

Patient-Centered Medical Home and Quality Measurement in Small Practices

Jason J. Wang, PhD; Chloe H. Winther, BA; Jisung Cha, PhD; Colleen M. McCullough, MPA; Amanda S. Parsons, MD, MBA; Jesse Singer, DO, MPH; and Sarah C. Shih, MPH

The patient-centered medical home (PCMH) concept has been widely promoted as a way to enhance primary care and deliver better care to patients with chronic conditions.^{1,3} This model of care has stimulated the attention of payers, Medicaid policy makers, physicians, and patient advocates, as it has the potential to address several of the shortcomings of the current health-care system.⁴

Components of the PCMH model include practice-based policies and processes intended to improve healthcare quality, patient experience, clinician satisfaction, and costs of care.⁵ Pilots and demonstration projects have yielded mixed results, but positive reports associate PCMHs in large practices and institutions with decreases in costs for patients enrolled in Medicaid; increased care of Medicaid patients; and positive patient and clinician experiences.⁶⁻⁸ Recently published studies have also shown that components of the medical home (eg, care coordination, pre-visit planning) are associated with positive effects on clinical outcomes for patients and quality of life for clinicians.^{9,10}

The process of transforming and achieving recognition as a medical home can be difficult, especially for small practices with few resources.^{11,12} Additionally, small practices located in low income neighborhoods face challenges unique to their settings (eg, smaller panel size for quality measurement, lack of information systems, and lack of support staff) which can further exacerbate their ability to generate the documentation needed to demonstrate transformation and meet the standards for recognition.¹³ Promoting the adoption of PCMH standards in small primary care practices in lower income neighborhoods with a large proportion of chronically ill patients can be advantageous for reducing healthcare inequalities.¹⁴

As part of a larger public health initiative, the Primary Care Information Project (PCIP), a bureau within the New York City Department of Health and Mental Hygiene, has offered assistance to small, independent practices in New York City to complete the application for the National

ABSTRACT

Objectives

To assess performance on quality measures among small primary care practices that recently adopted an electronic health record (EHR), and how performance differs between practices that have achieved patient-centered medical home (PCMH) recognition and those that have not.

Study Design

Retrospective cohort study.

Methods

Comparison of practice characteristics and performance on quality measures across 150 independent practices from 2009 to 2011 by recognition status for Physician Practice Connections-PCMH.

Results

PCMH-recognized practices performed significantly better than nonrecognized practices on 5 out of 7 clinical quality measures at baseline, and the differences were maintained over the 2-year study period. Both groups improved on all clinical quality measures. Though the magnitude of differences was small, PCMH-recognized practices had a higher number of patients diagnosed with hypertension and proportionally more black patients. A significant difference in PCMH-recognized practices is that they received, on average, 4 additional quality improvement visits compared with nonrecognized practices.

Conclusions

Among small practices that have adopted EHRs, practices with PCMH recognition consistently outperformed practices without recognition on most clinical quality measures. With adequate assistance, small, resource-strapped practices can continue to have higher performance on clinical quality measures.

Am J Manag Care. 2014;20(6):481-489

Take-Away Points

Patient-centered medical home (PCMH) recognition in small practices is associated with higher performance on quality measures over time.

- Small practices with PCMH recognition perform better on quality measures related to chronic conditions.
- The differences observed between the practice groups appear to be sustainable over the 2-year study period.
- Quality measure performance is correlated with greater participation in a quality improvement program.

Committee for Quality Assurance's (NCQA's) Physician Practice Connections–Patient Centered Medical Home (PPC-PCMH) recognition program.¹⁵ This study assesses the clinical quality outcomes of PCIP-participating practices that have achieved PPC-PCMH recognition from NCQA, and compares performance on quality measures from 2009 through 2011 in practices that have been PCMH-recognized with those that have not.

METHODS

PCIP Activities

In an effort to transform primary care and improve population health, PCIP assists primary care practices in the adoption and use of electronic health records (EHRs). From its inception in 2005 through early 2012, PCIP assisted over 3000 primary care clinicians located in over 600 independently owned practices to adopt prevention-oriented EHR systems. Collectively, PCIP participants represent over 20% of New York City's primary care clinicians and serve approximately 2.6 million patients.¹⁶

Recognizing that digitizing the information around healthcare alone would not bring about the changes needed to improve the delivery of clinical preventive services, PCIP offers additional support to address both technical needs and quality improvement (QI).¹⁷ PCIP employs a field team dedicated to assisting clinicians in optimizing work flows and leveraging data from their own EHR systems to track clinical quality performance. Much of the QI curriculum was modeled around the standards articulated by the NCQA's PPC-PCMH program. This included an initial visit to identify practice leadership or champion for QI activities; follow-up meetings with the practice or provider to review progress on meeting QI objectives; using the functions within the EHR, such as the registry tool that generates lists of patients by selected characteristics (eg, diagnosis of hypertension with blood pressure over 140/90 mm Hg without a visit to practice in past 6 months and no scheduled visit in next 3 months); and reviewing the quality reporting tool—a specific feature within eClinical-

Works co-developed with PCIP to display quality measures tied to the city's health policy agenda.¹⁸ PCIP offered visits to practices every 4 to 6 weeks; staff were available by e-mail and phone to answer questions in addition to the on-site visits.

To encourage and facilitate the PPC-PCMH recognition process, PCIP established a multi-site application and

offered to practices the ability to apply under the 2008 standards. Fees for the application were also subsidized by PCIP. Because some of the PCMH standards had been met across all PCIP practices, such as having an EHR with clinical decision support, clinicians did not have to repeat some of the standard documentation related to their EHRs in their NCQA applications. PCIP practices eligible to be included in the multi-site application were eligible to receive 36.75 points, which at the time was adequate for obtaining Level 1 recognition. However, all practices still needed to provide supporting documentation to demonstrate to NCQA their use of the systems; if practices wished to do so, they could work towards a higher recognition level by submitting additional documentation. NCQA then reviewed the documentation gathered by practices and submitted by PCIP to determine whether clinicians in the application met Level 1, 2, or 3 PPC-PCMH standards. By early 2012, PCIP had assisted roughly 25% of its member practices in achieving NCQA recognition, including 269 sites representing 169 practices and 657 clinicians to meet 2008 standards. Practices applying for PPC-PCMH recognition after July 1, 2012, are required to follow 2011 standards.

Practice Selection

Primary care practices were included in this analysis if they had 5 or fewer clinicians and adopted the eClinicalWorks EHR system prior to October 2009. Pediatric-focused practices were excluded as the quality measures analyzed were limited to adult primary care. Practices were also excluded if data were unavailable for either of the 2 analysis periods: October 2009 and October 2011. Because the process of obtaining NCQA recognition can take between 6 to 12 months, practices were categorized into the PCMH-recognized group if they achieved NCQA recognition at any time up until February 2012.

Data Collection

As part of a contract negotiated with eClinicalWorks, PCIP established an automated monthly data transmission process to receive summarized data generated from each

Table 1. Comparison of Quality Measure Performance at Baseline (October 2009) and Current (October 2011) for PCMH-Recognized and Nonrecognized Practices

Measure	Group	Mean Practice Rate (SD) (n)		P
		Baseline	Current	
A1C testing Patients aged 18-75 years with a diagnosis of DM, with a documented A1C test in the past 6 months	PCMH-recognized	0.52 (0.30)(44)	0.64 (0.24)(44)	.04
	Nonrecognized	0.35 (0.30)(56)	0.48 (0.27)(47)	.03
	<i>P</i>	.01	.005	
Antithrombotic therapy Patients aged ≥18 years with a diagnosis of IVD or ≥40 years with a diagnosis of DM taking aspirin or another antithrombotic therapy	PCMH-recognized	0.65 (0.20)(44)	0.80 (0.16)(45)	<.001
	Nonrecognized	0.54 (0.21)(56)	0.71 (0.17)(48)	<.0001
	<i>P</i>	.0107	.135	
BMI recorded Patients aged ≥18 years who have a BMI measured in the past 2 years	PCMH-recognized	0.86 (0.17)(55)	0.94 (0.14)(50)	.02
	Nonrecognized	0.74 (0.29)(72)	0.87 (0.24)(65)	.01
	<i>P</i>	.003	.003	
BP control (HTN only) Patients aged 18-75 years with a diagnosis of HTN and not of DM, with a recorded BP of <140/90 mm Hg in the past 12 months	PCMH-recognized	0.54 (0.19)(49)	0.64 (0.18)(46)	.01
	Nonrecognized	0.58 (0.18)(58)	0.64 (0.11)(51)	.04
	<i>P</i>	.3	.98	
BP control (HTN with DM) Patients aged 18-75 years with a diagnosis of HTN and DM, with a recorded BP of <130/80 mm Hg in the past 12 months	PCMH-recognized	0.30 (0.18)(43)	0.37 (0.19)(43)	.09
	Nonrecognized	0.30 (0.18)(54)	0.29 (0.13)(45)	.77
	<i>P</i>	.9689	.03	
Smoking status recorded Smoking status updated annually in patients aged ≥18 years	PCMH-recognized	0.72 (0.28)(55)	0.87 (0.15)(50)	<.001
	Nonrecognized	0.56 (0.34)(72)	0.76 (0.28)(65)	<.001
	<i>P</i>	.007	.02	
Smoking cessation intervention Current smokers who received cessation interventions or counseling in the past 12 months	PCMH-recognized	0.39 (0.28)(39)	0.60 (0.26)(37)	.001
	Nonrecognized	0.20 (0.18)(41)	0.36 (0.29)(45)	<.001
	<i>P</i>	<.001	<.001	

A1C indicates glycated hemoglobin; BMI, body mass index; BP, blood pressure; DM, diabetes mellitus; HTN, hypertension; IVD, ischemic vascular disease; PCMH, patient-centered medical home.

practice's EHR. Practices receiving support from PCIP have agreed to provide data transmitted through this process. The data transmitted consisted of clinician-level aggregated counts of patients meeting numerator and denominator definitions for each of the quality measures, developed to be consistent with National Quality Forum measure definitions.¹⁹ EHR utilization data are also received monthly, including number of labs reviewed, order sets used, number of monthly encounters per full-time equivalent (FTE), number of unique patients seen per month, as well as proportions of patients by age group, gender, race/ethnicity, or with a diagnosis of hypertension, diabetes, or both. PCIP staff used Salesforce, a commercially available, Web-based customer relationship management (CRM) application to monitor activities with the practices (eg, site visits with QI or other PCIP staff, attendance at classes or seminars hosted by PCIP or the vendor), maintain program administration and contact information, and track practice milestones such as initial contact for recruitment and date of EHR "go-live."

Selection of Quality Measures

Seven clinical quality measures of care and docu-

mentation were selected for analysis: (1) antithrombotic therapy for patients with diabetes or ischemic vascular disease; (2) blood pressure control in hypertensive patients with and without diabetes (2 separate measures); (3) body mass index (BMI) recorded; (4) glycated hemoglobin (A1C) testing in patients with diabetes; (5) smoking status recorded; and (6) smoking cessation intervention, including counseling, prescription drugs, and referrals to the New York State fax-to-quit hotline for identified smokers (Table 1). These 7 measures were selected because they are indicators of clinical performance aimed at preventing and reducing smoking, diabetes, and cardiovascular disease, all of which are leading contributors to a large burden of morbidity and mortality within New York City and the United States.^{18,20} These chronic conditions are also frequently reported by PCIP field staff as some of the most common conditions among patients in practices seeking NCQA PCMH recognition.

Data Analysis

Practices were grouped together based on whether they had an NCQA PCMH recognition status. We chose February 2012 as the cutoff date to categorize practices with or

■ **Table 2.** Comparison of Characteristics (October 2009) for PCMH-Recognized and Nonrecognized Practices

Characteristic	Mean Value		P
	PCMH (n = 59)	Non-PCMH (n = 91)	
Months using EHR	11.2	12.4	.29
QI visits	4.9	4.8	.78
Number of providers	1.9	2.0	.90
Provider FTE	1.4	1.5	.82
Number of monthly patients	552.3	521.2	.67
Number of monthly encounters per FTE	408.6	411.3	.96
Insurance type^a (%)			
Commercial	72.3	72.7	.90
Medicaid	16.8	12.1	.11
Medicare	14.9	18.7	.13
Self-pay	2.4	2.4	.99
Patients with (%)			
Diabetes	14.9	12.6	.09
Hypertension	22.0	17.0	.01
Diabetes & hypertension	11.9	9.3	.06
Female (%)	64.5	63.9	.18
Age distribution (%)			<.001
0-17 y	8.4	3.0	
18-24 y	6.1	5.8	
25-44 y	27.0	28.5	
45-64 y	35.4	36.3	
65+ y	20.6	26.5	
Race (%)			
Asian or Pacific Islander	26.6	26.4	<.001
Black	21.9	10.9	
White	35.5	39.6	
Others	16.0	23.1	

EHR indicates electronic health record; FTE, full-time equivalent; PCMH, patient-centered medical home; QI, quality improvement.
^aTotal may exceed 100% because patients may have multiple insurers. Medicaid and Medicare only include fee-for-service.

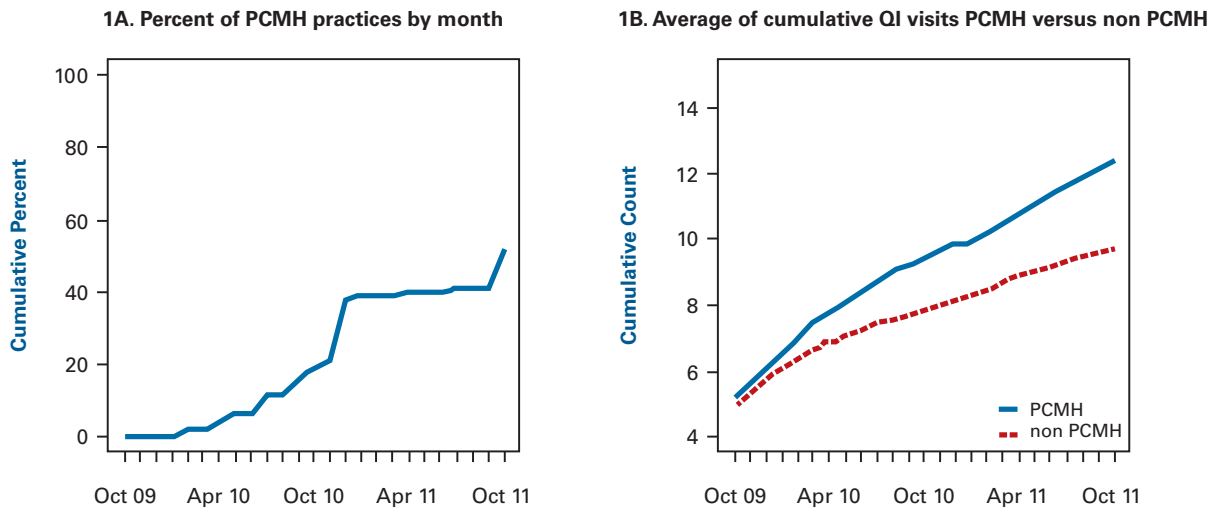
without an NCQA recognition status (Level 1, 2, or 3). Frequencies and descriptive statistics were generated and simple *t* tests and χ^2 tests were conducted to compare baseline practice characteristics for practices that did and did not receive PCMH recognition (Table 2). To illustrate the time distribution of practices achieving PCMH recognition, we graphed NCQA recognition dates (Figure 1A). Separately, we plotted the monthly cumulative average QI visits (on-site assistance provided to practices) by whether practices were PCMH-recognized or not from October 2009 to October 2011 (Figure 1B).

We compared performance over time on quality measures over the same time period (October 2009–October 2011). Performance on each quality measure was constructed as a rate (numerator divided by denominator) for each practice for each month. To calculate meaningful rates and create stable comparisons, practices were

excluded from individual measure analyses if their denominator for that measure was less than or equal to 10. Simple *t* tests were used to compare the performance on measures between practices with and without PCMH recognition at the baseline (October 2009) and current (October 2011) time points and to compare changes in quality measure performance within the groups (Table 1). Average rates of PCMH-recognized (solid lines) and nonrecognized practices (dashed lines) were graphed for each quality measure from October 2009 through October 2011 (Figure 2).

Mixed model regression was used to examine the differences in improvement between PCMH and non-PCMH practices over time for each quality measure, allowing each practice to have a different intercept to account for unexplained practice heterogeneity. Table 3 shows the odds ratios (ORs) and 95% CIs generated from a general estima-

■ **Figure 1.** Time Distribution of Practices Achieving PCMH Recognition and Average Cumulative QI Visits



PCMH indicates patient-centered medical home; QI, quality improvement.

tion model for the effects of PCMH recognition, time, and the interaction between the 2 variables across practices. All statistical analyses were conducted with SAS version 9.2 (SAS Institute Inc, Cary, North Carolina) and figures were drawn with R 2.15. For all statistical tests, a 2-tailed *P* value of less than .05 was considered statistically significant.

RESULTS

Out of 776 practices enrolled in PCIP as of July 2012, 349 were live on their system prior to October 2009. Of those, 150 practices met the selection criteria for inclusion in this analysis. Of the 150 included practices, 39.3% have achieved PCMH recognition from NCQA (Figure 1A), including 1 Level 2 and 12 Level 3 practices. The earliest practice to achieve PCMH recognition did so in February 2010, and the latest practice became PCMH-recognized in February 2012; half of practices gained recognition by December 2010.

PCMH-recognized and nonrecognized practices did not statistically differ at baseline in months using EHR, total encounters, number of clinicians, clinician FTE, or insurance type. PCMH-recognized practices had a slightly, though statistically significant, larger proportion of patients with hypertension (Table 2). A comparison of performance between practices by recognition level yielded no significant differences on any measure (data not shown).

At baseline, PCMH-recognized practices performed significantly better than nonrecognized practices on 5 of the 7 quality measures (Table 1). There was no difference

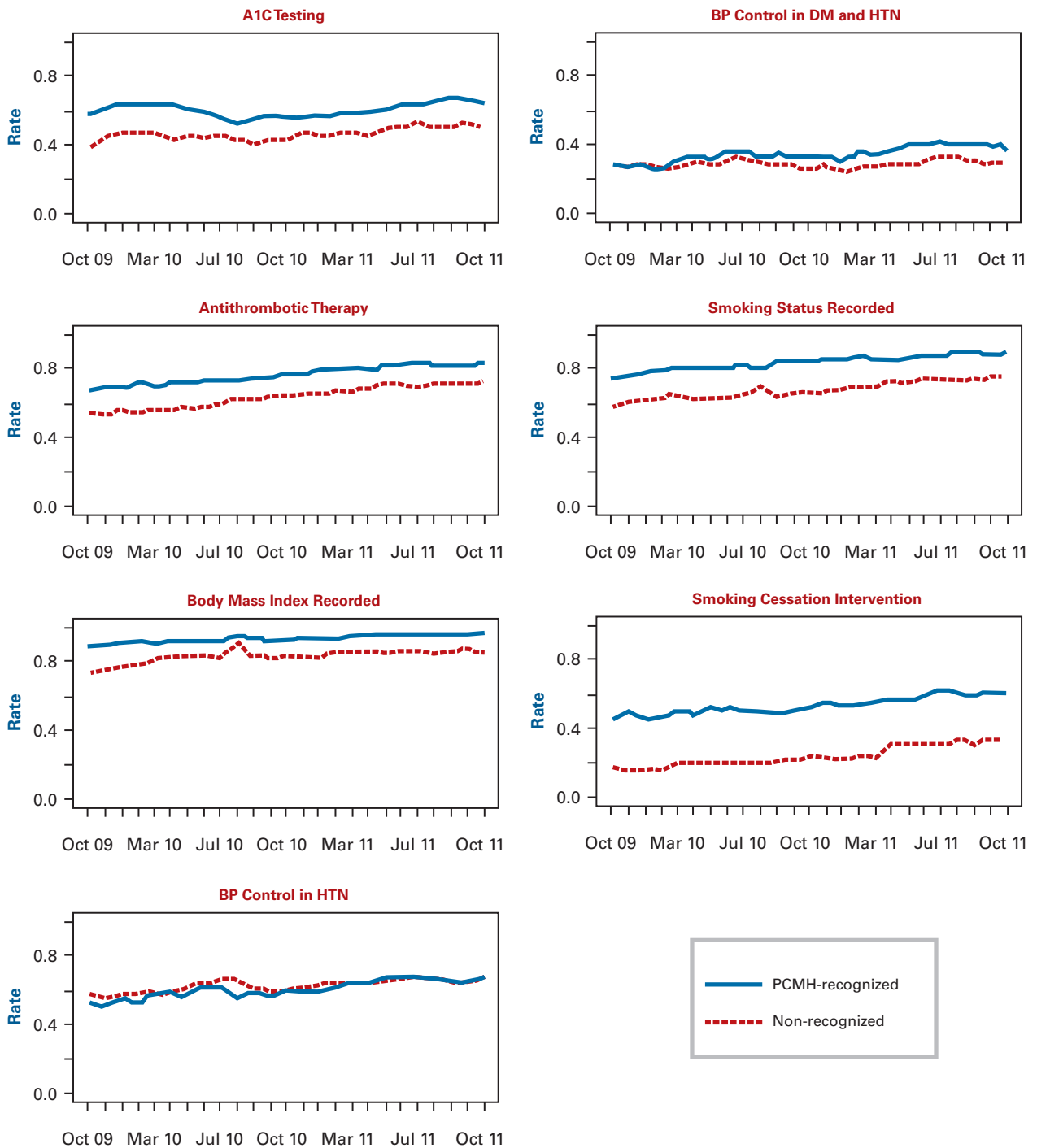
in performance at baseline between PCMH-recognized and nonrecognized practices for the 2 blood pressure control measures. At the later time point (October 2011), PCMH-recognized practices outperformed nonrecognized practices on A1C testing, BMI recorded, blood pressure control in patients with both hypertension and diabetes, smoking status recorded, and smoking cessation intervention measures. There was no significant difference in performance between the practice groups on antithrombotic therapy and blood pressure control in patients with hypertension only.

Overall, both groups of practices improved on every measure over the 2-year period (Table 1). For 6 of the 7 measures, time using the EHR was a significant predictor of improvement (Table 3). For both of the blood pressure control measures, the interaction term was significant with an OR greater than 1, indicating that PCMH-recognized practices improved at a faster rate than nonrecognized practices. For the A1C testing measure and the BMI recorded measure, the interaction term was significant with an OR less than 1, suggesting that nonrecognized practices improved at a faster rate than PCMH-recognized practices. By the end of the study period, PCMH-recognized practices, on average, had received 4 more visits than nonrecognized practices with PCIP QI staff (Figure 1B).

DISCUSSION

Practices in both the PCMH-recognized and nonrecognized groups significantly improved performance on key clinical quality measures over the 2-year study period.

Figure 2. Performance on Quality Measures for PCMH-Recognized and Nonrecognized Practices



A1C indicates glycated hemoglobin; BP, blood pressure; DM, diabetes mellitus; HTN, hypertension; PCMH, patient-centered medical home.

At both the baseline and later time points, practices that had achieved PCMH recognition consistently performed better on process measures, including measures referring to in-office screenings or documentation proficiency, than practices that had not achieved PCMH recognition.

PCMH-recognized practices performed about the same as nonrecognized practices at baseline on the blood pressure control measures in both diabetic and nondiabetic patients.

Time using the EHR was the most significant predictor of improvement on all quality measures, and the av-

■ **Table 3.** Parameter Estimates of Fixed Effect at Current Time Point (October 2011)

Quality Measures	PCMH	Time	PCMH × Time
	OR (CI)	OR (CI)	OR (CI)
A1C testing	2.97 (1.61-5.49)	2.08 (1.83-2.36)	0.80 (0.67-0.95)
Antithrombotic therapy	1.88 (1.32-2.69)	2.15 (1.95-2.37)	1.01 (0.87-1.17)
Body mass index recorded	2.92 (1.60-5.34)	4.76 (4.45-5.10)	0.62 (0.56-0.70)
BP control in HTN	0.86 (0.66-1.12)	1.33 (1.21-1.47)	1.25 (1.10-1.43)
BP control in DM and HTN	1.04 (0.77-1.42)	1.13 (0.98-1.30)	1.37 (1.14-1.65)
Smoking cessation intervention	3.42 (2.03-5.75)	3.16 (2.63-3.79)	0.79 (0.62-1.01)
Smoking status	2.72 (1.38-5.35)	4.00 (3.50-4.21)	0.99 (0.91-1.07)

A1C indicates glycated hemoglobin; BMI, body mass index; BP, blood pressure; DM, diabetes mellitus; HTN, hypertension; OR, odds ratio; PCMH, patient-centered medical home.

erage time using the EHR was roughly the same for both groups of practices. Although both groups of practices improved on all measures over time, for some measures, PCMH recognition was associated with even greater improvement. PCMH-recognized practices improved at a faster rate than nonrecognized practices on both of the blood pressure control measures over the 2-year period, suggesting that PCMH recognition may have a positive effect on the quality of care for patients with multiple chronic conditions. Given that improved performance on these measures requires not only clinician intervention (eg, medication order) but also patient engagement (eg, medication compliance, lifestyle changes), it may be that practices that achieve recognition as a PCMH have learned to provide an enhanced level of care, enabling them to do better on these types of measures. There are different pathways of implementing the PCMH model and practices emphasize different components depending on their circumstances²⁰; however, PCMH pilots across the country have shown a similar correlation between component processes of the PCMH model and improvements in quality of care for patients with multiple morbidities.^{10,22} Additionally, practice facilitator programs have been shown to have a positive impact on practice transformation; the PCIP QI curriculum may have had similar effects on the adoption of new processes or guidelines.²³

For other measures, PCMH recognition was not associated with a greater rate of improvement. Both groups improved at approximately the same rate on antithrombotic therapy and the 2 smoking measures, although a large gap remained in performance between PCMH-recognized and nonrecognized practices. Nonrecognized practices improved at a higher rate on BMI recorded and A1C testing. For both of these measures, nonrecognized practices performed significantly below PCMH-recognized practices at

baseline, and our results indicated that over time, non-recognized practices were able to reduce the initial gap in performance. Also worth noting is that the baseline rate of BMI recorded was quite high for PCMH-recognized practices (86%), and these practices may have reached a performance ceiling over the course of the study, whereas nonrecognized practices had more room to improve, leaving an opportunity to close the performance gap.

As part of the PCIP program, all practices were offered extensive on-site technical support. At baseline, there was no difference in the number of QI visits provided by PCIP staff to the 2 groups of practices, but by the later time period, the PCMH-recognized group received an average of 4 additional QI visits compared with nonrecognized practices. This may be due in part to the time needed to provide assistance with the NCQA application; we were not able to assess the reasons for visits. Practices were given the option for additional QI visits and could receive them upon request. Those that did request additional QI visits were committed to giving time and staffing, including closing the practice or meeting during off hours, which may have been more difficult for some practices than for others. There may have been different levels of motivation as well as resource availability for practices that sought additional visits.

Resource barriers to PCMH transformation have been well described¹² and many have noted that small practices struggle to secure the resources to support their transformative efforts.¹¹ While support from PCIP QI staff may alleviate some of the barriers for small practices to achieve or maintain PCMH-recognition, PCMH-recognized practices invested significant time and resources of their own in the transformation and application process. For some practices, achievement of PCMH recognition would not be possible without PCIP assistance. In addition to challenges posed by resource-strapped settings, QI staff ob-

served that small practices may have difficulty interpreting or adapting key PCMH concepts such as care coordination and team-based care in smaller practices with fewer staff.²⁴ Evidence has shown that shared technical assistance, like that provided by PCIP, can be a key element in enabling small practices to successfully implement these concepts.²⁵

These results demonstrate that both groups of participating practices have an ongoing commitment to quality that requires considerable effort and resources. Furthermore, despite all of the challenges they face, nearly 40% of small practices are able to operationalize the core components of the PCMH model, make meaningful changes to their practice, and improve quality with the aid of PCIP QI staff support. In order to expand these positive results, it is important for payers and policy makers to identify opportunities to provide support for small practices in implementing PCMH processes.

Limitations and Next Steps

This analysis only covered a 2-year period. We do not know whether the difference in performance among PCMH-recognized and nonrecognized practices can be sustained in the longer-term, or whether the differences would shrink or grow over time. Additionally, recent policy changes, such as the January 2013 expiration of New York State Medicaid incentive payments for PCMH Level 1 practices, may have an impact on recognition and performance trends. In addition, practices may continue to transform their office workflows and care processes—for instance, practices that have not yet achieved PCMH recognition from the NCQA may do so in the future, and those that are already PCMH-recognized may in the future achieve recognition at a higher level or reapply for recognition under the tougher 2011 standards. While we know that improvements may be a result of coding and documentation, we believe this is a limitation for measures where coding can impact measurement, such as smoking status recorded and smoking cessation intervention. Quality measures that rely on vitals or lab results, such as BMI, blood pressure, and A1C, are less prone to variations in documentation practices and likely reflect an improvement in the quality of care in addition to coding.²⁶

The goal of this paper was to highlight a difference in performance rates among practices that have and have not achieved PCMH recognition, but we cannot yet speak to what is causing the difference. Using the data currently available, the PCMH-recognized and nonrecognized practices appear very similar in practice characteristics with the exception of racial demographics and the number of patients with hypertension. However, the baseline perfor-

mance differences on most of these measures suggest that there may be other factors associated with these practices that may contribute to these differences that we could not detect with the data available to us.

Recent research has shown that the practice characteristics measured here may be less important to the key PCMH element of “team” than engaged leadership and organizational culture.^{27,28} Although all PCIP practices were offered the same quality improvement opportunities, given the differences in practice performance at baseline, it is possible that practices that were more organized, had stronger management, and provided higher quality care were more likely to elect to become PCMH-recognized.²⁹ For this reason there may be non-random selection in the recognized group. Other differences could include similarly difficult-to-define concepts, such as motivation. As part of the evaluation of the National Demonstration Project for PCMH, researchers identified 1 such concept—an element of “adaptive reserve” which they were able to scale and quantify.⁷ This concept covers a range of practice characteristics, including leadership and team relationships, which could contribute to a practice’s capacity to absorb change and lead to successful transformation and better quality outcomes. Further research is needed to delve into other potential factors that can sustain practice improvement, especially in small practices serving economically depressed populations. In particular, further research is needed to better define these concepts in the context of small practices.

Whether practices that became PCMH-recognized already had higher performance on quality measures or were able to improve their performance on quality measures through PCMH transformation, our findings suggest that these practices have higher rates of quality measurement in 7 areas of preventive care. As is currently under CMS consideration, PCMH recognition may serve as a marker to consumers in helping them select high-quality practices, and to payers who are looking to differentiate among their network clinicians.³⁰ However, better care and health could be achieved if all practices continued to improve over time. Efforts to further encourage all practices to demonstrate improvement on preventive care for patients with chronic conditions could be supported by PCMH transformation. Further rewards for practices and areas of care that may have been reaching a ceiling, such as smoking status recorded or BMI recorded, would be wasted resources that could be used to assist lower performers on areas of care with direct impact on improved population health. Finally, further monitoring over time will determine if PCMH recognition continues to produce positive health outcomes for patients with chronic conditions.

Author Affiliations: New York City Department of Health and Mental Hygiene, Primary Care Information Project, Queens, NY (JJW, CHW, JC, CMM, ASP, JS, SCS).

Source of Funding: New York City Tax Levy and the Agency for Healthcare Research and Quality R18 HS019164.

Author Disclosures: The authors report no relationship or financial interest with any entity that would pose a conflict of interest with the subject matter of this article.

Authorship Information: Concept and design (JJW, CHW, JS, SCS); acquisition of data (JJW, JC, CMM, SCS); analysis and interpretation of data (JJW, JC, CMM); drafting of the manuscript (JJW, CHW, CMM, ASP, SCS); critical revision of the manuscript for important intellectual content (JJW, CHW, CMM, ASP, SCS); statistical analysis (JJW, JC); provision of study materials or patients (AP, JS); obtaining funding (ASP); administrative, technical, or logistic support (JJW, CHW, JS, SCS); supervision (JJW, JS, SCS).

Address correspondence to: Jason J. Wang, PhD, New York City Department of Health and Mental Hygiene, Primary Care Information Project, 42-09 28th St, 12th Fl, Queens, NY 11101. E-mail: jwang5@health.nyc.gov.

REFERENCES

- Wagner EH, Coleman K, Reid RJ, Phillips K, Abrams MK, Sugarman JR. The changes involved in patient-centered medical home transformation. *Prim Care*. 2012;39(2):241-259.
- Maeng DD, Graham J, Graf TR, et al. Reducing long-term cost by transforming primary care: evidence from Geisinger's medical home model. *Am J Manag Care*. 2012;18(3):149-155.
- Reid RJ, Fishman PA, Yu O, et al. Patient-centered medical home demonstration: a prospective, quasi-experimental, before and after evaluation. *Am J Manag Care*. 2009; 15(9):e71-e87.
- Takach M. Reinventing Medicaid: state innovations to qualify and pay for patient-centered medical homes show promising results. *Health Aff (Millwood)*. 2011;30(7):1325-1334.
- Friedberg MW, Coltin KL, Safran DG, Dresser M, Zaslavsky AM, Schneider EC. Associations between structural capabilities of primary care practices and performance on selected quality measures. *Ann Intern Med*. 2009;151(7):456-63.
- Kaye N, Buxbaum J, Takach M; the Commonwealth Fund National Academy for State Health Policy. Building Medical Homes: Lessons from Eight States with Emerging Programs. http://www.commonwealthfund.org/~media/Files/Publications/Fund%20Report/2011/Dec/1569_Kaye_building_medical_homes_v2.pdf. Published December 2011. Accessed May 18, 2012.
- Nutting PA, Crabtree BF, Stewart EE, et al. Effect of facilitation on practice outcomes in the National Demonstration Project model of the patient-centered medical home. *Ann Fam Med*. 2010;8(suppl 1): s33-s44.
- Reid RJ, Coleman K, Johnson EA, et al. The group health medical home at year two: cost savings, higher patient satisfaction, and less burnout for providers. *Health Aff (Millwood)*. 2010;29(5):835-843
- Lee TH, Berenson RA. Chapter 2: the organization of healthcare delivery: a roadmap for accelerated improvement. In *The Healthcare Delivery System: A Blueprint for Reform*. Washington, DC: Center for American Progress. http://www.americanprogress.org/issues/2008/10/pdf/health_delivery_ch2.pdf. Published 2009. Accessed May 21, 2012.
- Bojadziewski T, Gabbay RA. Patient-centered medical home and diabetes. *Diabetes Care*. 2011;34(4):1047-1053.
- Berenson RA, Devers KJ, Burton, RA. Will the patient-centered medical home transform the delivery of healthcare? Urban Institute website. <http://www.urban.org/UploadedPDF/412373-will-patient-centered-medical-home-transform-delivery-health-care.pdf>. Published August 2011. Accessed May 15, 2012.
- Rittenhouse DR, Casalino LP, Shortell SM, et al. Small and medium-size physician practices use few patient-centered medical home processes. *Health Aff (Millwood)*. 2011;30(8):1575-1584.
- Landon BE, Normand SL. Performance measurement in the small office practice: challenges and potential solutions. *Ann Intern Med*. 2008;148(5):353-357.
- Nielsen M, Langner B, Zema C, Hacker T, Grundy P. Benefits of implementing the primary care patient-centered medical home: a review of cost and quality results, 2012. Patient-Centered Primary Care Collaborative website. http://www.pcpc.net/files/benefits_of_implementing_the_primary_care_pcmh.pdf. Published September 2012. Accessed December 10, 2012.
- Physician practice connections—patient-centered medical home 2008. National Committee on Quality Assurance website. <http://www.ncca.org/tabid/1016/default.aspx>. Accessed May 12, 2011.
- Armstrong DP, Forte GJ. Annual New York Physician Workforce Profile, 2010 Edition. Rensselaer, NY: Center for Health Workforce Studies, School of Public Health, SUNY Albany. December 2010.
- Mostashari F, Tripathi M, Kendall M. A tale of two large community electronic health record extension projects. *Health Aff (Millwood)*. 2009;28(2):345-356.
- Take Care New York: A policy for a healthier New York City: Fourth Year Progress Report. New York City Department of Health and Mental Hygiene website. <http://www.nyc.gov/html/doh/downloads/pdf/tcny/tcny-4yr-ar.pdf>. Published March 2009. Accessed March 26, 2012.
- National Quality Forum website. <http://www.qualityforum.org/QPS/>. Accessed March 19, 2013.
- Farley TA, Dalal MA, Mostashari F, Frieden TR. Deaths preventable in the US by improvements in use of clinical preventive services. *Am J Prev Med*. 2010;38(6):600-609.
- Bitton A, Schwartz GR, Stewart EE, Henderson DE, Keohane CA, Bates DW, Schiff GD. Off the hamster wheel? qualitative evaluation of a payment-linked patient-centered medical home (PCMH) pilot. *Milbank Q*. 2012;90(3):484-515.
- Grumbach K, Bodenheimer T, Grundy P. The outcomes of implementing patient-centered medical home interventions: a review of the evidence on quality, access and costs from recent prospective evaluation studies. Patient-Centered Primary Care Collaborative website. http://www.pcpc.net/files/pcmh_evidence_outcomes_2009.pdf. Published August 2009. Accessed May 15, 2012.
- Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. *Ann Fam Med*. 2012;10(1):63-73.
- Lowenstein D, Wetterman T, Dougherty C. Building New York's medical homes: learning from eight pioneers to move the model forward. Primary Care Development Corporation website. <http://www.pcdc.org/assets/pdf/building-new-york-s-medical-homes-11-18-12-final.pdf>. Published November 2012. Accessed April 23, 2013.
- Abrams M, Schor EL, Schoenbaum S. How physician practices could share personnel and resources to support medical homes. *Health Affairs*. 29(6):1194-1199.
- Parsons A, McCullough C, Wang J, Shih S. Validity of electronic health record-derived quality measurement for quality reporting. *J Am Med Inform Assoc*. 2012;19(4):604-609.
- Howard M, Brazil K, Akhtar-Danesh N, Agarwal G. Self-reported teamwork in family health team practices in Ontario. *Can Fam Physician*. 2011;57(5):e185-e191.
- Meyer H. Group Health's move to the medical home: for doctors, it's often a hard journey. *Health Aff (Millwood)*. 2010;29(5):844-851.
- Devries A, Li CH, Sridhar G, Hummel JR, Breidbart S, Barron JJ. Impact of medical homes on quality, healthcare utilization, and costs. *Am J Manag Care*. 2012;18(9):534-544.
- Proposed Policy and Payment Changes to the Medicare Physician Fee Schedule for Calendar Year 2014. CMS website. <http://www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-Sheets/2013-Fact-Sheets-Items/2013-07-08.html>. Published July 8, 2013. Accessed August 6, 2013. ■

www.ajmc.com Full text and PDF
Web exclusive eAppendices A-D