ORIGINAL RESEARCH

Does Ownership Make a Difference in Primary Care Practice?

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Purpose: **We assessed differences in structural characteristics, quality improvement processes, and cardiovascular preventive care by ownership type among 989 small to medium primary care practices.**

Methods: **This cross-sectional analysis used electronic health record and survey data collected between September 2015 and April 2017 as part of an evaluation of the EvidenceNOW: Advancing Heart Health in Primary Care Initiative by the Agency for Health Care Research and Quality. We compared physician-owned practices, health system or medical group practices, and Federally Qualified Health Centers (FQHC) by using 15 survey-based practice characteristic measures, 9 survey-based quality improvement process measures, and 4 electronic health record-based cardiovascular disease prevention quality measures, namely, aspirin prescription, blood pressure control, cholesterol management, and smoking cessation support (ABCS).**

Results: **Physician-owned practices were more likely to be solo (45.0% compared with 8.1%, $P < .001$ for health system practices and 12.8%, $P = .009$ for FQHCs) and less likely to have experienced a major change (eg, moved to a new location) in the last year (43.1% vs 65.4%, $P = .01$ and 72.1%, $P = .001$, respectively). FQHCs reported the highest use of quality improvement processes, followed by health system practices. ABCS performance was similar across ownership type, with the exception of smoking cessation support (51.0% for physician-owned practices vs 67.3%, $P = .004$ for health system practices and 69.3%, $P = .004$ for FQHCs).**

Conclusions: **Primary care practice ownership was associated with differences in quality improvement process measures, with FQHCs reporting the highest use of such quality-improvement strategies. ABCS were mostly unrelated to ownership, suggesting a complex path between quality improvement strategies and outcomes. (J Am Board Fam Med 2019;32:398–407.)**

Keywords: **Cardiovascular Diseases, Cross Sectional Analysis, Delivery of Health Care, Group Practice, Ownership, Primary Health Care, Process Measures, Quality Improvement**

The organizational structure of primary care practices is rapidly changing in the United States. Primary care can be categorized into 3 major ownership types: independent physician-owned practices, practices employed by hospitals (health system or medical group practices), and Federally Qualified Health Centers (FQHCs; ie, practices that provide comprehensive primary care to low-income people in underserved communities and that are governed by community boards). Among these, the propor-

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tion of US physicians employed by hospitals increased from 20% in 2002 to over 50% in 2008.[1] Simultaneously, the number of FQHCs has grown dramatically over the past 20 years in response to higher federal funding, and their role is likely to increase further in the future.[2–4] At the same time, independent physician-owned practices continue to provide care for millions of Americans.[5]

Despite these changes, we know little about how physician-owned practices, FQHCs, and health system or medical group practices differ in their structural characteristics; approach to quality improvement (QI), including both change management and quality-aligned care delivery processes; and patient outcomes. Health systems and medical groups (ie, practices owned by a hospital and practices owned by nonhospital organizations, respectively) have tended to perform well on process and care quality measures but not across all measures and studies.[6–15] These studies typically focus on a few measures, 1 or 2 ownership types, and larger practices. Studies on FQHCs have generally been favorable in terms of access, prevention, and quality of care [2,16–18], but they too typically focus on a few measures and lack explicit comparisons by practice ownership type.

In 2015, the Agency for Health Care Research and Quality (AHRQ) launched EvidenceNOW: Advancing Heart Health in Primary Care. This multiyear, multisite demonstration project tests the effectiveness of external support strategies (eg, practice facilitation) in helping small- to medium-sized primary care practices improve the delivery of preventive care for cardiovascular disease. AHRQ funded 7 regional cooperatives in 12 states that were responsible for recruiting practices and testing various forms of external support.[19–21] It also funded an independent national evaluation of the overall initiative called Evaluating System Change to Advance Learning and Take Evidence to Scale.[22] EvidenceNOW Cooperatives recruited 1719 small- to medium-sized primary care practices, defined by AHRQ as practices that provide "integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs".[23] Recruited practices typically had fewer than 10 clinicians, including physicians, physician assistants, or nurse practitioners.[22]

In this study, we comprehensively compared health system and medical group practices, FQHCs, and physician-owned practices along a rich set of practice characteristics, QI processes, and cardiovascular disease prevention quality outcomes by using a large sample of 923 small- to medium-sized primary care practices that participated in EvidenceNOW. Our goal was to identify differences in these 3 most prevalent primary care ownership types in the United States that might help practice leaders, researchers, and policy makers better understand these practice types to tailor their efforts to improve care where needed.

Methods

Data Collection

This analysis included data collected at baseline (before start of interventions) at each practice. The cooperatives, in collaboration with the initiative Evaluating System Change to Advance Learning and Take Evidence to Scale, developed 2 surveys: a practice survey and a practice member survey. The practice survey assessed practice and patient characteristics (eg, practice size and percent of patients receiving Medicare) and QI processes, including the QI strategy components of the Change Process Capability questionnaire (CPCQ).[24] In each practice, 1 leader knowledgeable about its structure and approach to QI and care was invited to complete the practice survey. Questions were derived from the National Ambulatory Medical Care Survey (Electronic Medical Records Questionnaire)[25] and prior primary care research studies.[26–31] Members of each practice completed the practice member survey.

All members of a practice, which included clinicians, clinical staff (eg, nurses), and administrative staff, were invited to complete the practice member survey. The survey, described elsewhere,[32] collected information about member characteristics (eg, role and years worked in the practice) and the respondent's perception of how the practice functions. We used 1 measure, a validated single-item burnout question[33–35] from this survey. The response rate for this measure was 73%.[32] Coopera-

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tives were responsible for collecting both practice surveys and practice member surveys from their practices and tailored their collection approach (eg, online or in person) to their local resources and region. Because they recruited practices on a rolling basis, cooperatives collected surveys over a 19-month period between September 2015 and April 2017.

Cardiovascular preventive care focused on 4 measures obtained from a practice's electronic health record (EHR) system: aspirin prescription when appropriate, blood pressure control, cholesterol management, and smoking cessation support (the "ABCS"). Participating practices were required to report ABCS data at the practice level quarterly throughout the study period (October 2015 to March 2018). Our baseline ABCS data were collected between October 2015 and March 2017. Before data collection, a collaborative-wide harmonization process specified details of ABCS measurement to ensure consistency across cooperatives.

Study Population

We selected all practices that (1) submitted both a practice survey and at least 1 practice member survey (N = 1495, an 87.0% response rate); (2) reported being physician-owned, part of a health system or medical group, or having FQHC status (N = 1236); and that (3) had submitted their first ABCS data before intervention start, for a sample size of 989 practices (57.5% of 1719 recruited practices). Ownership types not included in this study were academic health center or faculty practices, federal practices (eg, practices belonging to the Veterans Administration), rural health clinics, and Indian health services. We excluded these practices due to the small number of practices with such ownership types in our sample.

Ownership Types

We defined the 3 ownership types based on a question from the practice survey about the practice's ownership that was adopted from the American Board of Family Medicine's Demographic Survey Questionnaire[5,36]:

- Health system or medical group practices reported being owned by a hospital, health system, or health maintenance organization;
- FQHC practices reported being FQHCs or look-alikes;
- Physician-owned practices reported being physician-owned practices.

Our analysis focused on differences between these ownership groups. We note that these groupings are just 1 attribute of the practice setting, and within each of these groups, practices differed in terms of structure, resources, function, and patient populations. Most practices named just 1 ownership type but a small number of them (N = 8) reported several. We created mutually exclusive groups that reflected the distinct governance structure of these ownership types. Specifically, we considered all practices owned by a hospital, health system, or health maintenance organization to be health system or medical group practices irrespective of other ownership responses because they were all governed by an outside organization. Of the remaining practices, those with reported FQHC status were considered FQHC practices whether or not they also indicated being physician-owned because they were all governed by a community-based board of directors.

Measures

We organized survey variables into practice characteristics, QI process measures, and cardiovascular disease prevention clinical outcome measures. Appendix A provides details for all measures included in the study. Although 989 practices met the study criteria, not all measures had complete information; thus, we reported the number of practices with missing responses by ownership type and each of the individual measures in Appendix A.

Practice Characteristics

We used 15 practice characteristics categorized as practice demographics, practice patient demographics, and external and internal factors. Practice demographics included whether the practice reported being a solo practice (total practice size was not available because practice size was collected as a categorical variable; see Appendix A), residing in an urban location, being a multispecialty practice, having been under the current ownership for less than 5 years, having experienced at least 1 major change in the last year (eg, new billing system, moved location, and staff turnover), and having less than 5 years of EHR experience. Practice patient

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demographics included the reported percent of patients in a practice receiving Medicaid (which includes Medicaid recipients also eligible for Medicare), the percent of patients receiving Medicare (excluding those also receiving Medicaid), the percent of patients classified as nonwhite and the percent of patients classified as Hispanic or Latino. External and internal factors included whether a practice reported having patient-centered medical home recognition, participating in demonstration programs, such as state innovation model initiatives, being part of an Accountable Care Organization, and having an EHR with stage 1 and 2 meaningful use certification. In addition, the percent of practice members who reported being burned out (defined as the percent of these members reporting a score of 3 or higher on the single-item burnout question from the practice member survey, range 1 to 5) was an internal factor.

QI Process Measures

Nine QI process measures from the practice survey captured 3 key elements of QI in primary care practices[37]: quality-aligned care delivery processes, priority, and change management processes. Seven measures covering aspects of quality-aligned care delivery processes included whether the practice reported: (1) that its members routinely discussed clinical quality data, (2) having someone configuring or writing quality reports, (3) producing ABCS clinical quality measures reports in the past 6 months, (4) using at least 1 registry, (5) using empanelment, (6) having implemented cardiovascular disease (CVD) prevention guidelines through standing orders or prompts and reminders, and (7) having implemented CVD management guidelines through standing orders or prompts and reminders. In addition, 1 measure assessed priority (the extent to which a practice's leadership prioritized improving CVD prevention) and 1 measure assessed a practice's ability to manage change (the CPCQ score).

The CPCQ score was based on 14 items assessing practices' use of specific change strategies to improve care (eg, the extent to which a practice delegated tasks from physicians to nonphysicians or empowered those charged with implementing change). It was developed in an iterative modified Delphi process[38] and has been previously validated.[24,39] Following a previous study, we calculated the composite CPCQ strategies score as the sum of responses to these 14 items ranging from −2 (strongly disagree) to 2 (strongly agree), resulting in a summary score ranging from −28 to + 28.[40] The CPCQ score of practices with 1 or more missing response items was set to missing.

Cardiovascular Disease Prevention Clinical Quality Measures

CVD quality measures included the ABCS—aspirin prescription when appropriate (based on the Center for Medicaid and Medicare's clinical quality measure definition CMS164v4), blood pressure control (CMS165v4), cholesterol management (CMS347v1), and smoking cessation support (CMS138v4). For each of the ABCS measures, practices used EHRs to collect and report the percent of patients receiving treatment among those eligible for treatment.

Study Design and Statistical Analysis

This investigation was a cross-sectional study examining differences in practice characteristics, QI processes, and cardiovascular disease prevention quality measures by ownership type. We calculated mean or proportions as well as standard errors of these measures to characterize EvidenceNOW practices overall and by ownership groups. We used pairwise *t* tests to assess statistical significance of differences between health system or medical group and physician-owned practices and between FQHC and physician-owned practices, respectively. Visual inspection of the distribution of study measures and the large sample size showed the *t* test to be an appropriate test in this setting. Standard errors were clustered at the cooperative level to account for correlated responses of practices within each of the cooperatives. We used block bootstrap with 1000 iterations because of the small number of clusters.[41,42] The Institutional Review Board at Oregon Health & Science University reviewed, approved, and monitored this study, and it is registered as an observational study at clinicaltrials.gov (NCT02560428). We used R version 3.3.1 for our statistical analyses and statistical significance was set at a type I error of 5%.

Results

More than half of practices in the sample were physician-owned, about one-quarter were owned by health systems or medical groups, and one-fifth reported having FQHC status (Table 1). Physician-owned practices were more likely than the other 2

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Table 1. Practice and Patient Characteristics by Ownership Type*

Measure	Observations†	Physician-Owned Practices	Health System/Medical Group Practices			FQHC Practices		
		Value	Value	Difference (95% CI)	*P* Value	Value	Difference (95% CI)	*P* Value
Practice demographics								
Ownership (Values showing %)	989	53.2	25.6			21.2		
Solo practice (Values showing %)	966	45.0	8.1	36.9 (−54.4 to −16.1)	<.001	12.8	−32.2 (−56.4 to −9.1)	.009
Urban practice location (Values showing %)	989	74.9	57.3	17.6 (−48.9 to 1.0)	.16	46.7	−28.2 (−43.3 to −9.0)	.002
Multispecialty practice (Values showing %)	957	17.6	32.4	14.6 (10.2 to 21.1)	<.001	56.3	38.7 (28.3 to 53.0)	<.001
Less than 5 years under current ownership (Values showing %)	884	12.4	41.0	28.6 (21.1 to 37.1)	<.001	16.9	4.5 (−4.9 to 17.3)	.45
At least one major change in last year (Values showing %)	949	43.1	65.4	22.3 (6.0 to 39.4)	.01	72.1	29.0 (13.3 to 47.6)	.001
Less than 5 years of EHR experience (Values showing %)	869	33.3	46.3	13.0 (−4.1 to 36.7)	.23	25.4	7.9 (−24.2 to 19.1)	.47
Practice patient demographics								
Patients receiving Medicaid (Values showing %)	884	28.2	20.2	8.0 (−15.9 to 1.6)	.08	40.4	12.2 (0.8 to 22.9)	.03
Patients receiving Medicare (Values showing %)	885	23.0	28.7	5.7 (1.4 to 11.2)	.02	15.3	7.7 (−12.9 to −4.0)	<.001
Non-white patients (Values showing %)	851	45.2	42.4	2.8 (−26.5 to 13.0)	.77	35.0	10.2 (−24.1 to 7.0)	.2
Hispanic/Latino patients (Values showing %)	825	14.3	9.3	5.0 (−13.1 to 22.)	.24	31.8	17.5 (1.2 to 30.3)	.04
Other external and internal factors								
Have PCMH recognition (Values showing %)	926	39.3	42.2	2.9 (−17.0 to 16.7)	.73	66.5	27.2 (4.0 to 46.0)	.01
Participate in other demonstration programs (Values showing %)	908	33.6	23.3	10.3 (−29.3 to 4.4)	.22	35.2	1.6 (−14.3 to 23.2)	.87
Part of an ACO (Values showing %)	937	41.7	56.6	14.9 (−13.1 to 32.6)	.21	37.2	−4.5 (−25.6 to 14.8)	.66
Have stage 1 and 2 certified EHR MU (Values showing %)	874	72.9	66.8	6.1 (−22.4 to 9.5)	.48	62.3	−4.5 (−25.6 to 14.8)	.66
Burnout‡ (Values showing %)	930	14.7	19.6	4.9 (−0.1 to 11.9)	.11	19.4	4.7 (−4.2 to 10.1)	.19
No. of practices (Values showing numbers)	989	526	253			210		

*Based on practice surveys and practice member surveys of practices participating in EvidenceNOW, collected between October 2015 and April 2017.

†The column "Observations" shows the number of practices with an observed value for the respective measure. Urban practice location is defined as percent of practices in urban locations based on Rural-Urban Commuting Areas using 2010 Census data. A major change includes the following: have moved to a new location, lost one or more clinicians, lost one or more office managers or head nurses, been purchased by or affiliated with a larger organization, new billing system, or another change specified by the practice. Demonstration programs include State Innovation Models Initiative, Comprehensive Primary Care Initiative, Transforming Clinical Practice Initiative—Support and Alignment Network, Community Health Worker training program, Blue Cross/Blue Shield patient-centered medical home program, Association of State and Territorial Health Officials's Million Hearts State Learning Collaborative; Million Hearts: Cardiovascular Disease Risk Reduction Model, or another program identified by the practice.

‡The percent burned out denotes the percent of practice members who responded affirmative to one of the following items: level 3, I am definitely burning out and have one or more symptoms of burnout, such as physical and emotional exhaustion; level 4, the symptoms of burnout that I'm experiencing won't go away; I think about frustrations at work a lot; level 5, I feel completely burned out and often wonder if I can go on practicing; I am at the point where I may need some changes.

CI, confidential interval; FQHC, Federally Qualified Health Center; EHR, electronic health records; PCMH, patient-centered medical home; MU, meaningful use; ACO, Accountable Care Organization.

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ownership types to report being solo, single-specialty practices located in urban areas. They were also less likely to report having experienced at least 1 major change in the last year. By contrast, health system and medical group practices and FQHCs reported moderately high levels of experiencing a major change in the last year. Health system or medical group practices also had the highest share of Medicare patients. FQHC practices had the lowest share of these patients, the highest share of Medicaid and Hispanic or Latino patients, and by far the highest rate of patient-centered medical home recognition. Burnout was moderately high across all 3 ownership types.

Physician-owned practices less often reported the use of quality-aligned care delivery processes, such as use of registries and CVD care guidelines (Table 2). In contrast, FQHCs stood out in the degree to which they reported using these quality-aligned care delivery processes. Almost all of them reported having someone configure or write quality reports and having produced clinical quality measures reports in the past 6 months. They were also much more likely than the other 2 ownership types to report using at least 1 registry, empanelment, and CVD prevention and management guidelines in EHR prompts or standing orders. Health system practices were intermediate in relation to the use of these of quality-aligned care delivery processes. Differences in the CVD priority measure and CPCQ strategies score were not statistically significant across ownership types.

Regarding CVD quality measures, levels of aspirin prescription when appropriate, blood pressure control, and cholesterol management were similar across ownership types (see Table 3). Health system or medical group practices and FQHCs had higher rates of smoking cessation counseling than physician-owned practices (51.0% for physician-owned practices, 67.3%, $P = .004$ for health system practices and 69.3%, $P = .004$ for FQHCs).

Discussion

This large and diverse sample of small- and medium-sized primary care practices provides an important foundation for understanding differences and similarities across the 3 most prevalent primary care ownership models in the United States, that is, physician-owned, health system, and FQHC practices. Ownership groups differed with respect to practice structure and quality-aligned care delivery processes; whereas, the quality of care, as measured by the ABCS, were similar. The only exception in performance was lower rates of smoking cessation counseling among physician-owned practices than FQHC or health system practices, and this result may partly reflect differences in how well smoking counseling is documented across these ownership types. These findings suggest that ownership may be an important factor in understanding how practices engage in QI processes. In what follows, we discuss some possible hypotheses regarding how ownership might have shaped QI processes in our sample of practices.

FQHCs reported the highest use of quality-aligned care delivery processes among all 3 ownership types, which included producing quality reports, using registries, and having EHR prompts or standing orders for CVD prevention and management in place. This finding might reflect practice transformation efforts and reporting requirements by the Health Resources & Services Administration (HSRA). Other factors that may encourage these level of quality-aligned care delivery processes could include their socioeconomically disadvantaged patient population, participation in learning collaboratives, oversight by a community board, and payment-dependent business model, which includes the need for grant funding and their oversight requirements.

Health system or medical group practices were intermediate in terms of having quality-aligned care delivery processes in place. They did not report a higher change management capacity score than physician-owned practices, suggesting that their management may have provided some QI infrastructure (such as technical personnel to write quality reports) but was less focused on the actual change process in the practice. They were also characterized by a comparatively larger practice size as well as higher level of disruption, which may make it difficult for these practices to implement and sustain quality-aligned care delivery processes. Unlike a recent study conducted by 1 of the cooperatives, we did not find lower levels of burnout among health system practices,[43] which is likely explained by heterogeneity in the work environment among health system practices across regions, possibly related to how long they have been in the system.

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Table 2. Quality Improvement Process Measures by Ownership Type*

Measure	Observations†	Physician-Owned Practices	Health System/Medical Group Practices			FQHC Practices		
		Value	Value	Difference (95% CI)	*P* Value	Value	Difference (95% CI)	*P* Value
Quality-aligned care delivery processes								
Discuss clinical quality data (Values showing %)	989	27.9	44.3	16.4 (4.2 to 24.6)	.001	56.7	28.8 (16.0 to 41.6)	<.001
Have someone configuring/writing quality reports (Values showing %)	868	64.2	79.1	14.9 (2.7 to 25.4)	.01	91.5	27.3 (14.2 to 38.9)	<.001
Produced CQM reports in last six months‡ (Values showing %)	832	69.4	77.8	8.4 (−15.9 to 22.4)	.43	94.3	24.9 (9.3 to 40.0)	.002
Use at least one registry§ (Values showing %)	940	61.1	67.5	6.4 (−16.5 to 25.1)	.59	83.1	22.0 (14.2 to 32.9)	<.001
Use of empanelment (Values showing %)	929	73.1	88.0	14.9 (6.2 to 20.8)	<.001	81.8	8.7 (1.6 to 18.9)	.04
CVD prevention guidelines included in EHR prompts or standing orders (Values showing %)	946	60.2	65.3	5.1 (−14.3 to 21.9)	.61	76.6	16.4 (7.7 to 28.0)	.002
CVD management guidelines included in EHR prompts or standing orders (Values showing %)	946	57.0	61.5	4.5 (−15.4 to 21.5)	.66	70.7	13.7 (3.3 to 27.3)	.03
Score for CVD improvement being a priority is 8 to 10 out of 10 (Values showing %)	929	65.2	56.7	8.5 (−20.2 to 3.8)	.16	60.2	5.0 (−22.9 to 12.0)	.57
Change management processes								
CPCQ strategies score‖ (Values showing mean)	785	10.2	8.6	1.6 (−8.5 to 2.8)	>.99	8.9	1.3 (−4.1 to 1.4)	>.99
Number of practices (Values showing numbers)	989	526		253			210	

*Based on practice surveys and practice members surveys of practices participating in EvidenceNOW, collected between October 2015 and April 2017).
†The column "Observations" shows the number of practices with an observed value for the respective measure.
‡CQM reports refers to the following clinical quality measures: percentage of patients aged 18 years and older with ischemic vascular disease with documented use of aspirin or other antithrombotic (NQF 0068), percentage of patients aged 18 through 85 years of age who had a diagnosis of hypertension and whose blood pressure was adequately controlled (<140/90) during the measurement year (NQF 0018), and percentage of patients aged 18 years or older who were screened about tobacco use one or more times within 24 months and who received cessation counseling intervention if identified as a tobacco user (NQF 0028).
§Use of registry refers to the following patients: ischemic vascular disease, hypertension, high cholesterol, diabetes, prevention services, and high risk (high use) patients.
‖The CPCQ score is based on fourteen measures of strategies to improve cardiovascular preventive care; see text and Appendix A for details.
FQHC, federally qualified health center; CI, confidential interval; CQM, clinical quality measures; CVD, cardiovascular disease; EHR, electronic health records; CPCQ, Change Process Capability questionnaire.

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Table 3. Cardiovascular Disease Prevention Clinical Quality Measures by Ownership Type*

Measure	Observations†	Physician-Owned Practices	Health System/Medical Group Practices			FQHC Practices		
		Value	Value	Difference (95% CI)	*P* value	Value	Difference (95% CI)	*P* value
Aspirin (Values showing %)	886	57.5	67.5	10.0 (0.2 to 21.5)	.08	59.1	1.6 (−8.2 to 10.5)	.73
Blood pressure (Values showing %)	892	64.0	60.6	3.4 (−7.3 to 2.0)	.15	64.3	0.3 (−6.4 to 9.2)	.94
Cholesterol (Values showing %)	679	58.2	58.2	0.1 (−8.7 to 14.3)	.99	55.2	3.0 (−7.9 to 4.7)	.38
Smoking (Values showing %)	869	51.0	67.3	16.3 (1.8 to 24.2)	.004	69.3	18.3 (1.1 to 26.7)	.004
Number of practices (Values showing numbers)	989	526	253			210		

*Based on practice surveys of practices participating in EvidenceNOW, collected between October 2015 and April 2017. See Appendix A for a definition of the four cardiovascular disease prevention clinical quality measures.
†The column "Observations" shows the number of practices with an observed value for the respective measure.
CI, confidential interval; FQHC, federally qualified health center.

Physician-owned practices had the lowest levels of quality-aligned care delivery processes in place but may have less need for them due to their small scale. In addition, physician-owned practices may be more likely to use tacit, informal QI processes than the formal and explicit quality-aligned care delivery processes in place at FQHCs and health system practices. Future research could further explore and clarify the relationship between practice size and adoption of quality-aligned processes among primary-care practices.

Despite these clear differences in quality-aligned care delivery processes, levels of ABCS were similar across ownership types, and several hypotheses could explain this finding. The socioeconomically disadvantaged patient population of FQHCs may have motivated them to adopt many quality-aligned care delivery processes but may also have made it difficult for them to achieve a higher quality of care, resulting in similar levels of ABCS compared with the other 2 ownership types. Health system practices may not have achieved higher levels of ABCS because their comparatively higher level of disruption and larger practice size undermined the effectiveness of their quality-aligned care delivery processes. Also, physician-owned practices may have had less need for such processes to achieve comparable levels of care because of their small size. In the end, different levels of quality-aligned care delivery processes may reflect differences in what is needed to achieve the community standard of quality in different practice ownership contexts that reflect different levels of clinician and practice autonomy.

Although this study sheds light on important similarities and differences among various types of small to medium practices, it also has some limitations. This was a cross-sectional study, which does not allow us to identify changes over time as practices changed their ownership. Likewise, we were unable to distinguish whether the higher level of disruption and burnout experienced by health system or medical group practices were ongoing or whether these were transient effects due to an ownership change that dissipated over time. Furthermore, we did not have ABCS for all practices that submitted the practice and practice member survey. However, results for practice structure quality-aligned care delivery processes were similar among the 1222 practices with submitted surveys. Our analysis focused on variation across and not also within these ownership groups and, therefore, does not capture how practices within each ownership type vary in terms of structure, resources, function, and patient populations. Finally, although the numbers of practices were unusually large, participation in EvidenceNOW was voluntary, and our results, therefore, may not necessarily be representative of practices in each region.

We hope that the results of this study and these hypotheses will help provide material for existing studies and proposals but that they will also spur a

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variety of future research projects. For example, researchers could use mixed or qualitative methods to better understand how practices' ownership and associated characteristics shape their care delivery processes and approach to transformation. Such research could, for instance, explore motivating factors behind FQHCs' high use of quality-aligned care delivery processes or describe the effect of disruptions for care delivery processes and care quality. Other future research could investigate differences in practice performance within an ownership category. Although our study highlights substantial differences across ownership types, differences of practices within the same ownership group are also likely to play an important role in the delivery of care.

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Appendix A: Description and Number of Missing Values for Variables Used in this Analysis

Measure	Description	Missing Values*
Practice characteristics		
Ownership	The survey question was "Which of the following best describes your practice's ownership? (Check all that apply)" The following categories were possible responses: clinician-owned solo or group practice; hospital/health system owned; Health Maintenance Organization (e.g., Kaiser Permanente); Federally Qualified Health Center or look-alike; non-federal-government clinic (e.g., state, county, city, public health clinic, etc.); academic health center/faculty practice; federal (military, Veterans Administration, Department of Defense); Rural Health Clinic; Indian Health Service; other (please specify).	0 (526)/0 (253)/0 (210)
Solo practice (%)	Percent of practices with one clinician.	10 (526)/6 (253)/7 (210)
Urban practice location (%)	Percent of practices in urban locations based on Rural-Urban Commuting Areas using 2010 Census data.	0 (526)/0 (253)/0 (210)
Multispecialty practice (%)	Percent of practices with multispecialty.	19 (526)/9 (253)/4(210)
Less than 5 years under current ownership (%)	Percent of practices with less than 5 years under current ownership.	43 (526)/41 (253)/21 (210)
At least one major change in last year (%)	Percent of practices with at least one major change in the last year. A major change includes the following: have moved to a new location; lost one or more clinicians; lost one or more office managers or head nurses; been purchased by or affiliated with a larger organization; new billing system; or another change specified by the practice.	15 (526)/19 (253)/6 (21
Have PCMH recognition (%)	Percent of practices recognized or accredited as patient-centered medical home.	40 (526)/16 (253)/7 (210)
Participate in other demonstration programs (%)	Percent of practices that participated in the past 12 months in one of the following payment or quality demonstration programs: State Innovation Models Initiative, Comprehensive Primary Care Initiative, Transforming Clinical Practice Initiative—Support and Alignment Network, Community Health Worker training program, BC/BS PCMH. Collaborative; Million Hearts: Cardiovascular Disease Risk Reduction Model; or another program identified by the practice.	38 (526)/26 (253)/17 (210)
Part of an ACO (%)	Percent of practices that are part of an ACO.	23 (526)/18 (253)/11 (210)
Burnout (%)	Percent of practice members burned out. Practice member with a score of 3 or higher for the following question are considered burned out: Using your own definition of burnout—please indicate which of the following statements best describes how you feel about your situation at work (select only one response): 1: I enjoy my work. I have no symptoms of burnout.; 2: Occasionally I am under stress, and I don't always have as much energy as I once did, but I don't feel burned out.; 3: I am definitely burning out and have one or more symptoms of burnout, such as physical and emotional exhaustion.; 4: The symptoms of burnout that I'm experiencing won't go away. I think about frustrations at work a lot.; 5: I feel completely burned out and often wonder if I can go on practicing. I am at the point where I may need some changes.	29 (526)/7 (253)/23 (210)
Less than 5 years if EHR experience (%)	Average number of years of years a practice has used an EHR.	41 (526)/48 (253)/21 (210)

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Appendix A: Continued

Measure	Description	Missing Values*
Have stage 1 and 2 certified EHR MU (%)	Percent of practices those EHR is stage 1 and 2 certified meaningful use.	43 (526)/45 (253)/27 (210)
Patients receiving Medicaid (%)	Percent of patients receiving Medicaid, including those eligible for both Medicaid and Medicare.	48 (526)/37 (253)/20 (210)
Patients receiving Medicare (%)	Percent of patients receiving Medicare.	48 (523)/37 (253)/17 (210)
Non-white patients (%)	Percent of patients classified as non-white, which includes black/African-American; American Indian or Alaska Native; Asian; Native Hawaiian or other Pacific Islander; some other race/mixed race.	78 (526)/43 (253)/19 (210)
Hispanic/Latino patients (%)	Percent of patients classified as Hispanic or Latino.	100 (526)/45 (253)/19 (210)
Quality improvement process measures		
Discuss clinical quality data (%)	Percent of practices where people discuss data or reports about clinical quality from health plans or other external entities during meetings. Possible responses include: never, infrequently, often, not applicable/solo practice, don't know.	0 (526)/0 (253)/0 (210)
Have someone configuring/ writing quality reports (%)	Percent of practices that have someone who can configure or write quality reports from the EHR.	57 (526) 42 / (253)/22 (210)
Produced CQM reports in last 6 months (%)	Percent of practices that produced any CQM report in the last 6 months regarding the following clinical quality measures: percentage of patients aged 18 years and older with ischemic vascular disease with documented use of aspirin or other antithrombotic (NQF 0068); percentage of patients aged 18 through 85 years of age who had a diagnosis of hypertension and whose blood pressure was adequately controlled (<140/90) during the measurement year (NQF 0018); percentage of patients aged 18 years or older who were screened about tobacco use one or more times within 24 months AND who received cessation counseling intervention if identified as a tobacco user (NQF 0028).	91 (526)/50 (253)/16 (210)
Use at least one registry (%)	Percent of practices using at least one registry for the following categories of patients: ischemic vascular disease, hypertension, high cholesterol, diabetes, prevention services, and high risk (high use) patients.	27 (526)/13 (253)/9 (210)
Use of empanelment (%)	Percent of practices for which clinicians have their own panel of patients for whom they are responsible.	36 (526)/12 (253)/12 (210)
CVD prevention guidelines included in EHR prompts or standing orders (%)	Percent of practices using level 3 or 4 of cardiovascular disease prevention guidelines. Levels are as follows: practice does not follow specific guidelines (level 1), guidelines are posted or clinicians have agreed to use them (level 2), practice uses EHR provider guideline-based prompts and reminders (level 3), and practice uses standing orders (level 4).	24 (526)/14 (253)/5 (210)
CVD management guidelines included in EHR prompts or standing orders (%)	Percent of practices using level 3 or 4 of cardiovascular disease management guidelines. Levels are as follows: practice does not follow specific guidelines (level 1), guidelines are posted or clinicians have agreed to use them (level 2), practice uses EHR provider guideline-based prompts and reminders (level 3), and practice uses standing orders (level 4).	24 (526)/14 (253)/5 (210)
Score for CVD improvement being a priority is 8 to 10 out of 10 (%)	Percent of practices reporting that improving cardiovascular disease preventing care over the next year is a priority of 8 or higher on a scale of 1 to 10, with 0 = no priority and 10 = highest priority.	43 (526)/8 (253)/9 (210)

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Appendix A: Continued

Measure	Description	Missing Values*
CPCQ strategies score (mean)	Mean CPCQ score. The score is based on fourteen measures of strategies to improve cardiovascular preventive care. A practice can provide the following answers to each of these measures: strongly disagree (−2 points), somewhat disagree (−1), neither agree nor disagree (0 points), somewhat agree (1 point), strongly agree (2 points), and NA. The points are summed up, for a range from −28 to 28. The 14 measures are (1) providing information and skills-training; (2) using opinion leaders, role modeling, or other vehicles to encourage support for changes; (3) changing or creating systems in the practice that make it easier to provide high quality care; (4) removal or reduction of barriers to better quality of care; (5) using teams focused on accomplishing the change process for improved care; (6) delegating to non-clinician staff the responsibility to carry out aspects of care that are normally the responsibility of physicians; (7) providing to those who are charged with implementing improved care the power to authorize and make the desired changes; (8) periodic measurement of care quality for assessing compliance with any new approach to care; (9) reporting measurements of practice performance on cardiovascular disease prevention measures (such as aspirin for patients at risk for ischemic vascular disease) for comparison with their peers; (10) setting goals and benchmarking rates of performance quality on cardiovascular disease prevention measures at least yearly; (11) customizing the implementation of cardiovascular disease prevention care changes to the practice; (12) using rapid cycling, piloting, pre-testing, or other vehicles for reducing the risk of negative results for introducing organization-wide change in care; (13) deliberately designing care improvements so as to make clinician participation less work than before; (14) and deliberately designing care improvements to make the care process more beneficial to the patient.	132 (526)/48 (253)/24 (210)
Cardiovascular disease prevention clinical quality measures		
Aspirin (%)	Percentage of patients 18 years of age and older who were discharged alive for acute myocardial infarction, coronary artery bypass graft, or percutaneous coronary interventions in the 12 months prior to the measurement period, or who had an active diagnosis of ischemic vascular disease during the measurement period, and who had documentation of use of aspirin or another antithrombotic during the measurement period.	55 (526)/33 (253)/15 (210)
Blood pressure (%)	Percentage of patients 18 to 85 years of age who had a diagnosis of hypertension and whose blood pressure was adequately controlled (<140/90 mm Hg) during the measurement period.	54 (526)/30 (253)/13 (210)
Cholesterol (%)	Percentage of high-risk adult patients aged [mteq]21 years who were previously diagnosed with or currently have an active diagnosis of clinical atherosclerotic cardiovascular disease; OR adult patients aged [mteq]21 years with a fasting or direct low-density lipoprotein cholesterol level [mteq]190 mg/dL; OR patients aged 40 to 75 years with a diagnosis of diabetes with a fasting or direct low-density lipoprotein cholesterol level of 70 to 189 mg/dL; who were prescribed or are already on statin medication therapy during the measurement year.	134 (526)/93 (253)/83 (210)
Smoking (%)	Percentage of patients aged 18 years and older who were screened for tobacco use one or more times within 24 months AND who received cessation counseling intervention if identified as a tobacco user.	61 (526)/44 (253)/15 (210)

*The numbers show missing values and, in parentheses, number of practices, for physician-owned/health system and medical group/federally qualified health center practices, respectively. For instance, 10 out of 526 physician-owned, 6 out of 253 health system and 7 out of 210 Federally Qualified Health Centers (FQHC) practices had missing values regarding their solo practice status. CQM, clinical quality measures; CVD, cardiovascular disease; EHR, electronic health records; CPCQ, Change Process Capability questionnaire; BC/BS PCMH, Blue Cross/Blue Shield patient-centered medical home; MU, meaningful use; ACO, Accountable Care Organization; NA, Not applicable.

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