

Original Article

Promoting Physicians' Self-Assessment and Quality Improvement: The ABIM Diabetes Practice Improvement Module

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Abstract

Introduction: *The American Board of Internal Medicine (ABIM) recognized that certification and recertification must be based on an assessment of performance in practice as well as an examination of medical knowledge. Physician self-assessment of practice performance is proposed as one method that certification boards may use to evaluate competence in practice-based learning and improvement and systems-based practice.*

Methods: *Sixteen practicing general internists and endocrinologists with 10-year time-limited certification participated in a beta test of the ABIM's diabetes practice improvement module (PIM) as part of their recertification program. A PIM consists of a self-directed medical record audit, practice system survey, and patient survey. A quality improvement education specialist from the Connecticut Quality Improvement Organization provided on-site and distance consultation on quality improvement methods and tools. An independent audit assessed the reliability of physician self-audit. Qualitative interviews were conducted at 2 time points to assess for physician satisfaction and behavioral change in quality improvement.*

Results: *Fourteen physicians completed the diabetes PIM. All but 1 physician found the medical record audit to provide important information about the practice. Of the 11 physicians who completed a follow-up interview, 10 stated that the quality improvement education specialist helped improve their practice.*

Discussion: *Self-assessment using the ABIM diabetes PIM as part of recertification provides valuable practice information and can lead to meaningful behavioral change by physicians. Collaboration with an educator in quality improvement appears to facilitate the effects of the practice improvement module. Future work should investigate the effect on patient outcomes.*

Key Words: Self-assessment, quality improvement, maintenance of certification

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Introduction

Recognizing that evaluation of knowledge was necessary but insufficient for certification of internists and subspecialists, the American Board of Internal Medicine (ABIM) determined in 1995 that evaluation of performance in practice must be included as a component of certification and recertification. A number of important studies¹⁻⁵ have demonstrated substantial variation in actual performance at the level of physician practice, especially for patients with diabetes. Although performance measurement and reporting at the health plan level (e.g., by the National Committee on Quality Assurance) and the hospital level (e.g., by the Joint Commission for the Accreditation of Hospitals) follow established protocols, assessment at the physician-practice level remains more difficult.⁶ Therefore, the ABIM sought to develop formative assessment methods to promote physician-directed measurement of their performance and quality improvement.

Taking a lead from the American Diabetes Association Physician Recognition Program in diabetes care,⁷ the ABIM developed a self-assessment tool of physician-level performance in practice. Developing this tool required selecting useful measures, developing a mechanism to make it feasible to collect the data needed for measurement, and providing useful feedback for physicians. The result is a Web-based self-assessment module named a “practice improvement module” (PIM) as one element of the ABIM’s revised recertification program.

The measures used in the diabetes PIM were selected from established, validated measures or crafted from evidenced-base guidelines.^{7,8} The final makeup of the PIM was determined by a consensus panel of physicians assembled by the ABIM. The methods for collecting the medical record, patient and practice data, and the algorithms used for aggregating and scoring the data were developed by ABIM using computer- and Web-based tools for data management and trans-

fer. PIMs consist of 5 core activities including a medical record audit, a survey of patients in their practice, an assessment of the practice’s microsystems, a physician-generated quality improvement plan, and a follow-up assessment of the effectiveness of the quality improvement plan. When the PIM is complete, the physician is eligible to receive 20 continuing medical education credits and credit toward maintenance of certification.

In the late 1990s, ABIM determined that asking physicians to collect data sufficient to generate a “passing” practice performance score would create excessive burden and would likely impede the more important goal of using practice measurement as a stimulus for learning and improvement.⁹ In 2002, all of the American Board of Medical Specialties boards adopted a similar approach and incorporated practice performance and improvement as 1 of 4 elements in the framework for the maintenance-of-certification program. By 2010, all specialty boards will include an assessment of performance in practice as part of their maintenance-of-certification programs.¹⁰ The ABIM will require physicians enrolled in the maintenance-of-certification program to evaluate their performance in practice starting in 2006.

To better understand how the diabetes PIM performs as a stimulus for physician-level quality improvement, the ABIM initiated a pilot study with Qualidigm (the Quality Improvement Organization serving Connecticut). The pilot had 3 specific objectives. First, we sought to determine the reliability of physician self-report on the medical record audit compared with experienced, trained medical record abstractors. Our second objective was to assess the value of collaborating with a state quality improvement organization that would provide quality improvement support to address opportunities for improvement identified by the PIM. Finally, we sought to understand the physicians’ experience and any changes in attitudes or behaviors shortly after completion of the data collection and then 6 months later.

Methods

Subjects

Internists and endocrinologists from Connecticut with 10-year ABIM certification were contacted through a single direct mailing to participate in the beta test. As incentives for participation, the physicians received the diabetes PIM at no charge (a \$125 value), credit for 1 module toward the maintenance of certification, 20 hours of continuing medical education (category 1 CME) credit, and assistance in completing the PIM from a quality improvement education specialist. Physicians are required to complete at least 5 modules to fulfill requirements for recertification. Participation by physicians in this study was voluntary, and physicians were not obligated to complete the module.

Interventions

Practice Improvement Module: The practice improvement modules (PIMs) take physicians step-by-step through a medical record audit, patient survey, and practice system assessment. The automated report of their performance on multiple measures guides the physicians to develop a plan for changes to improve care (Figure 1). The PIM is based on the quality improvement framework popularized by the Institute for Healthcare Improvement (<http://www.ihl.org/ihl>),¹¹ and the practice system analysis is based on the Wagner Chronic Care Model.^{12,13} During phase 1, the ABIM recommends that the physician perform an audit of 25, but at a minimum 10, medical records, entering data needed to calculate performance rates for evidenced-based measures of diabetes care, the characteristics of the patient sample, and chronic care services delivered by the practice. Physicians can use office staff to complete the medical record audit or perform the audit themselves (physician self-audit). The diabetes quality measures include hemoglobin A_{1c} levels, lipid levels, blood pres-

sure at the last visit, and clinical processes such as eye and foot exams. The practice system survey includes questions about the specific information management processes, patient access and reminder systems, and patient activation for self-care. All this information is collected and then submitted to the ABIM via the Internet.

The physician invites patients to complete a survey about their self-care of diabetes and service aspects of the practice using an automated telephone response system. This survey, developed by ABIM, asks about practice access, communication and interpersonal skills of the physician, education, and self-activation in the care of their diabetes. Using a prespecified scoring algorithm, ABIM then analyzes the data from 3 sources and returns to the physician a summary report of his or her performance. The physician interacts with this summary to select opportunities for improvement that are then automatically aggregated to develop a quality improvement plan. After 6 months, the physicians are reminded to submit an impact statement via the Web describing the effects of their quality improvement interventions. The PIM program automatically sends e-mail reminders to physicians to keep on schedule with data submission, planning, and reporting. Because this was a pilot study with defined timelines for the

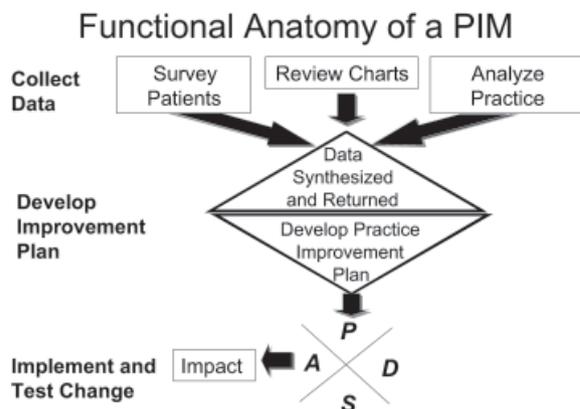


Figure 1

interviews, we allowed only 90 days for completion of all 3 components of the data collection.

Quality Improvement Education Specialist:

The quality improvement education specialist was a nurse from Qualidigm trained in quality improvement and communication skills. This individual provided several services. First, this quality improvement education specialist served as a local resource and an intermediary with the ABIM to troubleshoot educational and technical problems with the PIM. Second, the specialist met with physicians individually to discuss their performance results, answer questions, and serve as a quality improvement coach. Third, when requested, the specialist provided guidance on various quality improvement approaches the physicians could use to achieve the aims of their quality improvement plans. Fourth, the specialist provided a quality improvement tool kit with multiple tools and patient education materials physicians could use in their practice. Finally, the specialist was always available for in-office or telephone consultations.

Analysis

Reliability Analysis: Reliability of physician self-audit of records was calculated as the observed agreement rate between the diplomate's chart abstraction data and the Qualidigm nurse abstractor for 5 medical records abstracted for the PIM. Overall reliability was calculated based on the total number of variables that agreed between the nurse and the diplomate divided by the total number of possible variables. In addition to observed agreement, kappa statistics were calculated for categorical variables to assess the extent to which the observed agreement between the nurse auditor and the diplomate exceeded that which would have been expected by chance alone. For some variables, we created a dichotomous score for questions on the abstraction tool that had more than 2 cate-

gorical responses or that had continuous data responses. SPSS was used for all data analyses (College Station, Texas).

Quality of Diabetes Care: Quality of care was assessed using the self-reported medical record audits and patient surveys. The chart audit process measures included the proportion of patients receiving influenza and pneumococcal vaccines. Outcome measures included the proportion of patients with hemoglobin A_{1c} levels below 7%, systolic blood pressure below 130 mm Hg, diastolic blood pressure below 80 mm Hg, low-density-lipoprotein (LDL) cholesterol level below 100 mg/dL, and triglycerides below 150 mg/dL. The patient survey results are presented as the percentage of patients rating the particular aspect of care as excellent or not having any difficulty obtaining services from the practice itself.

Physician Assessment of the PIM: Qualitative interviews were conducted with the physicians at 2 time periods. The first interviews (survey 1) were conducted in person by the quality improvement education specialist just after the physicians had received their performance reports from ABIM. The specialist assessed the physicians' satisfaction with the PIM process, what they had learned about their performance, and what areas they viewed as opportunities for improvement. The second interview (survey 2) was conducted by 1 of the physician investigators (E.S.H.) by telephone at the end of the project. Physicians were asked to discuss what improvement goals they were working on as a result of the PIM and to reflect on what they learned through their participation, the value of the specialist in helping them bring about change, and suggestions for improvement of the PIM process. A semistructured questionnaire was used for both surveys. Content analysis was used to categorize responses.¹⁴ The study was approved by the University of Connecticut Institutional Review Board.

Results

Physician Subjects

Twenty-one physicians began the module and participated in the baseline medical record assessment. Sixteen completed the PIM data entry, and 14 completed all of the PIM's steps by the time of the follow-up interviews. The mean age of the 16 diplomates completing all data collection for the PIM was 46 years (range, 35–53), and 11 (69%) were women. Most (15 [94%]) were in private practice. One physician was a university faculty member based in a community-based primary care internal medicine residency program. Three were board certified in both internal medicine and endocrinology.

Reliability of Physician Self-Audit

A total of 104 medical records were reviewed among the 21 diplomates who completed at least 5 chart audits in the diabetes PIM. One abstractor inadvertently completed only 4 audits for 1 practice. When all observations were combined, the overall agreement scores between the trained abstractors and physician ranged from 75.7% to 94.3%, with an average reliability score of 85.7%. For individual variables, agreement rates ranged from 57% for the sensory foot exam to 100% for documenting end-stage renal disease. In all, agreement for 44 of 57 total variables was 80% or higher. Kappa statistics ranged from 0.11 for documenting protein restriction to 1.0 for type of diabetes for the 38 categorical variables assessed. Thirty-two of the variables (84%) had kappa values of 0.60 or greater, indicating excellent agreement.

Diabetes Care: Medical Record Audit

The demographics of the patients reported in this study are reported in Table 1. The majority of patients had type 2 diabetes mellitus, and diabetic complications ranged from 17% to 28% for

retinal disease, nephropathy, neuropathy, and cardiovascular disease. Most patients were treated with either single or combinations of oral hypoglycemic agents. Most patients had hypertension and hyperlipidemia. All physicians reported 80% or greater compliance for performing at least 1 measurement of hemoglobin A_{1c}, a lipid panel in the past year, and routine measurement of blood pressure. The average rate for influenza vaccination from the medical record audit was 69% in the past year and 67% for at least 1 lifetime pneumococcal vaccination, with a wide range of performance.

The proportion of patients meeting target goals for hemoglobin A_{1c}, systolic and diastolic blood pressures, and LDL cholesterol levels varied widely (Table 2).

Table 1 Results of Medical Record Audit by Physician: Patient Demographics (N = 313 Patients)

Measure	No. (%)
Demographics	
Female	171 (55)
Age, yr	
30-39	19 (6)
40-49	58 (19)
50-59	64 (21)
60-69	61 (20)
70-79	67 (22)
80-89	40 (13)
Type 2 diabetes	278 (89)
Hypertension	234 (75)
Hyperlipidemia	223 (71)
Obese	221 (71)
Diabetes complications	
Retinal disease	51 (17)
Nephropathy	80 (26)
Neuropathy	70 (22)
Cardiovascular disease	89 (28)

**Table 2 Results of Medical Record Audit by Physician: Patient Outcomes
(N = 313 Patients)**

Measure	No. (%)	Range of Performance Among Practices, %
Patients with systolic blood pressure <130 mm Hg	165 (53)	24–94
Patients with diastolic blood pressure <80 mm Hg	193 (62)	8–94
LDL cholesterol <100 mg/dL	162 (52)	16–88
Triglycerides <150 mg/dL	165 (53)	20–68
Hemoglobin A _{1c} <7.0%	155 (49)	28–80
Receipt of influenza vaccine	215 (69)	16–100
Receipt of at least 1 pneumococcal vaccine	210 (67)	14–100

Diabetes Care: Patient Survey

Patient ratings of specific aspects of the care differed substantially (Table 3). To many physicians' surprise, most patients were satisfied with the ease in making appointments and obtaining medication refills, test results, and referrals. Patients were much less satisfied with the education about their diabetes including diet, medications, and self-management. Only 30% of the patients rated the practices excellent for overall diabetes care.

Physician Assessment of the PIM Experience

Survey 1: Completion of the PIM Module: Fourteen physicians completed the interview for survey 1. Although the PIM permits medical record abstraction by staff, all 14 performed the abstraction themselves. Two physicians received assistance, 1 from a nurse and another from a medical assistant. After receipt of their initial data report, the physicians identified a number of areas for improvement. Table 4 lists the major opportunities for improvement physicians identified within their practices. The key finding was that all 14 physicians volunteered that they were not adequately performing at least some process of care.

When asked what they thought were the most useful aspects of the Diabetes PIM, the majority of the physicians (13 [81%]) indicated the medical record audit because it identified deficiencies that could be improved. Four physicians stated that the patient survey was most useful. Of the 14 physicians, 8 reported that at least some of their results were unexpected. Four physicians noted the discordance between their belief that access would be a major problem for their patients; instead, their patients rated the practice low in diabetes education. Three physicians were surprised by the audit results; they found that they were not doing as well as they would have predicted before receiving the summary of the audit results.

Survey 2: 6-Month Follow-Up After Completion of PIM: We interviewed 11 (79%) of the 14 physicians who completed all components of the PIM by June 2004. Reflecting on personal goals for participating in the study, 9 physicians stated that improvement in some aspect of diabetes care was their main goal. Three physicians reported that receiving credit toward recertification in internal medicine was an important goal. A clinician-educator in a residency program listed gaining experience in performing audits as a goal because of her lack of prior experience

Table 3 Patient Assessment of Their Diabetic Care (N = 236 Surveys)

	No. (%)	Range Among Physicians, %
Communication and Care Measures		
<i>Patients rating practice as excellent</i>		
How is this practice at showing understanding of what it is like to live with diabetes?	115 (49)	10–100
How is this practice at encouraging you to ask questions and answering them clearly?	130 (55)	40–100
How is this practice at making sure you have the information you need to take your medications properly?	126 (53)	30–70
How is this practice at making sure you check your blood sugar at home?	84 (36)	10–50
How is this practice at making sure you have the information you need to take care of your feet?	83 (35)	20–63
How is this practice at making sure you understand your recommended eating plan?	85 (36)	16–100
Access Measures		
<i>Patients responding “not a problem”</i>		
In the past 12 months, how much of a problem has it been to schedule appointments with this practice?	207 (88)	60–100
In the past 12 months, how much of a problem has it been to reach this practice when you have a question or concern?	196 (83)	40–100
In the past 12 months, how much of a problem has it been to get a prescription refill from this practice?	215 (91)	75–100
In the past 12 months, how much of a problem has it been to get a referral from this practice?	197 (83)	63–100
In the past 12 months, how much of a problem has it been to get your laboratory test results from this practice?	216 (92)	71–100
Overall Measure		
<i>Percentage rating as excellent</i>		
How would you rate your diabetes care overall?	94 (30)	0–68

and because her residents were performing audits as part of a curriculum in quality improvement. Finally, 2 physicians listed benchmarking their performance with other physicians as a goal. Only one physician listed getting CME credit as a personal goal.

Role of the Quality Improvement Education Specialist

Our second objective was to assess the value of a quality improvement education specialist. The quality improvement education specialist was an

Table 4 Most Common Physician Reports of What They Learned About Their Practice While Completing the Practice Improvement Module

Opportunity or Issue Identified	Physicians, No. (%) (N = 14)
Not performing at least 1 recommended process of care	14 (100)
Problems with office documentation practices	6 (43)
Problems with communication with specialist physicians	6 (43)
Problems with patient education	5 (36)

active participant and facilitator. During the first 6 months of the project, the specialist made approximately 70 individual contacts with the physicians. The type of communication (not including performing the first survey) included 22 in-person office visits, more than 40 phone consultations, and 6 e-mail contacts. In the follow-up survey, 10 of 11 physicians found the services of the education specialist to be helpful in completing the PIM and in implementing a quality improvement intervention. The specialist helped to implement a diabetes flow sheet for 5 physicians, with 2 physicians listing the flow sheet as the most useful outcome of the PIM experience. One physician listed the patient education materials offered by the specialist as the most useful outcome of the project. Other interventions brought by the specialist and used in the offices included wallet cards, fax-back documentation forms for eye specialists and podiatrists, diabetes education Web sites, and local information on smoking cessation classes. Two physicians noted that the specialist was essential to the success of the project.

Role of the Practice Improvement Module in Quality Improvement

The physicians reported the main benefit of the diabetes PIM was the identification of areas for improvement from both the medical record audit and patient surveys. One physician stated that

the chart audit, “reinforced to me how many things I was slipping up on. My percentage of what I thought I was getting done was lower than I would have estimated. It was good to go through the leg work to identify deficiencies, and it motivated me to do something.”

The results from the patient survey were also valuable. As one physician noted, “I was surprised at the high scores for [items] like making an appointment and getting through (by phones). I had expected these to be lower. On the other hand, despite doing a huge amount of education here (I pride myself on being very practical about the education), there were still areas where patients clearly felt they lacked understanding.”

Interventions and Physician Behavior Change

The most common intervention chosen to improve care was the initiation of diabetes flow sheets in the medical record (5 [31%]). All 5 physicians assumed the responsibility for putting them into the medical record themselves, rather than changing the work flow by having support staff perform this function. Other office system changes included developing a referral relationship with a podiatrist, starting a multidisciplinary team in the office for identifying and implementing improvement processes, displaying exam room posters to remind patients to examine their feet, sending postcard

reminders for overdue office visits, and using new patient education materials. Only 1 physician, an endocrinologist, shared the results of the audit with her medical assistant and enlisted her staff's help to screen for immunization status at each visit. More than 6 months after completing the PIM, 4 physicians were still trying to get their quality improvement interventions started. Time was cited as the main barrier for both the physicians and their staffs, consistent with a recent study of similar-sized practices.¹⁵ Other barriers were lack of access to specialists and communication problems with podiatrists and eye specialists regarding follow-up and obtaining results of exams and tests.

Discussion

In this small pilot study, the majority of participating physicians found that self-assessment using the ABIM's PIM was a valuable experience. A consistent theme was the value of the medical record audit. All the physicians identified areas for improvement in multiple processes of care through the medical record audit. This observation is important because we have little data on the effects of physician self-audit. A recent systematic review found that audit and feedback for diabetes at the individual physician level leads to modest improvement, but these studies did not involve self-audit by the physician.¹⁶ However, other reviews have found mixed results for audit and feedback.^{17,18} Finally, the PIM self-audit process provided an important needs assessment, previously shown to be an important prerequisite for physician change.¹⁹ Future work will need to determine if self-audit as performed in this pilot study leads to meaningful improvements in care.

Another important finding was the perceived value of a quality improvement education specialist from the state quality improvement organization. None of the participating physicians had

ever received any formal training in quality improvement. The specialist was a major facilitator for implementing change in most physician practices. Previous research has shown that educational outreach can be an effective intervention.¹⁸ A significant number of practices, even with this small sample, were not using basic quality improvement intervention tools such as flow charts, patient reminders, and preprinted patient education materials before this project. All of these materials were introduced by the specialist. Only 1 practice had performed medical record audits before starting the PIM.

Two other important findings were noted. First, the patient surveys were valuable for a significant proportion of physicians in assessing potential problems with patient-physician education. The specific questions on the patient survey produced information that was actionable for the physician. The second observation was that the high-quality performance data were more highly valued by the physicians than recertification credit or receiving CME credit. This finding was reflected in the myriad of quality improvement activities implemented or planned.

However, most of the quality improvement activities, from the audits to implementation of quality improvement interventions, were physician centered. Physicians identified a number of office systems problems, yet only one physician ultimately involved office staff in improvement activities.²⁰ Not surprisingly, few physicians commented on the utility or value of the practice system assessment section of the PIM. Future work with PIMs will need to develop approaches to more effectively engage physicians in practice redesign and avoid the "learn more and work harder" approach to change.

The study also has several other implications. First, the ABIM decided to implement the new American Board of Medical Specialties requirement for physicians to evaluate their performance in practice in January 2006. Practice improvement modules for multiple conditions will be 1 option to meet this requirement. Thus,

it was important for the ABIM to learn, at a minimum, the value of the PIMs to physicians who will need to use PIMs for recertification. Second, this study also highlights the next steps in the research needed to better understand the impact of the PIMs on patient care and outcomes. Does the self-audit experience, using a Web-based tool, lead to better care at the patient level? This study is a small first step.

The study has several limitations. First, the sample size was small, and the physicians were self-selected. We also did not mandate a specific sampling strategy for the medical record audit, although the PIM recommends that the physician use a prospective sequential sample. However, the wide variation seen among the physicians would suggest strongly that physicians were not “cherry-picking” patients for the PIM. In addition, the wide variation in performance allowed physicians to choose different interventions for quality improvement to meet their practice needs. This study also demonstrated that a tool like the diabetes PIM does facilitate meaningful reflection and behavioral change among practicing physicians.^{11,21} The study also demonstrates that self-audit, when performed as part of a formative assessment process, is statistically reliable for most measures.

Second, the quality improvement educational specialist is not a routine benefit of completing a PIM for recertification, so we do not know what specific aspects of this study are generalizable. The ABIM does plan, however, to continue to encourage state quality improvement organizations and medical societies to provide educational assistance. For example, the diabetes PIM contains links to the American College of Physicians Web site containing multiple quality improvement tools for diabetes care. The study was not designed to determine whether PIM completion leads to actual changes in patient care and outcomes. Further work should investigate whether the reflection and behavioral changes described in this study lead to actual improvements in patient care.

Lessons for Practice

- Self-assessment using practice improvement modules as part of maintenance-of-certification programs can lead to meaningful behavioral change by physicians in quality improvement.
- Collaboration with an educator in quality improvement as part of maintenance-of-certification programs can enhance the effectiveness of practice improvement modules.
- Assessment of performance in practice as part of the maintenance-of-certification programs has the potential to improve quality of care.

Conclusions

Self-assessment, using a multifaceted PIM, can lead to meaningful changes in physician quality improvement behaviors. Physician changes in practice appear to be facilitated by the inclusion of a quality improvement coach in the process of reflecting on practice data and implementing a quality improvement intervention. Future work should focus on the effectiveness of self-assessment in practice-based learning and improvement and systems-based practice to improve patient care and outcomes, especially when combined with maintenance of certification.

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