2010

An ethical justification for the Chronic Care Model (CCM)

Liviu Oprea
University of Adelaide

Annette J. Braunack-Mayer
University of Wollongong, abmayer@uow.edu.au

Wendy Rogers
Flinders University, wendy.rogers@scmp.mq.edu.au

Nigel P. Stocks
University of Adelaide

Publication Details

Oprea, L., Braunack-Mayer, A., Rogers, W. A. & Stocks, N. (2010). An ethical justification for the Chronic Care Model (CCM). Health Expectations, 13 (1), 55-64.

An ethical justification for the Chronic Care Model (CCM)

Abstract

Background: Chronic diseases are major causes of morbidity and mortality in developed countries. Their effects can be mitigated by high quality evidence-based care, but this is not the norm in most systems. The Chronic Care Model (CCM) is an evidence-based policy response to this practice gap, which uses multiple strategies to promote the quality of chronic care. **Objective:** To review CCM with an ethical lens. **Methods:** We reviewed the published empirical and non-empirical articles of CCM to analyse the ethical underpinnings of this model. **Results and conclusions:** We argue that its principal ethical value lies in the institutional cooperation it builds between the stakeholders involved in health care services. First, we briefly describe CCM and argue that the pathways through which it aims to improve patients' health outcomes are not made explicit. Second, we argue that the potential of CCM to be more beneficent, compared with traditional health care systems, depends on its capacity to promote mutual trust between health care providers and patients. There is no evidence to date that the implementation of CCM enhances mutual trust between health care professionals and patients. Third, we argue that CCM seeks to enhance human agency, allowing increased expression of individual autonomy and increased respect for individuals thereby expanding human freedom and avoiding social discrimination. However, we review the communication patterns that characterize the model of doctor-patient relationship promoted by this model and argue that these communication patterns raise ethical concerns that may prevent the model from reaching its expected outcomes.

Keywords

ethical, chronic, (ccm), justification, model, care

Disciplines

Education | Social and Behavioral Sciences

Publication Details

Oprea, L., Braunack-Mayer, A., Rogers, W. A. & Stocks, N. (2010). An ethical justification for the Chronic Care Model (CCM). Health Expectations, 13 (1), 55-64.

doi: 10.1111/j.1369-7625.2009.00581.x

Review Article

An ethical justification for the Chronic Care Model (CCM)

Liviu Oprea MD MA,* Annette Braunack-Mayer PhD,† Wendy A. Rogers BMBS PhD‡ and Nigel Stocks MBBS§

*Discipline of Public Health, The University of Adelaide, Adelaide, †Associate Professor in Ethics, Disciple of Public Health, The University of Adelaide, Adelaide, ‡Professor of Medical Ethics and Health Law, Department of Medical Education, School of Medicine, Flinders University, Adelaide and §Professor of General Practice, Discipline of General Practice, The University of Adelaide, Adelaide, Australia

Correspondence
Liviu Oprea, MD, MA
Discipline of Public Health
The University of Adelaide
9th Level, 10 Pulteney Street
Adelaide SA 5005
Australia
E-mail: liviu.oprea@adelaide.edu.au

Accepted for publication
21 September 2009

Keywords: chronic care model, doctor–patient communication, doctor–patient relationship, mutual trust, patient autonomy, social justice

Abstract

Background: Chronic diseases are major causes of morbidity and mortality in developed countries. Their effects can be mitigated by high quality evidence-based care, but this is not the norm in most systems. The Chronic Care Model (CCM) is an evidence-based policy response to this practice gap, which uses multiple strategies to promote the quality of chronic care.

Objective: To review CCM with an ethical lens.

Methods: We reviewed the published empirical and non-empirical articles of CCM to analyse the ethical underpinnings of this model.

Results and conclusions: We argue that its principal ethical value lies in the institutional cooperation it builds between the stakeholders involved in health care services. First, we briefly describe CCM and argue that the pathways through which it aims to improve patients' health outcomes are not made explicit. Second, we argue that the potential of CCM to be more beneficent, compared with traditional health care systems, depends on its capacity to promote mutual trust between health care providers and patients. There is no evidence to date that the implementation of CCM enhances mutual trust between health care professionals and patients. Third, we argue that CCM seeks to enhance human agency, allowing increased expression of individual autonomy and increased respect for individuals thereby expanding human freedom and avoiding social discrimination. However, we review the communication patterns that characterize the model of doctor–patient relationship promoted by this model and argue that these communication patterns raise ethical concerns that may prevent the model from reaching its expected outcomes.

Introduction

Chronic diseases are pervasive globally and their prevalence is increasing worldwide.[1] Heart disease, stroke, diabetes, depression and cancer are the major contributors. Individuals with chronic diseases have a poorer quality of life and decreased longevity. There is also an impact on their economic security directly through the costs of their medical care and indirectly because of reduced workdays and employment opportunities. Societies are directly affected through increasing health care costs and indirectly through a negative impact on economic development secondary to decreased productivity.[1–3]

Although technological developments regarding the prevention, diagnosis, monitoring and treatment of chronic diseases have been shown to be effective, actual health care services still lag behind these achievements.[1,4] Multiple studies have shown that evidence-based health care for chronic conditions is not the norm in most health care systems.[1,4,5] Multi-pronged strategies are required to reorganize the primary care practices for improving the quality of chronic care.

The Chronic Care Model (CCM) is an evidence-based policy response to this practice gap, which recommends a combination of multiple strategies to reform primary care practices to improve quality of care and health outcomes. The evidence about the effectiveness of the CCM is contradictory. Although most studies have shown that it can improve health outcomes for chronically ill patients, there are also studies that have different outcomes.[6] Despite this, the model has been implemented, partially or as a whole, in a large number of health care organizations in the USA, the UK, Sweden and some developing countries.[7–11] The World Health Organization (WHO) has recommended CCM for health care systems worldwide.[1,12]

The approaches advocated by CCM change the environment in which doctors and patients make health care decisions and, through this, can have an impact on the nature and quality of the doctor–patient relationship and on health care more broadly. Thus, the model might be expected to give rise to ethical interest. However, few papers have discussed the ethical issues raised by CCM and the papers that do have limited their analysis to just a few components.[13–16] Our intent in this paper is to review CCM using an ethical lens. We develop three arguments. First, we briefly describe CCM and the evidence of its effectiveness, and argue that the papers on CCM do not describe what is at the core of the productive interactions between health care professionals and patients through which it aims to improve health outcomes for chronically ill patients. Second, we argue that CCM's potential to promote beneficence depends on mutual trust between health care professionals in health care teams and between clinicians and patients at the level of care. There is no evidence to date that CCM achieves this. Third, we argue that CCM seeks to enhance human agency, allowing increased expression of individual autonomy and increased respect for individuals thereby expanding human freedom and avoiding social discrimination. However, we review the communication patterns that characterize the model of doctor–patient relationship promoted by this model and argue that they raise several ethical concerns that may prevent CCM from reaching its expected outcomes.

The Chronic Care Model

The CCM is an evidence-based policy response to the gap between significant scientific advances regarding the prevention, diagnosis, monitoring and treatment of chronic diseases and subsequent health outcomes for patients.[1,4] For instance, in the US, only half of the patients with hypertension, diabetes or depression reap the benefits of existing evidence-based treatments.[12,17] This evidence-practice gap has been attributed to failures of health care systems to organize care for chronic conditions, lack of tools to support evidence-based practice at the organizational level, health care professionals primarily trained to meet the needs of acute diseases, a failure to address prevention, lack of information systems and failures to connect health care systems with community resources.[1,4,18,19]

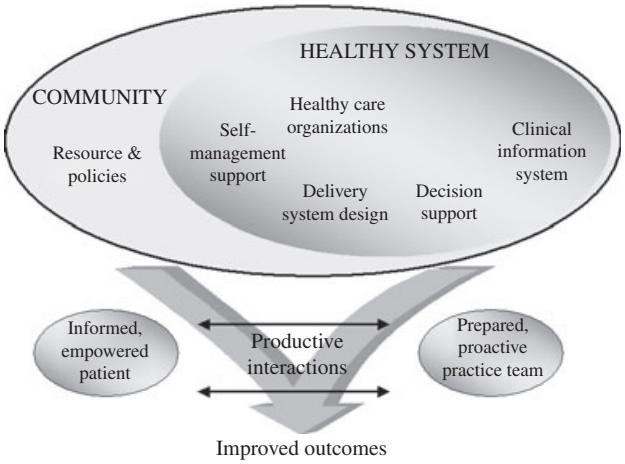

Figure 1 The Chronic Care Model[12] (Quality and Safety in Health Care).

The CCM has been developed to address these issues.[19,20] Proponents of the model have identified, by reviewing the evidence-based literature, the main critical factors necessary for success. These are:

1. The continuous relationships of patients with their care team;
2. Individualization of care according to patients' needs;
3. Care that anticipates patient needs; and
4. Services based on scientific evidence and cooperation amongst clinicians to improve the care of chronically ill patients.

They have proposed an ideal health care system where all these factors are taken into account (Fig. 1).[12] The CCM depicts health care systems as part of their communities and health care organizations as part of health care systems. At the core of this model are improved functional and clinical outcomes for patients' disease management resulting from productive interactions between informed, activated patients and prepared, proactive teams of healthcare professionals.[8,19,20] These productive interactions are deemed to result from the integrated implementation of the six components of this model. Figure 1 briefly describes these components. Health care organization and linkages with community resources and policies are the two top level components that support the next four – delivery system design, decision support, support for self-management, and clinical information systems – on which health care organizations should focus.[8,12,19,20]

Evidence of the effectiveness of CCM is not yet convincing. In the last decade, there have been a number of studies evaluating the effectiveness of the integrated implementation of the six components of this model.[21–23] These studies have assessed either the impact of the CCM on the quality of chronic care or on patients' health outcomes through measures such as improved blood pressure in hypertensive patients or HbA1c in diabetic patients. Although most studies have shown that CCM can improve health outcomes for chronically ill patients,[6] there are studies showing different outcomes.[22] Even the studies suggesting that CCM is effective have shown that, in CCM-led quality improvement efforts, there is considerable variation in the degree of health outcome improvement amongst participating organizations.[6] This variation has been attributed in part to the nature and extent of CCM implementation in different health care settings and in part to contextual factors characteristic of these organizations.[6] In addition, although the main expectation of CCM is that multidisciplinary care will improve the outcomes of chronic diseases compared with traditional specialty oriented care through better attention to co-morbidities for patients with complex medical

problems and reduced medical errors,[20,24,25] most evidence to date has come from studies focusing on patients with a single chronic disease.[6] Most evidence on the effectiveness of CCM has come from practices with health care teams highly motivated to improve the quality of care.[6,23] There is limited evidence that practice changes as a result of CCM implementation are sustainable over time or spread to other less motivated practices.[6]

The papers on CCM do not describe the nature of these productive interactions through which health outcomes for chronically ill patients are improved. This is a significant issue because CCM does not act directly on patients' health outcomes. Rather, it changes the environment in which doctors and patients make health care decisions. In addition, the evidence on CCM's capacity to develop these productive interactions is indirect. The studies on the effectiveness of CCM assess the quality of care or patients' health outcomes and, presumably, they assume that the implementation of CCM always results in these productive interactions. A description of these productive interactions and an analysis of their associated ethical issues may contribute to explaining the variations in effectiveness of this model in different environments. In the next section, we analyse the pathways through which CCM attempts to promote beneficence to identify what is at the core of these productive interactions and their related ethical issues.

The Chronic Care Model and beneficence

In this section, we argue that the descriptions of this model suggest that mutual trust between health care professionals and patients lies at the core of the productive interactions through which CCM aim at improving patients' health outcomes. The pathway to mutual trust is the redesign of primary care organizations to promote: (i) collaborative relationships at the level of health care teams, (ii) collaborative relations between patients and doctors at the level of care, and (iii) the implementation of information technologies. CCM does not explain the pathways through which mutual trust between individuals and professionals' responsibility for health care and patients' personal responsibility for their own health influence each other. However, we argue that CCM's approaches may be particularly beneficent for socially disadvantaged groups for whom there is the highest scope for health improvement at a community level.

The first means through which CCM seeks to promote beneficence is linked to the way it expands the scope of health care organizations to focus systematically on improvements in the health of the whole community served by a particular organization. The emphasis in CCM is on population level strategies that remove the barriers that currently stop people from accessing evidence-based care. There are three main ways in which CCM seeks to achieve this. First, CCM aims to remove the fragmentation of care that commonly occurs in primary care by reorganizing care to promote multidisciplinary cohesive and collaborative care.[26] The main expectation of CCM is that multidisciplinary care will improve the outcomes of chronic diseases compared with traditional specialty oriented care through better attention to co-morbidities, complex chronic conditions and reduced medical errors.[20,24,25] In CCM, specialty care is integrated with and coordinated by primary care and, in its ideal form, the care of people with chronic diseases is provided by a multidisciplinary team whose skills and competencies are utilized selectively depending on the varying needs of patients.[20,27] When this is not possible, specialist care is provided through external linkages.[8] Thus, CCM seeks to enhance the cohesion between medical practitioners from various specialties and strengthen professionals' capacities to provide evidence-based services.[20,27]

Second, CCM uses clinical information systems that function across whole health care organizations. Disease registries, for example, allow primary care doctors to identify all patients with abnormal pathology tests in the practice and to take pro-active measures to instigate appropriate treatment. Comprehensive electronic medical records prompt primary care doctors to perform specific screening tests, such

as eye or foot examinations.[28,29] Electronic previsit forms allow patients to describe their problems taking into account their specific circumstances[30] and give primary care doctors access to an extended informational base about the various personal, cultural, social and psychological needs of their patients. All of these technologies replace current models of care that are essentially reactive. CCM promotes health care professionals' abilities to focus on long-term prevention through a combination of patient and population-oriented approaches.[12,31,32]

Third, CCM seeks to promote a collaborative culture amongst health professionals. CCM attempts to change the clinical culture from one focused on fragmented care delivered by each medical speciality to collaborative care between professionals from multiple medical specialties.[33] This collaborative culture increases health care professionals' responsibilities. It attempts to expand professionals' responsibility to contribute to the goals of the whole health care organization, rather than just their own personal professional roles. In addition, it has been argued that all members of the team should have clear roles and tasks should be performed at the lowest appropriate level of professional level, allowing those with greater training or responsibility to perform the tasks for which they are uniquely equipped.[33,34] CCM aims at developing professionals' engagement with their new responsibilities through deliberative approaches in which professionals and staff jointly establish and agree on practice goals and measurable objectives, develop career paths within the organization, and learn skills in conflict resolution.[33] Within CCM culture, relations are based mainly on collaboration, feedback, addressing power asymmetries and mutual trust.

These interventions are as much technical as moral. Professionals' enhanced capacities to provide evidence-based care result from technical interventions that facilitate collaborative approaches and from interventions that aim to enhance mutual trust. Presumably mutual trust between professionals may enhance professionals' sense of responsibility, which in turn helps them to cope with their increased responsibilities. However, it is also reasonable to suggest a bidirectional influence between mutual trust and professionals' responsibility. For instance, an increased sense of responsibility amongst professionals in health care teams may enhance their mutual trust.[35] In CCM mutual trust between professionals promotes agreements with respect to professionals' responsibilities. Further research is required to understand the pathways through which mutual trust in health care teams and professional responsibility influence each other. This research may help to understand what relational interventions should be promoted in health care organizations to develop productive interactions between health care professionals.

In summary, then, the systematic whole-population approach of CCM – through the use of multi-disciplinary care teams, the implementation of clinical information systems, and the development of a collaborative culture amongst the health care workforce – may work to enhance beneficence as compared with traditional health care organizations. Further research is necessary to understand what relational interventions should be developed in health care teams to promote mutual trust and professionals' responsibility.

The second means that CCM uses to promote beneficence is through expanding patients' capacities to benefit from evidence-based care. The main expectation is that patients will assume an increased responsibility for their own health.[8] It seeks to do this in two main ways: through developing patients' psychological and cognitive abilities so that they can act as their own primary care givers;[7,36,37] and increasing their internal motivation to follow healthy behaviours.[7] CCM attempts to develop patients' self-efficacy – one's confidence that one can acquire the knowledge, skills and attitudes to achieve therapeutic goals.[37] In CCM patients learn problem solving skills and use action plans to address their own medical, social and emotional problems.[7,8,30]

It has also been argued that these new patient roles require partnerships between patients and doctors.[36] CCM changes the role of primary

care physicians from gate-keepers to coordinators of care to support patients' self-efficacy.[26] This new approach seeks to promote mutual trust in doctor–patient relationships. When primary care doctors act as gate keepers, this is often perceived in a negative way and associated with judging, meeting or denying patients' requests.[26] By contrast, when primary care physicians act as coordinators, they can help patients through complicated and potentially dangerous specialist care.[38] This change in doctor–patient interaction may help to promote mutual trust,[26,39] which has been shown to be associated with better health outcomes.[40]

However, in CCM the relation between mutual trust in the doctor–patient relationship and patients' personal responsibility for their own health is not clear. Presumably, CCM aims to promote personal responsibility by enhancing patients' self-efficacy, and promote mutual trust in doctor–patient relationships as a means of improving the health outcomes of chronically ill patients. Yet the focus on both self-efficacy and mutual trust between doctors and patients appears to be conceptually divergent. Self-management education programs emphasize the central responsibility of chronically ill patients for the management of their diseases,[36] whereas the focus on mutual trust may suggest a reliance of patients on doctors' health care decisions. In addition, it may also be possible that increasing patients' roles and responsibilities will decrease mutual trust in doctor–patient relationship. Further research is necessary to understand how self-efficacy and mutual trust interrelate and the pathways through which they may contribute to enhance personal responsibility.

There may be a further ethical justification for CCM that of targeting the needs of socially disadvantaged groups. Claims that CCM can mitigate the social gradient in health have been made.[41] Traditional health care systems tend to advantage those patients who already have better self-management skills, health literacy and increased self-efficacy. Socially disadvantaged groups tend to have poor health literacy, commonly associated with distrust in health care providers, lower self-management skills and decreased self-efficacy.[42,43] These groups also receive less preventive care and have a poorer quality of chronic care overall.[42] The approaches we have outlined above – with their emphasis on the systematic approaches that address whole population needs and the development of self-efficacy – are likely to have a higher impact on socially disadvantaged groups. Focusing care on people at social risk for ill-health may add significant health gains at a community level compared with traditional health care systems because the burden of chronic diseases falls disproportionately on these social groups.[1] Although there is some evidence that CCM can improve the health of chronically ill patients from socially marginalized groups,[21,41] further research is necessary to understand whether this improvement has an impact upon the social gradient in health. As the social determinants of health reside outside health care systems[44] and CCM interventions stop at the practice door, decreasing the social gradient in health is likely to require additional social interventions.

CCM and human agency

In this section, we argue that CCM seeks to promote human agency. CCM attempts to change the interaction between individuals from bargaining for power, which entails restricting each others' choices, to promoting collaborative relations that increase agency. This approach seeks to increase patients' control over their health and, through this, facilitate healthy behaviours and enhance autonomy. However, it is also true that the communication patterns that characterize the model of doctor–patient relationship promoted by CCM raise several ethical concerns that may prevent this model from reaching its expected outcomes.

CCM is built on the social cognitive theory of Bandura,[7] which holds that people do not live completely autonomously, as their lives are complex and interdependent and their choices depend on the context of their lives. People both produce and are produced by their environments.[45] Yet, our capacity for agency and the exercise of control over nature and our quality

of life is the essence of humanness.[45] A central part of human agency is the control of one's own thought processes, motivation, and action.[46] At the core of his theory Bandura places the psychological concept of perceived self-efficacy – personal confidence in reaching one's desired goals – which acts on motivational, cognitive, affective and decisional processes. Presumably, Bandura understands this psychological trait as shaping the scope and extent of people's free will. Thus, if perceived self-efficacy is high, people expand the range of opportunities and choices that they will consider, and face adversity better through emotional self-regulation, resilience and enhanced perseverance. By contrast, people with low self-efficacy have low resilience and perseverance in case of adversity and are more prone to depression or anxiety.[45,47]

The CCM uses this line of reasoning to promote human agency at collective and individual levels. It attempts to promote human agency at a collective level in two ways. First, CCM acts under the precautionary principle. That is, all its interventions that aim at enhancing patients' capacities to benefit from evidence-based care are addressed to all patients without exception.[48] For instance, it has been argued that a process of confirming patient comprehension should be the standard in clinical care, and embedded into practice as a basic universal precaution.

Second, CCM promotes collaborative relations between individuals. It seeks to reshape the environment of health care organizations to promote mutual trust and decreased power asymmetry.[26,49] Collaborative relations within health care teams support the agency of professionals by strengthening their capacity to provide evidence-based care. These relations, in turn, promote patients' agency through both individualized preventive and curative care and increased choice. Better educated patients with improved self-management skills enhance the clinical performance of health care professionals by strengthening their capacity to provide evidence-based care.

Porter has argued that an approach such as this focused on promoting shared value changes the interaction between individuals from bargaining for power to collaborative relations where individuals add value for each other because it benefits all parties and without creating losers.[25,50] However, several authors have argued that, given the significant investment of time and money necessary to develop these capacities, it is unlikely that doctors will try to develop them unless payment systems change to create incentives to promote quality of care.[51,52] Little is known about the kind of financial incentives that will promote both the clinical performance of health care organizations and equitable access to care for chronically ill patients.[53] Further research is necessary to understand the pathways through which trustworthy relations can be developed.

At an individual level these environmental changes attempt to strengthen patients' level of control over their health. They seek to facilitate a doctor–patient relationship consistent with the concept of enhanced autonomy,[54] which states that doctors should promote patients' health choices by making sure that these choices are well informed and the result of a self-reflective process rather than a reflection of factors outside the individual's control. Patients' choices in CCM may be more robust because patients have higher health literacy, increased trust in professionals, improved psychological abilities to cope with their medical conditions or many more opportunities to pursue their therapeutic intentions.

CCM is consistent with, and indeed moves beyond, the deliberative model of the doctor–patient relationship described by Emanuel *et al.*[55] It expands this model to include an assessment of patients' needs.[9] In this it differs substantially from the traditional model of patient compliance with doctors' recommendations.[7,9,32] In CCM patients define their own health goals and develop short-term self-management plans, periodically re-evaluated and changed accordingly to achieved outcomes.[7,56] Thus, decision-making takes a life course approach that facilitates the development of patients' internal motivation to follow healthy behaviours.

The model of the doctor–patient relationship used in CCM relies on four communication

patterns: information-giving; feedback; negotiation and contracting; and verbal persuasion.[7,8,57,58] These communication patterns raise a number of ethical concerns. First, the relationship between the communication patterns promoted by this model does not suggest mutual trust in doctor–patient relationship. Collaborative care aims to decrease power asymmetry between doctors and patients and develop patients' health literacy and self-efficacy, thereby supporting patients' internal motivation to follow healthy behaviours.[7] However, the emphasis on negotiation does not suggest that doctors trust that patients will develop the necessary internal motivation. In addition, persuasive communication patterns and contractual approaches suggest that the model attempts to produce behavioural changes by using the doctor–patient relationship to exert psychological pressure on patients. This may be perceived by patients as an external coercion threatening their internal motivation for health. These communication patterns appear conceptually divergent with CCM's goals to promote mutual trust in doctor–patient relationship and patient motivation. Further research is necessary to understand the effects of these persuasive and contractual approaches.

CCM does however provide a way to make sense of the ethical conflict between professional views of patients' best medical interests and patients' own judgments. CCM can support both beneficence and respect for persons, because it redefines patients' medical interests in terms of their broader life goals. To illustrate this, Bodenheimer *et al.* give the example of two brothers, both with hypertension and diabetes.[8] One of them has a happy life and comfortable income, and is concerned to preserve his long-term health as much as possible. He self-monitors his blood glucose and blood pressure to maintain them continuously within normal range and to prevent later complications. The second brother is divorced and has a disabled child with behavioural problems. His main concern is to care for his child. He is afraid of hypoglycaemic episodes that may interfere with his capacity to care for his child and is less concerned with kidney failure that may occur later in his life. These two men need different self-management plans. The proponents of CCM argue that we need to adjust therapeutic plans to patients' life goals and commitments because, without this adjustment, people will not develop the internal motivation and self-efficacy necessary to pursue those health goals. Further research is necessary to understand the pathways through which promoting patients' health choices can shape their internal motivation to follow healthy behaviours in the long run.

Conclusion

CCM is a model of health service provision that has received considerable attention, principally because it seems to be effective. In our view, CCM has the potential to be more ethically robust than ordinary care. It aspires to promote mutual trust between the main stakeholders in health care services through multiple systemic changes at the practice level. Mutual trust is at the core of medicine and there is evidence that it can improve the health outcomes for patients. However, before the large scale implementation of CCM there is a need for evidence that CCM can increase mutual trust.

In addition, there are a number of pertinent ethical issues revolving around beneficence and patient autonomy that need further clarification. These include the patterns through which mutual trust influences professionals' and patients' responsibility for health care, the role of CCM in promoting human agency, and the kinds of communication patterns likely to support this.

References

1 WHO. *Innovative Care for Chronic Conditions: Building Blocks for Action, Global Report*. Geneva: World Health Organization, 2002.

2 Colagiuri R, Colagiuri S, Yach D, Pramming S. The answer to diabetes prevention: science, surgery, service delivery, or social policy? *American Journal of Public Health*, 2006; **96:** 1562–1569.

3 Yach D. Globalization and health: exploring the opportunities and constraints for health arising from globalization. *Global Health*, 2005; **1:** 2.

4 IOM. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academy Press, 2001.
5 Schoen C, Osborn R, Huynh PT, Doty M, Peugh J, Zapert K. On the front lines of care: primary care doctors' office systems, experiences, and views in seven countries. *Health Affairs (Millwood)*, 2006; **25:** w555–w571.
6 Coleman K, Austin BT, Brach C, Wagner EH. Evidence on the chronic care model in the new millennium. *Health Affairs (Millwood)*, 2009; **28:** 75–85.
7 Bodenheimer T, Lorig K, Holman H, Grumbach K. Patient self-management of chronic disease in primary care. *JAMA: The Journal of the American Medical Association*, 2002; **288:** 2469–2475.
8 Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness. *JAMA: The Journal of the American Medical Association*, 2002; **288:** 1775–1779.
9 Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness: the chronic care model, Part 2. *JAMA: The Journal of the American Medical Association*, 2002; **288:** 1909–1914.
10 Holman H, Lorig K. Patients as partners in managing chronic disease. Partnership is a prerequisite for effective and efficient health care. *British Medical Journal*, 2000; **320:** 526–527.
11 Shoor S, Lorig KR. Self-care and the doctor–patient relationship. *Medical Care*, 2002; **40:** II40–II44.
12 Epping-Jordan JE, Pruitt SD, Bengoa R, Wagner EH. Improving the quality of health care for chronic conditions. *Quality & Safety in Health Care*, 2004; **13:** 299–305.
13 Tyreman S. The expert patient: outline of UK government paper. *Medicine, Health Care and Philosophy*, 2005; **8:** 149–151.
14 Tyreman S. An expert in what? The need to clarify meaning and expectations in ''The Expert Patient''. *Medicine, Health Care and Philosophy*, 2005; **8:** 153–157.
15 Wilson PM. A policy analysis of the expert patient in the United Kingdom: self-care as an expression of pastoral power? *Health & Social Care in the Community*, 2001; **9:** 134–142.
16 Wilson PM. Long-term conditions: making sense of the current policy agenda. *British Journal of Community Nursing*, 2005; **10:** 544–545. 8–52.
17 Bodenheimer T. Disease management – promises and pitfalls. *New England Journal of Medicine*, 1999; **340:** 1202–1205.
18 Meng YY, Leung KM, Berkbigler D, Halbert RJ, Legorreta AP. Compliance with US asthma management guidelines and specialty care: a regional variation or national concern? *Journal of Evaluation in Clinical Practice*, 1999; **5:** 213–221.
19 Wagner EH, Austin BT, Davis C, Hindmarsh M, Schaefer J, Bonomi A. Improving chronic illness care: translating evidence into action. *Health Affairs (Millwood)*, 2001; **20:** 64–78.
20 Wagner EH, Davis C, Schaefer J, Von Korff M, Austin B. A survey of leading chronic disease management programs: are they consistent with the literature? *Managed Care Quarterly*, 1999; **7:** 56–66.
21 Chin MH, Drum ML, Guillen M *et al*. Improving and sustaining diabetes care in community health centers with the health disparities collaboratives. *Medical Care*, 2007; **45:** 1135–1143.
22 Homer CJ, Forbes P, Horvitz L, Peterson LE, Wypij D, Heinrich P. Impact of a quality improvement program on care and outcomes for children with asthma. *Archives of Pediatrics & Adolescent Medicine*, 2005; **159:** 464–469.
23 Cretin S, Shortell SM, Keeler EB. An evaluation of collaborative interventions to improve chronic illness care. Framework and study design. *Evaluation Review*, 2004; **28:** 28–51.
24 Frist WH. Shattuck lecture: health care in the 21st century. *New England Journal of Medicine*, 2005; **352:** 267–272.
25 Porter ME, Teisberg EO. How physicians can change the future of health care. *JAMA: The Journal of the American Medical Association*, 2007; **297:** 1103–1111.
26 Bodenheimer T, Lo B, Casalino L. Primary care physicians should be coordinators, not gatekeepers. *JAMA: The Journal of the American Medical Association*, 1999; **281:** 2045–2049.
27 Wagner EH, Austin BT, Von Korff M. Improving outcomes in chronic illness. *Managed Care Quarterly*, 1996; **4:** 12–25.
28 Bodenheimer T. Interventions to improve chronic illness care: evaluating their effectiveness. *Disease Management*, 2003; **6:** 63–71.
29 Austin B, Wagner E, Hindmarsh M, Davis C. Elements of effective chronic care: a model for optimizing outcomes for the chronically ill. *Epilepsy & Behavior*, 2000; **1:** S15–S20.
30 Wellington M. Stanford health partners: rationale and early experiences in establishing physician group visits and chronic disease self-management workshops. *The Journal of Ambulatory Care Management*, 2001; **24:** 10–16.
31 Wagner EH, Groves T. Care for chronic diseases. *BMJ*, 2002; **325:** 913–914.
32 Von Korff M, Gruman J, Schaefer J, Curry SJ, Wagner EH. Collaborative management of chronic illness. *Annals of Internal Medicine*, 1997; **127:** 1097–1102.
33 Grumbach K, Bodenheimer T. Can health care teams improve primary care practice? *JAMA: The Journal of the American Medical Association*, 2004; **291:** 1246–1251.

34 Wagner EH. The role of patient care teams in chronic disease management. *British Medical Journal*, 2000; **320:** 569–572.
35 Cruess RL, Cruess SR. Expectations and obligations: professionalism and medicine's social contract with society. *Perspectives in Biology and Medicine*, 2008; **51:** 579–598.
36 Holman H, Lorig K. Patient self-management: a key to effectiveness and efficiency in care of chronic disease. *Public Health Report*, 2004; **119:** 239–243.
37 Lorig KR, Holman H. Self-management education: history, definition, outcomes, and mechanisms. *Annals of Behavioral Medicine*, 2003; **26:** 1–7.
38 Bodenheimer T. Coordinating care – a perilous journey through the health care system. *New England Journal of Medicine*, 2008; **358:** 1064–1071.
39 Rothman AA, Wagner EH. Chronic illness management: what is the role of primary care? *Annals of Internal Medicine*, 2003; **138:** 256–261.
40 Paasche-Orlow MK, Wolf MS. The causal pathways linking health literacy to health outcomes. *American Journal of Health Behavior*, 2007; **31:** S19–S26.
41 Franks P, Fiscella K. Reducing disparities downstream: prospects and challenges. *Journal of General Internal Medicine*, 2008; **23:** 672–677.
42 Fiscella K, Shin P. The inverse care law: implications for healthcare of vulnerable populations. *The Journal of Ambulatory Care Management*, 2005; **28:** 304–312.
43 Paasche-Orlow MK, Wolf MS. The causal pathways linking health literacy to health outcomes. *American Journal of Health Behavior*, 2007; **31** (Suppl. 1)**:** S19–S26.
44 Adler NE, Newman K, Ostrove JM. Socioeconomic disparities in health: pathways and policies. Socioeconomic status and health: what we know and what we don't. *Health Affairs (Millwood)*, 2002; **21:** 60–76.
45 Bandura A. Human agency in social cognitive theory. *American Psychologist*, 1989; **44:** 1175–1184.
46 Bandura A. Social cognitive theory: an agentic perspective. *Annual Review of Psychology*, 2001; **52:** 1–26.
47 Bandura A. Self-efficacy mechanism in human agency. *American Psychologist*, 1982; **37:** 122–147.
48 Paasche-Orlow MK, Schillinger D, Greene SM, Wagner EH. How health care systems can begin to address the challenge of limited literacy. *Journal of General Internal Medicine*, 2006; **21:** 884–887.
49 Wagner EH. Effective teamwork and quality of care. *Medical Care*, 2004; **42:** 1037–1039.
50 Porter ME, Teisberg EO. Redefining competition in health care. *Harvard Business Review*, 2004; **82:** 64–76. 136.
51 Casalino LP. Disease management and the organization of physician practice. *JAMA: The Journal of the American Medical Association*, 2005; **293:** 485–488.
52 Epstein AM, Lee TH, Hamel MB. Paying physicians for high-quality care. *New England Journal of Medicine*, 2004; **350:** 406–410.
53 Casalino LP, Elster A, Eisenberg A, Lewis E, Montgomery J, Ramos D. Will pay-for-performance and quality reporting affect health care disparities? *Health Affairs (Millwood)*, 2007; **26:** w405–w414.
54 Quill TE, Brody H. Physician recommendations and patient autonomy: finding a balance between physician power and patient choice. *Annals of Internal Medicine*, 1996; **125:** 763–769.
55 Emanuel EJ, Emanuel LL. Four models of the physician–patient relationship. *JAMA: The Journal of the American Medical Association*, 1992; **267:** 2221–2226.
56 Lorig K. Partnerships between expert patients and physicians. *Lancet*, 2002; **359:** 814–815.
57 Bodenheimer T. Helping patients improve their health-related behaviors: what system changes do we need? *Disease Management*, 2005; **8:** 319–330.
58 Bodenheimer T. A 63-year-old man with multiple cardiovascular risk factors and poor adherence to treatment plans. *JAMA: The Journal of the American Medical Association*, 2007; **298:** 2048–2055.