MSSU KNOWLEDGE SNAPSHOT 1

CHRONIC DISEASE MANAGEMENT MODELS AND INTERVENTIONS

INTRODUCTION

Chronic disease management is a core function of primary health care. This snapshot outlines evidence around chronic disease interventions in primary health care gathered through a review of literature related to chronic disease, multi-morbidity and individuals with complex care needs.

Figure 1 provides an overview of the interventions categorized into four primary domains adapted and referenced from Baxter et al. (1) that make up the organization and delivery of chronic care including:

1. Person and Family Centered Care
2. Work Force
3. Organization and Systems
4. Finance and Governance

The snapshot summarizes the most highlighted interventions from the evidence (bold in Fig. 1), and outlines brief information about these interventions, their outcomes, barriers and facilitators to implementation, and population-specific considerations (i.e. individuals with multi-morbidity and/or complex-care needs). Appendix 1 contains four tables that provide a brief overview of all interventions.

KEY FINDINGS

- The majority of interventions fell into the Person and Family Care domain.

- Interventions within the Organization and Systems and Workforce domains were generally cited less regularly within the articles reviewed and often displayed gaps or poorly detailed information.

- Intervention examples related to Self-Management and Care Coordination / Case Management had the most consistently positive results on individual and system outcomes among the populations considered.

- Interventions within the Finance and Governance domain were rarely mentioned. The only intervention of note pertained to payment models.

- Complex interventions (i.e. interventions with more than one strategy) were discussed more often in the articles than interventions with a single element.

- Among the articles reviewed, many focused on diabetes. Diabetes was the most regularly cited condition among chronic and multi-morbid populations.

Figure 1 – Interventions grouped by domain. *This snapshot summarizes the most highlighted interventions from the evidence (bold text).*

PERSON AND FAMILY CENTERED CARE

Self-Management

Self-management support strategies include actively involving individuals in the design of their care,[2–5] including shared decision-making[2,5] and incentives to increase individual engagement.[2] Strategies also involve providing individuals with resources / skill development opportunities to aid in managing their condition[3–11] such as health education classes. [2,4,5]

Table 1 - Summary information for self-management interventions

OUTCOMES
• Self-management strategies generally impact individual (e.g. quality of life),[9] clinical (e.g. physiological measure of disease)[12,13] and health care cost / utilization outcomes.[12]
DISEASE / MULTI-MORBIDITY & INDIVIDUALS WITH COMPLEX-CARE NEEDS
• Self-management is a useful intervention for individuals with multi-morbidity. • Specific findings in the articles reviewed support positive effects in individuals with diabetes and hypertension.[13] • Tailoring educational resources to specific disease(s) is shown to be a useful tactic (e.g. diabetes days).[3,4,14] • Combining self-management interventions with pharmacotherapy education noted as effective in individuals with complex-care needs.[9,10]
FACILITATORS
• A strong relationship between individual and provider improves self-management.[4,9] • Engaging individuals in design and implementation of care models impacts intervention effectiveness.[1,5,10,15]

Care Coordination / Case Management

Incorporating care coordination / case management into care teams aids in communication, helps individuals assess problems, supports with navigation of the health care system[1,2,6,7,9,11] and supports scheduling meetings and follow-up visits to ensure plans have been implemented.[2,10] Case management was most often implemented as a part of an intervention model that included multiple strategies[1,10] with emphasis placed on face-to-face contact and home visits. [6,7,9,12]

Table 2 - Summary information for care coordination / case management interventions

OUTCOMES
• Varying outcomes across strategies includes improved individual outcomes (e.g. individual satisfaction)[1,5] and promotion of collaboration / partnerships.[4] • There are mixed findings for cost effectiveness of care coordination / case management,[5] but care coordination / case management are found to minimize duplicating efforts and save time.[1,3]
DISEASE / MULTI-MORBIDITY & INDIVIDUALS WITH COMPLEX-CARE NEEDS
• Care coordination interventions are especially relevant, and may only be necessary for individuals with multi-morbidity.[1] • Social workers and nurses are effective care coordinators for individuals with multi-morbidity[10,12] and complex-care needs.[6] • More interaction with a coordinator is better for individuals with multi-morbidity and/or complex-care needs.[6] • Some evidence indicates the home is an effective intervention setting for individuals with complex-care needs and multi-morbidity.[12]
FACILITATORS
• Alternative payment models (e.g. value-based payment via performance-based penalties / rewards, bundled payments and shared savings[3]) incentivize integration[1,3–5,13] (should be tailored to unique multi-morbid care).[4]
BARRIERS
• Traditional payment models (e.g. fee-for-service) discourage cooperation.[1,3,5,9]

WORK FORCE

Multi-Disciplinary Team Approach

Integrating care into multi-disciplinary teams (MDTs) is shown to be an effective intervention. Teams should have varied expertise (e.g. mental health and social services),[3,16] have a nominated decision-maker for the team,[2] and pair with other intervention strategies including the use of case management and individual education.[1]

Table 3 - Summary information for MDT interventions

OUTCOMES
• Generally superior outcomes with MDTs than integrated care pathways especially as a complex intervention.[1]   • Broad range of improved system outcomes (e.g. hospital admissions / readmissions) and individual outcomes (e.g. quality of life).[1]   • Greater effectiveness when implemented in combination with case management or individual education.[1]
DISEASE / MULTI-MORBIDITY & INDIVIDUALS WITH COMPLEX-CARE NEEDS
• The incorporation of social workers into MDTs is especially relevant to individuals with complex needs.[11,16,17]   • A non-disease specific approach tends to promote greater collaboration within a team.[4]   • Evidence that individuals with complex care and mental health care needs benefit from MDTs.[13,18]   • Diabetes was the condition cited most frequently in the literature.[2]
FACILITATORS
• Sharing a common philosophy.[1,19]   • Align goals, vision and strategy.[1,5]   • Staff co-location.[6,10,15,17]
BARRIERS
• MDTs dominated by physicians.[1]   • Insufficient support from managers.[1,2,5]

ORGANIZATION AND SYSTEM

Decision Support

Decision support involves the integrated use of clinical guidelines such as standardizing discharge protocols[3,7,8,17] and other decision support tools including computerized recall and reminder systems.[2,13] Computerized recall and reminder systems involve incorporating algorithms to help with decision making (e.g. flag alerts).[2]

Table 4 - Summary information for decision support interventions

OUTCOMES
• General positive impacts of information technology (IT) interventions on professional behaviors, and individual level outcomes (e.g. consistency in promotion of care).[13]   • Limited research on the impact of individual-level measures on disease control.[13]
DISEASE / MULTI-MORBIDITY & INDIVIDUALS WITH COMPLEX-CARE NEEDS
• Generally, information technology (i.e. Electronic Medical Records, computerized recall systems) interventions have positive results on professional and individual-level outcomes, especially individuals with diabetes and hypertension.[13]   • Clinical guidelines[9,14] and algorithms are often used in multi-morbid care.[10]
FACILITATORS
• Adoption of monitoring and evaluation procedures to ensure quality improvement.[3–5,10,17]
BARRIERS
• Variability in health care delivery across a province or country.[16]

METHODS

A total of 21 articles were extracted and reviewed. The Primary Health Care team provided 15 core articles to be extracted. The MSSU included an additional 6 articles referenced among the core articles based upon their relevance to the research question.

Information pertaining to specific interventions for chronic disease care were extracted, as well as information on their outcomes and any information pertaining to specific diseases or high cost, high complexity care, when available.

LIMITATIONS

- This summary discusses commonly cited interventions referenced from the selection of articles reviewed and is not an overall indication of prevalence in a wider body of literature.

- The relative strengths of the evidence summarized was not examined explicitly.

- Barriers and facilitators were extracted secondarily when they were mentioned in the literature however the sources were not initially selected for the purpose of capturing these factors. This contributed to an imbalance between facilitators and barriers extracted as they related to the respective interventions.

RELEVANT DEFINITIONS

Care Coordination: coordination of care and services between the individual and care team. Care coordinators follow service progression, facilitate communication between individual family and health care provider and provide supportive services.[10]

Complex care needs: defined as having an active diagnosis (within 1 year of index) of 4 or more conditions (of a list of 55 conditions defined by the Ministry of Health and Long-Term Care to define the Health Links target population).[20]

Complex care services: a person-centered approach to address the needs of people who experience combinations of medical, behavioral health, and social challenges that result in extreme patterns of health care utilization and cost.[3]

Complex intervention: an intervention that consists of more than one discrete intervention element.

Individual Outcomes: includes individual satisfaction, quality of life, perceived quality of care, access to services, and clinical disease related outcomes.

Integrated Care Pathways: standardization of care that is cost effective, minimizes risks and inappropriate costs.[1]

Model: existing frameworks or theories of care.[4]

Multi-morbidity: refers to the presence of multiple chronic or long-term conditions that could include both physical and mental disease.[4,10,11,14]

Self-Management: The process of providing multi-level resources in health care systems (and the community) to facilitate a person's self-management.[21]

System Outcomes: includes hospital admission / readmission, waiting times, length of stay, hospital cost, health care utilization, health care spending coordination of services, individual flow, timely discharge, service efficiency, responsiveness of service delivery.

Value-Based Payment Models: seeks to align the incentives of providers with the system goals of controlling costs while improving quality.[3]

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APPENDIX 1

The following tables provide high-level summary information about the chronic disease care interventions that were highlighted in the literature. Interventions are grouped according to the four primary focus domains adapted and referenced by Baxter et al (1). Intervention features illustrate what interventions could or should entail in practice. Any information about an intervention (features or outcomes) that specifically addresses a disease or high-cost user is listed in a separate column. Any disease or key terms, such as "individuals with complex needs" or "multi-morbidity," that indicate a particular patient population are underlined for easy identification. These tables do not provide an exhaustive list of interventions from the literature (there are many more models, elements, interventions and factors that may not have been captured). The tables do not include an evaluation of the relative strengths of the evidence that is summarized.

Table 1 - Person and Family Centered Care

Person and Family Centered Care						
Element	Intervention Example	Intervention Features	Outcomes / Impact	Disease / Multi-Morbidity Specific	Complex Care Needs Specific	Barriers (B) & Facilitators (F)
Integrated Assessment and Treatment	Conduct regular **needs assessments / clinical evaluations** that are multi-dimensional. [4, 7, 9, 10, 15]	Schedule regular face-to-face meetings, [4, 8, 10, 11] or phone support lines [8, 11] to reassess goals and progress. [4] Prompt follow-up after hospital stays, [2, 3, 8, 10, 17] (important for individuals with high-needs). [10, 17]	Improved individual satisfaction from assessing needs & expectations regularly. [2]	Important in care for individuals with multi-morbidity to involve them in the planning and setting of realistic goals. Comprehensive, multi-disciplinary assessments are a staple of complex care [4, 9] along with risk screening. [7]	Multidisciplinary needs assessment and shared decision making may reduce unwarranted variation of expensive procedures. [18]	**F:** Effective assessment can help participants benefit from program. [17] **B:** Unsuccessful programs have large numbers of individuals unlikely to benefit from participation. [6]
Care Planning	Create **individualized and adapted care plans**. [10]	Consider the family's needs in the care plan. [10] Consider individual preferences Involve individuals in the decision-making process. [4, 16] Empowerment strategies for individual engagement. [10]	Optimize care processes across professionals [4] potentially by improving coordination. [5]	Individual-centered care characteristics are more common in multi-morbid practices. [14] Individual care plans common feature of multi-morbid care. [4, 10, 11]	Programs substituting care at the individuals' home in lieu of a hospital stay showed evidence of lower costs in individuals with high-need / cost. [9]	**F:** Understanding individual values. [19] **B:** Individuals with complex needs face unique barriers to engagement (e.g. stigma, and poor social support). [3]
Pathways and Protocols	Develop and implement **Integrated Care Pathways (ICPs)**.	Implemented as a stand-alone and a complex intervention (both show modest positive impact upon process outcomes). [1]	Improve discharge planning in hospitals. [1] Improve efficiency. [1] Promote increased guideline adherence. [1] Time-consuming. [1]	ICPs may be better for acute care and predictable conditions. [1]	*No findings*	*No findings*

Table 1 - Person and Family Centered Care (continued)

Person and Family Centered Care

Element	Intervention Example	Intervention Features	Outcomes / Impact	Disease / Multi-Morbidity Specific	Complex Care Needs Specific	Barriers (B) & Facilitators (F)
Technology	Implement **Telehealth** interventions.[10]	Tele-homecare units installed in individual homes.[10]	*No findings*	Had a positive impact upon health outcomes in individuals with multi-morbidity.[10]	*No findings*	*No findings*
Care Coordination / Case Management / Navigation	Add a trained **care coordinator** into each team.[1]	Care coordinator serves as communication hub and leader.[9, 17] Design care coordination intervention to client's care needs related to specific disease(s).[1] Program leaders / technical resource persons can serve as care coordinators.[2]	Provide continuity of individual engagement between individuals & providers.[1] Decrease in health care used in some chronic disease populations.[1] Saves time, minimizes duplication.[1, 3] ≥ 1 contact / month with care coordinator is reported as best.[6] Promote collaboration & partnerships.[4]	Care coordination interventions are especially relevant, and may only be necessary for complex multi-morbid individuals.[1] Social workers & nurses are effective care coordinators for multi-morbid individuals.[10, 12] Key features of care teams in treatment of individuals with complex needs.[9, 17] More interaction with coordinator is best for individuals with multi-morbidity.[6]	Social workers and nurses serve as effective care coordinators.[6] More interaction is better.[6]	*No findings*
	Incorporate **Care Managers** into care teams who help individuals to assess problems, facilitate communication and navigate the health care system.[1, 2, 6, 7, 9, 11]	Emphasize face-to-face contact and home visits.[6, 7, 9] Care coordinator arranges scheduled visits and follow-ups to ensure care plan is implemented.[2, 10] Care coordination most common for complex care needs.[1, 10] Multi-site interventions should have multiple care managers.[10] The home was a common setting for successfully implemented interventions.[12]	Consistent positive impact that ranged across individual satisfaction,[5] clinical outcomes & health care utilization[5] and spending with greatest impact seen upon health care use and spending outcomes.[12] Cost effectiveness of programs remains somewhat controversial.[5]	Nurse or social workers are effective care managers for individuals with multi-morbidity.[12] Positive impact on individual satisfaction and health outcomes,[10, 12] and clinical[12] and utilization / spending outcomes[1, 12] for complex, multi-morbid individuals. Optimizes multi-morbidity care among professional team.[4]	Quality of interactions between care managers, individuals, and providers strong predictor of reducing health care use.[9] Positive impact on satisfaction outcomes, clinical outcomes, health care utilization and cost.[12]	**F:** Value-based payment incentivizes integration[1, 3–5, 13] (should be tailored to unique multi-morbid care).[4] **B:** Traditional payment models discourage cooperation.[1, 3, 5, 9]

Table 1 - Person and Family Centered Care (continued)

Person and Family Centered Care

Element	Intervention Example	Intervention Features	Outcomes / Impact	Disease / Multi-Morbidity Specific	Complex Care Needs Specific	Barriers (B) & Facilitators (F)
Self-Management	Actively **involve individuals in the design of their self-management care plan.** [2–5]	Mutual decision-making and goals setting[2, 5] Employ incentives to increase individual engagement.[2] The home was a common setting for successfully implementing interventions.[12]	Generally SMS interventions found to impact individual,[9] clinical and health care cost & utilization outcomes.[12] Greatest impact upon clinical outcomes.[12, 13] System and health care utilization / cost outcomes also found in high-need, individuals w/ multi-morbidity.[12] Individual self-management support interventions were cited to positively affect physiological measures of disease in individuals with diabetic and hypertensivity.[13] Effect on individuals with diabetes & COPD mostly improved individual knowledge.[13]	Multi-morbidity practices generally aim at improving individual involvement in disease management.[3, 4, 14] Some findings of home being effective intervention setting for individuals with multi-morbidity.[12]	Individuals with complex care needs benefit from disease management care models.[18]	**F:** A strong relationship between individual & provider[4, 9] (trust associated w/ lower costs).[18] **F:** Engaging individuals in design and implementation of care models impacts intervention effectiveness.[1, 5, 10, 15]
	Provide educational resources & skills development opportunities to individuals geared towards **self-management and behavior change.** [3–11]	Integration of group workshops into care plan (led by peer leaders).[10, 11] Conduct regular face-to-face individual-provider self-management meetings.[2, 10] Offer health education/ literacy classes.[2, 4, 5]		Tailor individual education to the specific disease(s) that they experience[5, 6] (i.e. have diabetes educators onsite, hold diabetes days).[2]	Combining self-care management interventions with pharmacotherapy education noted in high-need individual care.[9, 10]	

Table 2 – Work Force

Work Force						
Element	**Intervention Example**	**Intervention Features**	**Outcomes / Impact**	**Disease / Multi-Morbidity Specific**	**Complex Care Needs Specific**	**Barriers (B) & Facilitators (F)**
Capacity Building & Skill Development	Provide continuous support to health care providers through **education & skill development** (e.g. Inter-professional skills, communication, & teamwork). [4, 10, 16]	Adapt training to program specifications, professional role and individual population needs[10, 17] (e.g. Case / Care Manager,[4, 6, 10] Care Coordinator training[11])	*No findings*	As case/care management and self-management interventions are so commonly cited for multi-morbid populations the importance of training staff in these areas is very relevant.	Caregiver support has positive effects on individual quality of life and health care utilization.[9] Training case managers is important in the care of individuals with complex care needs.[18]	**F:** Training can increase confidence, openness, communication and collaboration while facilitating the alignment of values.[1]
	Self-management support	Provide training to health care providers in delivering self-management strategies.[4, 8]	*No findings*		*No findings*	**F:** Prerequisite to adjusting roles and introducing new models[1] and changing normative paradigms.[9] **F:** Continuous support / training common to highly integrated programs.[1]
	Devise and employ clinical guideline adherence & decision support **capacity building strategies** for staff.[2]	Problem based, interactive workshops.[2] Expert consultations.[2]	*No findings*	*No findings*	*No findings*	
Inter-Professional Team Approach	Integrate care into **multidisciplinary teams (MDTs).**	Greater effectiveness when implemented in combination with case management or individual education.[1] Nominate a team member as decision-making facilitator.[2] Ensure teams have varied professional expertise (e.g. mental health & social services).[3, 16] Emphasis placed on co-location of teams.[17] Use informal care givers[4] to help support individuals in home.	Generally superior outcomes with MDT than Integrated Care Pathways (ICP), especially as a complex intervention.[1] Broad range of improved system outcomes and individual outcomes.[1] Combination of MDTs & Care Managers decreases health care utilization in individuals with complex needs.[1]	Diabetes was the condition seen most frequently in the literature.[2] The incorporation of social services is especially relevant to individuals with complex needs.[11, 16, 17] A non-disease specific approach tends to promote greater collaboration within a team, better suited to individuals with multi-morbidity.[4]	Evidence that individuals with mental health issues benefit from multi-disciplinary care.[13, 18]	**F:** Present organizational changes as cultural not structural.[1] **F:** Align goals, vision & strategy.[1, 5] **F:** Staff co-location.[6, 10, 15, 17] **B:** MDTs dominated by physicians.[1] **B:** Insufficient support from managers.[1, 2, 5]

Table 2 - Work Force (continued)

Work Force						
Element	**Intervention Example**	**Intervention Features**	**Outcomes / Impact**	**Disease / Multi-Morbidity Specific**	**Complex Care Needs Specific**	**Barriers (B) & Facilitators (F)**
Workforce Stability	Ensure role clarity[1] and common values of multi-professionalism.[19]	Frequent face-to-face interaction amongst team.[6] Provide time and support to team when undergoing role realignment / adopting new models.[1]	Shared vision fosters collective identity[1] and stronger relationships[15] leading to greater collaboration.[1, 17]	*No findings*	*No findings*	**F:** Mutual understanding of unique roles within team.[1] **B:** Team and staff turnover.[2]
Leaders / Champions	Ensure that there is a leader, champion or point person in the team invested in inter-professional collaboration.[1, 15]	Enthusiastically committed to the vision and motivational.[1] Have additional training in change management.[1]	*No findings*	*No findings*	*No findings*	**F:** Leadership across varying levels of the organization.[6, 17] **B:** Personal agendas, status and control can have negative long-term impacts.[1]

Table 3 - Finance and Governance

Finance and Governance						
Element	**Intervention Example**	**Intervention Features**	**Outcomes / Impact**	**Disease / Multi-Morbidity Specific**	**Complex Care Needs Specific**	**Barriers (B) & Facilitators (F)**
Payment Models	Implementing value-based **payment models**	Adopt performance based penalties and rewards, bundled payments, and shared savings.[3] Break down service boundaries between individual providers.[1]	Incentivizes financial integration and integration of care.[1, 4, 5, 15] Bundled payments may reduce duplicative and unnecessary services.[18]	Tailor payment model to unique additional demands of multi-morbid care.[4]	Integrated care programs, especially for individuals with complex care needs often require a long period of sustained funding before realizing a return on investment.[8, 18]	**B:** Traditional payment models (i.e. fee-for-service) discourage cooperation,[1, 5, 9] promote utilization,[3] and inhibit flexibility.[13] **B:** Adjustments in organizational incentives depend on wider health system financing mechanisms.[5]

Table 4 - Organization and Systems

Organization and Systems

Element	Intervention Example	Intervention Features	Outcomes / Impact	Disease / Multi-Morbidity Specific	Complex Care Needs Specific	Barriers (B) & Facilitators (F)
Electronic Records	Use **computerized clinical records** (i.e. EMRs, historical claims data).[2, 6, 8]	To track care management.[2] Allow individuals online access[16] and means to contact their provider.[2]	IT interventions were cited to have generally positive impacts upon both professional and individual level outcomes in particular for individuals with diabetes and hypertension.[13]	Most recurrent information systems intervention for multi-morbid care.[6, 10]	*No findings*	**B:** Use of distinct record systems across organizations.[16]
	Employ **individual registries** to track care plans and progress.[2]	*No findings*		Risk stratification algorithms identify individuals with multi-morbidity, order them according to level of disease complexity.[3]	*No findings*	**B:** Current systems poorly designed for individuals with high-needs.[3,6]
Information Sharing	Establish information sharing **systems and/or processes**.[4]	Case conferences.[4]		Central to multi-morbid care.[4]	*No findings*	**B:** Establishing data sharing agreements.[1, 3]
Decision Support	Use computerized **recall and reminder** systems.[2, 13]	Incorporate flag alerts and chart audits into systems.[2]		Most recurrent Information Systems related intervention for multi-morbid care.[10]	Real time alerts when priority individuals visit the emergency department.[9]	*No findings*
	Development, integrate and use **clinical guidelines and other decision support tools**.[10]	Develop computerized decision support tools (algorithms and other tools to help decision making).[10]	Decision pathways promote care consistency.[1] Impact professional behavior, but have limited impact on individual-level measures of disease control.[13]	Multi-morbid practices frequently report relying on clinical guidelines and striving towards evidence-based practice.[9, 14] Algorithm use was primarily cited in multi-morbid care.[10]	Standardized discharge protocols are key for individuals with complex care needs.[3, 7, 8, 17]	**F:** Adoption of monitoring and evaluation procedures & metrics to ensure continuous quality improvement.[3–5, 10, 17] **B:** Deeply-rooted variances in health care delivery across a province or country.[16]