

Patient-Centered Medical Home: How It Affects Psychosocial Outcomes for Diabetes

Bonnie T. Jortberg · Benjamin F. Miller ·
Robert A. Gabbay · Kerri Sparling · W. Perry Dickinson

© Springer Science+Business Media, LLC 2012

Abstract Fragmentation of the current U.S. health care system and the increased prevalence of chronic diseases in the U.S. have led to the recognition that new models of care are needed. Chronic disease management, including diabetes, is often accompanied by a myriad of associated psychosocial issues that need to be addressed as part of a comprehensive treatment plan. Diabetes care should be aligned with comprehensive whole-person health care. The patient-centered medical home (PCMH) has emerged as a model for enhanced primary care that focuses on comprehensive integrated care. PCMH demonstration projects have shown improvements in quality of care, patient experience, care coordination, access to care, and quality measures for diabetes. Key PCMH transformative features associated with psychosocial issues related to diabetes reviewed in this

article include integration of mental and behavioral health, care management/coordination, payment reform, advanced access, and putting the patient at the center of health care. This article also reviews the evidence supporting comprehensive and integrated care for addressing psychosocial issues associated with diabetes in the medical home.

Keywords Patient-centered medical home · Diabetes · Psychosocial outcomes · Mental health · Behavioral health · Team approach · Care management · Care coordination · Payment reform

Introduction

The current health-care system in the U.S. is a morass of fragmented care and competing interests [1]. Health care is costly, and the increased recognition that the system cannot maintain its current cost trajectory has led to some of the most significant health-care legislation in U.S. history [2]. Additionally, the added cost being spent on health care is not translating into improved outcomes and enhanced quality [3]. At the center of health care is the patient, who is ultimately the one suffering from our disparate approaches to comprehensively treating the whole person [4].

With all our efforts to redesign health care, if we don't include the patient in the center, we fail. To that end, we have decided to begin this article with a patient's view. Following is an excerpt from patient advocate Kerri Sparling:

The first time I met my pediatric endocrinologist, it was a week after my type 1 diabetes diagnosis, and my mother was crying. My mom cried often at that point, overwhelmed by the challenge of learning how to care for her newly-minted diabetic daughter. I have a clear memory of the endocrinologist telling my mother,

B. T. Jortberg (✉) · B. F. Miller · W. P. Dickinson
Department of Family Medicine,
University of Colorado School of Medicine,
Mail Stop F496, AO1, 12631 E. 17th Ave., Room 3519,
Aurora, CO 80045-0508, USA
e-mail: bonnie.jortberg@ucdenver.edu

B. F. Miller
e-mail: Benjamin.miller@ucdenver.edu

W. P. Dickinson
e-mail: perry.dickinson@ucdenver.edu

R. A. Gabbay
Division of Endocrinology, Diabetes and Metabolism,
Penn State Institute for Diabetes, Obesity,
Pennsylvania State College of Medicine,
500 University Drive,
Hershey, PA 17036, USA
e-mail: rgabbay@psu.edu

K. Sparling
Patient Advocate,
716 Centre of New England Blvd,
Coventry, RI 02816, USA
e-mail: kerri@sixuntilme.com
URL: www.SixUntilMe.com

“She will be okay. It’s our job to make sure you’re both okay.”

As a patient with a chronic, and highly-demanding, disease, I understand that my overall diabetes health is directly impacted by not only my blood sugar tests and insulin doses, but also by my emotional health. Diabetes management requires a full medical team, not just an endocrinologist, and my health outcomes are best when the team acknowledges these emotional hurdles. This approach was most appreciated during my high-risk pregnancy, where I credit my outcome as a healthy mom to a healthy baby as much to my medical team as I do to my own hard work. Diabetes was familiar territory to me, but being pregnant was a completely new experience, and the emotional support from my medical team made more of a difference overall than any tweaks to my basal rates. Being cared for by a team that asked how I was feeling, and what I needed, and actually took my feedback into account when devising next-steps for my healthcare plan was crucial. Diabetes affects the whole person; when it comes to diabetes management, the whole person should be cared for.

The increased prevalence and cost of chronic disease in the U.S., including diabetes, bring attention to the need to address all aspects of an individual’s health [5]. And there are a myriad of often unaddressed associated psychosocial issues that need to be included as part of a comprehensive treatment plan. Diabetes care should be aligned with comprehensive whole-person health care that runs the range from psychosocial aspects of a patient’s life to mental health diagnoses [6, 7••]. For example, it is well established that there exists a bidirectional relationship between diabetes and depression [8, 9]; however, as with most health conditions that have a “mental health” component, we tend to treat the various parts rather than the whole. And our health-care system perpetuates this false dichotomy by having one system to take care of the depression, or the “mental,” and another system to take care of the diabetes, or the “physical” [10]. This has led some to conclude that any attempts to separate the mind from the body and mental health from physical health are essentially perpetuating inferior care at a higher cost [11, 12].

In response to these problems, models such as the patient-centered medical home (PCMH) have emerged to better integrate care in the largest platform of health-care delivery, primary care [13–15]. The PCMH, initially seen in the 1960s within pediatric practices [16], is a model of care that builds off seven joint principles agreed upon by four major medical societies [17]. In 2007, the American Academy of Family Physicians, the American Academy of Pediatrics, the American College of Physicians, and the

American Osteopathic Association developed joint principles to describe the PCMH [11]. Recommendations for diabetes care align well with the PCMH and the chronic care model, particularly for the importance of patient-centered care, self-management support, patient empowerment, and a team approach to care [18••].

This article will address a critically important topic in the diabetes community: psychosocial issues and the evidence supporting comprehensive and integrated care for diabetes. We will examine key elements of the PCMH and their impact on improving psychosocial outcomes for patients with diabetes. This article predominately addresses type 2 diabetes because of the increased prevalence of this chronic disease in our communities. The authors recognize that there are major differences between type 1 and type 2 diabetes, and psychosocial issues and interventions for individuals with diabetes must be tailored depending on the type. However, this article will use the word diabetes interchangeably for both type 1 and type 2, recognizing that, in some cases, the intervention may not be appropriate, depending on the diagnosis.

Key PCMH Features and Diabetes Psychosocial Outcomes

PCMH offers a platform for enhanced primary care for all patients, especially for those with chronic diseases such as diabetes. This platform includes integrated behavioral health, care managers to address high-risk individuals and those with psychosocial issues, increased access for high-risk or distressed patients, and reimbursement changes that free up practices to explore innovative models of care and expansion of their care team to address these psychosocial issues.

Although the PCMH is a recent model of care, several demonstration projects have been underway to examine the outcomes of implementation of the PCMH on patient care. Because of the high cost, gaps in quality of care, and existence of evidence-based guidelines [18••], several PCMH demonstration projects have targeted patients with diabetes. These studies have looked at a variety of practice settings, spanning privately insured patients, Medicaid, State Children’s Health Insurance Program (SCHIP), Medicare beneficiaries, and the uninsured [19]. Across diverse practice settings and patient populations, the PCMH model has demonstrated improvements in patient experience, care coordination, access to care, and diabetes quality measures [14, 20]. Additionally, this article will discuss the health outcome benefits of identifying, treating, and prioritizing patient distress.

Integration of Mental and Behavioral Health

It is well established that more mental health problems are seen in primary care than in any other healthcare setting

[21–23]. The redesign of primary care through the PCMH provides enhanced opportunities to better address mental health. These strategies for addressing mental health often include integrating mental health providers into primary care so that patients are seen collaboratively with primary care providers [24]. However, regardless of the strategies, the evidence is striking that the mind and body must be addressed simultaneously to positively impact health outcomes [25–28].

Psychosocial Defined It is impossible to talk about mental health, behavioral health, and substance use with the diabetes population without first discussing the importance of psychosocial issues. Primary care routinely sees patients who present with substantial psychosocial issues [29]. According to Merriam-Webster's, the definition of *psychosocial* is twofold: (1) It involves both psychological and social aspects; (2) it relates social conditions to mental health. There has been a robust literature on how psychosocial issues can be a barrier for patient self-management, as well as quality of life [30]. While data support the use of psychosocial interventions on patients with diabetes [6], addressing these issues in primary care can be time consuming [31, 32] and, possibly, overlooked.

Diabetes often presents with multiple psychosocial issues [33]; these issues impact not only the patient, but also the patient's family [34]. Unaddressed psychosocial needs can worsen, leading to possible medical complications and, in some cases, mental health diagnosis. Having comprehensive health-care services in primary care that include both psychosocial and mental health allows for all aspects of the individuals to be addressed in one setting.

Consider the following example. A patient is given a new diagnosis of type 2 diabetes. With this diagnosis comes a host of “do's” and “don'ts.” On top of these new multiple behavior changes, the patient is confronted with the emotional adjustment of being given a diagnosis of a chronic disease. All of these issues at the same time can be overwhelming and, if not addressed, may lead to the patient appearing to be “noncompliant.” In situations like these, the better the collaborative relationship between the provider and the patient, the higher the likelihood of improving patient adherence to often complicated treatment recommendations [35].

Care Management/Coordination for High-Risk Patients

Optimal care for patients with diabetes involves coordinating multiple treatment regimens and assistance with self-management support and lifestyle changes. A designated care manager, provided either externally or within a practice, can effectively manage patients with complex care needs, which has been shown to improve health outcomes [20]. Care

managers have the capability to address many of the psychosocial aspects of diabetes care that physicians and other providers within the practice cannot within a 15- to 20-min appointment. Care managers conduct proactive outreach to patients, coordinate care across the health-care system, provide between-visit follow-up for self-management support, and manage patient registries and quality measures reporting.

Several PCMH demonstration projects specifically integrated care managers into primary care. The Community Care of North Carolina (CCNC) PCMH project [36] integrated external care managers into their practice to manage high-risk patients, including those with diabetes. The CCNC case managers worked collaboratively with each CCNC practice to manage their high-risk patient panel, and the results for patients with diabetes showed that CCNC patients exceeded National Committee for Quality Assurance benchmarks in most areas.

The John Hopkins guided care (GC) model [37] targeted older patients with several chronic health conditions, including diabetes, providing care management through a practice-based team. The team provided eight clinical services that were coordinated by the GC nurse (GCN), and a randomized clinical trial of eight community-based primary care practices found for all GC patients, as compared with the usual care group, 24 % fewer hospital days, 15 % fewer emergency department visits, and 29 % fewer home health-care episodes, as well as 9 % more specialist visits. This study estimated an annual net Medicare savings of \$75,000 per GCN deployed in a practice [38].

The Veterans Health Administration Veterans Integrated Service Network 23 (VISN 23) targeted veterans at highest risk for acute hospitalization related to chronic disease and assigned these patients to a chronic disease care manager and telehealth home monitoring [19]. After 1 year, 22.3 % of patients with diabetes in this group were achieving therapeutic goals for HgbA1C, LDL, and blood pressure, as compared with 10.4 % in the usual care group.

BlueCross BlueShield of North Dakota-MeritCare Health System initiated a PCMH model for patients with diabetes [39], replacing an external disease management program with a primary care-oriented program that included a nurse care manager within the practice. Results found that diabetes quality measures for the intervention group improved by 18 %.

The Pennsylvania Chronic Care Initiative [38] targeted patients with type 2 diabetes or pediatric asthma. Care coordination targeting high-risk patients and facilitated by care managers was part of the transformation of approximately 100 practices into PCMHs. Preliminary diabetes results from the first year for approximately 10,000 patients showed significant improvements in HgbA1C, blood pressure control, LDL cholesterol, complication screening, appropriate medication use, and the percentage of patients

establishing self-management goals (from 20 % at baseline to nearly 70 %; $p < .01$) [18••].

The Geisinger Health System, an integrated delivery system in central and northeastern Pennsylvania, launched a PCMH initiative that utilized additional nursing staff in primary care offices to coordinate care and to interact directly with patients [40]. Results showed improvements in the nine diabetes evidence-based quality indicators [41] and reductions in inpatient admissions and total medical costs [40].

Team Approach to Care

The PCMH is grounded in the concept of health care that is delivered by a team of professionals committed to evidence-based medicine and quality improvement. This model works well for patients with diabetes, since they face many challenges for effectively managing their disease. Diabetes care involves active participation by the patient and the various members of the physician's office to achieve desired outcomes, thus creating a "participatory village" [42]. Incorporating lifestyle adjustments into diet, physical activity, and medication regimens is impacted by the patient's culture, belief system, values, socioeconomic status, family conditions, religion, psychosocial status, and well-being [36]. These factors need to be taken into account by the health-care team when working collaboratively with the patient to develop a care plan. For example, recent systematic reviews and reports from the Agency for Healthcare Research and Quality (AHRQ) have shown the positive impact of integrating team members such as mental health providers into primary care for a variety of disease conditions, including depression and diabetes [27, 43]. Other authors have taken these conclusions and recommended that team-based care in a PCMH should include mental health providers [44]. However, most PCMH pilot projects have not done this to date.

Emerging research has highlighted the importance of disease-related distress in determining outcomes for patients with a chronic disease, particularly diabetes [45, 46]. One tool that has been developed to assist clinicians and patients in determining the impact of their diabetes on their emotional distress is the Diabetes Distress Scale [47]. This instrument serves as an assessment of a patient's perceived diabetes distress and is a valuable tool for clinical teams to use in focusing the provision of support and resources for the patient. Identifying issues such as stress and distress allows a multidisciplinary team to move into action and assist the patient with all facets of his or her health.

Several PCMH demonstration projects and diabetes studies have demonstrated the benefit of implementing a team approach to care. Shojania et al. [48] assessed the impact of several strategies for improving care for adults with type 2 diabetes on glycemic control. Two strategies, team changes

and the use of case management, resulted in the most robust improvements in glycemic control [48].

Group Health's PCMH prototype clinics tested the impact of implementation of a team approach to care over a 2-year period [49]. To test this model, Group Health increased standard in-person visit times from 20 to 30 min and allotted time each day for teams to plan and coordinate care. This included establishing care teams, previsit, outreach and follow-up activities led by medical assistants and licensed practical nurses, adoption of standard management practices, including use of "team huddles," and encouragement of care activities outside in-person visits [49]. Adoption of this model of care resulted in improvements in patients' experiences, quality, cost, and clinician burnout.

Tapp et al. [44] studied a team approach that focused on patients with poorly controlled diabetes ($A1c > 9$). The team consisted of resident and faculty physicians, a pharmacist, a social worker, nurses, behavioral medicine interns, an office scheduler, and an information technologist (IT). The physicians provided overall management; the behavioral medicine interns assessed depression, determined medication needs, and assisted patients in self-management support goal setting; pharmacists provided education sessions on diabetes self-care; the social workers offered assistance with medication access, transportation issues, food referrals, and cost-of-living subsidies; IT support assisted with population management reports; and office schedulers used diabetes reports to identify and contact patients who had not had a visit for diabetes in more than 6 months. This team approach resulted in the practice receiving recognition from the National Committee of Quality Assurance both for the Diabetes Prevention Program and as a Level III PCMH. It should be noted that residency programs have access to behavioral health specialists and pharmacists and that this may not be representative of resources available to most private practices.

The VA VISN 23 piloted a PCMH project in a rural-based primary care outpatient clinic [14]. The focus of this project was to implement practice redesign to include team-based care, continuous practice improvement, and performance goals. Twelve-month results showed that diabetes patients in the PACT clinic had improvements for HgbA1C, blood pressure control, and lipid control, as compared with control patients.

The team approach to meeting the patient's health care needs includes building "medical neighborhoods," which are made up of a broad range of health and health care resources [50]. The medical neighborhood includes relationships with area hospitals, nursing homes, specialists, other health care professionals, and community agencies, all partnering to seamlessly provide well-coordinated care based on a shared personalized care plan. The medical neighborhood concept, while not yet well-studied independently of other

PCMH components, is a central part of the more extended accountable care models for decreasing health care costs while improving quality of care and patient experience [51].

Payment Reform

Although restructuring the current payment system does not have a direct effect on psychosocial outcomes, it has an impact regarding how clinical care is delivered. The current fee-for-service payment structure for episodic care does not support the practice redesign needed to adequately provide care for those with chronic diseases, nor does it support team-based care delivery. For example, current billing and regulatory issues make it challenging for mental health, behavioral health, and substance abuse providers to be integrated into primary care [52, 53].

As such, a key component of the PCMH is payment for medical services that appropriately recognizes added value to patients who receive their care at a PCMH [11]. The Joint Principles of the PCMH recommends payment structure with features that include (1) the value of physician and staff care management outside of the face-to-face visit, (2) payment for services for care coordination within a practice and between consultants, (3) payment that supports adoption and use of health information technology for quality improvement and better communication and integration of care, (4) payment for services for enhanced and asynchronous communication, (5) separate fee-for-service payments for face-to-face visits, and (6) a payment structure that recognizes case mix differences in patient populations in a practice [11].

Payment restructuring is needed to fully transform a practice into a PCMH, since resources are needed to develop systems of care that are beyond the current fee-for-service model. A shift away from episodic care to bundled payments, shared savings, and other payment models allows practices to move from volume-based practice. This shift provides the ability to “invest” in staff to assist patients in dealing with psychosocial issues and allows more flexibility to reward team-based care and to hire staff with mental and behavioral health expertise.

Several PCMH demonstration projects have implemented payment reform through a per member per month (PMPM) fee or salary-based pay for physicians [49, 54, 55]. The PMPM fee has allowed practices to hire care managers to conduct proactive outreach for care and to implement “planned visits,” where patients can be seen by each member of the health-care team; to conduct follow-up with patients asynchronously through phone or secure patient portal e-mail; and to develop and maintain patient registries and report out quality measures. In the Community Care of North Carolina PCMH model, each participating practice received an added \$2.50

PMPM fee, which resulted in better diabetes quality measures (improved by 15 %) [55]. The Geisinger Health System also recognized the need for financial incentives to encourage their physicians and staff to support the transition to their PCMH initiative [56]. In addition to the fee-for-service payment, the Geisinger health plan offers practice-based payments to participating physicians, and the practice receives a monthly stipend to help finance additional staff, support extended hours, and implement practice infrastructure changes. Multipayer initiatives in a number of states have involved PMPM payments or other infrastructure payments to practices in order to incentivize transformation to a PCMH that provides more coordinated care [19]. The PMPM fee structure has been so successful in improving patient outcomes that it is being implemented as a key feature in the Centers for Medicare and Medicaid Services Innovation Center Comprehensive Primary Care Initiative.

More direct pay-for-performance (P4P) has also been shown to improve behavioral health outcomes. Unutzer et al. [57] evaluated a quality improvement program with a P4P incentive for safety-net patients in community health clinics. After implementation of P4P in a population with high levels of depression, other psychiatric and substance abuse problems, and social adversity, participants were more likely to receive timely follow-up, and time to depression improvement was significantly reduced.

Data regarding the impact of the PCMH elements and payment model are slowly emerging from multiple demonstration projects [58]. Existing studies provide some evidence of decreased hospitalizations and emergency room visits, but data are limited regarding the impact on total costs. Definitive results regarding the economic feasibility and impact on costs should emerge over the next few years with the maturation and completion of ongoing demonstration projects.

Advanced Access to Care

Primary care practices have a difficult time accessing outpatient mental health for their patients [59]. When patients are diagnosed with diabetes or any chronic disease, they often need counseling for the emotional issues associated with that diagnosis. Rather than having to wait for a referral to a mental health provider, which can often take weeks, what happens if primary care has immediate access to a mental health provider onsite? For patients with diabetes, advanced access to mental health providers can help the patient cope with the adjustment, and the mental health provider can work with the patient on health behaviors that may help manage the diabetes at the time when the patient needs it most.

Gaps

Although the PCMH model of patient care is a vehicle for delivering optimal diabetes care, gaps still exist. PCMH outcomes have focused on quantitative measures for diabetes quality measures (H_gA_{1c}, blood pressure, lipids), and not on specific psychosocial or patient-centered diabetes outcomes. The Patient Protection and Affordable Care Act of 2010 and the Health Information Technology for Economic and Clinical Health provisions of the American Recovery and Reinvestment Act of 2009 [60] encourage the use of electronic health records, and the Patient-Centered Outcomes Research Institute (PCORI) has made a big investment in supporting this kind of research. Emerging health information technology has the ability to capture electronic patient data and could revolutionize patient care by supplying tools to better personalize care and manage patient populations [61•]. However, attention needs to be given to recording other important determinants of behavioral and psychosocial outcomes as part of the electronic health record. Glasgow et al. [61•] proposed that a standardized set of behavioral and psychosocial items should be included in the electronic health record, including these four categories: (1) health behavior, (2) psychological and emotional issues, (3) patient characteristics, and (4) patients' preferences and goals. These measures align with Department of Health and Human Services "foundation health measures" for 2020 [62] and with the recommendations from the Institute of Medicine, the U.S. Preventive Services Task Force, and the Guide to Community Preventive Services to make assessment and treatment of behavioral and psychosocial issues a high priority. There is a strong link between health outcomes and measures of health and psychosocial behavior and quality of life [61•]. Yet gaps still exist on how best to integrate behavioral health expertise into primary care. Standardized collection of behavioral and psychosocial information has the potential to

provide invaluable information for providers, researchers, and patients on "best practices" for optimizing behavioral strategies and interventions.

Conclusions: Implications for Daily Practice

Table 1 summarizes the evidence for PCMH implementation and psychosocial outcomes. This article began with putting the patient at the center of care and will end with the patient experience in a PCMH.

Imagine the patient experience in the PCMH model:

Mrs. Jones receives a phone call from the practice's care manager, who has been monitoring the diabetes registry, noted that she was due for a quarterly visit, and scheduled a planned visit with her care team. Mrs. Jones has her lab work completed prior to the visit, and her team has huddled at the start of the day to discuss her needs for the visit, including depression screening and the potential need for mental health services. The nursing staff, care manager, and provider work seamlessly to see her and provide any appropriate referrals. In response to questioning, Mrs. Jones identifies a lack of family support for needed diet and exercise changes and distress over current financial strains as having caused difficulty for her in managing her diabetes. A personalized care plan is negotiated with the patient by the care manager to assist with these issues, with a plan to involve the psychologist for counseling if things do not improve by the next visit. The care manager follows up with her several days after the visit to discuss her self-management goals, changes in treatment regimen, and her mental health needs.

Changing health care to better accommodate the comprehensive needs of patients, their families, and our

Table 1 Summary of PCMH implementation and psychosocial outcomes

Implementation of PCMH Component	Psychosocial Outcomes	Reference
Integration of mental and behavioral health	Depression identification and management; patient activation; patient SMS*	[26–30]
Care management/coordination	Improved patient SMS*, patient satisfaction; improved coordination of care across health care system	[21, 22, 37–43, 45, 46]
Team approach to care	Improved patient experience, improved quality of care, improved integration of mental and behavioral health	[33, 44, 49–51]
Payment reform	Facilitates practice's ability to provide care management and proactive outreach for care resulting in improved quality measure outcomes	[44, 49–53, 54••, 55–58]
Access to care	Enables patients to receive timely care including mental and behavioral health	[59]

*SMS self-management support

communities experiencing diabetes requires addressing three worlds of healthcare simultaneously: clinical, operation, and financial [62]. Transforming primary care into a PCMH model, including integration of mental and behavioral health, care management, team-based care, payment reform, and advanced access, has been shown to improve quality indicators for patients with diabetes; and putting the patient at the center of care should be considered the most important aspect of redesign.

Disclosure Conflicts of interest: B. T. Jortberg, none; B. F. Miller, none; R. A. Gabbay, none. K. Sparling: has been a consultant for Animas Corporation and Lifespan Corporation; has received honoraria (contracted speaker) and consulting fees (TV commercial) from Animas Corporation; has received payment for development of educational presentations, including service on speakers' bureaus from the Juvenile Diabetes Research Foundation; has received travel/accommodations expenses covered or reimbursed from Animas Corporation and Juvenile Diabetes Research Foundation; is a columnist for Web page for dLIFE, diatribe, Juvenile Diabetes Research Foundation, and Animas Corporation (columnist for Web page and videos); has been a consultant in documentary for Novo Nordisk; has contract writing for WEGOHealth and CVS; has speaking engagements for Johnson & Johnson; and has been a consultant for Roche. W. P. Dickinson has received grant support from NIDDK.

References

Papers of particular interest, published recently, have been highlighted as:

- Of importance
- Of major importance

1. Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington, DC: National Academy Press; 2001.
2. Goodson JD. Patient protection and affordable care act: promise and peril for primary care. *Ann Intern Med.* 2010;152(11):742-4.
3. Starfield B, Shi L, Mackino J. Contributions of primary care to health systems and health. *Milbank Q.* 2005;83:457-502.
4. Miller BF, Patel KK. Putting patients at the centre of health care in the US. *Br J Gen Pract.* 2011;61:471.
5. Moussavi S, Chatterji S, Verdes E, Tandon A, Patel V, Ustun B. Depression, chronic disease, and decrements in health: results from the world health surveys. *Lancet.* 2007;370:851-8.
6. Delamater A, Jacobson A, Anderson B, et al. Psychosocial therapies in diabetes: report of the psychosocial therapies working group. *Diabetes Care.* 2001;24:1286-92.
7. •• Ciechanowski P, Russo J, Katon WJ, et al. Relationship styles and mortality in patients with diabetes. *Diabetes Care.* 2010;33(3):539-44. *Relationship styles play a profound role in health outcomes. In a sample of 3,535 patients, researchers found that a lower propensity to reach out to others for support is associated with higher mortality over a 5 year period. The authors' conclude that relationship style is an important variable in examining mortality and outcomes, and future studies should look at interventions based upon different relational styles.*
8. Gonder-Frederick LA, Cox DJ, Ritterband LM. Diabetes and behavioral medicine: the second decade. *J Consult Clin Psychol.* 2002;70:611-25.
9. Golden SH, Lazo M, Carnethon M, et al. Examining a bidirectional association between depressive symptoms and diabetes. *JAMA.* 2008;299:2751-9.
10. Institute of Medicine. Committee on crossing the quality chasm: adaptation to mental health and addictive disorders. Natl Acad Sci. Washington, DC: National Academies Press, US; 2006.
11. Petterson S, Phillips B, Bazemore A, Dadoo M, Zhang X, Green LA. Why there must be room for mental health in the medical home. *Am Fam Physician.* 2008;77(6):757.
12. deGruy F. Mental health care in the primary care setting. In: Donaldson MS, Yordy KD, Lohr KN, Vanselow NA, editors. *Primary care: America's health in a new era.* Washington, DC: Institute of Medicine; 1996.
13. Green CA, Perrin NA, Polen MR, Leo MC, Hibbard JH, Tusler M. Development of the patient activation measure for mental health. *Adm Policy Ment Health.* 2010;37(4):327-33.
14. Tsai AC, Morton SC, Mangione CM, Keeler EB. A meta-analysis of interventions to improve care for chronic illnesses. *Am J Manag Care.* 2005;11:478-88.
15. Coleman K, Austin BT, Brach C, Wagner EH. Evidence on the chronic care model in the new millennium. *Health Aff (Millwood).* 2009;28(1):75-85.
16. Sia C, Tonniges TF, Osterhus E, Taba S. History of the medical home concept. *Pediatrics.* 2004;113(5 Suppl):1473-8.
17. American Academy of Family Physicians (AAFP), American Academy of Pediatrics (AAP), American College of Physicians (ACP), American Osteopathic Association (AOA). Joint principles of the patient-centered medical home. 2007; <http://www.medicalhomeinfo.org/Joint%20Statement.pdf> Accessed August 13, 2009.
18. •• Bojadziewski T, Gabbay RA. Patient-centered medical home and diabetes. *Diabetes Care.* 2011;34(4):1047-53. *This review paper discusses the outcomes of several PCMH demonstration projects and their effects on diabetes outcomes.*
19. Grumbach K, Bodenheimer T, Grundy P. The outcomes of implementing patient-centered medical home interventions: a review of the evidence on quality, access and costs from recent prospective evaluation studies. Washington, DC: Patient-Centered Primary Care Collaborative; 2012. <http://www.pcpcc.net/resources>. Accessed 8 June 2012.
20. Office of the Congressional Budget. An analysis of the literature on disease management programs. Washington, CBO; 2004.
21. Kessler RC, Demler O, Frank RG, et al. Prevalence and treatment of mental disorders, 1990 to 2003. *N Engl J Med.* 2005;352(24):2515-23.
22. Regier DA, Narrow WE, Rac DS, Manderscheid RW, Locke B, Goodwin F. The de facto US mental health and addictive disorders service system: epidemiologic catchment area prospective. *Arch Gen Psychiatry.* 1993;50:85-94.
23. Wang PS, Lane M, Olfson M, Pincus HA, Wells KB, Kessler RC. Twelve-month use of mental health services in the United States: results from the national comorbidity survey replication. *Arch Gen Psychiatry.* 2005;62(6):629-40.
24. Collins C, Hewson DL, Munger R, Wade T. Evolving models of behavioral health integration in primary care. 2010.
25. Dickinson WP, Miller BF. Comprehensiveness and continuity of care and the inseparability of mental and behavioral health from the patient-centered medical home. *Fam Syst Health.* 2010;28(4):348-55.
26. Blount A. Integrated primary care: organizing the evidence. *Fam Syst Health.* 2003;21(2):121-33.
27. Butler M, Kane RL, McAlpin D, et al. Integration of mental health/substance abuse and primary care no. 173 (Prepared by the Minnesota evidence-based practice center under contract no. 290-02-0009.) AHRQ publication No. 09-E003. Rockville: Agency for Healthcare Research and Quality; 2008.
28. Craven M, Bland R. Better practices in collaborative mental health care: an analysis of the evidence base. *Can J Psychiatr.* 2006;51(6 Suppl 1):7s-72s.

29. Fries JF, Koop CE, Beadle CE, et al. Reducing health care costs by reducing the need and demand for medical services. *N Engl J Med*. 1993;329(5):321–5.
30. Glasgow R, Toobert D, Gillette C. Psychosocial barriers to self-management and quality of life. *Diabetes Spectrum*. 2001;14:33–41.
31. Yarnall KSH, Pollak KI, Ostbye T, Krause KM, Michener JL. Primary care: is there enough time for prevention? *Am J Public Health*. 2003;93(4):635–41.
32. Miller BF, Teevan B, Phillips RL, Petterson SM, Bazemore AW. The importance of time in treating mental health in primary care. *Fam Syst Health*. 2011;29(2):144–5.
33. Lustman P, Gavard JA. Psychosocial aspects of diabetes in adult populations. Washington, DC: United States Public Health Service, National Institute of Diabetes and Digestive and Kidney Diseases; 1995.
34. Lowes L, Gregory JW, Lyne P. Newly diagnosed childhood diabetes: a psychosocial transition for parents? *J Adv Nurs*. 2005;50(3):253–61.
35. Delamater AM. Improving patient adherence. *Clin Diabetes*. 2006;24(2):71–7.
36. Steiner BD, Denham AC, Ashkin E, Newton WP, Wroth T, Dobson Jr LA. Community care of North Carolina: improving care through community health networks. *Ann Fam Med*. 2008;6(4):361–7.
37. Leff B, Reider L, Frick KD, et al. Guided care and the cost of complex healthcare: a preliminary report. *Am J Manag Care*. 2009;15(8):555–9.
38. Pennsylvania Chronic Care Initiative. www.pccpc.net/content/pennsylvania-chronic-care-initiative. Accessed July 9, 2012.
39. McCarthy D NR, Mika S, Wrenn J, Wakefield M. The North Dakota experience: achieving high-performance health care through rural innovation and cooperation. *The Commonwealth Fund*. 2008.
40. Paulus RA, Davis K, Steele GD. Continuous innovation in health care: implications of the Geisinger experience. *Health Aff (Millwood)*. 2008;27(5):1235–45.
41. Weber V, Bloom F, Pierdon S, Wood C. Employing the electronic health record to improve diabetes care: a multifaceted intervention in an integrated delivery system. *J Gen Intern Med*. 2008;23(4):379–82.
42. Shahady EJ. Creating a participatory office practice for diabetes care. *J Participat Med*. 2011;4(3):e18.
43. Miller BF, Kessler R, Peek CJ, Kallenberg GA. A national research agenda for research in collaborative care: papers from the collaborative care research network research development conference. *AHRQ Publication No. 11-0067*. 2011. <http://www.ahrq.gov/research/collaborativecare/>.
44. Tapp H, Phillips SE, Waxman D, Alexander M, Brown R, Hall M. Multidisciplinary team approach to improved chronic care management for diabetic patients in an urban safety net ambulatory care clinic. *J Am Board Family Med: JABFM*. 2012;25(2):245–6.
45. Fisher L, Skaff MM, Mullan JT, Arean P, Glasgow R, Masharani U. A longitudinal study of affective and anxiety disorders, depressive affect and diabetes distress in adults with type 2 diabetes. *Diabet Med: J British Diabet Assoc*. 2008;25(9):1096–101.
46. Fisher L, Skaff MM, Mullan JT, et al. Clinical depression versus distress among patients with type 2 diabetes: not just a question of semantics. *Diabetes Care*. 2007;30(3):542–8.
47. Polonsky WH, Fisher L, Earles J, et al. Assessing psychosocial distress in diabetes: development of the diabetes distress scale. *Diabetes Care*. 2005;28(3):626–31.
48. Shojanian KG, Ranji SR, McDonald KM, et al. Effects of quality improvement strategies for type 2 diabetes on glycemic control: a meta-regression analysis. *JAMA: J Am Med Assoc*. 2006;296(4):427–40.
49. Reid RJ, Coleman K, Johnson EA, et al. The group health medical home at year two: cost savings, higher patient satisfaction, and less burnout for providers. *Health Aff (Millwood)*. 2010;29(5):835–43.
50. Nutting PA, Crabtree BF, Miller WL, Stange KC, Stewart E, Jaen C. Transforming physician practices to patient-centered medical homes: lessons from the national demonstration project. *Health Aff (Millwood)*. 2011;30(3):439–45.
51. McClellan M, McKethan AN, Lewis JL, Roski J, Fisher ES. A national strategy to put accountable care into practice. *Health Aff (Millwood)*. 2010;29(5):982–90.
52. Kathol RG, Butler M, McAlpine DD, Kane RL. Barriers to physical and mental condition integrated service delivery. *Psychosom Med*. 2010;72(6):511–8.
53. Mauch D, Kautz C, Smith SA. Reimbursement of mental health services in primary care settings. Rockville, MD: Center for Mental Health Services, Substance Abuse and Mental Health Services Administration; 2008. HHS Pub. No. SMA-08-4324.
54. •• Crabtree BF, Nutting PA, Miller WL, Stange KC, Stewart EE, Jaen CR. Summary of the national demonstration project and recommendations for the patient-centered medical home. *Ann Fam Med*. 2010;8 Suppl 1:S80–90. S92. *This paper describes the major outcomes of the PCMH National Demonstration Project, a national randomized test of implementation of a specific PCMH model or self-direction into 36 family practices. The paper also makes recommendations for translation of the results into primary care practice.*
55. Reid RJ, Fishman PA, Yu O, et al. Patient-centered medical home demonstration: a prospective, quasi-experimental, before and after evaluation. *Am J Manag Care*. 2009;15(9):e71–87.
56. Health care system "In pursuit of excellence" case example. www.aha.org/about/membership/constituency/hcs/sentara.shtml. Accessed June 15, 2012.
57. Unutzer J, Chan YF, Hafer E, et al. Quality improvement with pay-for-performance incentives in integrated behavioral health care. *Am J Public Health*. 2012;102(6):e41–5.
58. Williams JW, Jackson GL, Powers BJ, Chatterjee R, Prvu Bettger J, Kemper AR, Hasselblad V, Dolor RJ, Irvine RJ, Heidenfelder BL, Kendrick AS, Gray R. The patient-centered medical home. Closing the quality gap: revisiting the state of the science. *AHRQ Publication No. 12-E008-EF*. Rockville, MD. *Agency for Healthcare Research and Quality*. July 2012. Evidence Report No. 208.
59. Cunningham PJ. Beyond parity: primary care physicians' perspectives on access to mental health care. *Heal Aff*. 2009;28(3):w490–501.
60. Blumenthal D. Launching HITECH. *N Engl J Med*. 2010;362(5):382–5.
61. • Glasgow RE, Kaplan RM, Ockene JK, Fisher EB, Emmons KM. Patient-reported measures of psychosocial issues and health behavior should be added to electronic health records. *Health Aff (Millwood)*. 2012;31(3):497–504. *This paper recommends specific patient psychosocial measures that should be routine data collected through an electronic health record. These measures could enhance the patient-provider relationship and provide important population-based data.*
62. Peek CJ. Planning care in the clinical, operational, and financial worlds. In: Kessler R, Stafford D, editors. *Collaborative medicine case studies: evidence in practice*. New York: Springer; 2008.