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# Coordinating Chronic Care Management through Health Information Exchanges

*Better Care, Lower Costs*

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# Needed: A Better Way to Manage Chronic Conditions



More than 133 million Americans – almost half of the nation’s population – currently are afflicted with at least one chronic condition<sup>1</sup> such as diabetes, obesity, coronary artery disease (CAD), chronic obstructive pulmonary disease (COPD) or cancer. Individuals with chronic conditions account for 78 percent<sup>2</sup> of total health costs, largely resulting from hospital and emergency room costs associated with complications of their condition. If the nation’s chronic care management programs were more effective, total health care costs could be decreased and the overall health of the population could be improved.

There is widespread belief among physicians, policymakers and the general public that the quality of care available to those with chronic conditions is suboptimal. In short, the current model of chronic care management simply isn’t working. Half of all treatment for patients with chronic conditions is not based on clinical guidelines.<sup>3</sup> State-operated care management programs frequently lack coordination and visibility among physicians. Additionally, patients’ adherence to a prescribed treatment plan often is difficult for clinicians to monitor. All of these challenges will likely become more acute as the U.S. population ages and the incidence of chronic conditions increases.<sup>4</sup>

Effective chronic care management programs require collaboration and partnership among physicians, hospitals, health plans, government organizations and patients. We believe that Health Information Exchanges (HIEs) can assist in forming, maintaining and strengthening these relationships. Through an HIE, physicians can access a complete view of their patients’ treatment plans and adherence levels and actively coach them through the long-term behavioral changes that are required to maintain their health and keep costs in check.

HIEs and related technologies can help physicians manage numerous chronic conditions more effectively, reduce the costs of chronic care, and improve – and save – patients’ lives. In this paper, the Deloitte Center for Health Solutions, (the “Center”), a part of Deloitte & Touche USA LLP, contrasts today’s widely used model of disease management with future-state, HIE-enabled chronic care management to demonstrate the significant benefits that can be realized.

A handwritten signature in black ink that reads "Paul H. Keckley". The signature is fluid and cursive, with a long, sweeping tail that extends downwards and to the right.

Paul H. Keckley, Ph.D.  
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1 “Chronic Conditions: Making a Case for Ongoing Care,” Partnership for Solutions, September 2004

2 “Strategies for Chronic Disease Management,” The Advisory Board Company, March 22, 2005

3 “It Takes a Region: Lessons from a National Conference on Better Ideas for Chronic Disease Care,” *Issue Brief*, California Healthcare Foundation, March 2007

4 “It Takes a Region: Lessons from a National Conference on Better Ideas for Chronic Disease Care,” *Issue Brief*, California Healthcare Foundation, March 2007

# Chronic Care Management: A Burning Platform

Americans with chronic conditions are placing a huge financial and clinical burden on the nation's health care system. They account for approximately 78 percent of total U.S. health care costs, 76 percent of all hospital admissions, 88 percent of all drug prescriptions, and 72 percent of all physician visits.<sup>5</sup> A large portion of these costs could be reduced or avoided in the future if providers and patients effectively implement care management programs.

Chronic care management is defined as a system of coordinated health care interventions and communications for populations with chronic conditions, in which patient self-care efforts are significant.<sup>6</sup> It helps patients identify lifestyle and medication adherence issues that can enable them to better manage one or more chronic conditions. Chronic care management also enhances the quality of care by reducing medical errors and improving patient outcomes.<sup>7</sup> Such programs have been adopted by many states to target improvements in the health of their chronically ill citizens. Yet, as states have utilized these programs, they often find that they are lacking coordination and communication among providers, which limits the benefit to the patient.

In the current system of chronic care management, service vendors negotiate with health plans to coordinate care for chronically ill patients. The vendors assign a health coach to each patient who interacts via telephone on an ongoing basis. The patient's primary care physician is often "out of the loop" and any savings that result from this process usually accrue to the plan.

Primary care physicians (PCPs) are viewed by patients as their most influential health coach, and these physicians consider chronic care management a major focus of their profession. Yet, few use information technologies to appropriately identify and monitor their patients' care, and few health plans offer incentives for physicians to invest time in coaching patients to lifestyle changes, medication adherence, and better health.

Health Information Exchanges (HIEs), implemented at the community level, offer primary care physicians a vehicle to more effectively identify and manage chronically ill patients. This paper discusses the economic and clinical benefits that HIEs can provide for chronic patients and the health care industry as a whole. The paper also provides an illustrative example of the potential cost savings HIE use could produce in a hypothetical model segment of the chronic care population.

## Key Terms

**Chronic Condition** – A serious health condition which requires periodic visits for treatment by a health care provider, or by a nurse or physician's assistant under direct supervision of a health care provider. A chronic condition continues over an extended period of time (including recurring episodes of a single underlying condition) and may cause episodic rather than a continuing period of incapacity (i.e., asthma, diabetes, cancers, epilepsy, etc.).

**Chronic Care Management Program (CCMP)** – A program that uses a structured process to collaboratively define treatment(s) to manage a patient's chronic condition.

**Health Information Exchange (HIE)** – A multi-stakeholder organization that enables or oversees the business and legal issues involved in the exchange and use of health information, in a secure manner, for the purpose of promoting the improvement of health quality, safety and efficiency.<sup>8</sup>

**Electronic Health Record (EHR)** – A digital record completed from multiple disparate clinical systems, creating a longitudinal and aggregate display of those data for the patient.

**Electronic Medical Record (EMR)** – A digital record found in a unique care setting (e.g., the physician office or the hospital) and containing data specific to that care setting.

**Personal Health Record (PHR)** – A record that is patient-centric and patient-controlled, with clinically relevant information.

<sup>5</sup> Johnson, A. "Measuring DM's Net Effect is Harder Than You Might Think," *Managed Care*, June 2003, as cited in "Strategies for Chronic Disease Management," The Advisory Board Company, March 22, 2005

<sup>6</sup> <http://www.dmaa.org>

<sup>7</sup> "Strategies for Chronic Disease Management," The Advisory Board Company, March 22, 2005

<sup>8</sup> [http://www.himss.org/asp/topics\\_FocusDynamic.asp?faid=143](http://www.himss.org/asp/topics_FocusDynamic.asp?faid=143)

## Current State “Disease Management” versus Future State “HIE-enabled Coordinated Care”

There is considerable debate among health researchers about the effectiveness of the current model of disease management. Here’s the current state:<sup>9</sup>

**Step One:** A patient is diagnosed by a primary care physician with a chronic condition based on symptoms that correlate to high risk for heart disease, diabetes, etc. The patient is told to get a prescription filled, schedule a follow-up visit in three to six months, and have lab work done per a schedule (usually quarterly for heart disease or semi-annually for Type II diabetes).

**Step Two:** The physician directs the patient to take appropriate medications and make lifestyle changes. In some cases, the physician’s nurse might follow-up with the patient to gauge understanding of the condition or willingness to make lifestyle changes. In most cases, there is no additional follow-up.

**Step Three:** The physician submits a claim to the insurer electronically (90 percent of the time) or via FAX (10 percent) within days of the diagnosis and awaits payment.

**Step Four:** The insurer notes on the claim that a symptom – such as hemoglobin A1C level above 7 – was noted and informs the patient (directly or indirectly through a vendor such as Healthways or others) that he or she is eligible to participate in a coaching program to assist in self care. This is an opt-out model: If the patient doesn’t notify the plan, he or she is automatically enrolled.

**Step Five:** The patient gets a package by mail describing the plan’s program and is then contacted by a nurse from a remote call center. The nurse confirms the diagnosis with the patient and the two agree to speak regularly so the patient’s questions are answered and progress tracked.

**Step Six:** The call center nurse notes the patient’s progress and sends periodic updates to the physician via e-mail or FAX.

**Step Seven:** These notifications *might* find their way into the patient’s record (usually a file folder) and are reviewed when the patient returns for a scheduled visit.



While the above seems to be a fairly straightforward and workable model, it produces suboptimal results and clinical outcomes. There are three reasons for this:

1. The patient’s general medical data is missing, so often the disease management vendor’s recommendation to the patient is in conflict with the physician’s directive and could be, in fact, wrong.
2. A trusted source and the most influential coach for the patient – their physician – is out of the loop. The current state model dis-intermediates the physician-patient relationship.
3. The long-term effectiveness of the program – self-care management by patients – is suboptimal. It is estimated that only one in four patients with a chronic condition self-manages appropriately, so any improvement facilitated through an HIE platform is a significant improvement. Also, the remaining enrollee information used by health plans from claims data is incomplete. Risk factors, co-morbidities and important non-participants, as it turns out, are more severe and needful of help.

<sup>9</sup> Keckley, Paul. “The Role of Evidence-Based Medicine in Disease Management,” *Disease Management & Health Outcomes*, 11(7):429-437, 2003.



Does the current-state model work? Yes, to a degree. Can it be improved? Yes, substantially.

We believe that a future state of disease management enabled by local or regional Health Information Exchanges is a better mousetrap. An HIE-enabled chronic care management program has four advantages over the current state:

- 1. Improved diagnostic accuracy:** Embedded in the HIE platform are prompts, alerts and reminders built around evidence-based guidelines that suggest more thorough ways to query patients and more precise ways to address risk factors, co-morbidities and complex issues that might mitigate an otherwise “simple diagnosis.” An important fact about chronic care is this: Most Americans have at least one, and many have three or more, chronic conditions, so knowing how to address a host of complex issues and in what order requires synchronous data – accessed through real-time clinical knowledge management tools that HIEs have. Because of this capability, HIEs allow more accurate interventions, especially in medication monitoring. An HIE’s e-prescribing feature reduces adverse drug interactions and dosing complications, and permits the PCP to monitor script refills, avoid hospital utilization, and improve treatment plan adherence.
- 2. Enhanced physician-patient relationship:** An HIE facilitates interaction between the physician and the patient, bringing the provider into the chronic care loop. The physician becomes a coach using the HIE’s registry function to monitor a patient’s self-care success. Does the patient report taking his or her medications? Has the patient had lab work done? Was the blood test result in sync with the plan the two agreed upon? Are goals being met? Having firsthand, real-time knowledge about a patient between visits via the HIE is a physician benefit that can help to reduce avoidable complications and costs from chronic conditions left unmanaged.
- 3. Improved care team coordination:** Optimal treatment for a chronic condition usually requires the expertise of specialists, nutritionists and even mental health counselors to change patient lifestyles. An HIE provides a cost-effective mechanism for members of the extended care team to work with the physician and patient to determine the best course of self-care management and to share information to better coordinate care, monitor outcomes and avoid costs associated with complications.
- 4. Lower costs:** Using HIEs to improve diagnostic accuracy, enhance coordination among members of the care team, enable regular and frequent coaching, and avoid hospital admissions and emergency room visits can help to lower overall health care costs and produce a substantial ROI for a community or organization. In addition, HIEs equipped with e-prescribing applications provide the cost benefit of avoiding drug-drug interactions and adverse events.

### Current/Future State Care Management with HIEs

Issue	Current State	Future State Using HIEs
Lack of Accurate and Complete Data	Patient records often are in the form of paper files stored in several physician offices, hospital storage rooms, and independent laboratories.	All records can be transferred to an electronic format and stored in one location. This gives providers real-time access to a complete patient view. HIEs can reduce the number of days required for adjudication by automating processing from the provider/patient visit entry to the payor claims systems.
Inability to Access Real-time Information	Lab results and patient records are available only when the labs or physician offices are open. Also, lab results are not available until hours or days after the test results are created.	As labs are linked to an HIE, test results become immediately available. Data is accessible to providers for real-time evaluation and can be used to contact and monitor adherence. Lab results also can trigger an alert system, if necessary.
Lack of Scalability	Disease management programs are telephone-based and require a nurse to physically call patients. Information is collected via correspondence with the patient and the number of calls made daily is limited by the number of available nurses.	HIEs use an automated process to gather information from a variety of sources and require limited manual intervention. The HIE workflow is scalable and can accommodate the increasing number of chronically ill patients. With the addition of an alert system, human intervention can take place at the appropriate phase in the care treatment plan. Also, patient interactions can be synchronized and the care levels remain uniform.
Physicians are Outside the Care Management "Loop"	Nurses primarily interact with the patients and monitor their adherence levels. There is little-to-no physician involvement in this process.	HIEs bring physicians into the loop by providing an easily accessible form of complete and accurate patient information. Physicians can make quicker and better-informed evaluations and care decisions. Additionally, physicians often exert more influence than nurses, which can improve patient adherence levels.

### HIE Fast Facts<sup>10</sup>

Number of current HIEs (in all stages)	165
Number of states with HIEs (in all stages)	35
Number of fully operational HIEs (stages 5 and 6)	26
Number of bills passed between 2005 and 2006 calling for the creation of a commission, committee, council or task force to provide leadership or recommendations on HIT and/or health information exchange	19

10 "Improving the Quality of Healthcare through Health Information Exchange," *eHIssueBrief*, a publication of the eHealth Initiative, September 2006

## Key Functions in an HIE Platform Supporting a Local Chronic Care Management Program (CCMP)

<b>E-prescribing</b>	An electronic prescribing solution allows authorized physicians to order safe and cost-effective medications via their personal computer or portal device. The e-prescribing solution allows physicians to electronically submit prescriptions directly to a patient's pharmacy. Since these prescriptions are typed, the application reduces the likelihood of errors caused by illegible writing and reduces prescription complications.
<b>Patient Registry</b>	A patient registry is a list of patients with a given chronic disease and their specific characteristics. Providers use the list to track key measures and get notified automatically when patients need certain labs and preventive services. For example, a registry could be set up with six diabetes target values: blood pressure, lipids, foot exam, eye exam, immunizations and A1C. When "safe" levels are exceeded (e.g., A1C over 7.0) and/or regular scheduled checkups are not completed (e.g., last A1C over 90 days ago), alerts are triggered. This uses prevention to reduce complications and the need for emergency hospitalizations.
<b>Coordination of Emergency Care Among Care Team Members Through Secure Information Exchanges</b>	This HIE solution allows emergency departments and other clinics to access a patient's medical history. The application enables clinical data (lab, radiology, transcription, admission/discharge/transfer information and EKG) to be accessed by physicians at the point of care, by nurse coaches on the phone, and by nutritionists and other care team members who have secure access. By providing a complete medical picture, the solution helps the care team to address immediate patient needs and avoid potential complications. This complete data also alerts primary care providers to follow-up on the care that a patient has received elsewhere.
<b>Coordination of Care for Patient Through Secure Messaging</b>	This solution provides consumers with online access to connect with and exchange messages securely with their chronic care team. This capability will reduce physician visits, improve adherence, and allow better preventive care.
<b>Coordination of Care Among all Medical and Non-medical Providers</b>	The HIE solution enables all providers to take part in the complete care of a patient. For example, mental care providers can tap into accurate medical information that can be key to understanding a patient's condition. In the same regard, nutritionists and dietitians can work with providers to help patients with eating disorders.

## Some Innovators Using HIE for Chronic Care Management Programs (CCMP)

- The Missouri Division of Medical Service has enrolled its chronically ill Medicaid recipients in Missouri's Chronic Care Improvement Program (CCIP). This is the first state-level, Internet-based care plan for health and disease management that enables participants to collaborate more effectively by using EHRs. To date, the Missouri CCIP has had considerable success in using the application to manage treatment of its chronically ill Medicaid patients.
- From 2003 to 2005, the state agencies in Oregon combined in a pilot Chronic Disease Data Clearinghouse.<sup>11</sup> The pilot tested the feasibility and value in merging patient-level claims data (including pharmacy data) from 11 health plans into physician reports for patients with asthma and diabetes, replacing separate reports from each health plan. The project successfully engaged health plans to submit data in a HIPAA-compliant process and physician feedback was positive. The Oregon Medical Professional Review Organization (OMPRO) and its partners are currently exploring other potential uses for the merged data. Lessons learned will pave the way for future information exchange activities.
- As an example of e-prescribing's success, Massachusetts, with its MA-SHARE initiative, has reduced annual prescription errors by 8.9 errors per physician. E-prescribing also helps monitor adherence and reduces adverse drug events.
- Providers in Central Indiana have a single IHIE electronic mailbox through which they can access clinical results for their patients, regardless of which hospital or lab a patient has visited.
- The Hill Physicians Medical Group uses an electronic community communication network model. Per Hill's analysis, the number of secure online messages exchanged between the nearly 1,000 online physicians and more than 140,000 patients topped one-half million in March 2006. Patients most frequently went online to request appointments and send notes to their physicians.

## Quantifying Potential Chronic Care Coordination Savings Using HIEs

What savings might be achieved if a community pursued an HIE-enabled approach to CCMP? A case study isolating potential savings for improved management of Type II diabetes offers a useful perspective. Type II diabetes impacts six percent of the U.S. population and, if unmanaged can result in heart disease, heart attacks, kidney failure, blindness, colorectal cancer and premature death.

The following analysis offers a simple hypothesis: If HIE-enabled CCMP improved outcomes and reduced costs by 10 percent, 20 percent or 30 percent, what would that impact be in terms of savings to the health system?

### Assumptions: Cost Avoidance for HIE-enabled CCMP which Reduces Hospital Admissions

- Using estimates from 2005, the total cost of hospital admissions was \$640 billion.<sup>12</sup> Twenty percent of these admissions were diabetes-related, based on a primary or secondary diagnosis.<sup>13</sup>
- Cost and length of stay for each admission was normalized. This is reasonable where the diagnosis on admission was heart failure or limb amputation resulting from unmanaged diabetes that had progressed to a near-fatal stage.
- Costs are calculated at net present value; that is, inflation-related costs are not considered in this model.
- The HIE has been fully implemented with a CCMP solution that includes the full complement of functions previously noted.

	% of 2005 Hospital Admissions with a Primary or Secondary DRG of Diabetes	Total Cost of 2005 Hospital Admissions with a Primary or Secondary DRG of Diabetes	Potential Cost Savings
<b>Current State</b>	20.0%	\$172.8 billion	
<b>10% reduction with HIE</b>	18.0%	\$155.52 billion	\$17.28 billion
<b>30% reduction with HIE</b>	14.0%	\$120.96 billion	\$51.84 billion
<b>50% reduction with HIE</b>	10.0%	\$86.4 billion	\$86.4 billion

11 <http://www.oregon.gov/DHS/ph/hpcdp/cddata/index.shtml>

12 <http://www.statehealthfacts.org>

13 Russo, Allison C and Jiang, H Joanna. "Hospital Stays Among Patients with Diabetes, 2004" Healthcare Cost and Utilization Project, AHRQ, November 2006.

Many patients admitted to hospitals with diabetes as a primary or secondary diagnosis are admitted through the emergency department; that is, in the case of a heart attack, stroke or an event requiring emergency treatment.

A similar methodology illustrates potential savings associated with HIE-enabled CCMP focused on avoidance of emergency room uses:

**Assumptions: Costs Avoidance for HIE Enabled Reduction in Emergency Room Use**

- Using information from 2002, there was an average of 30,501 diabetes-related emergency room (ER) admissions per state, which equates to 1,525,050 ER admissions nationally.
- The average charge for each admission was \$16,264, which totals \$24,803,413,300 annually.<sup>14</sup>
- Cost and length of stay for each admission is the same. Calculations are based on averages.
- Cost and cost savings do not take into account the rate of inflation. All calculations are based on 2002 valuations.

	<b>% of Hospital ER Admissions with a Primary or Secondary DRG for Diabetes</b>	<b>Total Charge for ER Admissions with a Primary or Secondary DRG for Diabetes</b>	<b>Potential Cost Savings</b>
<b>Current State</b>	100%	\$24.8 billion	
<b>10% reduction by HIE</b>	90%	\$22.3 billion	\$2.4 billion
<b>30% reduction by HIE</b>	70%	\$17.3 billion	\$7.4 billion
<b>50% reduction by HIE</b>	50%	\$12.4 billion	\$12.4 billion

While it is hypothetical to suggest that HIE-enabled CCMP programs could achieve these savings, it is nonetheless credible to assume that the impact could be significant, even at the 10 percent improvement level. Also, these data are for Type II diabetes only. Imagine the impact if HIE-enabled CCMP is applied across the full spectrum of chronic conditions for which a similar model might be applicable, such as obesity, coronary artery disease (CAD), chronic obstructive pulmonary disease (COPD) or cancer. Imagine the impact if medication errors were avoided, dosage was more accurate, patients became more conscious of their overall health and adopted a healthier lifestyle. An HIE-enabled model should improve results and is certainly worth consideration.

**Implications for Stakeholders**

The potential of HIE-enabled CCMP is widely recognized by key health system stakeholders. There also is a growing chorus of discontent about the current state. The contrasts between the widely used traditional model of disease management and future-state, HIE-enabled chronic care management illustrate the significant tangible and intangible benefits that can be achieved. With more than 200 HIE efforts now under way, it is plausible to focus on CCMP as a primary vehicle for justification of investment costs for HIE sponsors. Local HIE efforts focused on CCMP may be successfully launched by any of the major stakeholders:

**Hospitals** – Although traditional CCMP programs are often sponsored by health plans, HIE-enabled models offer provider organizations the opportunity to innovate by working closely with their primary care physicians.

**States** – States can bolster their care management programs with the increased efficiency and improved care coordination that electronic health records and HIEs provide. They have unique leverage in managing special populations such as Medicaid programs and their own employees, and via legislative action designed to stimulate HIE-enabled CCMP efforts.

**Health Plans** – These organizations can improve the performance of their existing CCMP initiatives by using an HIE-enabled CCMP platform. Conceivably, they might create tiers in their provider panels that favor providers who actively support HIE-enabled care management approaches.

The bottom line is this: The current state of chronic care management is achieving modest results. HIE-enabled CCMP is a better mousetrap. However, effective implementation of HIE CCMP programs requires vision, focused operations, appropriate use of information technologies, effective structuring of the coordinated care among providers, and collaboration.

HIE-enabled CCMP is promising. It’s achievable. It’s not a matter of technology. It’s a matter of leadership and focus.

<sup>14</sup> “Economic evaluations of limits to access to prescription medication for the elderly in the US and implication for the elderly in the six southern states with three common illnesses,” Tim Lynch, Director, Center for Economic Forecasting and Analysis Health Care Finance Professor, Adjunct Florida State University Tallahassee, Florida & President Econometrics Consultants, Inc. August 1, 2002

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