Harnessing the EHR to Accelerate Improvement in Diabetes Care

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ABSTRACT

Numerous published studies indicate that electronic prompts at the point of care have inconsistent effects on the processes and intermediate outcomes of diabetes care. A review of the literature suggests that combinations of interventions may work better than single strategies. To determine whether a combination of electronic health record (EHR)-based strategies is consistently effective in improving diabetes metrics, a group of 40 primary care providers at Capital Region Health Care in Concord, NH customized our EHR to (1) embed evidence-based diabetes protocols within the EHR; (2) link these protocols to prompts at the point of care; (3) establish a diabetes registry; (4) create registry-based tools that identify and contact patients overdue for services; (5) utilize strategies that enlist patients in their own self-care. This combination of strategies, deployed within the context of an organizational leadership model, resulted in sustained improvement in nine of ten metrics of the Diabetes Physician Recognition Program over the period November 2003 to September 2005. We conclude that combinations of EHR-based strategies, when deployed within a leadership model, can lead to rapid and sustained improvement in the processes and intermediate outcomes of adult diabetes management.

OBJECTIVES OF PRESENTATION

- Describe the gap between the current quality of diabetes care in the United States and the quality benchmarks of the American Diabetes Association.
- Identify aspects of clinical leadership that increase the likelihood of sustained improvement in measurable quality.
- Name strategies that change provider behavior at the point of care, facilitate population-based disease management, and enlist patients in their own self-care management.
- Evaluate the effectiveness of an EHR in combining these strategies to accelerate improvements in the processes and the intermediate outcomes of diabetes care.
- Give examples that illustrate how the over-emphasis of measurable quality may paradoxically decrease the overall quality of medical care.

INTRODUCTION

Diabetes is a rapidly progressing American epidemic that, when combined with obesity, is projected to soon surpass smoking as our country's number one cause of preventable death and disability. Despite strong evidence that tight control of blood sugar, blood pressure, and lipids dramatically improves long-term outcomes[1-3], the widely respected NHANES 1999-2000 survey[4] reported that nationwide, only 7 percent of diabetics have all three parameters at or below the levels recommended by the American Diabetes Association (ADA). This percentage is not significantly higher than the levels documented in the earlier NHANES III study covering the period 1988-1994.

Numerous published studies over the last decade have evaluated the ability of electronic health record (EHR)-based tools to improve the processes and intermediate outcomes of diabetes management. The majority of studies examine only one intervention, most frequently prompts at the point of care. Results are often inconsistent and, when positive, quite modest in their magnitude[5-9].

Concord Hospital Physicians Group (CHPG), a hospital-owned primary care organization comprised of 29 primary care physicians and 11 mid-level providers, embarked upon a multifaceted initiative to determine whether combinations of strategies would yield larger and more rapid improvements than those documented in most published studies. All providers in the organization use the GE Centricity (formerly Logician) electronic health record.

METHODS

Developing a blueprint for transformational change

Beginning in early 2003, a multidisciplinary team of CRHC ambulatory care physicians and administrators (including the hospital CEO and the Vice President of Physician Affairs) created a charter for an ambitious, long-term quality improvement initiative for CRHC's hospital-owned and hospital-affiliated primary care practices. More than a collection of individual projects, this initiative is intended to be a pathway to the transformation of our culture, our relationships, and our services to our patients. CRHC administration has supported this initiative by (a) recruiting team members; (b) funding its physician leadership one full day a week for each of three physician members; and (c) broadly communicating our initial evidence-based accomplishments through all levels of the organization. Among the goals of this initiative, the following are directly relevant to our diabetes project:

- The concurrent creation of a) shared tools that improve those aspects of quality that we can measure, and b) work flow improvements that give us more time to focus on those aspects of quality that we can't measure – in particular, the time we have to talk with our patients.
- Cultural transformation of physician roles from "captains of the ship" to "leaders of the team".
- Development of provider skills and enterprise-wide systems that we can apply interchangeably to the management of multiple chronic diseases.

Adopting a leadership model

Recognizing the need for a leadership model, members of the team read Harvard Business School professor John Kotter's books *Leading Change* and *The Heart of Change* (HBS Press), then discussed the books' key points with their author at a private leadership seminar on August 21st, 2004. Professor Kotter's eight-step model has proven useful in providing a cultural context for our diabetes initiative. The steps include: (1) creating a sense of urgency; (2) enlisting effective leaders; (3) creating an organizational vision; (4) communicating the vision throughout the organization; (5) creating tools and removing barriers to change; (6) achieving the early win; (7) maintaining momentum; and (8) embedding changes within the organizational culture. The following paragraphs describe our efforts to address each of the eight steps.

Creating urgency

In spring 2003, we queried our EHR to determine the percentage of our patients with diabetes who were at ADA benchmarks for A1C, blood pressure, and LDL. We discovered that our enterprise-wide percentage was 10%. Although this is better than the national average of 7.3%[4], we found it unacceptable that 90% of our patients did not meet all three benchmarks. Over the next few months, physician leaders in our organization repeatedly communicated this "bad news" to our colleagues to convince them that our collective diabetes metrics were unacceptable.

Enlisting effective leaders

We recruited a multidisciplinary leadership team that includes administrators (vice president of physician affairs and vice president of rehabilitation services); information technologists (CIO and others); patient educators; and physicians in our own and other organizations affiliated with Concord Hospital. These leaders bring a broad-based set of skills and perspectives to quality improvement. They participate in multiple committees (quality improvement, provider training, electronic form development, and others) that meet on at least a monthly basis.

Creating an organizational vision

In October 2003, CHPG adopted the Diabetes Physician Recognition Program (DPRP), jointly sponsored by the ADA and NCQA, as our vehicle for improving diabetes care. At that time, there was only one physician in the state of New Hampshire, an endocrinologist on the seacoast, who was DPRP-recognized. Our vision was to become the first primary care physicians in the state to achieve DPRP recognition.

Communicating the vision

We began to build the case for DPRP at an evening seminar for primary care providers in September 2003. We followed this with multiple presentations at monthly group-wide provider meetings. At each gathering, we distributed provider-specific and group data documenting the quality chasm between our then-current diabetes quality indicators and ADA targets.

Creating tools and removing barriers to change

Guided by published research suggesting that combinations of strategies work better than any single method in changing provider behavior[10], we created the following EHR-based tools:

1. Evidence-based diabetes protocols within the EHR. Our EHR comes with an out-of-the-box Protocols application that is easily modifiable by local users. Prior to our diabetes initiative, however, we had not utilized Protocols in an enterprise-wide way, partly because we could not generate consensus about which diabetes benchmarks to incorporate. The adoption of the DPRP targets obviated this seemingly endless debate and allowed us to embed DPRP-mandated metrics into our Protocols.

2. Linkage of Protocols and other evidence-based benchmarks to prompts at the point of care. With the help of our IT department, we created our own generic encounter form for office visits. Comprised of a series of linked templates in a modified "SOAP" format (HPI, Histories, Risk, Review of systems, Vital signs, PE, Assessment, Plan), this form brings decision support to the point of care in two formats: in a window in the "HPI" template that displays "Services due" (see figure 1); and in other templates (ROS, Vital signs, Assessment) that are embedded with prompts that become visible when intermediate targets are not met (see figure 2). "Services due" in the "HPI" template is formatted to allow delegation of non-executive tasks to non-providers (example: a medical assistant receives prompts to obtain microalbumin, give a flu shot, or schedule a dilated eye exam before provider enters the exam room).

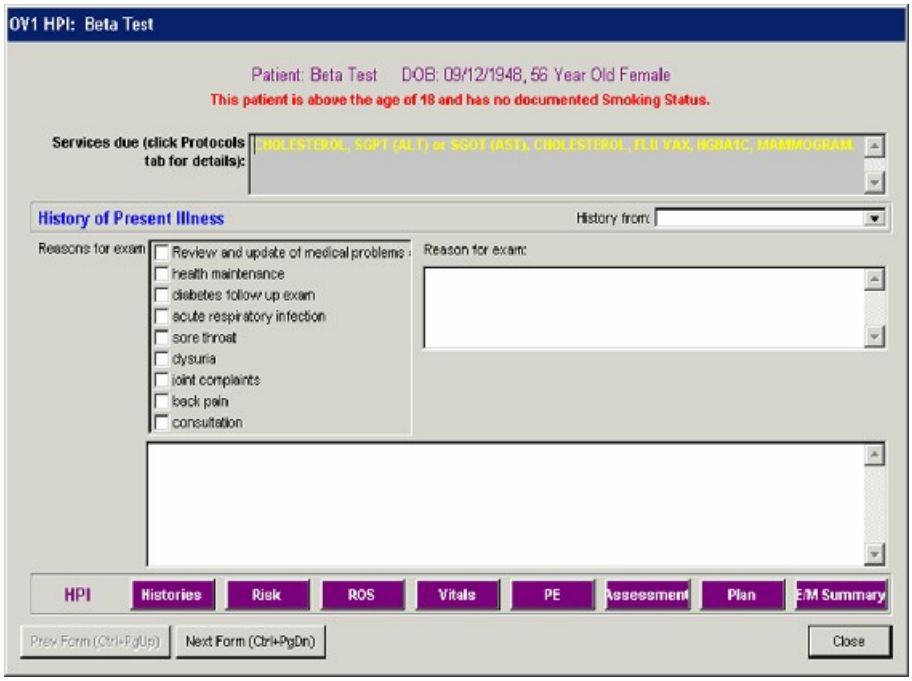


Figure 1

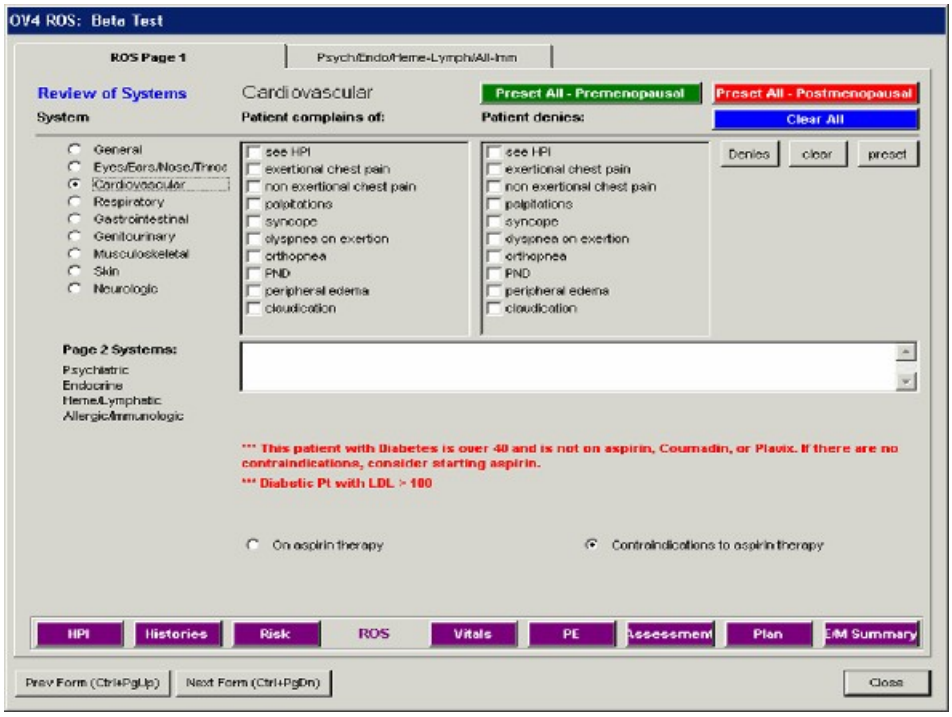
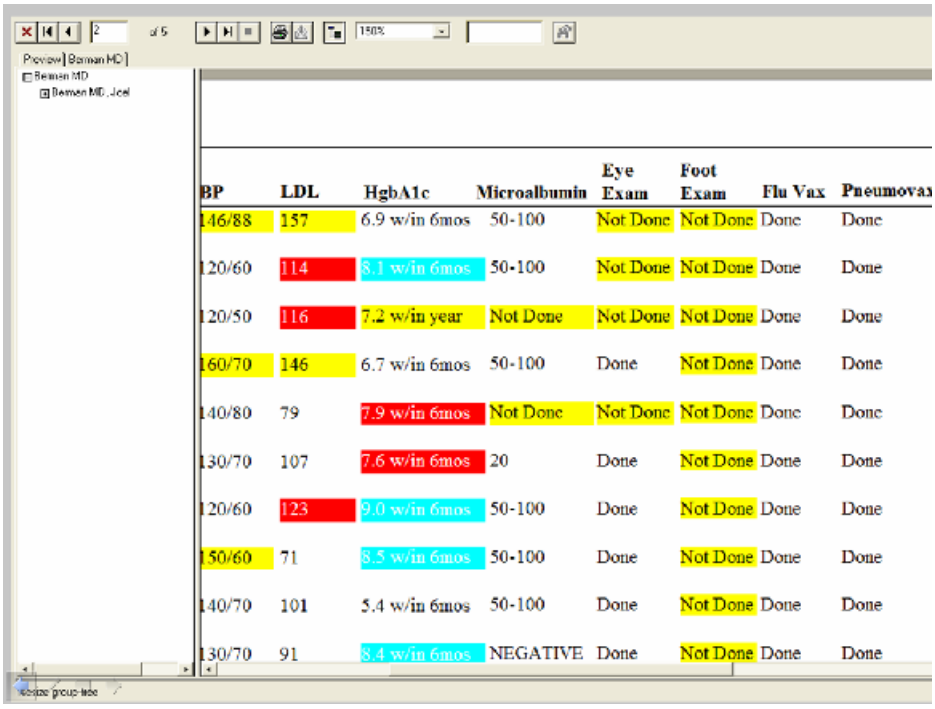


Figure 2

3. Diabetes registry. Each provider receives a monthly Crystal-generated registry of his/her diabetes patients. This registry lists the status of diabetes services received and due. It is color coded to highlight metrics that are not at DPRP or ADA benchmarks (see figure 3).



BP	LDL	HgbA1c	Microalbumin	Eye Exam	Foot Exam	Flu Vax	Pneumovax
146/88	157	6.9 w/in 6mos	50-100	Not Done	Not Done	Done	Done
120/60	114	8.1 w/in 6mos	50-100	Not Done	Not Done	Done	Done
120/50	116	7.2 w/in year	Not Done	Not Done	Not Done	Done	Done
160/70	146	6.7 w/in 6mos	50-100	Done	Not Done	Done	Done
140/80	79	7.9 w/in 6mos	Not Done	Not Done	Not Done	Done	Done
130/70	107	7.6 w/in 6mos	20	Done	Not Done	Done	Done
120/60	123	9.0 w/in 6mos	50-100	Done	Not Done	Done	Done
150/60	71	8.5 w/in 6mos	50-100	Done	Not Done	Done	Done
140/70	101	5.4 w/in 6mos	50-100	Done	Not Done	Done	Done
130/70	91	8.4 w/in 6mos	NEGATIVE	Done	Not Done	Done	Done

Figure 3

4. Registry-based tools that identify provider best practices. Providers receive monthly Access-generated graphs that compare their diabetes registry metrics with DPRP benchmarks, and with the 90th percentile scores of their CHPG colleagues (see figure 4). These reporting tools have allowed us to identify and share "best practices" within our group. (For example, the provider with the steepest improvement curves attributed his improvement to his discovery of the mail-merge technique described below, which the rest of us then adopted with similar success.) Our reports have also allowed us to identify physician outliers, several of whom have subsequently benefited from one-on-one "academic detailing" to improve their facility with our EHR tools.

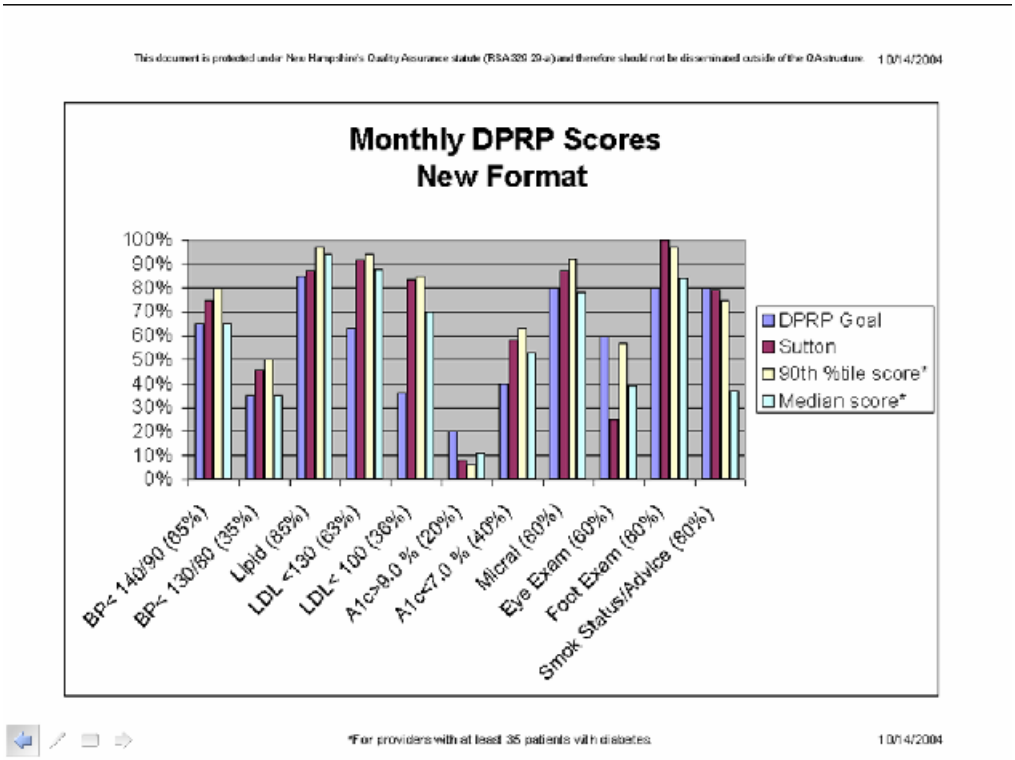


Figure 4

5. Strategies that enlist patients in their own self-care. The Diabetes Letter to Patient offers patients customized letters auto-populated with the status of their services due, as well as their most recent intermediate outcomes (see figures 5 and 6). By mail-merging this letter with a computer-generated inquiry of all diabetics who haven't been seen within the last 6 months, each office is able to quickly identify, contact, and schedule those patients who are overdue for services. To remind providers to offer the Diabetes Letter to Patient, we have written several articles in the local newspaper that directly inform our patients of this service. Our hope is that when providers forget to offer the letter, patients will remind them. This is an example of our preference for "pull" rather than "push" strategies to influence provider behavior.

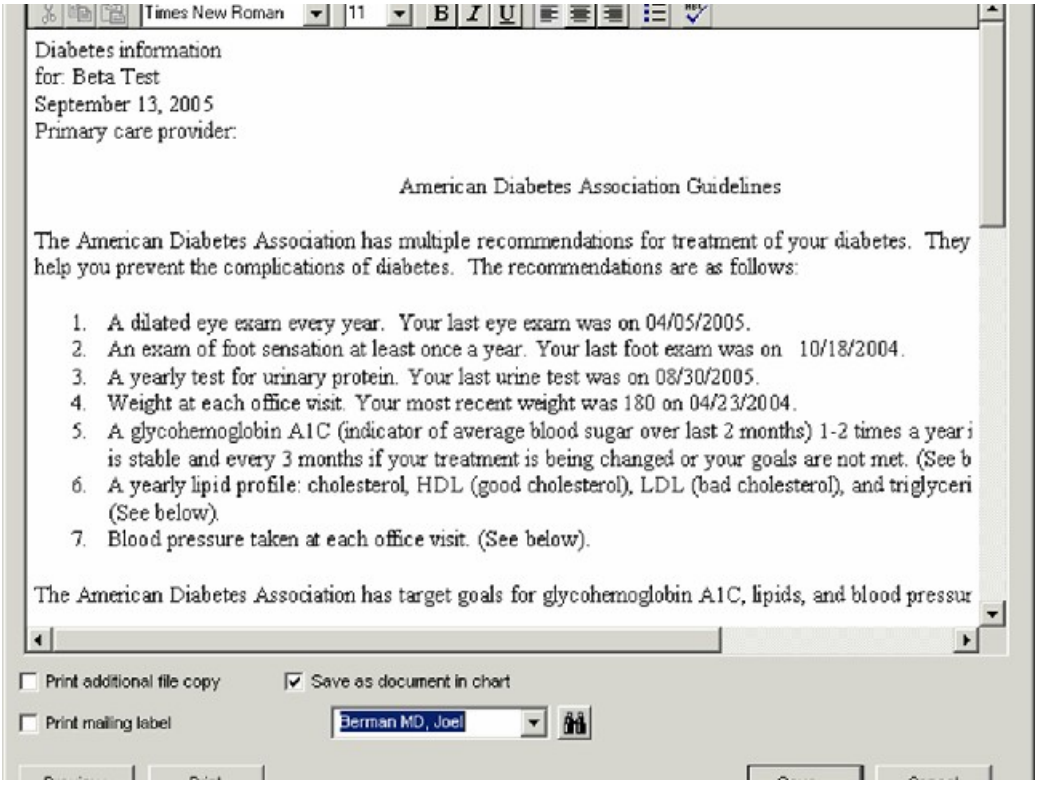


Figure 5

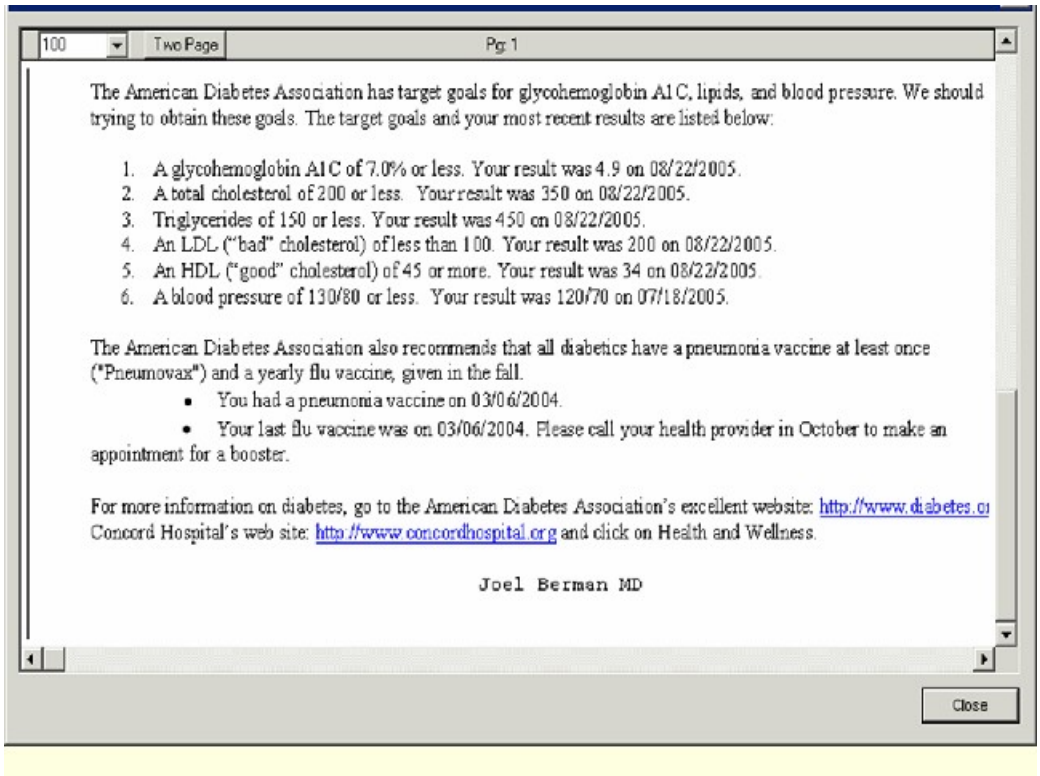
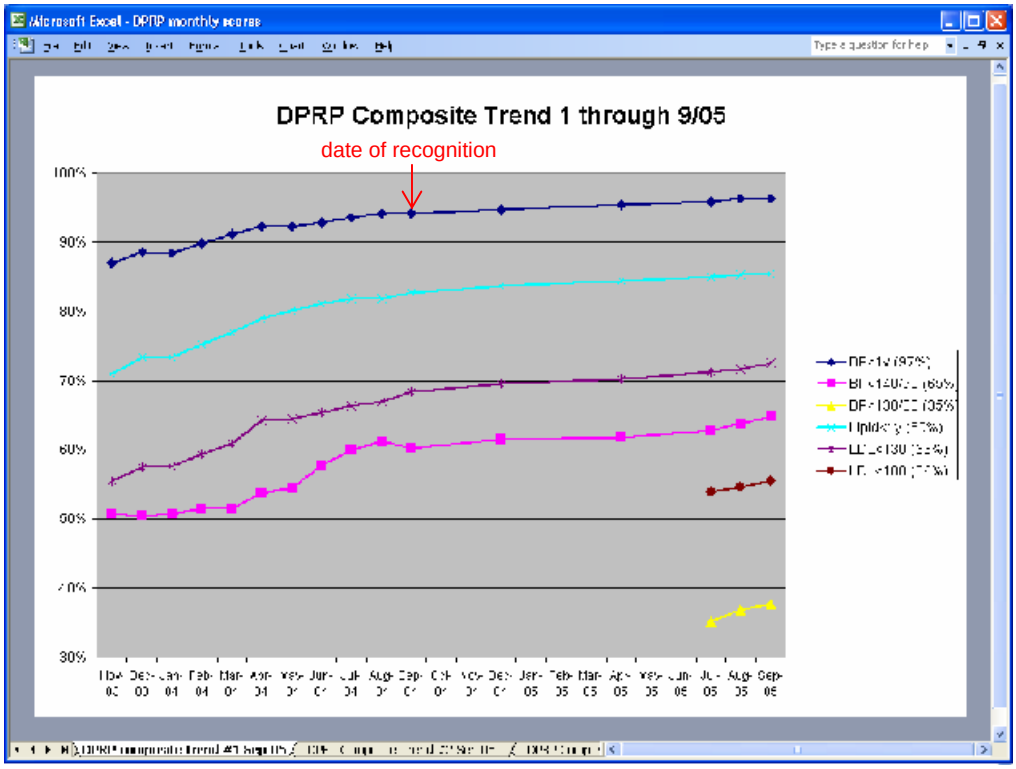


Figure 6

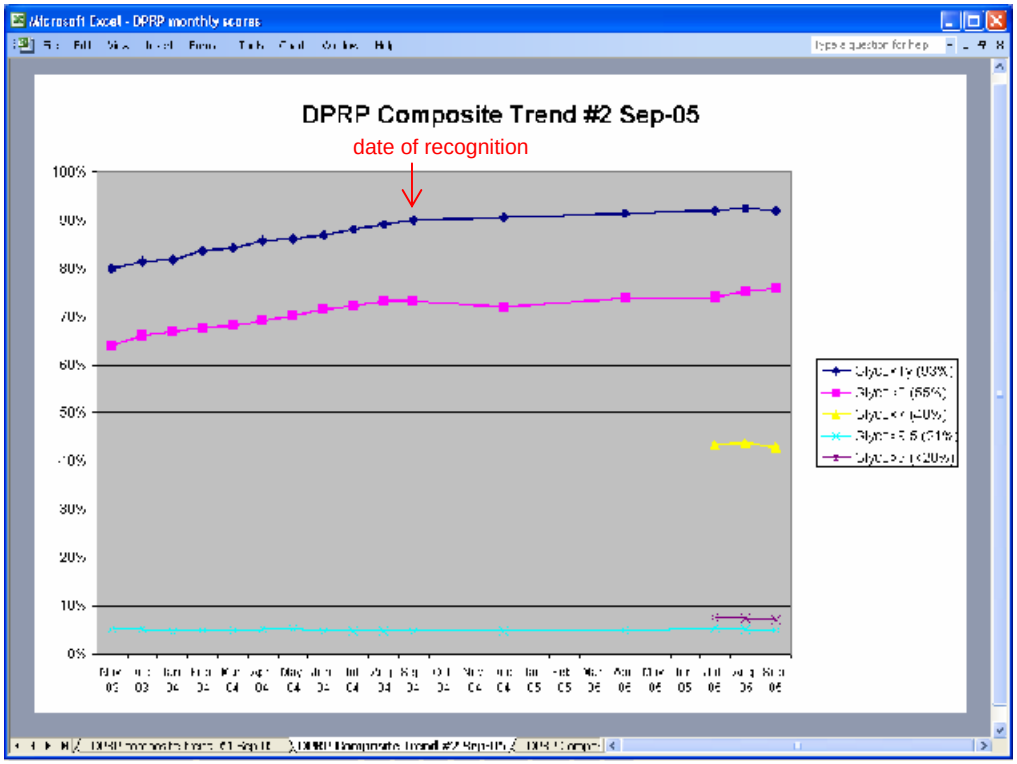
Achieving the early win

This combination of strategies resulted in steep improvements in nine of the ten metrics of DPRP between November 2003 and September 2005. Only the percentage of patients with A1C greater than 9.5% remained flat at 5%, which was already well below the DPRP target of ≤ 21% at the beginning of the study. (See graphs 1-3). The 29 participating physicians of CHPG received official DPRP recognition on August 17th, 2004, less than 9 months after beginning our initiative. Although DPRP requirements limit official recognition to physicians only, we formally recognized the contributions of non-physician PCPs (NPs and PAs) at a subsequent provider recognition dinner.

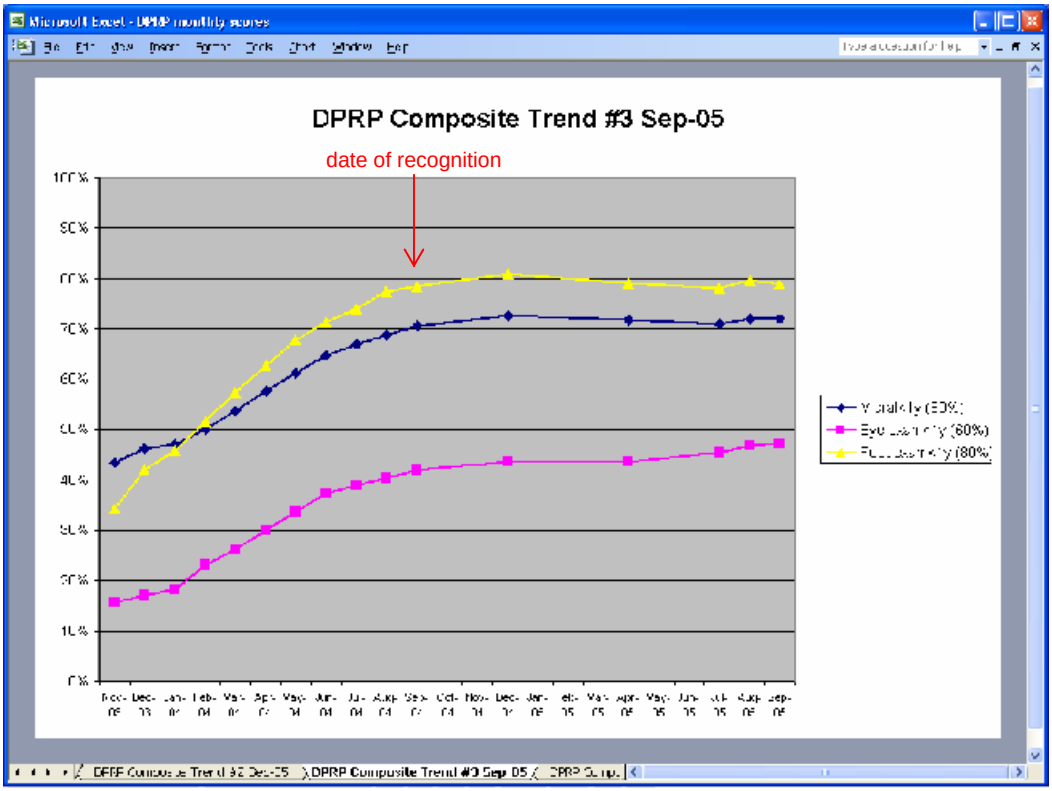
To create a control group against which to compare the improved metrics of our adult patients with diabetes, we are currently analyzing the de-identified metrics of 200,000 adult diabetic patients in GE Healthcare's Medicalogic Quality Improvement Consortium (MQIC) database over the same period from November 2003 to September 2005. If this comparison shows that our group's improvements are significantly greater than any concurrent changes in the metrics of the MQIC control group, we will incorporate these findings into a paper that we will submit for publication to a peer-reviewed journal.



Graph 1



Graph 2



Graph 3

Maintaining momentum

In February 2005, six months after our achievement of DPRP recognition, we adopted the NCQA's Heart Stroke Recognition Program as our next enterprise-wide quality initiative. Our major concern was that we might experience a decline in our diabetes metrics as we shifted our attention and resources to our new initiative. In fact, our diabetes metrics actually improved in the year following formal DPRP recognition (see graphs 1-3).

Embedding changes within our organizational culture

The sustainability of our improvements indicates that we have successfully embedded our customized EHR tools into the daily work flow of our diabetes care. We believe that our tools are facilitating a fundamental change in the way providers think about our patients with diabetes. Provider acceptance of the benefits of evidence-based prompts, team-based delegation of tasks, population-based techniques, identification of best practices, and patient-centered tools suggests that we have begun a cultural transformation in our skills, our services, and our roles.

DISCUSSION

Our experience has taught us that adhering to a leadership model is essential to enacting changes of the magnitude we have achieved. We have also learned that sustainable improvement requires: 1) clinical leadership that utilizes "pull" rather than "push" strategies to align incentives among all stakeholders; 2) tools that not only improve measurable quality, but also alleviate – or at least not worsen – clinicians' already burdensome work flow demands; 3) combinations of interventions that are aimed at patients as well as providers; 4) an enduring recognition that most of what constitutes quality can't currently be measured. While measurable quality is an essential component of overall quality, we believe that over-attention to measurable quality compromises care if it leads to inattention to other non-quantifiable dimensions of care – most notably, the time we need to invest in our healing relationships with our patients[11].

Joel C Berman is a family physician at Concord Hospital Physicians Group, a fully-owned primary care department of Concord Hospital. For the last two years, he has been a clinical advisor for the organization's electronic medical record. His team has created several disease registries to facilitate more effective and efficient management of chronic conditions such as diabetes, cardiovascular disease, and hypertension. The team has also created evidence-based templates within the electronic record that standardize the organization's approach to complex primary care problems such as outpatient anticoagulation management, smoking cessation counseling, and chronic opioid management.

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