Issue: Interprofessional Teams for Chronic Disease Management
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Evidence *in* Context

Health research — synthesized and contextualized for use in Newfoundland & Labrador

Interprofessional Teams for Chronic Disease Management

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About this Report

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The Newfoundland and Labrador Centre for Applied Health Research, established in 1999, contributes to the effectiveness of the health and community services system of the province and the physical, social, and psychological wellbeing of the population. NLCAHR accomplishes this mandate by building capacity in applied health research, supporting high-quality research, and fostering more effective use of research evidence by decision makers and policy makers in the province's health system.

About the Contextualized Health Research Synthesis Program

In 2007, NLCAHR launched the Contextualized Health Research Synthesis Program (CHRSP) to provide research evidence to help guide decision makers in the provincial health system on issues of pressing interest to Newfoundland and Labrador.

CHRSP does not conduct original research, but rather analyzes the findings of high-level research (systematic reviews, meta-analyses and health technology assessments) that have already been done on the issue in question. The findings of these studies are synthesized and are subjected to a systematic process of 'contextualization': they are analyzed in terms of their applicability to the conditions and capacities of the unique context of Newfoundland and Labrador.

Our contextual analysis includes assessment of the specific forms that the issue takes in this province as well as the applicability of proposed solutions and methods to locally available physical and human resources, cultural conditions and financial capacities. CHRSP uses a combination of external experts and local networks to carry out and contextualize the research synthesis and to facilitate the uptake of the results by research users.

CHRSP focuses on three types of projects: health services/health policy projects; health technology assessment (HTA) projects; and projects that combine the two to examine processes for the organization or delivery of care involving a health technology.

Research Team and Consultants

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The Research Question

"Is there reliable scientific evidence to support team-based management of chronic disease and, if so, given the Newfoundland and Labrador context (in terms of geography, demography, fiscal resources and health system capacities) what is the most effective and efficient way to organize, implement, and sustain team-based care for adults with diabetes and for individuals with chronic obstructive pulmonary disease (COPD) so as to derive the best possible outcomes for patients, providers and the health system?"

Key Messages from this Report

The research question is, unfortunately, in advance of the existing high-level review literature as well as of most of the recent primary studies. We found great heterogeneity and relatively little specificity in the research literature we reviewed in the way *teams* and *team-based care* are defined as well as a lack of detail in the descriptions provided of the *roles* of team members and their *functions* as integrated teams. As a result, it was impossible for us to determine, with any certainty, the best way to organize and implement team-based care for chronic disease management so as to achieve specific outcomes for patients, providers and the health system.

The current economic evidence to support team-based chronic disease management is also limited and the cost-effectiveness of team-based programs is currently impossible to determine.

Background

As in other parts of Canada and the world, the prevalence of chronic disease in Newfoundland and Labrador (NL) is growing as a result of the combined impact of our aging population, rising obesity rates, and persistent modifiable lifestyle risk factors such as smoking, unhealthy diets, and physical inactivity (1). The population of Newfoundland and Labrador is aging faster than is the case for any other province in Canada (2). The positive association between age and chronic disease means that this province can expect to have higher rates of chronic disease than the national average (3) and, consequently, will experience a mounting financial burden on the province's health system in the foreseeable future.

…management of chronic diseases is of primary concern for policy makers and healthcare providers alike.

Chronic diseases are a major cause of morbidity and mortality for Canadians. Medical care costs arising from such diseases account for 42% of total direct medical care expenditures, roughly $39 billion a year in Canada. Indirect productivity losses are estimated to be $54 billion. As such, the total economic burden from seven types of chronic illness (cardiovascular diseases, cancer, chronic respiratory ailments, diabetes, musculoskeletal disorders, diseases of the nervous system and sense organs, and mental illness), exceeds $93 billion a year (4). Given these statistics, management of chronic diseases is of primary concern for policymakers and healthcare providers alike (5). Accordingly, healthcare systems are shifting their focus from a disease-based approach to a more holistic approach to accommodate the multiple co-morbidities of individuals with chronic diseases. A team-based management approach to chronic care holds the promise of improving quality of care, increasing efficiencies of care delivery, reducing costs, and saving money over the longer term. However, even if these methods of care delivery are effective, they are complex and expensive to implement and to maintain. Assessing costs versus effectiveness is critical to determining the ultimate value of a team-based care approach and providing guidance concerning the adoption of such a model.

The Department of Health and Community Service's Strategic Plan for 2008-2011 identified chronic disease prevention and management as one of its top five priority issues (6). The incentive to find better and more efficient ways to manage chronic disease led our decision-making partners in the provincial health system and regional health authorities to ask the Contextualized Health Research Synthesis Program (CHRSP) team to synthesize and contextualize the evidence on the benefits and costs of interprofessional teams for the management of chronic disease.

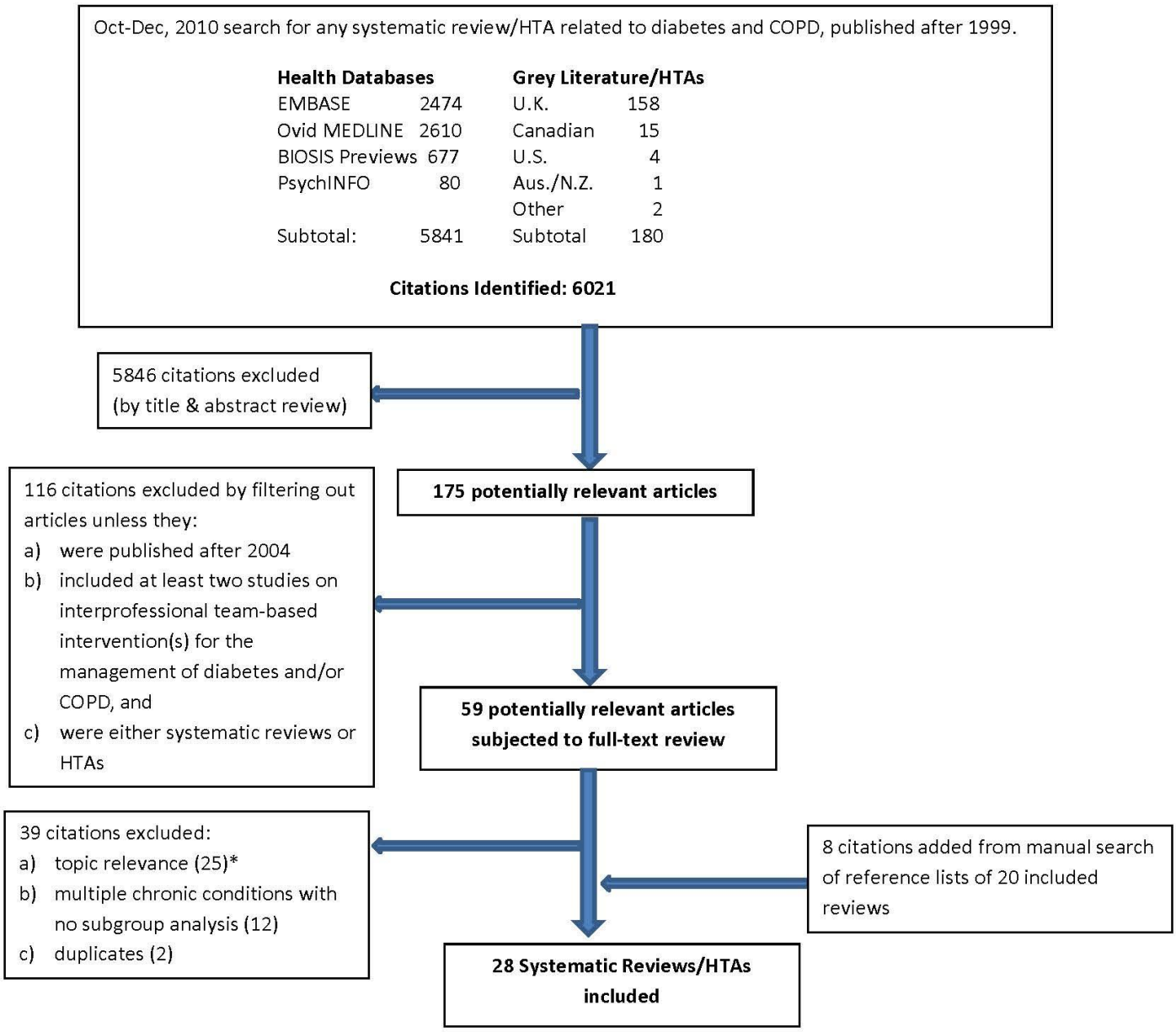
The research team chose narrow the focus of this study to the management of individuals with two specific chronic diseases: diabetes and chronic obstructive pulmonary disease (COPD). This decision was based on several reasons: In 2009, when the question was proposed, our health system partners had initiated plans to establish clinics in parts of the province to manage patients with diabetes and COPD. In 2009, NL had the highest age-standardized prevalence of diabetes of all provinces and territories in Canada (PHAC) and incidence rates were steadily increasing. According to the Canadian Community Health Survey (CCHS), the percentage of the provincial population aged 12 years and older who reported having diabetes rose from 5.8 in 2000/01 to 9.1 in 2007/08 (7,8). The complications associated with uncontrolled diabetes place a considerable burden on patients and the healthcare system. Additionally, COPD is a chronic disease that contributes to gradual debilitation and is the leading cause of hospital admissions and readmissions for chronic disease across Canada (9). In Newfoundland and Labrador, the percentage of the population aged 12 years and older who reported having COPD nearly doubled in the period from 2000/01 (1.0%) to 2007/08 (1.9%) (7,8).

There is widespread enthusiasm for team-based management of diabetes and COPD as this approach is perceived to improve the quality of care and to reduce healthcare costs. Adopting an interprofessional team-based approach to chronic disease management in NL would, however, require a rethinking of the current healthcare delivery system and would have implications for both patients and providers. In order to justify the potential increments in human and financial resources associated with making such a change, local health system decision makers, before making such significant investments, requested that the CHRSP team at NLCAHR synthesize and contextualize reliable research-based evidence on whether team-based management of chronic disease works and, if so, how such teams are best organized, implemented, and sustained.

What we looked at

The project team designed the research question to consider, in the first instance, whether there was sufficient evidence to support *team-based* management of chronic disease. On the advice of our Information Scientist, the team designed a search strategy that targeted any and all systematic reviews, meta-analyses and Health Technology Assessments (HTAs) that could be retrieved by searching for index terms/keywords related to diabetes, COPD, or chronic disease, regardless of whether or not the review specifically addressed team-based care. Figure 1 outlines the search strategy and article review process conducted for this study. The detailed description of the search strings used and the filtering criteria applied are available upon request.

FIGURE 1 Search Strategy and Article Review Process: Chronic Disease Management



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*Reviews on the following topics were excluded from the synthesis unless the topic was analyzed in terms of its relevance to the organization, implementation, and/or sustainability of interprofessional team-based modes of chronic disease management:

- **Patient self-management** (includes education, self-monitoring, psychosocial care)
- Interventions for improving **adherence to clinical practice guidelines**
- **Intra**professional aspects of care (e.g., scope of practice, role revision, interventions by a single health professional)
- **Patient-provider interaction**
- **Setting of care**
- **Use of information technology**

The end result of our systematic search produced a total of 28 systematic reviews / HTAs / reviews of reviews for synthesis in this report, eighteen reviews on diabetes, eight reviews on COPD and two that studied both chronic conditions (See Figure 2). While all 28 reviews (10-37) addressed some aspect of the clinical effectiveness of team-based management of diabetes and/or COPD, only eight included economic outcomes of relevance to this report.

FIGURE 2 Summary of Systematic Reviews/Reviews of Reviews/HTAs Included in this Report

Reviews on Diabetes exclusively			
Author/year	AMSTAR score (/11)	Quality[1]	Type of review
Shojania (2006)	7	Medium	SR of primary research
Saxena (2007)	6.6	Medium	SR of primary research
de Belvis (2009) (English translation)	6	Medium	SR of primary research
MAS (2009)	6	Medium	HTA
Peek (2007)	6	Medium	SR of primary research
Glazier (2006)	5.5	Medium	SR of primary research
O'Brien (2008)	5.5	Medium	SR of primary research
Welch (2010)	5	Medium	SR of primary research
Van Bruggen (2007)	4.4	Medium	SR of primary research and some reviews
Tieman (2006b)	3.3	Low	SR of primary research and some reviews
DeCoster (2005)	2.2	Low	SR of primary research
O'Reilly (2006)	2.2	Low	SR of primary research
Watson McGee (2005)	2.2	Low	SR of primary research and some reviews
Lavis (2009a)	n/a	n/a	Review of reviews and economic studies
Magwood (2008)	n/a	n/a	Review of reviews
Total: 15			

Reviews including Diabetes with sub-group analysis			
Author/year	AMSTAR score (/11)	Quality	Type of review
Foy (2010)	8	High	SR of primary research
Smith (2007)	8	High	SR of primary research
Zwar (2006)	6.6	Medium	SR of primary research and some reviews
Krause (2005)	5	Medium	SR of primary research
McDonald (2007)	n/a	n/a	Review of reviews
Total: 5			

Reviews on COPD exclusively			
Author/year	AMSTAR score (/11)	Quality	Type of review
Lacasse (2006)	9	High	SR of primary research
Hailey (2010)	8.8	High	HTA
Puhan (2009)	7	Medium	SR of primary research
Steuten (2009)	6.6	Medium	SR of primary research
Peytremann-Bridevaux (2008)	6	Medium	SR of primary research
Niesink (2007)	5.5	Medium	SR of primary research
Tieman (2006a)	2.2	Low	SR of primary research
Total: 7			

Reviews including COPD with sub-group analysis			
Author/year	AMSTAR score (/11)	Quality	Type of review
Smith (2007)	8	High	SR of primary research
Zwar (2006)	6.6	Medium	SR of primary research and some reviews
Lemmens (2009)	5	Medium	SR of primary research
Total: 3 (2 duplicates)			
Total of included reviews: 28			

NOTE: Reviews designated in green include economic outcomes.

[1] In keeping with Lavis' (2010) convention, "we consider the quality rating of each review as low quality if the AMSTAR score is between 0 and 3, medium quality if the AMSTAR score is between 4 and 7, and high quality if the AMSTAR score is between 8 and 11" (page 17).

Each of the systematic reviews and HTAs that met the inclusion criteria was subjected to critical appraisal using the AMSTAR tool (38), a validated measurement tool for evaluating the methodological quality of systematic reviews and HTAs. The CHRSP team at NLCAHR then set out to abstract the relevant data from each of the 28 studies considered for this synthesis report. The output from our data abstraction was sent to the Team Leader and the Health Economist to determine whether there was sufficient high-level research evidence to answer the original study question.

What we found

Defining 'Team'

We used the term "interprofessional" to describe teams in this synthesis, which implied that more than one type of healthcare professional was involved in the care of the individual, not necessarily that all teams included the *full* array of possible or recommended healthcare professionals. In the literature, there is a proliferation of terms describing teams (interdisciplinary, multidisciplinary, transdisciplinary, multi-professional, etc.). While many conceptual papers and some theoretical frameworks use these terms to refer to specific kinds of teams, composed of specific professional groups functioning in specific ways, we used 'interprofessional' as an inclusive term to cover all teams consisting of individuals from more than one healthcare profession or discipline, and used this broader definition to search the research evidence. In the literature we reviewed, we found that teams were generally not well defined, the terms used to describe teams varied widely, and in some cases, the term 'team' was used without any explanation of what was meant. In general, little attention was paid in the reviews we found to providing an operational definition of 'team.'

Evidence on team-based management of chronic disease is limited

We found considerable discussion in the literature about **configurations of interventions** designed to improve outcomes in chronic disease. Diabetes is one of the most frequently studied diseases in this literature, while COPD is less well-studied. Most reviews focused on interventions that included some component(s) of team-based care, but did not focus exclusively on interprofessional teams providing chronic disease management for these two specific conditions. Instead, team-based interventions were often applied to a variety of chronic diseases and were mixed with one or other types of interventions, most commonly patient education, but also with case management, financial incentives of varying types, audit and audit with feedback, registries, and reminder systems.

Another approach in the literature was to study interprofessional teamwork as part of **a broad, multi-component, intervention strategy** including delivery system design elements and the

implementation of the Chronic Care Model (CCM) (39). In its original form, the CCM consists of six elements:

- Delivery System Design (or Redesign),
- Self-Management Support,
- Decision Support,
- Clinical Information Systems,
- Community Resources, and
- Health Care Organization.

Each of these components has sub-elements. Relevant to our study, "Team Practice" is one of the sub-elements within the Delivery System Design element of the CCM. The CCM has been revised from its original formulation into what is now known as the Expanded Chronic Care Model (See Figure 3 on Page 13 of this report.) (40) In December, 2011, the provincial Department of Health and Community Services released a document, *Improving Health Together*: A *Policy Framework for Chronic Disease Prevention and Management in Newfoundland and Labrador,* which is based on this newer, expanded model. During the search, a number of the reviews we identified focused on team practice within the context of the CCM; however, descriptions of teams and the specifics of their design (number and types of disciplines, whether or not teams were physically co-located, and other important aspects of interprofessional team-based care) were generally not provided in the reviews we found.

Team-based care was **defined in different ways in different studies**, rarely very precisely or clearly. As we note in our discussion about the CCM, in many studies, team-based care was coupled with other changes in primary care provision such as implementing electronic health records or initiating patient registries. An important limitation of most studies providing information about team-based care is the lack of detail about **team functioning and the roles of different team members**. Most team-based interventions described changes in the way care for chronic disease was delivered to patients, usually in primary care settings, but few studies described with any specificity how teams functioned and how one might design a team to achieve similar outcomes. Even in the most narrowly focused reviews, it was rarely possible to understand the ways in which the specific professionals interacted, their specific roles and functions, and even whether they were all at the same physical location. In general, teams were treated as black boxes, making it difficult to examine specific roles and functions. For example, adding a physiotherapist to a chronic disease management team would certainly enable patients to receive physiotherapy services, but it is not clear how those services would be triggered; whether physiotherapists had access to patient records and could select patients who could benefit from their services; where, when, and how patients could access these services; and so on. Each of these detailed design elements has implications for understanding whether a specific intervention that contributed to the outcomes reported would be feasible and/or likely to produce similar outcomes in a different setting and, in particular, in a setting such as Newfoundland and Labrador.

FIGURE 3

The Expanded Chronic Care Model

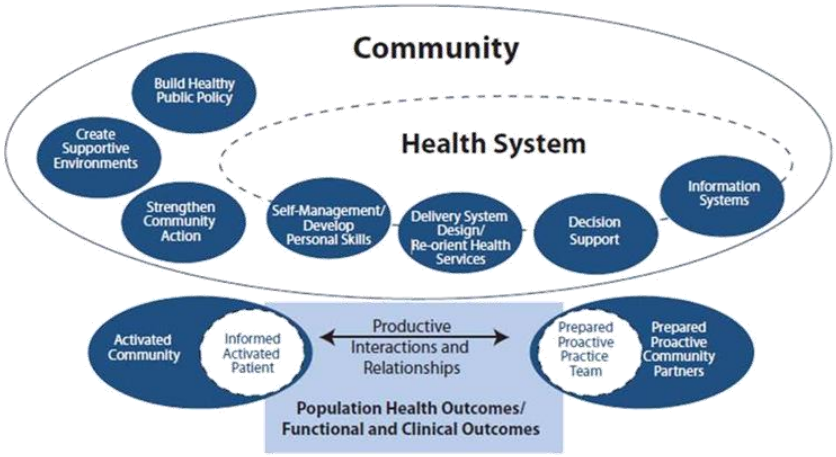

Table 1 The Chronic Care Model (Wagner et al. 1999)

MODEL COMPONENTS		EXAMPLES
Health System - Organization of Healthcare	Program planning that includes measurable goals for better care of chronic illness	• Visible support of improvements provided by senior leadership • Incentives for care providers
Self-Management Support	Emphasis on the importance of the central role that patients have in managing their own care	• Educational resources, skills training and psychosocial support provided to patients to assist them in managing their care
Decision Support	Integration of evidence based guidelines into daily clinical practice	• Wide dissemination of practice guidelines • Education and specialist support provided to healthcare team
Delivery System Design	Focus on teamwork and an expanded scope of practice for team members to support chronic care	• Planned visits and sustained follow-up • Clearly define roles of healthcare team
Clinical Information Systems	Developing information systems based on patient populations to provide relevant client data	• Surveillance system that provides alerts, recall and follow-up information • Identification of relevant patient subgroups requiring proactive care
Community Resources and Policies	Developing partnerships with community organizations that support and meet patients' needs	• Identify effective programs and encourage appropriate participation • Referral to relevant community-based services

Source: Barr V J, Robinson S, Marin-Link B, Underhill L, Dotts A, Ravensdale D, Salivaras S (2003). The expanded chronic care model: An integration of concepts and strategies from population health promotion and the chronic care model. **Hospital Quarterly**, 7 (1), p. 74

The question of **which health professional types should make up a team** is poorly addressed in the literature. Many reports do not provide clear information about the backgrounds, training, and even the disciplines involved in interprofessional teams. Little is reported about the education, training, and preparation of team members, nor are there many details about their roles within teams. Details about how teams function are also seldom provided—whether they are located in the same physical location, or in different locations, whether they share office resources such as common receptionists, common records, and other key details.

Some reviews included information from studies that introduced **innovative provider roles** in the delivery of chronic disease management. These included providing nurses with additional training to support delivery of nutrition or exercise counseling and expansion of pharmacist roles, such as training to adjust medications independently. While these expanded and/or innovative roles for providers may support team-based care, the studies evaluating these interventions did not focus solely on team-based care. Furthermore, while some reviews sought specifically to synthesize the literature on team-based care, it was difficult at times to determine from the published reports whether what was referred to as a 'team' involved the various health professionals functioning as an integrated and coordinated whole, or merely functioning as individual practitioners alongside one another, each with a distinct role in the care of the patient.

Models of shared care were, similarly, not well described in the literature. Whether primary care physicians and specialists were co-located was not specified in the studies reviewed, although in some studies they seem likely to have been in different locations. How they interacted (through telephone consultation, referral, electronic referral) was also not clearly specified in the reviews. The models of shared care included in the reviews, for the most part, did not include telehealth or telemedicine approaches to chronic disease management.

Evidence on the economics of team-based management of chronic disease is limited

The aim of interprofessional team-based chronic disease management is to improve processes and outcomes of care while making more efficient use of scarce healthcare resources, or even generating cost savings. **Evidence of the cost effectiveness** of interprofessional team-based management for diabetes and COPD was lacking in both quantity and quality. With one possible exception, all of the systematic reviews focused primarily on the clinical effectiveness of the intervention(s) under study and were not designed with the explicit objective of synthesizing the economic literature. Some studies provided cost data or differences in healthcare resource utilization, and sometimes both. The heterogeneity of the studies reviewed for this economic analysis, both in terms of the type and intensity of the interventions under study, the populations, and settings, and the cost elements included in the economic data, precluded any attempts at combining the study results for this synthesis.

While changes in healthcare resource utilization are important, knowing the actual cost differences would have been more enlightening. Good chronic disease management would require an increase in healthcare resource utilization (e.g., foot checks, eye checks for diabetics, etc.). At the same time, this only provides a small portion of the information required to determine efficiency. The studies reviewed frequently made no distinction between the *program-related* healthcare resource utilization and the utilization of resources required for treating *uncontrolled* disease (e.g., the resources required for general practitioner visits for ongoing monitoring of patients with controlled diabetes versus those required for hospitalization of patients with hyperglycemia associated with an episode of uncontrolled diabetes).

True economic evaluations are designed to provide a comparative analysis of alternative courses of action in terms of both their costs and their consequences (41). In summary, the paucity of such studies, combined with the uncertainty that surrounds the data on costs and on outcomes makes it difficult to determine which team-based chronic disease interventions, if any, are most efficient. Determining value for money could be aided by the creation of chronic disease registries for tracking patient progress and the establishment of benchmarks as indicators of program success.

Conclusion

Following a comprehensive search and careful analysis of the high-level research evidence and primary studies on team-based chronic disease management, we have arrived at the conclusion that, because of a combination of factors, including the heterogeneity in operational definitions of 'teams', the absence of details describing the roles of team members and their function as integrated wholes, and the design of systematic reviews on the economics of team-based care, it is impossible for us to determine, with any certainty, the most effective and efficient way to organize and implement team-based care for chronic disease management so as to achieve specific outcomes for patients, providers and the health system.

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Appendix A

Search Strategy

We targeted any and all systematic reviews that could be retrieved by searching for index terms/keywords related to diabetes, COPD, or chronic disease, regardless of whether or not they addressed team-based care. On the advice of our Information Scientist, we replaced the search hedge we had used for prior CHRSP reports with one designed by CADTH. We limited the search to articles published in English since 2001. On October 14, 2010, we ran the following search on EMBASE, PsychINFO, Ovid MEDLINE® In-Process & Other Non-Indexed Citations and Ovid MEDLINE®:

#	Searches	Results
1	*Diabetes Mellitus/	172090
2	exp Diabetes Mellitus, Type 2/	152116
3	exp Diabetes Mellitus, Type 1/	113170
4	exp Diabetes Complications/	487699
5	diabet*.ti.	407935
6	(diabet* adj3 (adult-onset or insulin independent or ketosis-resistant or maturity-onset or noninsulin dependent or non-insulin-dependent or slow-onset or stable or type II or type 2)).ab.	126384
7	(DM adj (adult-onset or insulin independent or ketosis-resistant or maturity-onset or noninsulin dependent or non-insulin-dependent or slow-onset or stable or type II or type 2)).ti,ab.	359
8	(anti-diabet* or antidiabet* or DM2 or DM 2 or MODY or NIDDM).ti,ab.	35771
9	(diabet* adj3 (sudden-onset or insulin dependent or brittle or juvenile-onset or ketosis-prone or autoimmune or type I or type 1)).ab.	93319
10	(DM adj (sudden-onset or insulin dependent or brittle or juvenile-onset or ketosis-prone or autoimmune or type I or type 1)).ti,ab.	262
11	(DM1 or DM 1 or SODY or IDDM).ti,ab.	16959
12	(diabet* adj2 complication*).ab.	22847

13	or/1-12	701669
14	*Diabetes Mellitus/	172090
15	(Non Insulin Dependent Diabetes Mellitus or Maturity Onset Diabetes Mellitus).sh.	89892
16	(Juvenile Diabetes Mellitus or Insulin Dependent Diabetes Mellitus).sh.	60701
17	exp Diabetic Angiopathy/ or (Diabetic Cardiomyopathy or Diabetic Coma or Diabetic Foot).sh.	53305
18	(Diabetic Hypertension or Diabetic Ketoacidosis or Diabetic Macular Edema or Diabetic Nephropathy or Diabetic Neuropathy or Diabetic Obesity or Diabetic Retinopathy or Nonketotic Diabetic Coma).sh.	78404
19	or/5-12,14-18	577593
20	*Diabetes/ or *Diabetes Mellitus/	175656
21	Diabetes Insipidus.sh.	12835
22	or/5-12,20-21	535679
23	exp Pulmonary Disease, Chronic Obstructive/	62854
24	(COAD or COPD).ti,ab.	39206
25	((chronic adj2 obstructi*) and (pulmonary or airway or lung or airflow) and (disease* or disorder*)).ti,ab.	50263
26	or/23-25	86243
27	Chronic Obstructive Lung Disease.sh.	48184
28	or/24-25,27	83280
29	exp Chronic Obstructive Pulmonary Disease/	63225
30	or/24-25,29	86338
31	*Chronic Disease/	22746
32	((chronic adj (disease* or illness*)) or chronically ill).ti.	18118
33	or/31-32	31686

34	*Chronic Disease/	22746
35	or/32,34	31686
36	*Chronic Illness/	27060
37	or/32,36	34537
38	Meta-Analysis.pt.	26887
39	Meta-Analysis/ or Systematic Review/ or Meta-Analysis as Topic/ or exp Technology Assessment, Biomedical/	127765
40	((systematic* adj3 (review* or overview*)) or (methodologic* adj3 (review* or overview*))).ti,ab.	71713
41	((quantitative adj3 (review* or overview* or synthes*)) or (research adj3 (integrati* or overview*))).ti,ab.	12250
42	((integrative adj3 (review* or overview*)) or (collaborative adj3 (review* or overview*)) or (pool* adj3 analy*)).ti,ab.	15284
43	(data synthes* or data extraction* or data abstraction*).ti,ab.	21177
44	(handsearch* or hand search*).ti,ab.	8189
45	(mantel haenszel or peto or der simonian or dersimonian or fixed effect* or latin square*).ti,ab.	20584
46	(met analy* or metanaly* or health technology assessment* or HTA or HTAs).ti,ab.	4144
47	(meta regression* or metaregression* or mega regression*).ti,ab.	2577
48	(meta-analy* or metaanaly* or systematic review* or biomedical technology assessment* or bio-medical technology assessment*).mp,hw.	186575
49	or/38-48	257107
50	(13 or 26 or 33) and 49 use prmz	3464
51	limit 50 to (english language and yr="2001 -Current")	2793
52	(19 or 28 or 35) and 49 use emez	5873
53	limit 52 to (english language and yr="2001 -Current")	4659

54	(22 or 30 or 37) and 49 use psyf	257
55	limit 54 to (english language and yr="2001 -Current")	219
56	51 or 53 or 55	7671
57	limit 56 to yr="2006 -Current"	5326
58	remove duplicates from 57	3530
59	limit 56 to yr="2001 -2005"	2345
60	remove duplicates from 59	1641
61	58 or 60	5171
	remove duplicates from 61	
62	EMBASE <1980 to 2010 Week 40> (2473)[1] Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) <1950 to Present> (2610) PsycINFO <1987 to October Week 1 2010> (80)	5163

A similarly-designed search was run on BIOSIS Previews and yielded another 677 results. The details for this search can be provided upon request. Finally, we manually searched a number of HTA/grey literature sites, which added 180 results to the list, bringing the total up to 6021.

A manual review of titles and abstracts by two research assistants eliminated 5846 articles leaving a total of 175 systematic reviews/HTAs published after 1999 that had subject relevance. Since reviews published before 2005 tended to include primary research that was conducted in the 1990s and earlier, we were concerned that the pre-2005 review literature did not accurately reflect the prevailing management diabetes and COPD. On the advice of the team leader, we applied the following filtering criteria to exclude articles unless they:

a) were published after 2004,
b) included at least two studies that evaluated some kind of interprofessional team-based intervention(s) for the management of diabetes and/or COPD, and
c) were either systematic reviews or HTAs

[1] Regular monthly updates in November and December brought that number up to 2816.

Working with these additional filtering criteria, we identified 59 reviews that merited full-text review by the project coordinator for relevance. Reviews on the following topics were excluded from our synthesis unless the topic was analyzed in terms of its relevance to the organization, implementation and/or sustainability of interprofessional team-based modes of chronic disease management:

a) Patient self-management (includes education, self-monitoring, psychosocial care)
b) Interventions for improving adherence to clinical practice guidelines
c) Intraprofessional aspects of care (e.g., scope of practice, role revision, interventions delivered by single professional)
d) Patient-provider interaction
e) Setting of care
f) Use of information technology

We also eliminated reviews that synthesized the results of multiple chronic conditions, and did not include sub-group analysis, such that it was not possible to determine whether the overall conclusions of the review applied specifically to either diabetes or to COPD. Application of these filtering criteria, combined with the elimination of duplicate publications, resulted in the exclusion of 39 reviews. The final step in our search process involved hand- searching the reference lists from the 20 included articles for citations to relevant reviews that were not identified through the electronic searches. These supplemental steps netted an additional 8 reviews, which combined with the 20 already included reviews, for a total of 28 reviews for the final synthesis.

Appendix B

Outcomes Considered for this Report

OUTCOMES		
Patient-Level Outcomes		
Clinical/Physiological	Diabetes	COPD
Intermediate Outcomes	• HbA1c • Blood glucose • Weight • Blood Pressure • Cholesterol • Quality of life	• Lung function • Dyspnea • Fatigue • Wheeze • Cough • Persistent phlegm • Antibiotic usage • Short term/ long term control agents • Home O_2 use
Long-term Complications	• Myocardial Infarction • Ischemic Heart Disease • Stroke • Heart failure • Amputation • Renal failure • Blindness • Quality of life • Death	• Exercise intolerance • Exacerbation • Emergency Department use rates • Hospitalization rates • ICU admission rates • Ventilation • Mental health (anxiety/depression) • Quality of life • Death
Patient/family engagement in treatment		
• Knowledge of disease • Medication adherence • Dietary adherence • Smoking cessation • Self-monitoring symptoms and glucose/pulmonary functions • Utilization of services • Satisfaction with care • Exercise/Pulmonary rehabilitation • Self-management • Increased visits to care providers • Acceptance of treatment • Feelings of well-being		

Provider-Level Outcomes
• Adherence to treatment/ guidelines • Appropriateness of treatment/ follow-up/screening • Prescribing behavior • Timely and appropriate referrals • Ability to work within scope of practice • Enhanced knowledge and skills • Satisfaction with job/patient care/remuneration model • Development of team spirit • Concerns about workload/acceptability • Provider role clarity • Provider morale/confidence • Provider flexibility/adaptability • Recruitment and retention of providers
Health System-Level Outcomes
• Hospital admissions/readmissions rates • Length of stay • Wait times • Rates of unscheduled hospital visits • Emergency department utilization rates • Physician/clinic visits • GP/Specialists consultations • Resource utilization (number of tests/investigations) • Cost of rehabilitation/cost of education regarding self-management • Accessibility to care • Appropriate facility utilizations • Inter-relationships among departments /providers • Information sharing/communication/relationship building • Partnerships developed