



Review

Aligning health information technologies with effective service delivery models to improve chronic disease care



Amy M. Bauer ^{a,*}, Stephen M. Thielke ^a, Wayne Katon ^a, Jürgen Unützer ^a, Patricia Areán ^b

^a Department of Psychiatry and Behavioral Sciences, University of Washington, Seattle, WA, United States

^b Department of Psychiatry, University of California, San Francisco, United States

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ABSTRACT

Objective. Healthcare reforms in the United States, including the Affordable Care and HITECH Acts, and the NCQA criteria for the Patient Centered Medical Home have promoted health information technology (HIT) and the integration of general medical and mental health services. These developments, which aim to improve chronic disease care, have largely occurred in parallel, with little attention to the need for coordination. In this article, the fundamental connections between HIT and improvements in chronic disease management are explored. We use the evidence-based collaborative care model as an example, with attention to health literacy improvement for supporting patient engagement in care.

Method. A review of the literature was conducted to identify how HIT and collaborative care, an evidence-based model of chronic disease care, support each other.

Results. Five key principles of effective collaborative care are outlined: care is patient-centered, evidence-based, measurement-based, population-based, and accountable. The potential role of HIT in implementing each principle is discussed. Key features of the mobile health paradigm are described, including how they can extend evidence-based treatment beyond traditional clinical settings.

Conclusion. HIT, and particularly mobile health, can enhance collaborative care interventions, and thus improve the health of individuals and populations when deployed in integrated delivery systems

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Introduction

In the wake of national health care reform in the United States, numerous state and federal initiatives have begun to implement integrated care approaches for chronic diseases into primary care medicine. These initiatives are meant to increase access to high quality care for

* Corresponding author at: Department of Psychiatry and Behavioral Sciences, University of Washington School of Medicine, 1959 NE Pacific Street, Box 356560, Seattle, WA 98195-6560, United States. Fax: +1 206 543 9520.
E-mail address: abauer1@uw.edu (A.M. Bauer).

patients and to assist clinicians in improving quality of care for chronic diseases. Nearly two decades ago, Wagner et al. articulated the need to organize services for more effective delivery of care for chronic conditions, by outlining key elements of the “chronic care model” (Wagner et al., 1996). The collaborative care model is one example of how these elements have been operationalized and implemented with an emphasis on improving care for common mental disorders such as depression in primary care (Katon et al., 1995; Unutzer et al., 2002).

With the expansion of health insurance through the Affordable Care Act, the anticipated demand from newly insured patients with needs related to chronic medical and mental health conditions will present a significant challenge for healthcare systems. Collaborative care can effectively leverage limited mental health specialty resources and address this need in high risk patients. Such patients often have combinations of comorbid medical and mental health conditions, limited health literacy, and inadequate provider–patient communication, all factors that can impede effective chronic disease care (Barnett et al., 2012; Benjamin, 2010; Kutner et al., 2006; Nielsen-Bohlman et al., 2004; Ratanawongsa et al., 2013; U.S. Department of Health and Human Services, 2010). Health information technology (HIT) can play an important role in addressing these potentially modifiable factors in the context of delivery models such as collaborative care.

HIT, defined as “the application of information processing involving both computer hardware and software that deals with the storage, retrieval, sharing, and use of health care information, data, and knowledge for communication and decision making” (p. 38) Thompson & Brailer, 2004, encompasses a variety of electronic tools including electronic and personal health records, patient registries, mobile health (mHealth) applications, and remote monitoring devices (U.S. Department of Health and Human Services, 2011). Consumer health technologies have greatly expanded in the last 5 years and have the potential for mitigating some critical barriers to quality care. For example, nearly 100,000 mHealth applications are now available for consumers to download (Pelletier, 2012; research2guidance, 2013). Although evidence for their effectiveness lags far behind (Ehrenreich et al., 2011; Free et al., 2013), some mHealth applications are already in widespread use by the general public (Ziobro, 2013). With this growth, mHealth is emerging rapidly with the potential to become a significant component of HIT and of health service delivery and an important tool in extending the population impact of traditional clinical services, including among underserved patients and those with limited health literacy (U.S. Department of Health and Human Services, 2010; California Pan-Ethnic Health Network (CPEHN) et al., 2013).

Despite the increasing availability of many mHealth technologies, several factors may limit their adoption and subsequent impact on chronic disease management. Older adults, who are frequently the target of chronic disease management programs, are less likely to have access to portable devices (Fox & Duggan, 2012) and may have limited literacy in health technologies. Both older adults and those with limited financial resources may be unable or unwilling to pay for equipment or access fees (such as broadband internet access), and patients in rural areas may not even have such services available. Individuals with cognitive impairments (Plassman et al., 2008) or mental health issues might be unwilling to use novel approaches to disease management. While it is important to consider potential limitations such as these, their actual impact remains uncertain. Among primary care patients, recent data suggests that mHealth use is less common among older adults but not related to such factors as the presence of chronic diseases, depression, or health literacy limitations (Bauer et al., 2014). Web-based and mobile technologies have been successfully designed and deployed in research settings among individuals with serious mental illness and their use has not been hampered by cognitive impairments or limited general or health literacy (Ben-Zeev et al., 2013, 2014; Druss et al., 2014). Home-based monitoring systems and video game interventions have been used among older adults, including those with cognitive impairments and chronic diseases, with some evidence for overall healthcare cost-savings

associated with home monitoring (Anguera et al., 2013; Baker et al., 2011; Kaye et al., 2014; Weintraub et al., 2010). Importantly, in order to be adopted, any technology for health improvement must meet the user’s specific needs and people with chronic diseases may have other more pressing personal or social needs which preclude attention to health improvement (Thielke et al., 2012). If users are not interested or motivated, then mHealth technologies, no matter how well-designed, will have no benefits for them, and thus will not be used.

In light of the opportunities and limitations, this paper addresses how HIT can support the implementation of evidence-based collaborative care models and in particular how programs that leverage HIT can potentially ease concerns health care systems and providers have regarding the anticipated volume of newly insured patients as coverage expands. Digital health tools and information management systems for providers and patients are reviewed, including how their integration into health systems can address mental health, health literacy and communication barriers to effective care. The collaborative care model of integrating mental health into primary care is used to illustrate the need to align HIT to appropriate health service delivery models; however, these principles may be relevant for care management for chronic conditions more generally and may also have relevance outside the United States among systems that have implemented similar models for organizing chronic disease care.

What is collaborative care (CC)?

The collaborative care (CC) model is one of the most widely researched and disseminated models for delivering evidence-based mental health services in primary care settings (Archer et al., 2012; Gilbody et al., 2006; Katon et al., 1995, 1999, 2010; Thota et al., 2012; Unutzer et al., 2002). The empirical support for the model is clear: there are more than 79 randomized controlled trials that demonstrate the effectiveness of this model for improving outcomes for common mental disorders including depression and anxiety (Archer et al., 2012; Thota et al., 2012). Studies have been conducted in a wide range of settings, nationally and internationally, and represent a diverse array of patients, target conditions, medical comorbidities, and treatment strategies (Katon et al., 2010). As a result, this model has been identified as a best practice for nearly 15 years at a national level (Substance Abuse and Mental Health Services Administration, 2003; U. S. Department of Health and Human Services, 1999). The scalability of this practice model is supported by large-scale implementations in ‘real-world’ healthcare settings, including by organizations that serve predominantly disadvantaged patients. These include the Mental Health Integration Program, which was implemented in 2008 and has served over 35,000 patients in safety net primary care sites across Washington State, large integrated care programs in the Department of Defense, the DIAMOND program in Minnesota, and other settings (Katon & Unutzer, 2013; Korsen & Pietruszewski, 2009).

CC consists of longitudinal care provided in a primary care setting by a multidisciplinary care team, which includes a primary care provider and a care manager (e.g., nurse, clinical social worker, or psychologist), with support from a psychiatric consultant. A structured approach is applied to diagnosis and treatment in which care managers perform comprehensive patient assessments, help engage patients in self-management with educational tools and negotiation regarding patient views about their illness and treatment expectations, and provide brief evidence-based behavioral interventions. Patients’ progress is monitored through proactive outreach and follow-up, monitoring outcomes with standardized tools (measurement-based care), along with systematic review of patients’ outcomes based on an electronic registry. Through systematic caseload review with care managers, psychiatric consultants may assist with diagnosis, provide treatment recommendations for the primary care-based team to implement, and suggest modifications to treatment for patients who are not engaged in care or are not improving. Care managers assist with care coordination and

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