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Evidence Synthesis for the Effectiveness of Interprofessional Teams in Primary Care

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This report synthesizes key academic literature that discusses the role of interprofessional teams in the delivery of healthcare in the primary setting. The importance of integrated care, care coordination and patient involvement in the management of chronic diseases makes interprofessional teams involving nurses particularly important. Research is presented showing that nurses working in their full scope of practice can provide appropriate and effective care. In such roles, nurses can make an important contribution to the expansion of capacity in the healthcare system.

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KEY MESSAGES

The evolution of the Canadian healthcare system requires a continuous focus on the optimal use and allocation of resources to focus equitably on the health outcomes of Canadians, and to ensure sustainability of the system. Over the medium and longer term, the inevitable slowing of growth in the Canadian economy to match the downturn in workforce growth means that there will be increasing pressures on government revenue and on manpower resources. This means that there must be an increased emphasis on maximizing the value from government programs such as healthcare. Trying to get more health gain for the same or fewer resources, both human and material, is necessarily an important goal. This can involve adapting healthcare processes and skill mixes to improve results. One potential route is to optimize the use of nursing human resources, which many experts consider to be under-utilized in Canada, to enhance the coordination of care and health outcomes.

This report reviews selected published literature and available grey material that focus on the contribution of nurse-led and interprofessional teams in areas such as chronic disease, health promotion, prevention, improved health outcomes and health access. The emphasis is on effectiveness with respect to health outcomes and other measures of health system performance. The overarching theme to the paper is the contribution of registered nurses (RNs) and nurse practitioners (NPs) as essential components of interprofessional teams in the management of complex chronic diseases. This report specifically focuses on primary care.

The key messages in this report devolve from a general focus on the effective use of collaborative teams involving nursing resources in the Canadian healthcare system.

- The role for nursing human resources is particularly clear in chronic disease management in primary care, because of the greater requirement for patient involvement and activation that is facilitated by team care, as highlighted in the chronic disease management literature.
- Chronic disease management requires more than just physicians to take a key role in helping patients manage their disease. Interprofessional team care should be the modality of choice, with a strong emphasis on the increased use of nursing resources in more responsible roles.
- Nurses and other healthcare providers share common ground in their respective practices. For example, nurses are able to provide equivalent care within their scope of practice compared to that provided by physicians, which has been shown to lead to better-quality care and improved patient satisfaction.
- This increased capacity of nursing makes a vital contribution to the success of interprofessional teams. However, institutional settings may constrain nurses' scope of practice to less than might be possible given their education and training. The economic rationale for interprofessional teams is the optimal utilization of healthcare providers in terms of their comparative advantage in skill sets, cost and availability.
- Patient-oriented payment modalities such as capitation and blended payment models are shown to be more appropriate to the optimal utilization of nursing resources in interprofessional teams.
- A shift in emphasis to nurse-led interprofessional teams can increase capacity at relatively lower cost than other alternatives if appropriate payment levels and modalities, as well as institutional settings, are available.
- Interprofessional models, including nurse-led teams, are shown to improve quality, patient satisfaction, access and equity. Such gains, appropriately valued, should offset the additional resource costs associated with such service expansion.
- Access to care in remote and rural areas and to other underserved populations can be facilitated particularly well with nurse-led teams.
- Increasing nursing resources may not result in direct cost-savings. However, there may be significant cost gains if resources are targeted at patients with specific chronic diseases or other high-needs populations.

EXECUTIVE SUMMARY

The evolution of the Canadian healthcare system requires a continuous focus on the optimal use and allocation of resources to focus equitably on the health outcomes of Canadians, and to ensure sustainability of the system. An emphasis on equity implies a focus on maximizing health gains for those with health deficits, rather than just achieving equality of access or similar goals. Over the medium and longer term, the inevitable slowing of growth in the Canadian economy to match the downturn in workforce growth means that there will be increasing pressures on government revenue and manpower resources. This means that there must be an increased emphasis on maximizing the value from government programs such as healthcare. Trying to get more health gain for the same or fewer resources, both human and material, is an important and necessary goal. This can involve adapting healthcare processes and skill mixes to improve results. One potential route is to optimize the use of nursing human resources, which many experts consider to be underutilized in Canada, to enhance the coordination of care and health outcomes.

This report focuses on the use of nurses in interprofessional teams, including nurse-led teams. The goal is to highlight the cost and outcomes effectiveness of interprofessional or nurse-led teams. The economic rationale for interprofessional teams is that the professionals have comparative advantages in skill sets and costs in the delivery of elements of the service basket to the patient. The scope of this report is outside the direct acute-care context, and instead focuses on primary care and on settings such as clinics, community health centres, family health teams, long-term care, and public health.

This synthesis report reviews selected published literature and available grey material to focus on the contribution of nurse-led and interprofessional teams in areas such as chronic disease, disease prevention, improved health outcomes and health access. The methodological approach to the synthesis started with the use of the major bibliographic search engines, including PubMed, CINAHL, Cochrane and Google Scholar, to identify papers dealing with the effectiveness of registered nurses (RNs), advanced practice nurses (APNs) and nurse practitioners (NPs).

One feature of interprofessional teams is their use of nurses in a more proactive and responsible role, often with a broader scope of responsibility for care management and coordination. These teams usually emphasize nurses with advanced qualifications, such as APNs or NPs. The latter two terms are often used interchangeably in the literature. In Canada and the U.S., the term “nurse practitioner” is often reserved for roles with specific licensing requirements. As well as having advanced competencies, these nurses are expected to have increased decision-making responsibilities within interprofessional teams. These roles are being developed in a number of countries in Europe and elsewhere as well as in North America.

GENERAL REVIEWS OF NURSING EFFECTIVENESS

This report synthesizes key results from a number of general reviews of nursing effectiveness, both in individual terms and in the team context. The report covers recent Canadian reviews as well as studies from the U.S., U.K. and other countries. A number of key conclusions were derived through this synthesis:

1. In certain cases, nurses have been shown to provide equivalent care to physicians within the range of their legislative competency.
2. Nurse-led initiatives are shown to improve outcomes as well as access and care continuity, but cost- savings may not be realized if more resources are used.
3. It should be emphasized that the comparability of specific studies and reviews to each other and to specific contexts in Canada may be affected by differences in the care population in terms of need and demographics, as well as by the payment modality and organization of the healthcare systems in various jurisdictions.

4. Differing study lengths may affect the results obtained, as health gains may appear later in terms of longevity and other outcomes.
5. The requirement to target resources to populations in most need in order to achieve real effectiveness is discussed in many of the papers reviewed.

GREY LITERATURE STUDIES OF EFFECTIVENESS

Referred journals are not the only places to find useful reviews of the effectiveness of nurses in collaborative care or interprofessional teams. This report also analyzes a number of working papers and reports. As with the material above, the key points in these studies can be summarized into key conclusions:

1. If the practice context allows nurses to use their full skill set, nurses can be effective in the management of chronic disease.
2. It is important to target any additional resources to the patient population with the most health deficits, so that the patients within that population can benefit appropriately.
3. It will be challenging to develop greater utilization of nurses due to financing and existing healthcare structures.

FINANCING MODALITIES FOR PRIMARY CARE

The importance of comprehensive coordinated patient-centred care is broadly recognized throughout the literature. As indicated above, the use of interprofessional teams, or any form of collaborative care in which healthcare providers play various roles, is clearly conditioned by the ways in which primary care is financed. Many countries and jurisdictions use or have experimented with various mixes and combinations of financing for primary care, including fee-for-service, capitation, salary payments for providers, performance incentives, and various practice payments. The issue is how to promote the care coordination and the effective use of non-physician health providers. Based on our research findings, the following generalizations related to primary care financing can be made.

1. Maximum patient contacts and minimum time per patient are obtained with fee-for-service payment systems; this type of payment system tends to reward volume rather than intensity of service.
2. Unless directives on the use and compensation of non-physician providers are explicitly incorporated in the payment system, there will be limited incentives to use them.
3. Intensive patient contacts – a term used in the literature to represent the level of resources being applied – are associated with effective chronic disease management and are likely best obtained in a more comprehensive capitation or blended compensation system. The key is to develop systems, ensuring that the savings flow to both the payer and the provider.

INTERPROFESSIONAL TEAMS AND CHRONIC DISEASE CARE

This report reviews the importance of the coordinated management of chronic diseases in the general healthcare system and summarizes literature indicating the significant role played by interprofessional teams in that care. It also emphasizes the role played by such teams in patient education and the promotion of lifestyle changes for the effective management of diabetes, cardiovascular disease, depression and other conditions.

DOES IT PAY?

This report also addresses the important question of resource requirements for the enhancements to primary care available through the use of interprofessional teams, including nurse-led teams. A number of cost-effectiveness studies have been synthesized, resulting in the following observations:

1. Studies shows that nurses, with appropriate scope of practice, can provide complementary care to general practitioners. Naturally, this approach is cost-effective only if the relative compensation is appropriate. If nurses provide more intensive patient care, then compensation rates must be appropriate if cost-effectiveness is to be achieved.
2. The relative skills and costs of the professionals should be a factor in the development of interprofessional teams. This mix of relative skills and costs is the economic rationale for the effectiveness of interprofessional teams.
3. The increased use of more nursing-intensive care approaches, including interprofessional and nurse-led teams, may not be save costs. However, if improved outcomes are assigned a monetary value, then these approaches are likely to be significantly cost-effective.
4. The health gain is likely most significant for high-risk high-needs patients.
5. These studies suggest targeting more intensive health care programs to the patients most likely to benefit.

DOES IT HELP ACCESS?

Access to all care, particularly primary care, is one of the key issues in the management of the healthcare system. This is a multi-dimensional concept. On one side, the issue of geographic access is a concern in all areas of the Canada, but particularly in the rural and northern communities. However, coordinated access to care is an issue in all parts of the country. In particular, the use of interprofessional teams and nurses working independently may be an important way to improve capacity and to optimize the use of scarce healthcare human resources. This report also reviews the use of nurse-led models to expand service capacity and improve patient activation through community-based person-centred care.

DISCUSSION

The research synthesis presented in this report highlights the potential role that can be played by the enhanced use of nursing resources in interprofessional teams or nurse-led teams to provide improved outcomes, from access to primary care, in Canada. The report points out the impact that the financing of healthcare delivery has on the incentive to effectively use healthcare resources. Throughout the report, there is a continued emphasis on the requirement to target resource enhancement to patient populations with the greatest need or health risk. This approach represents the most equitable use of resources. The report concludes that enhanced use of nursing resources can improve patient contact, education and disease management, and also that the use of interprofessional teams offers the potential for cost-effective improvements to healthcare access and to health outcomes if the latter are appropriately valued in cost-effectiveness analyses.

INTRODUCTION

The evolution of the Canadian healthcare system requires a continuous focus on the optimal use and allocation of resources to focus equitably on the health outcomes of Canadians in a sustainable system. Over the medium and longer term, the inevitable slowing of growth in the Canadian economy reflecting the downturn in workforce growth means that there will be increasing pressures on government revenue and on manpower resources. This means that there must be an increased emphasis on maximizing the value from government programs such as healthcare. Trying to get more health gain for the same or fewer resources, both human and material, is an important and necessary goal. This can involve adapting healthcare processes and skill mixes to improve results. One potential route is to optimize the use of nursing human resources, which many experts consider to be possibly under-utilized in Canada, to enhance the coordination of care and health outcomes.

Collaboration is an important part of a modern healthcare system. “The Principles and Framework for Interdisciplinary Collaboration in Primary Health Care” from the Canada’s Enhancing Interdisciplinary Care in Primary Health Care (EICP) initiative recognizes that interprofessional collaboration can exist at all stages of the healthcare continuum, including prevention, detection, treatment, rehabilitation, and recovery. The principles are set out as follows: 1) Focus should be on the patient; 2) Population health trend needs should drive the services offered; 3) Health outcomes should be tracked for effectiveness and quality; 4) Access should be provided where and when it is needed; 5) Shared decision-making by professions with different skills and knowledge will spark creativity and innovation; and 6) Effective communication facilitates information-sharing and decision-making.¹

Our report focuses on the use of nurses in interprofessional teams, including nurse-led teams. The concept of interprofessional care involves multi-professional collaborative interaction. That collaboration could include or be led by professionals other than nurses and nurse practitioners. In fact, the synthesis review studies show that collaborative teams can successfully involve all types of professionals, including nurses, physicians, pharmacists, therapists, and others.

The goal of this report is to highlight the cost- and outcomes-effectiveness of interprofessional teams that may be nurse-led. The scope of the project is outside the direct acute care context, and instead focuses on primary care and on settings such as clinics, community health centres, family health teams, long-term care, and public health.

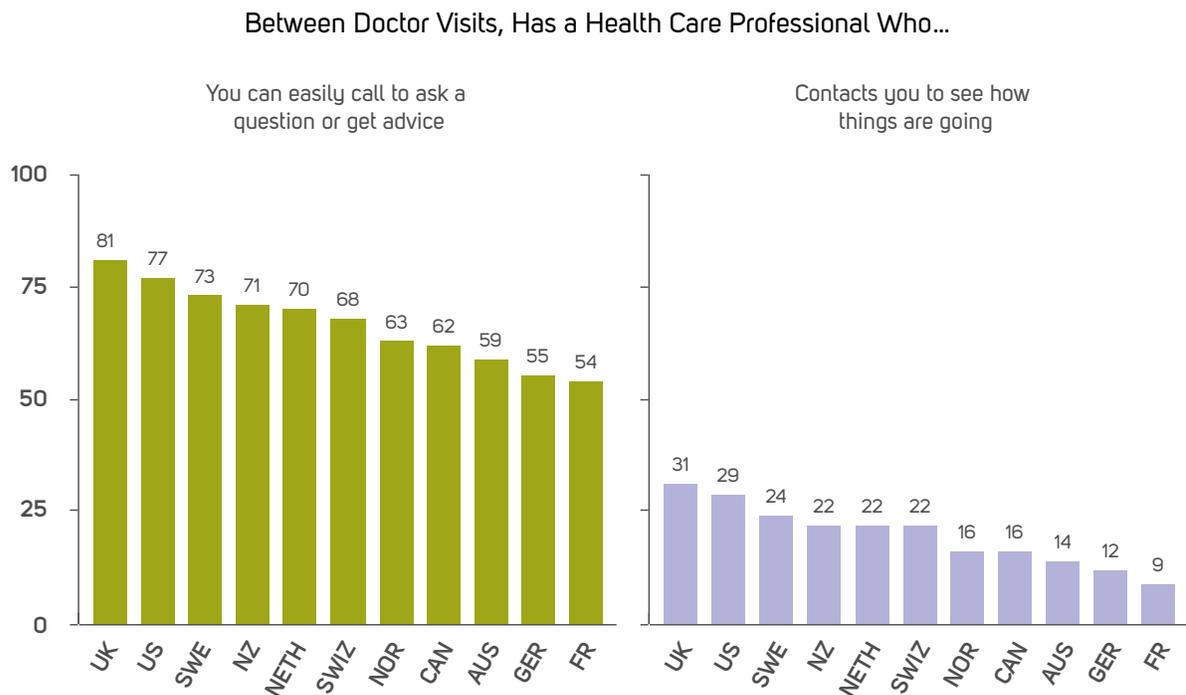
In the studies reviewed for this synthesis, the emphasis has been largely on effectiveness measures related to improved outcomes. The specific effectiveness of team care is also compared to usual care. The general characteristic of the studies is that the material does not focus on cost-savings, although some gains can be inferred from measures such as reduced readmission rates and the utilization of emergency services.

At the outset, it must be emphasized that many of the gains from collaborative professional activity are associated with gains in quality of care, such as improved patient experience, as indicated by satisfaction and general health outcomes. In some studies, gains are reported in cost metrics, such as reduced admissions within the study period. However, it is not possible to infer global system cost-savings from such estimates. In general, many of the gains in quality of care are linked to using more resources at possibly lower compensation levels. This approach may improve the quality of care, but it does not bend the cost curve in any significant way. Our synthesis indicates that one of the major gains from collaborative care is the better use of professional resources to provide access to levels, continuity, and comprehensiveness of care that did not otherwise exist without the initiative. This represents an improvement in supply and in value, but again, does not result in a lower overall level of expenditure.

The report reviews selected published literature and available grey material to focus on the contribution of nurse-led and interprofessional teams in areas such as chronic illness care, prevention, improved health outcomes and health access. The overarching theme is the management of complex chronic illnesses within an interdisciplinary setting to achieve improved health outcomes, using prevention approaches and improved health access. Research indicates that while these complex conditions are concentrated in a relatively small share of the population, they nevertheless represent a disproportionate share of health costs. Research also shows that patients with access to a concept that they characterize as a *medical home* – defined as an accessible primary care practice able to coordinate their care – are shown to have improved health, and that they use fewer healthcare resources. Essentially, the focus on managing complex chronic illnesses is patient-centred and extends beyond the boundaries of the traditional illness-based acute-care system. Interprofessional teams are considered one key element of that picture.²

In international studies, Canada did not rank well with respect to access to care or emergency department utilization rates when compared to other major OECD (Organisation for Economic Co-operation and Development) countries. For patients with chronic disease, for example, access to care coordination that might be supplied by a registered nurse was considered an issue, along with the usual cost considerations such as access to pharmaceuticals. Figure 1 shows Canada's ranking for that kind of coordination.

Figure 1 Access to Professional Healthcare Support



Base has chronic condition.

Source: 2011 Commonwealth Fund International Health Policy Survey of Sicker Adults in Eleven Countries.

There are many indicators, including emergency department use and unmet needs in areas such as mental health, which suggest that significant progress needs to be made.

The organization of this report is based around the following headings:

1. Methodology – outlines the literature databases consulted for this project
2. Advanced Nursing Practice in Canada – provides an overview of nursing development in this area
3. General Reviews of Nursing Effectiveness – summarizes the key conclusions of general reviews of nursing effectiveness in the team context
4. Grey Literature Studies of Effectiveness – summarizes additional key studies not found in the general academic literature
5. Financing Modalities for Primary Care – summarizes the issues for primary care financing which impact the utilization of nursing resources
6. Interprofessional Teams and Chronic Care – summarizes literature specifically in the area of chronic disease management, one of the key areas of team utilization
7. Does it Pay? – reviews the literature from the perspective of cost-saving as well as cost-effectiveness
8. Does it Help Access? – reviews the gains in access from nurse-led and team care
9. Discussion – summarizes the issues raised in the synthesis report

METHODOLOGY

The literature has been selected with the goal of highlighting a number of threads and combining them into a review, using review articles where appropriate. The papers chosen for this report were selected because of their focus on the key features of the use of interprofessional teams, including nurse-led teams. The citations of key papers were used to guide the choice of additional material to optimize the scope of discussion on key issues.

The methodological approach started with the use of major bibliographic search engines including PubMed, CINAHL, Cochrane, and Google Scholar. The key search terms were nursing, collaborative effectiveness, and primary care. Specific literature databases were also consulted, including:

- ▼ Econlit – American Economic Association
- ▼ APN Literature Database – McMaster University
- ▼ Centre for Reviews and Dissemination – York University – England
- ▼ Cost-Effectiveness Analysis Registry – Tufts University
- ▼ Virginia Henderson International Nursing Library

As the synthesis report developed, the focus was extended to include a specific discussion of chronic disease management and payment incentives.

Cost-effectiveness articles are occasionally referenced in this study. However, it should be noted that the comparability of cost-effectiveness studies across jurisdictions may be confounded by the impacts of the organization and funding of healthcare in each jurisdiction. It is challenging to generalize the results of such studies to other jurisdictions with differing healthcare systems incorporating different incentives and structures.

One of the challenges in the comparison of literature across jurisdictions is that the utilization of interprofessional and nurse-led teams is heavily conditioned by the institutional practices and payment modalities of the specific jurisdictions, as well as by the populations targeted for services. What may work well in one area may be less effective in another. Thus, the studies may not be directly comparable.

ADVANCED NURSING PRACTICE IN CANADA

One feature of interprofessional teams is the use of nurses in a more proactive and responsible role with possibly a broader scope of responsibility for care management and coordination. These teams usually emphasize nurses with advanced qualifications, such as advanced practice nurses (APNs) or nurse practitioners (NPs). The latter two terms are often used interchangeably in the literature.³ In Canada and the U.S., the term “nurse practitioner” is often reserved for roles with specific licensing requirements.⁴ As well as possessing advanced competencies, NPs are expected to have increased decision-making responsibilities within interprofessional teams.

In North America, the reliance on NPs has a long history. An early randomized trial of NPs in Burlington, Ontario from the 1970s provides an important base of evidence of the effectiveness of their role.⁵⁻⁷ It showed that NPs could provide equivalent and effective care to that of physicians in a primary care practice.⁸ One of the important conclusions from the Burlington study was that team practice that included NPs resulted in a major reduction in the use of acute care services and an 11% reduction in aggregate health costs per patient.⁹

Over time, there has been a significant advance in the use of NPs in primary care and public health.¹⁰⁻¹² The expansion of the utilization of the role appears to have been driven by health reform initiatives aimed at achieving increased access and lower costs. Access in rural areas was a particular driver to the expansion of the nursing role in Canada. However, the legal recognition of the enhanced NP scope of practice in primary care dates only recently, from 1998.¹² According to a recent Ontario survey, compensation seems to be higher for NPs in primary care and in nurse-led facilities. Community health centres are a particularly critical practice setting for NPs in Ontario, where the majority of NPs work in interprofessional teams with physicians.¹³

GENERAL REVIEWS OF INTERPROFESSIONAL TEAMS AND NURSING EFFECTIVENESS

There has never been any particular doubt about the value of nursing in healthcare. The volume of literature on the topic is significant. Even under the specific medical subject heading of “nursing economics,” PUBMED and the database of the National Library of Medicine provide over 1,100 references. To focus the discussion, we have chosen to concentrate on several key reviews, cited below.

In their review *Better Care: An Analysis of Nursing and Health Care System Outcomes*, Gina Browne et al. emphasize the depth of literature showing the contribution of nursing to better care.¹⁴ However, they also highlight the many challenges of evaluating the impact of nursing and interprofessional care in which nurses play a significant role. In the analysis, studies are presented showing both nurse-involved and nurse-led interventions including nurses with basic training (RNs), those with specific disease training, and advanced practice nurses or clinical specialists. The authors present an ecological framework for the relationship of nursing and patients. Essentially, the framework outlines the characteristics critical to the relationship between nursing, patient outcomes, and any measure of effectiveness. These characteristics include nursing (including family influences); the patient (including family support); the social institutions and service providers integrated with the health system; the funding of the various delivery arms of the health system; and the organization in which the nurses work. These factors vary in all jurisdictions, meaning that the direct comparability and applicability of studies in one area to another health system may not be easily evaluated. One of the challenges with the evaluation of any healthcare program is that the results may be confounded by changes in the social programs or economic climate that may also affect patient outcomes. The impact of these factors is well understood. For example, Roos et al. show that persons in lower socio-economic gradients have more physician visits and hospitalizations for ambulatory-sensitive health conditions than those in higher income groups.¹⁵ In other words, the results are affected by the population.

Even high-quality randomized controlled trials of specific nursing interventions may not be comparable to other jurisdictions as might be hoped. For example, different funding modalities for specific health practitioners might change the relative cost-effectiveness considerations. In terms of the economic impact, Browne et al. make the point that the duration of the study may also affect the results.

The Browne et al. analysis focused on nursing intervention review studies that evaluated outcomes and costs, as well as those that compared the results to usual care. Other reviews, such as Laurant et al., were oriented towards substitutive care and showed that nurse-led care could be of equal quality to that of primary care physicians.⁵ Under this model of care, nurses may be deployed to fulfill unmet needs and thus improve patient satisfaction but not necessarily resource usage. The Keleher et al. general nursing review showed similar results in primary care with emphasis on chronic disease management, illness prevention and health promotion. However, their review did not find sufficient evidence to make a strong conclusion on health outcomes.¹⁶

Browne et al. reviewed a number of studies involving nurse-led teams with specialized training working in clinics to support post-acute management of specific health conditions. These studies related to a broad range of conditions including heart failure, dementia, asthma, heart disease, chronic obstructive pulmonary disease (COPD), frail elderly and diabetes. Browne et al. noted a number of studies that demonstrated nurse-led care was more effective and less costly. Their summary indicated that 21 of 27 reviews showed that a nurse-oriented model reduced the use of costly crisis resources such as emergency departments and hospitalizations.

Raman et al. undertook a systematic review of a randomized control trial for post-discharge heart failure patients.¹⁷ Their technology assessment for the U.S. Agency for Healthcare Research and Quality suggested that increased clinic visits, home visits, and multidisciplinary care reduced the risk of readmissions.

Other reviews, such as Horrocks et al. and Newhouse et al., also supported the conclusion that NPs could provide care equivalent to physicians in the primary care setting.^{7,18} The policy conclusion of the Newhouse study was that NPs were an effective way to augment the healthcare workforce. More importantly, such studies have indicated the relative value of nurses to interprofessional teams. However, it must be explicitly recognized that if the goal is to “bend” the healthcare cost curve, a shift to greater use of nursing resources is appropriate only if the relative costs of health practitioners reflects their intensity of use.

In a technology review study for the U.S. Veterans Health Administration, one of the largest health management organizations in the world, author Karen Flynn emphasized the potential for the use of nurse practitioners, but indicated that this may not result in cost-savings if the general practitioner costs are sufficiently low. However, the study showed that gains in the continuity of care are possible in the primary care setting if NPs are appropriately utilized with sufficient practice authority. Essentially, Flynn’s review indicated that the successful implementation of NPs was a complex issue.¹⁹

One key conclusion that seems to emerge from all the studies is the importance of targeting resources where they can be effectively utilized. Browne et al. characterized a Cochrane review by Loveman et al. of the use of specialist nursing care for diabetes management as offering improved care for the same cost.²⁰ However, the improvement was significant only in the short term and was most relevant for patients with extreme glycemic control problems. Many of the trials reviewed were not structured to highlight longer-term gains.

In a recent OECD review of the use of nurses in advanced roles in developed countries, Delamaire et al. showed positive gains in health outcomes and services. However, they also noted that savings from nursing salaries, which are lower relative to physicians’, may be offset due to increased time spent with patients and additional diagnostic tests.³

While the reports cited in this section indicate that nurses can offer cost-effective and equal quality care to physicians in particular contexts, Dierek-Van Daele et al. have noted that the generalizability of cost-effectiveness studies to other contexts should be viewed with caution.²¹

The literature surveyed indicates improved outcomes from team care. We were unable to identify any literature that indicated any improvement in aggregate costs. This issue will be addressed in a subsequent section.

General conclusions

1. Nurses have been shown to provide comparable care to physicians within the range of their legislative competency.
2. Nurse-led initiatives are shown to result in improved outcomes as well as access and care continuity, but cost-savings may not be realized if more resources are used.
3. It should be emphasized that the comparability of specific studies and reviews to each other and to specific contexts in Canada may be affected by differences in the care population in terms of need and demographics, as well as by the payment modality and organization of the healthcare systems in various jurisdictions.
4. Differing study lengths may also affect the results obtained because health gains may appear later in terms of longevity and other outcomes.
5. The requirement to target resources to populations in most need in order to achieve real effectiveness is discussed in many of the papers reviewed. This has implications for the management of the health system.

GREY LITERATURE STUDIES OF EFFECTIVENESS

Examples of the effective use of nursing resources in interprofessional teams can be found in research studies that are not always directly referenced in articles published in academic journals. In this section, we review the highlights of several studies of nursing effectiveness. Although nurses with advance preparation and training have the longest history in the U.S. and Canada, they have been used in Australia, New Zealand and other jurisdictions in recent years. The term “practice nurse” is used in many countries such as Australia and New Zealand, and generally refers to a nurse with advanced training in primary care practices.

Our initial example is a report, by the Joanna Briggs Institute, which evaluated a program that utilizes nurses with advanced qualifications in residential aged-care facilities.²² The project evaluation was somewhat limited in that the nurse practitioner candidates were not licensed for prescribing at the beginning of the trial. The project funding also did not allow the nurses to prescribe, so that activity was not tested. Although the role of nurses could not be specifically evaluated, the conclusions of this report were that NPs in aged-care facilities, if given prescribing and diagnostic investigation authority, could complement the role played by general practitioners in the following areas:

- Providing early healthcare assessment, detection and prompt treatment of symptoms/conditions that would ordinarily lead to an acute medical episode and possible admission/readmission to the acute care sector
- Providing timely initiation of treatment – for example, directly ordering diagnostic investigations, and
- Commencing medications (oral antibiotics), and providing enhanced communication, coordination and monitoring of care for other healthcare providers, the client and/or their carers.²²

The report suggested that the nurses could be based in general practices serving aged-care facilities, located directly in the aged-care facilities or geriatric services, and possibly deployed by the Ministry of Health depending on the funding modality.

Hefford et al. provided a benefit-cost review of the use of practice nurses in primary care in New Zealand.²³ The focus was on task substitution between practice nurses and general practitioners. The analysis was undertaken using data from nine practices in the latter half of 2009. As noted above, the conclusions were dependent on the financing arrangements in New Zealand at that time. In the nine practices, the range of consultations undertaken by nurses varied substantially, with two practices showing very significant use of nurses in a consultative capacity. The financial results in New Zealand are dependent on the co-payment rates charged for nurses relative to general practitioners. In essence, the study demonstrated that nurses will be used more if it is financially advantageous to the primary care practice, and that capitation may be an appropriate payment model.

In Australia, Pearson et al. evaluated the use of NPs in 16 non-acute care area practices including diabetes outreach for residential clients; bush nursing; general practice/primary healthcare; custodial care; stomal, continence and wound management; cystic fibrosis; community-based palliative care; palliative care; diabetes care; community-based diabetes crisis intervention and management clinic; intensive care unit liaison; women’s health; homeless persons program; young people’s health; youth substance abuse; and community midwifery.²⁴ The evaluation showed the expected quality of care as lower than anticipated; however, this can be attributed to the confusion and expectations of NP roles in the practice areas. The projects were also seen as temporary and not part of the main-stream health system. Also discovered were issues related to the reluctance of general practitioners to see widespread prescription rights given to NPs. The overall conclusion was that NPs could deliver services as good as those provided by existing providers, such as general practitioners or physicians, at no significant cost difference and with comparable effectiveness and outcome.²⁴

In a working paper and article, Mousqués et al. documented a teamwork project between nurses and general practitioners to manage patients with type 2 diabetes.^{25, 26} This case control study compared the teamwork approach with a general practitioner-only management group and found the teamwork approach provided improved health outcomes for a similar cost. Essentially, there was more intensive management possible with the team approach. Specifically, better glycemic control was achieved because there were specific nurse visits for education and counseling, rather than just electronic reminders and the use of a registry.

Primary care networks (PCNs) with patient enrolment is a new initiative in Alberta.^{27, 28} PCNs emphasize the use of multidisciplinary teams, including nurses, dietitians and pharmacists, along with chronic disease management programs to improve access and care coordination. The specific focus of the study cited was on the impact on patients with diabetes in PCNs. It must be noted that non-physician members of the team with prescription alteration authority were used in only 12 of the 28 PCNs in the study. This was deemed to affect the impact of the teams. In general, the patients in the PCNs had better glycemic control than the control patients, and hospitalization rates were generally lower in the PCN population.

General conclusions

1. If the practice context allows them to use their full skill set, nurses can be effective in the management of chronic disease.
2. It is important to target any additional resources to the patient population with the most health deficits, so that they can benefit appropriately.
3. There will be challenges in developing greater utilization of nurses because of financing and existing structural barriers in health service delivery.

FINANCING MODALITIES FOR PRIMARY CARE

Arguably, the biggest challenge to the development of a first-class primary healthcare system is to “get the incentives right.” The challenges of the principal/agent relationship are well known; the physician as agent has more information than the patient as principal. The agent wishes to manage his or her income but the principal wishes to manage health. The agent has a choice in terms of managing the number of principals seen and the time and effort spent with each principal. The principal wants to manage his or her health and must optimize this across agents, hospitals, medicines and health practices.²⁹ The coordination of that relationship is complex. In Canada, there has been an increasing focus on the introduction of alternative payment mechanisms for physicians. Alternatives include capitation, blended incentive payments and salaries.³⁰ In Ontario, there is a long history, with mixed results, of experiments with capitation and various incentives³¹

At the outset, it should be highlighted that there is a difference between the financing of the practice and the financing of individual staff members. A practice that is predominantly funded by fee-for-service may offer particular incentives to the staff members who benefit from the associated volume incentives, even though other staff may be on salary compensation.

To improve the situation, the financing and organization of primary care must be set up to promote comprehensive coordinated patient-centred healthcare. Because of the importance of chronic co-morbidities for many significant health system users, the focus must be on the overall health needs of the patient.³² In many countries, payment and organization have developed around episode-oriented fee-for-service billing systems rather than patient-focused health systems. Much of the focus is on physician compensation. Berenson et al. have indicated that the three dominant modes for that compensation in the U.S. – fee-for-service, capitation and salary – do not support the kind of enhanced primary care services associated with interprofessional teams and the patient-centred medical home.³³ Traditional fee-for-service models do not adequately compensate more integrated approaches to patient care, health promotion and prevention, which utilize a broader spectrum of resources than just the physician. Fee-for-service systems are also challenged with the reimbursement of non-visit- related services such as telemedicine, or the use of e-mail for patient communications. Fee-for-service schemes also seem to provide a greater incentive for physicians to provide more patient visits in a week.^{34,35}

Capitation payments carry the issue of risk adjustment and may be perceived as providing incentives to the health provider to minimize care. However, they may provide more continuity of care because of the emphasis on the patient-doctor relationship. Devlin et al. reviewed studies that suggested capitation results in cost-savings.²⁹ Managing the risk adjustments needed to ensure adequate resources for complex patients is obviously a major challenge to capitation compensation schemes. Inadequate risk adjustment may incent the provider to “off-load” challenging patients. Tu et al. have suggested that physicians under capitation compensation achieved the best treatment and control rates for hypertension.³⁶

Salary programs may not provide the correct incentives to devote the time needed to complex patient needs. However, it is also difficult to set fees for specific services to reflect the correct resource allocation for patient-centred primary care. In Ontario, the community health centre model is associated with salaried service providers.³⁷

The general thrust of the discussion around payment modalities is a movement away from volume incentives and towards patient-centered, outcome-focused remuneration models. These models are becoming increasingly accepted by primary care physicians.³⁸ Figure 2 shows a comparison of the various payment modalities with a proposed comprehensive payment system for a practice.³⁹

Figure 2 Comparison of Payment Modalities for Primary Care (Table 2, Goroll, 2007)

	Comprehensive primary care payment	FFS	FFS+ PFP	Capitation	Capitation + PFP	FFS + monthly coordination fee
Monthly payment includes all primary care services	+	-	-	+	+	-
Payment for individual encounters	-	+	+	-	-	+
Primary care practice at risk for services delivered by others	-	-	-	+ (usually)	+	-
Measurement of performance (technical and patient experience)	+	-	+	-	+	-
Obligate probably reporting of performance	+	-	-	-	-	-
Expect total cost of care to decrease	+	-	-	+	+	±
Incentive to limit practice size	+	-	-	-	-	-
Incentive to treat complex patients	+	-	-	-	-	+

FFS = fee for service

PFP = pay for performance

Goroll's proposal is for a risk/needs adjusted payment model that covers all practice expenses. In this figure, the plus (+) indicates an attribute of the payment mechanism. Goroll's proposal includes payments for infrastructure and electronic health records. By covering the fixed costs, there is less incentive for large practices to limit the quality of care as indicated in other studies. The Goroll approach has developed alternative financial models for practices in the U.S. to evaluate implications of the financing options in actual monetary terms. We could identify no similar material for Canada. It would be useful to attempt a similar study in Canada based on the current state of remuneration and costs in a specific jurisdiction.

Salary compensation is considered to be incentive-neutral and is more feasible in a single-payer system for primary care than in a multi-payer system such as the U.S. Presumably, the salary approach is feasible for all members of an interprofessional team, although the performance incentives of salaried employees are often considered an issue. Pay-for-performance incentives are complicated by the issue of measuring true health outcomes and relating those outcomes to provider activities.

In a review of payment schemes, Devlin et al. showed that fee-for-service results in an over-provision of services because the risk of inefficient care for significant health users is born by the insurer, which in the Canadian case is the single-payer health system. Devlin et al. have suggested that a conclusion as to the best approach is not easily determined because of the multiplicity of factors.²⁹ This result – that fee-for-service compensation produces more consultations than salary – is also supported by research in Norway (also a single-payer system).⁴⁰

A model integrating nursing staff compensated by the payer (i.e., the province) into fee-for-services practices in B.C. has been discussed by DiCenso et al.⁴¹ Survey results of participants indicated that the nurses increased capacity to deliver services. However, there were concerns about the effect on practice income in a fee-for-service environment.

Qualitative interviews conducted by Wranik et al. have highlighted the importance of capitation and salary schemes to provide incentives for the location of primary care physicians in rural and remote locations. The authors have noted the reluctance of fee-for-service-compensated physicians to delegate tasks and collaborate with other service providers. Their analysis suggested that blended payment schemes have positive impacts on collaboration, preventive care and care continuity.³⁰ The authors have also highlighted the importance of the patient roster associated with capitation along with quality-incentive payment systems for the promotion of adherence to treatment regimes because of the stronger patient/provider relationship.

However, the literature is not clear on the subject of the efficacy of specific incentive payments to healthcare suppliers such as physicians. The payments for specific practices may go only to practitioners who were already doing what was needed. This seemed to be indicated by a study of diabetes care incentives in Ontario.⁴² A Cochrane review of literature on target payments (payments to physicians to achieve a certain care standard) did not provide conclusive support for the effectiveness of such payment systems in achieving improvements.⁴³ A Cochrane review on financial incentives in primary care was also inconclusive about the results because of limitations in the study designs.⁴⁴

It is also not clear that the payment system is as crucial a factor in getting good preventive care as simply the organization of the practice. A recent study by Dahrouge et al. of Ontario practices has suggested that, although overtly the capitation model results in a higher prevention score, the key factors may really be the size of practice (smaller is better), the presence of a female physician and the use of electronic reminder systems.⁴⁵ However, in the context of a trial in Ontario on the improved delivery of cardiovascular care, Liddy et al. found that the best standards of care were achieved in the community health centre, with its greater emphasis on nursing services, rather than in fee-for-services practices.⁴⁶ The authors also found that the practices with blended capitation provided more preventive care than those with fee-for-service.

It is important to recognize that primary healthcare finance is about more than just compensation to physicians. It is also about how to incent the delivery of services from an integrated team of health professionals. This is important for the management of chronic disease. Russell et al. used the Primary Care Assessment Tool to evaluate the delivery of chronic disease management under the various modalities of primary care.³⁷ This study involved chart assessments for patients with diabetes, congestive heart failure, and coronary artery disease, along with outcomes evaluations. Econometric analysis was used to associate organizational factors with health outcomes. The results indicated that better chronic disease management was achieved in community health centres that had longer consultations and interprofessional collaboration. However, independent of the organizational modality, the analysis indicated that the presence of NPs and lower patient/family physician ratios resulted in improved care. Smaller practices also seemed to provide better care.³⁷ Essentially, the funding and the organization of the service package delivered by the team are as critical as the individual payment options available to the specific team members.

The impact of healthcare finance on the utilization of healthcare professionals is an issue in most jurisdictions. Pearce et al. highlight attempts in Australia to promote teamwork and task substitution by nurses in general practice in Australia.⁴⁷ The researchers analyzed the impact of introducing specific line-item funding options for nursing tasks into the largely fee-for-service-funding mechanisms in Australian general practice. In addition, practice-based payments were also part of the reform effort. Such funding changes seemed to have less impact on nursing utilization than factors such as the interprofessional organization of the practice. Many of the activities associated with the nursing-related fee-for-service payments were already being done by nurses prior to the intervention. One of the issues created by the absence of specific funding options for nursing activities was the requirement for physician presence, which affected the professional climate. Of course, the nursing-related line items created an income stream for the practice, not for the nurse. This also affected attitudes as to the impact of the intervention. The study raises the issues and challenges of providing, through funding, the appropriate incentives to the nurses as well as to the private practices.

General conclusions

1. Maximum patient contacts and minimum time per patient are obtained with fee-for-service payment systems.
2. Unless the use and compensation of non-physician providers is explicitly allowed for in the payment system, there will be limited incentives to use them.
3. The more intensive patient contacts associated with effective chronic disease management are likely best obtained in a more comprehensive capitation or blended compensation system. The key is to develop systems so that savings flow to both the payer and the provider; otherwise, there will be significant resistance to their implementation.

INTERPROFESSIONAL TEAMS AND CHRONIC DISEASE CARE

More and more, focus is increasing on the management of health conditions that can be only managed, not cured. These are termed “chronic health conditions” and represent a significant economic burden for the health system and the country.⁴⁸ Proper management of chronic disease can lower its impact on the healthcare system and improve the system’s overall sustainability. The essential elements of chronic disease care involve integrated solutions with interprofessional teams, patient self-management, and the use of electronic management systems to assist in case management. The strategy is generally titled “chronic disease management.” The emphasis is on reducing the use of acute care services and focusing the delivery within primary care and the patients’ home. The goal is to improve the health of patients and thus reduce unnecessary demands on the healthcare system. Collaborative teams with a strong nursing component are a major part of this model. There is a very strong literature base, of which only a few citations will be discussed in this section.⁴⁹⁻⁵⁵

Management of chronic diseases such as diabetes and COPD requires an educated patient, due to the disease management and life-style changes, as well as health system coordination. A review by Bodenheimer et al. showed that self-management education emphasizing problem-solving with respect to lifestyle issues can improve outcomes.⁵⁶ An educated patient is best supported by a practice that includes the standard elements of interprofessional teams, case management, and follow-up evaluation, as emphasized by Glasgow et al.⁵⁷

Grumbach and Bodenheimer have highlighted the importance of interprofessional team activities in improving the results of primary care in the U.S. context.⁵⁸ The authors even provided some examples of functioning primary care teams going back to the beginning of the last century. They have described a successful primary care team in a private practice that involves two physicians and two NPs supported by other team members. The emphasis is on a systemized approach to patient triage to improve practice results. The paper also reviewed a Kaiser Permanente primary care team system that includes a nurse as co-leader to improve coordination. Of course, in the Kaiser Permanente system, the incentives are clearly defined using a risk-adjusted capitation scheme to focus the team on the management of outcomes.

The emphasis on education and follow-up management in chronic disease care processes creates a strong incentive to enhance the use of nurses to the full potential of their training. Mason et al. describe the results of the U.K. SPLINT (Specialist Nurse–Led Clinics to Improve Control of Hypertension and Hyperlipidemia in Diabetes Trial), focused on improving blood pressure and lipid control, which utilized clinics led by specialist nurses to provide detailed patient assessments and follow-up on individualized action plans and medication management.⁵⁹ Given the high costs of managing patients with strokes, the clinics were judged to be a cost-effective enhancement.

Because of the time and personnel intensity of chronic disease management, there is strong incentive to move to a nurse-led shared care model. Eley et al. have described the challenges and successes of nurse-led care in Australia, where the emphasis is on the increased efficiency of the process and improved patient communications.⁶⁰ Lenz et al. have shown that NPs can provide equivalent care to that provided by physicians for chronic diseases such as diabetes.^{61, 62}

One of the more challenging issues with chronic disease management is the treatment of depression that can accompany chronic diseases like heart disease or diabetes. The TrueBlood study by Morgan et al. has shown that the personnel intensity of the frequent contacts required to diagnose and monitor depression can be effectively managed by the use of practice nurses.⁶³ The enhanced use of nurses makes such treatment more sustainable from a health system perspective. Katon et al. showed that nurses in a collaborative program can effectively assist in the management of depression by providing an individualized stepped-care program.⁶⁴ In another paper, the same authors reported on a successful collaborative care program that helped with depression management and chronic disease risk factor reduction.⁶⁵ The intervention was a guideline-based management program by nurses.

It should be noted that the organization of primary care is critical to delivering successful collaborative chronic disease management and care. Russell et al. note that community health centres made the most optimal use of interprofessional collaboration to deliver chronic disease care.³⁷

The use of primary care teams is well advanced in Canada. In a series of case studies, the Health Council of Canada (HCC) has documented some of the successful projects.⁶⁶ For example, one feature of the chronic disease management model used in the Calgary Health Region is the use of community-based nurses to provide case-management and referral support to patients. Another feature is the use of interdisciplinary clinics to manage the needs of patients with multiple chronic conditions. One key feature of the chronic disease management strategy in the Group Health Centre in Sault St. Marie is the use of electronic medical records to improve group communication. The HCC report also discussed a COPD clinic in Nova Scotia that emphasizes education about the management of the disease. All of the case studies in the HCC report emphasize the use of electronic medical records as well as strong group communications in the primary health team.

DOES IT PAY?

Economics is known, with some justification, as the “dismal science.” The decision to treat must necessarily add to costs. In other words, healthcare is not free. Using increased nursing and other resources for chronic disease management may result in significant improvements in the quality of life and health for patients. This does not represent a “bending” of the cost curve, but it may result in more health value-for-money. Allocating resources specifically to chronic disease management, such as the Chronic Disease Management model, can result in cost- savings, at least in the short run, in terms of avoiding the use of acute-care services.⁵² The model emphasizes guided self-management of chronic diseases by the patient, usually supported by education and counselling delivered by nurses. The goal in such programs is to trade the use of expensive resources for cheaper resources. Louise Russell’s reviews of cost-effectiveness literature have shown that one of the challenges of many of the new drugs and other therapies is that they are difficult to target to those who really need them. This limits the potential savings.⁶⁷ The author has also highlighted a diabetes management program that clearly reduces diabetes but, by definition, requires resources and thus raises costs. One essential point in the author’s paper is that absolute cost- savings may be illusory. However, the other point is that targeted use of resources may provide significant gains in health.

It is important to recognize that if the goal is improved health, disease management programs can provide significant value in terms of health outcomes. Effective use of nursing resources can provide equivalent or improved results from such programs at lower costs than other alternatives. Nurse-led support for heart failure patients is an area that has received significant study. Because of the differences in populations in the various studies, the true statistical validity of the meta-analyses may be difficult to determine.⁶⁸ However, the general conclusion of effectiveness is clearly appropriate.

For our discussion on cost-effectiveness literature, we will focus on some specific programs, as it is impractical to review all types of programs. For this purpose, we will focus this segment of the discussion on heart failure programs, of which all of the studies involve nurse-led initiatives. For example, Postmus et al. discussed three programs for the management of heart failure.⁶⁹ One goal of any heart failure program is to minimize hospital readmission rates and improve treatment compliance. In the Postmus study, three program variants were examined: intensive nurse-led management; basic nurse-led management; and usual care provided by a cardiologist. The intensity of contact with a specialist nurse was essentially the difference between the intensive and basic programs. The term “intensity” is used to indicate time allocated as well as frequency. All three programs involved four visits with a cardiologist. The costs of the programs were remarkably similar. Basic support was found to be the most cost-effective in terms of additional years of life gained for most patients; however, for patients with serious heart failure, extensive support was found to be the most cost-effective if health is assigned a monetary value. In other words, it pays to use more resources if you value the results.

Hebert et al. have described a randomized control trial for heart failure support.⁷⁰ The trial was conducted in an ethnically diverse area of New York City (East Harlem) from 1999 to 2003. The focus of this study was on a low-salt diet and optimal medication management delivered through a nurse-led program. The intervention included one in-person visit from a nurse as well as telephone follow-up. The evaluated costs included the intervention along with medical and non-medical costs. In the analysis, the incremental cost per Quality-Adjusted Life Year (QALY) was within the standard guidelines. In this specific example, the direct intervention costs were offset by savings in hospitalization costs, but the additional costs for medication, home healthcare and outpatient procedures prevented the intervention from being totally cost-saving. The gain in physical functioning is an important benefit of the nurse-led initiative. The important point is that if improved health has a value, then such interventions make sense.

Rafferty et al. evaluated a nurse-led clinic intervention focused on secondary prevention in patients with a diagnosis of coronary heart disease.⁷¹ In the context of this Scottish trial, there was no specific cost reduction, in part because of higher drug costs and higher nursing costs. However, if the gain from decreased mortality was assigned a monetary value, the intervention was found to be cost-effective. In other words, the cost curve was not bent down but the value curve certainly rose.

Thompson et al. evaluated an U.K. intervention that combined clinic support with home-based intervention for chronic heart failure patients discharged from two hospitals in Northern England.⁷² The home interventions included education on symptom recognition and management as well as lifestyle issues. The study found that clinic support with home-based intervention improved the quality of care in terms of evidence-based protocols and outcomes. Specifically, the authors found that there was a 45% reduction in the risk of death or readmission as compared to usual care. The authors have pointed out that the arguments for interventions, whether clinic, home-based or hybrid, are so compelling that trials involving the usual cardiac care might be considered unethical.

In another study, the integration of hospital therapy and nursing follow-up for elderly high-risk patients was found to be clearly important in reducing future unplanned admissions and other costs. This was shown in a study by Graves et al. to offer substantial savings in the Australian context.⁷³

Based on data from a rural practice near Ottawa, limited cost-effectiveness was found in a randomized control trial study of Anticipatory and Preventive Team Care (APT Care) to provide services to elderly patients deemed at risk of adverse health outcomes.^{74,75} As with similar studies, quality of care improved; however, achieving that improvement meant a minor increment in costs. Appropriately valued, there are gains to society. The authors also made the point that cost improvements might be achieved with a more mature program than that used in the study.

In the U.S. context, Litaker et al. evaluated the cost-effectiveness of an interprofessional team in the treatment of patients with diabetes and hypertension.⁷⁶ The use of an interprofessional team versus usual physician care resulted in modestly increased costs, although the interprofessional team approach resulted in improved patient satisfaction and better glycemic control. The important point was that achieving good health outcomes for patients with chronic diseases is labour-intensive, but a team approach can make these outcomes more feasible. The longer-term health costs reductions from improved glycemic management were not included in the analysis, and as a result, weakened the strength of the conclusions about the value of interprofessional teams.

The cost of geriatric care is a major issue for any healthcare system. Counsell et al. studied the Geriatric Resources for Assessment and Care of Elders Intervention (GRACE) program of in-home geriatric integrated care involving an NP/social worker dyad.⁷⁷⁻⁷⁹ Essentially the program focused on a care management plan for the vulnerable population, developed by a geriatrician, pharmacist, physical therapist, mental health social worker, and a community-based service liaison. In year two of the intervention, hospitalizations and emergency department visits were significantly lower in the intervention group that received care from the dyad. With improved health outcomes, costs did not change significantly. Cost results were more positive for persons with a high risk of hospitalization.

One common thread throughout much of the literature is the reduction in the un-needed utilization of emergency departments in the acute care system and acute care readmissions. Access, which is discussed below, is one aspect of that. However, coordinated care and follow-up is another. Older patients, particularly those living in long-term care, often have preventable emergency department transfers. Bandurchin et al. showed that a trial of an Emergency Mobile Nursing Service (EMNS) in Toronto was able to reduce the number of avoidable transfers along with the associated stress on the patients.⁸⁰ The specially-trained nurses

of the service provided regular rounds in collaboration with the nursing staff within the long-term care facilities, to provide early identification of patients at risk and associated health problems. The program resulted in very substantial reductions in emergency department transfers from most of long-term care facilities in the trial (from 24% to 7%). Drug management is a major issue in any setting, but particularly in long-term care. A study in Winnipeg indicated that collaborative care between an NP and the medical director in a nursing home can achieve significant improvements in pharmaceutical usage and a reduction in emergency department transfers.⁸¹

The economic rationale for interprofessional teams is that the optimal utilization of the team members, reflecting comparative advantages, contributes to the economic effectiveness of the team. The development of interprofessional teams should reflect the relative skills and availability of the various professional resources, including nurses and physicians.⁸² For example, there are direct examples the cost-effectiveness of task substitution in the primary care teams between nurses and physicians. In primary care, where the roles and responsibilities can be shifted, task substitution between nurses and physicians provides an interesting perspective on the cost-effectiveness issue. In interprofessional teams, the use of lower-cost resources, such as nurses to substitute for doctors, may result in savings. However, some studies indicate that net gains may not be that large. For example, in the nursing home context, Aigner et al. showed that an NP/physician team could provide equivalent care to physician-only care, with concomitant savings in resources from better utilization of scarce physician time.⁸³ Kaasalainen et al. have highlighted the relative contribution of NPs to pain management in particular.⁸⁴ Optimizing the use of the comparative advantage of the various professionals on a team is the key to achieving effectiveness.

Obviously, then, if nurses can provide equivalent care to that provided by physicians, then the substitution can be cost-saving if additional health support is not included. Essentially, the cost of nursing resources must be appropriately lower than physicians if nurses are going to provide more intensive health support to the patients. Venning et al. examined the cost-effectiveness of using NPs instead of physicians as the first point of contact for patients wanting a same-day appointment in 20 primary care clinics in the U.K.⁸⁵ Care, in terms of prescribing and outcomes, was found to be equivalent; however, the cost-savings were reduced because the NPs spent more time with the patient and requested more follow-up consultations. In other words, the service provided was more intensive. If the latter increase in service was assigned a value, the conclusion on cost-effectiveness would likely be stronger. Of course, the relatively low cost-savings is a function of the relative costs of the practitioners in the U.K.

Hollinghurst et al. applied synthetic cost data to performance measures from two randomized control trials comparing the use of NPs and physicians in primary care.⁸⁶ In their analysis using English prices, the authors compared the use of an NP and a salaried general practitioner. They used data from the Venning study reported above, as well as one by Kinnersley, to develop the analysis.^{85, 87} The key issue was the intensity of care provided by NPs relative to general practitioners and the relative cost structures in the U.K. environment. From the practice perspective, the Hollinghurst models have suggested that an NP consultation was moderately more expensive than a general practitioner one. From the National Health Service's perspective, the use of NPs was less cost-effective because of the time element and because of the general practitioners' time associated with the NP consultation. This suggests that there are issues in the organization of healthcare that influence the utilization of NPs and their scope of practice.

In a study based on Dutch costs, Dierick-van Daele et al. included societal costs such as productivity losses.⁸⁸ In this study, the focus was on the treatment of common conditions that can lead to minor health problems. Patients had respiratory and throat symptoms, ear and nose symptoms, musculoskeletal symptoms and injuries, skin injuries, urinary symptoms, gynaecological symptoms, or problems related to older age. Because of the differences in salary costs, the use of NPs was found to be relatively cost-reducing. In this specific Dutch evaluation, the NPs had no prescribing rights but could recommend prescriptions.

Managed care organizations are an important feature of the U.S. healthcare landscape. In this context of financing, Roblin et al. showed that the use of physician assistants and NPs could result in cost-savings.⁸⁹ As would be expected because of the different salary costs, the use of this mid-level personnel resulted in lower labour costs. These findings highlight the importance of the influence of healthcare finance on the use of particular types of resources. The authors of the study noted the importance of the use of mid-level practitioners to the potential for increasing capacity, and hence, access.

Community care has become increasingly important as a method to avoid the use of more expensive resources further along the continuum of care. In Canada, a Nurse-Family Partnership program has been pilot-tested in Hamilton, Ontario. This community outreach program is a collaboration of health, child welfare and community services, and involves nurse home visitations to at-risk mothers with young children.⁹⁰ The program has been in extensive use in the U.S. for over 30 years, and has a strong research base highlighting long-term benefits to the children in the program along with significant reduction in health and social costs.⁹¹⁻⁹⁴

Community health centres have been shown to provide improved access and support. For example, in a recent Ontario study, Glazier et al. showed that, although community health centres had a user population with above-average rates of chronic disease, comorbidities, low income and mental illness, they had lower than expected emergency department visit rates.⁹⁵

In the particular financing models of U.S. healthcare, North et al. showed a reduction in hospital admissions with the use of independent NPs who provide home-based primary care for a specific high-risk, chronically ill, elderly veteran patient population.⁹⁶

Targeting resources to the high-risk patient population is clearly an issue. In some circumstances, the existing system may adequately fulfil patient requirements. Therefore, adding additional resources may not improve outcomes. In a study of a home care nursing outreach intervention for elderly persons in the Hamilton, Ontario area, the evaluation indicated that health services use and health outcomes did not appear to be improved by the intervention.⁹⁷

General conclusions

1. Studies shows that nurses, with appropriate scope of practice, can provide equivalent care to general practitioners. Naturally, this is cost-effective only if the relative compensation is appropriate. If nurses provide more intensive patient care, then compensation rates must be appropriate to make the arrangement cost-effective.
2. The mix of relative skills and costs of professionals is the economic rationale for the effectiveness of interprofessional teams and should be a factor in their development.
3. The increased use of more nursing-intensive care approaches, including interprofessional and nurse-led teams, may not save costs. However, if improved outcomes are assigned a value, then these approaches are likely to be significantly cost-effective.
4. The health gain is likely most significant for high-risk high-needs patients. Therefore, more intensive healthcare programs should be targeted at the patients most likely to benefit.

DOES IT HELP ACCESS?

Access to care, particularly primary care, is one of the key issues in the management of the healthcare system. The concept of access to care is a multi-dimensional concept involving space, timeliness and equity. The issue of geographic access is a concern in all areas of Canada, but particularly in the rural and northern communities, although coordinated access to care is an issue in all parts of the country. In particular, the use of interprofessional teams and nurses working independently may be an important way to improve capacity and to optimize the use of scarce healthcare human resources. The clinic model or community health centre may be an important component of access. McMurphy has emphasized the importance of coordinated care to which nurse-led and interprofessional care can make a significant contribution to achieving a high-quality primary healthcare system.⁹⁸ Better care coordination improves equity because resources reach those with the greatest need.

Community outreach through collaborative/interprofessional teams has been shown to reduce cardiovascular disease risks in community health centres. Allen et al. have shown that collaborative teams with an NP and a community health worker in an urban centre could reduce cardiovascular risk factors through education and management.⁹⁹ This example shows the gains that are possible when access is expanded with such teams.

Multidisciplinary/Interprofessional support is critical for the treatment of patients with chronic pain, particularly if psychosocial issues are involved. This kind of multidisciplinary support is difficult to obtain in rural areas. Burnham et al. reported on the use of such a team, which included a nurse and other healthcare professionals including a dietitian, a physiotherapist, a family physician, a psychiatrist and a psychologist.¹⁰⁰ This model was found to be practical in a rural area, indicating that the team approach may provide a more productive healthcare experience even in a rural setting. Studies, such as that by Hogg et al., have shown that collaborative teams are practical and provide real gains in health outcomes in a rural setting.⁷⁵

Providing healthcare in rural areas is a major challenge in most parts of the country. Increasing rural capacity is likely a key part of any focus on equitable access to healthcare. Nurses can provide valuable capacity expansion in outposts; however, there are real challenges in recruiting and preparing them for such roles.¹⁰¹

The collaboration between nurses and physicians is beneficial in a rural setting. Bailey et al. discussed the elements of this collaboration in four rural practices.¹⁰² Their analysis emphasized the importance of developing shared views on role definition and agreement on scope of practice, and on the importance of disease prevention.

Nova Scotia has an abundance of rural communities. For a number of years, the province has been trying to strengthen primary care. Collaborative practice has been strongly emphasized in the reform process, with the NP seen as playing a key role in this reform.^{103, 104} The goal has been to provide more integrated collaborative and accessible care. Challenges to implementing the Strengthening Primary Care Initiative (SPCI) include that of role definition with a lack of consistency in the acceptable scope of practice. In terms of the outcomes of patients with chronic disease issues such as diabetes and hypertension, the initiative of using collaborative teams has shown improved results.¹⁰⁵

Healthcare access is particularly important for the elderly and those with complex or chronic illnesses. Mitton et al. have discussed the implementation of a small interprofessional team – one physician and two homecare nurses – in rural Alberta.¹⁰⁶ While the 12-month evaluation involved only 37 patients, the study demonstrated gains in terms of patient outcomes, reduced rates of hospitalization, and a 40% reduction in acute care service costs.

Integrated access to services including healthcare is an important issue. In Quebec, the PRISMA program is an example of what might be done with more and better integrated resources to support the frail elderly or disabled.¹⁰⁷⁻¹¹⁰ The PRISMA program is an integrated service delivery system involving a single entry point, case management and individualized service plans. The approach emphasizes the nurse-case manager role, and the delivery of services using an interprofessional team is a key part of the service. The system has been designed to function within the single-payer modality without specific capitation funding.

Additional primary care capacity might be developed at access points staffed under the leadership of a nurse rather than a physician. DiCenso et al. have described the introduction of NP-led clinics in Ontario to provide services to patients who do not have a regular primary-care physician. The initial results indicated improved patient satisfaction and quality of care.⁴¹ This approach, under the name of Nurse-Managed Health Centres, has been tried in the U.S., with the goal of increasing capacity in underserved areas. Pohl et al. and Barkauskas et al. have found that care was comparable to physician-managed centres.^{111, 112} Esperat et al. highlighted the challenges of funding such centres in the American system.¹¹³

General conclusions

1. Collaborative models involving nurses can expand healthcare access.
2. Nurse-led facilities offer a useful approach to access expansion, if the system organization and funding are appropriate.

DISCUSSION

This report highlights the role that nurses can play in an interprofessional team to expand health capacity and to deliver targeted services to populations in need. The concept of “need” tends to focus one’s thinking on populations that are inadequately served, but in fact, “need” also encompasses those who require a more coordinated approach to health management. In particular, the implication of providing health services to people with chronic disease is indicated throughout this report, focusing particularly on primary care requirements.

TARGETING AND EQUITY

In health services, as in all areas of activity, it is important to use resources effectively. Browne et al. reported on a number of studies of nurse-led interventions in which some measures of outcomes effectiveness improved for equivalent or lower costs.¹⁴ However, the studies cited were usually specific randomized control trials with specifically targeted populations. Spending more time with patients to improve patient experience is a hallmark of many of the studies. If system performance is to be improved, and in order obtain the most health gain for the resources committed, any additional nursing resources should be targeted at populations in need. This, in fact, can be considered a very equitable goal of health policy. Equity is not the same as equality. Focusing healthcare resources on patient populations with the most potential need and gain is an approach that leads to increased equity. Providing equal access to services does not necessarily meet the same goal. As Culyer has pointed out, maximizing aggregate health gain is a very equitable concept for aggregate healthcare planning.¹¹⁴

COST-SAVING AND HEALTH GAINS

As Russell has contended, investing in chronic disease management programs, when health itself is given a cost value, is a valuable policy.⁶⁷ The benefits will be in improved quality of life and potentially in productivity. The cost-effectiveness studies cited in our analysis clearly shows that nursing interventions can meet reasonable cost and outcomes thresholds. However, the introduction of such interventions will rarely result in actual budget savings; rather, costs and outcomes will collectively increase. This is not necessarily a bad thing if society truly wants to commit resources for better health outcomes. However, the point is that an improvement in health outcomes through better chronic disease management is not likely to come for free: an investment in additional health resources will be required.

The literature shows clearly that nurses working alone or in interprofessional teams can provide an important increment in the available health services.

The economic advantage of interprofessional teams is achieved through the optimal utilization of the comparative skill and cost advantages of the team members. This is a key component of the development of a successful team program.

HEALTH OUTCOMES AND HEALTH ORGANIZATION

If the goal is better health outcomes through chronic disease management, a greater interaction is required between the patient and the health system. The literature cited in this synthesis indicates that relative productivity of nurses in providing increased patient contact is required for good chronic disease management. Good chronic disease management implies a patient-oriented, rather than a health episode, focus. This means that payment modalities must be chosen to enhance that focus. In general, a patient-oriented system is more likely to emphasize rostered patients, as in community health centres or capitated practices. The organization of primary care must be targeted to improving resource allocation by providing an incentive to use nurses in the more effective roles, without dissipating the extra resources in compensation rather than services to patients.

Nurses are shown to be able to provide equivalent care to that provided by physicians within their scope of practice. However, current institutional settings in many Canadian jurisdictions may constrain that scope of practice to less than might be possible given the nurses' training.

It is not clear whether the incentives and delivery modalities in primary care in most jurisdictions in Canada are as well oriented to provide the optimal support to manage patients with chronic diseases as they might be.

ACCESS AND HEALTH HUMAN RESOURCES

Given the increasing emphasis on providing timely and adequate patient-oriented primary care in a diversity of locations, it seems clear that initial patient contact and management must be delegated to more than the primary care physician. These physician resources are simply too scarce to expend on all patient contacts. The literature shows that nurses can provide equivalent care to physicians for many components of primary care. It is also equally clear that there is a strong role for other non-physician professionals in the management of complex diseases in primary care. The literature surveyed in this report suggests that interprofessional teams may be the most productive direction to take in delivering care with the most effective resources. Most importantly, there is a more flexible and lower-cost supply of non-physician human resources not currently utilized in the current organization of primary care to the extent of their potential skill set and scope of practice.

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