



WORKING TOGETHER
ENHANCING MULTIDISCIPLINARY
PRIMARY CARE IN BC

A Policy Paper by BC's Physicians

October 2005

The BCMA Council on Health Economics and Policy (CHEP) reviews and formulates policy through the use of project oriented groups of practising physicians and professional staff.

**BCMA Council on Health Economics and Policy (CHEP)
2004-2005**

Dr. Marshall Dahl, Chair – *Internal Medicine/Endocrinology, Vancouver*
Dr. Geoffrey Appleton – *General Practice, Terrace*
Dr. James Chrones – *General Practice, Queen Charlotte*
Dr. Brian Gregory – *Dermatology, Vancouver*
Dr. Michael Kenyon – *Internal Medicine, Nanaimo*
Dr. Trina Larsen Soles – *General Practice, Golden*
Dr. Mike Lawrence – *General Practice, Vancouver*
Dr. Margaret MacDiarmid – *General Practice, Trail*
Dr. Alexander (Don) Milliken – *Psychiatry, Victoria*
Dr. Josie Schmid – *Anaesthesia, Prince George*

Multidisciplinary Care Project Group

Dr. Geoff Appleton, Chair, *General Practice, Terrace*
Dr. William (Bill) Cavers, *General Practice, Victoria*
Dr. Marshall Dahl, *Internal Medicine/Endocrinology, Vancouver*
Dr. Alan Gow, *General Practice, Salmon Arm*
Dr. David F. Smith, *Pediatrics, Vancouver*

BCMA Staff Support

Michael Epp, *Director of Policy and Planning*
Darrell Thomson, *Special Advisor*
Jonathan Agnew, *Senior Policy Consultant*
Greg Dines, *Senior Policy Analyst*
Cindy Ong, *Policy Analyst*
Linda Kowalski, *Administrative Assistant*
Melissa Kramer, *Policy Assistant*

Table of Contents

Executive Summary / 1

I. Introduction / 7

II. Multidisciplinary Care: Previous Research and Key Elements / 9

III. Multidisciplinary Care in British Columbia / 25

IV. Challenges to Implementing MDC / 33

V. Funding for Multidisciplinary Care / 37

VI. Conclusions / 39

List of Recommendations / 41

Endnotes / 42

Executive Summary

Multidisciplinary care (MDC) is cited as one solution to the challenges facing primary care, which include limited patient access, increasing prevalence of chronic conditions, the aging population, the restructuring of the hospital sector, and the emergence of more complex patients in community care. MDC may meet these challenges by better coordinating care, optimizing the use of health care resources, and improving patient outcomes, particularly for those with chronic conditions.

This report builds upon the BCMA's 2002 primary care renewal paper, *Ensuring Excellence*.^{*} The Association expands upon its earlier support for MDC practice and provides a vision for MDC in community-based, primary care settings.

Multidisciplinary Care: Previous Research and Key Elements

Research on the clinical effectiveness of MDC (e.g., morbidity and mortality, process measures, patient and provider satisfaction) suggests improvements associated with MDC among patients with chronic conditions such as diabetes, mental illness, asthma, and the frail elderly. Benefit for the “mainstream” population remains unclear. Research on the cost impact of MDC is mixed. While some studies indicate that MDC can lead to cost savings in primary care practices, these conclusions have been criticized for not fully accounting for non-physicians seeing fewer patients per hour and working fewer hours per week than physicians. There is some support for reduced costs in the hospital sector through MDC, however, the research literature is focused on specific populations, usually the elderly or chronically ill.

The literature identifies key elements that lead to successful MDC teams, including shared objectives and goals, effective clinical information systems, mutual trust, teamwork training for all team members, effective communication, and a division of labour that specifically defines the roles of each provider. To these elements for success we add two more: collaboration and effective team leadership. Effective multidisciplinary teams require a clear delineation of responsibility and accountability, including a clinical team leader with ultimate responsibility for patient care and who is the best-trained generalist. In the majority of instances, this would be the GP.

Multidisciplinary Care in British Columbia

The BCMA surveyed General Practitioners in British Columbia to understand better the overall state of multidisciplinary practice in primary care. The objective of the survey was twofold: first, to determine the nature and extent of current MDC arrangements in BC, and second, to determine members' attitudes towards MDC. A MDC GP was defined as

^{*} http://www.bcma.org/public/news_publications/publications/policy_papers/EnsuringExcellence/Index.htm

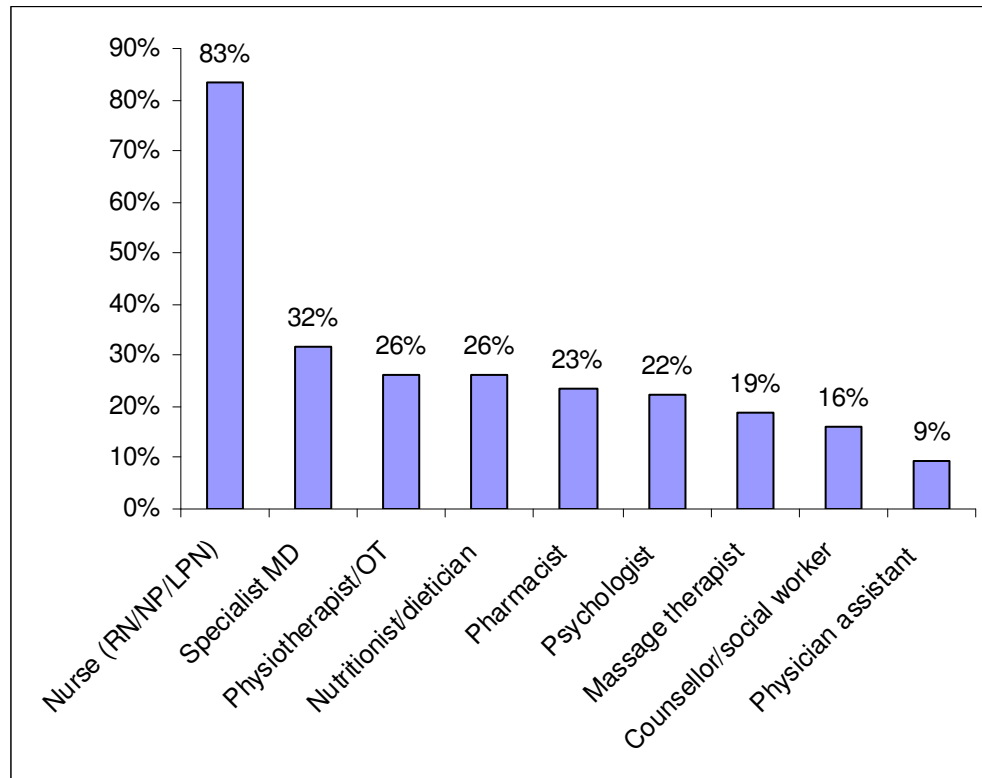
any GP who met the following definition:

A GP who practises with co-located non-physician providers, and whose practice setting is a private office, community health centre (CHC), or primary health care organization (PHCO).

Of those surveyed, 17% were MDC GPs. The results show that MDC GPs were very similar to non-MDC GPs in terms of age, rural residence, gender, and income. The only statistically significant difference was related to practice size: MDC GPs had significantly larger practices compared to the non-MDC respondents working in a private office, CHC, or PHCO (4.4 versus 3.5 physician FTEs, respectively). MDC GPs were significantly more likely than non-MDC GPs to agree that MDC would achieve the key objectives of improving patient outcomes, enhancing the comprehensiveness of care, enhancing the coordination of care delivery, and improving patient access to primary health care services.

The survey results also show that MDC GPs practice with a variety of health professionals, with the vast majority (83%) working with a nurse (e.g., registered nurse, licensed practical nurse, or nurse practitioner), followed by a specialist MD (32%), physiotherapist/OT (26%), nutritionist/dietician (26%), pharmacist (23%), psychologist (22%), massage therapist (19%), counsellor/social worker (16%), and physician assistant (9%).

Figure 1
Health Professionals with Whom MDC Physicians Currently Practise *

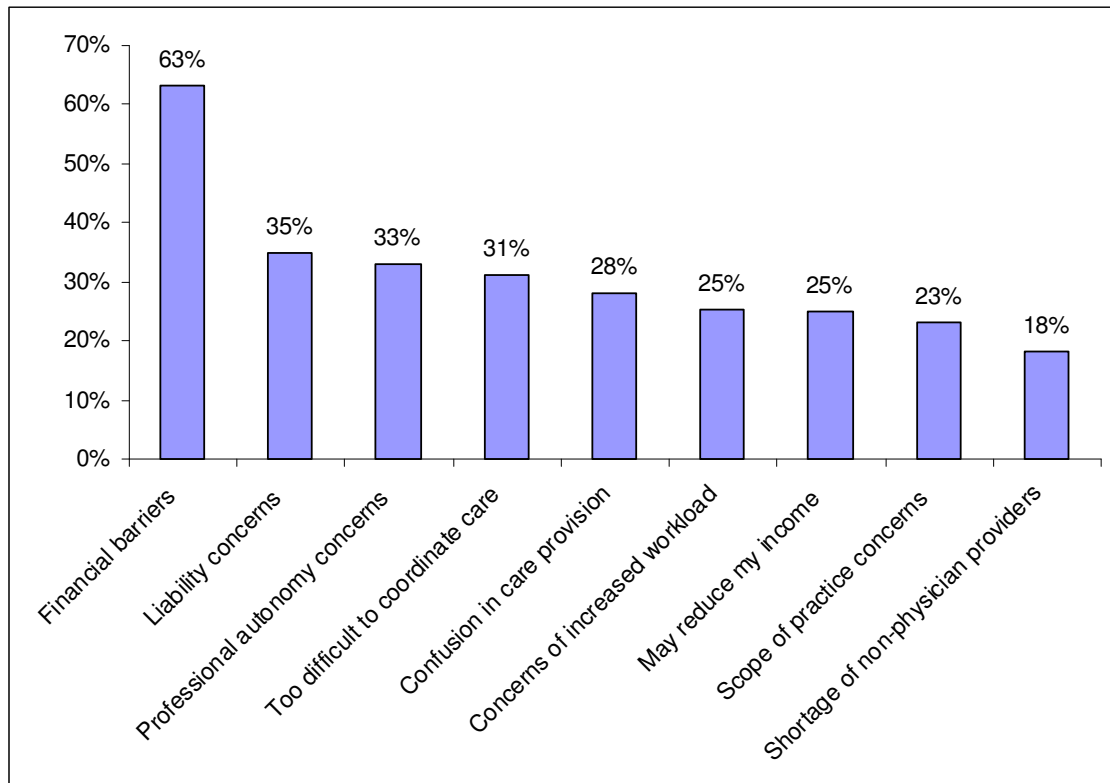


* Survey question: "Please indicate the type(s) of health professionals that you practise with (choose all those that apply)."

Those GPs not working with co-located non-GP providers were also asked with whom they would prefer to practice. The majority (71%) stated that their first preference was a nurse.

GPs not practising with co-located non-physician providers were asked for the reasons why they did not practise in a MDC setting. The most common reasons were financial barriers (63%), liability concerns (35%) and professional autonomy concerns (33%).

Figure 2
Why BC Physicians Do Not Practise MDC *



* Survey question: "What is your main reason for not working in a multidisciplinary setting (choose all those that apply)?"

Challenges to Implementing MDC

For the full potential of MDC practice to be realized, several issues must be addressed, including:

Scope of practice. MDC teams should have a written delineation of responsibility and accountability for team members in accordance with appropriate scopes of practice. Scopes of practice need to correspond to levels of training in order to ensure patient safety and to facilitate collaboration between physicians and allied health professionals. It is imperative that the medical profession continue to be involved in the process for developing regulations and standards of allied health professionals in order to ensure that patient safety is not compromised.

Liability. In a MDC setting, physicians potentially increase their risk of liability by delegating acts more frequently to a variety of allied health professionals. To help address this concern, several professional organizations, including the BCMA, the College of Family Physicians of Canada, the Canadian Medical Protective Association, and the Canadian Nurses Protective Society, have recommended that all health

professionals practising in a MDC setting have appropriate and adequate liability coverage.

Funding for MDC

The recent federal funding for MDC through the First Ministers' Accord on Health Care Renewal (2003), which includes \$2.1 billion for BC over five years, helps make successful implementation of MDC an achievable goal.¹

Efforts to fund MDC should be guided by principles designed to ensure maximum levels of participation, proper accountability, adequate levels of support, and long-term sustainability:

- To protect MDC funds from competing demands in other areas of health care, there should be a separate funding envelope for MDC.
- The BCMA needs to be integrally involved in funding decisions on MDC.
- Funding for an information technology infrastructure and training for team members must be included as part of MDC initiatives.
- Funding models must be flexible enough to accommodate variations in population health needs as well as individual physician preferences for payment mechanisms.
- Physician participation in MDC initiatives must remain voluntary. At the same time, the choice for physicians to discontinue participation in MDC initiatives must be preserved.
- MDC funding mechanisms must take into account the higher practice costs associated with the incorporation of allied health professionals into physicians' practices. Physicians who supervise, consult, or collaborate with other providers and/or function as team leaders must be compensated for their time and associated overhead costs.
- Funding decisions should be developed in an environment that allows for proper planning, a streamlined decision-making process, and a coordinated and efficient distribution of funds.

Conclusions

Significant numbers of BC GPs already practising in MDC settings agree that MDC practice can lead to more comprehensive, better coordinated care and improve patient access to primary care services. While MDC practice is not the preferred model for all of primary care, the research suggests it can improve the health of specific populations, particularly the chronically ill. With mechanisms to ensure that MDC groups are properly supported and incentives to encourage physicians to incorporate other providers in their practice, the expansion of MDC has potential to improve health outcomes.

Improvements in the quality of primary care will require significant up-front investment by government and close collaboration with the BCMA. Fortunately, recent initiatives bode well for such interaction. The BCMA/BC Government Rural Joint Standing Committee

(Rural JSC) and the General Practice Services Committee (GPSC) serve as examples of successful joint governance on issues directly affecting primary care in BC. The development of MDC policies should include meaningful input from other key stakeholders, including regional health authorities and relevant health professional organizations.

The growing BC budget surplus and the significant new funding through the 2003 Federal/Provincial Health Accord will allow the government and the BCMA to build upon previous successful collaborations. By working collaboratively, physicians, allied health professionals, and government can develop practical, effective policies for MDC practice and improve health care for British Columbians.

I. Introduction

The changing nature of primary care has prompted calls for reform from government, the medical profession, and academics. General practitioners today see a more complex caseload with chronic disease and multiple co-morbidities.² Projected increases in the prevalence of chronic conditions, combined with an aging population, ongoing concerns of patient access to primary care, and family physicians' continuing dissatisfaction with medical practice all point to the need for reform.

Multidisciplinary care (MDC) is cited as one solution to these challenges. Recent targeted funding has brought MDC to the forefront of the policy agenda. In 2000, the federal government provided \$800M to support primary care renewal initiatives in Canada,³ while in 2003 it established a five year \$16 billion Health Reform Fund,⁴ dedicated in part to primary care renewal. One goal of the Health Reform Fund is to ensure that at least 50% of Canadians have "24/7 access to multi-disciplinary teams by 2011." Reports commissioned by provincial and federal governments over the past decade have also identified the need to reform the way primary health care services are organized and delivered.^{5,6,7,8,9} A common element among these reports includes the use of multidisciplinary care teams to improve continuity and coordination of care. Public opinion also supports the use of multidisciplinary teams, with the GP as the first point of contact and team leader.¹⁰

MDC is an important component of a broader primary care approach designed to meet the need for delivering increasingly comprehensive services as the population ages and the incidence of chronic illness increases. GPs are treating a greater number of patients with more complex and higher clinical needs, as more of their care is shifted from the hospital to the community. As a result, the role and responsibilities of GPs are expanding to include longitudinal, more comprehensive care and care coordination.

Health care stakeholders differ in their understanding of MDC, the best way to implement it, and the benefits that may arise from such reform. Advocates of MDC argue that, if implemented properly, it can result in better coordination of care, meet human resource challenges (e.g., physician shortages), better maximize health care resources, and improve patient outcomes (particularly for those with chronic conditions). Concerns over increased costs, professional autonomy, liability, governance issues, scopes of practice, and payment methods remain. Despite greater focus on MDC and primary care renewal, few physicians in BC or Canada are adopting such models. According to the 2004 National Physician Survey, only 2% of BC GPs (1.8% nationally) said they had changed to a multidisciplinary practice in the past two years.¹¹

There have been several attempts to renew primary care in BC. Previous attempts at health care reform in BC show that leadership from providers is essential for MDC to advance as part of a broader primary care renewal effort. Without such leadership,

policy-makers may design renewal strategies that do not reflect the needs of patients or the expectations of practitioners.

In this report, the BCMA builds upon the Association's recommendations in the 2002 primary care renewal paper, *Ensuring Excellence*,¹² which supported multidisciplinary practice. This report provides a vision, composed of principles and a framework for MDC in community-based settings that BC physicians see as critical for promoting team-based and collaborative primary care.

Definition

Primary care provides the first point of contact for individuals accessing the health care system and facilitates continuity of care. Through primary care, short-term episodic health issues are resolved and chronic conditions are managed.

Multidisciplinary care (MDC) remains loosely defined with an inconsistent and interchangeable use of terms (e.g., interdisciplinary collaboration, team-based care).¹³ From the literature, the term interdisciplinary practice implies that care is co-dependent, the roles and responsibilities of health care providers may shift depending on their experience, and group decisions are made about patient care. Multidisciplinary practice is characterized by teams whereby the providers work more independently in planning patient care.¹⁴ In this report, we developed a working definition of MDC that incorporates elements from both traditional views of multidisciplinary and interdisciplinary practice:

Multidisciplinary care involves a group or team of diverse health professionals who participate collaboratively and interdependently in the care of a defined group of patients.

Organization of the report

The report begins with a review on previous research of MDC and key elements of successful MDC teams. This is followed by a discussion of multidisciplinary care in British Columbia. Additional challenges to implementing MDC are analyzed. The report concludes with a vision for MDC in BC.

II. Multidisciplinary Care: Previous Research and Key Elements

Research on multidisciplinary care encompasses a broad range of studies examining clinical effectiveness (e.g., morbidity and mortality, process measures, patient and provider satisfaction), cost impacts, and the organization and management of MDC teams. MDC practice, if expanded in BC, would affect the entire primary care patient population, but the vast majority of studies on the clinical or cost impact of MDC focus on patient sub-populations, such as chronic disease patients. The applicability of findings or conclusions from the research literature to the BC context is therefore limited. The following sections examine the research literature in each of these three areas.

Clinical effectiveness

Advocates of MDC cite potential gains in health outcomes as a primary benefit, in terms of mortality, morbidity, physiological measures and, increasingly, more subjective patient-based assessments of health.¹⁵ Evidence showing the effect of MDC on some indicators of health outcomes exists in a variety of settings, although studies are limited to specific patient populations, as shown below:

Diabetes patients - Among diabetes patients, MDC appears to improve glycemic control and cholesterol levels.¹⁶ Two studies in the UK demonstrated that better teamwork and team climate are associated with better processes of care for patients with diabetes.^{17,18}

Mental Health - Among patients with depression, MDC was associated with improvements in mental health outcomes and no increase in medical visits.¹⁹ For mental health patients in a primary care setting, those treated by a MDC team were less likely to be admitted to the hospital.²⁰

Asthma - Roblin et al. assessed the impact of collaborative clinical culture, as characterized by role collaboration, appropriate task delegation, team affiliation and provider autonomy, in 25 primary care teams on patient satisfaction and quality of care for diabetes and asthma patients. Findings suggest that those teams with higher “collaborative clinical culture” scores have superior patient outcomes, including better patient satisfaction and better control of diabetes and asthma.²¹ Similarly, interdisciplinary collaboration was found to reduce ER visits, reduce hospital admissions, increase the rate of steroid prescriptions (consistent with national guidelines), and improve communication between the ER and the patient’s primary care team.²²

Other Conditions - Stewart et al.²³ found that multidisciplinary home-based interventions had the potential to lower the rate of unplanned hospital readmissions and associated health care costs, prolong event-free and total survival, and improve quality of life among

patients with chronic congestive heart failure. A systematic review of the literature found that formal liaisons between GPs and specialist physicians led to greater patient satisfaction among patients with diabetes, hypertension, chronic schizophrenia, and geriatric problems.²⁴ Palliative care patients requiring symptom relief were found to be best served in the community where the GP was part of a care team.²⁵

The impact on patient outcomes associated with MDC in other primary care populations is limited. This is not surprising; the relationship between practice activities and health outcomes is complex. Mortality and other severe negative outcomes are rare in the mainstream population. Program effects can be difficult to detect because of the small proportion of patients potentially affected by these severe outcomes. Other difficulties in evaluating health outcomes include controlling for case mix and measuring functional status.

The application of these clinical findings to primary care practice in British Columbia should be done with caution. As MDC practice develops in British Columbia, formal efforts to evaluate these programs should be undertaken by an independent party. The previous evaluation of BC's Primary Care Demonstration Project did not examine issues of clinical outcomes or quality of care related to MDC.

Cost impact of MDC

Results of research on the cost impact of MDC is mixed. Cost impact studies tend to focus on one of two subjects. First is the potential for labour cost savings or efficiency improvements as allied health professionals act as lower-cost provider substitutes in MDC settings.[†] Most of this research examines exclusively the role of nurse practitioners (NPs) and physician assistants (PAs). While some studies indicate that the use of NPs and PAs can lead to labour cost savings in primary care practices,^{26,27,28,29, 30} such conclusions have been criticized for not fully accounting for non-physicians seeing fewer patients per hour and working fewer hours per week than physicians.³¹ One randomized controlled trial of the cost effectiveness of nurse practitioners and GPs in primary care found that health service costs were similar between nurse practitioners and GPs.³² A recent systematic review of 16 studies in the UK, USA, and Canada found little evidence that shifting patient care from physicians to nurses reduces physician workload or health care costs.³³ There is a lack of research on the cost effectiveness of other allied health professionals working in MDC environments.

[†] The role of non-physician providers can generally take one, or a combination, of three forms: (1) supplementary, whereby the non-physician provider extends the efficiency of the physician by assuming part of the tasks, generally those that are technical in nature and usually under the direction of the physician; (2) complementary, whereby the non-physician provider extends the effectiveness of physicians by undertaking additional tasks for which they are uniquely qualified to perform; and (3) substitutive, whereby the non-physician provider replaces the role of the physician for a select type of services. Source: (Starfield, B. *Primary Care: balancing Health Needs, Services, and Technology*. Oxford University Press, New York:1998, p.91).

Chronic Disease Patients

A second area of cost impact research focuses on potential reductions in health care spending (e.g., reduced hospitalizations, inpatient visits, and emergency room use) due to increased MDC. There is some support for reduced costs in the hospital sector by MDC, including among chronic illness patients.^{34, 35, 36} MDC teams may also lower ER visits, lengths of stay in hospitals, and inpatient bed usage.^{37,38,39,40,41,42} Similarly, a UK study found that patient placement in primary health care trusts as compared to traditional primary care settings was associated with reduced hospitalization and health care costs among elderly and chronic illness patients.⁴³ However, other studies show no cost savings associated with MDC care. Rates of specialist referrals and medical visits did not appear to be affected by multidisciplinary care interventions,^{44,45} and two studies found no cost-effectiveness associated with MDC, although the authors were careful to note that MDC costs may be offset by long-term savings.^{46,47}

Application of these clinical and cost effective studies to MDC in British Columbia must be done with caution. The research literature focuses on specific populations, usually chronic disease patients. These results are only generalizable to the extent that British Columbia GPs' patient case-mix resembles these populations. While this is certainly possible given the growing incidence of chronic disease in BC, further analysis will be necessary. For the BC government, long term cost savings may be realized from MDC practices servicing chronic disease patients but, to date, this has not been assessed nor quantified in BC.

To ensure that MDC expansion is understood as thoroughly as possible, future program evaluations should examine both the quality of care and cost impacts of these issues. The framework for such evaluations should be in place prior to MDC implementation to ensure that the evaluations are rigorous and properly conducted.

Recommendation 1

That the impacts on quality of care and cost of multidisciplinary primary care be externally evaluated using established criteria mutually agreed upon by the BCMA, government, and other appropriate professional organizations.

Key elements of multidisciplinary care

Much research has been devoted to examining those factors that lead to successful MDC teams. A team is a group with a specific task or tasks, the accomplishment of which requires the interdependent and collaborative efforts of its members.⁴⁸ Health professionals working in multidisciplinary care settings must be able to work together as a team in order to succeed. But whether a group of health professionals who participate in the care of a defined group of patients is considered a team will depend on how they function as a group – whether they meet, whether they explicitly define clinical roles, and what kinds of clinical roles they have. Thus, a consideration of teams evokes two questions: “Considering the needs of the patient population, which health care providers should be on the team?” and “How can a group of health professionals act as a team rather than a collection of individuals?”

The composition of a team depends on the patients being served and the environment in which it is working. Because primary care is orientated to the local community, local circumstances dictate who will be members of a primary care team. Teams change and evolve to meet the needs of patients and can include nurses, physicians, dieticians, nurse practitioners, physiotherapists, occupational therapists, social workers, mental health workers, psychologists, pharmacists, speech therapists, family service workers, and other practitioners required to respond to the needs of the patient.⁴⁹ The specific elements included in any program of multidisciplinary primary care development should take into account those features unique to each health region (e.g., disease prevalence, local barriers to optimal care, and local resources). For example, a patient suffering from a myocardial infarction is likely to benefit most from a team model that is designed for rapid assessment and intervention whereas a patient with complex chronic diseases have been hypothesized to experience better outcomes with team-orientated practice models that provide coordinated multidisciplinary care. A variety of team models needs to exist in the primary care system in order to accommodate different types of care.

A team that functions well requires effective teamwork to be exercised. Effective team members understand what teamwork is and why it is important. The World Health Organization (WHO), which considers teamwork essential to the delivery of primary health care, defines teamwork as follows:

*“...the coordinated action carried out by two or more individuals jointly, concurrently or sequentially. It implies commonly agreed goals, clear awareness of, and respect for, others’ roles and functions. On the part of each member of the team, adequate human and material resources, supportive cooperative relationships and mutual trust, effective leadership, open, honest and sensitive communications, and provision for evaluations are present. Teamwork is a process rather than an end itself and occurs whenever two or more workers interact to solve problems, whether in a formally constituted team or informally.”*⁵⁰

Teamwork does not necessarily follow from professionals working together, and the path to achieving teamwork may be a long and difficult one. As prerequisites, key elements are needed for teamwork to be effective. Effective teamwork has been identified as having certain specific characteristics:

- The members of a team share a common purpose that binds them together and guides their actions;
- Each member of the team has a clear understanding of his or her own functions, and recognizes common interests;
- The team works by pooling knowledge, skills, and resources, and all members share responsibility for outcome; and
- The effectiveness of a team is related to its capability to carry out its work and to manage itself as an independent group of people.⁵¹

Cohesive health care teams exhibit six key characteristics:^{52,53}

1. Shared objectives and clear goals resulting in measurable patient outcomes;
2. Clinical information and administrative systems;
3. Division of labor or defining the roles of providers;
4. Teamwork training of all team members;
5. Effective communication; and
6. Mutual trust among team members.

Along with these key characteristics of effective teams, we add:

7. The need for team leadership; and
8. Collaboration.

The following sections explore each element.

Shared objectives and goals

Team goals need to be defined in terms of overall vision statements and specific, measurable operational targets accepted by all team members. High-performing team members share common goals. Mutually developed goals are clearly related to the group's vision, and each team member understands their role in attaining the vision. Examples of vision statements can be to improve patients' health, to reduce barriers to accessing care, and to enhance patient and provider satisfaction.

Examples of measurable operational targets may be to have a certain percentage of diabetic patients with reduced hemoglobin A1c counts or to have 90% of patients waiting less than a week for a non-urgent appointment. Goni⁵⁴ found that outcomes of patient-

perceived quality and patient satisfaction were higher for primary care teams with common goals, confidence in the group to overcome obstacles, and open communication when compared to primary care teams without these characteristics. In patient sub-populations, teams with greater cohesiveness are associated with better clinical outcome measures and higher patient satisfaction.

As a first priority, MDC teams must establish a clear vision and a realistic set of targets to be adopted and shared by all team members. Most importantly, the targets should be designed to improve the quality of patient care and should be communicated to all team members in a clear and concise manner. The process of establishing a shared vision and operational targets must be facilitated by a team leader.

Clinical information and administrative systems

Multidisciplinary care requires providers to communicate with one another about their patients and to coordinate care. The presence of clinical information and administrative systems facilitates this communication and coordination in a number of ways:

Promoting the use of clinical care management protocols. Evidence-based practice guidelines or protocols ensure that provider teams are aware of effective treatments. This information must be integrated into the fabric of decision-making in order to impact patient care meaningfully.⁵⁵ Clinical information systems can help integrate clinical guidelines where they are most effective by embedding them at the point of care in the form of reminders at the time the patient is seen.⁵⁶

Providing individual- and population-level data. Clinical information systems may provide useful, timely data about individual patients and populations of patients. Clinical information systems such as chronic disease registries serve as a valuable tool for decision support. Clinical system functions also include procedures for providing prescription refills and informing patients of laboratory results. Clinical information systems can also provide feedback to physicians on their clinical performance for preventative and long-term care. Such feedback has been shown to improve both process and outcome measures in diabetes care⁵⁷ and have a modest but significant positive impact on other clinical processes and outcomes.⁵⁸

Improving clinical processes through the use of reminder systems. Computerized reminder systems improve the clinical process for a variety of conditions by scheduling regular visits with defined clinical goals such as ordering tests to determine glycosylated haemoglobin and lipid levels, foot examinations, counselling smokers, diabetic eye examinations, immunization, blood pressure screening, clinical processes for diabetes care, and others.^{59,60}

Increased use of home telecare. Home telecare involves home-based disease management programs with the primary role of providing support for the patient rather than the health professional(s). In order to increase compliance with self-management regimens amongst chronic disease patients, clinical information systems can be applied to home telecare. For GPs, this will enhance their ability to manage chronic disease by providing the necessary support to continue care outside the standard consultation and the ability to monitor treatment progress.⁶¹

Electronic Health Records

One of the most important clinical information systems to improve patient care is the electronic health record (EHR). The EHR enables clinicians treating people in a variety of settings to exchange and continuously update a patient's clinical data and then present that information in logical clinical groupings that other clinicians can access easily. The key functions of an EHR system are health information and data storage, results management, order entry and management, decision support, electronic communication connectivity, patient support, administrative processing, and reporting and population health management.⁶² A British Medical Journal study of GP practices with electronic and paper-based records found electronic records were more legible and understandable, as well as more likely to have at least one diagnosis recorded. The study also notes that good quality electronic records can prompt better care and improve coordination of care between primary and secondary care. Bodenheimer and Grumbach argue that EHR systems offer greater convenience, accessibility, integration, and accuracy of information about individual patients compared to practices without one.⁶³ EHR systems facilitate sorting and retrieval of patient information to produce chronic disease registries and reminder prompts for clinical and preventative services. In a 2003 BCMA survey on information systems, 71% of physicians stated that patient care has improved with the implementation of electronic records in their practice. Seventy-three percent of total respondents also believe that electronic records can improve work efficiency, while 68% stated they could improve the quality of patient care.

Recommendation 2

That the provincial government, health authorities, and the BCMA work immediately toward establishing an IT infrastructure as a critical element of MDC with the goal of electronically linking physicians and allied health professionals through an Electronic Medical Record and core data set.

Virtual Groups

Given the advances in information technology, it is often unnecessary to locate health providers in the same physical space. Many of the advantages of group practice can be

realized through the development of so-called ‘virtual’ groups separated by distance but connected through IT. A fundamental difference between such virtual groups and the already existent call group associations among GPs is the required sharing of clinical information on patients within the group, ideally through an EHR. Currently, few BC GPs are practising in virtual MDC groups. According to the 2004 BCMA MDC survey, only 9% of respondents indicated that they are working in a virtual MDC practice.

Barriers to Adoption of Clinical Information and Administrative Systems

Clinical information and administrative systems are essential components of multidisciplinary care, where the need for communication among providers is particularly great. However, successful implementation of these systems requires that critical barriers be addressed.

Lack of common technical standards. An effective EHR system must interface with laboratories, x-ray departments, hospitals, specialists, pharmacies, and other health providers. Currently, the connectivity between community-based physicians and other parts of the health care system is problematic. The need for common technical standards to record and transmit clinical information is widely recognized.^{64,65}

Support for IT training of MDC team members. Clinical information and administrative systems alter existing information and work-flow patterns and require a conscious examination of practice procedures and office staff division of labour.⁶⁶ In any team setting, it is important that all providers have the basic training and knowledge to use various clinical information systems.

Financial costs. GP practices, particularly small ones, are inhibited from adopting IT because of high costs. Although some measures to reduce IT expenses can be adopted – for example, adopting a modified EHR system, the so-called “electronic medical summary,” instead of a full-scale model⁶⁷ – shifting a practice to an electronic data system where none exists remains a major undertaking. Government investment into IT infrastructure for physicians in MDC practices will be required if electronic data systems are to be implemented successfully. Moreover, there is increasing recognition that payers who provide IT funding for physicians will realize cost efficiencies. Purchasers of care are the most likely to benefit financially from implementing EHRs through reduced numbers of unnecessary hospitalizations, repeat tests, and adverse drug reactions, especially for the chronic disease patients.⁶⁸

Recommendation 3

That funding be provided for implementing and maintaining information systems (clinical and administrative) in multidisciplinary group practices, including training resources for team members.

Liability concerns. Another issue related to the use of electronic data systems amongst various providers is the legal liability of physicians relying on data from other providers, which to date has not been established. For example, case law offers little guidance on the liability of a physician for acting on clinical information made available but not requested. Similarly, there is uncertainty about whether an email message from a patient constitutes part of a medical record for which the physician may be liable.⁶⁹ To assuage these concerns, physicians may need to be educated on medical risk management or actual legal protection. Guidelines and active involvement of the medical liability industry in designing electronic data systems may be necessary as well.⁷⁰

Privacy concerns. Without confidence that the privacy of electronic information will be maintained, patients may refrain from disclosing critical information, may refuse to provide their consent to use personal health information for research purposes, may lie about health status, or may simply not seek treatment.⁷¹ It is critical that patient information is protected and members of the health care team are able to access only the information they require to care for an individual patient. The BCMA therefore believes that responsibility for data stewardship in primary care should be retained by GPs – the health professional most responsible for the coordination of care.

Recommendation 4

That health information policies and information technology be developed to protect patients' privacy rights whilst facilitating the effective sharing of information among physicians as well as between physicians and allied health professionals.

Effective Teams

The roles of various health care providers are changing as new models of delivering care are explored and implemented. The attempt to create a health care system that is more “patient-centred” may lead to changes in the way health professionals are trained, the way they are paid, and the way in which they work together.⁷²

A properly constructed division of labour involves a definition of tasks and an assignment of roles. The objective of defining appropriate roles is not to replace one health care provider with another, but to ensure that the patient is being cared for by a provider with

the necessary skill sets. Each team member must know and be well trained to accomplish the role required to perform each task. The strengths of each team member are identified and used, and individual efforts are coordinated when necessary. Ultimately, team productivity should increase as workload is appropriately shared. Practice systems including clinical and administrative tools can be used to track the assignment of tasks and definition of roles.⁷³

While training and legal scopes of practice largely determine team members' roles, the skills of various health care professions overlap to some extent. In cases where there is overlap, it is important to ensure that the most appropriate provider is caring for the patient at any given time. This is particularly critical as the prevalence of chronic disease increases, resulting in a greater need to share care among providers. For example, National Health Service (NHS) nurses in the UK have taken on a larger role in managing patients with chronic disease. Specialist nurses there work alongside both General Practitioners and consultants to assist in managing people with complex problems in both hospital and community settings. Practice nurses also act as case managers to patients with conditions such as diabetes in primary care.⁷⁴ There is emerging evidence supporting the efficacy of non-physician providers in complementary roles within a team. Rather than functioning as physician substitutes, team members can contribute unique talents that enhance the skill mix of the practice such as health prevention, patient education, and counselling. The literature has suggested that the real potential for team care to improve health outcomes for chronic disease patients is to focus on providing complementary and/or supplementary functions (e.g., counselling on behavioural change, patient follow-ups).⁷⁵ As the move toward MDC pushes forward, care may be provided by other health care providers such as nurses, nurse practitioners, and care assistants depending on the complexity of tasks, degree of autonomy, and level of training.

Some tasks traditionally undertaken by the General Practitioner can be covered within the multidisciplinary team by members with particular skills and expertise in those areas. Detailed health professional job descriptions that clearly outline the roles and responsibilities of all providers in the MDC setting should be developed in order to best meet patients' needs. These job descriptions must be within the scopes of practice established for each of the professions. Members of a health care team must be clear on which health care provider is responsible for which aspect of the patient's care. This information should be communicated to the patient and documented in the health record. The College of Physicians and Surgeons of BC states that physicians should specify in writing the relationship between themselves and other healthcare provider(s), including a statement regarding the lack of mutual responsibility for patient care. However, if the associated healthcare provider is unregulated, the physician must take full responsibility for the quality of care provided.

Physician Assistants

A physician assistant (PA) is a health care professional who practises medicine under the supervision of a physician in a PA-physician team. In Canada, there has been growing interest in the use of PAs to extend physician resources in primary care, especially in under-serviced areas with no or few physicians.⁷⁶ In May 2003, the CMA Allied Health Accreditation body officially recognized the PA profession. Currently, PAs provide up to 95% of the primary health care within the Canadian Armed Forces, although their practice in the civilian arena is limited. Manitoba is the only province that licenses and regulates PAs under the Clinical Assistant (CA) Registry contained within the Medical Practitioners Act. The only training institution in Canada for PAs is the Canadian Forces Medical Service School in Borden, Ontario. The Justice Institute of BC has signed a five-year memorandum of agreement with the MEDEX Northwest Program affiliated with the University of Washington Medical School to import their accredited two-year PA curriculum to BC. Currently, there is no enabling legislation for licensing PAs to practise in BC.

Unlike nurse practitioners who have their own scope of practice and are regulated separately from physicians, PAs are not allowed to work independently. Instead, their scope of practice mirrors that of the supervising physician and is carefully outlined in a practice contract or agreement. Because the PA training curriculum emphasizes the development of the PA-physician relationship, GPs are comfortable working with PAs and willing to delegate responsibilities to them. Examples of PA services include taking patient history, conducting physical exams, diagnosing and treating illness, ordering and interpreting lab tests, counselling on preventative health, assisting in surgery, and writing prescriptions. Within the physician/PA relationship, PAs collaborate closely with their supervising physician to ensure the care and management they provide is in keeping with the physician's patient management practices. The clinical versatility of PAs makes them particularly valuable in supplementing physicians in a wide range of roles. Furthermore, because physician supervision of the PA can be remote, PAs are well-suited to help meet the health care needs of remote and/or underserved populations by working as “physician-extenders.”

Training

Teams go through stages of development. Team implementation is a complex change process that requires planned training and development for team members involved.^{77,78} Teams cannot be created instantly but are developed over time and require investment on an organizational, professional, and interpersonal level.

Opportunities for training in team functioning and productive team behaviours should be provided. Training can take the form of workshops, conferences, training guides with modules addressing common problems, management classes for team leaders, and

consultant support. A benchmarking tool to evaluate team functioning should be in place. Although resources for team development and staff training can be high, it must be considered a long term investment in service development and not necessarily viewed with a short-term focus of saving money.

Training for effective team skills should also be included in health professional training. It has been argued that when health care professionals are expected to work and function collaboratively as part of multidisciplinary teams, they should be prepared to engage in these activities through undergraduate education, clinical training and professional development.^{79,80} A good example of such an initiative is the Inter-Professional Rural Program of BC, which was designed to promote multidisciplinary learning among health professionals to enhance health care services in rural communities. Under this program, students in rural communities are organized into teams of four or more members from a range of disciplines. Students are able to share and engage in team activities beyond the scope of their discipline-specific training.⁸¹ The BCMA believes that such collaborative training opportunities should be evaluated, explored further, and funded appropriately by government.

It is important to emphasize that training within the health care system is a life-long process. Physicians and other health care professionals should be updating their skills on a continual basis. Such training, however, should have a greater focus towards team-based approaches to patient care. As a potential example, continuing medical education (CME) opportunities covering practice governance issues could be developed to allow physicians to participate in joint training sessions with other health care professionals. In addition, other tools along with CME (e.g., incentive structures) may also be effective in enhancing team-based approaches to care. Other subject areas might include how to better manage chronic care patients or how to use the latest health information technologies.

Effective communication structures and processes

Effective communication among providers is essential for delivering safe and high quality team-based care. Today, communication failures are a common cause of inadvertent patient harm, and the complexity of medical care, coupled with the inherent limitations of human performance, make it important that clinicians have standardized communication tools, work in an environment in which individuals can speak up and express concerns, and share common "critical language" to alert team members to unsafe situations.⁸²

Communication is the foundation of success for interdisciplinary collaboration.⁸³ Effective and efficient communication can be facilitated by information technology (IT), protocols, face-to-face and minute-to-minute conversations, regular meetings, and use of a common language that is consistent, easily explained and understood by all team members and clients. The availability and ease of communication are increased with the

co-location of services. However, electronic communication technology may be sufficient to facilitate virtual interdisciplinary teams.⁸⁴ For example, given the advances in IT, it is often unnecessary to locate physicians as well as other health care providers within the same physical space. Many of the advantages of MDC practice can be realized through the development of ‘virtual’ groups, separated by distance but connected through IT. The formation of virtual MDC groups, which could share on-call responsibilities as well as patient information, should be supported. In many cases, virtual groups are more feasible than creating large group practices in the same location due to considerable capital and transaction costs (e.g., leases) and geographic considerations.

Multidisciplinary team meetings should be held frequently in order to facilitate communication linkages. In one Canadian survey, 86% of providers found that team meetings were useful and strongly agreed that working with other health care professionals was helpful.⁸⁵ Team members should also be able to voice their concerns and opinions in an open fashion. This openness is critical as team members should be encouraged to report all medical errors in order to improve patient care and reduce future errors. A recent study on patient safety, for example, shows that poor team work leads to increased incidences of adverse events in hospitals.⁸⁶ Helmreich et al. (1994) also note that the most significant outcome factors related to teamwork are patient safety and quality of treatment.

Team leadership

The role of a leader is a key component of team development. MDC teams without clear leadership report low levels of team participation, lack of clarity about objectives, low commitment to quality of care and low support for innovation in quality of care.⁸⁷ Lack of clear leadership was also associated with higher levels of stress among team members.⁸⁸

A fundamental challenge with the team approach to health care is to structure the team in terms of authority, autonomy, and liability more effectively. Even with the best collegiality, differences of opinion will inevitably arise. “Care by Committee” becomes problematic, as a single professional ultimately needs to be responsible and accountable for clinical decisions and actions.

Practising physicians are the leaders and primary decision-makers in health care (in BC, GPs see 81% of the population at least once in a year)⁸⁹ – in large measure because of their legal responsibility for patient care decisions as well as their possession of extensive education and training.⁹⁰ Where available, GPs should continue to act as the coordinator of care for the majority of patients. Effective multidisciplinary teams require a clear delineation of responsibility and accountability, including a clinical team leader who should be the best-trained generalist. In the majority of instances, this would be the GP.

Recommendation 5

That multidisciplinary care teams have a clinical team leader with ultimate responsibility for patient care and who is the best-trained generalist. In the majority of instances, this would be the GP.

Team members should be held independently accountable for their own professional practice within their own scope of practice. Physicians should require from all regulated health professionals evidence of liability coverage that is sufficient to cover actions that might arise from negligent performance.

The importance of team leadership in MDC should not be underestimated. A recent Saskatchewan document on primary health care, for example, found that teams without clear leadership reported lower levels of participation, a lack of clarity about objectives, low commitment to quality of care and low support for innovation in quality of care.⁹¹

Practice governance is the business of managing and running a practice. The main components of effective practice governance include:

1. Clear lines of responsibility and accountability;
2. Programs for quality improvement;
3. Education and training plans; and,
4. Procedures to identify and remedy poor performance.⁹²

As long as these general principles are adhered to, there should be flexibility in governance structures across practices. The team leader, or another member of the team, should be responsible for setting up team logistics such as meeting dates, creating agendas, quality improvement plans, and performance reviews.⁹³ The team leader must also communicate effectively to team members through well-established practice governance structures and processes. The creation of practice governance templates may further aid this process and ensure that it aligns with the clinical goals and objectives of the team.

Collaboration

Collaboration is an extremely important element in teamwork. To collaborate is “*to work together, especially in a joint intellectual effort.*”⁹⁴ Collaboration is an attitude and an interpersonal process that embodies cooperation and a spirit of working together. Collaboration is a way for professionals to provide quality, comprehensive, and efficient care.⁹⁵ The critical attributes for collaboration include sharing in planning, decision-making, solving problems, setting goals and assuming responsibility, working together cooperatively, and coordinating and communicating openly.

According to the Canadian Medical Association and the Canadian Nurses Association,⁹⁶ interdisciplinary collaboration has the following attributes:

- Development of a common purpose or care outcome;
- Acceptance and recognition of complementary skills and expertise among different providers; and
- Effective coordination and communication among providers that strengthens inter-professional communication and increases the efficient use of health care resources.

Strategies that team members should use to enhance collaboration include:

- Establish standards for accomplishing tasks and identify norms for team behaviour;
- Encourage all team members to contribute;
- Listen carefully and respectfully to all opinions, brainstorming possible solutions and focusing on common interests;
- Seek consensus in arriving at the best decision;
- Give and receive feedback about positive and/or negative behaviour; and
- Review and evaluate progress at the conclusion of interaction.⁹⁷

Collaboration, one of the most important factors for any team to be effective, is *“a joint communication and decision-making process with the goal of meeting the patient’s health needs as best as possible while respecting the unique qualities and abilities of the profession”*.⁹⁸ In order for primary care physicians to address the complex needs of their patient population, they must be able to collaborate with other health professionals.⁹⁹ Likewise, other relevant health professionals must equally be able to collaborate with primary care physicians. The importance of collaborative education for health professionals was recently recognized at the University of British Columbia. In July 2005, the university created the position of Director of Interprofessional Health Education in the Faculty of Medicine.¹⁰⁰

Recommendation 6

That health professional education programs foster enhanced collaboration among providers and that such programs be critically evaluated.

Summary

By developing shared objectives and goals to improve the quality of care, MDC teams will be more effective. A team leader who can communicate these objectives and goals through appropriate structures and processes is critical for effective team work. Team members require a clear definition and delineation of their roles and responsibilities to ensure that patients receive the right care from the right provider in a safe and efficient manner.

Clinical information and administrative systems are crucial to support effective teams as is ensuring that team members have the appropriate level and type of training to care for patients. Training should have a greater focus on team-based care within MDC practices, whether real or virtual. All of these elements for establishing effective teams will require greater collaboration among various health care providers. Without collaboration, MDC teams will be ineffective and the true benefits of MDC (e.g., better coordination of care) will not be fully realized.

III. Multidisciplinary Care in British Columbia

Primary health care organizations in BC

The BC government has introduced primary health care organizations (PHCOs) as a delivery model that incorporates an integrated, multidisciplinary approach to care. Seven PHCOs were established in 1999 as part of BC's Primary Care Demonstration Project and supported by the federal Health Transition Fund (1998-2001). Government's key objectives for PHCOs included:

- An interdisciplinary team approach to primary health care delivery (in which each health care provider contributes to patient care according to their competencies and skills);
- 24/7 access to advice and care (including some extended hours);
- Patient access to the full range of primary health care, including health promotion and illness/injury prevention services;
- Quality assurance mechanisms (e.g., setting population health target goals, case-finding, use of clinical protocols, peer review, outcomes monitoring) and patient satisfaction monitoring through direct patient surveys;
- Continuous patient health records via clinical information management systems technology;
- Integration with community-based services; and,
- Use of a blended funded model that included FFS income and capitation adjusted for age, sex, and health status with additional infrastructure funding.

BC received \$74 million through the federal Primary Health Care Transition Fund (PHCTF) between 2002 and 2006. The majority of funding is being provided to BC's Health Authorities to help accelerate and expand primary health care initiatives, including PHCOs.[‡]

PHCO retrospective review

A retrospective review of the six original PHCOs was undertaken during the spring of 2003¹⁰¹ to examine the quantitative indicators of performance. One of the study

[‡] As of May 2005, fourteen PHCOs have been established: Agassiz Primary Care Centre, Brookwood Family Practice, Chase & District Health Centre, Clearbrook Family Practice, Fort Family Practice, James Bay Community Project, Kamloops Downtown Health Centre, Ladysmith Primary Health Centre, Langley Primary Health Care Associates, Logan Lake Health Centre, Murrayville Family Practice, Spectrum Health Centre, UBC Family Practice Centre, and Urban Primary Care Centres (Evergreen, Pacific Spirit and Raven Song Community Health Centres).

questions centred on whether the PHCO practices incorporated key features of primary care, including integrated multidisciplinary care.

The review found that the concept of integrated multidisciplinary care was not fully realized in the majority of PHCOs. At the outset, each PHCO was required to include at least one non-medical practitioner in the care provider team. All six PHCOs that were assessed hired at least a nurse, and four sites added other allied health professionals (dietitians, pharmacists, and mental health workers) to the team on a part-time basis. Site personnel reported a desire to include other practitioners, but this was offset by the cost of doing so. At sites where disciplines other than nursing were involved, the positions were funded by government or pharmaceutical companies. The study also found that the small number of physicians involved may have limited the PHCOs' ability to enrol more patients, and as a consequence, restricted their ability to recruit more and a wider mix of allied health professionals. With only a minimum number of allied health professionals involved, there was little opportunity for sharing clinical and non-clinical tasks.¹⁰² It is likely that increasing the number of allied health professionals would have helped with this problem.

Current practice in BC

Outside of PHCOs, the dominant primary care delivery model in BC currently includes private practice physicians who work primarily alone or in groups. These practitioners may associate with other health care professionals, including nurses. According to the 2004 National Physician Survey, 64% of BC GPs worked in group practice (60.5% nationally), compared to 23% who worked in solo practices (25.5% nationally). However, many details of multidisciplinary practice in BC are unknown, including the extent of inter-professional collaboration in family practice settings and the extent to which family physicians liaise with PHC providers who work in other settings. To date, there is qualitative evidence on the successful use of clinical practice teams in the BCMA-sponsored Diabetes Collaborative. These physician-led teams have found that non-physician providers, both in and out of the office, are an asset in delivering care for diabetes patients. For example, Medical Office Assistants flagged all diabetes patients' charts, measured the patients' weight and blood pressure, and entered all patient flow sheet data into the web-based CDM Toolkit. Local diabetes education centre nurse educators met with groups of patients at the doctor's office, conducted foot exams, and worked with patients to adjust their insulin or medications. Nutritionists from local grocery stores led interactive group visits to provide information on healthy food choices. Local pharmacists educated patients on proper glucose meter use. Between February 2004 and March 2005, 92 GPs were involved in these diabetes clinical practice teams.

The BCMA conducted a web-based survey of General Practitioners in British Columbia to understand better the overall state of multidisciplinary practice in primary care. The objective of the survey, which was e-mailed to approximately 3,000 GPs, was twofold:

first, to determine the nature and extent of current MDC arrangements in BC, and second, to determine members' attitudes towards MDC. Although the findings of the survey rely on self-reported data, the responses give a much better overview of MDC practice than previously available.

GPs were classified according to two criteria. First, they were asked whether or not they practised with non-physician providers co-located in the same practice (e.g., a nurse working in the same office). Second, they were asked in what type of setting they practised: either (1) an office-based practice, such as a private office, community health centre (CHC), or primary health care organization (PHCO); or (2) a hospital, long-term care facility, or other setting. These questions were used to define a MDC GP as follows:

A GP who practises with co-located non-physician providers, and whose practice setting is a private office, community health centre (CHC), or primary health care organization (PHCO).

The remaining non-MDC GPs were classified into two groups:

- Group I includes those GPs that practise with co-located non-physician providers, but whose practices are based in a hospital, long-term care facility, or other setting.
- Group II includes GPs who do not practise with co-located non-physician providers.

Table 1 summarizes the characteristics of all survey respondents.

Table 1: Characteristics of BC MDC Survey Respondents

	MDC GPs	Non-MDC GPs		All Respondents
		Group I	Group II	
Number of Respondents	107 (17% of sample)	97 (15% of sample)	433 (68% of sample)	638
Practise with co-located non-physician providers	Yes	Yes	No	n/a
Practice Setting	Private Office/ CHC/PHCO*	Hospital/ LTC/Other**	Private Office/ CHC/PHCO*	n/a
Average age group	46-50 years old	46-50 years old	46-50 years old	46-50 years old
Rural residence	28 (26%)	25 (26%)	102 (24%)	155 (24%)
Mean practice size (Physician FTEs)	4.4	5.1	3.5	3.9
Female	34 (32%)	33 (34%)	134 (31%)	201 (32%)

* CHC = Community Health Centre. PHCO = Primary Health Care Organization.

** LTC = Long-term Care.

A total of 638 GP responses were received (response rate = 21%). Of those surveyed, 17% were MDC GPs. This figure corresponds very closely with the results of the CMA 2004 National Physician survey, which found that 17.2% of BC GPs practised with at least one other non-physician provider in an “office-based” setting. Among the non-MDC GPs, 97 GPs (15% of the sample population) fell into Group I (practised with co-located non-physician providers in a hospital, LTC, or other setting). The remaining 68% of the sample population (433 GPs) fell into Group II (does not practise with co-located non-physician provider).

We compared MDC GPs with non-MDC GPs along several characteristics, including age, residence (rural/urban), mean practice size (number of physicians in practice), gender, and income. According to these measures, MDC GPs were very similar to their non-MDC GPs. The only statistically significant difference was related to practice size: MDC GPs and Group I non-MDC GPs had significantly larger practices compared to the Group II non-MDC respondents (4.4 and 5.1 versus 3.5, respectively).

Survey respondents were also asked to express their agreement on a 5-point scale (1 = strongly disagree, 5 = strongly agree) with a series of statements on how well MDC could meet key objectives (Table 2).

Table 2: Goals of Multidisciplinary Care

Please indicate how strongly you agree with the following statements:

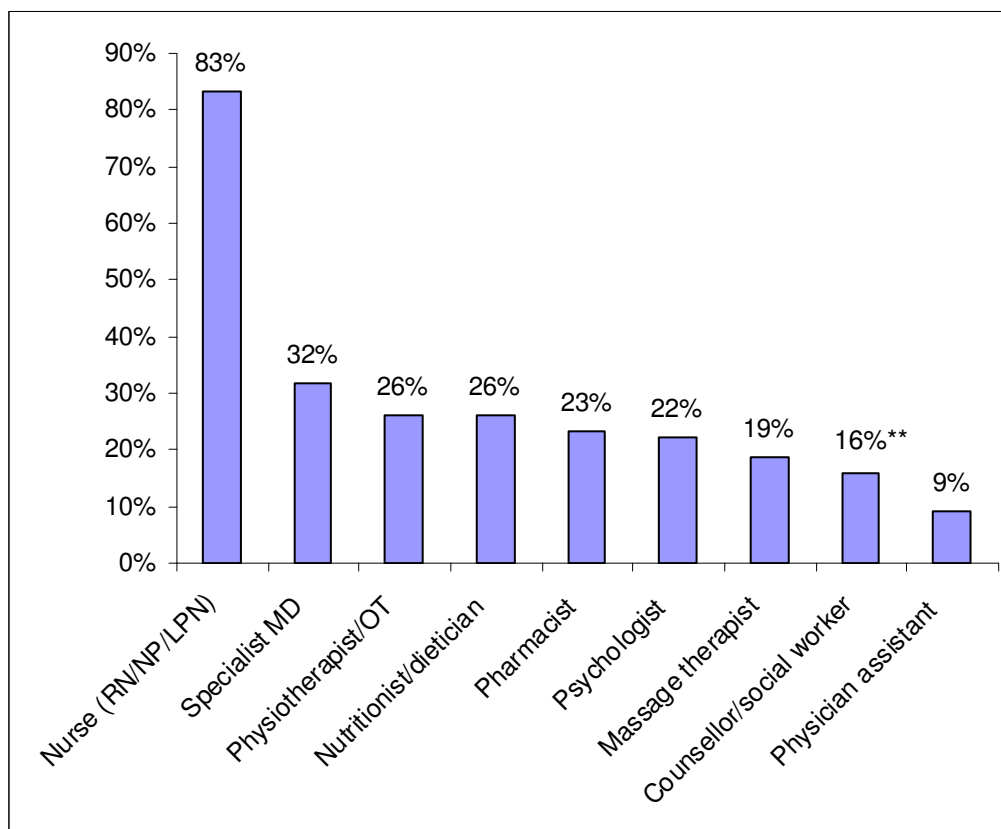
Multidisciplinary care will ...

- improve patient outcomes
 - enhance the comprehensiveness of care
 - enhance the coordination of care delivery
 - optimize the use of health providers' skill sets
 - make better use of health providers' time
 - produce cost savings
 - improve patient access to primary health care services
-

When asked how well MDC could meet these goals when health providers were *not* all co-located at the same site, there was no significant difference between MDC GPs and all other GPs. Responses from all surveyed GPs ranged from a low of 2.55 for “produce cost savings” and a high of 3.90 for “comprehensiveness of care.” However, when asked how well MDC could meet these goals when health providers *were* co-located at the same site, MDC GPs differed significantly from their non-MDC counterparts on every statement: MDC GPs were significantly more likely to agree that MDC would achieve the key objectives than non-MDC GPs.

The survey results also show that MDC GPs practise with a variety of health professionals (Figure 1). Eighty-three percent stated that they work with a nurse (e.g., registered nurse, licensed practical nurse, or nurse practitioner), followed by a specialist MD (32%), physiotherapist/OT (26%), nutritionist/dietician (26%), pharmacist (23%), psychologist (22%), massage therapist (19%), counsellor/social worker (16%), and physician assistant (9%).

Figure 1
Health Professionals with Whom MDC Physicians Currently Practise *

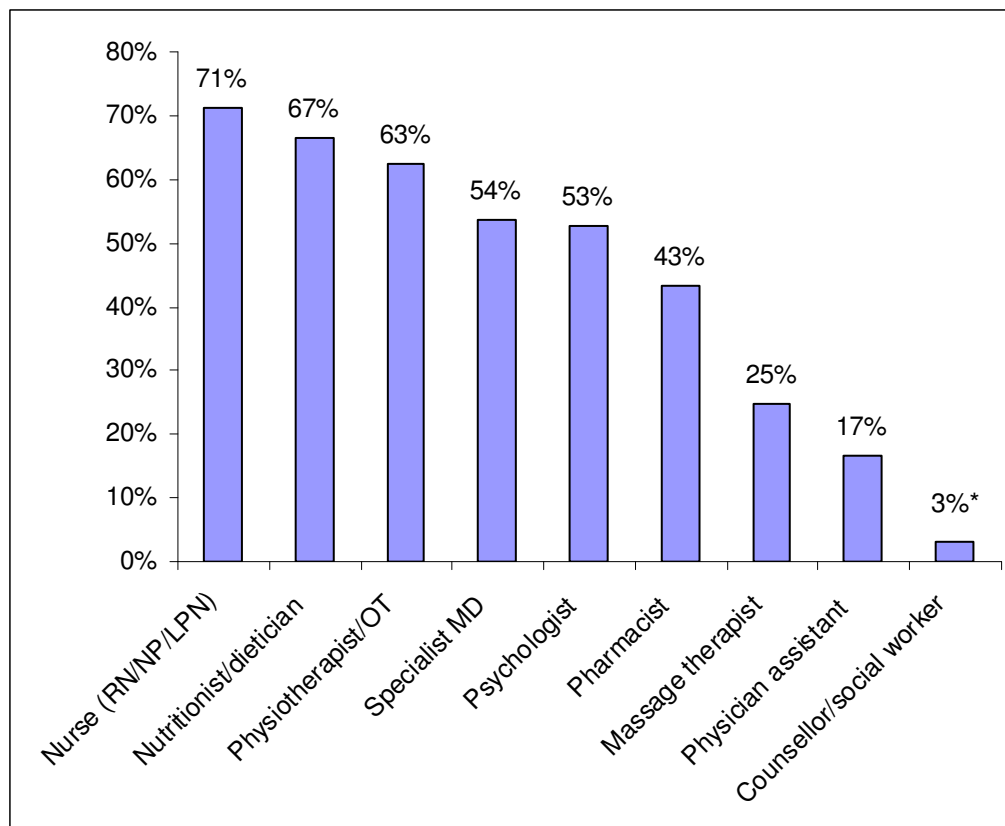


* Survey question: "Please indicate the type(s) of health professionals that you practise with (choose all those that apply)."

** "Counsellor/social worker" was not included in the checklist of responses. The 16% figure represents respondents' open-ended answers.

Those GPs not working with co-located non-GP providers were asked with whom they would prefer to practise. Their responses were similar to those of the MDC GPs (Figure 2). The greatest preference was for a nurse (71%), followed by nutritionist/dietician (67%), physiotherapist/OT (63%), specialist MD (54%), psychologist (53%), pharmacist (43%), massage therapist (25%), physician assistant (17%), and counsellor/social worker (3%). In a province-wide consultation with BC's GPs in November 2004 and January 2005, a number of fee-for-service GPs have noted that their practice could potentially benefit from an addition of a nurse.¹⁰³ In a 2005 BC Ministry of Health environmental scan on nursing models, BC GPs indicated that more nurse involvement in direct patient care, especially in chronic disease management, was a priority area for development.¹⁰⁴

Figure 2
Health Professionals with Whom Non-MDC Physicians Would Like to Practise*

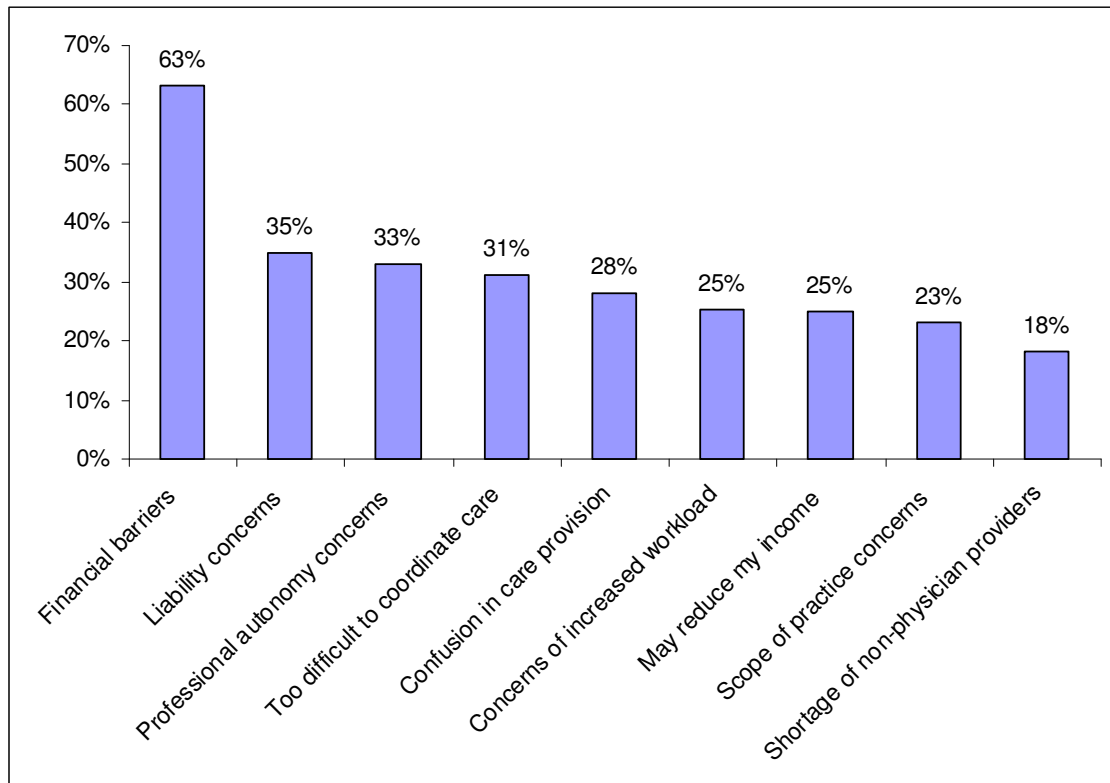


* Survey question: "If you were to practice in a multidisciplinary setting, please indicate the types(s) of health professionals you would choose to practice with (choose all those that apply)."

** "Counsellor/social worker" was not included in the checklist of responses. The 3% figure represents respondents' open-ended answers.

GPs not practising with co-located non-physician providers were also asked for the reasons why they did not practise in a MDC setting. Table 3 shows that the most common reason was financial barriers (63%), followed by liability concerns (35%), professional autonomy concerns (33%), difficulties in coordinating care (31%), confusion in care provision (28%), concerns over increased workload (25%), fear of a reduced income (25%), scope of practice concerns (23%), and a shortage of non-physician providers (18%).

Figure 3
Why BC Physicians Do Not Practise MDC *



* Survey question: "What is your main reason for not working in a multidisciplinary setting (choose all those that apply)?"

Despite concerns regarding MDC practice (Figure 3), the BCMA survey showed that 96% of MDC GP respondents see themselves continuing to practise in a multidisciplinary setting within the next five years. Nonetheless, data from the 2004 National Physician Survey suggest that BC GPs increasingly are reducing their scope of practice. In BC, 15% of GPs indicated that they reduced their scope of practice in the last two years (versus 13% nationally). Moreover, only 5% of BC GPs indicated that they expanded the scope of their practice in the past two years (versus 4.4% nationally). Almost one-fifth of BC GPs said they reduced their weekly work hours, and only 7% of BC GPs said that they increased their weekly work hours over the past two years.¹⁰⁵ Such reductions in the scope of practice will have definite implications for physician supply and physician resource planning in British Columbia and should be taken into account in policies intended to increase MDC practice.

IV. Challenges to Implementing MDC

The previous sections suggest the potential of MDC in terms of improved outcomes. In order for MDC teams to realize this potential, they must incorporate a number of organizational, professional, and interpersonal elements. Before dealing with these concerns, however, additional challenges must be addressed. This includes the scope of practice of allied health professionals, liability, and 24/7 coverage.

Scope of practice

Multidisciplinary care requires close collaboration among individual providers with varying education, training, and skills. The optimal provision of care by a multidisciplinary team requires an approach that enables providers to practise to the full extent of their education, skill, and competence. In other instances, MDC may occur when providers are working outside their scope of practices. Hence, proper delegation of care will require clearly defined scopes of practice and clinical accountability for all team members. In a joint statement, the Canadian Medical Association, Canadian Nurses Association, and Canadian Pharmacists Association outlined principles and criteria for the determination of scopes of practice (SOP):¹⁰⁶

Principles Scopes of practice should promote the following:	Criteria Scopes of practice should take into account the following:
<ul style="list-style-type: none"> ▪ High-quality care ▪ A flexible approach that allows providers to practice to the extent of their education, training, skills, knowledge, experience, competence, and judgment ▪ Collaboration, cooperation, and good communication among providers ▪ Coordination ▪ Patient choice 	<ul style="list-style-type: none"> ▪ Accountability, responsibility, and authority that the provider assumes for their practice ▪ Provider’s educational background ▪ Provider’s competencies and practice standards ▪ Risk to patients ▪ Evidence-based practice standards ▪ Legal liability and insurance ▪ Legislative and regulatory authority

Multidisciplinary care teams should have a written delineation of responsibility and accountability for team members that are in accordance with legislated scopes of practice. Legislated scopes of practice need to correspond to levels of training in order to ensure patient safety and to facilitate collaboration between physicians and allied health professionals. Removing these barriers to MDC implementation requires that regulatory bodies and professional associations be closely involved in any proposed changes to the scope of practice for allied health professionals who work with physicians. In addition, expanded scopes of practice must be granted only on the basis of sufficient training. Many physicians work with allied health professionals and would be affected by amendments to the Health Professions Act. It is imperative that the medical profession

be involved early in the process for developing regulations and standards of allied health professionals in order to ensure that patient safety is not compromised.

Recommendation 7

That appropriate regulatory bodies and professional associations be integrally involved in any proposed changes to the scope of practice for health professionals.

Recommendation 8

That the BCMA, the College of Physicians and Surgeons of BC, and relevant BC health professional organizations work to determine the principles under which medical acts can be appropriately assigned within a multidisciplinary care practice.

Recommendation 9

That expanded scopes of practice for allied health professionals be granted on the basis of sufficient training and demonstrated expertise.

Liability

Models of multidisciplinary care vary significantly in their organizational configuration, professional composition, and level of interaction among providers. Nonetheless, all require increased collaboration between physicians and allied health professionals. Physicians may be reluctant to collaborate, however, because of concerns over their personal liability in the event their patient is harmed by an involved health care provider. The law does not require the physician to double-check the work of other health care providers practising within their scope of practice. Nonetheless, the physician should know whether the performance of a task by another health care provider on the team falls within that provider's normal scope of practice or is being carried out subject to delegation from the physician. When a delegated medical act is outside the accepted scope of practice of another discipline, the responsibility for the act is shared and the physician who delegates the act retains responsibility and liability. The Canadian Medical Protective Association recommends that the physician must decide on the appropriate level of supervision when a medical act is delegated outside the scope of practice of an allied health professional.¹⁰⁷ MDC physicians will also want to be familiar with any relevant guidelines issued from their regulatory authority or health care facility concerning delegation, as well as any relevant legislation. Another legal consideration is vicarious liability when the physician employs other health care providers. The principle of

vicarious liability holds that as an employer, the physician may be liable for the negligence of their employees when they are acting within the scope of their employment.

Physicians will need to consider the legal issues associated with multidisciplinary care, including being familiar with the scope of practice, qualifications, experience, and training of the other health care providers involved in the care of their patients.

Several professional organizations have commented on the issue of liability coverage and multidisciplinary practice. The College of Family Physicians of Canada has recommended that “each provider on ... [a MDC] team be accountable for his or her own professional practice and be responsible for securing his or her own liability coverage.”¹⁰⁸ Similarly, the BCMA recommended in its report on primary care, *Ensuring Excellence*, that “physicians require from all health professionals evidence of liability coverage that is sufficient to cover actions that might arise from negligent performance.”¹⁰⁹ In a joint statement issued in March 2005, the Canadian Medical Protective Association and the Canadian Nurses Protective Society recommended that all members of the collaborative health care team and the institution or facility must have appropriate and adequate professional liability protection at the beginning of the working relationship and on an ongoing basis. In such cases, physicians should take care to examine the type and level of liability coverage in question.

Recommendation 10

That all health professionals practising in a multidisciplinary care setting have appropriate and adequate liability coverage.

24/7 coverage

Health reports commissioned by the federal government have highlighted the need for 24/7 coverage as part of primary care reform.^{110,111} The objective of providing 24/7 community-based care is often included in the BC and federal governments’ plans for furthering MDC. For example, the 2003 Health Accord included the goal to provide at least 50% of Canadians 24/7 access to multidisciplinary primary care teams by 2011.¹¹² However, a common understanding of 24/7 access to primary care services has not been reached between government, providers, and patients. The BCMA believes that the creation of MDC teams will not subsequently lead to 24/7 coverage without proper incentives and compensation for providers. Non-physician providers often do not share on-call duties with physicians, and physicians require adequate support for taking on this responsibility. As stated by the BCMA’s *Ensuring Excellence* (2002) paper, community-based on-call should:

- Be for urgent and emergent clinical problems only;
- Allow for telephone triage, advising patients on appropriate course of action;
- Be sharable through after-hours call groups;
- Ensure that service delivery following triage is based on the physician's clinical judgement; and
- Provide the on-call physician with relevant patient information.

V. Funding for Multidisciplinary Care

A key policy goal for ensuring the successful implementation of MDC must be the provision of long term, targeted, and sustainable funding. The recent federal funding for MDC through the First Ministers' Accord on Health Care Renewal (2003) makes this an achievable goal. The Accord established a five-year, \$2 billion Health Reform Fund (HRF), in part to *“immediately accelerate primary health care initiatives and to make significant annual progress so that citizens routinely receive needed care from multidisciplinary primary health care organizations or teams.”* This is the latest in a series of funding mechanisms to support MDC in BC.

Efforts to fund MDC should be guided by principles designed to ensure maximum levels of participation, proper accountability, adequate levels of support, and long-term sustainability:

- To protect MDC funds from competing demands in other areas of health care, there should be a separate funding envelope for MDC.
- The BCMA needs to be integrally involved in funding decisions on MDC, particularly those that directly affect physicians' practices.
- Funding for an information technology infrastructure and training for team members must be included as part of MDC initiatives.
- Funding models must be flexible enough to accommodate variations in population health needs as well as individual physician preferences for payment mechanisms.
- Physician participation in MDC initiatives must remain voluntary. At the same time, the choice for physicians to discontinue participation in MDC initiatives must be preserved.
- Previous experiences with primary care initiatives demonstrate the difficulty in integrating allied health professionals into physician practices. MDC funding mechanisms must take into account the higher practice costs associated with the incorporation of allied health professionals into physicians' practices. Physicians cannot be expected to bear the burden of increased practice-related costs when working in MDC teams, and those who supervise, consult, or collaborate with other providers and/or function as team leaders must be compensated for their time and associated overhead costs. Practical support (e.g., resource persons, consultants) to assist those undertaking the establishment and implementation of new organizational and managerial methods for team-based care will be necessary.

- Funding decisions should be developed in an environment that allows for proper planning, a streamlined decision making process, and a coordinated and efficient distribution of funds.

Recommendation 11

That the BC government dedicate long term sustainable MDC funding and resources to primary care.

VI. Conclusions

Multidisciplinary care has been offered as a solution for the problems facing the primary care system, including increased access, better quality care, and greater coordination of services. The rise in the incidence of chronic disease, the growing needs of the aging population, the increasing number of patients with complex and higher clinical needs, and the shifting of care away from the acute care sector will continue to accelerate changes in primary care practice. Moreover, the changing demographics of primary care physicians are having a significant impact. Patient access to primary care services will be adversely affected by the aging of BC's GPs, the decreasing number of medical graduates entering family practice, and the higher percentage of female physicians working fewer hours than their male counterparts. Calls for change – including the expansion of MDC practice – will only grow louder. Indeed, new models of health care that offer increased opportunities for primary care physicians to collaborate with other health professionals are already emerging.

Significant numbers of BC GPs already practising in multidisciplinary settings agree that MDC practice can lead to more comprehensive, better coordinated care and improve patient access to primary care services. The expansion of MDC has enormous potential assuming that MDC groups are properly supported, expanded scopes of practice for allied health professionals are granted on the basis of sufficient training (not legislation), participation in MDC practice is voluntary, specific medical acts are assigned appropriately, the MDC team leader is the best-trained generalist (usually the GP), MDC programs are rigorously evaluated, and funding is made available on a long-term and sustainable basis.

Improvements in the quality of primary care will require significant up-front investment by government and close collaboration with the BCMA. Fortunately, recent initiatives bode well for such interaction. The BCMA/government Rural Joint Standing Committee and the General Practice Services Committee serve as examples of successful, sustained joint governance on issues directly affecting primary care in BC. The development of MDC policies should include meaningful input from other key stakeholders, including regional health authorities and relevant health professional organizations.

The implementation of MDC policies must include meaningful input from key stakeholders. The BCMA has already worked with other health professionals on issues related to MDC. The 2003 release of joint position statement on scopes of practice by the Canadian Medical Association, the Canadian Nurses Association, and the Canadian Pharmacists Association signal a willingness among health professionals to address – and reach a consensus on – key components of MDC. The format for MDC should be jointly developed by Health Authorities (HAs) and physician leadership. HAs have a larger capacity than individual physician practices for profiling patient populations for

clinical needs, managing and distributing IT resources for GP offices, and providing resources for change management.

The recent BC budget surplus and the significant new funding through the 2003 Federal/Provincial Health Accord allows the government, the BCMA, and other health professional organizations to build upon previous successful collaborations. By working collaboratively, physicians, allied health professionals, and government can develop practical, effective policies for MDC practice and improve health care for British Columbians.

List of Recommendations

Recommendation 1: That the impacts on quality of care and cost of multidisciplinary primary care be externally evaluated using established criteria mutually agreed upon by the BCMA, government, and other appropriate professional organizations.

Recommendation 2: That the provincial government, health authorities, and the BCMA work immediately toward establishing an IT infrastructure as a critical element of MDC with the goal of electronically linking physicians and allied health professionals through an Electronic Medical Record and core data set.

Recommendation 3: That funding be provided for implementing and maintaining information systems (clinical and administrative) in multidisciplinary group practices, including training resources for team members.

Recommendation 4: That health information policies and information technology be developed to protect patients' privacy rights whilst facilitating the effective sharing of information among physicians as well as between physicians and allied health professionals.

Recommendation 5: That multidisciplinary care teams have a clinical team leader with ultimate responsibility for patient care and who is the best-trained generalist. In the majority of instances, this would be the GP.

Recommendation 6: That health professional education programs foster enhanced collaboration among providers and that such programs be critically evaluated.

Recommendation 7: That appropriate regulatory bodies and professional associations be integrally involved in any proposed changes to the scope of practice for health professionals.

Recommendation 8: That the BCMA, the College of Physicians and Surgeons of BC, and relevant BC health professional organizations work to determine the principles under which medical acts can be appropriately assigned within a multidisciplinary care practice.

Recommendation 9: That expanded scopes of practice for allied health professionals be granted on the basis of sufficient training and demonstrated expertise.

Recommendation 10: That all health professionals practising in a multidisciplinary care setting have appropriate and adequate liability coverage.

Recommendation 11: That the BC government dedicate long term sustainable MDC funding and resources to primary care.

Endnotes

- ¹ Department of Finance, March 2004
- ² A-M. Broemeling, D. Watson, C. Black. *Chronic conditions and co-morbidity among residents of British Columbia*. Centre for Health Services and Policy Research. February 2005.
- ³ Government of Canada, *Primary Health Care Transition Fund* (Ottawa, Health Canada, 2004). Available [on-line] on the Internet at: <http://www.hc-sc.gc.ca/phctf-fassp/english/index.html>.
- ⁴ Government of Canada, *2003 First Ministers' Accord on Health Care Renewal* (Ottawa: Health Canada, 2003).
- ⁵ Clair Commission, *Emerging Solutions: Report and Recommendations* (Quebec City: Government of Quebec, 2001)
- ⁶ Health Council of Canada. *Health Care Renewal in Canada: Accelerating Change*. January 2005.
- ⁷ Commission on the Future of Health Care in Canada, *Building on Values: The Future of Health Care in Canada, Final Report* (Saskatoon: Commission on the Future of Health Care in Canada, 2002)
- ⁸ M. Kirby, *The Health of Canadians –The Federal Role, Volume 6: Recommendations for Reform* (Ottawa: The Standing Senate Committee on Social Affairs, Science and Technology, 2002).
- ⁹ D. Mazankowski, et al., *A Framework for Reform* (Edmonton, Alberta: Alberta Advisory Council on Health, 2001).
- ¹⁰ Decima Research Incorporated. *Public Survey Results On Primary Care Reform* (Dec 2000). Commissioned by the Ontario College of Family Practice.
- ¹¹ College of Family Physicians of Canada, Canadian Medical Association and Royal College of Physicians and Surgeons of Canada, "Regional Data Release of the 2004 National Physician Survey: A Collaborative Project" (February 2005).
- ¹² British Columbia Medical Association. *Ensuring Excellence: Renewing BC's Primary Care System*. September 2002.
- ¹³ R.F. Schofield, M. Amodeo. *Interdisciplinary Teams in Health Care and Human Services Settings: Are They Effective?* Health and Social Work 1999;24 (3):210-19.
- ¹⁴ H. Boon, M. Verhoef, D. O'Hara, B. Findlay. *From parallel practice to integrative health care: a conceptual framework*. BioMed Central Health Services Research 2004; 4: 15. Published online 2004 July 1. doi: 10.1186/1472-6963-4-15.
- ¹⁵ C. Jenkinson. *Measuring health and medical outcomes*. London: University College London Press, 1994.
- ¹⁶ C.M. Renders, G.D. Valk, S.J. Griffin, E.H. Wagner, J.T. Eijk van, W.J. Assendelft. *Interventions to Improve the Management of Diabetes in Primary Care, Outpatient, and Community Settings*. Diabetes Care 2001; 24 (10): 1821-1833.
- ¹⁷ K. Stevenson, R. Baker, A. Farooqi, R. Sorrie, K. Khunti. *Features of primary health care teams associated with successful quality improvement of diabetes care: a qualitative study*. Family Practice 2001;18 (1):21-26.
- ¹⁸ S.M. Campbell, M. Hann, J. Hacker et al. *Identifying predictors of high quality care in English general practice: observational study*. BMJ 2001;323:1-6.
- ¹⁹ K.B. Wells, C. Sherbourne, M. Schoenbaum, N. Duan, L. Meredith, J. Unutzer, J. Miranda, M.F. Carney, L.V. Rubenstein. *Impact of Disseminating Quality Improvement Programs for Depression in Managed Primary Care: a randomized controlled trial*. JAMA 2000;283(2):212-220.
- ²⁰ V.K. Sharma, G. Wilkinson, C. Dowrick et al. *Developing mental health services in a primary care setting: Liverpool Primary Care Mental Health Project*. Inter J Soc Psychiatry 2001;47;16-29.
- ²¹ D.W. Roblin, S.H. Kaplan, S. Greenfield, M.H. Roberts, L.D. Jacobs, D.G. Carlton. *Collaborative clinical culture and primary care outcomes*. Program and abstracts of the annual meeting of the Academy for Health Services Research and Quality; June 23-25, 2002; Washington, DC.
- ²² K.B. Weiss, G. Mendoza et al. *Breakthrough Series Guide: Improving Asthma Care in Children and Adults*. 1997.
- ²³ S. Stewart, J.E. Marley, J.D. Horowitz. *Effects of a multidisciplinary, home-based intervention on unplanned readmissions and survival among patients with chronic congestive heart failure: a randomised controlled study*. Lancet 1999; 354(9184):1077-83.
- ²⁴ G. Mitchell, C. Del Mar, D. Francis. *Does primary medical practitioner involvement with a specialist team improve patient outcomes? A systematic review*. British Journal of General Practice 2002, 52: 934-939.
- ²⁵ J. Hearn, I. Higginson. *Do specialist palliative care teams improve outcomes for cancer patients? A systematic literature review*. Palliative Medicine. 1998; 12:317-32.
- ²⁶ R.M. Scheffler, N.J. Waitzman, J.M. Hillman. *The Productivity of Physician Assistants and Nurse Practitioners and Health Work Force Policy in the Era of Managed Health Care*. Journal of Allied Health. 1996; 25 (3): 207-217.

- ²⁷ D.M. Grzybicki, P.J. Sullivan, J.M. Oppy, A-M Bethke, S.S. Raab. *The Economic Benefit for Family/General Medicine Practices Employing Physician Assistants*. The American Journal of Managed Care. 2002; 8(7): 613-620.
- ²⁸ R.S. Hooker. *A cost analysis of physician assistants in primary care*. Journal American Academy of Physician Assistants. 2002; 15 (11): 39-50.
- ²⁹ D.W. Roblin, D.H. Howard, E.R. Becker, E.K. Adams, M.H. Roberts. *Use of Midlevel Practitioners to Achieve Labor Cost Savings in the Primary Care Practice of an MCO*. Health Services Research. 2004; 39(3): 607-625.
- ³⁰ S. Horrocks, E. Anderson, C. Salisbury. *Systematic review of whether nurse practitioners working in primary care can provide equivalent care to doctors*. BMJ. 2002; 324: 819-23.
- ³¹ C.D. DeAngelis. *Nurse practitioner redux*. JAMA. 1994; 271:868-871.
- ³² P. Venning, A. Durie, M. Roland, C. Roberts, B. Leese. *Randomised controlled trial comparing cost effectiveness of general practitioners and nurse practitioners in primary care*. British Medical Journal 2000;320:1048-53.
- ³³ M. Laurant, et al. *Substitution of doctors by nurses in primary care (review)*. The Cochrane Database of Systematic Reviews. 2005, Issue 2.
- ³⁴ G.M. Eggert, J.G. Zimmer, W.J. Hall, B. Friedman. *Case management: A randomised controlled study comparing a neighbourhood team and a centralized individual model*. Health Services Research. 1991; 26(4): 471-507.
- ³⁵ S. Stewart, J.E. Marley, J.D. Horowitz. *Effects of a multidisciplinary, home-based intervention on unplanned readmissions and survival among patients with chronic congestive heart failure: a randomised controlled study*. Lancet 1999; 354(9184):1077-83.
- ³⁶ S.L. Hughes, J. Cummings, F. Weaver, L. Manheim, B. Brawn, K. Conrad. *A randomized trial of the cost effectiveness of VA hospital-based home care for the terminally ill*. Health Services Research. 1992; 26(6); 801-817.
- ³⁷ A. Jansson, A. Isacson, L.H. Lindholm. *Organization of health care teams and the population's contacts with primary care*. Scandinavian Journal of Health Care. 1992; 10:257-265.
- ³⁸ K.B. Weiss, G. Mendoza, et al. *Breakthrough Series Guide: Improving Asthma Care in Children and Adults*. 1997.
- ³⁹ S.M. Shortell, J.E. Zimmerman, D.M. Rousseau et al. *The performance of intensive care units: does good management make a difference?* Medical Care. 1994; 32:508-525.
- ⁴⁰ V.K. Sharma, G. Wilkinson, C. Dowrick et al. *Developing mental health services in a primary care setting: Liverpool Primary Care Mental Health Project*. Inter J Soc Psychiatry. 2001; 47:16-29.
- ⁴¹ D.I. Cohen, D. Breslau, D.K. Porter, et al. *The cost implication of academic group practice*. NEJM. 1986; 314:1553-1557.
- ⁴² H.I. Goldberg, D.I. Cohen, C.O. Hershey, I. Hsiue, D.K. Porter, C.E. McLaren. *A randomized controlled trial of academic group practice*. JAMA. 1987; 257:2051-2055.
- ⁴³ L.S. Sommers, K.I. Marton, J.C. Barbaccia, J. Randolph. *Physician, nurse and social worker collaboration in primary care for chronically ill seniors*. Archives of Internal Medicine. 2000;160:1825-1833.
- ⁴⁴ V.K. Sharma, G. Wilkinson, C. Dowrick et al. *Developing mental health services in a primary care setting: Liverpool Primary Care Mental Health Project*. Inter J Soc Psychiatry 2001; 47:16-29.
- ⁴⁵ K.B. Wells, C. Sherbourne, M. Schoenbaum, N. Duan, L. Meredith, J. Unutzer, J. Miranda, M.F. Carney, L.V. Rubenstein. *Impact of Disseminating Quality Improvement Programs for Depression in Managed Primary Care: a randomized controlled trial*. JAMA. 2000; 283(2):212-220.
- ⁴⁶ S. Goni. *An analysis of the effectiveness of Spanish primary care teams*. Health Policy. 1999; 48:107-117.
- ⁴⁷ G. Mitchell, C. Del Mar, D. Francis. *Does primary medical practitioner involvement with a specialist team improve patient outcomes? A systematic review*. British Journal of General Practice. 2002; 52:934-939.
- ⁴⁸ H. Wise, R. Beckhard, I. Rubin, A.L. Kyte. *Making Health Teams Work*. Cambridge, Mass: Ballinger Publishing Co; 1974.
- ⁴⁹ J. Nolte. *Enhancing Interdisciplinary Collaboration in Primary Health Care in Canada*. Draft prepared for Enhancing Interdisciplinary Collaboration in Primary Health Care in Canada Initiative, Nov. 9, 2004.
- ⁵⁰ P. Kekki. *Teamwork in Primary Health Care*. World Health Organization. 1990.
- ⁵¹ P. Pritchard, J. Pritchard. *Teamwork and Shared Care: a practice workbook*. 2nd edition. Oxford:OUP; 1994.
- ⁵² K. Grumbach, T. Bodenheimer. *Can Health Care Teams Improve Primary Care Practice?* JAMA. 2004; 291:1246-1251.
- ⁵³ P. Kekki. *Teamwork in Primary Health Care*. World Health Organization. 1990.
- ⁵⁴ S. Goni. *An analysis of the effectiveness of Spanish primary care teams*. Health Policy. 1999; 48:107-117.

- ⁵⁵ J.E. Epping-Jordan, S.D. Pruitt, R. Bengoa, E.H. Wagner. *Improving the quality of health care for chronic conditions. Quality and Safety in Health Care.* 2004; 13:299-305.
- ⁵⁶ L.I. Solberg. *Guideline implementation.* Joint Commission Journal on Quality Improvement. 2000; 26:525-537.
- ⁵⁷ M.A. Thomson O'Brien, A.D. Oxman, et al. *Audit and feedback: effects on professional practice and health care outcomes* (Cochrane Review). The Cochrane Library. London, England: Update Software; 1998.
- ⁵⁸ S.R. Weingarten, J.M. Henning, E. Badamgarav, et al. *Interventions used in disease management programs for patients with chronic illness—which ones work?* British Medical Journal. 2002; 325:925-932.
- ⁵⁹ J.G. Demakis, C. Beauchamp, W.L. Cull, et al. *Improving residents' compliance with standards of ambulatory care.* JAMA. 2000; 284:1411-1416.
- ⁶⁰ E. Mitchell, F. Sullivan. *A descriptive feast but an evaluative famine.* British Medical Journal. 2001; 322:279-282.
- ⁶¹ B. Celler, N. Lovell, J. Basilakis. *Using information technology to improve the management of chronic disease.* Medical Journal of Australia. 2003; 179:242-246.
- ⁶² Institute of Medicine. *Key Capabilities of an Electronic Health Record System: Letter Report* (2003). Available at <http://www.nap.edu>.
- ⁶³ T. Bodenheimer, K. Grumbach. *Electronic Technology: A Spark to Revitalize Primary Care?* JAMA. 2003; 290(2):259-264.
- ⁶⁴ E. Barthell, W. Cordell, J. Moorhead, et al. *The Frontlines of Medicine Project: A Proposal for the Standardized Communication of Emergency Department Data for Public Health Uses Including Syndromic Surveillance for Biological and Chemical Terrorism.* Annals of Emergency Medicine. 2002; 39:422-9.
- ⁶⁵ R. Dolin. *Advances in Data Exchange for the Clinical Laboratory.* Clinics in Laboratory Medicine. 1999; 19:385-419.
- ⁶⁶ Ibid.
- ⁶⁷ T. Bodenheimer, K. Grumbach. *Electronic Technology: A Spark to Revitalize Primary Care?* JAMA. 2003; 290(2):259-264.
- ⁶⁸ J. Goldsmith, D. Blumenthal, W. Rishel. *Federal Health Information Policy: A Case of Arrested Development.* Health Affairs. 2003; 22:44-55.
- ⁶⁹ D. Blumenthal. *Doctors in A Wired World: Can Professionalism Survive Connectivity?* Milbank Quarterly. 2002; 80:525-46.
- ⁷⁰ L. Burton, G. Anderson, I. Kues. *Using Electronic Health Records to Help Coordinate Care.* Milbank Quarterly. 2004; 82:457-81.
- ⁷¹ Canadian Medical Association. *Canadians' Perceptions of Health Information Confidentiality Survey.* Prepared by Angus Reid. Ottawa: Canada.
- ⁷² R. Lissauer. *Future focus.* Nursing Standard. 2002; 17(1):16.
- ⁷³ K. Grumbach, T. Bodenheimer. *Can Health Care Teams Improve Primary Care Practice?* JAMA. 2004; 291(10):1246-1251.
- ⁷⁴ L. Gask. *Role of specialists in common chronic diseases.* British Medical Journal 2005; 330:651-653 (19 March), doi:10.1136/bmj.330.7492.651 <http://bmj.bmjournals.com/cgi/content/full/330/7492/651>
- ⁷⁵ E. Wagner. *The role of patient care teams in chronic disease management.* British Medical Journal. 2000; 320:569-72.
- ⁷⁶ P. Sullivan. *Do physician assistants have a role to play in Canada?* Canadian Medical Association. 2005. Available at http://www.cma.ca/index.cfm/ci_id/10025206/la_id/1.htm.
- ⁷⁷ R. Curry, J. Hollis. *An evolutionary approach to team working in primary care.* British Journal of Community Nursing. 2002; 7(10):520-527.
- ⁷⁸ Primary Health Services Saskatchewan Branch. *Team Development: A paper to facilitate the development of primary health service sites.* 1999. Regina, Sask.
- ⁷⁹ T. Drinka, P. Clarke. *Health Care Teamwork.* Connecticut: Auburn House, 2000.
- ⁸⁰ J. Gilbert. *Interdisciplinary Learning and Higher Education Structural Barriers: A Commissioned Paper* (Ottawa: Interdisciplinary Education for Collaborative Patient-Centred Care Initiative, 2004).

- ⁸¹ D. Watson, S. Wong. *Canadian Policy Context: Interdisciplinary Collaboration in Primary Health Care*. (Enhancing Interdisciplinary Collaboration in Primary Health Care Initiative) February 2005.
- ⁸² M. Leonard, S. Graham, D. Bonacum. *The human factor: the critical importance of effective teamwork and communication in providing safe care*. *Quality and Safety in Health Care*. 2004;13 Suppl 1:i85-90.
- ⁸³ D. Watson, S. Wong. *Canadian Policy Context: Interdisciplinary Collaboration in Primary Health Care*. (Enhancing Interdisciplinary Collaboration in Primary Health Care Initiative.) February 2005.
- ⁸⁴ D. Pringle, C. Levitt, M.E. Horsburgh, R. Wilson, M.K. Whittaker. *Interdisciplinary collaboration and primary health care reform Statement from the Ontario Chairs of Family Medicine and the Council of Ontario University Programs in Nursing*. *Canadian Family Physician*. 2000; 46(4):763-5,771-4.
- ⁸⁵ K.B. Farris, I. Cote, D. Feeny, J.A. Johnson, R.T. Tsuyuki, S. Brilliant, S. Dieleman. *Enhancing primary care for complex patients. Demonstration project using multidisciplinary teams*. *Canadian Family Physician*. 2004; 50:998-1003.
- ⁸⁶ F. El-Jardali, M. Lagace. *Making Hospital Care Safer and Better: The Structure-Process Connection Leading to Adverse Events*. *Healthcare Quarterly*. 2005; 8(2):40-8.
- ⁸⁷ K. Stevenson, R. Baker, A. Farooqi, R. Sorrie, K. Khunti. *Features of primary health care teams associated with successful quality improvement of diabetes care: a qualitative study*. *Family Practice*. 2001; 18(1):21-26.
- ⁸⁸ Ibid.
- ⁸⁹ H. Platt. *Primary Care in British Columbia: What's right, what's wrong, what's next?* Presentation to the BC Medical Association-BC Ministry of Health Professional Quality Improvement Day. Vancouver, BC. November 2004.
- ⁹⁰ FIPSE project group, Office of Educational Development, University of North Carolina School of Medicine. *The Expert Preceptor Interactive Curriculum*. [Electronic] URL: <http://www.med.unc.edu/epic/module4/m4to.htm> (October 1998).
- ⁹¹ D. Watson, S. Wong. *Canadian Policy Context: Interdisciplinary Collaboration in Primary Health Care*. (Enhancing Interdisciplinary Collaboration in Primary Health Care Initiative) February 2005.
- ⁹² British Columbia Medical Association. *Ensuring Excellence: Renewing BC's Primary Care System*. Sept. 2002
- ⁹³ G. Sierchio. *A Multidisciplinary Approach for Improving Outcomes*. *Journal of Infusion Nursing*. 2003; 26(1):34-43.
- ⁹⁴ W. Morris. ed. *The American heritage dictionary of the English language*. Boston, Houghton Mifflin Company, 1973.
- ⁹⁵ C. Sicotte, D. D'Amour, M.P. Moreault. *Interdisciplinary collaboration within Quebec community health care centres*. *Social Science and Medicine*. 2002; 55:991-1003.
- ⁹⁶ Canadian Medical Association, Canadian Nurses Association. *Working Together: A Joint CNA/CMA Collaborative Practice Project, HIV/AIDS Example* (Ottawa: CMA, 1996)
- ⁹⁷ FIPSE project group, Office of Educational Development, University of North Carolina School of Medicine. *The Expert Preceptor Interactive Curriculum*. [Electronic] URL: <http://www.med.unc.edu/epic/module4/m4to.htm> (October 1998).
- ⁹⁸ M.C. Huffman. *Family Physicians and the Health Care Team*. *Canadian Family Physician*. 1993; 39:2165-70.
- ⁹⁹ A.D. Lorenz, L.B. Mauksch, B.A. Gawinski. *Models of Collaboration*. *Primary Care*. 1999; 26(2):401-10.
- ¹⁰⁰ Lesley Bainbridge (Director of Interprofessional Health Education, UBC Medicine). Personal communication. September 12, 2005.
- ¹⁰¹ K. McEwan, M. Kilshaw. *A Retrospective Review of BC's Primary Care Demonstration Projects*. BC Ministry of Health. 2004.
- ¹⁰² K. McEwan, M. Kilshaw. *A Retrospective Review of BC's Primary Care Demonstration Projects*. BC Ministry of Health. 2004.
- ¹⁰³ BC Ministry of Health. *Models of Nursing in BC General Practitioner Fee-For-Service Practice*. 2005.
- ¹⁰⁴ BC Ministry of Health. *Models of Nursing in BC General Practitioner Fee-For-Service Practice*. 2005.
- ¹⁰⁵ College of Family Physicians of Canada, Canadian Medical Association and Royal College of Physicians and Surgeons of Canada, "Regional Data Release of the 2004 National Physician Survey: A Collaborative Project" (February 2005).
- ¹⁰⁶ Canadian Medical Association, Canadian Nurses Association, Canadian Pharmaceutical Association. *Joint statement: Scope of practice*. Ottawa, ON: Canadian Medical Association (2002).
- ¹⁰⁷ E. Stone. *Shared Care: Issues You Should Consider*. Canadian Medical Protective Association. 2005.
- ¹⁰⁸ College of Family Physicians of Canada. *Prescription for Renewal*. 2000.

¹⁰⁹ British Columbia Medical Association. *Ensuring Excellence: Renewing BC's Primary Care System*. Sept. 2002.

¹¹⁰ M. Kirby. *The Health of Canadians – The Federal Role, Volume 6: Recommendations for Reform*. Ottawa: The Standing Senate Committee on Social Affairs, Science and Technology, 2002.

¹¹¹ Commission on the Future of Health Care in Canada. *Building on Values: The Future of Health Care in Canada, Final Report* (Saskatoon: Commission on the Future of Health Care in Canada, 2002)

¹¹² Government of Canada. *First Ministers' Accord on Health Care Renewal* (Ottawa: Health Canada, 2003).