/a	n/a	n/a	n/a
f) Audit and feedback	The effects of psychiatric guideline implementation on provider performance and patient outcomes(75)	Insufficient evidence was found for audit and feedback.	2006	5/11	1/18	18/18 (mental illness)	Not reported
	The effectiveness of evidence-based strategies for implementing guidelines in obstetrics on quality of obstetric	Generally effective results were found for audit and feedback.	2005	4/11	Not reported	Not reported	Not reported

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
	care(104)						
	Effectiveness and efficiency of guideline dissemination and implementation strategies(101)	The distribution of educational materials was generally effective for improving the appropriateness of care with medium effect sizes.	1998	7/11	15/235	Not reported	Not reported
	The effect of different intervention strategies for implementing clinical guidelines at hospitals(46)	Generally effective results were found for audit and feedback vs. control.	1998	5/11	Not reported	Not reported	Not reported
g) Reminders and prompts	Effectiveness and efficiency of guideline dissemination and implementation strategies(101)	Reminders were generally effective for improving appropriateness of care with medium effect sizes.	1998	7/11	15/235	Not reported	Not reported
	The effect of different intervention strategies for implementing clinical guidelines at hospitals(105)	Generally effective results were found for reminders vs. control.	1998	5/11	Not reported	Not reported	Not reported
	The effects of introducing clinical practice guidelines in nursing, midwifery, and other professions allied to medicine(102)	Insufficient evidence was found for reminders.	1996	8/11	1/18	Not reported	1/18
	The effectiveness of evidence-based strategies for implementing guidelines in obstetrics on quality of obstetric care(104)	There was insufficient evidence to determine results of reminders.	2005	4/11	Not reported	Not reported	Not reported
h) Tailored interventions	No relevant reviews were identified.	n/a	n/a	n/a	n/a	n/a	n/a
i) Patient-mediated interventions	Effectiveness and efficiency of guideline dissemination and implementation strategies(101)	Patient-mediated interventions were generally effective for improving appropriateness of care with medium effect sizes.	1998	7/11	12/235	Not reported	Not reported
	The effects of introducing clinical practice guidelines in nursing, midwifery, and other professions allied to	Insufficient evidence exists for patient-mediated interventions.	1996	8/11	1/18	1/19	1/18

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
	medicine(102)						
j) Multi-faceted interventions	The effects of psychiatric guideline implementation on provider performance and patient outcomes(75)	Multi-faceted interventions were found to be generally ineffective for appropriateness of care. Studies comparing multi-faceted interventions with distribution of educational materials had mixed effects.	2006	5/11	1/18	18/18 (mental illness)	Not reported
	The effectiveness of evidence-based strategies for implementing guidelines in obstetrics on quality of obstetric care(104)	Multi-faceted interventions were generally effective for improving appropriateness of care, as compared with no intervention.	2005	4/11	Not reported	Not reported	Not reported
	The effects of interventions targeting professionals or the organization of care on the management of patients with diabetes in primary healthcare, outpatient, and community settings(106)	Combinations of professional interventions improved health professional performance outcomes.	2000	7/11	0/48	Not reported	Not reported
	Effectiveness and efficiency of guideline dissemination and implementation strategies(101)	Multi-faceted interventions compared with no intervention were generally effective for improving appropriateness of care with medium effect sizes. Multi-faceted interventions compared with intervention controls were generally effective for improving appropriateness of care with small effect sizes.	1998	7/11	15/235	Not reported	Not reported
	The effect of different intervention strategies for implementing clinical guidelines in hospitals(105)	Generally effective results were demonstrated for comparisons of multi-faceted interventions vs. control, multi-faceted interventions vs. distribution of educational materials, multi-faceted interventions vs. educational meetings and multi-faceted interventions vs. multi-faceted interventions for improving appropriateness of care.	1998	5/11	Not reported	Not reported	Not reported

Option element	**Focus of systematic review**	**Key findings**	**Year of last search**	**AMSTAR (quality) rating**	**Proportion of studies that were conducted in Canada**	**Proportion of studies that deal explicitly with one of the prioritized groups**	**Proportion of studies that focused on chronic pain**
	The effects of introducing clinical practice guidelines in nursing, midwifery, and other professions allied to medicine(102)	There was insufficient evidence for multi-faceted interventions.	1996	8/11	1/18	Not reported	1/18
	The cost-effectiveness of two implementation strategies (patient-directed and professional-directed) compared with usual hospital outpatient care(105)	Both guideline implementation strategies in secondary care are cost-effective compared with current care, by Dutch standards, for these patients.	n/a (cost-effectiveness study)	n/a	n/a	n/a	n/a
	A controlled trial of a multi-faceted intervention versus usual care for managing diabetes(47)	There were no changes in healthcare utilization or costs between the two firms.	n/a (cost-effectiveness study)	n/a	n/a	n/a	n/a
Support for undergraduate professional training programs	No reviews identified that related specifically to support for undergraduate professional training programs. However, some reviews are available about the effectiveness of undergraduate professional training approaches.	n/a	n/a	n/a	n/a	n/a	n/a
	The educational effects of portfolios on undergraduate student learning(107)	The main benefits of portfolio use include improvements in knowledge and understanding, increased self-awareness and engagement in reflection and improved student-tutor relationships.	2007	5/11	28/69 (North America)	Not reported	0/69
	To review the evidence on developing nursing students' critical thinking through problem-based learning.(108)	There is a lack of large high-quality RCTs which determine the effects of problem-based learning on critical thinking.	2006	5/11	Not reported	0/10	0/10
	To provide a framework for peer teaching and learning in the clinical education of undergraduate health science	Peer teaching and learning resulted in mostly positive outcomes (e.g., increase student's confidence in clinical practice and improve learning in the	2005	8/11	2/12	Not reported	0/12

Option element	**Focus of systematic review**	**Key findings**	**Year of last search**	**AMSTAR (quality) rating**	**Proportion of studies that were conducted in Canada**	**Proportion of studies that deal explicitly with one of the prioritized groups**	**Proportion of studies that focused on chronic pain**
	students(109)	psychomotor and cognitive domains).					
	To review the evidence on the effectiveness of undergraduate curriculum in palliative care(110)	There is a lack of consistency in what undergraduates are taught about palliative care.	2001	2/11	Not reported	Not reported	2/49
Continuing professional development and other strategies to support evidence-based care (both for single disciplines and multidisciplinary teams)	Reviews identified about "interventions to support the dissemination of clinical practice guidelines" are also relevant for this element.	n/a	n/a	n/a	n/a	n/a	n/a
	The effectiveness of inter-professional education (IPE)(73)	The studies in this review evaluated different IPE interventions and were not of high quality. Therefore, it is difficult to draw conclusions about effectiveness.	2006	9/11	0/6	4/6 (mental illness)	0/6
	The effectiveness of inter-professional education(76)	IPE interventions with staff involved in the care of adults with mental health problems indicate positive outcomes. However, the studies were not of high quality.	1998	4/11	0/19	19/19 (mental illness)	Not reported
	The effectiveness of inter-professional education(111)	Two studies indicated improvements in providers' documentation following IPE.	2005	4/11	Not reported	Not reported	4/4
	Problem-based learning in large and small groups(112)	No relevant key findings	2000	4/11	Not reported	Not reported	Not reported
Monitoring and evaluation efforts to improve care (across the full range of payers and the full continuum of care)	No relevant reviews identified. However, the reviews identified as part of Option 1 will also be relevant for this element.	n/a	n/a	n/a	n/a	n/a	n/a

Appendix 3: Systematic reviews relevant to Option 3 – System redesign

Option element	Focus of systematic reviews	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
Cross-payer models of patient-centred primary healthcare-based chronic pain management	No reviews identified	n/a	n/a	n/a	n/a	n/a	n/a
Cross-discipline models of patient-centred primary healthcare-based chronic pain management	The effects of multidisciplinary pain management programs on patients' function and quality of life(52)	There is strong evidence that multidisciplinary approaches improve function. There is moderate evidence that multidisciplinary approaches improve pain.	2003	6/10	0/1	Not reported	1/1
	The efficacy, effectiveness, and economic consequences of multidisciplinary pain programs for patients with chronic pain not related to cancer(56)	There was strong evidence to support the use of intensive multidisciplinary programs (> 100 hours) to improve function in patients. There was moderate evidence to support this intensive approach in reduction of pain. Less intensive multidisciplinary outpatient programs (< 30 hours) did not improve pain, function, or vocational outcomes in patients.	n/a (Overviews of reviews)	n/a	n/a	n/a	2003
	The effectiveness of multidisciplinary rehabilitation for subacute low back pain among working age adults(53)	There is moderate evidence showing that multidisciplinary rehabilitation helps patients to return to work faster, results in fewer sick leaves, and alleviates subjective disability.	2002	9/11	1/2	0/2	2/2 (subacute back pain)
	The effectiveness of multidisciplinary biopsychosocial rehabilitation for neck and shoulder pain among working age adults(54)	There is limited evidence for the effectiveness of multidisciplinary biopsychosocial rehabilitation for neck and shoulder pain.	2002	9/11	Not reported	Not reported	2/2
	The effectiveness of	Four of the included RCTs on	1999	8/11	Not reported	Not reported	7/7

Option element	Focus of systematic reviews	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
	multidisciplinary rehabilitation for fibromyalgia and widespread musculoskeletal pain among working age adults(82)	fibromyalgia were graded low quality and suggest no quantifiable benefits. The three included RCTs on widespread musculoskeletal pain showed no evidence of efficacy. Education combined with physical training showed some positive effects in long-term follow up.					
	The effectiveness of acute pain teams in improving the quality of analgesia and other postoperative outcomes of adult patients undergoing surgery(69)	There is insufficient robust research to assess the impact of acute pain teams on postoperative outcomes of adult patients or on the processes of postoperative pain relief.	1999	7/11	Not reported	Not reported	9/12 (post-operative pain)
	An evaluation of the evidence on the economic cost-effectiveness of multidisciplinary pain treatment in chronic non-malignant pain patients(64)	Due to low-quality evidence, this review was not able to answer whether multidisciplinary pain management in chronic pain patients is cost-effective or not.	1999	2/11	1/9	Not reported	9/9
	The effects of multidisciplinary biopsychosocial rehabilitation with functional restoration on patients' pain, function, employment, and quality of life(55)	There is strong evidence for the improvement of function and moderate evidence for reduction in pain. Mixed effects were found for multidisciplinary biopsychosocial rehabilitation on employment and there is no evidence for the effects of multidisciplinary biopsychosocial rehabilitation on quality of life.	1998	9/11	2/10	Not reported	10/10
	The costs and effectiveness of ambulatory care provided by specialists, non-specialists, and both specialists and non-specialists (co-care) to patients with knee osteoarthritis (OA) and/or chronic low back pain	Specialist-only ambulatory care for OA or LBP was effective at slightly higher costs compared with non-specialty care. Co-care cost substantially more and was associated with little improvement in functional status.	n/a (economic evaluation)	n/a	n/a	Outcome measurement of functional status involved mental health	n/a

Option element	Focus of systematic reviews	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
	(LBP)(65)						
Rewards for quality and efficiency in primary healthcare	The effects of results-based financing in low- and middle-income countries(81)	Financial incentives targeting recipients of healthcare and individual healthcare providers are effective in the short term. However, there is less evidence that financial incentives can sustain long-term changes. Risks associated with results-based financing include: motivating unintended behaviours, ignoring important tasks that are not rewarded with incentives, improving or cheating on reporting rather than improving performance, widening the resource gap between rich and poor, and dependency on financial incentives.	2006	n/a (Overview of systematic reviews)	3/10	1/10 (rural)	Not reported
	The effects of physician-level and provider-level financial incentives(57)	Physician-level financial incentives had partial or positive effects on measures of quality in five of six studies and provider-level financial incentives had similar effects in seven of nine studies. Financial incentives had unintended effects in four studies. No studies examined the optimal duration of financial incentives or the persistence of their effects after termination.	2005	6/11	Not reported	Not reported	Not reported
	The effects of performance-based payment for prescription drug prescribing(68)	No studies on the effects of performance-based payments or other policies were found despite an exhaustive search.	2004	10/11	0/16	Not reported	0/16
	The effects of pay-for-performance(113)	Pay-for-performance yielded no effects in all but two well-designed studies and positive effects in the two well-designed studies.	2003	5/10	Not reported	Not reported	Not reported
	An examination of the impact of	Of the eight financial interventions	2002	5/11	0/6	0/6	0/6

Option element	Focus of systematic reviews	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
	financial incentives on provider preventive care delivery(114)	reviewed, only one led to a significantly greater provision of preventive services. The rewards offered in these studies tend to be small. Therefore, the results suggest that small rewards will not motivate doctors to change their preventive care routines.					
	To review the available evidence on initiatives affecting primary healthcare referral to specialist secondary care(77)	Organizational innovations in the structure of service provision need not increase total costs to the National Health Service (NHS), even though costs associated with referral may increase.	2001	7/11	Not reported	10/44 (mental illness)	0/44
	To review the effectiveness of strategies to improve the quality and efficiency of medication use in managed care organizations (MCOs)(78)	High-quality studies of interventions to improve drug use in MCOs are increasing in frequency. There is evidence for the effectiveness of several strategies to change drug use, but little is known about longer-term clinical outcomes.	2001	3/11	0/48	1/48 (mental illness)	Not reported
	The impact of target payments on the professional practice of primary healthcare physicians (PCPs) and healthcare outcomes(72)	There is insufficient high-quality evidence to determine whether target payment remuneration provides a method of improving primary healthcare.	1997	9/11	0/2	Not reported	0/2
	Overview of reviews focused on financial incentives in low- and middle-income countries(115)	There are several promising health systems arrangement and implementation strategies for strengthening primary healthcare. However, the evidence is sparse and their introduction must be accompanied by evaluations of them.	2008	n/a (Overview of reviews)	2/20	2/20	0/20
Fee schedules that consider the time demands associated with assessment, management, support, and dealing with	No reviews were identified about fee schedules. However, reviews are available related to remuneration types including fee-for-service, capitation, etc. A	n/a	n/a	n/a	n/a	n/a	n/a

Option element	Focus of systematic reviews	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
payers and employers (remuneration)	few are included here for information purposes.						
	The effects of target payments on primary healthcare physician behaviour(116)	The evidence of the impact of target payment on immunization rates was inconclusive.	1997	7/11	1/4	Not reported	0/4
	The impact of payment systems (fee-for service versus capitation or salary) on the behaviour of primary healthcare physicians(117)	Fee-for-service resulted in a higher quantity of primary healthcare services provided. Fee-for-service resulted in more patient visits, greater continuity of care, higher compliance with a recommended number of visits, but lower patient satisfaction with access to a physician.	1997	6/11	2/10	Not reported	Not reported
Accrediting chronic pain “specialist” providers or clinics	Identifying and analyzing research into accreditation and accreditation processes in the health sector(118)	Only in two categories were consistent findings recorded: promote change and professional development. Inconsistent findings were identified in five categories: professions’ attitudes to accreditation, organizational impact, financial impact, quality measures, and program assessment. In the remaining three categories – consumer views or patient satisfaction, public disclosure, and surveyor issues – insufficient studies were found to draw conclusions.	2007	3/11	Not reported	Not reported	Not reported
	A review of the international peer-reviewed literature on organizational assessments used in general practice settings(119)	While professionally led accreditation is well-developed and dependent on externally led quality assurance, approaches to internally led quality improvement are less well-developed. There is a need for organizational assessment tools designed for the	2003	3/11	Not reported	Not reported	Not reported

Option element	Focus of systematic reviews	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
		purpose of stimulating internal development.					
Engaging the most cost-effective providers *Although there are numerous reviews related to the effectiveness of multidisciplinary teams we chose to include only those reviews that addressed their cost-effectiveness.	An examination of the effects of multidisciplinary rehabilitation, in either in-patient or ambulatory care settings, for older patients with hip fracture(120)	Pooled results showed no statistically significant difference between multidisciplinary rehabilitation and control groups for poor outcome or hospital readmission. Overall, the evidence indicates that multidisciplinary rehabilitation is not harmful. The trial comparing primarily home-based multidisciplinary rehabilitation with usual in-patient care found marginally improved function and a clinically significantly lower burden for carers in the intervention group.	2009	10/11	1/13	Not reported	Not reported
	The hiring of nurse practitioners (NPs) as a proposed solution to the ongoing overcrowding and physician shortage facing emergency departments (EDs)(121)	The medical community should further explore the use of NPs, particularly in fast-track areas for high volume departments. In rural areas, NPs could supplement overextended physicians and allow health centres to remain open when they might otherwise have to close.	2006	4/11	2/36	Not reported	Not reported
	An assessment of the effectiveness and cost-effectiveness of counselling in primary healthcare by reviewing cost and outcome data in randomized controlled trials for patients with psychological and psychosocial problems considered suitable for counselling(58)	The analysis found significantly greater clinical effectiveness in the counselling group compared with usual care in the short term but not the long term. Levels of satisfaction with counselling were high. There was some evidence that the overall costs of counselling and usual care were similar.	2005	10/11	0/8	Not reported	0/8
	The effectiveness of nurse-led cardiac clinics for adult patients diagnosed with coronary heart disease(59)	Although not all outcomes obtained statistical significance, nurse-led clinics were at least as effective as general practitioner clinics for most outcomes.	2002	7/11	Not reported	Not reported	Not reported

Option element	Focus of systematic reviews	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
	An assessment of the efficacy of formal liaison of GPs with specialist service providers on patient health outcomes(122)	Formal liaison between GPs and specialist services leaves most physical health outcomes unchanged, but improves functional outcomes in chronically mentally ill patients. It may confer modest long-term health benefits through improvements in patient concordance with treatment programs and more effective clinical practice.	2001	4/11	Not reported	Not reported	Not reported
	To evaluate: 1) the existing evidence on whether specialist epilepsy clinics are more clinically effective and cost-effective than general neurology outpatient clinics and 2) the existing evidence on whether specialist epilepsy nurses in in-patient, outpatient, or GP care are more clinically effective and cost-effective than "usual care" without a specialist nurse(123)	There is no convincing evidence, from the RCTs or other studies reviewed, that specialist epilepsy clinics improve clinical effectiveness outcomes when compared to general outpatient neurology clinics or that specialist epilepsy nurses improve clinical effectiveness outcomes when compared to normal in-patient, outpatient, or GP care.	2000	8/11	Not reported	Not reported	Not reported
	An evaluation of the evidence on the economic cost-effectiveness of multidisciplinary pain treatment in chronic non-malignant pain patients(64)	Due to low-quality evidence, this review was not able to answer whether multidisciplinary pain management in chronic pain patients is cost-effective or not.	1999	4/11	1/9	Not reported	9/9
	Provider costs, clinical outcomes, and patient satisfaction of chiropractic care compared to medical care for the treatment of acute and chronic low back pain.(66)	Chiropractic office costs were higher for both acute and chronic pain visits, but the same as medical care when the costs of referrals and medical imaging were included. Chiropractic patients with chronic LBP experienced better outcomes in pain and functional disability.	n/a (economic evaluation)	n/a	n/a	n/a	n/a

Option element	Focus of systematic reviews	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
		When total costs rather than office costs are considered, chiropractic care is relatively cost-effective.					
	Patients' ability to return to work and the cost-effectiveness of the addition of cognitive-behavioural treatment (CBT) to standard therapy compared to standard 3-week in-patient rehabilitation for patients with chronic low back pain(124)	There were no significant differences in health outcomes between groups, but patients in the CBT group missed fewer days of work, resulting in less indirect costs. The authors concluded that the increased costs of the CBT intervention in addition to standard therapy are offset by the reduced indirect costs.	n/a (economic evaluation)	n/a	n/a	n/a	n/a
	The long-term effects and costs of combined manipulative treatment, stabilizing exercises, and physician consultation compared with physician consultation alone for chronic low back pain(67)	Physician consultation alone was more cost-effective for healthcare use and led to equal improvement in disability and health-related quality of life, but less patient satisfaction.	n/a (economic evaluation)	n/a	n/a	n/a	n/a
	The costs and effectiveness of ambulatory care provided by specialists, non-specialists, and both specialists and non-specialists (co-care) to patients with knee osteoarthritis (OA) and/or chronic low back pain (LBP).(65)	Specialist-only ambulatory care for OA or LBP was effective at slightly higher costs compared with non-specialty care. Co-care was substantially more costly and was associated with little improvement in functional status.	n/a (economic evaluation)	n/a	n/a	Outcome measurement of functional status involved mental health	n/a
Providing tiered support from telecommunications to in-person interactions, and through tiered referrals from primary healthcare to accredited regional multidisciplinary chronic pain management centres	To estimate the effectiveness and efficiency of interventions to change outpatient referral rates or improve outpatient referral appropriateness(60)	Active local educational interventions involving secondary care specialists and structured referral sheets are the only interventions shown to impact on referral rates based on current evidence. The effects of "in-house" second opinion and other intermediate primary healthcare based alternatives to outpatient referral appear promising.	2007	9/11	0/17	Not reported	1/17

Option element	Focus of systematic reviews	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on chronic pain
	To determine the effectiveness of shared-care health service interventions designed to improve the management of chronic disease across the primary-specialty care interface(70)	There is insufficient evidence to demonstrate significant benefits from shared care apart from improved prescribing. This review indicates that there is no evidence to support the widespread introduction of shared care services at present.	2006	9/11	0/20	6/20 (mental illness)	Not reported
	To examine the evidence that continuity of primary healthcare is important for older people with chronic diseases(63)	Although the literature on continuity of care generally suggests that continuity of interpersonal primary healthcare is important and beneficial, specific evidence that it is beneficial for elderly people is scant. There is a need for well designed studies to investigate this issue.	2005	5/11	Not reported	Not reported	Not reported
	The effect of sustained continuity of care (SCOC) on the quality of patient care(61)	SCOC is associated with patient satisfaction, decreased hospitalizations and emergency department visits, and improved receipt of preventive services. No studies documented negative effects of increased SCOC on quality of care.	2002	7/11	0/18	1/18 (mental illness)	Not reported
	One overview of reviews examined packages of care for CDM that included case management(62)	Integrated care programs (which commonly include case management) appear to have a positive effect on quality of care. However, program components are defined in varying ways, which leads to inappropriate conclusions or application of results.	n/a (Overview of reviews)	n/a	n/a	n/a	n/a
	A review of published research into the effectiveness of strategies to shift specialist services from acute hospitals to the community and so bring care closer to home for patients(125)	Policy may be effective in improving access to specialist care for patients and reducing demand on acute hospitals. There is a risk, however, that the quality of care may decline and costs may increase.	Not reported	3/11	Not reported	Not reported	Not reported