Primary Care Models of Care - A scoping meta-review

Models of primary care for clients with chronic complex conditions

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LIST OF ABBREVIATIONS

Abbreviation	Full form
AMSTAR	Assessing the Methodological Quality of Systematic Reviews
CCM	Collaborative Care Model/Collaborative Chronic Care Model
ISCRR	Institute for Safety Compensation and Recovery Research
MoC	Model of Care/Models of Care
MSK	Musculoskeletal
PHC	Primary Health Care
RCT	Randomised controlled trial
TAC	Transport Accident Commission
WHO	World Health Organisation

EXECUTIVE SUMMARY

Background and Purpose

In Australia, primary care is generally provided by general practitioners, nurses (including general practice nurses, community nurses and nurse practitioners), allied health professionals, midwives, pharmacists, dentists, and Aboriginal health workers. Complex health conditions are often managed in primary health care settings and require intense case management, coordination and frequent contact.

This evidence review was conducted to identify primary care models and interventions that are effective at supporting individuals with chronic and complex ongoing health conditions. Additionally we sought to identify the specific elements of the effective primary care models and interventions in order to determine what works and how it might work. It is intended that the findings from this evidence review will provide evidence of effective primary care models and interventions available to the Transport Accident Commission (TAC) to inform the development of their new Primary Health Care strategy.

Method

This evidence review is in the form of a scoping meta-review and has two parts: 1) a search for models of primary care and associated interventions (through a search of published studies and online databases); and 2) a search for systematic reviews of effectiveness studies from within the part 1 search results, and additional targeted scanning.

Key Findings

Initially we identified two comprehensive models of primary care. The Health Care Home model - which was developed recently in Australia, and the collaborative Chronic Care Model (CCM) - originally developed in the USA in the 1990s. To examine the effectiveness of these models on patient outcomes we focused solely on the CCM. The CCM is comprised of eight elements. Nine systematic reviews were identified that evaluated primary care interventions based on the CCM. The individual interventions within the systematic reviews were examined and characterised according to the specific CCM elements they tested.

The key findings are summarised below:

- Overall, the collaborative Chronic Care Model appears to be effective across different disorders and populations for physical health conditions, mental health and comorbidities.
- There is good evidence of the effectiveness of primary care interventions incorporating the following four elements of the Chronic Care Model: *Self-management support*, *delivery system design*, *decision support*, and *clinical information systems*.
- Evidence for the effectiveness of including the *health system improvement*, *community support*, and *family support* elements of the Chronic Care Model is currently lacking, which means we do not yet know if these interventions are effective.
- Multiple element interventions were found to be generally more effective, however the effectiveness of interventions which included all eight elements of the Chronic Care Model has not been sufficiently evaluated.

- Single element interventions, such as *self-management support* and *delivery system design*, may be as effective as multiple element interventions for some clients if delivered at the right intensity.

Key Insights

Key considerations and insights emerging from this evidence review are:

- The Chronic Care Model has a robust evidence base and can be used as a framework to guide development of a TAC approach to primary health care.
- Including two or more elements of the Chronic Care Model is well supported by evidence.
- *Self-management support* interventions need to be delivered comprehensively, over time and in combination with other elements of the Chronic Care Model.
- Consider delivering *Delivery system design*, *Decision support* and *Clinical information system* interventions in combination, for example multidisciplinary evidence-based guidelines and case management supported by referral systems and electronic client records
- Partnerships and collaboration with health care providers that includes developing shared goals and a vision for a new primary health care model of care will promote and support effective implementation

INTRODUCTION

Individuals who experience transport accidents often sustain complex disabling injuries that require long-term ongoing care in the post-acute phase. Furthermore, 15-25 per cent of individuals develop chronic mental and physical health conditions following injury.[1, 2] Complex and chronic ongoing health conditions are often managed in primary health care settings.[3, 4]

Appropriate management of chronic health conditions is associated with improved health and social outcomes for individuals, and economic benefits for health services, compensation schemes and society as a whole.[5] However quality primary care for individuals with complex care needs requires intense management, coordination, frequent contact and ongoing patient support.[6] Reform in the primary health sector has been a topic of research for over a decade[7], with key components of care that are particularly relevant for people with chronic and complex conditions being widely examined.[8]

Primary care-based models of care are developed by health services, organisations and researchers to articulate pathways of care and guide the delivery of primary health care to support patients with complex care needs. This evidence review was conducted to identify primary care models and interventions that are effective at supporting individuals with chronic and complex ongoing health conditions. Additionally we sought to identify the specific elements of the effective primary care models and interventions in order to determine what works and how it might work. It is intended that the findings from this evidence review will provide evidence of effective primary care models and interventions available to the Transport Accident Commission (TAC) to inform the development of their new Primary Health Care strategy.

Research questions and scope

The key research questions for this review, identified in consultation with the TAC were:

1. What range of primary care models and interventions for clients with chronic and complex ongoing conditions have been reported?
2. How effective are primary care models and interventions for improving patient outcomes?
3. What are the key characteristics of effective primary chronic care models or interventions?

This report was prepared by the ISCRR Evidence Review hub and presents a scoping meta-review of the literature as part of a larger stream of work on primary care (ISCRR Project 172) and should be considered along with the other project components - an environmental scan (State Analysis) and data analysis report.

METHODS

This evidence review is in the form of a scoping meta-review and has two parts: 1) a search for models of primary care and associated interventions (through a search of published studies and online databases); and 2) a search for systematic reviews of effectiveness studies from within the part 1 search results, and additional targeted scanning.

Literature search

1. Primary care-based models

A search for published primary care-based models of care and interventions to support patients with complex conditions was conducted in January 2017. The electronic databases searched were: Cochrane, CINAHL, EMBASE, Medline, Scopus, Web of Science and PsycINFO. A combination of the following search terms were applied: chronic disease; comorbidity; multi-morbidity; complex patient; primary care; models of care; pathways of care; collaborative care; multidisciplinary care; and coordinated care. The search was restricted to English language peer-reviewed papers published since 1995. A separate targeted search of the Google database was also conducted to identify primary care-based models of care published on government health department and health organisation websites.

We identified the underlying elements of models of care included for review based on descriptions within the published literature or government health service websites.

2. Systematic reviews of primary care interventions

Systematic review titles identified in the initial stage of the review were retrieved and screened. Papers were retained if they described a systematic review or meta-analysis of evaluation studies of interventions that were informed by the Chronic Care Model and delivered in a primary care setting. Following the initial screening process, full text articles were obtained and assessed for eligibility based on specific criteria developed a priori by the ISCRR Evidence Review team in collaboration with the TAC project sponsors. The inclusion criteria are outlined below.

Population

- Primary (individual) studies involving individuals with a chronic or complex health condition in receipt of primary care services.

Intervention

- Interventions conducted in primary care, defined broadly as general practice, practice nurse, allied health and community services.
- Systematic reviews of interventions delivered at a practice level and based on the Chronic Care Model;
    - Interventions could comprise one or more specific strategy or activity, and be directed to patients, healthcare providers or practices

Outcomes

- At least one health-related primary outcome measure;
    - Health-related outcomes could include: functional status, symptom reduction, morbidity, mortality, mobility, activities of daily living, or pain
    - Additional outcomes included quality of life, hospital admissions, return to work, cost-effectiveness, client satisfaction, medication adherence, and health practice change

Study review process

The PRISMA flowchart (refer to Appendix 1) provides an overview of the study identification and review process conducted in 2 of the literature search. Initially, 2661 records were identified through the database searches and a further 18 records through scanning of reference lists of retrieved relevant papers. Following removal of duplicates, the titles and abstracts of 1,386 titles and abstracts were reviewed manually. After the initial abstract and title screen, 50 systematic reviews were identified as potentially relevant for the meta-review of systematic reviews (stage 2). Full text papers were obtained and assessed for eligibility.

Forty-one full text systematic review papers were excluded as they did not meet the inclusion criteria for review. Nine systematic reviews were included in the synthesis of effectiveness of the CCM approach (stage 2). The following information was systematically extracted from each systematic review: characteristics of the primary intervention studies, nature of the interventions, selected outcomes, and effects of intervention on primary outcomes.

Quality Appraisal

The quality of the systematic reviews included in stage 2 was assessed using the Assessing the Methodological Quality of Systematic Reviews (AMSTAR) tool.[9] The AMSTAR appraises the methodological rigour of systematic reviews across 11 items. Systematic reviews received a score for each checklist item adequately addressed. No score was given for inadequately addressed items or where a judgement could not be made. Review papers could achieve a possible total score of 11. Systematic reviews that adequately addressed 9-11 checklist items were judged to be high quality. Moderate quality papers addressed five to eight items, while low quality papers addressed four or fewer items. The methodological quality of primary studies included in review papers was determined by systematic review authors and is provided in Appendix 2.

Synthesis of primary health intervention data

Primary care-based interventions that were evaluated and reported within the scientific literature were categorised according to the type and number of Chronic Care Model[10] elements they contained.

RESULTS

1. Primary health models

The scoping review undertaken in stage one identified a range of condition- and organisation-specific primary health models of care. These models described inter-professional, collaborative and interdisciplinary chronic care and were informed by the broad Chronic Care Model (CCM) that underpins the World Health Organisation's Care for Chronic Conditions framework.[11] In the following section two current Australian primary care models are briefly summarised followed by a description of the CCM. Given its broad usage and extensive evidence base, the CCM has been closely examined to assess its usefulness for the TAC context.

Australian Primary care models

The national **Primary Health Care Strategic Framework** was released in April 2013 and developed by the Commonwealth, state and territory health departments. This Framework articulates a comprehensive approach to primary healthcare across Australia that adopts a biopsychosocial view of healthcare. The focus of this model is on healthcare characterised by equity and community empowerment, provided by multidisciplinary teams with strong multi-sectorial collaboration.[12]

The **Health Care Home model** was developed in 2016 by the Australian Primary Health Care Advisory Group. This model articulates a model of primary healthcare for patients with chronic and complex conditions and describes a risk stratification approach to provide targeted health services according to individual needs (see Figure 1).[3]

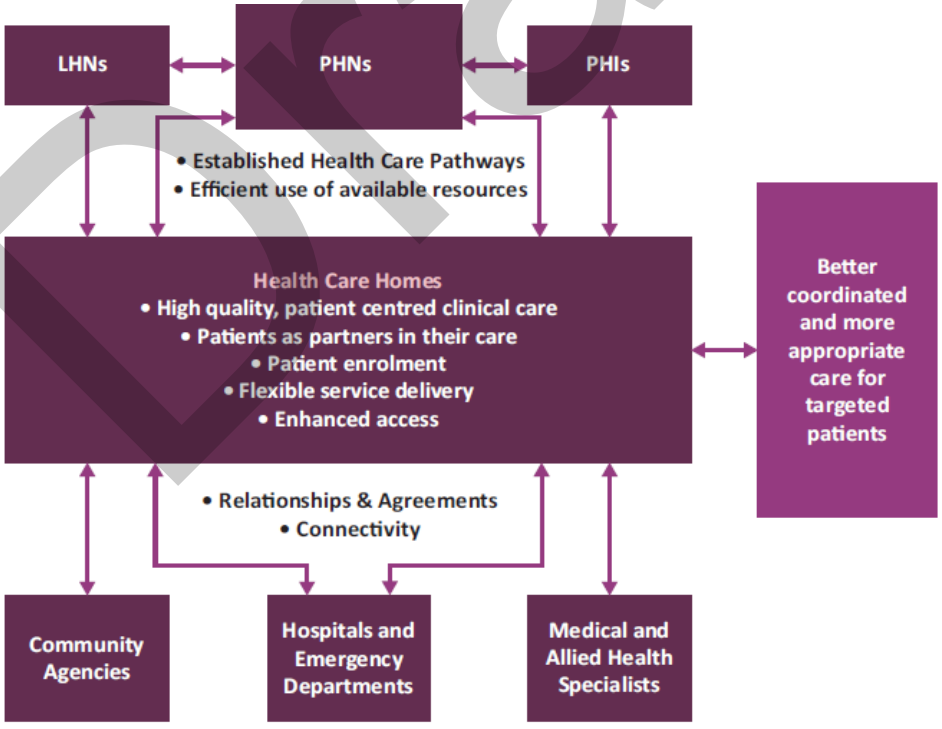

Fig 1. The HealthCare Home Model[3]

Within the Health Care Home model a general practice or healthcare provider serves as a clinical 'home base' for the coordination, management and ongoing support of patient care. This model is underpinned by seven key principles: voluntary patient enrolment; patient and family engagement;

enhanced access to health services; patient-nominated preferred health care provider; shared and integrated care planning; high-quality evidence-based care; quality improvement.

At the time of preparing this report, elements of the Health Care Home model were currently being piloted in several regions in Melbourne through the 'CarePoint' service. Evaluation of the model will be conducted over two years (2017-2019). A comprehensive case study of the Health Care Home model is provided in the Primary Care State Analysis report.

Chronic Care Model

The **collaborative Chronic Care Model (CCM)** was initially developed in the USA during the 1990s for the management of chronic and complex conditions[13, 14] in primary care (refer to Figure 2).[12, 15] According to this model, the management of chronic health conditions is dependent on interactions among the community, healthcare providers and the patient. Specifically this approach focuses on mobilising community resources, supporting patient self-management, promoting quality primary health care, consistent and continuous care, cultural competence, coordination, health promotion and efficient use of data. The model has gained considerable attention and has been adopted and expanded by the World Health Organisation to develop an Innovative Care for Chronic Conditions framework.[16] A range of condition-specific models of care have been developed that are informed by the original CCM. Examples are: musculoskeletal conditions,[17] pain management,[18] orthopaedic trauma,[19] mental health conditions,[20] arthritis[21] and osteoarthritis.[22]

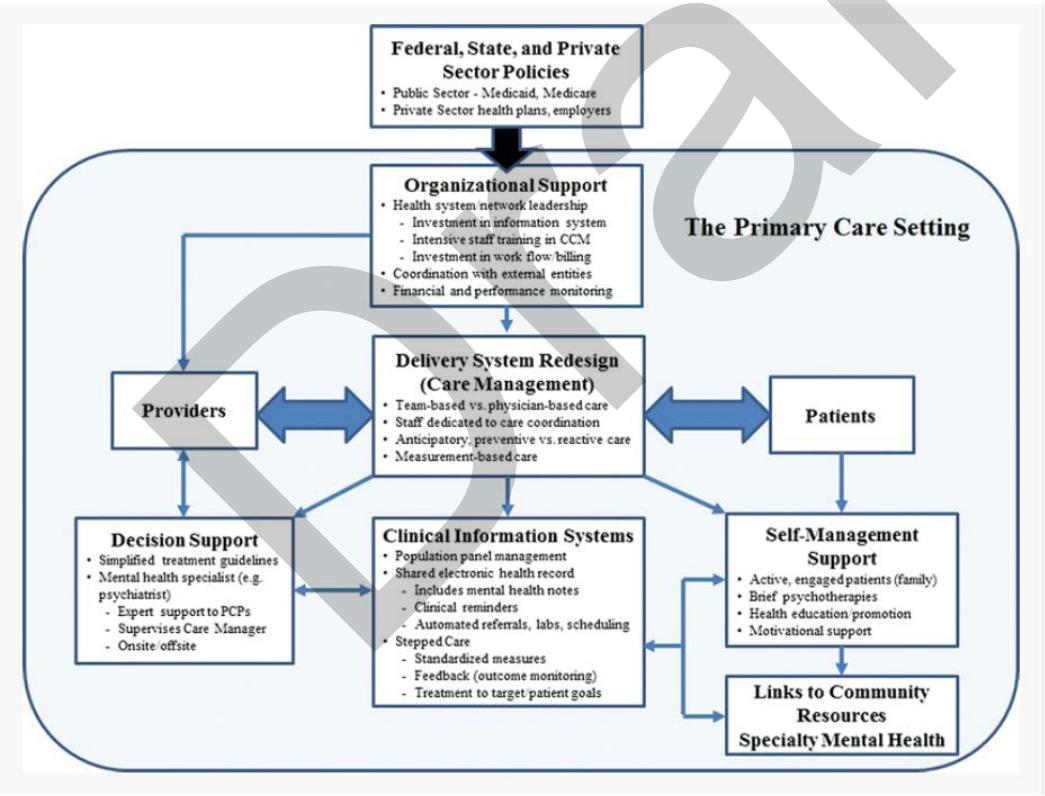

Fig 2. Example of use of collaborative chronic care model for mental health in primary care,[23] based on original Wagner Chronic Care Model.[16]

The Chronic Care Model (CCM) comprises six key elements or components: *self-management support, delivery system design, decision support, clinical information systems, health care organisation, and community links*. Since its initial development the CCM has been adapted and refined for a range of contexts. Specifically an additional two elements of a comprehensive CCM have been identified[4] as *enhanced case management* and *facilitated family support* (see Table 1).

Table 1. Description of the eight Chronic Care Model elements[16, 23, 24]

CCM Model element	Description
Self-management support	Interventions to foster patient and/or family competence in managing their condition. Includes educational, behavioural and motivational interventions
Decision support	Interventions to support the provision of evidence-based chronic care. Includes guidelines, professional training and education, engagement of condition-specific specialists.
Delivery system design	Practice, role and task design to support chronic care management. Includes case management, formation of multidisciplinary care team, enlisting specialist health providers.
Clinical information system	Systems to collect and maintain patient, care and clinical outcome data to support proactive chronic disease management. Includes electronic health records, clinical reminders, care plan tools.
Health system/Organisational Support	Organisational measures to support the provision of chronic care. Includes resource funding, chronic care management leadership.
Community support	Engagement and collaboration with community resources to ensure continuity of care and patient access to local housing, mental health, employment, transport and specialty services.
Case management	Dedicated case management role to oversee chronic care, monitor patient treatment adherence and self-management and coordinate health services.
Family support	Strategies to engage family members in chronic care management. Includes home visits, community support services

2. CCM-based primary care interventions

Characteristics of systematic reviews

The impact of primary care interventions relating to specific components of the CCM has been examined by many local and international primary studies and systematic reviews. Nine eligible systematic reviews, incorporating four meta-analyses,[13, 15, 25, 26] were identified for review and were published between 2005 and 2015. Appendix 2 summarises the characteristics of the included systematic reviews. Four studies were conducted in Australia,[4, 25-27] three were conducted in the USA,[13, 15, 24] and two in Canada.[28, 29] Each included systematic review contained between seven and 112 primary studies, with a total of 462 primary studies captured. It is probable that a proportion of studies are duplicated by being considered in more than one included systematic review however we did not identify duplicate studies.

All nine systematic reviews included randomised controlled trial (RCT) study designs within the primary studies they examined which are considered to provide the most reliable evidence on the effectiveness of interventions. Three reviews considered only RCTs,[15, 25, 28] and five also included cohort and cross-sectional studies.[13, 24, 26, 27, 29] Davy et al.[4] reviewed 15 controlled trials, six observational cohort and 11 cross-sectional studies in addition to 31 case studies and case series. For the purposes of this report, only findings and conclusions relating to the 15 controlled trials included in Davy et al.'s review were considered in this meta-review.

All included systematic reviews were judged to be of moderate quality.

Populations targeted

The included systematic reviews addressed a wide range of health conditions managed in primary care, including diabetes, depression, asthma, congestive heart failure, respiratory, renal, HIV/AIDS,

and mental health disorders. Four reviews[15, 24, 26, 29] evaluated the effectiveness of the collaborative care model in managing a specific health condition and five[4, 13, 25, 27, 28] considered a range of specified chronic health conditions or chronic health conditions in general.

Collaborative care model elements evaluated

All eight Chronic Care Model elements were considered across the nine systematic reviews, and individual studies included between two and seven elements (see Table 2). None included all eight elements.

Table 2. Chronic Care Model elements in single and multi-element interventions

Author (n studies)	Self-management support	Decision support	Delivery support design	Clinical Information system	Health system support	Community support	Case Management	Family support
Adams[24] (32)	*	*	*	*	-	-	-	-
Atlantis[25] (7)	*	*	*		-	-	*	-
Davy[4] (32)	*	*	*	*	*	*	*	*
Moullec[28] (18)	*	*	*	*	-	-	-	-
Pasricha[29] (16)	-	*	-	*	-	-	-	-
Powell-Davies[30] (85)	*	*	*	-	*	-	-	-
Si[26] (69)	*	*	*	*	*	*	-	-
Tsai[13] (112)	*	*	*	*	*	*	-	-
Woltman[15] (78)	*	*	*	*	*	*	-	-

Note: Studies contained single and multi-element interventions in varying numbers and combinations.

Decision support was the most frequently evaluated element considered by all nine systematic reviews, followed by *self-management support* (n = 8), *delivery support design* (n = 8) and *clinical information system* (n = 8). *Facilitated family support* was considered in only one systematic review.[4]

Seven systematic reviews considered interventions characterised by a single element along with interventions that comprised one or more elements in various combinations. Single element interventions sometimes included multiple strategies to address that element. Two reviews only considered interventions characterised by multiple elements. *Self-management support* interventions were most widely implemented across the primary studies and were commonly combined with *decision support* or *delivery system design* interventions, or both, and less frequently *clinical information systems*. One review only studied *decision support* and *clinical information system* interventions. *Community support* and *health system improvement* were the least studied elements, most likely owing to the challenges in examining interventions addressing these elements under controlled conditions.

Table 3 below provides examples of the specific approaches and interventions within each of the CCM elements evaluated in the studies.

Table 3. Example interventions evaluated across primary studies according to Collaborative Care Model elements

Element	Example interventions
Self-Management Support	• Education to promote client's understanding of their complex condition • Behavioural therapy; provide tools to modify client's behaviour to optimise self-care • Motivational therapy; setting goals and linking specific goals for behaviour change to clinical information
Decision Support	• Provider education and communication sessions • Implementation of evidence based guidelines • Integration of specialty services/expert consultation support • performance reviews
Delivery System Design	• Formation of multidisciplinary collaborative teams • Use of case managers • Client care planning and proactive follow-up • Collaboration and coordination between primary care and specialist services • Stepped care • Co-location between primary healthcare and other service providers
Clinical Information System	• Clinical/disease registry to organize client data and track care • Provision of feedback regarding provider performance data • Enhanced electronic medical record and guidelines/disease reminders
Health System)/ Organisational Support	• Organizational complex care goals and resources • Quality improvement strategies • Primary healthcare provider/service joint funding, management and planning • Change to funding arrangements impacting primary healthcare
Community Support	• Referrals to community-based peer support groups, exercise programs, housing resources, home care programs • Access to community-based health services
Case management	• Family education through home visits • Community based and regional workshops on disease management
Family Support	• Case management including education, motivation, follow-up, referral to community resources

Outcomes evaluated

All of the nine systematic reviews we examined, except Moullec et al.[28] included as a primary outcome - health outcomes. Three systematic reviews included process of care measures.[4, 13, 29] Other outcomes reported included cost effectiveness, quality of life, patient satisfaction and medication adherence. Systematic reviews included between one and four primary outcomes.

Evidence of the effectiveness of chronic care model elements

In this section we present a synthesis of the evidence regarding the effectiveness of the eight elements of the Chronic Care Model to support individuals with chronic and/or complex conditions in primary health care. In order to examine the effectiveness of the different elements of the Model we have described the evidence according to whether interventions were characterised by a single element or multiple elements of the Chronic Care Model. Appendix 3 presents a summary of the results.

Single element interventions

Seven of the systematic reviews included single element interventions. The specific CCM element in single element interventions varied across interventions, however *self-management support* was the most common element in single element interventions, followed by *delivery support design*.

Self-management support emphasises the client's central role in health care and includes support strategies such as assessment, goal-setting, action planning, problem solving, and follow-up. In the literature, several interventions were described and were grouped under the *self-management support* element. Some of these reported interventions were education by health care providers, behavioural therapy, and motivational therapy, collaborative decision making with patients, and making guidelines available for patients.[24-26, 28] Tsai et al.[13] found that single interventions (predominantly *self-management support* interventions) led to statistically significant improvements across a number of health outcomes for diabetes and depression, as well as process-of-care outcomes (number of patients receiving tests or prescriptions) but not quality of life outcomes. Based on a meta-analysis of studies with enough interventions to enable comparison of those consisting of a single or multiple elements, Tsai et al. concluded that single element interventions were as effective as multi-element interventions (comparisons showed no significant difference).

In a meta-analysis of chronic care oriented interventions for diabetes, Si et al.[26] reported a small to moderate significant reduction in a number of patient outcomes for diabetes, for example there was a mean reduction of 0.46% (95% CI 0.38, 0.54) in blood glucose levels, a mean reduction of 0.22 mmHg (95% CI 0.9, 3.5) in systolic blood pressure, a mean reduction of 1.3 mmHg (95% CI 0.6, 2.1) in diastolic blood pressure and a mean reduction of 0.24 mmol/L (95% CI 0.06, 0.41) in total cholesterol. For specific CCM components, interventions employing *delivery system design* and *self-management support* reported the largest improvements in patient outcomes, the authors also found that effect sizes did not differ between interventions targeting multiple elements and those involving a single element, such as *self-management support*. There is some evidence that the intensity of a single element intervention,[26] or the type of intervention and chronic condition (e.g. cognitive behavioural therapy for depression),[13] may be more important than the number of elements targeted. Pasricha et al.[29] also found support for single element interventions relating to *decision support* and *clinical information systems* for improving care administered to patients living with HIV. *Decision support* interventions, particularly implementation of guidelines, and *clinical information systems*, including reminders to providers, showed the most frequent improvement in outcomes for HIV clients.

In contrast to the findings of Tsai et al.[13] and Si et al.[26], Moullec et al.[28] found that *self-management support* delivered in isolation was associated with improved asthma medication adherence in the minority of studies (only three of 13 RCTs), and Adams et al.[24] concluded that that single elements (including *self-management support*, *decision support* and *delivery system design*) delivered in isolation had no significant effect on health outcomes for chronic obstructive pulmonary disease or measures of health service use.

In summary, certain single element interventions have been found to be effective for diabetes and mental health outcomes where the intervention has been delivered at the right intensity. The weight of the evidence however suggests that single elements in isolation are not as effective as multi-element interventions.

Multi-element interventions

All reviews included studies that had implemented interventions with more than one element and in various combinations.

In a large review of collaborative primary care interventions in Australia, the United States, the United Kingdom, New Zealand, Canada and the Netherlands, Powell-Davis et al.[27] identified 36 studies, out of a total of 65 studies measuring a range of health outcomes (diabetes, heart disease, asthma, pulmonary disease, and mental health), that reported significant intervention effects. The highest effect was seen with *delivery support design* interventions, followed by *decision support* interventions and *self-management* interventions, these effects were similar across health issues with the exception of mental health where *decision support* interventions had the greatest effect on mental health outcomes. Studies incorporating between two to four different elements had the greatest effects on health outcomes compared to single element interventions.

These findings are supported by Moullec et al.[28] who found that inclusion of a greater number of Chronic Care Model elements within interventions was associated with stronger effects on asthma medication adherence and control of asthma symptoms. Interventions featuring one, two and four elements had medium (0.29; 95% CI: 0.16-0.42), large (0.53; 0.40-0.66) and very large (0.83; 0.69-0.98) effects respectively.

The overall effectiveness of multi-element interventions was consistently demonstrated by all other included reviews[4, 13, 15, 24-26, 29] however the most effective number and/ or combination of elements could not be determined. Two reviews[13, 15] reported that four specific Chronic Care Model elements (*self-management support*, *delivery system design*, *decision support* and *clinical information systems*) showed statistically significant improvements in health outcomes and processes. Both reviews, however, suggest that the significant effects for these elements may be attributed to the larger number of studies that incorporated interventions relating to these elements. *Community support* and *health system improvement* interventions were the least implemented and evaluated of all the Chronic Care Model elements, likely due to the recent addition of these two elements to the Model and the challenges of evaluating these complex interventions with controlled trials.

One review provides support for the effectiveness of interventions based on multiple elements of the Chronic Care Model in improving health outcomes for clients with comorbid conditions. Based on seven randomised controlled trials in the United States, Atlantis et al.[25] identified that collaborative care interventions involving case management, structured management plans, integrated care programs, proactive follow-up and lifestyle risk factor modification had a significant effect on health outcomes in clients with comorbid depression and diabetes.

In summary, across the systematic reviews analysed, there is good evidence that multi-element interventions are effective in improving health outcomes. This was found despite the wide variability between the CCM elements included within the intervention approaches and the way in which they were implemented.

Limitations

The review did not identify any models of primary health care specifically for clients in the injury or compensation environment.

IMPLICATIONS OF THE FINDINGS

This evidence review identified that primary care-based models of care and interventions for chronic and complex ongoing health conditions that are based on the Chronic Care Model are likely to be effective.

Specifically, the evidence indicates that:

- Overall, the **chronic care model** is effective across different disorders and populations for physical health conditions, mental health and comorbidities
- Primary care interventions incorporating the following four elements of the Chronic Care Model are well supported by the evidence and likely to be effective: *self-management support*, *delivery system design*, *decision support* and *clinical information systems*
- Evidence for the effectiveness of including the *health system improvement*, *community support*, and *family support* elements of the Chronic Care Model is currently lacking, which means we do not yet know if these interventions are effective.
- **Multiple element** interventions are generally more effective however the effectiveness of interventions which include all eight elements of the Chronic Care Model has not been sufficiently evaluated.
- **Single element** interventions, such as *self-management support* and *delivery system design*, may be as effective as multiple element interventions but only for some clients and if delivered at the right intensity.

The potential implications of these findings for the TAC in the development of a new evidence based primary health care strategy are discussed below.

1. Primary care models

The Chronic Care Model was identified from the various models existing in the literature as a robust framework for care of patients with chronic and complex conditions. This model is also consistent with the various other inter-professional models of collaborative/integrated care which were frequently described in the literature. Key features of all these models included: encouraging and supporting relationship building activities between service providers; co-location to improve collaboration and integration; and, enhancing and supporting multidisciplinary team function based on the size of the general practice team. Shared information systems were also reported as an essential element of an effective collaborative model.

Key considerations

- Consider using the Chronic Care Model as a framework to guide development of the new TAC Primary Health Care strategy.

2. Primary care interventions

Most of the evidence reviewed relates to four key elements of the Chronic Care Model: *self-management support*, *delivery system design*, *decision support* and *clinical information systems*. Interventions that incorporated two or more elements appear to be more effective.

The evidence indicates that *self-management support* delivered in isolation or in combination with other elements is effective for chronic or complex/co-morbid conditions. Interventions that combine multiple self-management strategies (patient education, behaviour therapy and motivational therapy) delivered across multiple sessions appear especially effective based on one systematic

review.[28] Self-management support delivered in combination with other intervention components is likely to achieve sustained health outcomes based on findings of one systematic review.[26] The primary care State Analysis (a component of the larger 172 Primary Care project for TAC) identifies effective and widely implemented *self-management support* interventions.

There is no evidence that *decision support* or *clinical information system* interventions delivered in isolation are effective.

The evidence suggests that no one element within the Chronic Care Model contributes to positive health outcomes, patient satisfaction or health practice outcomes across all chronic or complex conditions, and conversely that no one element is superfluous to the model. The effectiveness of interventions across the full scope of the Chronic Care Model requires further research.

Key considerations

- An approach that integrates the implementation of two or more elements of the Chronic Care Model in combination is well supported by evidence.
- S*elf-management support* interventions need to be delivered comprehensively, over time and in combination with other elements of the Chronic Care Model.
- Consider delivering *delivery system design, decision support* and *clinical information system* elements in combination. For example, multidisciplinary evidence-based guidelines and case management supported by referral systems and electronic client records.
- Work collaboratively with health care providers to develop shared goals and a vision for a new primary health model of care for TAC clients.

CONCLUSION

There is good evidence that a primary care model that implements a combination of two or more interventions primarily derived from four Chronic Care Model elements (*self-management support, delivery system design, decision support* and *clinical information systems*) can improve health outcomes and health practices for people with chronic or complex health conditions. Implementing such a model requires partnerships and collaboration.

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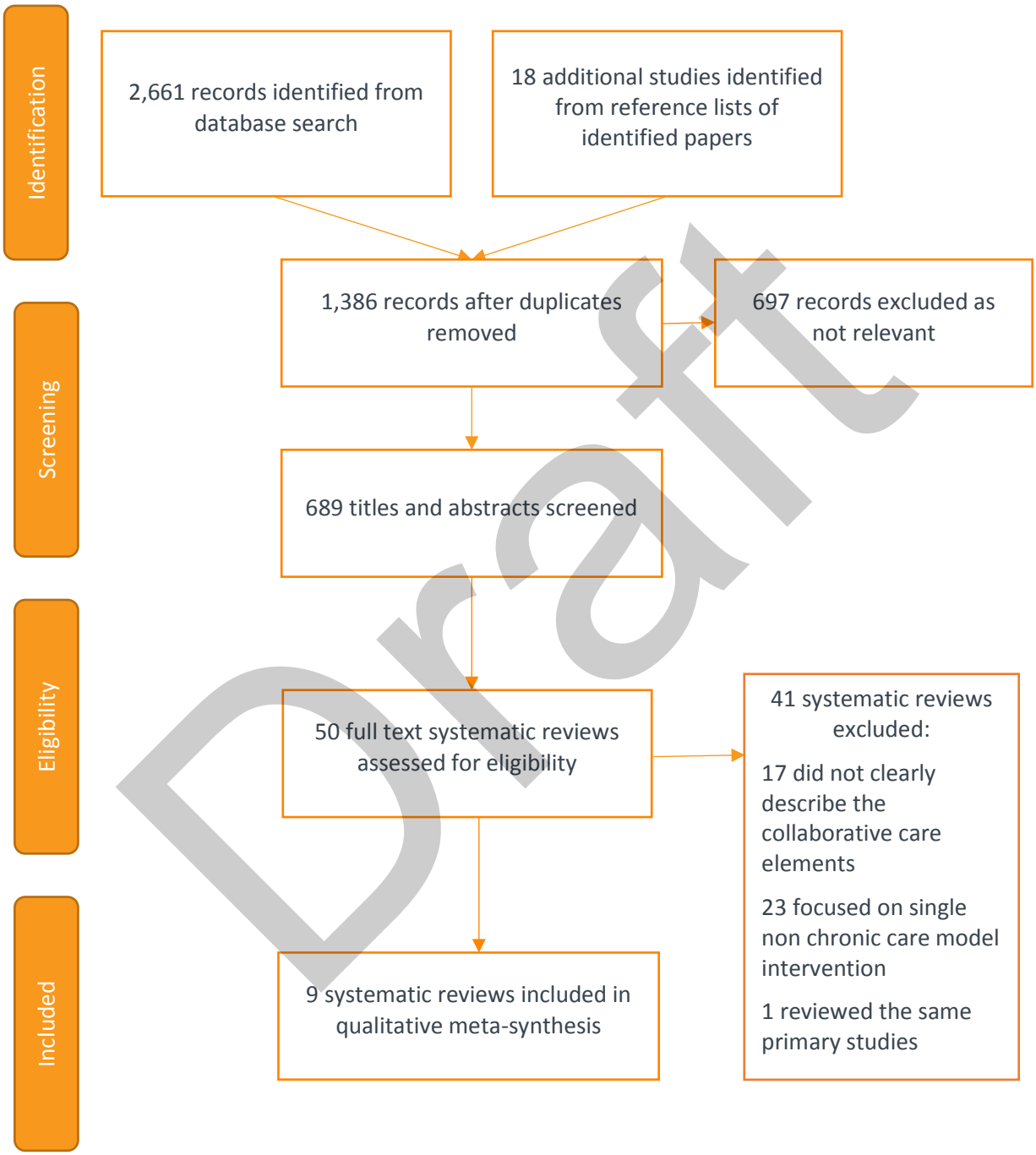
APPENDICES

Appendix 1: PRISMA flowchart of Stage 2



Appendix 2: Systematic review characteristics

Reference (year) Country	N databases searched (searched date range)	Inclusion criteria	N included studies (date range) N participants	Target condition	CCM elements evaluated	Outcomes	Systematic review AMSTAR rating	Quality of primary studies[#]
Adams[24] (2007) America	3 (1966-2005)	Intervention(s) with at least 1 CCM component; control or comparison group or at least 1 outcome measured at 2 points; relevant outcome(s)	32 (1987-2004) NR	Chronic Obstructive Pulmonary Disease (COPD)	Self-management support Decision support Delivery support design Clinical information system	Mortality; ED presentations; hospitalisations; patient knowledge; QoL; functioning	Moderate	Study quality: 1 good, 5 fair, 14 poor, 5 not assessed
Atlantis[25] (2014) Australia*	7 (-2013)	Study type RCT; interventions consisted of collaborative care; majority of participants needed to have comorbid diabetes and depression; health outcomes reported	7 (2004-2013) 1895	Depression with diabetes	Self-management support Decision support Delivery support design	Depression; diabetes clinical outcome	Moderate	6 of 7 RCTs better quality
Davy[4] (2015) Australia	7 (1998-2013)	Studies with a focus on care of people with a chronic disease (specified or non-specified) in the primary care setting; interventions included at least 2 CCM elements; measurement of health care practices or outcomes; any study type	77 (1999-2012) NR	Chronic disease	Self-management support Decision support Delivery support design Clinical information system Health system support Community support Enhanced case management Facilitated family support	Health; practice outcomes	Moderate	13 RCTs, 2 non-RCTs, 6 retrospective cohort and 11 cross sectional studies – high risk of bias
Moullec[28] (2012) Canada	2 (1948-2010)	Adults with asthma and/or COPD disease; effectiveness study; interventions with CCM elements; included outcome of asthma controller medication use	18 (1990-2010) 612	Asthma and COPD	Self-management support Decision support Delivery support design Clinical information system	Adherence to asthma medication	Moderate	Study quality: 6 good, 11 moderate
Pasricha[29] (2012) Canada	3 (1996-2011)	Individuals known to be living with HIV; all intervention strategies for people with HIV that were evaluated	16 (2002-2010) 29,897	HIV/AIDS	Decision support Clinical information system	Immunological, medical and psychosocial outcomes; QoL; process of care	Moderate	2 RCTs, 1 CBA, 9 cohort, 1 cross sectional and 3 time series studies Risk of bias: 1 in RCT
Powell-Davies[30] (2006) Australia	12 (NR)	Article looking at Coordination of PHC interventions; published in English; studies from Australia, Canada, New	85 (1994-2005) NR	Chronic disease, mental health, and aged care	Self-management support Decision support Delivery support design Clinical information system Health system support	Health; patient and clinician satisfaction; cost-effectiveness	Moderate	79 RCTs and 6 other experimental or cohort – only higher quality studies included

Reference (year) Country	N databases searched (searched date range)	Inclusion criteria	N included studies (date range) N participants	Target condition	CCM elements evaluated	Outcomes	Systematic review AMSTAR rating	Quality of primary studies[#]
		Zealand, UK, US, or Netherlands; study type experimental or evaluation						
Si[26] (2008) Australia*	3 (1966-2005)	Experimental studies; diagnosis of type 1 or type 2 diabetes; aged 16 years or more; receiving care in a primary care, outpatient or community setting	65 (1988-2004) NR	Diabetes	Self-management support Decision support Delivery support design Clinical information system Health system support Community support	Clinical outcomes	Moderate	Study quality: 23 RCTs strong, 2 CBA strong
Tsai[13] (2005) America*	8 (-2003)	Effectiveness of interventions containing 1 or more of the CCM elements; RCTs and non-RCTs	112 (1993-2003) NR	Depression, Asthma, CHF, Diabetes	Self-management support Decision support Delivery support design Clinical information system Health system support Community support	Clinical outcomes; process of care outcomes; QoL	Moderate	Methodological quality: 36 studies scored 3 or higher (moderate - high quality)
Woltmann[15] (2012)*	6 (-2011)	Trials were required to compare an intervention meeting CCM definition with another intervention or treatment as usual	78 (1994-2010) 22,037	Mental health conditions with or without other condition	Self-management support Decision support Delivery support design Clinical information system Health system support Community support	Depression symptoms; QoL; social role functioning	Moderate	No evidence of bias, no publication bias present

Notes. *Meta-analysis; #based on systematic review authors' determination; NR = not reported.

Appendix 3: Systematic review findings

Author & Year	Results	Direction of effect
Adams[24]	Pooled data demonstrated that patients who received 2 or more CCM components had lower rates of hospitalisation and ED visits and shorter LOS. No significant effect on COPD symptoms, quality of life, lung function and functional status.	Positive
Atlantis[25]	Depression score and diabetes control significantly improved.	Positive
Davy[4]	Majority of studies reported improvements to healthcare practice or health outcomes for people living with chronic disease. Most common elements were self-management support and delivery system design, there were considerable variations between studies regarding what combination of elements were included as well as the way in which chronic care model elements were implemented. The authors were not able to identify optimal combinations of chronic care model elements that led to the reported improvements.	Positive
Moullec[28]	Inclusion of a greater number of CCM components within interventions was associated with stronger effects on asthma medication adherence outcomes, with interventions featuring one, two, and four CCM components having medium (ES= 0.29; 95%CI, 0.16-0.42), large (0.53; 0.40-0.66), and very-large (0.83; 0.69-0.98) effects respectively.	Positive
Pasricha[29]	Overall, 5/9 (55.6%) and 17/41 (41.5%) process measures and 5/12 (41.7%) and 3/9 (33.3%) outcome measures for decision support and clinical information system interventions, respectively, were statistically significantly improved.	Positive
Powell-Davies[30]	Six types of elements/strategies were identified consistent with the CCM. All were associated with improved health and /or patient satisfaction outcomes in more than 50% of studies and interventions using multiple strategies were more successful than those using single strategies.	Positive
Si[26]	Included studies reported a mean reduction of 0.46% (95% CI 0.38, 0.54) in HbA1c, mean reduction of 2.2 (95% CI 0.9, 3.5)mmHg in systolic blood pressure, mean reduction of 1.3 (95% CI 0.6, 2.1)mmHg in diastolic blood pressure and mean reduction of 0.24 (95% CI 0.06, 0.41) mmol/L in total cholesterol; For specific CCM components, interventions that addressed delivery system design reported the largest improvements in patient outcomes, followed by those employing a self-management support component. Interventions involving decision support or clinical information systems reported relatively smaller effect sizes	Positive
Tsai[13]	Overall the interventions led to statistically significant improvements in ED visits, Readmission, quality of life and process of care. Four elements of the CCM (delivery system design, self-management support, decision support, and clinical information systems) were associated with better outcomes and processes.	Positive
Woltmann[15]	The meta-analysis indicated significant effects across disorders and care settings for depression as well as for mental and physical quality of life and social role function (Cohen's d values, 0.20–0.33).	Positive