

Quality improvement in action

Design of a quality and performance improvement project for small primary care practices: reflections on the Center for Practice Innovation

Jill A Marsteller PhD MPP

Assistant Professor, Johns Hopkins Bloomberg School of Public Health, Baltimore, USA

Paula Woodward MPH RN CCM

Senior Associate

William S Underwood MPH

Senior Associate

Center for Practice Innovation, American College of Physicians, Washington, USA

Chun-Ju Hsiao PhD MHS

Postdoctoral Researcher, Johns Hopkins Bloomberg School of Public Health, Baltimore, USA

Michael S Barr MD MBA FACP

Senior Vice President, Center for Practice Innovation, American College of Physicians, Washington, USA

ABSTRACT

Background Small practices often lack the human, financial and technical resources to make necessary practice improvements and infrastructure investments in order to achieve sustainable change that promotes quality and efficiency.

Aims To report on an effort to assist small primary care practices in improving quality of care and efficiency of practice management to meet the needs of patients, improve physician satisfaction and enhance the ability of these small practices to survive.

Methods We report on an intervention design and the reflections of the implementers on what they learned and what went well or poorly during implementation. Results of the intervention are reported separately (in *Quality in Primary Care*). Thirty practices underwent the entire intervention. The practices were selected on the basis of practice size, diversity in patient factors, apparent dedication to making practice improvements and geographic location. The main components of the intervention were two site visits to the participating practices by Center for Practice Innovation (CPI); now known as the Centre for Practice Improvement and Innovation, team members. The CPI team provided ongoing advice and support in focus areas selected by practices after initial site visit and assessment.

Results A customised session focusing on the practice report and on helping practices to think about which areas they wished to improve was more effective in engaging practices than didactic presentation. Quality and practice management improvements were observed in information posting, patient education, staff communication and patient safety practices. Having a strong physician champion and a strong office manager determined to make quality improvement changes were important elements for successful change. In addition, practices with greater stability of staff and strong finances were more likely to meet project goals.

Conclusions Small practices today are facing a range of important challenges. The CPI sought to provide successful guidance to small practices with evidence of positive change in some clinical measures, patient satisfaction and practice motivation to implement quality of care and practice management improvements.

Keywords: practice management, quality improvement, small primary care practices

How this fits in with quality in primary care

What do we know?

Small primary care practices often need assistance in learning to measure and improve performance and quality of care. Practices participating in quality improvement programmes may not receive the customised one-on-one attention that can help them modify programme elements in order to succeed.

What does this paper add?

This paper describes the design of a customised quality and practice management improvement intervention undertaken in small American primary care practices. Lessons learned may be useful to primary care providers, managed care organisations, regulatory agencies and others interested in primary care quality and performance improvement.

Introduction

Gaps in the quality of medical care in the United States and evidence of significant variation in medical practice are well documented.¹⁻³ It is also evident that higher cost does not equate to better care.⁴ In response, private sector payers and Medicare are restructuring reimbursement systems so that physicians receive incentives for effective management and coordination of patient care according to evidence-based guidelines. Many large medical groups are taking advantage of these opportunities by leveraging their information technology infrastructures and quality improvement departments. Unlike institutions and large practices, however, many private physicians in small practices lack the human, financial and technical resources to make the necessary practice improvements and infrastructure investments to achieve sustainable change.⁵

The promulgation of ambulatory quality measures and programmes that link compensation, public reporting and technology implementation to achieving better clinical outcomes comes at a time of economic stress for most small practices.⁵ These practices also face perhaps the greatest hurdles to transformation.⁶

Programmes and legislative agendas such as the patient-centred medical home (PCMH) are being proposed in the interests of promoting quality and efficiency.⁷ Without successful models of patient-centred practice redesign, and without support to achieve the necessary changes in the small practice environment, unintended consequences may result.⁷ Redesign will require significant investments of time and money in such areas as technology, office space restructuring, implementation of new workflow processes, introduction of advanced scheduling, modification of staffing ratios and provision of new services.^{7,8} Physicians in practice may conceivably choose to limit access to patients with low-paying insurance or to leave practice, and others may make the calculation that the transformation is too difficult to implement or too costly to adopt. Still others may fail to recognise that

there are quality gaps within their own practices contributing to the overall underperformance of the US healthcare system. There is already a notable decline in the number of medical students choosing primary care residencies – partly due to the perception of significant practice hassles and economic pressure on primary care physicians.⁹⁻¹¹ Therefore, the end result for patients if these imperatives are not appropriately addressed could be the opposite of the original intent.

In response to the needs of small internal medicine practices, the American College of Physicians (ACP) developed the Center for Practice Innovation (CPI) with grant funding from the Physicians' Foundation for Health Systems Excellence (PFHSE) (now known as the Physicians Foundation, www.physiciansfoundation.org). The overarching vision of the CPI over time is to assist small primary care practices in improving quality of care and efficiency of practice management to meet the needs of patients, improve physician satisfaction and enhance the ability of these small practices to survive. A six-part series on the CPI appeared in the *ACP Internist* from January to June 2008.¹²⁻¹⁷ Its first project, the subject of this article, was to assist a small cohort of practices to undertake performance and quality improvement in order to learn more about the challenges these practices faced and what methods could be useful to them.

Methods

In this, its initial effort, the CPI called for practices to volunteer to participate in: 1) a thorough assessment of the processes, management and quality of the practice; 2) selection of areas for improvement in the practice; 3) training in quality improvement and practice management methods; 4) adoption of new tools, policies or practices; and 5) follow-up assessment at the end of a two-year study period. The CPI received 131 applications and accepted 34 volunteer practices located in or near several geographic clusters

across the nation (to facilitate travel to visit each practice).

This initial project of the CPI was designed to be an interactive quality improvement programme (the CPI's work was conducted without Institutional Review Board (IRB) review as quality improvement). The primary goals were to catalogue the types of challenges faced by small practices and ascertain the best methods of providing support for quality improvement and practice management. Given the unique characteristics of independent, small practices and the data demonstrating that the majority of office visits in the USA occur in medical offices of less than five physicians,^{18,19} the CPI sought to identify strategies that could be widely disseminated to provide practice-level support to a broad range of medical practices. This paper documents the intervention provided by the CPI to the 34 pilot practices and offers lessons learned by the CPI team from this first group of innovators.

Participants

Recruitment

Voluntary participation was sought from members of the ACP and their practice partners. Almost half of ACP members spend most of their volunteer or paid time in private ambulatory care offices. Of those members working directly with patients, almost half are employed in practices with five or fewer physicians.¹⁰ However, membership of the ACP was not required to participate in the CPI project, and one of the selected practices does not have any current ACP members. The call for applications appeared in both electronic and paper versions of the *ACP Observer*, an association newsletter, and on the ACP website. Quality improvement organisations (QIOs) nationwide were also notified of the call for applications. Both a paper and an electronic application submission method were available in order to ensure that practices without access to the internet could participate.

Selection

One hundred and thirty-one applications were received of which 99 were complete. Thirty-six practices were selected and 34 accepted the invitation to participate. The primary bases for selection were: 1) practice size (to include representation of solo practices and practices of up to six clinicians); 2) diversity in patient factors such as ethnicity and disease conditions; 3) apparent dedication to making practice improvements (taken from the practice's application essay); and 4) geographic location, where clusters were identified among applicants to minimise travel. Because the CPI was interested in understanding the impact of electronic medical record (EMR) systems, some practices

with EMR and some without were chosen. The guiding principle in practice selection was finding a representative group of small practices based on the above criteria.

Intervention

The timeline of the CPI intervention is shown in Figure 1. Among the main components of the intervention were two site visits: one initial, in-depth team visit and a follow-up visit by one CPI team member. The CPI core team consisted of three individuals with quality improvement expertise. Based on the initial assessment of the practice by the CPI team, practices selected clinical, operational and financial areas on which to focus during the course of the project, for which they received ongoing advice and support, called 'directed guidance', from CPI staff. Practices also participated in conference calls on topics they nominated as potentially helpful; these were not, however, necessarily related to their CPI action plans. About half of the practices filled out an assessment called the Practice Management Check Up Tool, which arrayed their information on financial/operational measures (such as accounts receivable), coding and productivity against national benchmark cost data. These data were fed back to the practices with advice on how to address problems. To monitor progress, the CPI collected satisfaction surveys from clinicians, staff and patients, and self-reported clinical metrics based on nationally accepted clinical measures. The staff satisfaction surveys were self-reported via a web-based survey, while the patient satisfaction surveys and clinical metrics information were collected by the practices using paper forms provided by CPI. To facilitate collection of the paper forms, practices could either fax the forms directly to the CPI or mail them. The CPI also arranged a concluding conference featuring feedback on project progress, further education and presentations by participating practices. This intervention differed considerably from learning collaborative models used in other quality improvement efforts in that a major goal was to minimise interruptions in practice.

Site visits and practice assessment

A team of three CPI staff, including the director, an MBA-trained primary care physician and one of his senior associates – a nurse with quality improvement expertise and a quality improvement researcher – made an initial site visit to each practice to assess that practice. The first round of site visits were conducted between late May and late September 2006 and the follow-up round, which featured one visitor per site, was conducted between April and July 2007.

Applications received

↓↑

CPI (complete application process may have required 1–3 communications between CPI staff and applicant)

↓

Notification of selection and scheduling of first visits to practices

↓

CPI newsletter started to keep practices informed of news, upcoming deadlines etc.

↓

First site visit:

Chart reviews

Review of operational procedures, facility

↓

Compilation of results

↓

Conduct Workshop:

Provide observations and feedback

Discuss possible alternative practices in areas found needing improvement

↓

Formal report of site visit is created and sent to practices

↓

Practices develop work plan in collaboration with ACP staff

↓

Yahoo chat group initiated to facilitate instant communication between practices

↓

Practices begin collecting data based on their work plans

Series of six teleconferences begin (based on topics identified by participating practices)

'Practice tips' are initiated via email

Support is given via telephone and email

First physician and staff satisfaction survey and patient satisfaction survey are distributed and results collected

↓

Second site visit

Chart reviews

Review of operational procedures, facility

↓

Compile results

↓

Formal report of site visit is created and sent to practices

↓

Practices continue working on their selected changes and collecting data based on their work plans

↓

Second physician and staff satisfaction survey and patient satisfaction survey are distributed and results collected

↓

November 2007 conference – first face-to-face meeting of participants, sharing of ideas

↓

Practices continue working on their selected changes and collecting data based on their work plans

↓

Data collection stops January/February 2008

Figure 1 Center for Practice Innovation project flow

In the first round, a typical site visit featured a three-hour review of the practice. The CPI team assessed practice operations via an on-site walk-through during clinical hours (for a 'fly-on-the-wall' perspective) and interviews of practice staff using a structured data collection tool. The nurse or physician on the CPI team – both experienced with chart abstraction – conducted a clinical chart review of up to 20 charts at each practice. The team then created and printed a preliminary consultation report based on the site visit and used it to brief the practice during the workshop portion of the visit. During the workshop, the CPI team presented recommendations and discussed early priority setting with practice members. Typically the contact physician and the practice manager (or equivalent) would attend the meeting, sometimes with additional staff or partners. The CPI team also provided the practice with sample forms and resources, a binder of workshop materials and additional materials posted on the CPI website.

Selection of focus areas and directed guidance from CPI

After the site visit, practices selected areas they wished to concentrate on and submitted an action plan to the CPI team. Each practice was asked to select: 1) one to three significant operational issues identified during the site visit; 2) two or three clinical measures from those common to the Centers for Medicare and Medicaid Services (CMS) Physician Voluntary Reporting Program (renamed the Physician Quality Reporting Initiative for 2007) and the AQA starter set (www.aqaalliance.org); and 3) a financial measure. There was variation in the numbers of distinct areas selected to track and improve. In some cases practices added or shifted the measures they wished to track during the course of the project. When practices submitted clinical performance and patient satisfaction data they were sent detailed reports on their performance on a continuing basis.

Based on the issues identified by each practice, CPI staff provided directed guidance during the intervention period. This intensive customised support differentiates the CPI project from other initiatives which apply specific pre-selected interventions to each participant. The CPI support consisted of helping practices find existing tools (sometimes customising/developing them for that practice), answering questions and responding to practice needs in order to facilitate quality and operational improvements. This also included telephone seminars on subjects of wide interest and a regular 'practice tips' email. For example, if one of the key practice issues was access to appointments, then the CPI team would discuss options such as open access, group visits (for practices with the physical space provide these), web-based scheduling, email consultations through secure messaging etc. If

the key problem was telephone access or repeat prescribing, the team would suggest analysing the workflow, consideration of e-prescribing, outsourcing some functions typically handled by front office staff, etc. If the physicians/clinicians in the practice were working at maximum capacity, open access would not solve their problems without redistribution of workflow (or adding a clinician), so the CPI team would discuss the redistribution process with the practice.

During this phase of the project practices were also invited to participate in a series of seven conference calls that concentrated on quality improvement subjects that were not necessarily directly related to their improvement goals. The conference calls were directed by experts in their respective fields and conducted outside of regular business hours to minimise the intrusion on the project practices' normal operations.

Follow-up site visits

Follow-up visits conducted by one member of the CPI staff featured a limited reassessment of project practices and further guidance from the visitor. Data collection was limited to a more narrow review of practice operations, with a limited follow-up chart review to assess mainly structural changes with chart documentation and organisation. The CPI staff specifically reviewed whether the practice had achieved improvements in the areas identified in their action plan and issues discussed during the first visit.

Findings presented here are counts or consensus impressions of the three CPI staff gathered through the practice application, at site visits and during the directed guidance portion of the project.

Results

Description of participants

The selected practices came from 14 states across the USA and averaged 1.79 physicians and 3472 patients. Eight practices (23.5%) also had physician assistants or nurse practitioners. On average, each physician had one to two clinical staff members and one administrative staff member. Most practices (62%) handled internal medicine cases exclusively, while another 18% served 80 to 99% internal medicine needs. Two practices indicated that less than half of their cases were internal medicine. All but one of the practices were independent or privately owned. More than half (56%) were located in suburban locations, with 21% in urban and 18% in rural areas. Most of the participating practices did their own billing (73.5%). The predominant type of medical record keeping was paper based (68%), compared with 29% of practices

using EMRs and 3% with other types of medical record in use.

Figure 2 shows the flow of practice application, selection, attrition and site visit allocation. Attrition during the intervention period was four of the 34 practices. Two practices dropped out due to a perceived lack of time or ability to implement improvements. One solo practitioner left to begin a specialty residency. In another case, one practice was unresponsive to all CPI contact attempts and was dropped from the project.

Practices were to select financial, clinical and operational improvement areas and develop action plans. The most common items selected among clinical and operational measures were related to diabetes mellitus (23 sites) and working on documentation/forms (20 sites). In the financial area, the most common choice was to complete the Practice Management Check Up Tool (17 sites), an ACP sponsored automated data collection tool with reports and interpretation.

Practice difficulties

Interactions with the practices revealed a range of interesting findings. One observation was that 40% of the practices were family run, with a number of husband and wife teams. Several more had co-worker relationships that had spanned many years. These

long-term relationships sometimes caused problems in the practices. For example, a birth to one physician husband and office manager wife caused substantial practice turmoil while they were both on leave. In another instance, a long-established practice rather set in its ways saw a period of turbulence after adding a second physician who brought in a lot of new ideas.

In addition, a number of the small practices participating in the project were significantly challenged by EMR adoption and use. One-third of the practices had an EMR and wanted to use their EMR software to create reports on clinical quality indicators for the project, but found it impossible to do so without incurring large financial costs for add-on components. CPI staff found that practices often delayed updating EMRs, due to previous experiences with lost data, lack of time to implement updates, lack of or loss of EMR support and cost. For example, one practice had a shelf full of EMR updates that had not been installed because of prior experience with an update which had significantly interrupted the practice. Another had lost all of the customised clinical rules developed by the practice on installing a subsequent update, which significantly dampened enthusiasm for customising the rules engine a second time to re-implement clinical decision support. Further, only one practice had a back-up server to preload updates and tweak their system, as is recommend by health information technology vendors.

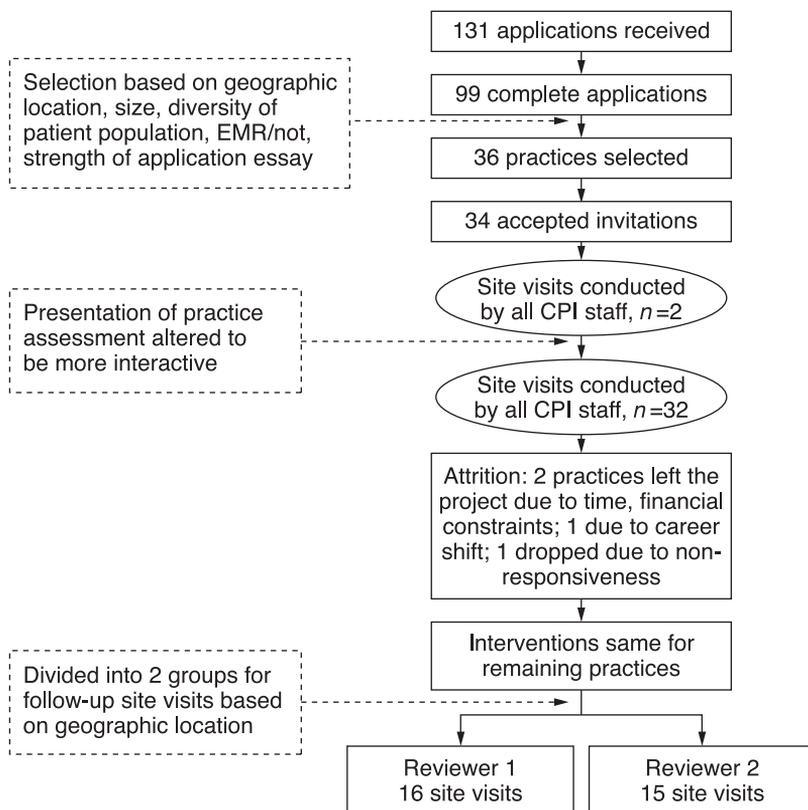


Figure 2 Participation flow diagram

Three practices found the EMR would not connect to the billing system; 12 were unable to connect to lab vendors electronically; and ten practices which sought to use electronic prescribing were prevented from doing so by pharmacy and state regulations. In some cases, practices had to print repeat prescription requests from their electronic server, sign and then fax the requests rather than affixing an electronic signature or directly sending them via fax server. One practice elected to completely scrap its EMR and revert back to a 100% paper-based system.

Another common issue expressed by small practices was concern about their own ability to survive under the current reimbursement structure, combined with increasing demands for better documentation, insurance paperwork and pre-authorisation of prescriptions, procedures and laboratory investigations. A handful of practices expressed genuine fear that they might be forced out of practice.

Keys to change

Team reviewers from CPI also noted a range of positive changes at the end of the intervention period. Among the positive changes seen on the second visit as compared with the first were increases in the percentage of practices where information posting, patient education and communication with support staff were rated by CPI as 'working well,' and a larger percentage of practices consistently observing a range of patient safety practices (e.g. having two identifiers in patient records and appropriately securing sharps containers).²⁰

Practices that the CPI team considered the most successful in making changes had a strong physician champion determined to make quality improvement changes and a strong office manager (in offices with multiple staff members) equally determined to make changes. The CPI found that practices that worked on one or two areas made better progress than ones that tried to change everything at once. Practices with greater stability of staff and reasonable finances were more able to pay attention to the project than others.

Discussion

There were lessons of two kinds from the pilot of the CPI small practice quality improvement project. First, the CPI discovered some recurrent themes related to the nature of small internal medicine practices in the USA today. Second, CPI staff gained knowledge about how to best support small practices in their quality improvement endeavours.

The project offers an intriguing profile of small practices in the USA. With reference to the predominance of

family relationships in small practices, in general a high level of familiarity among practice members is probably a good thing, indicating positive and productive working relationships. However, possibly related to these tight ties among staff and the small size of the practices, normal life events such as births, deaths, position changes, recruitment difficulties, surgery and even the addition of new clinicians all had a major impact on day-to-day operations. Such changes may be more easily absorbed by larger practices or by those with lower levels of interpersonal involvement. In some cases, family relationships even posed barriers to change, since the dynamics of these relationships prevented individuals from openly disagreeing or discussing current practices. By extension, family relationships can be an additional challenge in tackling quality improvement or significant practice change in small family-run businesses.

Several of the practices experienced difficulties with the use of information technology (IT). Unlike larger medical practices with more resources, small practices can be severely constrained by the cost of IT and the limitations of personnel to support the technology in their practice. For example, the failure by most practices to acquire back-up servers (as recommended by IT vendors) may be due to lack of education on the importance of back-up systems, or perhaps more probably relates to the associated costs. Overall, the CPI staff came away with the impression that small practices were overwhelmed by: 1) the cost of IT; 2) the level of support staff and the knowledge required to support IT; 3) the hidden costs of IT; 4) the level of support for IT in the community; 5) the difficulties of optimising their IT systems and the extra funding needed; and 6) the level of workflow analysis required to effectively integrate IT into their practice. Findings here are consistent with early findings in PCMH transformation efforts.⁷

Small practices expressed concern about their ability to survive in the face of decreasing reimbursements and increasing demands for time-consuming tasks such as measurement and documentation. Their concerns were heightened by the changes in payment they expected due to the sustainable growth rate (SGR) formula, which requires cuts in Medicare payments when physician-related expenditures exceed growth in per capita gross domestic product (GDP). Congress has typically legislated payment increases to negate the SGR, but physicians say the legislated updates have not kept up with costs.²¹ The expanding movement toward the PCMH in the USA is likely to lead to further changes in the way payments are structured.²²

Despite difficulties experienced by practices, however, the CPI did note the presence of physician and office manager champions who were dedicated to change. Having a key individual to continually push the project helps maintain group commitment and

keeps the effort in the front of people's minds. Other studies of quality improvement projects have also emphasised the value of having a champion.^{23,24}

Observations on providing practice change support

Among the lessons learned regarding practice support from the first round of site visits was that the planned didactic presentation of quality improvement methods was not effective in engaging practices. The team felt that practice participants were not absorbing the material presented. As a result, after the first two site visits the site visit team altered its presentation to focus specifically on the practice report and on helping practices to think about which areas they wished to concentrate on. A discussion format with back-and-forth interaction proved more fruitful.

Another lesson for the CPI staff was that practices had difficulty formulating an action plan for implementing changes following the site visit. A range of day-to-day tasks would take priority, and for those who allowed too much time to pass before turning to the task of making the action plan, returning their focus to this work was difficult. A number of practices needed the CPI staff to provide active help in the development of their plans. Some practices turned in plans that had to be sent back to practices for additional thought.

CPI staff were somewhat surprised by the amount of time they needed to dedicate to directed guidance of the practices between site visits. Helping practices to improve quality and practice management proved to be a full-time job. Two staff members split the caseload of practices and found that during the peak period, which lasted from six to eight months, about a quarter of the average day was spent working directly with practices. Typical needs of the practices during their quality improvement efforts included questions about ACP policy, federal law (such as HIPAA or documentation of vaccinations), chart documentation in general, standardised chart forms, safety devices and/or practices, practice staffing and workflow and practice scheduling. Perhaps the most frequently asked question was what practices were expected to do under the project, which may point to difficulty making time to focus on project-related tasks given the business of day-to-day practice. In addition, practices relied on CPI staff to explain the results of patient satisfaction surveys and other reports sent to the practice or to discuss specific suggestions for scheduling. A somewhat unanticipated role for CPI staff was providing general encouragement to physicians who were discouraged – by reimbursement; by ‘complaining’ staff, patients and physician colleagues; or by long hours worked and a lack of personal time. In one case, in which the practice

ultimately closed, many hours were spent brainstorming ideas to keep the practice going.

Conclusion

As health care moves toward regulated quality expectations for ambulatory care and linked financial incentives, small practices stand poised to potentially fail without help. For many small practices across the USA fundamental practice changes will be required to track quality measures and provide patient-centred care while controlling the costs associated with this care. The CPI is one response to small practices' need for guidance that also provides a forum for those accomplishing change to share their methods with peers who face many of the same obstacles.

REFERENCES

- 1 Institute of Medicine. *Crossing the Quality Chasm: a new health system for the 21st century*. Washington, DC: National Academy of Sciences, 2001.
- 2 Institute of Medicine. *To Err is Human: building a safer health system*. Washington, DC: National Academy of Sciences, 1999.
- 3 McGlynn EA, Asch SM, Adams J *et al*. The quality of health care delivered to adults in the United States. *New England Journal of Medicine* 2003;348:2635–45.
- 4 Leatherman S and McCarthy D. *Quality of Health Care for Medicare Beneficiaries: a chartbook*. New York, NY: The Commonwealth Fund, 2005. Report No. 815.
- 5 Landon BE and Normand SL. Performance measurement in the small office practice: challenges and potential solutions. *Annals of Internal Medicine* 2008;148:353–7.
- 6 Lowes R. Earnings. Primary care tries to hang on. *Medical Economics* 2004;81:52–4,56,58.
- 7 Nutting PA, Miller WL, Crabtree BF, Jaen CR, Stewart EE and Stange KC. Initial lessons from the first national demonstration project on practice transformation to a patient-centered medical home. *Annals of Family Medicine* 2009;7:254–60.
- 8 Baron RJ. What's keeping us so busy in primary care? A snapshot from one practice. *New England Journal of Medicine* 2010;362:17.
- 9 Schwartz MD, Basco WT Jr, Grey MR, Elmore JG and Rubenstein A. Rekindling student interest in generalist careers. *Annals of Internal Medicine* 2005;142:715–24.
- 10 American College of Physicians. *Creating a New National Workforce for Internal Medicine*. Philadelphia, PA: American College of Physicians, 2006.
- 11 Association of American Medical Colleges. *2007 State Physician Workforce Data Book*. Washington, DC: Association of American Medical Colleges, 2007.
- 12 Berthold J. Staffing can make or break a small practice. American College of Physicians, January 2008. *ACP Internist* www.acpinternist.org/archives/2008/01

- 13 Berthold J. Investing in EHRs pays off in paperless perks. American College of Physicians, February 2008. *ACP Internist* www.acpinternist.org/archives/2008/02
- 14 Berthold J. The front office bottleneck: schedules, phones and refills. American College of Physicians, March 2008. *ACP Internist* www.acpinternist.org/archives/2008/03
- 15 Berthold J. Managing risk: a little attention equals a lot of prevention. American College of Physicians, April 2008. *ACP Internist* www.acpinternist.org/archives/2008/04
- 16 Berthold J. In-office lab tests augment patient self-education efforts. American College of Physicians, May 2008. *ACP Internist* www.acpinternist.org/archives/2008/05
- 17 Berthold J. Improving access tops list of small-office tips. American College of Physicians, June 2008. *ACP Internist* www.acpinternist.org/archives/2008/06
- 18 Hing E, Cherry DK and Woodwell DA. *National Ambulatory Medical Care Survey: 2003 summary*. Atlanta, GA: Centers for Disease Control and Prevention, 2005. Report No. 365.
- 19 Hing E and Burt CW. *Office-based Medical Practices: methods and estimates from the National Ambulatory Medical Care Survey*. Atlanta, GA: Centers for Disease Control and Prevention, 2007. Report No. 383.
- 20 Marsteller JA, Hsiao CJ, Underwood W, Woodward P and Barr MS. A simple intervention promoting patient safety improvements in small internal medicine practices. *Quality in Primary Care* 2010;18:307–16.
- 21 American College of Physicians. *Reform of the Dysfunctional Healthcare Payment and Delivery System. A position paper*. Philadelphia, PA: American College of Physicians, 2006.
- 22 Davis K and Stremikis K. Family medicine: preparing for a high-performance health care system. *Journal of the American Board of Family Medicine* 2010;23(supplement):11–16.
- 23 Gustafson DH, Sainfort F, Eichler M, Adams L, Bisognano M and Steudel H. Developing and testing a model to predict outcomes of organizational change. *Health Services Research* 2003;38:751–76.
- 24 Shortell S, Marsteller JA, Lin M *et al*. The role of perceived team effectiveness in improving chronic illness care. *Medical Care* 2004;42:1040–2.

FUNDING

This research was supported by funding from the Physicians Foundation for Health System Excellence and contributions in kind from the American College of Physicians.

ETHICAL APPROVAL

Ethical approval was not required by the Johns Hopkins School of Public Health Institutional Review Board as this research was deemed secondary data analysis and therefore not human subjects research. The original project was conducted by the ACP CPI as a quality improvement activity, and therefore was not considered to be research.

PEER REVIEW

Not commissioned; externally peer reviewed.

CONFLICTS OF INTEREST

None.

ADDRESS FOR CORRESPONDENCE

Jill A Marsteller, Assistant Professor, Health Policy and Management, Bloomberg School of Public Health, Johns Hopkins University, 433 Hampton House, 624 N. Broadway Street, Baltimore, MD 21205, USA. Tel: 001 410–614–2602; fax: 001 410–955–6959; email: jmarstel@jhsph.edu

Received 14 December 2009

Accepted 28 November 2010