

# Quality Performance Monitoring, Data Collection, and Reporting

Report of Experiences From Primary Care Practices in  
the Virginia Ambulatory Care Outcomes Network



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# ***Final Contract Report***

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## **Quality Performance Monitoring Data Collection and Reporting**

### **Report of Experiences From Primary Care Practices in the Virginia Ambulatory Care Outcomes Network**

**Prepared for:**

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# Structured Abstract

**Overview.** Primary care practices are aware of the importance of performance monitoring to track patient outcomes and receive reimbursement for improved care management. However, a lack of experience with comparative data analysis, a lack of familiarity with or access to information technology resources, and inadequate reimbursement for related activities has limited progress toward this end. Primary care clinicians are faced with multiple competing practice demands for their time that limit their ability to become fully engaged in quality performance monitoring, data collection, and reporting (QPMDCR).

**Design.** Primary care practices in the Virginia Ambulatory Care Outcomes Research Network (ACORN) were invited to conduct QPMDCR projects of their own choosing in an effort to identify and document barriers faced by primary care practices as they attempt to conduct performance monitoring. A review of the literature from 1989 to 2009 was also conducted.

**Population.** Participating practices represented a range of practice size, patient population, resources, medical record systems (electronic or paper-based), and experience with quality improvement activities.

**Methods.** Six ACORN practices were selected to conduct projects based on their level of interest and commitment and their ability to respond to the demands of the project timeline. Each practice selected a project to be completed during the 6-month implementation period (July - December 2008); independently, all six practices chose to focus their efforts on issues related to diabetes care. Practices were provided with guidance by the Task Order Principal Investigator and a network Practice Liaison through face-to-face, telephone, and email consultation. Focus groups were held at the mid-point and conclusion of the study period to gather qualitative feedback.

Also, taking a comprehensive approach the research team conducted a search for relevant studies in multiple electronic databases from 1980 to 2009 using the MESH term "quality of health care" combined with additional MeSH terms and text words data collection, reporting, monitoring, and measuring, as well as primary care. Retrieved articles were classified by article type (medical literature or other sources, such as Web sites or press releases) and how directly they addressed primary care quality performance monitoring. Over the course of the task order, the team identified 39,837 potential articles; however, only 75 directly addressed primary care performance monitoring and 108 addressed performance monitoring in other health care fields. An additional 256 specifically addressed various "tools and techniques" applicable to performance monitoring, and another 173, largely from business and industry, addressed future trends.

**Findings.** Five of the six practices completed implementation of QPMDCR projects; one practice began the planning stage but was unable to complete implementation. Practices experienced multiple barriers in their efforts to conduct performance monitoring, including lack of expertise in systematic collection and analysis of data, access to actionable data systems,

clinician engagement and support for performance data collection, and resources to support time and staff necessary for data collection.

**Conclusion.** Many factors affect the ability of primary care practices to effectively carry out performance monitoring activities. Fundamental system change, addressing staff roles and expertise, information technology infrastructure, and practice culture, will likely be required to disseminate and implement performance monitoring in primary care.

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# Introduction

Despite widespread national and international interest in and discussion about performance monitoring in primary care, very few primary care practices are actually engaged in this activity. Primary care lags behind while the hospital field, influenced by advances in business and industry (especially manufacturing and the aircraft industry) as espoused by Demming and others, has made significant strides and been a leader in the area of performance monitoring, including development of consumer guides and comparative clinical information. To some extent, this discrepancy may reflect the fact that primary care is for the most part provided by practices that are small businesses that cannot afford the infrastructure, time, capital, and other resources vital to performance monitoring. Primary care practices face many competing demands for limited resources, including providing patient care, maintaining patient records, billing, and staffing while remaining financially viable in a competitive market. While performance monitoring could ultimately enhance some of these basic activities, restrictive reimbursement and small profit margins limit practices' capacity for more advanced functions.

Findings from this investigation indicate that performance monitoring is not an activity that can easily be accomplished in today's primary care practice without adequate infrastructure, including the necessary financial investments to support that infrastructure, and strong organizational commitment to the importance of the effort. For example, it is clear that while electronic medical records (EMRs) are necessary for performance monitoring, they alone are not sufficient. Paper medical records can only do the job if practices are willing to devote countless hours of "sweat equity" to retrieving and abstracting records, or adding manual data collection at the point of care to the present workload of busy clinicians and/or staff. Several of the practices in the study attempted such an approach—one practice totally abandoned their project as a result, while the other most likely will not conduct performance monitoring until they are either "forced to" by the Federal Government or external payers, or they find a reasonably priced EMR. Most likely, some Federal financial support for EMRs will be needed if all practices are to implement them. Further, while EMRs are necessary, there are a number of additional important considerations, including workable interfaces with other clinical information systems such as radiology and laboratory, and on-site expertise among staff knowledgeable not only clinical electronic data systems but in the art and science of performance monitoring. These elements in general are currently found only in larger practices that are affiliated with, or owned by, large health care systems that have access to needed capital.

The above are just a few of the challenges to performance monitoring identified by this investigation; others are detailed within this report. Despite the picture portrayed by these multiple barriers, there are areas where some larger primary care practices serve as "best practice" models for meaningful performance monitoring that have led to provider and practice change and, ultimately, quality improvement. Perhaps the most vital factor for these practices' successes was organizational culture and commitment to performance monitoring, as well as clinical buy-in and engagement. However, the two best practices that served as mentors to the studies in this project are part of large health care systems with the capacity to provide the EMR system, clinical interface with other electronic systems, and access to knowledgeable staff. Consequently, while smaller practices may look to these larger practices for examples of

successful strategies, they still may be unable to conduct performance monitoring without the resources these larger systems provide.

Our findings demonstrate that change must take place in practice organization and structure. This will require changes in Federal and private payer reimbursement to allow for necessary infrastructure changes and practice redesign activities that support performance monitoring.

Despite various initiatives such as Physician Quality Reporting Initiative (PQRI) and pay-for-performance, we conclude that current approaches to providing financial incentives to primary care practices to conduct all aspects of performance monitoring are not sufficient and, in fact, result in added cost to practices that participate in these activities.

The work conducted under this task order included several activities, including the implementation of quality performance monitoring, data collection, and reporting (QPMDCR) projects at six primary care practices, the development of a process model outlining a series of steps practices need to consider as they move toward implementation of performance monitoring, the development of an interactive Web tool for practice self-assessment of strengths and weaknesses relative to conducting performance monitoring, and an extensive search and synthesis of relevant literature. The results of the first activity (QMPDCR projects) are the focus of this report.

The investigation of the study practices' experiences also identified that performance monitoring may best be conceived of as a series of steps that allow for the collection and reporting of necessary data. Performance monitoring is a building block of a practice's movement toward quality improvement and can be viewed as the foundation upon which a practice must build its quality improvement program. As with any foundation, performance monitoring must be designed in a sound and durable manner to withstand the many challenges that may be faced as full quality improvement is implemented. These findings led to the conceptualization of a process model, briefly presented at the conclusion of this report, which graphically depicts the relationship between the various components of performance monitoring and illustrates their role in the various processes that culminate in performance improvement and on-going improvements in care. The proposed process model illustrates the larger context in which fundamental changes in the design of primary care systems must take place, including changes in individual practices addressing staff roles and expertise, information technology infrastructure and practice culture, and reimbursement that supports the dissemination and implementation of performance monitoring in primary care.

## Background

Quality of health care has been on the national agenda, both from a policy and a practice perspective, for decades.<sup>1-4</sup> A number of national studies and reports focused attention on this issue; prominent studies examining program quality following the enactment of Medicare and Medicaid;<sup>2,3,5</sup> the Quality Chasm series;<sup>6</sup> the landmark Institute of Medicine (IOM) *To Err is Human*,<sup>7</sup> and several critical studies published 5 years following the 1999 IOM report.<sup>8-11</sup> Since the majority of these efforts initially focused on the hospital setting, there was a substantial gap in rigorous work that addresses the quality of primary care, including the collection and reporting of data in primary care physician office settings.<sup>12-17</sup> This gap is particularly troubling since "primary care is the point of entry into the health services system and the locus of responsibility for organizing care for patients and populations over time,"<sup>18</sup> with a large percentage of care provided in the primary care setting as documented in the *Ecology of Medical Care*<sup>19</sup> and *The Research Domains of Family Medicine*.<sup>20</sup> In 2004, Green revisited<sup>21</sup> *The Ecology of Medical Care*<sup>19</sup>; data from this re-analysis finds that in a population of 1,000 persons, 800 report symptoms, 327 seek care, 217 visit a physician's office, 113 visit a primary care physician's office, and 8 are hospitalized, with less than 1 hospitalized in an academic setting. Green stresses that "As nations struggle to organize effective, sustainable health care systems for all their people, a foundation of primary care (first, foremost, fundamental care) is known to be essential, and family physicians have been unequivocally identified as providers of this foundation of care."<sup>20</sup>

As national concerns about quality of care began to rise regarding primary care office practice,<sup>22</sup> the issues were more rigorously addressed with the development of data collection and reporting requirements designed by the Washington Business Group on Health (now the National Committee on Quality Assurance). The resulting Health Employer Data and Information System (HEDIS)<sup>23</sup> connects actual preventive services needs with quality indicators. While criticized by some for containing a narrow range of services,<sup>24</sup> it has nevertheless been one of the driving forces in physician office-based quality data efforts. Other influences include a number of congressionally mandated studies funded by the Agency for Healthcare Research and Quality's (AHRQ's) Patient Safety Research Agenda,<sup>25,26</sup> reports released by the work of the AHRQ Quality Indicators projects,<sup>27</sup> the AHRQ Conference on Health Care Data Collection and Reporting,<sup>28</sup> and national reports issued by physician professional organizations such as the Future of Family Medicine Project.<sup>29</sup>

A review of the current status of these issues in primary care office settings reveals inefficiencies associated with quality measurement and management, variations among performance measurement systems, organizational and cultural barriers, technological barriers, economic pressures, and the competing demands and priorities in primary care practices.<sup>3,29,30</sup> A variety of innovative studies addressing patient safety and medical reporting in primary care highlight issues of data reporting necessary for provider performance change<sup>31,32</sup> and practice improvement,<sup>33</sup> all in an effort to improve the quality of primary care.<sup>34,35</sup> As recently as 2006, Schoen and colleagues report that "U.S. physicians are among the least likely [in a study of seven Western countries] to have extensive clinical information systems or incentives targeted on quality."<sup>36</sup> While few U.S. physicians use outpatient electronic medical records (EMRs), Blair reports that most would like to begin. However, there are a number of barriers including

reimbursement, interoperability, access to capital, privacy concerns, system maintenance, and the number of potential vendors, as well as their transience. Blair concludes that key initial policy challenges must address financial incentives and interoperability.<sup>37</sup>

Measurement of practice parameters in office settings is complex and related to the multiple environments in which the providers work (e.g., office, town, hospital system).<sup>12</sup> Additionally, not all quality measures are appropriate to every patient encounter, as there may be one or more urgent competing issues not related to the quality issue or measure of immediate interest, such as has been found in the case of smoking cessation counseling.<sup>38</sup> Further, the occurrence of multiple critical issues in a given visit is under-reported by providers in both traditional and electronic formats.<sup>39</sup> Therefore, realistic practice evaluations and quality performance measures in primary care need to take into account "from the ground up"<sup>12</sup> that patient encounters are not consistent with regard to the provider's ability to address performance quality areas of interest, and should not be analyzed as though they were.

Bodenheimer reports that the American College of Physicians recently warned that "primary care, the backbone of the nation's health care system, is at grave risk of collapse."<sup>40</sup> Issues such as physician dissatisfaction, reimbursement, life-style, and fewer U.S. medical students entering the field, together with competing demands, clearly document that "action is needed."<sup>40</sup> A substantial body of work, *Competing Demands in Primary Care Practice*, documents the reality of practice today.<sup>38</sup> Crabtree and colleagues write "multiple competing demands as well as opportunities are simultaneously affecting physicians, staff and patients within primary care practices."<sup>12</sup> They argue that to change practice effectively, these realities need to be understood. If not executed carefully, the introduction of health information technology (IT) to small primary care offices could contribute to the potential collapse of the U.S. primary care system.

Despite these words of caution, if health IT is carefully implemented, it has the potential to revolutionize the processes of collecting, tracking, and reporting quality performance data. A specific health IT example is electronic medical records (EMRs), which are recognized as beneficial by the Institute of Medicine, the American Academy of Family Physicians, and the American College of Physicians. Stange in discussing the "new model of care" called for by the *Future of Family Medicine Report*,<sup>29</sup> stresses that "electronic medical records are a cornerstone of the new model practice."<sup>30</sup> The central function of EMRs is to organize and manage clinical data, creating an efficient system for storage and access of information to facilitate timely patient care. EMRs can provide clinician alert and reminder systems, decision support tools, laboratory and test management, electronic communication and connectivity, patient support, and reporting and population management.<sup>41-43</sup> Compared to paper-based records, these features occur automatically, on a large scale, and with little additional work—making EMRs essential to effectively and efficiently respond to and meet the demands of a number of national quality initiatives such as HEDIS<sup>23</sup> and "pay for performance." However, this investigation highlights that while necessary to performance monitoring, EMRs alone are not sufficient to implement meaningful quality improvement leading to clinical practice change. Indeed, some practices have used EMRs for years without conducting any performance monitoring activities.

Unfortunately, at this juncture neither EMRs nor health IT in general have dramatically altered quality performance monitoring within the United States. While an increasing percentage of

outpatient physicians have adopted EMRs, they represent a minority of practices (24 percent in 2005).<sup>44</sup> Loomis and colleagues write, "If electronic records are so great, why aren't family physicians using them?"<sup>45</sup> Concerns and issues identified to explain the low level of adoption include: paying for start-up costs, physician uncertainties about EMRs, managing EMR security and privacy issues, and developing contingency plans to safeguard health care data in the event of disasters and emergencies. From a policy perspective, these same issues and concerns exist, but also include ownership issues related to clinical and administrative data, determining the minimum common data sets for ensuring the compatibility of systems, and defining population health and quality measures.<sup>27</sup>

Even after adopting EMRs, few practices (only 9 percent) use the more complex quality improvement features available, such as e-prescribing.<sup>46</sup> With respect to quality performance monitoring, EMRs have limited vendor-programmed ability to report provider and practice quality measures or to generate patient registries. This may explain why a growing body of literature demonstrates that EMR adoption alone does not guarantee improved care, but may result in diminished quality of care.<sup>47-49</sup> As an example, Crosson et al. demonstrated in one family medicine setting that if EMR functions are not systematically implemented, with clear planning and communication on how various team members should use the EMR, it functions less effectively than a paper-based record.<sup>50,51</sup>

Against this backdrop of increased attention to the need for performance monitoring to promote quality improvement in primary care, AHRQ funded a series of task order initiatives to better understand the barriers faced by primary care practices as they attempt to undertake such efforts. One task order's main objective was to comprehensively report on the issues involved in supporting primary care practices in collecting and reporting quality measure data, as well as current effective strategies that practices have implemented to collect and report quality data, and potential innovations in the field. The findings from these "natural experiments" are reported here.

# Summary of Literature Review and Synthesis

A literature review and synthesis was conducted as one of the project's major deliverables. The following is a summary of the systematic literature synthesis.

Clearly, in the health care literature as well as the trade and popular press there is growing interest in extending quality performance monitoring and reporting to ambulatory care settings, especially the setting of the primary care office. However, the extensive literature search reveals that relatively little is published in the literature about how to broadly implement and diffuse such systems into typical medical offices.

Taking a comprehensive approach with two well-experienced medical librarians, the research team searched for relevant studies in multiple electronic databases from 1980 to 2009 using the MESH term "quality of health care" combined with additional MeSH terms and text words data collection, reporting, monitoring, and measuring, as well as primary care. Retrieved articles were classified by article type (medical literature or other sources, such as Web sites and press releases) and how directly they addressed primary care quality performance monitoring. Over the course of the task order the team identified 39,837 potential articles; however, only 75 directly addressed primary care performance monitoring and 108 addressed performance monitoring in other health care fields. An additional 256 specifically addressed various tools and techniques applicable to performance monitoring, and another 173, largely from business and industry, addressed future trends. Common barriers and solutions were reported in all settings for each performance monitoring process step: planning,<sup>52-56</sup> reporting data,<sup>50,52,54,57,58</sup> reviewing data,<sup>4,59-61</sup> and acting on data.<sup>50,56,62-64</sup> Most of the articles directly addressing primary care performance monitoring were not found in journals with significant primary care readership.

Using the 76 most relevant articles, the researchers read and collated their findings, together with the ongoing findings from the practice focus groups and monthly visits to the implementation practices into a process model that became the conceptual framework (see Appendix 1. Process Model for Quality Performance Monitoring, Data Collecting, and Reporting) that guided our remaining investigation, the Web tool (see Appendix 2. Screen Shots of Web-based Practice Self-Assessment Tool), and this final report. The team specially focused on the barriers identified and their possible solutions that could potentially assist primary care providers in anticipating barriers and potential solutions to performance monitoring implementation.

The literature synthesis leads to some important conclusions. First, the literature is not extensive and is largely descriptive. Secondly, performance monitoring cannot easily be accomplished without adequate infrastructure and organizational support, including health IT. While health IT is perhaps one of the most important resources required, it is not as predominant in primary care settings as it is in other settings. Further, the literature demonstrates that EMR adoption alone does not guarantee improved care, and may even result in diminished quality of care.<sup>47-49</sup>

Next, the competing demands of primary care<sup>38</sup> limit the ability to both monitor quality and to improve it. Despite the field's concern with quality performance monitoring, the primary care setting lags behind that in business and industry as well as the hospital acute care setting. There

are a number of barriers that may stand in the way. These as well as potential strategies and solutions to each barrier are displayed in summary form in the process model in Appendix 1.

These conclusions point to a literature that is sparse and without the characteristics of a literature base that is powerful enough for the change processes necessary to enhance performance monitoring in primary care. Clearly, much research is required if the state of the art of quality performance monitoring and data collection and reporting is to change primary care quality.

# Primary Care Practice Experiences

## Methods

Primary care practices in the Virginia Ambulatory Care Outcomes Research Network (ACORN) were invited to learn about the task order project; 20 expressed interest in possible participation. A pool of candidate practices was identified for inclusion based on a track record of participating and completing previous ACORN projects, diversity in terms of practice characteristics (i.e., system ownership, private practice, university-affiliated, presence of an EMR, medical specialty), practice populations (i.e., urban, rural and suburban patients), patient characteristics including minority and underserved populations, and ownership status such as private practice, system, or corporate ownership. Nine ACORN practices were selected to participate in preliminary focus groups conducted by the Task Order Director and "best practice" project consultant to solicit input on current issues faced by network practices related to data collection and utilization. Six of the 9 practices were ultimately selected to conduct QPMDCR projects, based on their level of interest and commitment, and their ability to respond to the demands of the task order timeline. Despite the small sample dictated by the parameters of the contract, the participating practices represented a range of practice sizes, patient populations, resources, medical record systems (electronic or paper-based), and experience with quality improvement activities. See Table 1 for a description of participating practices.

The Task Order Director and the network's Practice Liaison met face-to-face with the six study practice representatives during a 2-month project planning period (May–June 2008) to identify goals and objectives and expectations for the project. During the planning meetings, interim steps were outlined to facilitate project tracking and progress toward goals. Each practice selected a QPMDCR project to be completed during a 6-month implementation period (July–December 2008); independently, all six practices chose to focus their efforts on diabetes care. During the implementation period, the Practice Liaison met with practice representatives on a monthly basis, either in person or via telephone and email communication, to check on project progress and troubleshoot difficulties experienced. Each practice carried out their project independently, with guidance provided by project staff and consultants on an as-requested basis only. A midpoint focus group was held at each practice site to identify issues of concern and discuss implementation experiences. A final focus group was held as the projects neared completion to gather practice insights about barriers encountered and potential strategies identified, and in some cases, attempted to implement. All focus groups were tape recorded and transcribed and informed consent was obtained according to protocol per the VCU Institutional Review Board.

## Overview of Findings

Five of the six participating practices completed implementation of QPMDCR projects; one practice began the planning stage but was unable to complete implementation. All five practices that completed implementation were able to achieve some degree of success in selecting and planning a project, gathering data and generating comparative reports. Some practices relied heavily (or exclusively) on physician involvement, while others involved nurses and other practice staff. Two practices used automated queries of data; the remaining practices used

manual data collection methods or some combination of the two approaches. See Table 2 for descriptions of each of the QPMDCR projects.

All of the study practices experience multiple and common barriers. Many obstacles were external to the control of the practice and significant enough to act as real hindrances to progress. As a result, most of the practices were able to gather and analyze data and spend time brainstorming strategies for how to make improvements to care delivery but were unable to establish mechanisms for ongoing quality improvement in their practices as an outcome of this project. Importantly, study practices did not have the necessary expertise in systematic collection and analysis of performance data. They needed assistance identifying, setting up and learning to work with systems that could perform this function. They also needed financial support to compensate for the time involved in performance monitoring: time for Physician Champions to lead initiatives, time for data collection tasks, time for interpretation of data, and so on. One practice that implemented their project experienced significant difficulty and is unlikely to continue with performance monitoring efforts at the time of this report. The remaining practices plan to continue with some form of performance monitoring, though in modified version from what was initiated through the task order. See Table 3 for a detailed summary of project outcomes.

## Case Study Narratives

### Case Study #1

**Background.** Practice #1 is a small suburban general internal medicine practice, with two physicians and two medical assistants on staff; they serve a panel of 4,200 clinically active patients. The practice implemented an electronic medical record (EMR) in 2002, but had not previously used the EMR for any quality monitoring efforts.

**Project Selection.** Practice #1 chose a project to measure the proportion of diabetic patients who had their A1c measured in the prior quarter and the proportion of diabetic patients who had their urine microalbumin measured in the past year to improve diabetes mellitus management. The project was chosen by the lead physician, who selected the topic because he felt it was important to the practice's ability to manage the growing number of diabetic patients, currently more than a third of their practice population. Prior to this project, reports generated by the EMR-vendor's technical support staff contained EMR data on a number of tests performed to measure the two selected indicators; these reports were provided to clinicians at Practice #1, but a system had not been established to routinely and openly review the reports and use the data to improve management of diabetic patients in an organized manner. Instead, reports were distributed to individual physicians for their private review. Physicians and staff had difficulty interpreting the reports because they contained only raw data on the number of tests reported for diabetic patients during the period, without any denominator data or other information to put the data in meaningful context. Further, laboratory test result data were recorded only in the practice's paper records, since the EMR-laboratory interface was not in place, and integration of information from both paper and electronic formats required additional staff time that was not readily available. The reports were therefore seen as useless by the physicians, resulting in a lack of

"buy-in" as evidenced by the absence of meaningful review or action based upon them. The need for an improved system of data collection and monitoring appeared clear to the practice leaders.

**Project Planning.** During the project planning period, representatives from Practice #1 (the lead physician/practice founder and the office manager) expressed enthusiasm about moving forward with the project, stating that it would be beneficial to have access to more useful data and a system for interpreting it. Some concerns were expressed about future "pay for performance" implications and the role of physician accountability for clinical outcomes that rely heavily on patient adherence to treatment plans, but overall support to move forward was indicated.

Early in the project planning period, the two practice physicians delegated responsibility for the project to the office manager, who would function as the "project champion" and be responsible for coordinating all activities related to the project. In this role, the Office Manager was responsible for working with the EMR technical support staff to gain a better understanding of the reports currently being generated, and explore how laboratory reports could ultimately be interfaced with the practice's EMR system to simplify the data collection process.

The office manager was also responsible for working with the two practice physicians to establish a schedule of monthly meetings at which transparent reports would be reviewed and discussed. Multiple attempts were made by the office manager to arrange an initial planning meeting to discuss project roles and responsibilities with physicians and staff at the practice, but recurring scheduling conflicts prevented this planning meeting from occurring.

**Project Implementation.** Practice #1 did not implement their QPMDCR project for reasons related primarily to lack of and competing demands for time. In addition to experiencing difficulty arranging the initial practice planning meeting, the Office Manager was unable to schedule a mutually convenient time to discuss the process for generating the laboratory reports with the EMR technical support staff; this conversation had not taken place 2 months into the Implementation Phase. Simultaneously, the practice experienced significant staff turnover that restricted the office manager's ability to focus on anything other than day-to-day operations of the practice as she was called upon to assume the additional responsibilities of the front desk staff and the medical assistant. The office manager didn't have time to even begin a project tracking document. Based upon these circumstances, in August 2008 (month 2 of the implementation period) the office manager decided to withdraw Practice #1 from the project as it appeared unlikely that they would be successful with their QPMDCR efforts.

**Barriers Identified.** Practice #1 experienced multiple barriers to initiating the QPMDCR project, including lack of staff with expertise in retrieval, interpretation and analysis of data from the EMR. Although the practice has used an EMR for several years, their EMR does not have inherent reporting capabilities, requiring significant investment of time and training to make the data useful. Simply having the EMR was not enough to make undertaking the selected performance monitoring project feasible without additional support. Before project planning began, the practice office manager said that the data collected would not be meaningful or useful to physicians without interpretation and manual lab data entry into the EMR system. An interface with the laboratory would allow the practice to receive lab reports directly and download them into the EMR; this would make the desired data readily available once an indication from the lab is received. Instead, the practice has to rely on the office manager to interpret and enter the lab

data and on the EMR vendor to generate reports. This process leads to a delay in the receipt of important laboratory data and the involvement of a third party, potentially leading to errors and inaccuracies during data transcription.

The practice also experienced an unexpected amount of staff turnover, leading to an increased administrative burden on the sole individual charged with the project. Competing demands for the office manager's time led to difficulties with organization and planning the data collection process. In such a small practice, the loss of even staff member clearly has much greater impact than at a larger practice. Many small practices are so lean in human resources that doing something extra like this project is almost impossible and "something else has to be dropped" to make it happen.

**Lessons Learned.** Assignment of project responsibility to a single staff member, without the direct involvement of a physician, may have played a significant role in the practice's inability to carry forward with the project. Having the Physician Champion or another physician become involved in project management may have made a critical difference. While initial support for the project from physicians was noted, in reality their involvement in the project was limited, resulting in conflicting messages about project importance to the Project Champion and perhaps reflecting a lack of genuine belief in the importance of the project and its link to improvements in patient care.

Further, it may not have been possible to conduct the project without employing additional nursing and IT support staff to overcome data collection barriers (most notably, the lack of direct interface between the EMR and the clinical laboratory system) experienced by this practice. A small practice like Practice #1 has very little excess capacity to undertake data gathering and performance monitoring, and in this particular practice's case, loss of personnel eliminated any excess capacity to undertake the project. Additionally, increasing the practice's knowledge of the capabilities and limitations of their current data system may have led to a more realistic assessment of what was possible to achieve, and involvement of the EMR technical support staff in project planning may have helped in the development of a more successful and realistic implementation strategy. It appears most likely that the small size of this practice, staff turnover, and inadequate staffing influenced the outcome of the practice's efforts. The practice does not plan to continue the project.

## **Case Study #2**

**Background.** Practice #2 is a community-based family medicine residency program with 10,800 clinically active patients. The practice has been in operation since 1976, and has been part of a university residency system for 30 years. The practice currently uses both paper and EMR systems, with conversion to an EMR-only system underway. The practice has 8 full-time and 2 part-time physicians, 17 residents and 6 nurses on staff.

**Project Selection.** Practice #2 focused on monitoring selected indicators of diabetes mellitus to improve understanding of barriers to collection of routine indicators. Measures included the proportion of all diabetic patients that had hemoglobin A1c measured in the past quarter and the proportion of all diabetic patients that had urine/creatinine ratio measured in the past year. A second-year resident was selected as the Physician Champion at the request of one of the

attending physicians. The resident expressed interest in assessing how well the practice was currently following guidelines of care for diabetic patients and in assessing physician behaviors in an effort to validate physician experiences and identify barriers to providing optimal care. The project involved collecting and recording data that would be easy to obtain through review of patient charts. Data collected would be used to facilitate discussion at a series of independent meetings to explore barriers to data collection, issues related to patient nonadherence to treatment, and strategies for motivating patients.

**Project Planning.** The Physician Champion developed a project-specific paper data collection form to allow participating clinicians (six attending physicians, seven second-year residents and five third-year residents) to document the collection of quarterly hemoglobin A1c and yearly urine creatinine/albumin ratios obtained for diabetic patients at 3-month intervals throughout the 6-month study period. The data collection form included a "free text" section for physicians and residents to note barriers encountered in obtaining the diabetes measures according to the desired schedule. Residents were advised to tell their patients to request them when coming back for follow-up appointments, to ensure continuity of monitoring.

A provider meeting was held to inform all physicians about the project and address roles and responsibilities. Each participating physician was given a single data collection form to complete based on prospective interactions with 20 diabetic patients. Physicians were instructed to submit their data collection form midway through the study period to allow for preliminary analysis; forms were then returned to physicians and data collection continued. The practice scheduled a series of provider meetings to discuss barriers encountered, patient adherence issues, and strategies to motivate patients at the midway and conclusion points of the study.

**Project Implementation.** Beginning July 15, 2008, physicians from Practice #2 began the first phase of data collection with the goal of completion by August 30. While many of the physicians were able to complete data collection for 20 patients within this timeframe, some physicians (including the residency director) faced obstacles related to competing patient care demands. Miscommunication among some residents about the purpose and scope of the project was identified during a project mid-point focus group conducted in September. The Physician Champion acted immediately upon these findings to answer questions about the project and provide further guidance. The Physician Champion presented the first transparent comparative report to residents and attending physicians at a lunch meeting; the report was discussed and the audience response was described as "receptive," with acknowledgement that some physicians had not yet submitted data.

The second phase of data collection took place September 1 through December 31, 2008. There was an overall increase in participation by attending physicians in the practice, as reported by the Physician Champion. At the end of December, the Physician Champion gathered the data collection forms and completed the second round of data analysis. Because the practice physicians are split into care teams, some data reports contained information about patients that a physician did not see during the study period. Therefore, the Physician Champion reviewed each physician's report to confirm that the physician had actually seen the patients that were included for analysis.

A provider meeting to discuss the data was held in mid-January to allow physicians an opportunity to review their data prior to the final focus group. Discussion during the final focus group reinforced the importance placed by Practice #2 on patient adherence to physician recommendations. Physicians at the practice felt that the project helped them recognize the importance of being proactive about talking with patients, providing education, and engaging patients in the disease management process.

**Barriers Identified.** Practice #2's experience illustrated a number of barriers in conducting a QPMDCR project. As may be expected, there was a lack of time to devote to the project due to demands on physician and staff time for daily clinical responsibilities and patient visits; a shortage of support staff to assist with the effort was noted. Six of the residents (including the Physician Champion) spent one entire month of the study period doing only hospital medicine and, therefore, were not available to some of their patients for follow-up. Further, the extra responsibility involved in conducting a residency program was significant for the practice, and other claims on residents' time (attending lunchtime didactic lectures, keeping track of patient numbers, procedures for completion of records prior to graduating from the residency) limited their ability to participate fully. Scheduling conflicts related to vacations and summer schedules resulted in delays in project implementation.

Obtaining feedback from physicians and securing their "buy-in" to the extra effort involved was identified as a challenge, particularly without monetary compensation; a perception of QPMDCR efforts as interfering with or being invasive to the practice was mentioned. Ensuring that physicians knew where the data collection form was located and remembered to complete it was noted as a challenge in and of itself. Generally, practice physicians felt that they should be blinded to which patients' data were being analyzed to reduce bias, and that strategies to increase patient responsibility for their condition and outcomes were needed. Importantly, Practice #2 determined that having an identified staff member who served as the "data gatherer" on staff would be necessary to ensure that the process is conducted consistently and accurately in the future; the practice stated that they are unable to continue with the current system of having physicians serve as primary "data gatherers."

The practice's current patient registration process does not require identification of a primary care provider when appointments are made, limiting the ability of physicians to provide continuity of care and monitor outcomes. Further, the impact of patient adherence and self-management on outcomes (not fasting as instructed, seeing physicians outside of the primary provider's office, lack of follow-up due to costs and transportation issues, reluctance to accept treatment for condition when asymptomatic) were identified as potentially interfering with accurate attribution of outcomes to physicians. Having a resident as the primary physician was also perceived as having a negative impact on the practice's ability to monitor and report on the same patients over a 6-month period. Finally, the practice's current use of both EMR and paper systems for documentation may have led to errors and data extraction difficulties, limiting their ability to generate accurate comparative reports. The process of implementing the EMR at the practice was noted to be an extremely time-consuming process. However, once the EMR is fully implemented, additional options for streamlined data collection may become more feasible.

**Lessons Learned.** The popularity of the Physician Champion played a significant role in the willingness of the practice residents to participate in the project—even at times when they were

not entirely clear about the details—illustrating the importance of a strong leader with a clear vision toward practice improvement in making a QPMDCR project happen in a busy small practice. Providing greater clarity to physicians and nurses about the purpose of quality improvement projects prior to implementation, promoting greater understanding of the practical reasons for monitoring, and engaging more physicians in the development of measures could further enhance chances of success.

Patient adherence was identified as having a significant impact on the practice's ability to manage diabetes care; Practice #2, therefore, identified a number of strategies for addressing adherence issues during the provider meetings where data was discussed. Suggestions discussed included mailing laboratory orders to patients ahead of scheduled visits, providing reminder messages (phone or mail) about scheduling routine follow-up appointments, limiting medical refills to a 3-month supply to encourage office visits, developing "behavioral contracts" with patients to ensure patient "buy-in", and ensuring that diabetes education is provided to all diabetic patients. The practice noted that it will continue to refer newly diagnosed patients to their supporting hospital's diabetes care center for education.

Some limitations of the practice's project methodology were identified by physicians, including the fact that a number of patients seen late during the study period were seen for follow-up and laboratory retesting outside the study timeframe and therefore not counted as having received appropriate follow-up care. Another example related to the methods that certain physicians had adopted over time; one attending physician noted that he always orders microalbumin/ creatinine ratios during the first quarter of the year on every diabetic patient seen during that time period, and therefore these patients would not have been captured in the study data as having received appropriate testing, although, in fact, they did. Further, it was noted that patients with more advanced stages of diabetes do not need yearly microalbumin checks because their disease state has already been established.

### **Case Study #3**

**Background.** Practice #3 is a family medicine residency and part of a large health system. The practice has been in operation since 2001, and has been part of a university residency system since 2005. The practice provides complete primary care for newborns, children, and adults, serving a panel of 10,000 clinically active patients. The practice has 5 full-time and 1 part-time faculty physicians; the practice also employs 18 residents, 7 nurses and 10 staff members. Practice #3 currently uses paper medical records, with plans to convert to an EMR system in August 2009. The practice began monitoring data for the Centers for Medicare & Medicaid Service (CMS) Physician Quality Reporting Initiative (PQRI) in January 2008.

**Project Selection.** Practice #3 focused on a project that built upon ongoing practice efforts to respond to the PQRI from the CMS. For the past year, all physicians have been expected to submit quarterly PQRI reports on three diabetes indicators: hemoglobin A1c, blood pressure, and LDL. The Physician Champion decided to use the existing PQRI data gathering process as an opportunity to promote performance monitoring at the practice through establishment of a system for transparent PQRI data tracking and interpretation for diabetic patients covered by Medicare Part B. The project measured the impact of patient adherence to suggested testing, prescribed medication, recommended diet and exercise on clinical outcomes, and the

development of patient-specific action plans based on major factors identified. This project was also seen as an opportunity for residents to fulfill their practice management residency program requirements, preparing them to present findings at the Virginia Academy of Family Physicians meeting in February 2009.

**Project Planning.** Practice #3 planned to review PQRI data recorded in the preceding 12 months for three diabetes quality control indicators (hemoglobin A1c, LDL level, and blood pressure) to identify Medicare Part B diabetic patients whose indicators did or did not meet recommended consensus goals. Measures included an assessment of the impact of the patient adherence-related behaviors outlined above on Medicare Part B diabetic patients with hemoglobin A1c greater than 9.0 percent (poor control) or less than 7.0 percent (good control); systolic blood pressure greater than 140 mm Hg (poor control) or less than 130 mm Hg (good control), diastolic blood pressure greater than 90 mm Hg (poor control) or less than 80 mm Hg (good control), and LDL level greater than 130 mg/dl (poor control) or less than 100 mg/dl (good control).

The resulting data report would allow the practice to document patterns of physician and patient behavior that led to positive or negative outcomes. The practice planned to separate a sample of patients using appropriate ICD-9 codes for analytical purposes. Twelve of the practice's residents would become involved by interpreting PQRI data already being gathered by attending physicians. The Physician Champion and the Coding Practice Consultant (employed by the health system that owns the practice and responsible for providing the practice with data needed for PQRI) would provide data reports for the project based on the PQRI quality indicators and billing information. Reports were to be provided to the Physician Champion for distribution to residents, and a series of project meetings was planned to discuss the data and develop provider and patient action plans.

**Project Implementation.** Early in the implementation phase, the Physician Champion made a presentation about the PQRI project to the staff and physicians in the residency program to discuss how it related to the QPMDCR project.

The practice began the project by identifying patients who met PQRI criteria and had a diabetes mellitus diagnosis. Patient service representatives verified which patients were Medicare Part B recipients at the time of office visit check-in. Forty records were pulled for each of the three quality indicators (N=120 records). The records were evenly divided into two groups—those considered to have positive indicators and those considered to have negative indicators. A PQRI worksheet listing appropriate codes for each diabetes quality control indicator and an encounter form were then attached to the qualifying patient's record.

Practice physicians manually reviewed the PQRI patient lists and corresponding records to assess the validity of the recorded quality indicators and to determine the accuracy of the categorization of the record, based on the number of positive or negative quality indicators. The physician reviewed the patient's record to find and document appropriate ICD-9 codes for each quality control indicator. Once the review was completed, the PQRI worksheets were given to the billing data entry staff. The indicator data and billing information were entered into the financial billing system and a report was generated.

The practice developed a simple paper data collection sheet to document the results of the record reviews and capture patterns that might explain why patients registered positive or negative outcomes. Additional information assessed by record review included patient adherence to suggested testing, medication, and recommended diet and exercise changes as related to each quality indicator. Records were examined to look for common themes that could be easily recognized from the physicians' written diagnostic assessment and prospective treatment plan. A list of some common treatment plans documented by physicians included medications given, dietary and exercise recommendations, and smoking cessation.

Patient adherence to physician treatment plans was examined to determine if physician recommendations correlated with positive or negative outcomes. Adherence was selected as part of the assessment because of its direct influence on the effectiveness of disease management, as well as being an indirect measure of how the physician-patient relationship influences patients to change unfavorable behaviors. A separate section of the data collection sheet assessed whether the reviewing physician could determine if medication cost was a factor in patient adherence. Recorded laboratory values and blood pressure readings provided additional information regarding whether the treatment plan was effective. Modifications made on subsequent visits allowed the tracking of how positive outcomes were achieved. Finally, physicians were asked what they felt made patients experience either positive or negative outcomes.

Reports on PQRI data obtained January through September 2008 were distributed on October 1 to a team of residents, and a sample of patient charts were reviewed during a project meeting in mid-October 2008 to allow residents to discuss themes and trends observed in patients with positive and negative quality indicators. Transparency in reporting allowed residents to discuss individual treatment plans and the factors (including physician and patient behavior) that led to various outcomes. Discussion included the development of patient-specific action plans to improve care for patients with negative quality indicators.

In late October 2008, the practice held a provider meeting to develop a strategic plan based on the results of the data review. During the meeting, three factors were repeatedly found in patients with positive quality indicators: patient adherence, frequency of laboratory testing, and frequency of follow-up office visits; many of the residents believed from prior experiences that the most important factor was patient adherence. Upon further discussion, it was identified that the effectiveness of adherence came from a more significant and comprehensive attribute - patient engagement. The practice observed that when a patient was made an active member of the care team, rather than a passive observer, and took an active role in the management of their disease, this correlated with good outcomes.

The meeting was interactive, with a high level of physician participation and enthusiasm. Suggestions were made regarding ways to benefit diabetic patients, including use of community resources that could assist patients in making appropriate dietary selections, group walking programs organized by churches, and other "meet up" groups to encourage exercise. The practice was noted to have a collaborative spirit, and physicians were excited and motivated to find local and inexpensive ways to improve patients' health.

**Barriers Identified.** Practice #3's experience illustrated several common barriers faced by primary care practices. The practice has no established methodology for accurate attribution of care for an individual patient to a primary care physician, and patients are not always seen by the same physician from visit to visit; concerns were raised early on about the accuracy of PQRI data submitted to CMS with regard to the attribution of care to specific physicians. Further, feedback from CMS about performance was not provided to physicians in a timely manner to facilitate action plan development; the practice attempted to address this barrier by producing internal reports based on PQRI data.

Barriers related to time were also noted; for example, the implementation of the project was delayed to the start of the residency semester, and there was a general lack of time noted to organize and plan the project due to competing demands related to patient care.

Finally, not all staff members were involved in the project, which may have acted as a barrier to securing maximum clinician and staff support for the project. While the residents were part of the QPMDCR project, the faculty physicians were not; participation of all physicians at the practice may have enhanced what the practice was able to take on. Further, because a given chart and encounter form might be handled by several people over the course of one encounter due to the project methodology, the recorded data could be impacted by human error (i.e., lost or misplaced laboratory data, delays in receiving lab reports, or failure to input certain test results correctly). The practice reported instances where the PQRI worksheet became separated from the billing sheet, preventing the data sheet from being turned in to be recorded. Complacency about good results may have led to failure of form completion or use of improper coding. Time constraints placed on physicians could also play a key role in incomplete flow sheet forms. These barriers could be alleviated with implementation of the EMR to help streamline the process, and negate errors at many critical points along the path of the chart and flow sheet.

**Lessons Learned.** Time constraints faced by physicians can play a key role in the lack of complete data collection or flow sheet forms. A possible solution discussed by the practice for possible future use was to have staff (i.e., front desk or nursing staff) play a "backup role" to make sure that physicians would be notified when charts have been identified as appropriate for quality improvement study inclusion.

The residency culture of Practice #3 made conducting the QPMDCR project challenging due to the lack of continuity of care, as patients are seen by different faculty and residents over time. Communication among all clinicians involved in providing care to a particular patient is critical to ensuring that all data are captured and treatment plans are carried out. Nevertheless, the residents and faculty felt that the project was a positive experience; the residents made a good effort to find solutions to problems identified and improve patient care. The project was seen as motivating residents to develop better action plans, and heightening awareness of the importance of engaging patients in the care process. Practice #3 plans to continue to participate in PQRI and performance tracking activities beyond the QPMDCR project. However, changes to the current system will be held off until the EMR is implemented.

## Case Study #4

**Background.** Practice #4 is a private family medicine practice that offers a community-based residency serving a socioeconomically diverse population. Established in 1978, Practice #4 serves a panel of over 10,000 clinically active patients, with 7 physicians, 16 residents, 2 nurse practitioners, and 11 nurses. The practice has used an EMR since 2003, but had not previously undertaken a formal quality improvement project using their EMR.

**Project Selection.** Discussions regarding potential projects occurred over the course of several weeks during routine weekly meetings of all the providers and via email. Ultimately, the Practice #4 providers chose monitoring of blood pressures for diabetic patients, measured at both the practice and the provider level, to provide practice clinicians with data regarding how many of their patients were not meeting the blood pressure goals of the American Diabetic Association; measurement included the percentage of all diabetic patients with most recent systolic blood pressure greater than 140 mm Hg or greater than 130 mm Hg, and the percentage of all diabetic patients with most recent diastolic blood pressure greater than 90 mm Hg or greater than 80 mm Hg. The project was selected based on the practice's collective, literature-based perspective that "blood pressure is the primary thing to control" in diabetes care to prevent adverse outcomes. The practice felt that the project had the potential to significantly improve clinical care for diabetic patients, a group seen as "particularly complex people who have a lot of morbidity and mortality", and to perhaps lay the groundwork for Medicare reimbursement for this type of service in the future. Further, the practice specifically selected a project that used data that could be obtained from the EMR; EMR database inquiry was an identified interest of one of the managing partners.

**Project Planning.** The QPMDCR project team consisted of the Physician Champion and the two managing partners of the practice, one of whom was the practice's EMR manager; the other became the de facto data manager. The data manager developed an attribution algorithm (See Figure 1) for use by practice staff when assigning patients to individual physicians, with the goal of enhancing continuity of care and accurately evaluating physician data over time; the algorithm was designed based on guidelines described in an article by Murray, Davies and Boushon on the AAFP's Family Practice Management Web site ([www.aafp.org/fpm](http://www.aafp.org/fpm))<sup>65</sup>. During less busy times (and while fully staffed), the billing and front office staff were asked to apply this algorithm manually and enter any changes in attribution in the EMR and were given one-time financial incentives to complete this additional initial work. Physicians then reviewed data after using the new attribution algorithm and found it 95 percent accurate; future inaccuracies were to be directed to a single staff member, who was charged with handling changes to attribution records to reduce the potential for any physician to 'game' the system by self-selecting healthier patients.

To address accuracy of blood pressure data in the EMR, Practice #4 provided in-service training to physicians, nurses, and administrative staff in blood pressure measurement to standardize the procedure. Blood pressure measurements taken at home with a blood pressure device that had been calibrated against standard methodology by nursing staff could be entered when appropriate (to account for 'white-coat' hypertension) as if taken at the practice, and blood pressures taken in the office could be retaken at the discretion of the provider. Analysis was focused on the most recent blood pressure measurement entered into the EMR, whether home or office.

The project data manager and/or EMR manager were to extract the data from the EMR and generate comparative reports, which would be reviewed and discussed at provider meetings. The Physician Champion met with the residents to discuss the project roles and responsibilities prior to implementation, and the Chief Resident was charged with ongoing communication and dissemination of data to residents. The project was also discussed at crucial points during routine monthly meetings of the entire office (all physicians, nurses, and staff, with limited resident attendance).

**Project Implementation.** Practice #4 experienced initial difficulties in carrying out the project. Reports generated by the practice's EMR were determined to be inadequate, and an EMR product that permitted the practice to generate useful reports and electronically send them to each physician for review was not part of the practice's existing EMR package. The Physician Champion contacted the EMR vendor for technical assistance and was advised to use Crystal Reports, a computer software program that Practice #4 had purchased several years prior. Although Crystal Reports was described as "a powerful, dynamic, actionable reporting solution that helps you design, explore, visualize, and deliver reports via the Web or embedded in enterprise applications" (<http://www.businessobjects.com>), the data manager at Practice #4 found this description to be misleading; while the software was adequate for extraction, the data manager did not believe that the program would be useful for cleaning and aggregating the specific quality measures the practice wanted to monitor for this project.

Practice #4 decided to abandon use of Crystal Reports, and instead create their own analytic system using Access. Because Practice #4 had not previously extracted data directly from the EMR, there was a significant learning curve and a fair amount of trial and error as the project team members obtained passwords and negotiated firewalls to get to the section of the EMR database that contained the information they were seeking; once obtained, the data needed significant and time-consuming cleaning for redundancies. Technical assistance was therefore requested from a QPMDCR project consultant. With the help of the consultant, Practice #4 was able to use Microsoft Access to extract data from the EMR database, as well as learning how to clean and aggregate it. The Physician Champion then used his experience with Microsoft Excel and SPSS to import the cleaned aggregate data from Access and create the first reports for distribution. The report generated from Excel was transparent (i.e., it identified which data went with which specific provider), allowing physicians to compare their own performance with that of their colleagues. With extensive assistance from the consultant, the process for extracting and initial analysis of blood pressure data was later automated for future reports.

When analysis for blood pressure measurements taken August 2007 through August 2008 was complete and the first report generated in mid-September, the Physician Champion was concerned. The data showed significant numbers of diabetic patients not meeting BP goals and perhaps they would be challenged on the basis of previously identified areas of uncertainty such as attribution, measurement, and patient adherence. However, at the next regular provider meeting where these data were presented, response to this initial report was described as "bland." Possibly, as a result of the briefings that physicians received throughout the process at provider meetings, the physicians knew what to expect from the performance report and in turn gave very little negative feedback to the Physician Champion. Rather, they seemed grateful to have what they found to be clinically relevant data. Physicians from Practice #4 further reported that they

did not feel they were competing against each other on the clinical outcome measures in the performance report. They felt that the transparent nature of the comparative data reports would influence how they practice, and that regular review of comparative data reports would make them more aggressive when reviewing patient data and following up to improve patient outcomes.

The discussion of the second round of blood pressure data (September 2008 to December 2008) occurred during a provider meeting in December 2008. The report was generated by the automated query, and again provided physicians with percentages of their patients not meeting goals and information about all other physicians and residents' percentages. Physicians were also given a list of diabetic patients attributed to them for the past 3 months; inaccurate attribution could be corrected at the discretion of the physician, using the established internal office mechanism. This second round of data showed a small but statistically significant decrease in percentages of patients not meeting blood pressure goals. However, the report differed from the first report slightly in how the percentages were calculated, necessitating a repeat analysis of the original data for accurate comparison, and additional time spent explaining to the physicians why the report had changed.

The practice plans to generate "rolling" quarterly reports to capture data from the previous 6 months for patients who may not have been seen during a given 3-month data collection period. It is anticipated that future reports will be generated by the practice's nurse manager, who is responsible for many of the information technology functions in the office. This automated process is expected to take approximately 10 minutes.

**Barriers Identified.** Practice #4 experienced barriers related to the amount of time involved in conducting a QPMDCR project, both with regard to the additional work created (finding time for project staff/directors to meet, factoring scheduling issues such as summer schedules vacation times) and competing demands of the practice and residency (orienting a new resident class, negotiating a new contract with hospital regarding nursing home, managing staffing shortages, losing and adding providers). While the involvement of several individuals ultimately enhanced the project and its results, it also served to increase the time involved. For example, original and automated reports presented slightly different analyses of the data.

Practice #4 also experienced significant barriers related to data. The data that the practice wanted to analyze were difficult to obtain from the EMR due to system security issues, and the practice had to deal with multiple levels of clearance in the hospital system. The practice noted that having EMR data and being able to access it are "two completely different things." According to the practice, "every step was frustrating: access to database, extraction, aggregation, reporting, formatting." The practice's current EMR was not able produce the kinds of reports desired for the project, resulting in the need for practice staff to teach themselves to become facile with custom reporting, utilizing software with which they only had a basic working knowledge.

Physicians were initially concerned about the project being viewed as invasive to the practice by staff, and concerns were expressed regarding accuracy of data and the time spent reviewing measures that are "probably already okay." Ultimately, these attitudinal barriers were overcome by the practice's strong collaborative approach. A lack of control over some outcomes was also

noted to be a barrier to physician "buy-in"; the impact of poor patient adherence and self-management on outcomes, and being held responsible for patients whom physicians saw, but who were not "their patients," were recurring themes, especially at initial provider meetings.

Finally, personnel issues figured largely in Practice #4's experience; the practice experienced physician turnover during the course of the project (one physician leaving and two new physicians joining the practice), shortages in nursing and front desk staff, and a lack of appropriate information technology staff with the skills to resolve data issues to enable them to carry out the project.

**Lessons Learned.** The Physician Champion was selected due to his previous involvement and commitment to research. While willing to take on this role, he did not feel he was necessarily the most appropriate person to lead practice change projects, stating that the involvement of a managing partner was essential to muster the resources to make sustainable change possible. Nevertheless, the Physician Champion played a pivotal role in motivating practice staff and providing leadership and persistence in achieving project goals. All faculty physician, residents and nurses expressed a strong commitment to improving care for diabetic patients at the outset of the project. The willingness of the practice physicians to take on the task of designing comparative reports facilitated the progress Practice #4 made in generating a meaningful data. This level of physician engagement certainly helped make the project possible. Further, the Physician Champion's commitment to clear communication and teamwork for this project yielded a high level of participation at all levels within the practice.

Practice #4's experience highlights the need to ensure practice knowledge of the capabilities and limitations of the available data system, and to ensure that additional support staff or other resources are available to assist with data collection and analysis tasks. After weeks of effort with EMR and Crystal Reports, as well as multiple attempts by the data manager and Physician Champion to use Access to query the EMR database, Practice #4 reached outside their current staff to obtain the necessary IT expertise to carry out the project. Without the support and extensive assistance of a project consultant with sophisticated information technology skills, physicians or staff would have needed expertise in Access and other programs to extract, clean and report the data, a process viewed by the practice as extremely time-consuming and not easily sustainable from reporting period to reporting period. As a result, the practice likely would have been unable to overcome the barriers they faced, and the project may have stalled. In fact, without access to database expertise, the practice felt that a project like this probably would not have been successfully carried out. At the very least, it would have taken much longer (perhaps over a year, by the practice's own estimate) to accomplish.

While EMRs are an important component of performance monitoring efforts, simply having an EMR in place is not sufficient. Though the practice had an existing EMR, they had not previously attempted to use it for performance monitoring due to limitations in its reporting capabilities. A de facto decision was made to wait for system upgrades before embarking on a performance monitoring project; the next upgrade was usually touted by the EMR vendor as allowing reports of the sort in which the practice was interested, but the reporting capacity never materialized in a usable format. Once the project was begun, it became clear that EMRs need to be chosen carefully with regard to their reporting capabilities, and that reporting needs must be

understood by practice leaders. In fact, this practice strongly believes that practices need to work with EMR vendors before installation to ensure that EMRs are set up with specific reporting needs in mind, to avoid some of the challenges faced by Practice #4.

Involvement of multiple practice staff in the project provided strength to the effort by incorporating many different points of view and approaches, enhancing both the processes and the resulting analysis, and providing the additional benefit of almost always having someone available with the necessary high energy to push forward on the project. The involvement of the practice's managing partners was especially significant, as it brought increased access to potential resources and access to the practice's EMR lead person.

Review of transparent data was felt to heighten physician awareness of areas of patient care needing attention, leading to improvement in patient care and outcomes in the long run. Physicians noted that a significant amount of effort is involved in what may seem, at the outset, to be a simple performance evaluation activity. The ability to prepare for future "pay for performance" systems was seen as a positive outcome of this project.

## **Case Study #5**

**Background.** Practice #5 is an inner-city practice that offers family medicine, pediatric, and women's health services to individuals of all ages. Established in 1994, the practice serves a panel of 5,000 clinically active patients, with four physicians, four nurses, and 17 others on staff. The practice uses a paper-based medical record system, with transition to an EMR system underway. Previous quality improvement initiatives centered on Joint Commission requirements and included such topics as adequacy of problem, medication, and allergy lists; pain scores; and unapproved abbreviations.

**Project Selection.** The Physician Champion chose to focus their project on diabetes care because it was unanimously felt by practice physicians that better control of diabetes can decrease morbidity "in every other organ system." The systemic damage done by uncontrolled diabetes can affect every part of the body, and improved management of diabetes was felt to have a measurable positive impact on their patient population as a whole. The goal of the project was to measure the proportion of new diabetic patients that had hemoglobin A1c measured in the past quarter and the proportion of new diabetic patients that had fasting blood sugar measured during most recent doctor visit. The project was discussed at a providers' meeting and agreement was reached with regard to the topic and its importance.

**Project Planning.** The practice planned to use information from the patient accounting system to denote diabetic patients seen in the practice to develop a registry. Using this registry, Practice #5 planned to monitor improvement by measuring the rate of collection of quarterly hemoglobin A1c of diabetics, rate of measurement of fasting blood sugar levels during clinician visits, and development of action plans by physicians. During the planning period, the Physician Champion contacted the patient accounting department and requested a report of diabetic patients seen in the practice. Based on the report, the Physician Champion planned to provide monthly blinded reports to practice physicians for review, discussion, and action plan development. While all physicians at the practice expressed support for the concept of the project and its importance, the Physician Champion took on primary responsibility for implementation; she felt that it was not

feasible to ask the other practice physicians to devote time to the project, given current clinical demands on their time.

**Project Implementation.** After several months of waiting for the patient accounting department to produce the requested patient list, it was determined that implementation of the practice's new EMR system at the time of the project, as well as other competing projects, resulted in the accounting department being unable to provide the list requested by the Physician Champion. Plans were therefore made to prospectively recruit diabetic patients to the registry at the time of their next appointment. A paper laboratory data monitoring sheet was developed by the practice to document when a hemoglobin A1c or glucose test had last been completed, reasons for noncompletion, if applicable, and note of any action plan outlined in the record, particularly with regard to medication adjustments. Practice nurses were instructed to collect and monitor lab data on a random sample of 10 patients per physician per month for the 6-month study period, beginning with an initial office (index) visit; information was manually recorded on the monitoring sheet. Diabetes tests that the patient needed that had not yet been provided were performed at that visit and noted in the chart.

A report based on raw data gathered by nurses from each physician's patients between July and October 2008 was generated at the end of October. The report was not transparent, as the Physician Champion felt that this would be viewed as punitive by practice physicians. While the practice had planned to present data reports at each monthly meeting, these discussions did not occur due to full meeting agendas and meeting cancellations. The patient list originally requested from the patient accounting department was finally made available in late November/early December, and the process of manual data collection was discontinued at that time. However, the list was found to include only raw data on the number of patients seen with a diabetic diagnosis code during the study period; no denominators were provided, and patients seen multiple times during the data collection period (i.e., duplicates) were not removed. Therefore, the Physician Champion determined that manual record review needed to continue to obtain a meaningful data report. Subsequently, the practice decided to "regroup" regarding how the process would move forward. Ideas discussed included changing the data set to include who the primary care physician was, the date of the last hemoglobin A1c, and action taken if results were abnormal; finger stick blood glucose measurements were excluded as a measure. The practice planned to continue with the data collection process with existing nursing and IT staff and to generate a second report for discussion in the near future.

**Barriers Identified.** Practice #5 is a busy practice that provides care to a high volume of patients, many of whom are indigent and uninsured. The ability to devote physician and staff time to a performance monitoring project was quite limited, particularly a project that involved time-consuming activities such as pulling charts and manually extracting data. There was a noted shortage of support staff to assist with the project, and as indicated above, not all staff or physicians were engaged in the process or the project due to other practice demands on their time, limiting what the organization was able to take on. Time constraints were noted, especially related to the effort involved in keeping up with patient records to locate, document and interpret laboratory results and action plans. For example, completing data collection for more than 10 patients per provider was not considered feasible, resulting in a relatively small sample size. Vacation and personal schedules also impeded project implementation to a certain degree.

Data from the patient accounting system to build the diabetic patient registry were not available for project use within a reasonable timeframe, data received were ultimately not as helpful as originally hoped, and there were no other automated sources for the data. The resulting need to manually retrieve data from paper records slowed down the data collection process. Further, the practice's sample of patients may have been biased by enrolling patients as they arrived, rather than relying on existing data from a random sample. The practice felt that "good computerized systems" could make quality improvement projects much more feasible. The EMR system currently being implemented should facilitate their efforts.

Significantly, during the implementation period there was a fire in a neighboring office that caused major damage to the building. The practice was closed for several weeks as a result, with clinical care provided at off-site locations. Continuing clinical operations in a disrupted environment proved challenging, and little time or energy was left to devote to organization or implementation of the project until this situation was resolved. However, the practice's flexible approach to the project, and their ability to come up with an alternative project in the midst of chaos, speaks to the importance of working with available resources within the practice. Their continued efforts demonstrated their commitment to this endeavor even in the face of serious obstacles.

**Lessons Learned.** Practice #5's experience highlights the importance of increasing practice-wide knowledge of the capabilities and limitations of its data system before undertaking performance monitoring initiatives. The lack of a fully implemented EMR system hindered their ability to collect existing data; the only automated data system available was the patient accounting system, and billing staff was not trained in the type of data extraction required for the project, nor was the project considered a high priority for the department in light of other requests received.

Further, the importance of establishing a reliable attribution methodology was apparent, but attribution issues were not directly addressed through the project. Concerns were expressed about holding physicians responsible for patients who "just are not doing well." Actively engaging other practice clinicians in the development of quality measures and methodologies would likely assist in making the effort sustainable at this practice, rather than relying on a single physician. On the other hand, the project's use of the least invasive methods possible (i.e., relying heavily on nurse involvement in data collection rather than physician involvement) likely played a significant role the progress this practice was able to make.

## Case Study #6

**Background.** Practice #6 is a family medicine practice associated with a health system and serves both urban and suburban populations in the Richmond metropolitan area. The practice has nine physicians providing primary care for newborns, children, and adults. Established in the 1990s, Practice #6 serves a panel of 6,800 clinically active patients. The practice uses a paper-based medical record system, with transition to EMR planned. Practice #6 has been submitting Physician Quality Reporting Initiative (PQRI) data to the Centers for Medicare & Medicaid Services (CMS) since participating in a pilot program in July 2007, with full submission beginning in January 2008. The practice had previously undertaken quality improvement projects in areas such as access, continuity of care, and vaccination rates.

**Project Selection.** Practice #6 focused on a project that simultaneously addressed PQRI and QPMDCR project needs. At the time the QPMDCR project was being considered, the practice was working toward the goal of physicians completing at least one PQRI paper-based form for each diabetic patient per quarter, with plans to use the data to create a diabetic patient registry. Registry data for all diabetic patients using the standard PQRI measurement ranges was included: hemoglobin A1c categories <7.0%, 7.0% -9.0%, >9.0% or not performed within 12 months; systolic blood pressure <130 mm Hg, 130-139 mm Hg, > or = 140 mm Hg, diastolic blood pressure <80 mm Hg, 80-89 mm Hg, > or = 90 mm Hg; and LDL levels of <100 mg/dl, 100-120 mg/dl, > or = 130 mg/dl, not performed for medical reasons, or not performed within 12 months.

The Physician Champion made an independent leadership decision to use the concurrent QPMDCR project opportunity to promote the development of a system for reviewing the PQRI registry data and developing action plans to improve chronic care management in the practice. The idea for the project was discussed at a provider meeting; not all physicians attended, and no nursing or other staff was included.

**Project Planning.** Practice #6 experienced initial delays with project planning due to receipt of conflicting information from CMS regarding the need for the health system to appoint a security officer for access and retrieval of PQRI data reports. Significant time was spent by the Physician Champion during the planning phase in understanding the details of meeting this requirement; a security officer was ultimately appointed by the health system's quality improvement leadership group in month five of the QPMDCR project. In the meantime, the Physician Champion decided to develop an internal system for generating reports to provide more timely feedback about performance to physicians; CMS-generated reports can arrive as long as 18 months following data submission, making the data much less meaningful. The internal reports were intended to be transparent, with data presented in 6-month increments, and would be discussed openly at regularly-scheduled monthly provider meetings attended by all clinicians. Practice physicians, nurses and staff were not specifically informed about the scope, roles and responsibilities of the QPMDCR project separate from those of the larger PQRI project, resulting in some confusion about who "owned" the project.

**Project Implementation.** As part of the PQRI process already taking place at the practice, the Physician Champion requested that the patient accounting department prepare a report of diabetic patients to help build a diabetic registry. Physicians were expected to complete one

PQRI form per quarter for each diabetic patient seen during the study time frame. In April 2008, prior to the QPMDCR project, the patient accounting department staff compiled a comparative data report reflecting retrospective PQRI data submitted July 2007-December 2007. This report presented basic aggregate frequency data; denominator data were not provided.

The report was distributed to each physician for review, with names blinded to other physicians in the practice. The data in the first report was determined to be incomplete, due in part to an apparent lack of completed PQRI forms. A group discussion did not occur due to competing practice demands on physician and staff time.

When the QPMDCR project began, physicians expressed concerns about remembering and locating an additional piece of paper when seeing patients. To simplify the process, the Physician Champion solicited the help of a front-desk receptionist, who was asked to screen for diabetic patients during the registration process and ensure that the appropriate charts had PQRI reporting sheets attached. In response to the inadequacies of the first data report, a biostatistics student was employed by the practice to develop the project's comparative reports; the student was paid per report generated. The biostatistics student received copies of all submitted PQRI forms and manually entered data from the forms into a Microsoft Excel computer program to allow for comparative report generation. A report reflecting PQRI data from January 2008 to July 2008 was generated in August 2008 by the biostatistics student, and the Physician Champion distributed the report to physicians at that time. The report was transparent, and showed an overall increase in PQRI reporting at the practice, with both very high and very low reporting scores among physicians.

The report was discussed at a meeting in early September. Concerns were expressed about the clinical validity of the report; several physicians felt that PQRI forms they had completed were not reflected in the comparative data reports, and expressed frustration that they did not have input regarding the data in the report (i.e., they said that using numbers instead of a range for A1c or blood pressure would have been more useful). Discussion at this time also revealed significant misunderstanding regarding the two overlapping quality improvement efforts simultaneously underway at the practice, with physicians expressing frustration that the decision to participate in both projects was made without open discussion of process, roles and responsibilities, and timelines. Some physicians were unclear when to complete the form (i.e., annually, quarterly, or every time there was a status change). Nurses were not given a significant role, and therefore did not appear to understand the scope or significance of the project and were not involved in the discussion of the report; they reported that they knew "nothing about the project except that the doctors had to fill out sheets and we [the nurses] had to give the physician the sheet." During monthly partners meetings, difficulties created by poor communication about the practice's participation in both the QPMDCR project and PQRI efforts were reiterated. Lack of clarity about the overlapping projects led to resistance from some physicians, who were faced with multiple, and sometimes competing, timelines for tasks and data collection processes. While the Physician Champion reported that she tried to clarify the expectations and move the project forward, this opinion was not shared by the other clinicians.

A second report reflecting PQRI data from July 2008 to December 2008 was generated in January 2009. The report showed a marked improvement in the practice's PQRI form submission

rate for Medicare diabetic patients, bringing the practice close to, but not reaching, the level where they could be eligible for CMS financial incentives. The results of the second report were sent to the practice physicians via email. In that communication, the Physician Champion wrote of gains to the health system through this endeavor, including: increased health system-wide PQRI participation; CMS reimbursement received through PQRI work done by other departments; increased support and recognition by the patient accounting department and health system leadership of the importance of collecting billing-level data in an outpatient setting; and establishment of the necessary infrastructure to receive data from CMS (including assignment of a security officer and a data manager).

A meeting was not planned to discuss the second report at the time of project conclusion. Instead, the Physician Champion considered providing physicians with a full year of registry data, and solicited feedback via email from practice partners about their willingness to take the project to the next level by developing an "activated team of doctors and nurses who review data and pre-plan diabetic visits." Further, the health system that owns the practice recently purchased a data abstraction component for their health information system that would allow for the collection of outpatient data, including blood pressure, hemoglobin A1c and LDL. This system is to be implemented in March 2009, and the Physician Champion has been in contact with the data retrieval team to ensure that they are aware of the practice's performance monitoring data needs.

**Barriers Identified.** Practice #6's experience identified several barriers related to the retrospective PQRI data on which the project was based. The Physician Champion believed that data would be available online from CMS; however, the practice found that due to computer registration requirements and issues related to the health system's control of practice access to data, such data was not available. Lack of a fully implemented EMR system made the performance monitoring project more challenging since desired data were not readily available, and reliance on paper forms introduced opportunities for error (i.e., data collection forms not consistently attached to charts, forms not consistently filled out); the data collection tool became one of many papers for providers to complete. Further, having physicians complete data collection and abstraction added yet another responsibility to their already tightly scheduled time. Involvement of the nursing staff would likely have benefited both the physicians and the patients, and secured the investment of a critical partner in the practice care delivery team.

The lack of physician "buy-in" was a significant barrier to the project at Practice #6; physicians expressed significant concerns about participating in PQRI (let alone another project) at a time when a transition to an EMR system was underway. Further, the perception of PQRI data as "poor overall" and "clinically meaningless" by physicians due to inaccurate or incomplete practice reporting was a hindrance to obtaining their full support. Perhaps most importantly, physicians at Practice #6 did not appear to support the project due to lack of communication about the end result of their efforts and a vision for how the data would be ultimately used. During the course of the project, it became apparent that some physicians, nurses, and staff were not even aware that two overlapping quality improvement projects were being undertaken. The lack of communication about the two projects and the lack of shared decisionmaking about roles and responsibilities acted as a barrier to establishing the kind of team approach that could have made the project easier to undertake, and the results of the project more meaningful and sustainable. While the project seemed simple and straightforward to the Physician Champion, it

quickly became clear that messages were not being received as intended, and the implementation of the "simple" idea was anything but easy. Early and regular face-to-face meetings with everyone on the project team would likely have increased chances of the practice being satisfied with the results of their efforts.

Practice #6 also experienced a lack of time and expertise among current practice and billing staff to generate meaningful comparative reports, resulting in the need to subcontract for this service. This strategy proved problematic due to lack of complete project information transfer between the students who served as data managers and language barriers encountered when working with nonnative English speaking students. Lack of funds to hire a permanent staff member to perform this function was perceived to have negatively impacted the practice's ability to obtain meaningful data in a timely fashion.

Physician Champions have a unique opportunity to provide leadership to a practice's performance monitoring efforts; such leadership must include a commitment to open communication and team-building to foster success. The benefits of soliciting input from physicians, nurses and staff about proposed performance monitoring activities is a vital component of building effective teams that cannot be underestimated. Without this level of leadership, much time, energy and good will is wasted.

**Lessons Learned.** Practice #6's experience illustrates the importance of having, and sharing with all clinicians and staff, clarity about project goals, processes, deliverables, and expectations at the outset. The participants in the final focus group reported that they were very confused by the communications about the project from the Physician Champion and that it "appeared as if the project kept changing." This confusion reflects communication problems generally in the practice, and in particular around this project. Practice #6's experience illustrates that practice leaders must seek clinical "buy-in" and ensure that the practice has a set of mutual, clearly articulated goals and objectives agreed to before initiating a QPMDCR project. Further, the practice must thoroughly understand the resources needed to carry out performance monitoring, as well as the actual resources available to the practice, so that appropriate planning can take place for a successful effort. While the Physician Champion at Practice #6 viewed the project as determining the institutional capacity for supporting a performance monitoring effort prior to actual implementation, this vision was not effectively communicated to the rest of the practice. If physicians at Practice #6 had clearly understood that the purpose of the project was to pilot-test the practice's capacity for performance monitoring, a greater level of "buy-in" most likely would have been secured.

The practice identified that difficulties created by the lack of a standard registry software package and a dedicated data manager for their project were significant obstacles to their ability to create the registry. Collaboration between physicians, nurses, and other staff to determine and document registry data needs will likely be necessary to develop a strategic plan whereby identified needs can be clearly communicated to health system decisionmakers as they consider health IT options (including EMR and registry software). Consultation with a health IT expert to better understand the electronic resource needs and options may be advisable.

Strategies identified by the practice for the immediate future include improved communication about goals and roles, involvement of the entire care team, and a streamlined data collection process, possibly through the electronic data retrieval system currently soon to be implemented. The resulting quality improvement process should include presentation of timely, accurate comparative data reports, positive feedback, and open discussions regarding areas of concern. Further, when the practice moves to an EMR-based system, continued attention must be paid by practice leaders to EMR data extraction and reporting capabilities to meet the needs of planned quality improvement projects. In the meantime, suggestions for drawing attention to paper data collection tools to capture physician attention (i.e., printing on brightly colored paper or attaching to billing slips that have to be completed by each physician) were discussed as ways to enhance physicians' performance of manual data collection.

# Summary

The Task Order project was designed to prospectively identify and report barriers experienced by primary care practices as they attempt to conduct performance monitoring. As barriers were experienced over the course of the projects, potential solutions identified and employed by the practices to overcome barriers were also examined. Barriers and practice strategies to overcome barriers are detailed below, followed by policy recommendations to provide practices with necessary external support.

## Barriers to QPMDCR

Practices participating in the study experienced multiple challenges in their efforts to conduct QPMDCR projects. While some barriers were specific to the situation of an individual practice at a particular point in time, several common themes were observed. Some obstacles were significant and problematic enough to make conducting projects impossible, whereas others were handled with adaptations to project methods and outcomes, with varying degrees of success. The barriers described below are grouped by category, but many overlap in their impact on the ability of practices to successfully conduct QPMDCR.

### Lack of Time/Competing Demands

All six practices experienced significant problems related to competing demands for time; overall, the practices simply did not have enough excess capacity to undertake a new project that would take time away from patient care and other practice needs. Without additional resources, adding performance monitoring to primary care practices' list of existing responsibilities was not feasible in most cases, and required that other tasks be put "on hold." The amount of time involved in conducting a QPMDCR initiative was noted to be substantial. This was particularly true for practices that relied on time-intensive data collection methods like manual chart abstraction, and for those that relied on physicians as data collectors.

### Staffing Constraints

All practices in the study lacked enough on-site staff with the expertise needed to retrieve, interpret and analyze data. Some, due to varying degrees of interest, acquired expertise through networking and sheer determination to succeed in implementing the projects. Other sites had some basic understanding of the skills required, but still required external assistance and consultation to progress with implementation. Practices faced difficulties finding available staff to assist with the day-to-day implementation of the projects, and typical practice human resources issues such as physician turnover and unexpected staff shortages further lowered their ability to focus on the project and keep it a high priority. When practices assigned responsibility to a single individual, it was often too overwhelming to be successful.

### Data Challenges

Practices that had fully implemented EMRs were generally able to make more progress toward generating meaningful reports than those using paper-based records, but problems were still

encountered. Extracting data from the EMRs was not straightforward, and EMRs often did not interface with other clinical information systems or have the desired reporting capabilities. This highlights one of our major findings: EMRs are necessary but not sufficient to support performance monitoring. Practices that relied on billing system data to generate reports encountered their own challenges: Data were difficult to obtain and were of limited usefulness. Finally, several practices entwined their QPMDCR projects with related PQRI efforts, and faced barriers in understanding and meeting PQRI data requirements and obtaining timely feedback.

## **Attribution Concerns**

Study practices faced barriers to assuring the accuracy of attribution of care and responsibility for outcomes to individual physicians. Practices often did not have systems or methodologies in place to identify primary care providers at the time of appointment. Some physicians were unavailable for patient follow-up during the study period due to other clinical responsibilities. The artificially short window of data collection time limited the practices' ability to accurately track outcomes. Patient adherence to treatment plans and self-management of disease was experienced as a barrier to the practices' ability to accurately attribute outcomes to physicians. Physicians' lack of control over patient behaviors and being held responsible for patients attributed to physicians but who were not technically "their patients" were concerns not completely addressed.

## **Clinician Engagement**

Obtaining feedback from physicians and securing their support, particularly without reimbursement incentives, was a barrier to maximum success. Lack of physician "buy-in" to the importance of QPMDCR relative to other practice demands, concerns about data quality and lack of communication about goals and objectives limited physician support for the projects. Not all practices actively sought the participation of all staff and physicians, a decision that sometimes acted as another barrier to obtaining support and ongoing engagement in the process. Attitudes about the invasiveness of QPMDCR projects were sometimes a barrier in and of themselves.

## **Practice Strategies to Address Barriers**

Participating practices identified a number of strategies for addressing barriers encountered during QPMDCR project implementation. While the short implementation period precluded most practices from being able to fully test out many strategies for long term impact, several showed early signs of positive effect. The implementation period of our study is one of the major limitations that must be taken into consideration in assessing success. However, the study timeframe did provide parameters to the projects, including scheduling specific milestones that may not been met if the time period for implementation had been longer or less rigorous.

## **Selection of Physician Champion**

Careful selection of a Physician Champion clearly provides a strategic advantage to practices engaged in QPMDCR. A well-respected Physician Champion willing to assume leadership and embody a vision of practice improvement, combined with a commitment to clear communication and teamwork, appeared to have a powerful impact on success. Physician Champions in this study clearly played a pivotal role in motivating practice staff to achieve project goals. However,

there was a good deal of variation in how the Physician Champion was selected at the various practices. In some cases, the physician who had the most experience with the tasks necessary to conduct the project was chosen; in other cases, it was a physician who truly was a champion for practice change. Thus, it is important to carefully distinguish between "appointed" champions, "self-appointed" champions, and those whose influence lies in their informal credibility with other physicians and practice staff. While such details are beyond the limits of this report the issue merits consideration for practices undertaking such activities in the future.

## **Clinician and Staff Involvement**

Involving clinicians and staff at all levels within the practice had a positive impact on project progress. The involvement of multiple individuals (physicians, nurses, and staff) in projects strengthened their practice's efforts by incorporating different points of view and approaches to problem solving, enhancing both the processes and the results, and enhancing the chances that enthusiasm for the project would be sustained. Involving managing partners was a particularly effective strategy by virtue of increasing access to resources. Further, involvement of staff at all levels allowed the use of the least practice-invasive methods (i.e., involving nurses or other staff in data collection, rather than physicians), a strategy that would appear to make QPMDCR projects more sustainable. The premise that those who perform a given task are in the best position to make recommendations about its improvement is confirmed in all quality improvement literature, especially that based on manufacturing and industrial models. This concept was clearly heard in project focus groups, especially in cases where front line nursing staff had no idea what the projects were about; nurses and physicians at these sites generally found it most difficult to comply with requests for participation, especially from "self-appointed" physician champions.

## **Development of Attribution Systems**

Accurate attribution of care provided to an individual patient by an individual physician, referred to as "attribution," was a commonly noted concern, and development of an attribution algorithm was a strategy successfully implemented by one practice after a great deal of discussion, investigation and agreement by the clinicians. However, other practices had difficulty identifying an appropriate attribution methodology on their own. The attribution algorithm developed by a practice in our study was shared with the medical director at one of the small participating practices that identified attribution as a problem, although that site opted not to implement it. Correction of identified attribution inaccuracies by a single practice staff member was found to increase accuracy and reduce the potential for physician selection of healthier patients, thereby enhancing the meaningfulness of reports.

## **Innovation and Flexibility**

When some practices were unable to carry out their project plans as initially designed, innovation and flexibility allowed for continued progress. Importantly, when practices were able to identify a gap in existing knowledge and reach out to obtain assistance from experts, significant progress was made where projects would otherwise have stalled. Thus, willingness to acknowledge practice needs permitted these practices to ask for help. This proved to be an effective strategy for overcoming technical, staffing and process barriers on several occasions. While practices that are part of larger health systems with access to greater financial and health

information technology resources are certainly at an advantage when conducting performance monitoring, even smaller practices can approach the process by starting small, with incremental progress toward quality improvement goals that can be adapted over time to meet changing circumstances and resources.

## **Gathering Input on Technical Issues**

Learning from peer experts is essential, as reliance on EMR vendors for guidance on technical issues proved problematic due to competing financial interests. For example, several practices reported that in their initial negotiations with EMR vendors, the vendors never mentioned performance monitoring or quality improvement, or the need for computer interfaces with other clinical electronic data systems. When this need was eventually discovered by the practice, a fee was always required to obtain what was in most cases a one-time report rather than a long-term solution to the problem. Thus, practices that are able to think beyond the immediate need to capture EMR patient encounter data, to the type of data and related reports that may ultimately be required from the EMR, will likely achieve greater success; this may require consultation with other practices with more experience with EMRs and the development of performance monitoring systems and quality improvement activities. The experiences of "best practices" within ACORN suggests that involvement in research can, in and of itself, be an effective strategy for catalyzing practice change by developing necessary data retrieval and analysis skills and providing access to resources and expertise beyond the practice.

## **Building on Existing Data Systems and Projects**

Projects that built upon existing quality data collection efforts, such as PQRI, provided an opportunity for practices to further their understanding and readiness to respond to Federal reporting guidelines, though this strategy also proved at times problematic when limitations of the existing programs were significant enough to act as a barrier. In some cases, practices achieved progress by circumventing the idiosyncrasies of the external process through development of internal systems for generating reports from the same data source. Likewise, limitations of other data sources (such as billing systems) required creative alternative methods for obtaining and analyzing data. Further, while no practices in the study purchased EMRs specifically to conduct their projects, practices that already had EMRs in place did experience increased opportunities to analyze data without reliance on labor intensive manual data extraction; a carefully thought-out purchase of an EMR with sophisticated reporting capabilities is a strategy fundamental to long-term sustainability of QPMDCR efforts. Once an EMR is in place, continued attention to development of interfaces with other clinical systems is vital to further the process.

## **Transparency in Reporting**

Experiences of ACORN "best practices" that have engaged in performance monitoring for longer periods of time, as well as the current study practices, indicate that the evolution toward transparency in reporting can be an effective strategy for engaging clinicians in the process. However, the implementation practices had various opinions about report transparency. One "self-appointed" Physician Champion decided not to produce transparent reports for fear that physicians would resist. However, another practice implemented transparent reports and reported that no problems with physician reaction as "none of us did particularly well, so it did not matter

that everyone saw the data." Both ACORN "best practices" in the study recommend producing transparent reports from the start of performance monitoring; neither site experienced problems with this approach.

## Policy Recommendations

Many primary care practices are aware of the importance of performance monitoring to assuring quality of care, enhancing accountability to patients and payers, and improving reimbursement that will allow them remain operational in a competitive market. Some practices are already engaged in quality improvement efforts, and some are testing out innovative strategies for improving the impact of their efforts. However, they are limited in their ability to comprehensively conduct QPMDCR for a variety of valid reasons, including financial, infrastructure, and technological barriers; primary care practices will need an infusion of assistance and support to overcome this host of barriers to conduct systematic, low-cost performance monitoring for entire practice populations. Policymakers and payers must pay careful attention to the following considerations as they move forward with mandates for performance monitoring to ensure that such initiatives are grounded in the reality of primary care practices and that support is provided in the most effective manner.

### Adequate Funding

Many primary care practices have demonstrated interest in and responsiveness to initiatives to improve the quality of patient care they provide. However, their ability to get quality performance monitoring initiatives "off the ground" is often limited by a lack of infrastructure to support to the effort. Innovations that come from grants and contracts have historically not led to sustained efforts; when project-specific funding goes away, so does the commitment to performance monitoring efforts when continuation would mean that limited practice resources must be allocated away from other, more immediate practice needs. Quality performance monitoring and reporting has been promoted by the Future of Family Medicine and other influential initiatives, but only start-up costs are acknowledged. In reality, the costs to practices of conducting meaningful performance monitoring go far beyond initial purchasing costs, and payers and policymakers that promote performance monitoring must take the direct and indirect costs into account when setting forth mandates for practices. Health care reform initiatives currently under consideration by the new administration seem certain to include mandates for performance monitoring throughout all tiers of the health care system; already Medicare has announced that e-prescribing will be mandated by 2011, with practices using the system for less than 20 percent of their patients facing reduced reimbursements. This type of mandate will certainly move the process forward for establishing the kind of streamlined, electronically interconnected health information system needed to increase efficiencies. However, with less than half of primary care practices currently even using EMRs (and even those using EMRs not always able to report data on enough patients to meet reimbursement thresholds) adequate financial support is needed to set up and enhance data collection and retrieval systems prior to mandate deadlines. Without such support, these national policies could make it difficult for many small practices to stay in business.

A sustainable system of innovative and flexible funding is needed. Establishment of reimbursement codes across payers (public and private) for quality performance monitoring activities will be required to make time-consuming data collection possible and worthwhile for small practices. Current reimbursement rates through HEDIS and PQRI are not enough to

motivate practices that are often already stretched too thin in human resources to devote the necessary time and effort to sustain performance monitoring. In fact, the two study practices that were involved in PQRI explicitly stated that the funds from CMS are not sufficient to motivate a practice to participate in this activity. When asked in a focus group how much the practice would have to receive to continue participation in PQRI, there were two responses. One physician responded: "There is not enough money for anyone to want to do what PQRI requires." Another physician reported: "Sufficient funding to hire an individual who would do nothing but PQRI so the physician would not have to be involved in data collection."

We must note, however, that the issue of adequate payment for a practice to conduct quality performance monitoring is complicated by the fact that practices are at various levels in their ability to conduct such activities. For example, the costs of collecting and reporting performance monitoring data are very different depending on whether a practice has an EMR or is using a paper-based medical record. Additionally, if a practice has some prior experience with producing such reports, their cost may be substantially less than a practice that has not yet conducted any of these activities. Finally, given the variability of data collecting and reporting methods, cost may also differ. Perhaps the development of national standards, with an initial amount of start-up funding based on the current status of performance monitoring in a given practice, may help address concerns about adequate reimbursement.

Most primary care practices, often small organizations operating with minimal staff (who, out of necessity, fill a variety of roles within the practice), are simply unable to absorb the cost of a data gathering exercise that takes staff away from more readily reimbursable activities directly centered on the delivery of primary care services. Effective and reasonable reimbursement systems must be developed to support practice redesign efforts that incorporate quality performance monitoring as standard business practice.

## **Data Retrieval and Analysis Expertise**

Primary care practices nationwide are in widely varying stages of EMR implementation. An EMR can make collection of performance monitoring data a more feasible and sustainable prospect than reliance on paper-based systems; however, an operational EMR is necessary but in itself not sufficient to support performance monitoring activities. Initial EMR purchases (or EMR upgrades negotiated with vendors) require the careful consideration of immediate and future performance monitoring reporting needs, and ongoing assessment of EMR reporting design strengths and weaknesses. For example, the capacity for an EMR to create a patient registry has been noted to be important to the success of primary care practice performance monitoring efforts, something that may not be recognized at the time of initial EMR purchase by either the practice or the vendor. This study found that many vendors are anxious to sell EMR systems that may not be as complete as needed, and in some cases may totally overlook the importance of performance monitoring and other quality of care data that must be generated from the EMR and interfaced with other clinical information systems such as laboratory and radiology. As one focus group member, a physician with some computer expertise, said "Many mistakenly think that once the practice has an EMR all you do is press a button and a report appears; that is not reality and few vendors ever point out such limitations." Regulations are

needed to support transparency in disclosing what EMRs can and cannot do, and whether additional add-on purchases are required for key functions such as performance monitoring.

In addition, most primary care practices do not have on staff individuals with expertise in information technology (IT) needs or applications, nor do they have the excess capital required to add these resources. Thus, practices may not even know the questions they need to ask the EMR vendors prior to selection of a system. Additionally, if the Federal Government and payers eventually require performance monitoring reports, it will be necessary for them to develop explicit guidelines for EMR disclosure by vendors, as apparently many vendors at this juncture do not bring such issues to the attention of potential EMR purchasers. Initiatives are needed that would provide for a variety of IT support services to enable primary care practices to hire additional staff or contract with consultants; these additional IT resources could greatly assist practices when making decisions about EMR and/or reporting application purchases or upgrades, and to make the best use of existing data systems. Again, the cost of obtaining such expertise cannot be overlooked by policymakers as they press for increased use of EMRs and other health information technologies.

## **Clinician Engagement**

Securing clinician engagement after initial conceptual "buy-in" to performance monitoring activities is important. Even with appropriate funding, performance monitoring is unlikely to be successful unless physicians, nurses and other partners on the care team understand and value the importance of the role played by performance monitoring in improving patient care, and are willing to participate in the process. This participation requires time for discussion of practice needs relative to performance monitoring. Meeting time may take time away from clinical responsibilities or require additional work time outside the patient encounter to review and discuss performance monitoring, even before quality improvement efforts are identified and implemented. In order for primary care practices to succeed with performance monitoring, they need to have access to data that are meaningful and that they feel empowered to act upon. Otherwise, practices feel that collecting data adds no value to what they do, they do not "buy-in" to the importance of the effort, and they will discontinue the process as soon as specific projects are over. Performance monitoring needs to be something that can be seamlessly integrated into their primary care mission of providing comprehensive, patient-centered care.

As indicated above, a significant measure of clinician "buy-in" and eventual engagement can be accomplished by adequately reimbursing practices for QPMDCR- related activities. Further, soliciting the ongoing input of physicians and nurses in the development of performance measures to be used, and the rubrics by which they will be assessed, should be a standard step in the process of establishing reporting policies. Incorporation of such feedback in a meaningful way could significantly enhance the validity of the process and the support engendered by those mandated to participate. Performance monitoring needs to include measures that matter to practices, measures that will demonstrably improve the care they deliver. Finally, reporting entities should held accountable for giving practices timely, transparent and actionable feedback on their performance to allow for measurement of practice change, motivation to remain engaged, and concrete information about how changing performance would improve their reimbursement.

## Practice Redesign

Many primary care practices in the United States operate under outdated and fragmented models of care delivery that do not support ongoing performance monitoring to promote and assure high quality patient care. Further, these models do not support the ability of primary care practices to find creative ways to improve the way they do business or the way they conduct and document quality improvement monitoring efforts and outcomes. The widely touted chronic care model incorporates features that support performance monitoring, but many practices have not been able to make the fundamental shifts (cultural or financial) needed to realize the benefits. Meaningful practice redesign requires a new way of looking at how primary care delivery is viewed within the larger context of the health care system, requiring a commitment to fundamental change by practice leaders, insurance companies, and government entities.

The disconnect between current primary care methods of operation and the tightening reimbursement environment is problematic for both patients and practices. Programs to expand the reach of concepts like those espoused by the American Academy of Family Physicians' TransforMED initiative are sorely needed to support the process of widespread primary care practice redesign. Funding on a national level for innovative redesign efforts is needed to provide support to primary care practices in each of the key areas identified by this study, starting with improved electronic medical record linkages that cross traditional system boundaries and allow for sustained application of quality improvement measures. This electronic inter-connectedness will greatly enhance the ability of primary care practices to provide "state-of-the-science" care based on timely decision support built upon real quality improvement data.

The core elements of the American Academy of Family Physicians' practice redesign model highlight the very areas most needed to secure clinician engagement: a primary care-based, patient-centered approach to service balanced with a team-based approach to improving office functionality and reimbursement. The fundamental shift promoted by this model supports better outcomes for patients through improved chronic disease management realized by more effective and cost-efficient care. Clinicians likewise benefit by more efficient operations that streamline office practices and provide more appropriate reimbursement for services.

In the current environment of increased scrutiny to fiscal accountability and demands for improved health care quality and efficiency at all levels, initiatives that support the infrastructure needed by primary care practices to provide quality comprehensive care and promote wellness and disease prevention while demonstrating cost effectiveness are a "win win" that will reap rewards for the health care system overall. Primary care practices have lagged significantly behind other sectors of the health care system in their ability to effectively gather and report quality data. Primary care practices must be supported in ways that will allow them to improve the quality and effectiveness of the health care system.

## Conclusion

Many factors affect the ability of primary care practices to effectively carry out performance monitoring activities. Fundamental system change, addressing staff roles and expertise, information technology infrastructure, and practice culture will likely be required to disseminate and implement performance monitoring in primary care. Related to all of these is the issue of practice redesign. The reality is that most primary care practices are not currently structured (i.e., organization, financing, staffing) to support these key components to success. Without technical assistance and financial support in these critical areas, primary care practices are unlikely to be able to incorporate meaningful performance monitoring into clinical operations and remain viable providers of patient-centered care.

For performance monitoring to occur in primary care practices nationwide, substantial work will be required to examine incentives. Most importantly, for the goals of clinical performance monitoring to be achieved, there must be an influx of Federal funding to support the implementation of EMRs, establishment of required clinical data interface systems and development of onsite expertise; these vital features are missing from most primary care practices at present. While this solution may not be popular during the current recession, it is consistent with a number of proposals made by the new administration about EMRs, e-prescribing and the need to foster prevention and health behavior promotion.

To assist primary care practices in navigating the process of establishing and maintaining a system for routine performance monitoring, the real-world experiences of the six study practices were examined to identify process elements that appear necessary for carrying out successful QPMDCR. This examination led to the development of a "process model" (see Appendix A) outlining the phases of performance monitoring that practices need to pay attention to as they assess their readiness to incorporate performance monitoring and quality improvement into daily practice operations. The process model highlights important topics such as identification of performance monitoring goals, establishment of a plan for systematic data collection and organization, and establishment of a method for development of action plans based on reported data. The model also illustrates the interplay between the internal and external environments in which performance monitoring takes place. The process model served as the basis for the development of an interactive Web-based practice self-assessment tool (see Appendix B). The tool provides a series of questions for practices to consider as they assess their readiness to conduct performance monitoring. Based on answers to the questions, the tool provides feedback about areas that may require additional attention before the practice can expect success. Further development and testing of this tool could yield additional insight into factors that play into successful performance monitoring in primary care practices throughout the country.

# Tables and Figures

**Table 1. Study practice characteristics**

Case #	Setting	Practice Type	Years in Operation	Staffing	Number of Active Patients	Medical Record System	Prior Performance Measurement
1	suburban	private internal medicine	14	2 physicians 2 medical assistants	4,200	EMR since 2002	no
2	suburban	family medicine residency	33	8 FT/2PT physicians 17 residents 6 nurses	10,800	EMR and paper (transitioning to EMR-only)	yes
3	suburban	family medicine residency, part of large health system	8	5 FT/1 PT physicians 18 residents 7 nurses	10,000	paper (transitioning to EMR)	yes PQRI participant
4	rural/small town	private family medicine, with residency affiliation	31	7 physicians 16 residents 2 nurse practitioners 11 nurses	10,000	EMR since 2003	no
5	inner-city	community health center	15	4 physician 4 nurses	5,000	paper (transitioning to EMRI)	yes
6	urban/suburban	part of large health system	15	9 physicians 5 nurses	6,800	paper (transitioning to EMRI)	yes PQRI participant

**Table 2. Details of QPMDCR projects**

<b>Case #</b>	<b>Variable</b>	<b>Measurement</b>	<b>Data Source</b>	<b>Process</b>	<b>Project Output</b>
1	Hemoglobin A1c	Proportion of diabetic patients that had hemoglobin A1c measured in the past quarter	Automated query of EMR data	EMR vendor's technical staff to produce reports	None—practice discontinued project prior to implementation
	Urine microalbumin	Proportion of diabetic patients that had urine microalbumin measured in the past year			
2	Hemoglobin A1c	Proportion of all diabetic patients that had hemoglobin A1c measured in the past quarter	Paper data collection forms	Forms completed prospectively by physicians and residents at time of encounter for 20 diabetic patients	Two transparent comparative reports presented to physicians at 3-month intervals
	Urine/creatinine ratios	Proportion of all diabetic patients that had urine/creatinine ratio measured in the past year			
3	Hemoglobin A1c	For Medicare Part B diabetic patients with most recent hemoglobin A1c > 9.0% (poor control) or < 7.0% (good control): affect on outcomes of patient adherence to <ul style="list-style-type: none"> <li>▪ Suggested testing</li> <li>▪ Prescribed medication</li> <li>▪ Recommended diet</li> <li>▪ Exercise</li> <li>▪ Other</li> </ul>	Manual query of PQRI patient lists, paper charts	Patients identified by nurses, PQRI lists and 120 paper charts manually retrospectively reviewed by physicians, with results documented on paper data collection forms	One transparent comparative report presented to physicians at study mid-point, patient-specific action plans developed based on major factors affecting patient adherence

Case #	Variable	Measurement	Data Source	Process	Project Output
	Blood pressure	<p>For Medicare Part B diabetic patients with most recent systolic blood pressure &gt;140 mm Hg (poor control) or &lt;130 mm Hg (good control): affect on outcomes of patient adherence to:</p> <ul style="list-style-type: none"> <li>▪ Suggested testing</li> <li>▪ Prescribed medication</li> <li>▪ Recommended diet</li> <li>▪ Exercise</li> <li>▪ Other</li> </ul> <p>For Medicare Part B diabetic patients with most recent diastolic blood pressure &gt; 90 mm Hg (poor control) or &lt; 80 mm Hg (good control): affect on outcomes of patient adherence to:</p> <ul style="list-style-type: none"> <li>▪ Suggested testing</li> <li>▪ Prescribed medication</li> <li>▪ Recommended diet</li> <li>▪ Exercise</li> <li>▪ Other</li> </ul>			
	LDL values	Percentage of patients with LDL level: <100 mg/dl 100-129 mg/dl			
	LDL values	Percentage of all diabetic patients with most recent LDL levels >130 mg/dl (poor control) or <100 mg/dl (good control) affect on outcomes of patient adherence to:			
		<ul style="list-style-type: none"> <li>▪ Suggested testing</li> <li>▪ Prescribed medication</li> <li>▪ Recommended diet</li> <li>▪ Exercise</li> <li>▪ Other</li> </ul>			
4	Blood pressure	<p>Percentage of all diabetic patients with most recent systolic blood pressure</p> <ul style="list-style-type: none"> <li>▪ &gt; 140 mm Hg</li> <li>▪ &gt; 130 mm Hg</li> </ul> <p>Percentage of all diabetic patients with most recent diastolic blood pressure:</p> <ul style="list-style-type: none"> <li>▪ &gt; 90 mm Hg</li> <li>▪ &gt; 80 mm Hg</li> </ul>	Automated query of EMR data using Access and Excel systems developed by practice	Physician Champion extracted, cleaned and created data reports	<p>Attribution algorithm developed</p> <p>Two transparent comparative reports presented to physicians at 3-month intervals</p>
5	Hemoglobin A1c	Proportion of new diabetic patients that had hemoglobin A1c measured in the past quarter	Automated query of patient accounting data, paper	Nurses documented lab data on paper data collection	One blinded comparative report, not presented to

Case #	Variable	Measurement	Data Source	Process	Project Output
	Fasting blood sugar (FBS)	Proportion of new diabetic patients that had a FBS measured during most recent doctor visit	data collection forms	forms for random 10 patients per physician	physicians
6	Hemoglobin A1c	Percentage of all diabetic patients with hemoglobin A1c: <ul style="list-style-type: none"> <li>▪ &lt;7.0%</li> <li>▪ 7.0–9.0%</li> <li>▪ &gt;9.0%</li> <li>▪ Not performed within 12 months</li> </ul>	Automated query of PQRI data using Excel	Front desk staff screened patients, physicians completed PQRI forms, internal reports generated by biostatistics student	Two transparent comparative report, first report presented to physicians in month 4 of the study, second report shared via email
	Blood pressure	Percentage of all diabetic patients with systolic blood pressure: <ul style="list-style-type: none"> <li>▪ &lt;130 mm Hg</li> <li>▪ 130–139 mm Hg</li> <li>▪ &gt; or = 140 mm Hg</li> </ul> Percentage of all diabetic patients with diastolic blood pressure: <ul style="list-style-type: none"> <li>▪ &lt;80 mm Hg</li> <li>▪ 80–89 mm Hg</li> <li>▪ &gt; or = 90 mm Hg</li> </ul>			

**Table 3. Summary of QPMDCR project outcomes**

Case #	Able to measure performance (# of reports produced in 6 mo. period)	Plan to continue measurement after study	Barriers encountered	Strategies used
1	No (0)	No	<ol style="list-style-type: none"> <li>1. Lack of staff with expertise in data retrieval, interpretation and analysis</li> <li>2. Unexpectedly high level of staff turnover led to increased administrative burden on office manager</li> <li>3. Lack of physician involvement - project delegated to single office manager</li> <li>4. Lack of time to devote to project/ competing demands for office manager time</li> </ol>	<ul style="list-style-type: none"> <li>• None—practice discontinued project prior to implementation</li> </ul>
2	Yes (2)	No	<ol style="list-style-type: none"> <li>1. Lack of time to devote to project/ competing demands for physician and staff time for clinical and residency responsibilities</li> <li>2. Shortage of support staff to help with project</li> <li>3. Lack of physician "buy-in" to extra effort - project relied heavily on physician involvement</li> <li>4. Lack of system for identifying PCP when patients made appointments and residency program limited ability to provide continuity of care and track outcomes</li> <li>5. Lack of fully implemented EMR and reliance on both paper and electronic records introduced opportunities for error</li> </ol>	<ul style="list-style-type: none"> <li>• Used a popular Physician Champion - a strong leader with commitment to project</li> <li>• Used transparency in reporting - promoted discussion of plans to improve patient care</li> </ul>
3	Yes (1)	Yes, as is	<ol style="list-style-type: none"> <li>1. Lack of time to devote to project/ competing demands for physician and staff time for clinical and residency responsibilities</li> <li>2. Lack of accurate attribution methodology led to concerns about physician performance data</li> <li>3. Limited faculty physician involvement limited scope of project</li> <li>4. Involvement of multiple individuals in chart review and encounter form completion introduced opportunities for error</li> <li>5. Difficulty in providing continuity of care over time due to residency program</li> </ol>	<ul style="list-style-type: none"> <li>• Built on existing PQRI efforts</li> <li>• Used transparency in reporting - led to discussion of individual treatment plans and physician and patient factors that led to various outcomes</li> </ul>
4	Yes (2)	Yes, but data collection process and analysis will be automated in the future	<ol style="list-style-type: none"> <li>1. Lack of time to devote to project/ competing demands for physician and staff time for clinical and residency responsibilities</li> <li>2. Difficulty in obtaining desired data due to security issues</li> <li>3. Lack of EMR capacity to produce desired reports</li> <li>4. High level of physician turn-over</li> <li>5. Shortage in nursing and front desk staff</li> <li>6. Lack of IT staff with necessary skills</li> <li>7. Lack of physician "buy-in" about importance and accuracy of measures being studied</li> <li>8. Physician concerns about impact of patient adherence on outcomes</li> </ol>	<ul style="list-style-type: none"> <li>• Trained staff and clinicians to standardize data collection</li> <li>• Used a strong Physician Champion with a commitment to research and quality improvement</li> <li>• Gathered input on EMR data extraction and reporting from clinician with IT expertise at another practice</li> <li>• Involved clinicians and staff at all levels</li> </ul>

Case #	Able to measure performance (# of reports produced in 6 mo. period)	Plan to continue measurement after study	Barriers encountered	Strategies used
				<p>of practice to incorporate multiple points of view and ensure momentum</p> <ul style="list-style-type: none"> <li>• Developed attribution system to enhance continuity of care and assure accuracy of physician-specific data</li> <li>• Used transparency in reporting - heightened awareness of areas of patient care that needed attention</li> <li>• Adapted project in response to barriers with initial plan</li> <li>• Relied on nurses for data collection - limited demands on physicians</li> </ul>
5	Yes (1)	Yes, as is	<ol style="list-style-type: none"> <li>1. Lack of time to devote to project/ competing demands for physician and staff time for clinical responsibilities</li> <li>2. Shortage of support staff to help with project</li> <li>3. Lack of timely access to automated data from patient accounting</li> <li>4. Limited usefulness of patient accounting data once received</li> <li>5. Reliance on manual data abstraction method - too time intensive to sustain</li> <li>6. Limited physician support due to concerns about accountability for patients with poor outcomes</li> </ol>	<ul style="list-style-type: none"> <li>• Adapted project in response to barriers with initial plan</li> <li>• Relied on nurses for data collection - limited demands on physicians</li> </ul>
6	Yes (1)	Yes, as is	<ol style="list-style-type: none"> <li>1. Difficulty obtaining access to performance data</li> <li>2. Lack of physician "buy-in" to importance and management of the project</li> <li>3. Physician concerns about accuracy of performance data</li> <li>4. Reliance on paper data collection methods introduced opportunities for error</li> <li>5. Lack of nurse involvement - reliance on physicians as data collectors limited support and success</li> <li>6. Lack of time to devote to project/ competing demands for physician time for clinical responsibilities</li> <li>7. Lack of staff with skills in data retrieval and analysis</li> </ol>	<ul style="list-style-type: none"> <li>• Built on existing PQRI efforts</li> <li>• Used transparency in reporting</li> </ul>

**Figure 1. Attribution algorithm designed by Practice #4**

**Algorithm for Assigning Patients to a Primary Provider**

We will be using the patient listing with all patients seen for the past 3 years in alphabetical order. Current "usual provider" is listed below the patient name, then the date, actual provider, and visit type for all office visits for the past 3 years.

- . Take the top page from the stack.
- . Look at the first patient on the page and determine the currently listed usual provider (this may be blank, or "unassigned"). To determine the actual provider to whom the patient should be assigned:
  - . If the patient has seen predominantly one provider, assign that provider.
  - . If multiple providers are listed more or less equally, assign the provider who provided the last preventive care visit.
  - . If no preventive care, assign the provider whom they have seen most often in the past year. Ties will go to the most recent provider.
  - . Leave [Provider X] out of the process. If she is the only provider who has seen the patient they will be listed as unassigned.
  - . If the assigned provider turns out to be an R3, or a resident who has already graduated, assign the patient to the R1 resident on that pod.
- . If the provider you are assigning and the usual provider listed are the same person, circle the usual provider.

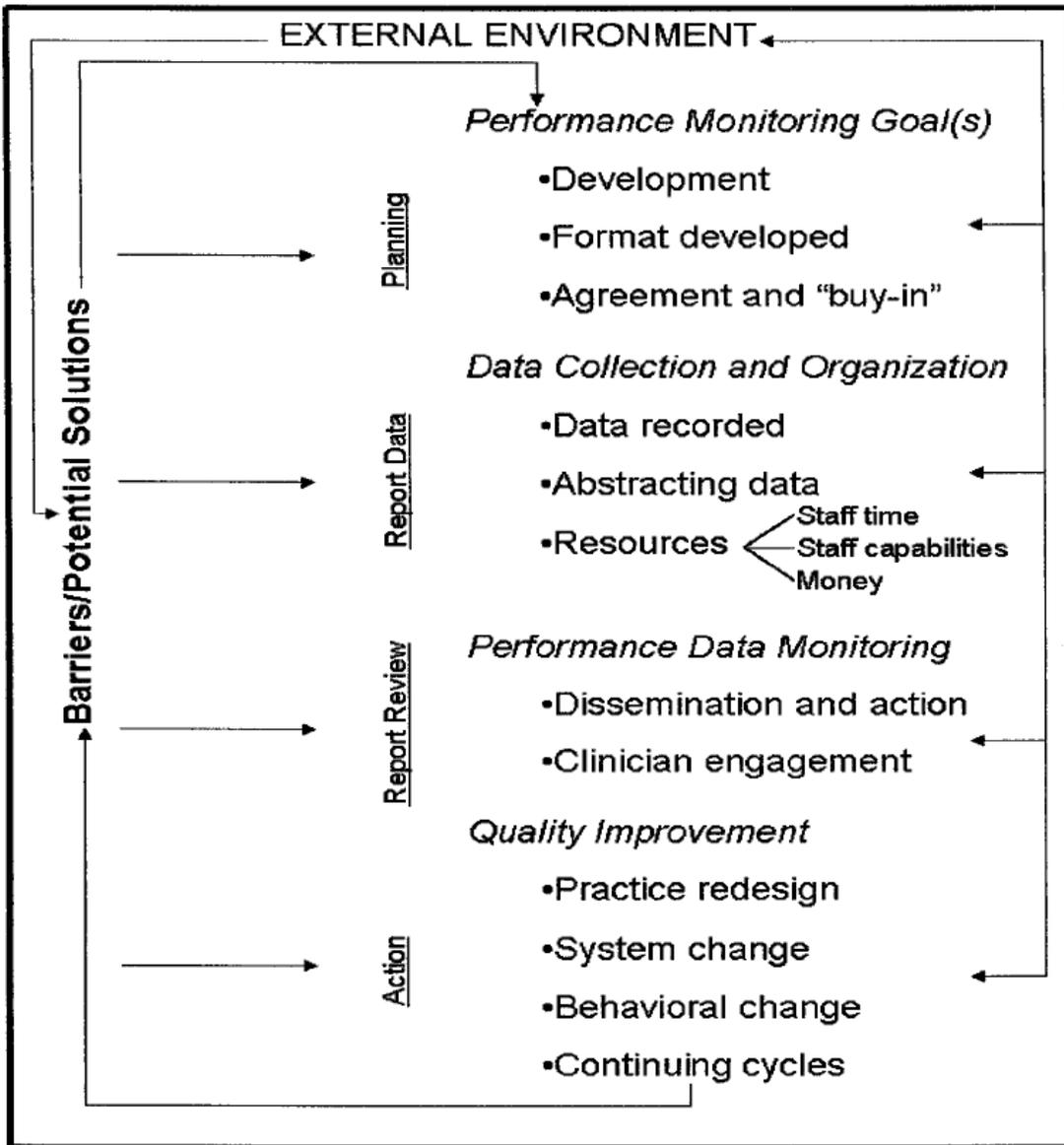
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# Appendix A. Process Model for Quality Performance Monitoring, Data Collection, and Reporting ("Performance Monitoring")



# Appendix B. Screen Shots of Web-based Practice Self-Assessment Tool

Figure B-1. Home page

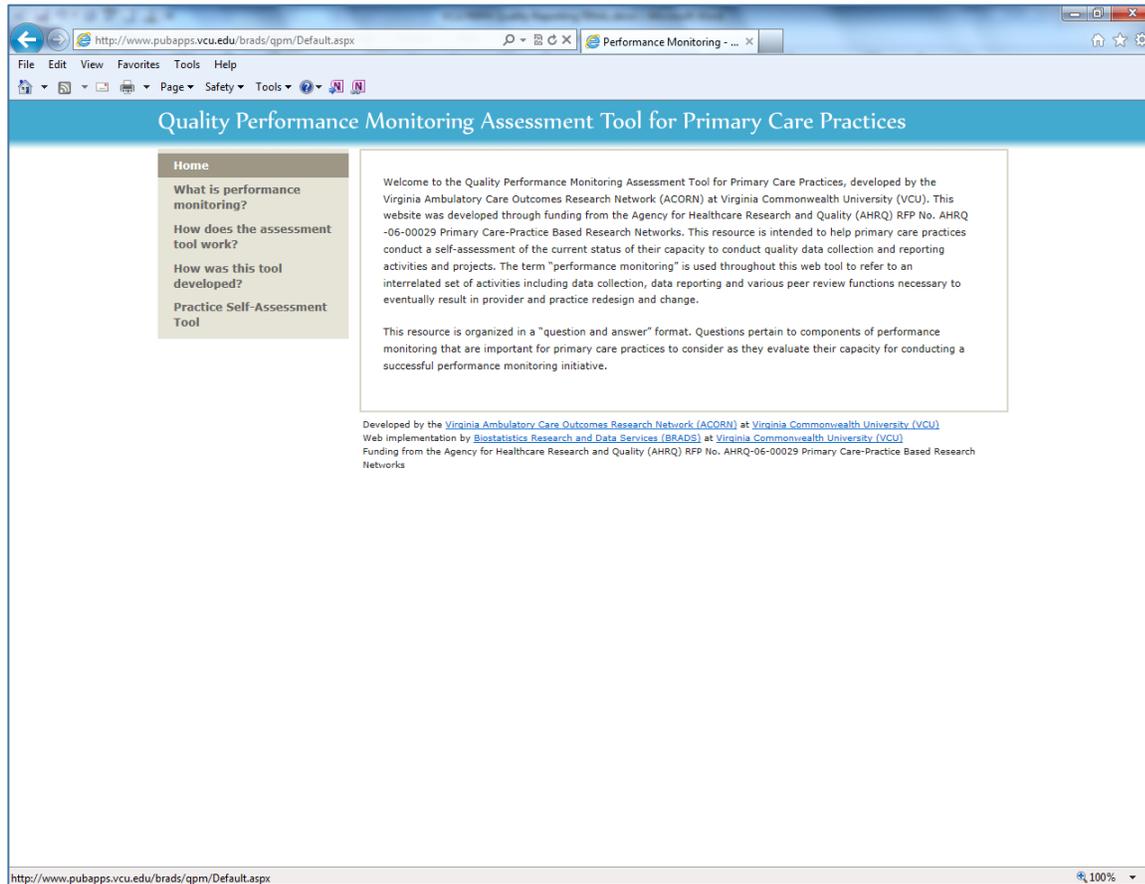


Figure B-2. Sample self-assessment tool question screen

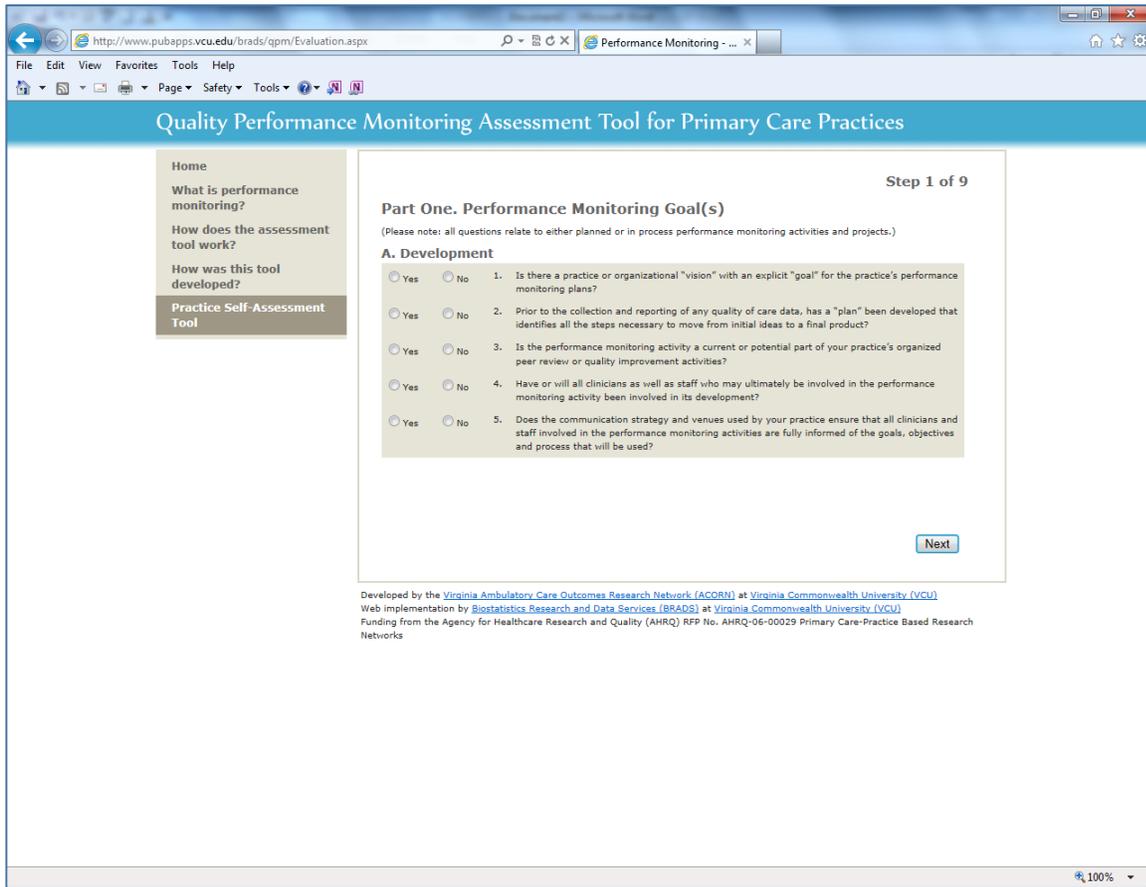


Figure B-3. Sample summary report screen

**Quality Performance Monitoring Assessment Tool for Primary Care Practices**

Home  
 What is performance monitoring?  
 How does the assessment tool work?  
 How was this tool developed?  
**Practice Self-Assessment Tool**

**Summary of Results** 44 of 49 possible points

Below is a summary of your responses, by category. All negative responses are included, which could suggest areas for improvement or further reflection.

**Part One. Performance Monitoring Goal(s)**

<b>A. Development</b>	<b>4 of 5 possible points</b>
> Prior to the collection and reporting of any quality of care data, has a "plan" been developed that identifies all the steps necessary to move from initial ideas to a final product? <b>No.</b>	
<b>B. Format</b>	<b>4 of 5 possible points</b>
> Have the members (clinical and non-clinical staff) of your practice identified what the end product of your performance monitoring activity will look like? (This may be a "mock up" or dummy tables of the type of data to be collected and how it will be organized in the final report.) <b>No.</b>	
<b>C. Agreement and "Buy-In"</b>	<b>4 of 5 possible points</b>
> Is there agreement among the clinicians and involved staff that the quality performance activity will not adversely impact clinic operations or productivity? <b>No.</b>	

**Part Two. Data Collection and Organization**

<b>A. Data Recorded</b>	<b>10 of 11 possible points</b>
> Is the data available and used in the performance monitoring reports regarded by your clinicians as being high quality (i.e., accurate and reflective of the care provided to patients. For example, a recorded blood pressure reading of 140/80 was actually collected during the patient encounter)? (If "yes" skip to question number 22.) <b>No.</b>	
<b>B. Abstracting Data</b>	<b>3 of 4 possible points</b>
> Does the performance monitoring report use data that comes from the practice's billing system rather than the EMR or a hard copy medical record? <b>No.</b>	
<b>C. Resources</b>	<b>5 of 5 possible points</b>

**Part Three. Performance Data Monitoring**

<b>A. Dissemination and Action</b>	<b>4 of 4 possible points</b>
<b>B. Clinician Engagement</b>	<b>3 of 3 possible points</b>

**Part Four. Quality Improvement**

<b>A. Practice Redesign</b>	<b>1 of 1 possible points</b>
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100%