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Physician profiling for quality improvement in a diabetes chronic care clinic

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Physician Profiling for Quality Improvement

in a Diabetes Chronic Care Clinic

by

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A CAPSTONE

Presented to the Department of Biomedical Informatics

and the Oregon Health and Science University

School of Medicine

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Certificate of Approval

This is to certify that the Master's Capstone Project of

Amy C. Norcom

*"Physician Profiling for Quality Improvement
in a Diabetes Chronic Care Clinic"*

Has been approved

_____
David A. Dorr, MD, MS

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Abstract

OBJECTIVE: To find an acceptable method of presenting guideline adherence or "profiling" data to primary care providers in a chronic diabetes clinic.

METHODS: We presented guideline adherence data to a select group of clinicians and gathered verbal and written feedback. This feedback informed changes to the data presentation, and a new version was presented to six physicians in a second round of feedback, gathered through one-on-one interview sessions.

RESULTS: In our second round of feedback, our data presentation gained much acceptance. All interviewees either strongly agreed (5/6) or agreed (1/6) that the information was useful. In addition, all six either strongly agreed (3/6) or agreed (3/6) that the information was likely to improve patient care. Constructive comments were plentiful, and suggestions for changes to the graphs and tables fell into five groups: changes in format, appearance, content, presentation, and specific guidelines.

CONCLUSION: Our final format for presentation of profiling data to physicians is acceptable to incorporate into an overall diabetes management program; however, there is more work to be done before the feedback tool can be integrated with the electronic health record and implemented in a monthly profiling system.

Introduction

Diabetes and other chronic diseases can greatly diminish the quality of life for the people who live with them, leading to disability and high need for health care services. Patients with chronic disease, if treated promptly and with evidence-based care, can avoid many of these disabling complications, prolong lives, and reduce resource consumption. Chronic diseases require more proactive health care than our current health system allows. A paradigm shift toward a proactive, patient-inclusive chronic care model [1] is underway in primary care, and Oregon Health and Science University is participating in a collaborative that aims to implement and study this new model in academic settings. Decision support and clinical information systems are two of the six elements in the chronic care model, and strategies such as guideline adherence feedback can help health care providers to improve the quality of care that they provide to patients with chronic illness.

Diabetes

Over 1.5 million people die in the United States each year from chronic disease. [2] Estimates of the US population suffering from chronic conditions, including arthritis, heart disease, hypertension, and diabetes, range from 15% to 45%. [3, 4] Direct health care costs for people with chronic conditions account for 75% of the total national expenditure for health care, with diabetes alone accounting for 10%. [4, 5] It is estimated that 20.8 million Americans have diabetes mellitus, although nearly a third of these are undiagnosed. An additional 41 million have prediabetes – a blood glucose level that is

elevated but not high enough to be classified as diabetes. [6] Type II diabetes accounts for 90% to 95% of all diagnosed cases of the disease, and it continues to grow at an epidemic rate.[7]

Hyperglycemia, an abnormally elevated blood glucose concentration, is the hallmark of diabetes. Testing for blood glucose levels over a two- to four-month period can be accomplished with a blood test for glycosylated hemoglobin, or hemoglobin $A1_C$ ($HbA1_C$). In patients without diabetes, hemoglobin is approximately 4% - 6% glycosylated, while patients with consistently elevated glucose levels have a higher percentage of $HbA1_C$. [8] Left untreated, hyperglycemia can cause microvascular disease, leading to extremely serious complications such as kidney failure, heart disease, neuropathy (nerve damage), retinopathy (retinal damage sometimes leading to blindness), and diabetic foot disease which can sometimes require amputation.[9]

The first-line treatment for diabetes is lifestyle change. Changes including consistent blood glucose monitoring, healthy diet, exercise, weight loss, and smoking cessation can sometimes improve blood glucose control enough that no further treatment is necessary.[10] Where this is not possible, blood glucose lowering agents may be needed. There are many other important treatments and guidelines that diabetic patients may need to stay healthy. For example, blood pressure control reduces the risk for heart disease and stroke among people with diabetes by 33%–50%. [6] Cholesterol-lowering agents can reduce the possibility of cardiac complications, and regular eye and foot exams are crucial screenings to detect diabetic retinopathy and foot disease, respectively, before they

become a serious threat. Diabetic patients are also at increased risk for infections, and a

pneumococcal vaccine and an annual influenza immunization are highly recommended to

protect against these common pathogens. [21]

Many health care quality organizations have responded to the need for standardized

guidelines on these treatments. One such organization is the Ambulatory Care Quality

Alliance (AQA), a broad based collaborative dedicated to quality and patient safety. The

guidelines disseminated by organizations such as the AQA have been established to

monitor patient processes and outcomes which can decrease complications and improve

quality of life in the diabetic population. Implied in these recommendations are the long-

term monitoring and treatment of these disease; therefore, it is extremely important that

the system of care support longitudinal, active follow-up for diabetic patients to keep

adherence to these guidelines as high as possible.

The Chronic Care Model

The current health care model in the US focuses on acute, episodic health concerns, and

generally provides quick-fix treatment rather than prevention. These practices have

become a rapidly growing concern in health care. This concept, known as the "Tyranny

of the Urgent" [1] prevents patients from receiving sufficient counseling and support for

chronic disease management. The Chronic Care Model, developed by Ed Wagner, MD,

of Seattle's MacColl Institute for Healthcare Innovation, consists of six essential

elements: community resources and policies, health care organization, self-management

support, delivery system design, decision support, and clinical information systems.

Figure 1 is a graphical depiction of these elements. [11]

Figure 1: The Chronic Care Model.

Community
Resources & Policies

Health System
Organization of Health Care

Self-Management Support	Delivery System Design	Decision Support	Clinical Information Systems
Advocacy	Providers	Guidelines	Registries
Resources	Roles Clear	Provider Education	Reminders
Skills Training	Communication &	Specialty Support	Measurement
Role Adaptation	Follow-up System	Feedback	Feedback

Informed, Activated Patient

Productive Interactions

Prepared, Proactive Practice Team

Functional and Clinical Outcomes

Adapted from Wagner EH. Chronic disease management: What will it take to improve care for chronic illness? Effective Clinical Practice. 1998;1:2-4.

The Association of American Medical Colleges has launched the Academic Chronic Care

Collaborative (ACCC) to promote improved quality of care in chronically ill patients.

The twenty-two US medical schools and teaching hospitals participating in this

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collaborative have agreed to extensively redesign their chronic care strategies to put Dr. Wagner's model into practice.

Oregon Health and Science University (OHSU) is one such institution. Albert DiPiero, MD, Judith Bowen, MD, and David Dorr, MD, among others, are investigating the effect of a clinic focused on diabetes care, the Chronic Illness Management (CIM) clinic, within the Division of General Internal Medicine (GIM) at OHSU. The CIM clinic was established in 2003 with the goal of improving the processes and outcomes of care in diabetic patients followed in the clinic. An additional goal of the clinic is to improve resident physician knowledge about managing diabetic patients under the chronic care model. [12] A team approach is used in the clinic to work with patients to develop self-management skills and keep the lines of communication flowing between the patient and the rest of the multidisciplinary team.

Diabetic patients followed in the GIM clinic are entered into a diabetes registry database. The registry collects demographic information and clinical data on each patient for use in measuring clinical processes and outcomes. In this capstone project, we used data from this registry to determine each provider's adherence to specific practice guidelines within his diabetic patient population and present this information back to the provider in such a way that an overall improvement in patient care could be facilitated. David Dorr, MD provided the expertise necessary to convert raw data into usable charts and tables, as well as overall guidance for the larger project. Figure 2, borrowed with permission from Dr. Dorr, details the important steps in the process of creating the longitudinal measures,

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aggregating them over populations, and assigning and delivering population reports to individual PCPs. The technical details involved in these steps are generally beyond the scope of this report.

Figure 2: Conceptual Design of Clinician Feedback System.
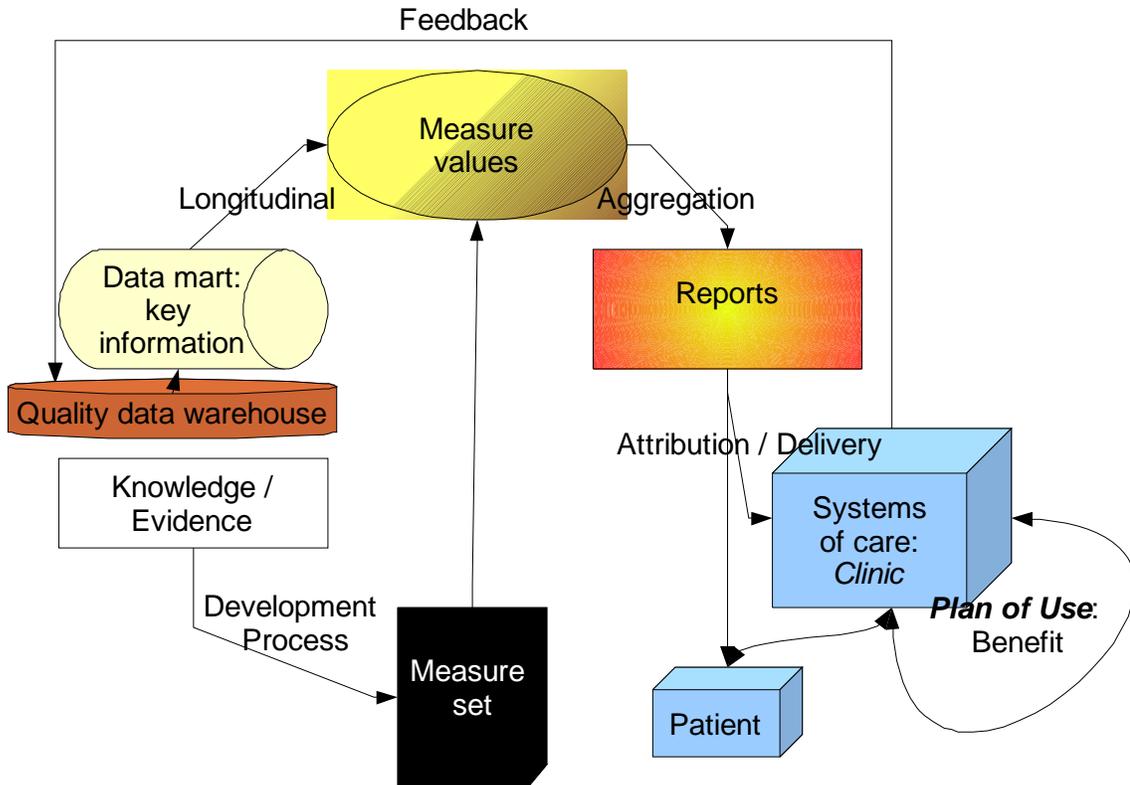
Figure from personal communication with David A. Dorr, MD MS, May 1ˢᵗ, 2006

Clinical Decision Support

Using data from the diabetes registry in this way is an example of the broader field of clinical decision support, one of the key elements of the Chronic Care Model. Clinical decision support is defined by the Healthcare Information Management Systems Society (HIMSS) as "[that which provides] clinicians or patients with clinical knowledge and patient-related information, intelligently filtered or presented at appropriate times, to

enhance patient care." [13] In this project our clinical decision support focus will be on guideline adherence and physician feedback, also known as profiling.

Physician attitudes about profiling

Profiling is simply the analysis of physician practice patterns for purposes of quality improvement or performance assessment. Physicians are often skeptical of profiling.[14] Many believe that they know how to care for their own patients without being held to strict guidelines. Some may have concerns about potential financial penalties associated with profiling, and indeed initial profiling attempts by managed care organizations in the late 90s – associated mostly with financial incentives – resulted in a significant backlash by providers.[15] Generally, performance measurement for the purposes of quality improvement are accepted much more readily than performance measurement to assess competence.[16] By avoiding incentives or penalties, and focusing on quality improvement and education, we hoped to create a positive response to our intervention.

There are myriad other critiques of guideline-based profiling and of practice guidelines in general. A patient with chronic disease may see a specialist for this disease, which could cause his primary care physician to omit testing that has been done in another clinic. In this case, any profiling of the primary care physician may not be indicative of her practice patterns.[14] In addition, a given patient population may be "sicker" (having more comorbidities, more severe disease, or being more elderly and frail) and goal setting for the patients may reflect a different set of needs, obviating the applicability of the guidelines. Others disagree with the concept of guidelines because they feel that

medicine is a complex science and guidelines are oversimplified or "cookbook".[17] There

is some skepticism about the statistical significance of profiling data in normal-sized

practice populations, as well.[18, 19]

Clinicians may also disagree with specific guidelines, and in some cases may receive

conflicting recommendations from various expert groups.[20] Prostate cancer screening

through prostate-specific antigen, for example, is recommended by the American

Urological Association and the American Cancer Society beginning at age 50, but is

recommended against by the American College of Physicians and the US Preventive

Services Task Force.[21] This type of discord may cause difficulty for physicians who are

attempting to embrace a more evidence-based paradigm.[22]   Fortunately for our project,

diabetes mellitus is a disease in which the experts do agree on a good many quality

measures.

Diabetes care guidelines

Diabetes practice guidelines, as previously discussed, include process and outcome

measures based primarily on keeping blood glucose levels under control and protecting

against microvascular disease, which in turn may cause serious cardiac, renal, and other

complications. Process measures (e.g., whether a patient has had an LDL test in the past

year) determine whether preventive guidelines are being followed, while outcome

measures (e.g., a patient's actual LDL level) determine whether an intervention has

helped a patient gain better control over a disease process. Health care quality

organizations use practice guidelines for varying purposes. Some of the major

organizations are listed here, along with the general aim of each.

The AQA, consisting of a large contingent of clinicians, consumers, purchasers, and

health plans, has standardized a "starter set" of 26 clinical performance measures to be

used in the ambulatory care setting. The Agency for Healthcare Research and Quality

(AHRQ), a federal agency dedicated to improving health care quality and patient safety

in its own right, is a member of this coalition. The National Committee for Quality

Assurance (NCQA) focuses on the quality of health plans. The NCQA created the Health

Plan Employment Data and Information Set (HEDIS) to assess health plan and provider

performance information, primarily in Health Maintenance Organizations (HMOs). The

employer-led Bridges to Excellence (BTE) coalition is a pay-for-performance (P4P)

initiative which uses HEDIS data to determine physician compensation based on

guideline adherence. The Centers for Medicare & Medicaid Services (CMS) are looking

to incorporate BTE practices as part of their own P4P initiative. The National Quality

Forum (NQF) is a non-profit organization that endorses quality standards for

measurement and public reporting.

These groups strive for a truly standardized set of guidelines, but there is much work to

be done before this goal becomes a reality. Table 1, adapted from a report written for a

health care quality committee in Oregon [23], shows diabetes quality measures

recommended by some of these major health care quality organizations as well as those

used in the CIM clinic at OHSU's division of General Internal Medicine. We can see

that out of ten measures, six of them are recommended by at least two organizations, and all but one of the measures listed are adopted for our feedback tool.

The aim of the CIM clinic is to improve processes and outcomes of care through implementation of a chronic care approach. Our specific project aims to further this goal by finding the physician preferred way to present guideline adherence data to the faculty and resident physicians who rotate through the clinic. We hypothesize that our iterative formulation of graphs and tables followed by feedback sessions to assess usability and satisfaction will providers accept the feedback in a positive, useful way. It is our hope that the final product will improve patient care and outcomes, but such an evaluation is outside the scope of this project.

Table 1: Diabetes Quality Measures Matrix.

Measure	HEDIS**	AQA/AHRQ	BTE/NCQA	GIM Feedback
HbA1$_C$ Monitoring	H	X		X
HbA1$_C$ Control		X	X	X
Blood Pressure Monitoring		X		X
Blood Pressure Control			X	X
Complete Lipid Profile	H	X	X	X
LDL Cholesterol Control		X	X	X
Aspirin Therapy				
Eye Exam	H	X	X	X
Foot Exam			X	X
Nephropathy Assessment	H		X	X

Table 1: Diabetes Quality Measures Matrix: Recommendations by Different Organizations
Source: Adapted from O'Kane N. Measuring Health Care Value in Oregon: Ambulatory Care. Prepared for the Oregon Health Care Quality Corporation Expert Committee, October 2005.
** H: Indicates an administrative measure used by the Health Plan Employer Data Information Set (HEDIS). The standardized set is supported by NCQA and used to publicly compare performance and quality improvement of different health plan populations.
AQA / AHRQ: The Ambulatory Care Quality Alliance and Agency for Healthcare Research and Quality
BTE / NCQA: Bridges to Excellence and National Committee for Quality Assurance
GIM CIM Feedback: Measures chosen by the CIM clinic, of the General Internal Medicine division of OHSU

Methods

We aimed to meet our research goals through cycles of presentation of guideline adherence/profiling data to a select group of clinicians, followed by feedback sessions to inform the next round of graphs. For purposes of this specific capstone project, we completed two iterations of this cycle. Our findings will ultimately inform a monthly profiling system which will integrate with the University-wide EHR and facilitate patient contact through easy-print patient lists with phone numbers and eventually printable lay language information sheets for patients.

Subjects and Setting

Our first round of feedback was collected verbally and with a basic preference form following the initial presentation of data. This presentation was given during a faculty meeting of the OHSU Division of General Internal Medicine, and the preference forms were completed and returned by the end of the session. This session stimulated discussion among approximately seven or eight faculty members, and four preference sheets were formally submitted.

The second round of feedback was gathered in a series of one-on-one semi-structured interviews in faculty members' offices. All physicians and residents who see patients in the diabetes Chronic Illness Management clinic were eligible to participate in the study. Recruitment for the interviews was performed by Dr. DiPiero. No monetary or other incentives were offered in exchange for participation. Six providers from the practice completed interviews.

Chosen Measures

The final guideline measures to be implemented in the CIM clinic were adapted from various quality initiatives and from chronic disease collaboratives such as the Chronic Care Model ACCC group. Criteria for selection were whether the measures were accurate representations of the quality of care provided to the patients in the clinic, were feasible to measure, and were of high importance.

<u>Presentation of Feedback Data</u>

We wanted to avoid any potential negative reactions from the physicians, and present our information in a helpful and non-confrontational way. We refrained from using the terms "benchmarking" or "profiling", as these terms have historically not been well-received. Instead we used neutral terms such as "feedback" and "quality measure data". We also made it very clear that the information was being presented only for educational purposes.

Round One – Presentation

Our initial graphs to display physician adherence to care guidelines contained actual non-blinded data from the registry, but names were changed to generic, fabricated names to first introduce the concept of the charts before displaying names and individual clinician averages. The overall look of the graphs was our primary assessment goal for this stage. Three bar charts (Appendix A) were shown on an overhead projector during a faculty meeting, generally charting adherence of a physician's patient population to a series of treatment guidelines. Chart A was a clustered bar chart, containing information only about a hypothetical physician's "performance" (based on percentage of that physician's patient's adherent to a specified guideline) as compared to the practice average. Chart B compared each physician in the practice to the national guideline on one metric only. Chart C (Figure 3) was a stacked bar chart, and showed the quarter-over-quarter increase in the percentage of each provider's patients adherent to four chosen guidelines.

Round Two – Personal interviews

Feedback from the first graphs informed the next round of graphs. These were eleven simple run charts containing six months worth of data, and each physician was compared only to the practice average (Appendix B). This data, along with more detailed tables and an explanatory page, were presented to six physicians during ten- to thirty-minute interviews.

<u>Physician Feedback</u>

In addition to the verbal feedback that was gathered in our first session, a preference sheet with extra space for comments was distributed (Appendix C). Respondents were asked to rate the three charts in order of preference, and were given space for any comments or questions about each chart. In the second feedback iteration, a semi-structured interview instrument was developed to capture physician attitudes and preferences in the presentation of performance data (Table 1). This questionnaire included 8 questions, which were either 5-point Likert type, yes/no, or text only (Table 2). Comments were welcomed on all questions as well.

Table 2: Questionnaire 2

#	Question/statement	Question type
1	The information presented in these Web pages is useful	5-point Likert + text
2	I felt that these Web pages had problems or downsides	5-point Likert + text
3	Would you make any changes to the format or appearance of the graphs?	yes/no + text
4	Would you make any changes to the format or appearance of the tables?	yes/no + text
5	Would you add or remove any of the information presented?	yes/no + text
6	What do you think you will actually do with the information presented?	text
7	Is there anything you would change (in content or presentation) to increase the chance of the information being used to its full potential?	yes/no + text
8	I believe that the information presented in the profiling document will improve patient care	5-point Likert + text

Items were based on perceived usefulness and drawbacks of the information, format and appearance preferences for the graphs and tables, overall impression of clarity and content, and speculation about whether and how receiving this data might lead to improved patient care. In addition, several iterations of feedback were given by Dr. DiPiero and other key individuals involved in the project during the development phase of the project.

Implementation of Feedback

Feedback from the interviews was prioritized and incorporated into the profiling tools through a consensus process. Technically challenging or major additions to the tools were prioritized for later iterations, while other changes are being incorporated prior to the first distribution.

Results and Discussion

The feedback we received on our first attempt at profiling graphs was instructive, and we were able to make some formatting changes that turned out to be very well received. Links to patient tables with easily accessible contact information were added to the charts, and an explanatory page was developed to give more detailed instruction about the graphs and the guidelines measured. Our second round of graphs was quite a bit more promising than the first. We garnered a great many useful suggestions in our one-on-one interviews, which will be implemented in the larger profiling project, but are beyond the scope of this capstone project.

Round One Feedback

Four preference sheets were returned after the first feedback session. Three of the four ranked the three charts presented, and all of the three chose Chart A (clustered bar chart comparing physician vs. practice average) as their first preference. All three also chose Chart B as second preference and Chart C third. The few comments made centered chiefly around clearer labeling of the graphs and the insertion of a goal line. There were also several negative comments about Chart C (Figure 3); one reviewer commented, "Too confusing, I wouldn't spend the time to try and decipher this." In the verbal comments, two people did not appreciate the comparison to peers, and two thought that it was not useful to see the progression over time.

Shift to Run Charts

Comments and feedback from round one were incorporated into our second round of graphs and tables. Chart C was widely disliked, and this fact on top of the other comments made it apparent that the providers strongly preferred a simple graphical display. Graph A was the most preferred example, but physicians did want to see their results over time. Therefore, run charts (or Statistical Process control charts) were chosen as the most simple graphical display that included prior performance. Run charts were generated for each metric, and output into a single HTML document for each provider (Appendix B). Charts were linked to list of non-adherent patients for each set of measures. Like measures were put into each of these tables; for instance, $HbA1_C$ tested in the past 6 months is in the same table with $HbA1_C$ level, and pneumovax is in the same table as flu shot. These tables also contained patient names, medical record numbers, and phone numbers, and were sorted with the longest overdue or most above acceptable measure patients at the top (Appendix D).

Another table containing a grid of all patients and all measures, sorted by the highest number of non-adherent measures was also developed (Appendix E). In addition, an explanatory page – linked through both the graphs and the tables – gave a more detailed description of the graphs and the guideline measures chosen.

Figure 3: Chart C from Round One.

Total % Change in # Patients Adherent

Legend:
- %mgmt plan
- %monofilament
- %HbA1c <7
- %HbA1c test
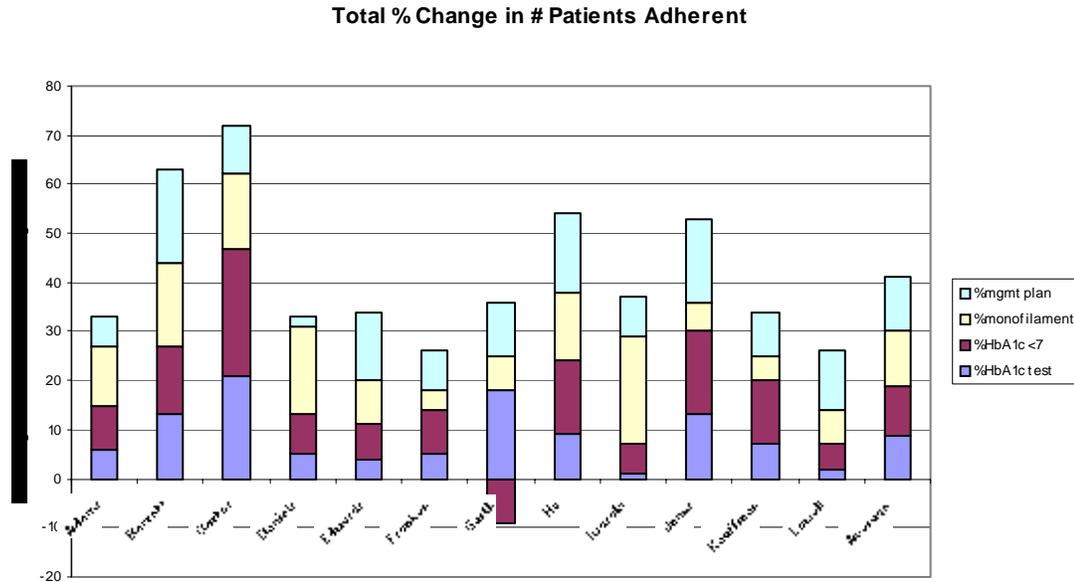
Round Two Feedback

The physicians were positive overall about the benefits of the information presented. On a five-point Likert scale, five out of six interviewed strongly agreed to the statement, "The information presented in these Web pages is useful," and the remaining respondent agreed (Figure 4). One commented that the graphic display over time was very useful, and another said, "This is a great motivator. The fact that they can link right to the list and it's easy to do is great, and makes an immediate intervention very feasible."

Figure 4: Questionnaire 2 Data, Item 1

The information presented in these Web pages is useful
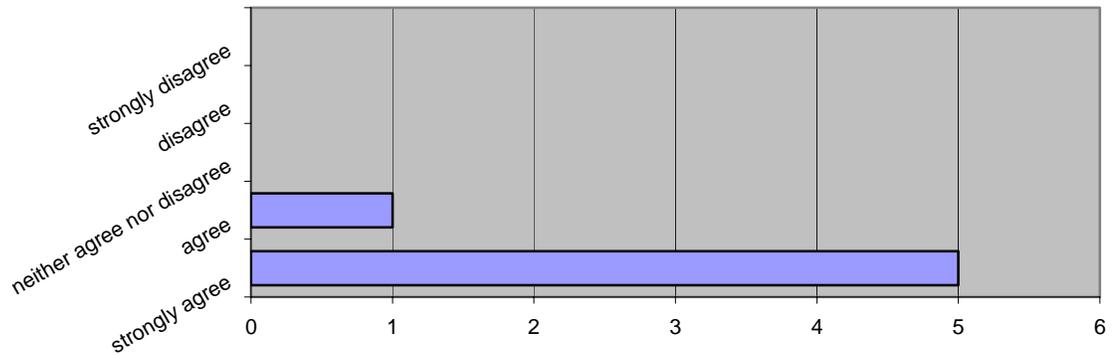
In a related question, also using a five-point Likert scale, four out of six respondents disagreed with the statement, "I felt that these Web pages had problems or downsides." One respondent strongly disagreed, and one agreed, with some very specific feedback about the appearance and format of the graphs and tables (Figure 5).

Figure 5: Questionnaire 2 Data, Item 2

I felt that these Web pages had problems or downsides
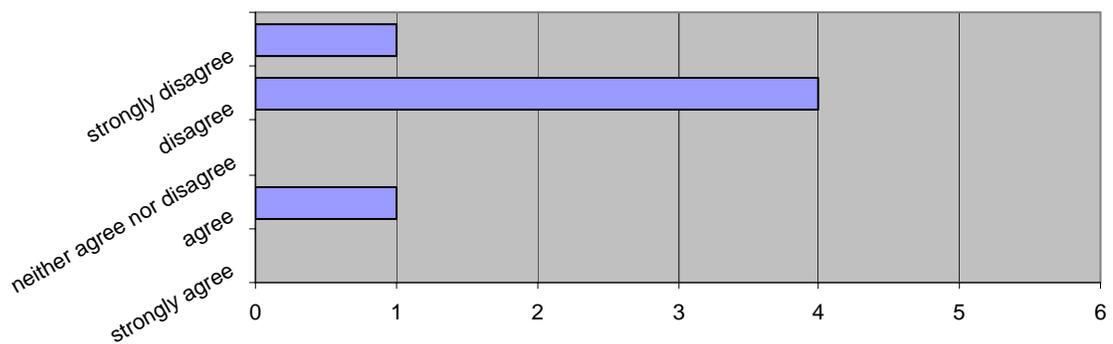
Questions 3, 4, 5, and 7 (Appendix D) were related to any desired changes in the format, appearance, content, or presentation of the graphs and tables. Five out of six answered yes to the question, "Would you make any changes to the format or appearance of the graphs?" and one answered no. Fewer had feedback about the appearance and format of the tables (4 out of 6 would not make any changes, while 2 out of 6 would make changes). Most respondents also seemed content with the type and the amount of information presented (4 out of 6 would not add or remove any of the information presented, while 2 out of 6 would). Five out of six said that they did believe there were changes that could be made in content or presentation to increase the chance of the information being used to its full potential, while one said no changes were needed. Comments from these four questions focused on three main areas: content, format, and presentation.

Content

Content-related suggestion topics included new functionality, changes in current functionality, clarification of labels, and addition of information.

Suggestions for new functionality ranged from linking the patient list to a printable patient recommendation sheet to linking information between the CIM registry and the patient record in other related clinics (GIM clinic, Casey Eye Institute). Changes to existing functionality were also suggested. On the comprehensive patient list, it was suggested that values could be entered into the outcome measure fields when the patient was not adherent to the established guideline, rather than a generic red mark. Also, one

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respondent was confused about the blood pressure metric, because although her patient's systolic blood pressure was below 130 mmHg, the patient was marked as non-adherent because the registry records mean arterial pressure. The suggestion was to make the label clearer if systolic blood pressure was not going to be used as the metric.

Label clarification was a common suggestion for both the tables and the graphs. We had chosen to leave labels off of the mean and confidence interval lines on the graphs for the sake of keeping them "cleaner" and more readable. We had provided a link to an explanatory page (Appendix F) below each graph, in which we had provided much more detail on the graphs. However, there was a definite preference for having the labels on the pertinent page. Some of the language used in graph titles and at the top of the graphs page was thought to be unclear, and in the tables a couple of the respondents mentioned that they would like the microalbumin measure to be labeled more completely.

Content additions requested were minor. For example, one respondent asked that first names as well as last names be added to the comprehensive patient list. Another requested the addition of the number of patients in the registry for each physician at the top of the graph page.

Format

Formatting comments were few, but those given involved color and font in the graphs and tables. A couple of respondents recommended the use of a larger font to label the

axes on the graphs, and one person thought that the background color of the graphs should be lighter than the background of the page.

Presentation

Presentation comments were also sparse, and involved frequency of delivery and delivery method. One physician thought that the information should be put into the "best practice alerts" section in EPIC, the electronic health record system used in the clinic. One hoped that the information would not be distributed by email, as many of the clinicians have too much email to sift through already and it might prevent the information from being readily accessed and utilized. Another suggested monthly distribution, rather than quarterly.

The final question on the questionnaire asked respondents to speculate on whether the information presented would improve patient care, using a five-point Likert scale (Figure 6). All of the respondents had a positive response to this question, with half (3/6) agreeing and half (3/6) strongly agreeing. One commented that, "So much still depends on whether the PCPs actually use the information." Another cited concerns about data accuracy within the registry but believed that once these issues were addressed, the information would be a great help in improving patient care.

Figure 6: Questionnaire 2 Data, Item 8

I believe that the information presented in the profiling document will improve patient care
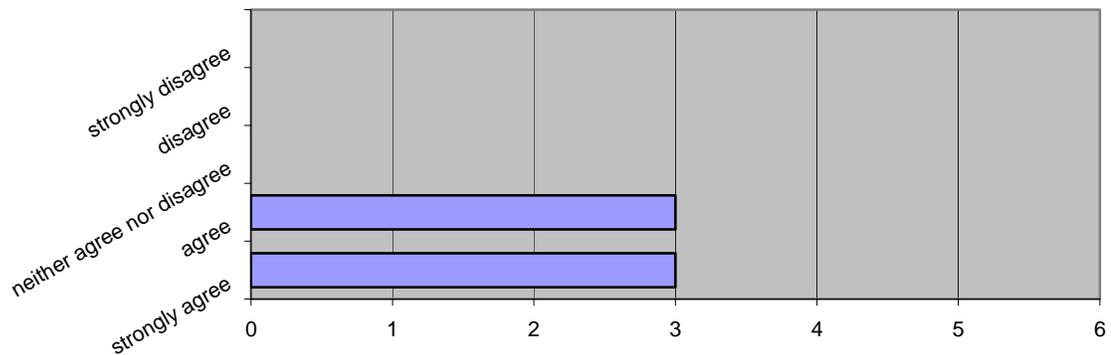
Feedback on Chosen Measures

Another type of comment that was scattered throughout the interview was about the specific guidelines used. Ultimately there were seven process measures and four related outcome measures chosen as practice goals (Table 3). These goals were chosen carefully by the leaders of the CIM clinic in conjunction with the ACCC and will probably not be altered, but these concerns and suggestions are worth noting.

One of the overall concerns was that on a population level, these measures make sense as goals. However, on an individual basis, meeting a specific guideline may not be practical and in fact may not be what is best for the patient. One physician suggested that it would be nice to have another line on the outcome graphs with slightly relaxed measures, so that they could see how many patients were at least close the stated goals. She gave the

example of the blood pressure guideline of < 130/80 mmHg. In some elderly patients, that is not a realistic blood pressure. Hypertension medications can be tough to titrate and lowering the blood pressure too much may lead to hypotension, which can cause dizziness or even fainting. In a case like this, coming close to the goal while not quite achieving it might be the best thing for that patient.

Another concern was that providers would be "penalized" with a negative mark for the microalbumin process and outcome measures in any patients with kidney disease. One provider noted that since patients with kidney disease will generally always have a higher microalbumin level, it would be fruitless to test for this once a year. Testing would result in a high microalbumin level, so the provider has no way to become consistently "adherent" to both of those measures in the case of patients with kidney disease.

There were several simple suggestions on the measures, such as adding a measure for an aspirin regimen, and adding the result (normal/abnormal) of foot exams. One respondent suggested that $HbA1_C$ be tested more frequently for those patients with a high $HbA1_C$ level. A third (2/6) of those interviewed did not believe that documentation of self-management goals was a relevant measure, since the fact that the patients are in the CIM clinic means that they must receive counseling about personal goals from staff as well as from their PCPs.

Table 3: CIM Clinic Chosen Measures.

Measure	Practice goals: % of pts adherent	Nat'l averages: % of pts adherent
Process measures		
HbA1$_C$ tested < 6 months ago	90	68.8*
LDL tested < 1 year ago	90	78.2[1]
Last eye exam < 1 year ago	70	61.9
Last foot exam < 1 year ago	90	66.6
Documented self-management goals	80	56.6[+]
Flu vaccine given < 1 year ago	90	45.9
Pneumovax given < 1 year ago	90	38.8
Outcome measures		
Microalbumin < 20 µg albumin/mg creatinine	65	54.8[2]
LDL ≤ 100 mg/dl	70	46.1[3]
HbA1$_C$ < 7.0	70	34.0[3]
BP < 130/80 mmHg	75	33.0[3]

Unless otherwise specified, data is from the Centers for Disease Control and Prevention. Diabetes Surveillance System: Preventive Care Practices, Behavioral Risk Factor Surveillance System 2004, U.S. rates. Available at: http://www.cdc.gov/diabetes/statistics/preventive/mUSMenu.htm. Accessed March 7, 2006.
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* HbA1$_C$ tested 2 or more times in the past year
+ Has been to a self-management class

Conclusion

Chronic diseases such as diabetes can lead to disability and diminished quality of life. Caring for these diseases can (but doesn't have to) be very resource intensive, currently consuming more than 70% of the US health care dollar. Our current care model often focuses on quick fixes to the exclusion of consistent preventive care, but the Chronic Care Model of disease is beginning to take root in our academic primary care clinics. Changes in physician practice patterns are sometimes difficult to implement, but can be very effective in conjunction with other chronic disease interventions.

We aimed to present guideline adherence data to physicians in a useful and satisfactory way, in order to facilitate patient contact where needed and ultimately improve quality of care. The physician feedback from our initial presentation of the data heavily influenced the changes we made, and the second presentation garnered a much more positive reaction. Our results suggest that when feedback is solicited and changes are made to reflect physician preferences, the results are well-accepted. The project may require additional iterations before the feedback tool is implemented in the clinic.

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Appendix A – Round One Charts

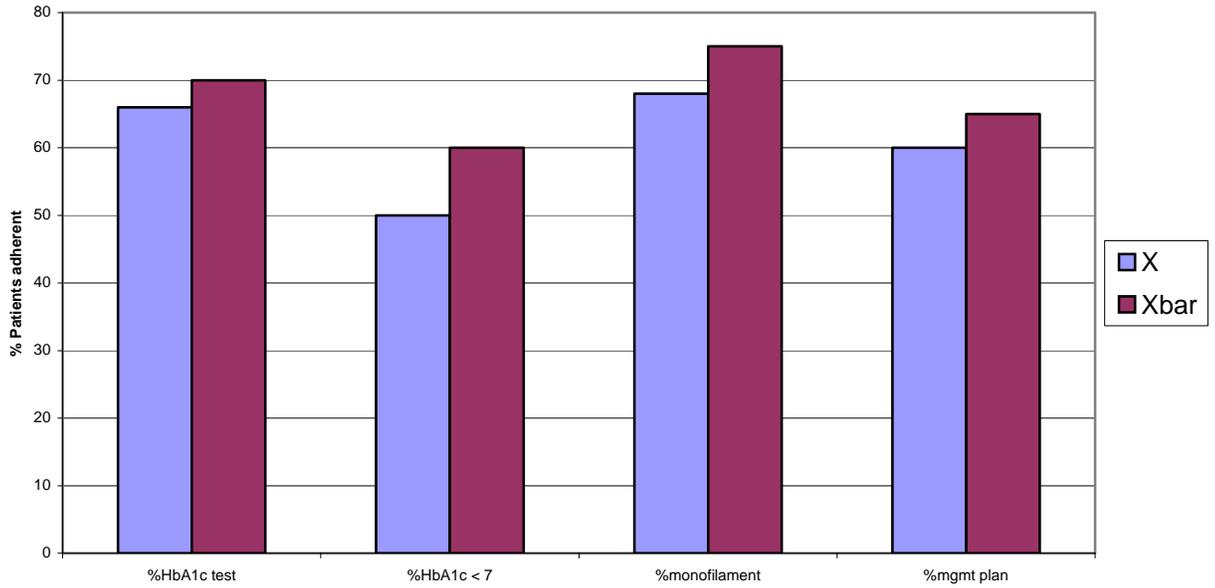## Chart A

Personal results vs. Clinic Average

Chart B

% Increase Q1 to Q2, # of Pts with Written Management Plan
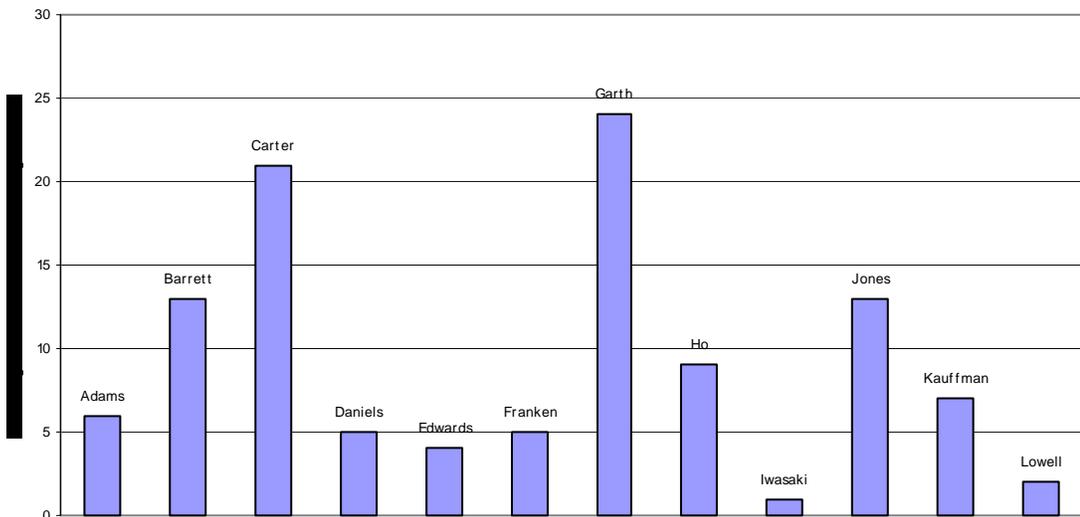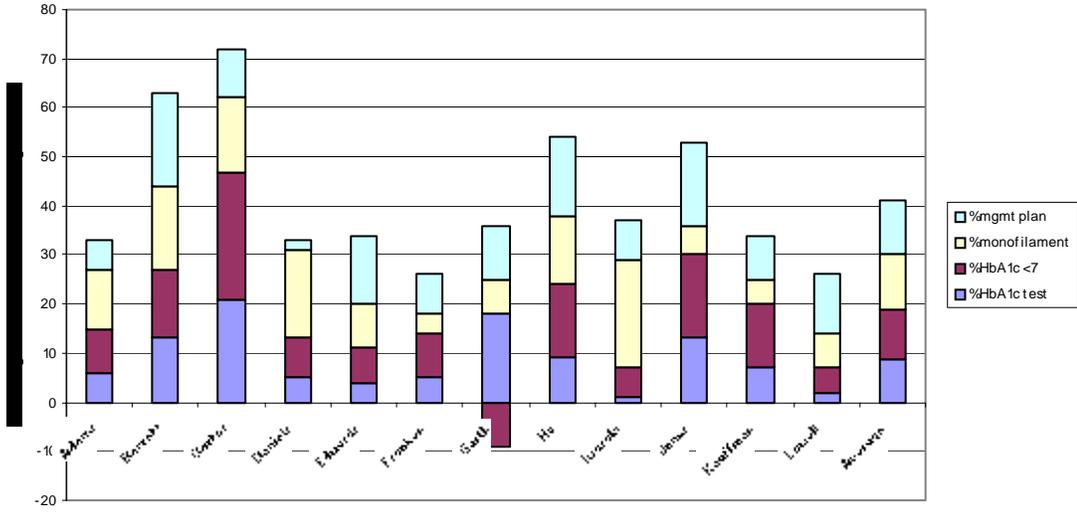
Chart C

Total % Change in # Patients Adherent

Appendix B – Final Run Chart Example
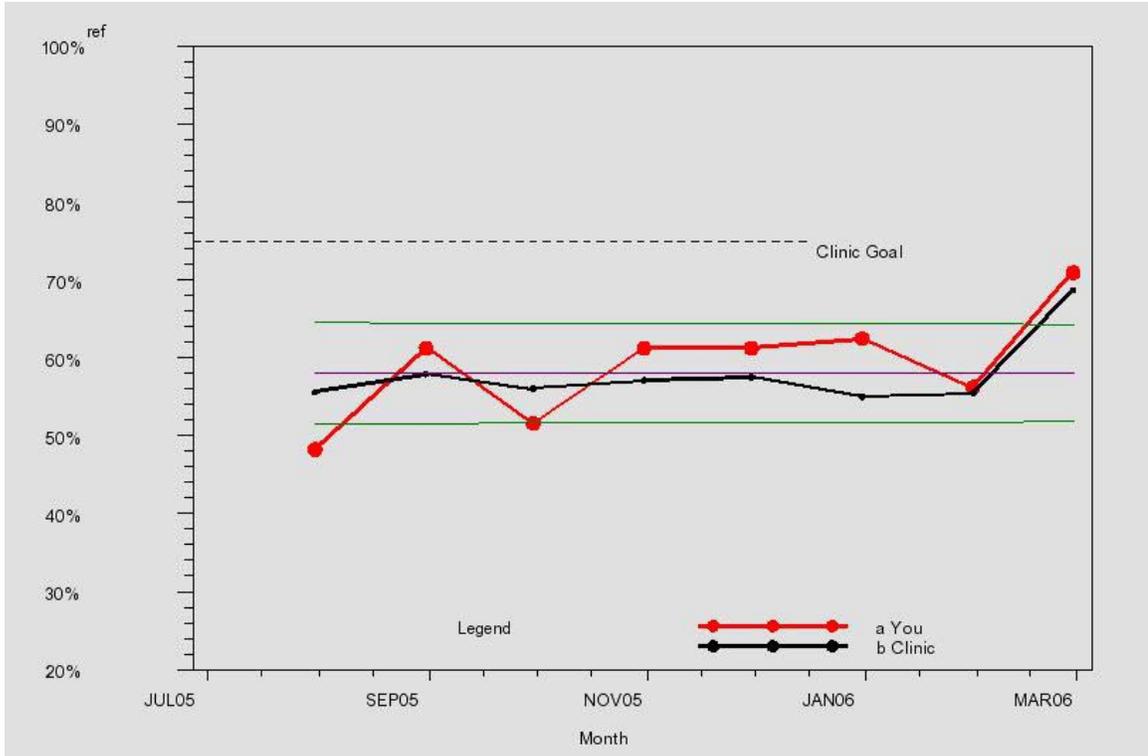
Appendix C – Questionnaire 1

Name _____

Please rank the 3 charts in order of preference, with 1 being the best and 3 being the worst:

_____ Chart A

_____ Chart B

_____ Chart C

Comments or questions about the charts:

Chart A:

Chart B:

Chart C:

Other feedback:

Are you willing to participate in Phase I of our pilot study? This will involve email questionnaires and/or short 1-on-1 feedback sessions.

_____ Yes

_____ No

Appendix D – Patient List, Specific Measures

Obs	MRN Last Name	First Name	PHONE	Last LDL	Date of LDL
290				112	10/17/02
365				63	02/19/03
418				94	04/18/03
532		Personal		76	08/20/03
551		Health		80	09/08/03
1602		Information		53	01/21/05
1630				67	01/24/05
1694				72	02/02/05
1752				85	02/07/05

Adherence for PCP [Protected] of LDL test
Patients not adherent to LDL test with PCP [Protected]

For explanation or feedback, click here

Appendix E – Complete Patient List

Complete list of patients for PCP

Protected

For explanation/feedback, click here

| MRN	Last name	Phone	HbA1c test<6mo	HbA1c<7	LDL test<1yr	LDL <100	bp<130/80	eye exam<1yr	foot exam<1yr	Doc SM goals	flu vaccine	pneumovax	microalbumin	albumin < 1 yr
			+	X	+	+	X	X	X	X	X	X	X	X
			X	X	+	+	+	X	X	X	X	X	X	X
			+	X	X	+	X	X	X	X	X	+	X	X
	Personal		X	X	X	+	X	X	X	X	X	+	X	+
	Health		X	X	+	X	+	X	X	X	X	X	X	+
	Information		X	X	+	X	+	+	X	+	X	X	X	X
			+	+	+	+	X	X	X	X	X	X	X	X
			X	+	X	+	+	X	X	+	X	X	X	X
			X	+	+	+	+	X	X	X	X	X	X	X
			+	X	+	+	X	X	X	X	X	+	X	X
			X	+	X	X	X	+	+	X	X	+	X	X
			X	+	X	+	+	X	X	X	X	X	+	X
			+	X	X	+	X	X	X	X	+	+	+	X
			X	+	+	+	+	X	X	X	X	X	X	+

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Appendix F – Explanatory Page

Explanation

This material is given to you to aid in population management of your patients.

The graphs

The file you linked to from the email has a number of graphs on it. Each graph has the average performance for you and the practice overall. The 95% confidence intervals for the practice are given as a reference, but your patients are a subset of the overall practice population and the distance above or below is just a relative reference and may not be statistically significant. If you have a small diabetic population, these are undoubtedly **not significant** and are only to help you see how your population is doing.
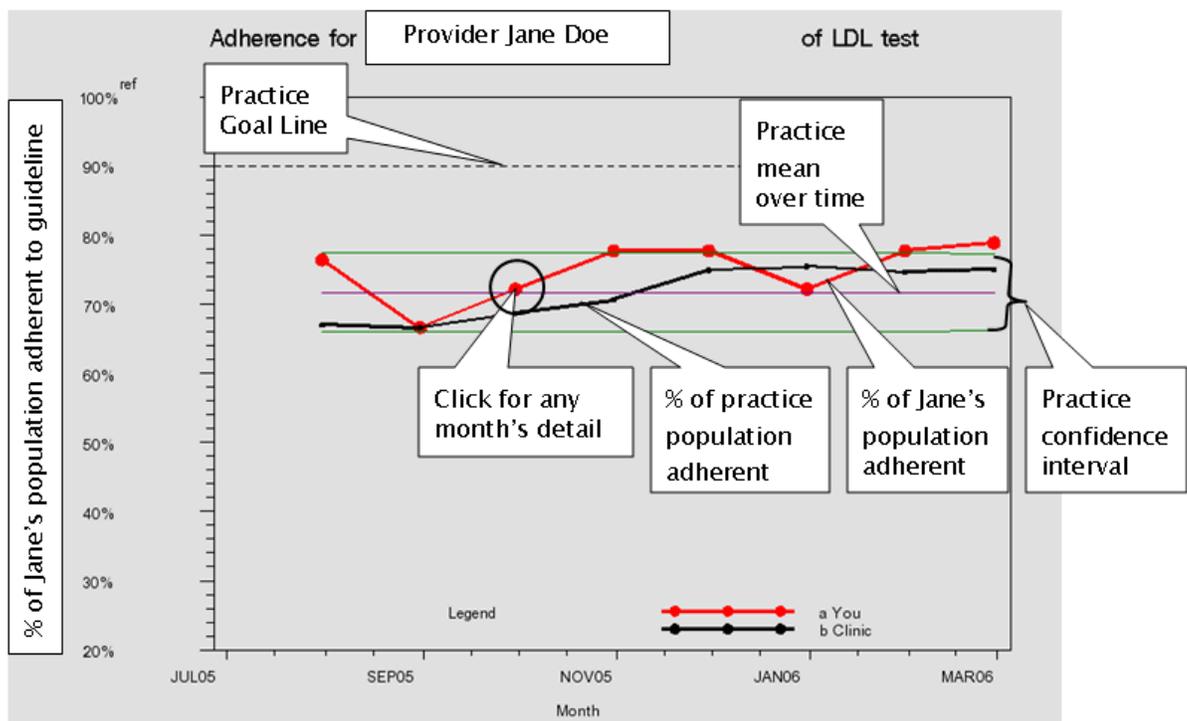
If you click on the dots on your line graph, you will go to a list of non-compliant patients (if you have more than 20 patients with diabetes) or a list of your patients and their current status.

The lists

When you click on a dot, you will go to a list of your patients. These either represent non-compliant patients (>20 patients with diabetes) or show all of your patients and their status for the entire set. These are intended to help you identify and schedule these patients for tests. Taking care of a population of patients is a team-based approach – you can forward these lists to others or send the reference of the file. To send the reference of the file, go to the list in question and select the URL then hit Edit … copy or Control-C. Then, enter the URL in an email by hitting Edit…Paste or Control-V. The person may copy the URL into their browser. Depending on your browser, you may have a File … Send link … option which will automatically send the link to someone of your choosing.

You can also print the list to give to others by going to File … Print or save a copy of the file through File… Save and attach it to a Groupwise email.

The practice goals

Measure	Practice goals: % of pts adherent	National averages: % of pts adherent
Process measures		
HbA1c tested < 6 months ago	90	68.8*
LDL tested < 1 year ago	90	78.2[1]
Last eye exam < 1 year ago	70	61.9
Last foot exam < 1 year ago	90	66.6
Documented self-management goals	80	56.6[+]
Flu vaccine given < 1 year ago	90	45.9
Pneumovax given < 1 year ago	90	38.8

Outcome measures		
Microalbumin < 20 µg albumin/mg creatinine	65	54.8[2]
LDL ≤ 100 mg/dl	70	46.1[3]
HbA1c < 7.0	70	34.0[3]
BP < 130/80 mmHg	75	33.0[3]

Unless otherwise specified, data is from the Centers for Disease Control and Prevention. Diabetes Surveillance System: Preventive Care Practices, Behavioral Risk Factor Surveillance System 2004, U.S. rates. Available at: http://www.cdc.gov/diabetes/statistics/preventive/mUSMenu.htm. Accessed March 7, 2006.
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* HbA1c tested 2 or more times in the past year
+ Has been to a self-management class

Feedback

Some patients on the lists may have barriers to care, may not be your patients, or have died or left the practice. Please send an email to dorrd@ohsu.edu to let Dave Dorr know of these issues. Please specify which issue has occurred.

Thank you!