



## Practice Transformation in Teaching Settings: Lessons From the I<sup>3</sup> PCMH Collaborative

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**BACKGROUND:** The Patient-centered Medical Home (PCMH) model provides a roadmap for practices engaged in practice transformation to improve quality, accessibility, and satisfaction. Primary care residencies can use these principles to transform their practices, but it is unclear how best to facilitate this transformation. This paper describes the design, implementation, and initial outcomes of an academic PCMH collaborative.

**METHODS:** The I<sup>3</sup> PCMH Collaborative adapted the Institute for Healthcare Improvement's Breakthrough Collaborative model to facilitate practice transformation in 25 primary care teaching sites across North Carolina, South Carolina, and Virginia. The National Committee for Quality Assurance (NCQA) PCMH Recognition Program provided the goal and outcome measures. Surveys at baseline, midpoint, and end of the 20-month collaborative period, as well as activity assessments, described practice characteristics, tracked progress, and identified key lessons.

**RESULTS:** Twelve programs (48%) achieved NCQA PCMH recognition or submitted applications during the collaborative, and nine programs (36%) planned to submit applications by July 2011. A majority of programs characterized improvements toward becoming a PCMH as "significant" (56%) or "sustainable" (12%). Sixteen (64%) programs credited the collaborative with helping to maintain focus on practice transformation in the face of competing priorities. Twenty-one (84%) programs indicated willingness to participate in a future practice improvement collaborative.

**CONCLUSIONS:** A heterogeneous group of primary care residency programs working together can achieve substantial, measurable improvement toward becoming PCMHs, with a modest investment in collaborative infrastructure.

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There is a critical need for practice transformation to improve the quality, satisfaction, efficiency, and safety of primary care. In recognition of this need, the American Academy of Family Physicians, American College of Physicians, American Academy of Pediatrics,

and American Osteopathic Association developed joint principles to describe the Patient-centered Medical Home (PCMH).<sup>1</sup> More recently, the Patient Protection and Affordable Care Act of 2010 endorsed development of new approaches to health care delivery, including the PCMH.<sup>2,3</sup>

Transforming existing primary care practices into PCMHs, however, presents significant challenges.<sup>4</sup>

Primary care residencies must provide the foundational knowledge, attitudes, and skills their graduates will need to practice in PCMHs. Yet, academic leaders and faculty members often struggle with their own knowledge and skills gaps in this area. Additionally, it has been demonstrated that improvement work in academic settings is "orders of magnitude" more difficult than in other settings, due to their organizational size, complexity, competing priorities, and bureaucratic challenges.<sup>5</sup> Commensurate with these challenges, however, is potential for substantial benefit, since teaching practice redesign will affect not only the patients served by the practice but also their learners' future practices. Moreover, residencies often serve as centers of expertise, providing teaching and consultation for practices in surrounding communities.

In recent years, collaboratives have shown promise for achieving practice redesign goals.<sup>6,7</sup> The breakthrough collaborative method developed by the Institute for Health Care Improvement (IHI) has achieved success through sharing and implementation of best practices. In a recent

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report of an exclusively academic primary care collaborative, redesign strategies with corresponding performance measures were developed in conjunction with curricular innovations anchored in the Chronic Care Model (CCM).<sup>8</sup> Focused on improvements in chronic disease care, practice teams used rapid-cycle quality improvement (QI) methods and reported clinical and educational performance monthly, while extensive redesign centered on the CCM occurred within the practices.<sup>7</sup> Similarly, the findings of the TransformMED National Demonstration Project showed that intense facilitation increased the number of PCMH components implemented and also improved practices' adaptive reserve.<sup>9</sup> Taken together, the collaborative, or facilitated, approach and the potential of transformation in teaching practices, provided the rationale for the I<sup>3</sup> Collaborative model: by working together, residency practices can achieve improvement to the third power (I<sup>3</sup>)—to the benefit of their own patients, the patients of their learners, and patients of nearby community practices. The initial I<sup>3</sup> Collaborative, comprised of 10 family medicine residencies in North and South Carolina, focused on improvement of chronic illness care and is described elsewhere in this journal.<sup>10</sup> The PCMH Collaborative described in this paper built directly on that prior experience.

The I<sup>3</sup> PCMH Collaborative is composed of 25 academic teaching practices from family medicine, internal medicine, and pediatrics in South Carolina, North Carolina, and Virginia. These programs worked together over 20 months to share best practices for practice transformation. The goal of the collaborative was to help participating programs improve as PCMHs, as measured by the National Committee on Quality Assurance (NCQA) PCMH standards, with the specific objective that each program would achieve NCQA PCMH recognition by the end of the collaborative period. This paper has three purposes: first, to describe the design

and structure of the I<sup>3</sup> PCMH Collaborative; second, to assess the feasibility of a collaborative of primary care residency programs, and third, to describe improvement outcomes based on NCQA recognition standards.

## Methods

### *Setting and Participants*

Table 1 summarizes the geographic and specialty distribution of collaborative programs, as well as their institutional affiliations. Collaborative practices serve 280,000 patients with 880,000 visits per year. More than two thirds of patients (69%) are low income, and 50% are minority. Collaborative practices employ 295 faculty physicians and graduate more than 250 residents annually. Fewer than half (40% or less) have allied health professionals (eg, social workers, diabetes educators, PharmDs) on staff. All 25 practices use an electronic health record (EHR), but nine practices had only partially implemented systems, and only one had direct control of EHR modifications.

### *Collaborative Design and Implementation*

To the IHI Breakthrough Collaborative model, we added a regional focus to facilitate periodic face-to-face meetings and an extended time

period of 20 months. An activity calendar (see Table 2) designed to avoid high-risk times for competing activities such as resident recruitment season and orientation of incoming residents was based on the experience of the earlier I<sup>3</sup> Chronic Illness Collaborative.<sup>10</sup> A parallel academic collaborative focused primarily on description, assessment, and reporting of collaborative methods and outcomes.

Collaborative infrastructure included a 13-member volunteer Executive Committee, two part-time paid faculty, as well as a secure Web site for sharing electronic resources and a toll-free conference call network. Unlike the earlier, more substantially funded I<sup>3</sup> Chronic Disease Collaborative, the I<sup>3</sup> PCMH Collaborative was accomplished with only \$150,000 in direct cost, provided by the North Carolina Area Health Education Centers and the Duke Endowment. These funds covered a portion of time for the two faculty project directors and the expenses associated with four meetings over 2 years. Contributed resources included varied time commitments of the Executive Committee members, conference line costs for phone meetings and Webinars (\$225/month), the secure Web site (the Blackboard<sup>®</sup> curriculum management system,

**Table 1: Summary of State, Specialty, and institutional Affiliations of Collaborative Sites**

	Family Medicine	General Pediatrics	General Internal Medicine
North Carolina (total)	9	2	3
Community hospital based	6	1	1
University based	3	1	2
South Carolina (total)	6		
Community hospital based	4		
University based	2		
Virginia (total)	5		
Community hospital based	4		
University based	1		

**Table 2: Collaborative Activity Calendar**

Date	Activity
April 2009	Launch meeting
June 2009	Webinar: PPC-1 Access
July 2009	Webinar: PPC-1 Communication
August 2009	Webinar: PPC-2 Patient tracking and registry functions
September 2009	Webinar: PPC-3 Care management
October 2009	Face-to-face meeting PPC-4 Patient self-management support PPC-5 Electronic prescribing
November 2009	Webinar: PPC-6 Test tracking
January 2010	Webinar: PPC-7 Referral tracking
February 2010	Mid-point survey (pre-work for March meeting)
March 2010	Face-to-face meeting PPC-8 Performance reporting/improvement PPC-9 Electronic communication
April 2010	Webinar: NCQA Nuts and bolts
May 2010	Webinar: Health literacy
June 2010	Webinar: Educating residents and students in the PCMH
August 2010	Webinar: Integrating behavioral health into the PCMH
September 2010	Webinar: Transitions of care
October 2010	Final outcome survey (pre-work for November meeting)
November 2010	Face-to-face meeting

PPC—Physician Practice Connections

NCQA—National Committee for Quality Assurance

PCMH—Patient-centered Medical Home

provided at no cost by UNC), and the cost of participants' travel and lodging to attend the face-to-face meetings.

All non-military family medicine residencies in North Carolina (12), South Carolina (8), and Virginia (10) were invited to join the collaborative. Five general internal medicine and two pediatric residencies in North Carolina were also invited. A total of 30 programs expressed interest; 25 joined the collaborative.

Collaborative activities consisted of three major components: biannual meetings, monthly Webinars, and independent work at each site. The initial launch meeting, held in April 2009, introduced the structure

and goals of the collaborative, established a construct for participation, and provided an overview and practical guidance regarding the NCQA recognition process. At subsequent meetings in October 2009 and March 2010, sites reported progress toward goals, shared lessons learned, and participated in didactic presentations on specific elements of the NCQA recognition process. A final meeting in November 2010 continued the theme of shared learning among collaborative members, and reported and celebrated collaborative accomplishments. Each of the meetings followed a similar schedule and format outlined in Table 3.

The bulk of collaborative activity revolved around twice monthly Webinars (see Table 2). Repetition provided scheduling flexibility for participants, and a smaller number of participants facilitated greater discussion. The first half of the Webinar series was devoted to each of the NCQA PCMH standards. Collaborative members were surveyed to identify topics for subsequent Webinars. Webinar leaders with experience/expertise in each topic area were recruited from among the executive committee and general membership. Leaders were responsible for assessing learning needs, usually via on-line survey (eg, presence of components of PCMH) or pre-call data posting (eg, access and continuity measures from each practice). Leaders also identified preparatory reading, prepared a focused didactic presentation, and facilitated discussion during Webinars. Team members at each site participated via conference call and viewed presentation slides and other resources on the collaborative Web site.

Multidisciplinary teams at each site included clinicians, nurses, allied health professionals, practice administrative staff, residents, and information technology personnel. Teams ranged in size from four to 10 or more. Of 25 teams, 20 included residents. Team leaders were responsible for organizing and pursuing their program's NCQA recognition effort, implementing practice redesign activities and for sharing interventions and results with the collaborative.

#### *Data Collection*

We surveyed participating sites at the beginning, mid-point, and end of the collaborative. We also tracked meeting attendance and evaluations, as well as monthly Webinar participation. At baseline, we developed two surveys in March–April 2009 to identify important characteristics of each practice and to assess current readiness for NCQA PCMH recognition. The collaborative's Executive Committee served as a consensus panel for development and pilot

**Table 3: Patient-centered Medical Home Meeting Format**

Meetings span 2 days, including one weekend day, beginning early afternoon the first day and ending mid-afternoon the next day. Weekend meeting days minimize team members' absence from practices, and start and end times facilitate same-day travel.	
Keynote address	Invited outside speaker on specific Patient-centered Medical Home (PCMH)-relevant focus area, followed by question and answer period
Learning from each other	Four sessions distributed across both meeting days in which each collaborative site presents in 5 minutes a successful change and an interesting failure, followed by question and answer period
Concurrent learning sessions	40–50-minute sessions focused on specific PCMH-relevant knowledge, skills
Concurrent team member breakout sessions	40–50-minute sessions focused on specific PCMH-relevant knowledge and skills tailored to different team members (eg, faculty, residency directors, nurses, administrators, IT personnel, residents, medical students)
Educational innovations	Five to 10-minute presentations on new educational approaches or attempts to address educational challenges, followed by question and answer period
Team meeting time	During noon and evening meals, teams eat together with a preassigned discussion or planning topic
Academic collaborative	One-hour session in which academic collaborative representatives from each program plan academic products and review manuscripts

testing the Baseline Practice Characteristics survey. Items included practice personnel, payer mix, clinician staffing, patient volume, patient demographics, electronic health record use, and patient scheduling. To assess experience with NCQA recognition, we also asked whether practices had or planned to pursue disease-specific NCQA recognition for any of its physicians or practice recognition for PCMH. Two iterations of the survey were piloted to assess face validity. The baseline survey protocol was approved by the University of North Carolina Institutional Review Board; other surveys were exempted from review. We assessed baseline NCQA recognition readiness by asking practices to score themselves on the 10 NCQA “must-pass” elements.<sup>11</sup> The results of this assessment were used by the Collaborative Executive Committee to design the curriculum. At the collaborative midpoint (January–February 2010), we surveyed sites regarding their overall progress toward PCMH transformation, as well as their specific progress toward satisfying NCQA recognition standards. The final survey in October 2010 asked sites again to report their NCQA recognition status and to assess the value

of the collaborative and its activities. This survey also asked sites to rate their progress on each of the NCQA standards, independent of recognition, as “little to none,” “modest,” “significant,” or “sustainable.” Similar to the baseline survey, the NCQA readiness, mid-point, and final assessment surveys were pilot tested through two to three iterations by the collaborative’s Executive Committee to enhance face validity.

## Results

### Participation

More than 100 participants attended the initial Collaborative meeting in April 2009, with all 25 programs represented. Attendance at subsequent meetings is reflected in Figure 1. Pre-work for the final two meetings involved preparation of a 5-minute presentation describing a success and an interesting failure in collaborative work and was completed by all attendees. Of the 20 teams that included residents, 19 had residents attend at least one collaborative meeting. Participation in monthly Webinar calls ranged from 12 (48%) to 24 (96%) programs. As the topics broadened from the specific NCQA standards, attendance became more variable, suggesting greater

variation in value of the material presented. Submission of Webinar pre-work assignments ranged from 9 (36%) to 22 (88%) and averaged 18 (71%) teams. Resident attendance at Webinars was not systematically recorded. One program rescheduled one of its noon conferences to make the Webinars a formal part of the conference curriculum. This innovation was occasionally adopted by several other programs.

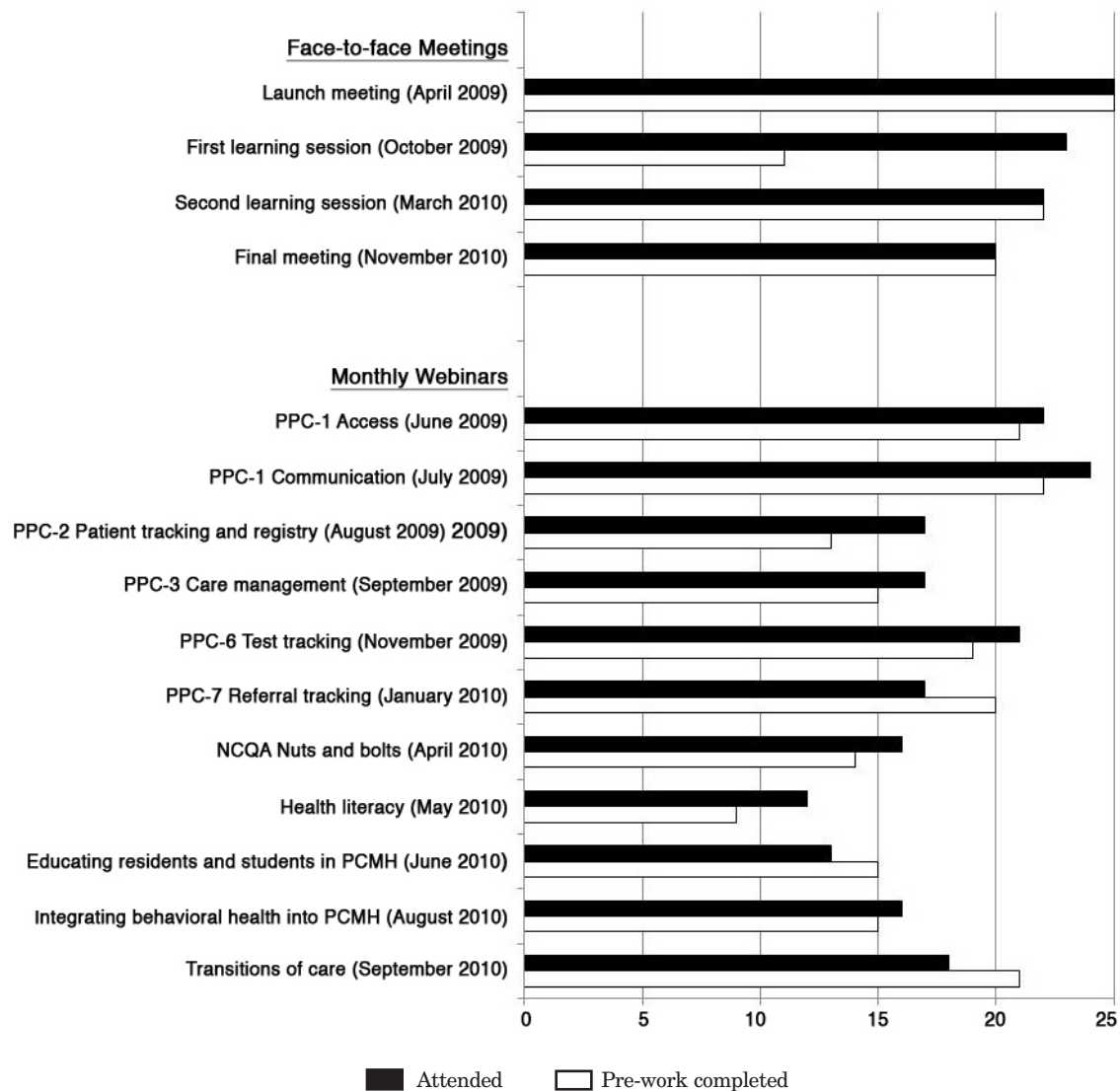
### NCQA Recognition

Responses to the baseline PCMH readiness assessment indicated that all but four sites had key components in place for NCQA recognition. Areas of overall strength for the participating practices included written access and communication standards (25/25), use of charting tools to organize clinical data (23/25), use of data to identify important conditions (21/25), and measures (24/25) and reports (23/25) of performance for the practice and individual physicians. Gaps included patient self-management support (11/25), test tracking (16/25), and use of data to ensure access and communication standards are met (15/25).

By the end of the collaborative in November 2010, nine practices had



Figure 1: Collaborative Activity Participation and Pre-Work Completion



achieved NCQA recognition, and three had submitted applications. Of the remaining 13, nine practices had registered with NCQA with plans to submit applications by July 2011. One practice opted to participate in the collaborative without applying for NCQA recognition, since their health care organization had achieved NCQA Level 3 recognition under the previous Physician Practice Connections standards. Three practices suspended NCQA recognition efforts, but continued participation in the collaborative, focusing on practice transformation activities. All three practices cited inadequate

resources to sustain the application effort absent financial incentives for recognition.

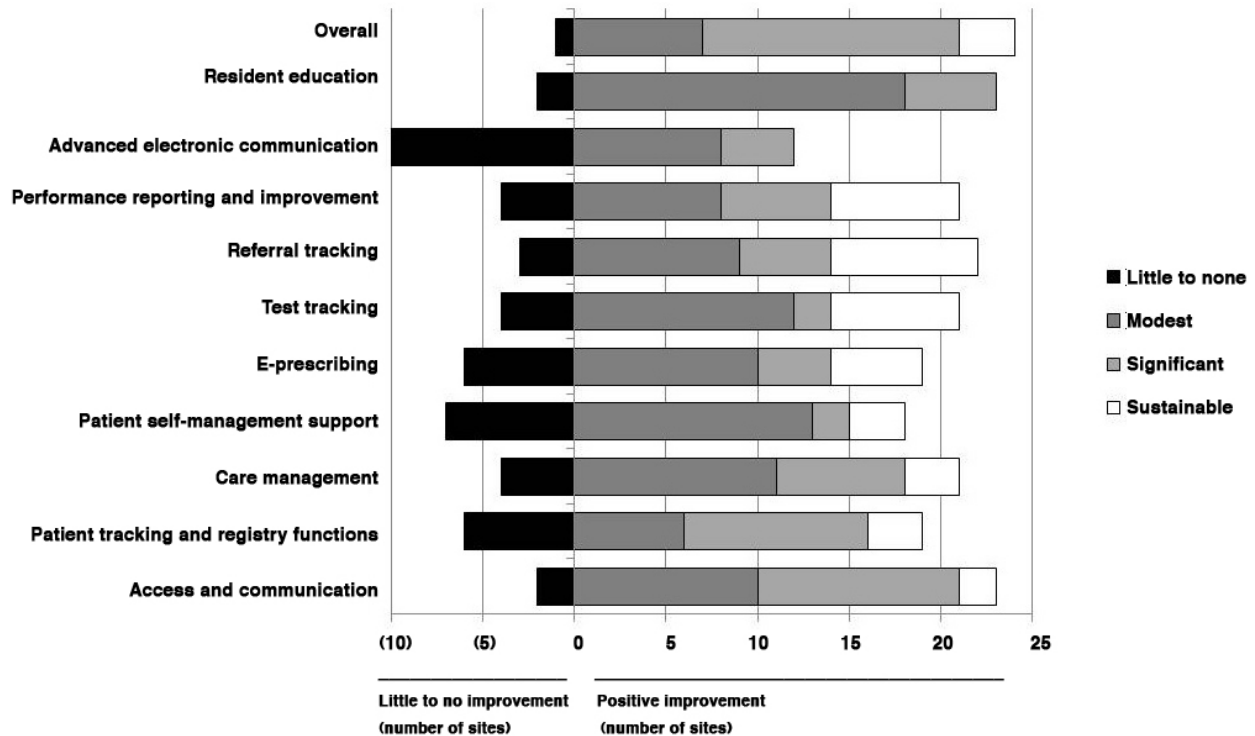
Independent of NCQA recognition, collaborative sites reported significant improvement in all areas and sustainable improvement in all but two (Figure 2). Moreover, each of the areas identified as gaps in our initial assessment (test tracking, patient self-management support, and use of data for access and communication standard compliance) showed significant improvement. The area of least improvement, advanced electronic communication, likely reflects

the widespread lack of EHR control noted earlier.

#### *Collaborative Assessment*

When asked to rate the value of collaborative activities as low, moderate, or high, most sites seeking NCQA recognition (9/17 responding) rated face-to-face meetings high. By contrast, two of the three sites not seeking NCQA recognition rated the face-to-face meetings low. Programs rated the collaborative Web site low (nine) or moderate (eight). Team members noted that the site was difficult to navigate and that the process of uploading and later

Figure 2: Self-reported Improvement Toward Becoming a Patient-centered Medical Home



finding documents was cumbersome. As a result the Web site did not realize its full potential as an information-sharing mechanism. One third of the survey's suggestions for improvement addressed the Web site, suggesting that teams would have found a more congenial tool more valuable.

In the mid-point evaluation, several sites cited the collaborative as a driver for keeping PCMH among their top priorities, in the face of many other competing goals. When asked in the final survey to rate the value of the collaborative in keeping attention focused on PCMH, a substantial minority (five) rated it high; most others (11/19 responding) rated this aspect of moderate value.

In response to open-ended items about the most valuable elements of the collaborative, site team leaders most frequently (14) identified the face-to-face meetings, specifically citing the opportunity to focus exclusively on PCMH work and networking with other sites. Seven team leaders identified monthly Webinars

as most valuable, citing their structured format, practical value, and regularity. Team leaders also frequently identified the process of sharing examples and best practices, independent of context (eight), and the spirit of collegiality in pursuing a common goal (five) as most valuable elements. Responding to similar items regarding suggested improvements (other than improvement to the Web site mentioned above), seven team leaders suggested establishing different tracks in the collaborative, for example, for programs at different stages of the PCMH process, for different team members (nurses, administrators, etc), or for programs using the same EHR. The next most frequent suggestion (four) was to increase emphasis on practical "how-to" information and examples of successful policies and procedures. An equal number suggested more emphasis on Web resources for making more kinds of material available and for improving efficiency and effectiveness of Webinars.

Across the collaborative, programs differed widely regarding program size (faculty, resident, patients), setting, discipline, prior experience with QI and collaboratives, and participation in this collaborative. We found no clear pattern relating any of these factors either to achievement of collaborative objectives or to assessment of collaborative value. When asked on the final survey if they would participate in the I<sup>3</sup> PCMH Collaborative again, given the opportunity, 21 programs indicated they probably or definitely would; four responded "don't know" (none responded probably or definitely not). The "don't know" responses included only one program that opted out of the NCQA recognition process but also included both pediatric programs and one internal medicine program.

## Discussion

This report describes the successful design and implementation of a regional PCMH-focused collaborative of 25 primary care residency programs. It demonstrates that such

a collaborative is a feasible model for achieving the practice changes necessary to train the coming generation of primary care physicians. Success is demonstrated by substantial achievement of the objective of NCQA recognition, significant and sustainable improvement in NCQA measures independent of recognition, and largely positive assessment by participating programs. The core lesson of the I<sup>3</sup> PCMH Collaborative experience is that a heterogeneous group of primary care residency programs working collaboratively can achieve substantial, measurable improvement toward becoming PCMHs, with a modest investment in collaborative infrastructure. Here we discuss the important lessons to be derived from critical consideration of our experience.

Readers should bear in mind that collaborative participants were volunteers (and included the 10 participants in the earlier I<sup>3</sup> Chronic Disease Collaborative), suggesting they considered themselves sufficiently prepared in practice redesign to benefit from the collaborative. Thus our findings may be less applicable to less experienced practices. Likewise, the relatively small number of pediatrics and general internal medicine programs urges caution in generalizing to primary care too broadly. By the same token, however, we found little evidence of systematic differences in our outcomes related to program characteristics, including specialty.

Participants identified directly funded activities of the collaborative, particularly monthly Webinars and face-to-face meetings, as key elements of their success. In both cases, they placed greatest value on shared resources and experience as well as the sense of common mission fostered by Webinars and meetings. The collaborative Web site was a disappointment in this regard; however, our experience indicates that collaboration software that offers both

security and ease of use is a worthwhile investment.

Contributed resources also played a crucial role. The contributed time of the collaborative Executive Committee was critical in planning and executing Webinars and meetings. Likewise, contributions of participant teams for travel and lodging, as well as opportunity costs of absence from the practice were vital to the collaborative's success. Day-to-day operation of a residency practice can often be consumed by addressing needs that are both important and urgent, leaving little time or energy for the merely important. The role of the collaborative in keeping the non-urgent, but critically important, tasks of practice redesign in the forefront should not be undervalued.

The NCQA recognition process was valuable in providing a common objective and a common set of measures to gauge progress. It also brought into relief the tension between achieving NCQA recognition and becoming genuinely a PCMH. The effective practice of medicine is built on a foundation of best-available evidence, and the NCQA recognition program has provided a valuable metric in this regard. The fact that collaborative practices not pursuing recognition found NCQA standards helpful in guiding and assessing their practice redesign activities supports this assertion. At the same time, however, our experience also highlights the sometimes substantial effort required to obtain, collate, and report evidence of a PCMH (prompting one team member to suggest that it might be more accurately called a *data-centered* medical home). Within the collaborative, the variation in EHR capabilities—even within the same EHR software—and the frequent misalignment of these capabilities with PCMH reporting requirements required additional effort from all collaborative members to meet the information requirements of the NCQA and the

documentation needs of the collaborative. Three practices found this effort unsustainable over the course of the collaborative, unanimously citing the absence of financial incentives as the primary reason. Two of these programs are in Virginia, where payer incentives for PCMH recognition are not yet available. While such incentives are important, our findings also illustrate the importance of closer alignment of health information technology (HIT) with PCMH. Incentives for meaningful use of HIT will be useful in this regard.

The transformation of primary care practices to PCMHs will play a key role in providing high-quality, accessible health care. The success of the I<sup>3</sup> PCMH Collaborative in helping residency practices measurably achieve this transformation with a modest investment of time and resources is significant. Equally significant, we believe, is the potential of academic collaboratives such as I<sup>3</sup> not only to disseminate innovation rapidly among residency programs but also to facilitate a culture of innovation beyond residency. Such a culture will produce and support physicians to constantly re-examine their practices in light of changing priorities of health care organizations and priorities of patients. Future research will focus on this exponential impact of our collaborative.

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