UCLA
UCLA Previously Published Works

Title
Patient Experiences with Care Differ with Chronic Care Management in a Federally Qualified Community Health Center

Permalink
https://escholarship.org/uc/item/3rs9g8f9

Journal
Population Health Management, 20(6)

ISSN
1942-7891

Authors
Setodji, Claude M
Quigley, Denise D
Elliott, Marc N
et al.

Publication Date
2017-12-01

DOI
10.1089/pop.2017.0003

Peer reviewed

eScholarship.org Powered by the California Digital Library
University of California

POPULATION HEALTH MANAGEMENT
Volume 00, Number 00, 2017
© Mary Ann Liebert, Inc.
DOI: 10.1089/pop.2017.0003

Original Article

Patient Experiences with Care Differ with Chronic Care Management in a Federally Qualified Community Health Center

Claude M. Setodji, PhD,[1] Denise D. Quigley, PhD,[2] Marc N. Elliott, PhD,[2] Q Burkhart, MS,[2] Michael E. Hochman, MD, MPH,[3] Alex Y. Chen, MD, MS,[4] and Ron D. Hays, PhD[2,5]

Abstract

This study compares patient experience among practices that vary in adoption of the chronic care management (CCM) dimension of the patient-centered medical home (PCMH) model that focuses on care coordination and management of chronic diseases. Study participants were 2903 adult patients (ages 18 years or older) at 14 primary care centers in California. Seven of the sites were classified as high (more CCM) and the other 7 low on a CCM index. Hypotheses were tested using ordinary least squares regression models. After adjusting for the number of providers at the sites, high CCM scores were associated with significantly better overall ratings of providers, provider communication, follow-up on test results, and willingness to recommend the provider (differences of 5.82, 6.85, 9.81, and 4.56, respectively on the 0–100 scale scores). The results of this study provide support for the value of the PCMH for patient experiences with care.

Keywords: patient-centered medical home, chronic care management, CAHPS, patient experience

Introduction

The patient-centered medical home (PCMH) model started in the late 1960s with the goal of improving care for children with special needs because the lack of complete patient records and a ''medical home'' were thought to impede management of care.[1] The PCMH model is endorsed as a way to achieve high-quality, accessible, efficient primary health care in the United States.[2] It aims to respond to each patient's specific needs and preferences through the implementation of physician-led teams providing comprehensive care, including acute care, chronic care, preventive services, and end-of-life care. The PCMH model aims to deliver culturally and linguistically appropriate care focusing on quality and safety while improving access.[3]

Evidence of the effectiveness of the PCMH model has been mixed.[4–6] Some studies documented improvements in quality of care and patient experience, as well as fewer emergency visits and hospitalizations, and reductions in clinician burnout.[7] However, Friedberg et al[8] reported an increase in cost and improvement for only 1 of 11 quality measures they studied. Jackson et al[9] conducted a systematic review, in which effect size is defined as the standardized mean difference and categorized (small, medium, large) according to Cohen's[10] rules of thumb, and concluded that there was evidence that the PCMH model has small positive effects on patient experience and small-to-medium positive effects on preventive care services, but insufficient evidence about effects on clinical and economic outcomes.

Theory and conceptual framework

The PCMH model is a primary care approach to delivering care that encompasses the Institute for Healthcare Improvement's Triple Aim of improving quality (including clinical care and the patient and provider experience), improving health outcomes, and controlling costs.[11,12] The PCMH model addresses issues of access, continuity, coordination of care, and comprehensiveness of care and services, while including the use of information technology and quality measurement of both clinical outcomes and patient experience. The chronic care model informed the development of the PCMH model[13]

[1]RAND Center for Causal Inference, RAND Corporation, Pittsburgh, Pennsylvania.
[2]RAND Corporation, Santa Monica, California.
[3]Keck School of Medicine, University of Southern California, Los Angeles, California.
[4]AltaMed Health Services, Los Angeles, California.
[5]Division of General Internal Medicine & Health Services Research, Department of Medicine, UCLA, Los Angeles, California.

by delineating how practices can improve patient health outcomes by changing the routine delivery of care and making it more patient centered.[14] The PCMH model specifies identification and electronic extraction of populations with chronic health conditions to enhance care and tailor practice activities to patient needs (eg, flag charts, send reminders, alert the physicians). In a PCMH, a designated care coordinator uses chronic condition patient registries and protocols, which include goals, services, interventions, and referral contacts, to support and engage patients and their families in self-management activities across settings. These types of practice capabilities influence many aspects of patient experience. For example, changes in team-based care and having the clinical care coordinator spend time with patients and/or families discussing disease management and patient education can address patient needs, support self-management, and influence the frequency and intensity of visits, the quality of the physician-patient relationship, the array of services delivered, and the number of care needs coordinated across settings by the primary care office.

This study examines the associations between the Medical Home Index (MHI) chronic care management (CCM) score, and patient experiences with care in a Federally Qualified Community Health Center (FQHC) in California. It was hypothesized that implementation of the chronic condition management aspects of the PCMH model would be associated with better patient experience.

Methods

Fourteen of 26 sites in a large independent FQHC in California participated in this study. Twelve sites with targeted populations were excluded because they were not traditional primary care sites and were not being administered the Consumer Assessment of Healthcare Providers and Systems (CAHPS) clinician and group (CG-CAHPS) visit survey[15]: 5 sites serving only the elderly, 3 sites serving HIV patients, and 4 sites located in zonal housing projects. Two pilot sites received recognition in June 2011, while the remaining 12 sites achieved National Committee for Quality Assurance (NCQA) PCMH Level 3 recognition in July 2012.[16,17] The pursuit by the FQHC of NCQA PCMH Level 3 recognition and PCMH transformation coincided with the hiring of a new chief medical officer.[18] The observed range of the NCQA PCMH scores (obtained in July 2012) across the 14 sites on a 0 to 100-point scale was 87.00–90.75 with a median of 89.75. There are 3 levels of NCQA PCMH recognition that reflect the degree to which a practice meets the requirements of the elements and factors that compose the standards. For each element's requirements, NCQA provides examples and requires specific documentation (http://www.ncqa.org/portals/0/programs/recognition/PCMH_2011_Scoring_Summary.pdf).

CG-CAHPS visit survey

The CG-CAHPS visit survey was designed to assess patient experiences with ambulatory care. CAHPS surveys focus on aspects of quality of care that patients have identified as important and for which patients are the best or sole source of information (http://www.ahrq.gov/cahps/index.html). This study examined the 6 main CG-CAHPS visit scores: (1) overall rating of the provider using a 0 (''worst provider possible'') to 10 (''best provider possible'') response scale; (2) recommend the provider to family and friends (*Yes, definitely; Yes, somewhat; No*); (3) whether a provider's office followed up with test results when they were ordered during a visit (*Yes; No*); (4) a 6-item communication scale (*Yes, definitely; Yes, somewhat; No*); (5) a 5-item access to care scale (*Never; Sometimes; Usually; Always)*; and (6) a 2-item office staff scale (*Yes, definitely; Yes, somewhat; No*). Following standard approaches (eg, Paddison et al,[19] Hays et al[20]), responses to each CAHPS item were transformed linearly to a possible range of 0–100, with a higher score representing a more positive experience; items in multi-item composites were averaged together.

The study team analyzed the CG-CAHPS survey data collected monthly, capturing visit dates from August 2012 to March 2014 for the 2 pilot sites that received NCQA recognition in June of 2011, and from July 2013 to March 2014 for the remaining 12 sites that received NCQA recognition in July 2012. The data included 3225 visits by 2903 adult patients across the 14 sites. Patients were eligible if they had at least 1 visit with their primary care or specialist physician (named in the survey) in the month prior to the date the survey was fielded. The vendor used the patient visit data submitted weekly from the professional billing system to randomly sample patients ages 18 years and older for every primary care or specialty physician, aiming for at least 30 completes per doctor per year. This stratified random sampling approach allows for characterizing the data as the average of a provider panel, not the average of all patients who walk through the doors of the site. The sampling procedure allowed for 1 adult and/or 1 child per household to be sampled, and no repeat surveys within a household for a 6-month period. Any patient who had seen more than 1 physician during the last month was assigned to the physician with whom they had visited most during the prior 3 months, with ties being broken in favor of physicians with lower patient volume to maximize the number of providers with adequate sample sizes.

All surveys were administered in English or Spanish by e-mail (if available) or mail with no follow-up, which deviates from standard CAHPS survey recommendations of using a mixed mode of mail with telephone follow-up.[21,22] Ten percent of the eligible patients completed a survey.

MHI

The level of ''medical homeness'' of each practice was assessed during the week of August 5, 2014 by a clinical site-level expert in PCMH transformation (author MH), as recommended by the MHI instructions. The CAHPS scores for providers were not revealed to the assessor. In this study, the MHI assessment is assumed to be a retrospective measure of the NCQA recognition that occurred between June 2011 and July 2012 across the sites.

The MHI[23] is a self-rating tool for quality improvement to be used by a practice undergoing PCMH transformation. It consists of 25 items or themes (Table 1) divided into 6 domains of practice activity that are critical to the quality of care in a medical home: organizational capacity (7 themes), chronic condition management (6 themes), care coordination (6 themes), community outreach (2 themes), data management (2 themes), and quality improvement (2 themes). Achievement can be partial or

Table 1. Different Domains and Themes in the Medical Home Index

Domain	*Themes*	*Scores obtained from sites*[a]
Organizational capacity	Mission of the practice	7
	Communication access	4
	Access to medical records	5
	Office environment	3
	Family feedback	6
	Cultural competence	7
	Staff education	5
Chronic condition management	Identify population with chronic conditions	5
	Care continuity	4
	Continuity across settings	4, 7
	Cooperative management with specialists	7
	Supporting transition to adult services	7
	Family support	5, 7
Care coordination	Role definition	5
	Family involvement	5
	Child and family education	5
	Assessment of needs/plans of care	5
	Resource information and referrals	6
	Advocacy	5
Community outreach	Community assessment of needs	8
	Community outreach to agencies and schools	8
Data management	Electronic data support	7
	Data retrieval capacity	8
Quality improvement	Quality standards (structure)	8
	Quality activities (processes)	7

Levels of how practice currently provides care across all 6 domains
1. Basic, no knowledge of the concept
2. Reactive, some knowledge
3. Proactive, knowledge/concept sometimes applied in practice
4. Comprehensive, knowledge/concept regularly applied in practice

Scores are defined as followed. 1 = Level 1, partial; 2 = Level 1, complete; 3 = Level 2, partial; 4 = Level 2, complete; 5 = Level 3, partial; 6 = Level 3, complete; 7 = Level 4, partial; 8 = Level 4, complete.

[a]All sites received the same scores for all the Medical Home Index items except for 2 items in chronic condition management, for which 2 different scores were observed across sites.

complete within each level. For each MHI domain, a series of 2 to 7 items were assessed, representing a progression of care and expressed as level 1 through 4 (Table 1).

The different MHI theme scores are reported in Table 1. With the myriad of changes the practices underwent in 2011 and 2012 to become NCQA PCMH Level 3 recognized and the resulting standardization in the delivery of care, the practices had very similar MHI scores across many of the MHI domains, with the most variation across sites remaining in the CCM domain. For the chronic condition management theme of ''continuity across settings,'' 7 of the sites were assessed at level 2 (ie, ''making requests and/or responds to requests from agencies or employers on behalf of patients with chronic health conditions and all communications are documented'') while the 7 other sites were assessed at level 4, indicating comprehensive continuity across settings. For the ''patient and family support'' theme within the CCM domain, all the sites that received level 2 on the ''continuity across settings'' theme received level 3 (ie, proactive where overall impact is taken into account, and staff helps patients set up supportive connections), and the 7 other sites were assessed at level 4. One group of 7 sites had reactive practices of continuity across settings and proactive practices of patient and family support; this group was labeled low CCM and had lower overall MHI scores of 146. The other group of 7 sites, labeled high CCM, was rated with comprehensive practices on both themes and had higher overall MHI scores of 151. All the other CCM themes were scored the same across all sites. These 2 groups are compared for the assessment of the impact of CCM within a medical home on patient experiences with care.

Covariates

Case-mix adjustment of patient reports and ratings of care is designed to control for systematic response biases and thereby yield fairer comparisons. This study included standard CAHPS case-mix adjustors of age, education, and self-rated general health status[24,25] as well as patient sex, race/ethnicity, and survey language (Spanish vs. English). The number of providers at a site (physicians, nurse practitioners, and physician assistants; part time or full time) also was used as a proxy for the size of the site.

Statistical analysis

The study team tested differences in patient characteristics between low and high CCM medical home sites using chi-square and *t* tests for categorical and continuous variables, respectively. To investigate the relationship between CCM within a medical home and the 6 patient experience measures, the team fit multivariate linear regression models of high CCM on the CAHPS scores. For the follow up with test results item, the team also fit a logistic regression (results are similar to those of the linear model and, thus, not reported). All the patient experience scores were modeled in 2 ways. The first set of models included all covariates except for the number of providers at the site. A second set of models added the number of providers to account for differences in CCM that might be attributable to the difference in practice size. All statistical analyses were performed using SAS version 9.4 (SAS Institute Inc., Cary, NC, USA).

Results

Patient and site characteristics

The sample of 3225 patient visits (more than 1 visit for some patients) was predominantly female and Hispanic; nearly 40% of the sample completed the CG-CAHPS survey in Spanish (Table 2). Only 37% were in excellent or very good self-reported health; 40% were younger than age 45; 33% did not complete high school and 15% had a 4-year college degree. These patient characteristics were similar for the low and high CCM sites (Table 2), with the exception that the high CCM site patients were slightly older, more likely to be Hispanic, and less likely to have a high school degree. In contrast, the high CCM sites averaged nearly twice as many physicians per site as the low CCM sites (Table 2).

Multivariate associations of CCM and patient experience

Multivariate analyses (Table 3) showed several significant associations between having high CCM within a medical home and case-mix adjusted patient experience, but the patterns were inconsistent (positive and negative associations) for the initial models, not controlling for practice size. Scores were significantly more positive for high-CCM sites on 2 measures (overall provider rating and provider communication) but significantly worse for 2 measures (access to care and experience with office staff). These observed differences are small to medium according to Paddison et al's[19] thresholds of 1 point for small, 3 points for medium, and 5 points for large differences. A 3-point increase in CAHPS scores was associated with a 30% reduction in disenrollment from Medicare health plans.[26]

Table 2. Characteristics of Patient Population by Low Versus High Chronic Care Management Medical Home Index Sites

Patient and provider characteristics	*Chronic care management Medical Home Index*			
	Overall (N = *3225*)	*Low* (N = *703*)	*High* (N = *2522*)	*Significance*
Age (%), years				
18–24	7	8	7	
25–34	17	20	16	**
35–44	16	16	16	
45–54	21	20	21	
55–64	29	27	29	
65 or older	11	10	11	
Education (%)				
8th grade or less	19	16	20	*
Some high school	14	13	15	
High school degree	23	24	22	
Some college	29	31	28	
Bachelor's degree (BA)	9	10	9	
Higher than BA	6	6	6	
Self-rated general health (%)				
Excellent	13	11	13	
Very good	24	25	24	
Good	34	36	33	
Fair	24	22	25	
Poor	6	6	6	
Male (%)	31	29	31	
Race/ethnicity (%)				
Hispanic	73	70	74	*
Non-Hispanic white	14	15	13	
Asian/Pacific Islander	6	7	6	
Other/unknown	7	8	6	*
Survey language: Spanish (%)	39	36	40	*
Number of providers, mean (SD)	8.03 (2.73)	4.72 (2.39)	8.95 (2.00)	***

*$P < 0.05$, **$P < 0.01$, ***$P < 0.001$ for test of whether means or percentages for patients in low or high index sites differ.

Table 3. Parameter Estimates for Associations Between Chronic Care Management Medical Home Index (High vs. Low) and Patient Experience Measured by Consumer Assessment of Healthcare Providers and Systems Items (0–100 Scale)

	Model without adjustment for number of providers	*Model with adjustment for number of providers*	
Patient experience domain	*MHI high vs. low, Est. (CI) Sign.*	*MHI high vs. low, Est. (CI) Sign.*	*Number of providers, Est. (CI) Sign.*
Overall provider rating ($N=3194$)	1.89 (0.46–3.32)**	5.82 (3.95–7.69)***	–0.92 (–1.2 to –0.64)***
Recommend the practice to others ($N=3188$)	0.63 (–1.48 to 2.74)	4.56 (1.79–7.33)**	–0.92 (–1.34 to –0.5)***
Provider communication ($N=3129$)	2.31 (0.82–3.8)**	6.85 (4.91–8.79)***	–1.07 (–1.36 to –0.77)***
Access to care ($N=3169$)	–2.79 (–5.27 to –0.3)*	–2.26 (–5.52 to 1)	–0.12 (–0.62 to 0.37)
Experience with office staff ($N=3207$)	–3.34 (–5.1 to –1.58)***	–0.25 (–2.56 to 2.05)	–0.72 (–1.08 to –0.37)
Follow up with test results (linear, $N=1382$)	4.18 (–2.08 to 10.45)	9.81 (1.59–18.03)*	–1.32 (–2.57 to –0.07)*

Linear models were used for the CAHPS measure scales with chronic care management coefficient unstandardized estimates reported. For the follow up with test result dichotomous item (Yes/No) a linear probability model is used (logistic regression estimates were similar). All the models controlled for patient age, sex, race/ethnicity, education, survey language, and health status. The model ''with adjustment for number of providers'' controlled for the number of providers (physicians, nurse practitioners, and physician assistants) while the other did not.

Significance: $*P<0.05$, $**P<0.01$, $***P<0.001$.

CAHPS, Consumer Assessment of Healthcare Providers and Systems; CI, confidence interval; MHI, Medical Home Index.

High CCM was confounded with large practice size, which has been found to be significantly associated with lower patient experience scores.[27,28] Thus, possible beneficial unique effects of high CCM might have been suppressed by site size. A second analysis controlled for the number of providers to compare patient experience scores in high and low CCM sites to what otherwise might have been expected, given their differences in size. Adjusting for number of providers and the case-mix variables in the original model revealed that patient experiences were significantly better in high CCM sites than in low CCM sites for 4 measures (overall rating, provider communication, recommend the practice to others, and follow up with test results). The differences were large (4.6 points or more). The 2 measures that showed a negative relationship before adjusting for the number of providers (access to care and experience with office staff) now showed no significant difference between high and low CCM sites. Number of providers was negatively associated with all the patient experience measures but it was not significantly associated with access to care.

Discussion

Patient experience measures provide information about care delivery that can inform PCMH transformation.[29–31] This study of 14 Level 3 medical home sites found that high CCM sites had consistently more positive patient experiences (provider communication, follow up on test results, recommend the practice to others, and overall rating of the primary care provider) after controlling for number of providers at each site. These results are consistent with studies that have reported aspects of PCMH CCM to be associated with better patient experiences with care.[32,33] Even the worse access to care and experience with office staff from high vs. low CCM observed in the model that did not control for practice size in this study was explained by number of providers. This confounding of practice size with CCM could have been affected by the sampling strategy of assigning patients to physicians with lower patient volume for analytic purposes when there was a tie in physicians most visited during the last month. The CCM domain also may capture practices related to coordination and continuity but not related to access. CCM focuses on management of chronic conditions (assuring continuity in care, and support of patients and their families), whereas *patient access to care* measures timeliness, ease of making an appointment, and getting feedback from providers. As such, CCM may not improve access per se.

The PCMH model was informed by the chronic care model,[13] developed to transform care for patients so that services are proactive and self-management driven, use information technology, and are attuned to high-need patients with chronic disease. The PCMH model's provision of additional services related to patient-centered care puts demands on provider time and focus[34] as it requires a workforce equipped with leadership, communication, quality improvement, and population-oriented skills and electronic data support.

The results of this study provide some evidence for the value of CCM within the PCMH model. Future research is needed to identify the core elements of the PCMH associated with improved outcomes and to identify barriers that need to be overcome for successful implementation.

This study's findings should be considered in light of several limitations. First, although patients were randomly selected to participate in the CG-CAHPS survey, their willingness to complete the survey is a self-selection process that can confound the relationship between survey scores and being at high CCM sites. Second, the FQHC had a low

survey response rate (10%) on their CAHPS visit-based survey using e-mail (when available) or mail survey mode without follow-up. This may have resulted in nonresponse bias, and information about nonrespondents was unavailable. Nevertheless, it is unlikely that any such nonresponse bias differentially affected high and low CCM sites and therefore biased the comparisons related to CCM. Also, CCM measured in August 2014 is a retrospective measure of the ''medical homeness'' recognition that occurred before July 2012, but the CAHPS scores measured experiences during visits that occurred between August 2012 and March 2014. As such, the study team cannot be certain of the direction of causality between CCM and CAHPS. Finally, because this study involved adults evaluating providers in FQHCs, the results may not be generalizable to all clinic settings, as differences have been reported between FQHCs and other primary care clinics.[35,36]

Practical implications

The results of this study provide support for the value of the PCMH for patient experience with care. Future research is needed to see if similar results are found in other samples comparing variation in patient-centered ''medical homeness'' of different practice sites.

Author Disclosure Statement

Drs. Setodji, Quigley, Elliott, Hochman, Chen, and Hays, and Mr. Burkhart declared no conflicts of interest with respect to the research, authorship, and/or publication of this article. This research was supported through a cooperative agreement from the Agency for Healthcare Research and Quality (AHRQ; U18 HS016980). The content is solely the responsibility of the authors and does not necessarily represent the official views of AHRQ.

References

1. Sia C, Tonniges TF, Osterhus E, Taba S. History of the medical home concept. Pediatrics 2004;113(5 Suppl):1473–1478.
2. Bitton A, Martin C, Landon BE. A nationwide survey of patient centered medical home demonstration projects. J Gen Intern Med 2010;25:584–592.
3. American Academy of Family Physicians (AAFP), American Academy of Pediatrics (AAP), American College of Physicians (ACP), American Osteopathic Association (AOA). Joint principles of the patient-centered medical home. 2007. www.aafp.org/dam/AAFP/documents/practice_management/pcmh/initiatives/PCMHJoint.pdf Accessed January 5, 2017.
4. Hoff T, Weller W, DePuccio M. The patient-centered medical home: a review of recent research. Med Care Res Rev 2012;69:619–644.
5. Peikes D, Zutshi A, Genevro J, Smith K, Parchman M, Meyers D. Early Evidence on the Patient-Centered Medical Home. Final Report. AHRQ Publication No. 12-0020-EF. Rockville, MD: Agency for Healthcare Research and Quality (AHRQ), 2012.
6. van Hasselt M, McCall N, Keyes V, Wensky SG, Smith KW. Total cost of care lower among Medicare fee-for-service beneficiaries receiving care from patient-centered medical homes. Health Serv Res 2015;50:253–272.
7. Maeng DD, Graf TR, Davis DE, Tomcavage J, Bloom FJ, Jr. Can a patient-centered medical home lead to better patient outcomes? The quality implications of Geisinger's ProvenHealth Navigator. Am J Med Qual 2012;27:210–216.
8. Friedberg MW, Schneider EC, Rosenthal MB, Volpp KG, Werner RM. Association between participation in a multipayer medical home intervention and changes in quality, utilization, and costs of care. JAMA 2014;311:815–825.
9. Jackson GL, Powers BJ, Chatterjee R, et al. Improving patient care. The patient centered medical home. A systematic review. Ann Intern Med 2013;158:169–178.
10. Cohen J. Statistical power analysis for the behavioral sciences, 2nd ed. Hillsdale, NJ: Lawrence Earlbaum Associates, 1988:25.
11. Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. Health Aff (Millwood) 2008;27:759–769.
12. Cook N, Hollar L, Isaac E, Paul L, Amofah A, Shi L. Patient experience in health center medical homes. J Community Health 2015;40:1155–1164.
13. Gabbay RA, Bailit MH, Mauger DT, Wagner EH, Siminerio L. Multipayer patient-centered medical home implementation guided by the chronic care model. Jt Comm J Qual Patient Saf 2011;37:265–273.
14. Coleman K, Austin BT, Brach C, Wagner EH. Evidence on the chronic care model in the new millennium. Health Aff (Millwood) 2009;28:75–85.
15. Dyer N, Sorra JS, Smith SA, Cleary PD, Hays RD. Psychometric properties of the Consumer Assessment of Healthcare Providers and Systems (CAHPS®) Clinician and Group adult visit survey. Med Care 2012;50 Suppl:S28–S34.
16. Barr MS. The need to test the patient-centered medical home. JAMA 2008;300:834–835.
17. National Committee for Quality Assurance (NCQA). Patient-centered medical home recognition. 2015. www.ncqa.org/Programs/Recognition/Practices/PatientCenteredMedicalHomePCMH.aspx Accessed January 5, 2017.
18. Quigley D, Mendel P, Predmore Z, Chen A, Hayes R. Use of CAHPS® patient experience survey data as part of a patient-centered medical home quality improvement initiative. J Healthc Leadersh 2015;7:41–54.
19. Paddison CA, Elliott MN, Haviland AM, et al. Experiences of care among Medicare beneficiaries with ESRD: Medicare Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey results. Am J Kidney Dis 2013;61:440–449.
20. Hays RD, Berman LJ, Kanter MH, et al. Evaluating the psychometric properties of the CAHPS patient-centered medical home survey. Clin Ther 2014;36:689–696.e1.
21. Agency for Healthcare Research and Quality (AHRQ). Fielding the CAHPS® Clinician & Group surveys. 2011. www.cahpsdatabase.ahrq.gov/files/CGGuidance/Fielding%20the%20CAHPS%20C&G%20Surveys.pdf Accessed February 21, 2017.
22. Finkelstein A, Taubman S, Allen H, et al. The short-run impact of extending public health insurance to low income adults: evidence from the first year of The Oregon Medicaid Experiment. 2010. www.nber.org/oregon/documents/analysis-plan/analysis-plan-one-year-2010-12-01.pdf. Accessed January 5, 2017.
23. Cooley WC, McAllister JW, Sherrieb K, Clark RE. The Medical Home Index: development and validation of a new practice-level measure of implementation of the medical home model. Ambul Pediatr 2003;3:173–180.
24. Elliott MN, Swartz R, Adams J, Spritzer KL, Hays RD. Case-mix adjustment of the National CAHPS benchmark-

ing data 1.0: a violation of model assumptions? Health Serv Res 2001;36:555–573.
25. Elliott MN, Zaslavsky AM, Goldstein E, et al. Effects of survey mode, patient mix, and nonresponse on CAHPS hospital survey scores. Health Serv Res 2009;44(Pt 1):501–518.
26. Lied TR, Sheingold SH, Landon BE, Shaul JA, Cleary PD. Beneficiary reported experience and voluntary disenrollment in Medicare managed care. Health Care Financ Rev 2003;25:55–66.
27. Elliott MN, Lehrman WG, Goldstein E, Hambarsoomian K, Beckett MK, Giordano LA. Do hospitals rank differently on HCAHPS for different patient subgroups? Med Care Res Rev 2010;67:56–73.
28. Jha AK, Orav EJ, Epstein AM. Public reporting of discharge planning and rates of readmissions. N Engl J Med 2009;361:2637–2645.
29. Browne K, Roseman D, Shaller D, Edgman-Levitan S. Analysis & commentary. Measuring patient experience as a strategy for improving primary care. Health Aff (Millwood) 2010;29:921–925.
30. Manary MP, Boulding W, Staelin R, Glickman SW. The patient experience and health outcomes. N Engl J Med 2013;368:201–203.
31. Stange KC, Nutting PA, Miller WL, et al. Defining and measuring the patient-centered medical home. J Gen Intern Med 2010;25:601–612.
32. Menec VH, Sirski M, Attawar D. Does continuity of care matter in a universally insured population? Health Serv Res 2005;40:389–400.
33. Saultz JW, Lochner J. Interpersonal continuity of care and care outcomes: a critical review. Ann Fam Med 2005;3:159–166.
34. Goldberg DG, Mick SS, Kuzel AJ, Feng LB, Love LE. Why do some primary care practices engage in practice improvement efforts whereas others do not? Health Serv Res 2013;48(Pt 1):398–416.
35. Goldman LE, Chu PW, Tran H, Romano MJ, Stafford RS. Federally qualified health centers and private practice performance on ambulatory care measures. Am J Prev Med 2012;43:142–149.
36. Starfield B, Powe NR, Weiner JR, et al. Costs vs quality in different types of primary care settings. JAMA 1994;272:1903–1908.

Address correspondence to:
Claude M. Setodji, PhD
RAND Center for Causal Inference
RAND Corporation
4570 5th Avenue, Suite 600
Pittsburgh, PA 15213

E-mail: setodji@rand.org