# Organizational Factors Associated with Guideline Concordance of Chronic Disease Care and Management Practices

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***Background:*** **Guidelines for managing and preventing chronic disease tend to be well-known. Yet, translation of this evidence into practice is inconsistent. We identify a combination of factors that are connected to guideline concordant delivery of evidence-informed chronic disease care in primary care.**

***Methods:*** **Cross-sectional observational study; purposively selected 22 practices to vary on size, ownership and geographic location, using National Quality Forum metrics to ensure practices had a ≥ 70% quality level for at least 2 of the following: aspirin use in high-risk individuals, blood pressure control, cholesterol and diabetes management. Interviewed 2 professionals (eg, medical director, practice manager) per practice (n = 44) to understand staffing and clinical operations. Analyzed data using an iterative and inductive approach.**

***Results:*** **Community Health Centers (CHCs) employed interdisciplinary clinical teams that included a variety of professionals as compared with hospital-health systems (HHS) and clinician-owned practices. Despite this difference, practice members consistently reported a number of functions that may be connected to clinical chronic care quality, including: having engaged leadership; a culture of teamwork; engaging in team-based care; using data to inform quality improvement; empaneling patients; and managing the care of patient panels, with a focus on continuity and comprehensiveness, as well as having a commitment to the community.**

***Conclusions:*** **There are mutable organizational attributes connected-guideline concordant chronic disease care in primary care. Research and policy reform are needed to promote and study how to achieve widespread adoption of these functions and organizational attributes that may be central to achieving equity and improving chronic disease prevention. (J Am Board Fam Med 2022;00:000–000.)**

***Keywords:*** **Chronic Disease, Community Health Centers, Disease Management, Leadership, Primary Health Care, Qualitative Research, Quality Improvement**

## Introduction

The United States (US) has a high prevalence of chronic disease,[1,2] particularly among racial and ethnic minorities and people who are socially and economically disadvantaged.[1] Chronic diseases such as diabetes, hypertension, and high cholesterol are primary risk factors for cardiovascular disease, which is the leading cause of death and disability in the US,[3,4] and are largely preventable with cost-effective interventions.[3,5–7] Yet, uptake of these interventions is low, particularly among at-risk, and social and economically disadvantaged patients.[5,8–16]

Organizational and operational changes (eg, adding a care coordination role to a clinic, adding a

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panel manager to a practice, or screening for social need) may foster delivery of guideline concordant chronic disease care among primary care practices.[17–19] However, practices may lack the time and operational know-how to implement systems that promote guideline concordant care,[19–22] and what works in a practice will vary based on local characteristics.[21,23] Results of studies informed by models, such as the Patient Centered Medical Home (PCMH), have been mixed, with few demonstrating the effectiveness of individual components.[24–26] Research design challenges manifest in these studies, including small sample sizes that often focus on a single organizational setting and lack of granularity, that lessens the usefulness and generalizability of the results.[27–30] As a consequence, the operational and organizational mechanisms by which models like the PCMH are implemented and achieved in different practice settings is not well understood and described.[31]

This study addresses this gap by answering the following research question: What is the combination of organizational and operational factors that higher performing practices use that their leaders identify as connected to higher quality clinical chronic disease care?

## Methods

This was a cross-sectional sequential mixed method observational study, which was part of an effort to develop and validate a self-report tool to assist primary care practices with chronic care clinical quality, was approved by the New York University Grossman School of Medicine (NYUGSOM) and the Oregon Health & Science University (OHSU) Institutional Review Boards.

### Setting

Four practice-based research networks with capacity to assess clinical performance using electronic clinical quality metrics and to maximize variation on practice characteristics (ie, size, ownership, geographic location) participated: OCHIN – a nonprofit organization providing an electronic health record (EHR) system to over 500 federally qualified health centers and community health centers (CHCs) nationwide;[32] DARTNet – a nonprofit organization that collaborates with health care organizations, academic medical centers, and clinicians to extract data from a range of EHR systems and use these

data to improve quality and foster research;[33] New York City Department of Health and Mental Hygiene's Bureau of Equitable Health Systems (BEHS) – a bureau that supports New York City primary care practices in the adoption and use of EHRs to deliver evidence-based preventive care services;[34] and NYU Langone Health Faculty Group Practices – a network of 3 large multidisciplinary ambulatory care locations and more than 30 single and multi-specialty ambulatory care sites.[35]

### Sample and Recruitment

We conducted this study among a diverse, national sample of primary care practices selected because of the higher quality of chronic disease care they delivered (ie, positive deviants). Focusing on higher performing practices offered the opportunity to examine local solutions to this common translation problem, and to characterize and disseminate strategies that higher performers have developed, in their complex adaptive system, for achieving higher quality chronic care.[36,37] To select higher performing practices, we used the Centers for Medicaid and Medicare Services (CMS) specifications to define chronic disease clinical quality and our measures included aspirin use in high-risk individuals, blood pressure control, cholesterol and diabetes management. We defined higher performance as a level of 70% or greater achievement in at least 2 of the quality metrics shown in Table 1. Eligible practices also needed to report that at least 70% of their encounters were with adults (patients ≥18 years).

Each network partner identified practices that met these criteria, and purposely selected practices that varied on size, ownership, and geographic location, as relevant, to meet recruitment targets (OCHIN = 10; DARTNet = 10; BEHS = 5; NYU = 5). Across these networks, 29 practices expressed interest in participation, and 22 agreed to participate (OCHIN = 10; DARTNet = 6; BEHS = 2; NYU = 4). Practices' reasons for declining were due to internal staffing changes, merger with another practice participant, and COVID-19-related challenges. Two people with operational knowledge (eg, medical director/ practice owner, quality improvement lead, practice manager) from each practice participated in an individual interview. One practice had 3 participants due to a request to include their Chief Operating Officer and 1 practice had a single

**Table 1. Aspirin, Blood Pressure Control, Cholesterol, and Diabetes Management Metrics**

| Domain | Description | Description - Full | NQF |
|---|---|---|---|
| Aspirin | Aspirin for CVD | Percentage of patients 18 years of age and older who were diagnosed with acute myocardial infarction (AMI), coronary artery bypass graft (CABG) or percutaneous coronary interventions (PCI) in the 12 months before the measurement period, or who had an active diagnosis of ischemic vascular disease (IV.D) during the measurement period, and who had documentation of use of aspirin or another antiplatelet during the measurement period | 0068 |
| Blood Pressure | Hypertension control < 140/90 mm Hg | 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 | 0018 |
| Cholesterol | Statin therapy | Percentage of the following patients - all considered at high risk of cardiovascular events - who were prescribed or were on statin therapy during the measurement period: <br> • Adults aged ≥ 21 years who were previously diagnosed with or currently have an active diagnosis of clinical atherosclerotic cardiovascular disease (ASCVD); OR <br> • Adults aged ≥ 21 years who have ever had a fasting or direct low-density lipoprotein cholesterol (LDL-C) level ≥ 190 mg/dL; OR <br> • Adults aged 40 to 75 years with a diagnosis of diabetes with a fasting or direct LDL-C level of 70 to 189 mg/dL | None |
| Diabetes | Poorly controlled (HbA1c > 9) | Percentage of patients 18 to 75 years of age with diabetes who had hemoglobin A1c > 9.0% during the measurement period OR had no measured HbA1c during the measurement period | 0059 |

Abbreviation: NQF, National Quality Forum.

participant, the clinician/owner (n = 44). Participating practices received a $300 honorarium.

### Data Collection and Management

Semistructured interviews (Interview Guide, online Appendix) were informed by the Chronic Care Model and PCMH model.[23,38] We explored the mechanics of care delivery, which included identifying all employee/practice professionals' roles, responsibilities, and clinical tasks. We pilot-tested and refined the interview guide to improve question format and flow. Before conducting interviews, we sent participants a brief survey to gather practice demographic data (eg, staffing, payer mix, patient characteristics).

Interviews were conducted between February and May 2020. Before March 2020, we traveled to 7 practices, conducting 14 interviews in-person. In March, we pivoted to virtual interviews due to COVID-19. Participants from 13 of the remaining 15 practices participated in an interview using a video-camera (n = 26);[39] 4 interviews were conducted by telephone. Telephone interviews were assessed and determined to be of sufficient quality to include. Interviews were 45 to 60 minutes long, audio-recorded, professionally transcribed, reviewed for accuracy and deidentified. Transcripts were entered into ATLAS.ti Version 9 (Scientific Software Development GmBH, 2021) for data management, coding and analysis.

### Data Analysis

We engaged in an iterative analytic process, known as immersion-crystallization, to identify cross-practice findings.[40] Three qualitative analysts (DC, TWL, PB) listened to and discussed a small, varied set of interviews. We identified and tagged segments related to delivery of chronic disease prevention and management. We developed names and definitions for tagged segments, which we developed into a codebook that was then used by TWL and PB to analyze the remaining data. These 2 team members independently analyzed data, meeting regularly with (DC) to discuss analytic differences, which were addressed by reaching consensus and/or refining the codebook. After all data were analyzed, we examined cross-practice output by coded text and created matrices to document and identify similarities and differences, with attention to how practice size, ownership, geographic location, and patient population might influence emerging findings. As a final step, we connected our findings to the literature,[41] observing a symmetry between our findings and Bodenheimer's

Building Blocks of High-Performing Primary Care,[42] which informed discussion of our study's findings.

## Results

Participating practices varied on size, geographic location, ownership type, participation in an Accountable Care Organization (ACO), and the patient population served (see Table 2). CHCs tended to serve a less affluent population (as indicated by the percentage of Medicaid patients served) and communities that included black, indigenous and people of color (BIPOC) as compared with clinician- and hospital- and health system-owned practices, although there were exceptions (clinics 21 and 22). CHCs also employed a more varied group of professionals (see Table 3). Common professionals employed at all practices included clinicians (ie, MD, DO, NP, PA), Registered Nurses (RNs), Medical Assistants (MAs), front desk staff, and practice leaders (ie, Medical or Operations Director, Practice or Office Manager). CHCs, which have different funding structures and resources, included behavioral health, dental health, pharmacy staff, and professionals that assisted patients with navigating the health care system and mitigated the social and economic barriers that might impede care engagement. It was less common to see professionals in these roles employed by the HHS and clinician-owned practices.

### Core Functions and Attributes of Practices

Table 4 defines the practice attributes and functions practice members reported to be important to delivery of chronic disease prevention and management. Table 5 includes illustrative quotes. Table 6 shows the distribution of these attributes and functions across practice types. Below, we define and describe each core function and practice attribute. We explain variations regarding the presence of a function and the form it took in practices.

### Engaged Leadership

All clinical leaders that we interviewed reported facilitating change, when needed. Leadership attributes included proving the resources necessary to promote quality and fostering a culture (ie, values, expectations, and practices) of quality improvement, teamwork, and distributed leadership. All the practices in our sample reported having some level of protected time to meet and discuss quality. Ten practices did this as part of an established quality improvement team with clinical leader participation. Team activities focused on improving operational processes and monitoring patient care gaps through patient registries. Quality improvement teams varied in their formality. CHCs tended to have quality improvement committees and reported conducting formal plan-do-study-act (PDSA) cycles that engaged a multidisciplinary team in process improvement activities. In contrast, clinician-owned practices, and the 1 HHS-owned practice that had an active quality improvement meeting, reported having smaller teams, and working less formally on quality improvement. For example, a practice manager may be tasked with monitoring team metrics and reviewing and modifying workflows and processes, as needed. Thus, while all practices engaged in quality improvement, how this was accomplish varied in its formality and process, which was influenced by practice size and ownership type.

**Table 2. Practice and Patient Characteristics, n = 22**

| Practice Ownership | Number | Percentage |
|---|---|---|
| Clinician-owned | 8 | 36.36% |
| Hospital-health system | 4 | 18.18% |
| Community Health Center | 10 | 45.45% |
| Accountable Care Organization (ACO) involvement | | |
| Part of an ACO | 7 | 31.82% |
| RUCA designation | | |
| Metropolitan area core | 16 | 72.73% |
| Metropolitan area high commuting | 3 | 13.64% |
| Small town core | 2 | 9.09% |
| Rural area | 1 | 4.55% |
| Geographic region | | |
| Southwest | 4 | 18.18% |
| Northwest | 4 | 18.18% |
| Midwest | 4 | 18.18% |
| Northeast | 6 | 27.27% |
| Southeast | 4 | 18.18% |
| Practice size* | | |
| Small (2 to 5 clinicians) | 17 | 77.27% |
| Medium (6 to 10 clinicians) | 2 | 9.09% |
| Large (>10 clinicians) | 3 | 13.64% |
| Patient characteristics | | |
| Greater than 50% patients indicated as "non-white" | 6 | 27.27% |
| Greater than 50% Medicaid payer | 7 | 31.82% |
| Greater than 50% Medicare payer | 2 | 9.09% |

*This is based on the number of full-time equivalent clinicians (not full-time equivalent primary care clinicians).

**Table 3. Type of Professionals Employed by Study Practices**

| Professional type | Clinics | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hospital-Health System | | | | Clinician-owned | | | | | | | | CHC | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 19 | 20 | 21 | 22 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Clinician (MD, DO, NP, PA) | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| Medical Assistant | • | • | • | • | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| Registered Nurse | | • | • | | • | | | | | • | • | | • | • | • | | • | | • | | • | • |
| Licensed Practical Nurse | • | • | | | • | | | | | | | | | | | | | • | | | | |
| Front Desk Staff | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| Clinical Team Assistant | | | | | | | | | | | | | • | | | | | | | | | |
| Visiting Nurse | | | | • | | | | | | | | | | | | | • | | | | | |
| Nurse-midwives | | | | | | | | | | | | | | | | | | | | | | • |
| Specialists (e.g., cardiology) | | | • | • | | | | | | | • | | | • | • | | | | | • | | |
| Dental Health Staff | | | | | | | | | | | | | | • | | | • | | • | • | | |
| Clinical Pharmacy Staff | | | | | | | | | | | | | • | | | | • | | • | | • | |
| Clinical Lab Staff | | • | | | • | | | | | • | • | | | • | | | | | | • | • | |
| Behavioral Health Clinicians | | | | | | | | | | | | | • | • | • | • | • | • | • | • | • | • |
| RN Care Manager/Care Management Team | | | | • | • | | • | | | | • | | | | | | • | | • | • | | |
| Referral Coordinator | | • | | | | | | | | • | | | | | | | | | • | | | |
| Care Coordinator | | | | | | | • | | | | | | • | • | • | | • | • | • | | | |
| Care-Gap Closure Specialist/Team | | | | | | | | | • | • | | | | | | | | | | | | |
| Health Educators / Coaches | | • | | | | | | | | | | • | | • | | | | • | | • | | |
| Social Worker | | | | | | | | | | | | | | | | | • | • | • | | | |
| Patient Advocate | | | | | | | | | | | | | | | | | | | | | • | |
| Chaplain | | | | | | | | | | | | | | | | | | | | • | | |
| Outreach and Enrollment | | | | | | | | | | | | | • | | • | | • | • | | | • | |
| Insurance Specialist / Navigator | | | | | | | | | | | | | • | | | • | | | | | | |
| Retention Specialist | | | | | | | | | | | | | | | | | • | | | | | |
| Community Health Worker | | | | | | | | | | | | | • | • | | | | | • | | | |
| Medical / Operations Director | | | • | | | | | | | • | | | • | • | • | • | • | • | • | • | | • |
| Quality Leader | | • | | | | | | | | | • | | | • | | | • | • | | • | | • |
| Practice/Office Manager | • | • | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |

Abbreviation: CHC, Community Health Centers.

### Culture of Teamwork

Participants across all sites identified teamwork and, more explicitly, a practice of distributed team leadership across the clinical team as separate from the role of leadership and critical to the clinic's success with regard to chronic care clinical performance. Practice leaders indicated that teamwork, open communication, camaraderie, mutual trust, and respect were interdependent and identified as facilitating staff buy-in, cohesion, and a learning environment, and that it was within this set of shared values, which was described as a practice culture, that improving individual skills and abilities as well as practice performance were valued.

### Data-Driven Quality Improvement

All practices used data sources to inform quality improvement, although variations existed in how data were obtained and used in data-driven improvement. Practices reported using data to develop registries, which are lists of patients by diagnosis and/or a combination of diagnoses that put patients at high risk for an emergency department visit, and/or help to identify and address care gaps. Examples included monthly reports on clinical quality measures (eg, HbA1c) to identify patients who did not meet practice benchmarks.

Clinician-owned practices relied heavily on outside partners (eg, payers and/or ACO partners) to

**Table 4. Definitions of the Functions and Attributes Reported by Practices with Higher Performance on Chronic Disease Care**

| Functions / Attributes | Description |
|---|---|
| **Commitment to community** | Stated mission to promoting the health of the specific community the practice serves. |
| **Engaged leadership and culture of teamwork** | Leaders fully engaged in the process of change. Leadership at all levels of the organization create concrete measurable goals and objectives to clinical quality. Practice fosters a culture of teamwork. |
| Supports active QI committee | Leadership supports and promotes a team or committee that meets regularly to identify and facilitate opportunities for practice-wide improvement. |
| Encourages use of QI strategies | Leadership encourages actions or approaches that are implemented to improve practice quality (e.g., facilitation, peer coaching, audit and feedback, Plan-Do-Study-Act cycles, and continuing education). |
| Protected time and resources for improvement | Leadership creates dedicated capital that allows practice staff to receive regular communication about and engage in sustained quality improvement efforts (e.g., team meetings, printed educational materials). |
| Distributed leadership / Culture of teamwork | Individuals with different skills and from different levels pool their expertise and resources, work together, and share in leading efforts to bring about change.[1] |
| **Data-driven quality improvement** | Practice staff monitor progress toward clinical quality goals, including utilizing data systems to track and drill down into clinical quality, and regularly sharing the data. |
| Internal data source | Practice staff use internal data systems to generate reports to track and drill down into clinical quality. |
| Insurer and/or ACO data source | The practice receives regular reports from an insurer, on the insurer's patients, to track and drill down into clinical quality. |
| **Team-based care** | Development of primary care teams, with non-clinicians on the team, who add capacity. Often these are organized around small team or clinician / MA dyad. |
| Core clinical team | A stable pairing of clinician and clinical assistant(s). |
| Expanded team | A larger team – perhaps including a registered nurse, social worker, pharmacist, and behaviorist – that supports several teamlets. |
| Standing orders | Standing orders enable staff (e.g., panel managers, MAs, and registered nurses) to address care gaps without involving the clinician. |
| **Empanelment** | Linking each patient to a care team and a primary care clinician. This is the basis for the therapeutic relationship and ensures that patients and teams know each other. |
| Defined panels | Each patient is assigned to a primary care clinician. |
| Panel management | Practice staff who monitor a clinician's panel of patients for important preventive and chronic care needs based on guidelines. |
| **Population management** | Practice staff actively stratify the needs of patient panels and design team roles to match those needs, including panel management, health coaching, and complex care management. |
| Engage patients in appropriate follow-up care | • Periodically check registry, where staff member periodically checks practice registry to identify patients who are due for routine services, but don't have an appointment scheduled, and contact them as appropriate.<br>• Tie medication prescription renewal cycles to follow-up visits. |
| Review health maintenance screen in EHR | Staff member checks health maintenance screen and identifies patients who are coming in for a visit and due for routine services. |
| Behavior changes and self-management support | Providing information and skills to patients and helping them engage in behavior change and / or chronic disease self-management. Could be done by MA, nurses, health educator, behavioral health coordinators, or pharmacists. |
| Complex care management | Complex care management is a way to address patients' needs that are medically and psychologically complex as well as patients who are high utilizers of expensive health services. Typically, these teams are headed by nurses or social workers. |
| **Continuity of care** | Continuity requires empanelment and builds on the relationship developed when each patient is linked to a clinician and a team. |
| Consistent patient scheduling | Schedulers encourage patients to see the clinician to whom they are empaneled. |
| **Comprehensiveness and care coordination** | The responsibility of arranging for services that primary care is unable to provide. |
| Referral coordinator | Clinic staff who have a primary responsibility to coordinate care with other members of the medical neighborhood (e.g., hospitals, pharmacies, and specialists). |
| Care coordination | Clinic staff whose role includes connecting patients to community resources to manage social and economic needs. |

[1]Chreim S, Williams BE, Janz L, Dastmalchian A. Change agency in a primary health care context: The case of distributed leadership. Health Care Manage Rev. 2010;35(2):187-199. doi:10.1097/HMR.0b013e3181c8b1f8.
Abbreviations: ACO, Accountable Care Organization; QI, quality improvement; MA, Medical assistants; EHR, Electronic Health Record.

**Table 5. Quotations to Illustrate Core Functions and Attributes of Practices**

| | |
|---|---|
| Engaged Leadership | We use the PDSAs. We have the meeting. We explain why we're making change. If people have questions, we're small enough and they've been there long enough that they feel comfortable to speak up. And then once everybody's on board at that point, we get to lead from behind – myself, the clinic managers. Most of the ideas of what to do come from the people who are doing the things. – Lead Clinician, CHC, Clinic 9 |
| | …we have monthly meetings with the medical assistants … and I go over things that are coming up, or that have changed, or what we need to improve, or what needs to be done that I'm looking at. Then I bring out any points that need to be taken care and addressed. – Office Manager, Clinician-owned, Clinic 6 |
| Culture of Teamwork | The goal is continuous learning, never judgement or shame. For instance, there's a random chart review, and it comes up that this was a blood pressure management question. Then there is a core group discussion… 'You know, you increased the Lisinopril from 20 to 40 but didn't recheck BP.'… If they're already on it, I wouldn't necessarily recheck, but the group consensus says… standard of care is, with any increase in therapy, you recheck within two weeks. That's a practice that we all follow because we talk about it sort of openly. – Lead Clinician, CHC, Clinic 12 |
| Data-Driven Quality Improvement | …I run our reports, on all of our clinical quality measures every month… I look at all of our patients who have not met our measure, and then I do a deep dive into those patients and see where we've missed our opportunities.   (Director of Quality, CHC, Clinic 10). |
| | We also have a strong Cigna Medicare Advantage plan with over 800 members… they have a lot of support. We have a person who comes in from outside, an embedded care coordinator, and they bring us lots and lots of lists of outliers. So they provide us with a lot of data on their end of it. (Practice Owner, Clinician-owned, Clinic 7) |
| Team-based Care | I ended up linking our clinical pharmacist, our nurse care manager, and our community health worker into that visit at that time. The community health worker got that person signed up for health insurance. Our clinical pharmacist helped to get them some of their pills. And our nurse care manager made a follow-up visit to that patient's house the next morning. (Clinician, CHC, Clinic 12) |
| | For our [clinic] population, the patient population that we see here are very well-educated, higher income level groups, very well-based in information, and know how to find information. So, what that means for us is that it challenges us to make sure we're using guidelines, because our patients are coming in already exposed and have all the right questions based on their previous diagnoses. And even if it's a new diagnosis, they already have some idea from either their friends who are also providers or family members, and they know how to ask the right questions. (Nurse Practitioner, HHS, Clinic 4) |
| | Education, especially like diabetes, as we know, diabetes is a huge part of health care. So, there's diabetic education programs and I try to direct them in that path. And again, the one that I'm very active with the led by the [insurer]. So, the [insurer] developed a diabetic education program, and so those people that are falling out of control, you basically send them out there…. Success rate is actually pretty good for those people that are in control. They actually managed to control their diabetes within a pretty good time period. – (Practice Owner, Clinician-owned, Clinic 8) |
| | We are in the beginning of a new initiative, which is chronic disease management. We put in place a team of internal medicine doctor, a nurse, a registered nurse, and medical assistants that are already doctors from the Dominican Republic. We have the concept of what the patient needs are, and how the cultural sensitivity to approach the population that we serve. - (Practice Owner, Clinician-owned, Clinic 21) |
| | The other thing is that we actually hired a clinical quality nurse. She is our care manager. And she has helped us tremendously with the phone calls and working our list and helping us to identify along with our ACO support who comes in about once every week or once every other week and sits down with our clinical quality nurse and just talks about the patients and our gaps in care and where we are and where we need to be. And we've just seen those numbers continue to climb because they've worked really well together. (Practice Manager, Clinician-owned, Clinic 5) |
| Empanelment & Continuity of Care | …especially our chronic care people, they pretty much stay with the same physician. We try not to bounce them around the clinic because we feel like the continuity of care is better when that patient is followed by one physician unless the physician is out of the office. (Office Manager, Clinician-owned, Clinic 5) |
| Population Management at the point-of-care | Within the Epic chart…the gynecology, the mammograms, vaccines, those things actually pop-up automatically if they have not been done in the last 12 months or so. – Medical Director, HHS, Clinic 3 |
| | … if [patients] are coming in for an appointment, we check to see what their gaps in care are and make a printout of that and give it to the physicians…And then they can address those… they try to do as much as they can at the time that they're seeing the patient. – Office Manager, Clinician-owned, Clinic 5 |
| Outreach | …we just basically look for anybody whose hypertension is not in control that hasn't been here in three months, and do some kind of outreach. The same with the hemoglobin A1Cs greater than nine… that registry will drive monthly outreach to diabetics that haven't had an A1C in six months. – MA/QI Manager, CHC, Clinic 15 |
| | We have one patient who's a bilateral amputee. She lives alone. She has very limited resources. She's a diabetic. We need to see her frequently. She has no transportation, so we have set that up through the county. We've set up the Meals on Wheels. We've set up a shopping network – part of it's through a church, part of it is just from friends of friends helping. But that's how she survives. She couldn't get here without the transportation issue being resolved. – Practice Manager, HHS, Clinic 1 |
| Commitment to Community | …being an FQHC makes a practice great because anyone that works here works here for a reason. They know what population they're working with. It is a mission-driven organization, and no one accidentally found this practice   (Physician, FQHC, Clinic 17) |
| | we're a small community, between 3,000 and 4,000 folks inside the corporate limits…I've been in practice here since 1997. I am originally from [here]…Spent three years at two different locations and returned home in 1997 to start my practice   (Physician, Clinician-owned, Clinic 5) |
| | …I don't care if you're straight out of work. I don't care if you smell. I don't care if your shoes are dirty… What I care is about your health… We try to be as accommodating as we can.   (Clinical Program Manager, CHC, Clinic 9) |

Abbreviations: CHC, Community Health Centers; HHS, Hospital-health systems; FQHC, Federally qualified health centres.

assist with data access. CHCs reported using a combination of data that they accessed from their organization and from outside entities. Both clinician-owned and CHCs that were part of an ACO received reports regularly to close gaps associated with CMS quality measures. In comparison, although HHS practices generally reported having access to internal data sources, 3 of the 4 HHS practices described little engagement with the available data due to limited time and resources and/or that the data they received was out-of-date. These practices described internal work arounds such as excel-based patient tracking tools, managed by the practice manager, and manual chart audits to give clinicians feedback on patient quality gaps.

### Team-Based Care
All practices identified a core clinical team composed of primary care clinicians, MAs and/or RNs/LPNs tasked to deliver primary care. Table 3 shows

that CHCs employed larger, multidisciplinary teams of professionals involved in patient care. This extended team helped mitigate the social and economic risks of their patients. For example, CHCs reported functions related to coordinating referrals and assisting with patient engagement and activation, that were not present in other types of practices. Clinician- and HHS-owned practices, served more affluent patient populations who were described as proactive about their care needs and not in need of supportive services. In these practices, when additional professional input was needed, clinicians made referrals, and it was expected that patients would follow-through. Two exceptions, clinics 21 and 22, were clinician-owned practices serving large immigrant populations. Practice owners developed a clinic staff that was part of the same immigrant group as their patients. This was a cornerstone of the team's success and ensured care was sensitive to and aligned

with patients social and cultural preferences. If clinician- and HHS-own practice added a professional to their team it was often an RN Care Manager or Care Gap Closure Specialist, whose tasks focused on patient outreach and closing clinical care quality gaps.

### Empanelment, Continuity of Care, Population Management, and Care Coordination

All but 1 practice (Clinic 9) defined and actively managed patients via a panel assigned to a clinician. Empanelment fostered care continuity because it tethered responsibility of a clinician or a clinical team to a patient's health care, and fostered population management (see Table 4), which included point-of-care activities (eg, scrubbing the EHR to review health maintenance ahead of visit, conducting health risk assessments) and outreach activities (eg, reaching out to patients to encourage an overdue visit, assisting with managing self-care). Practices also reported using a range of strategies to help mitigate the social and economic barriers that make patient engagement in care difficult (eg, arranging transportation to the clinic, helping patients get their power turned on).

Implementation of population management functions varied across practices. While all practices identified complex patients (ie, patients living with multiple chronic conditions), often using a risk stratification process, CHCs reported employing a Care Manager or Care Management Team to make regular contact with patients, answer questions, and help with medication management. This higher level of care coordination, which included making sure patients were attending medical/mental health care appointments and following up on lab results, was in contrast to HHS-owned practices, which relied on patients regularly visiting the practice, for instance, by tying prescription renewals to a visit and setting up transportation to the practice, when needed.

### Commitment to Community

Although observed in some practices, a stated commitment to serving their community was not a requirement for higher clinical performance. CHC leaders reported a commitment to the uninsured and underinsured, which could extend more specifically to the local population, such as rural farmworkers. Clinician-owned practices, particularly in rural communities, highlighted their being part of and serving their community. Professionals that had a connection to the community reported understanding their patients more deeply and gave examples of how this could be a difference-maker by creating a space where practices were more accommodating of their patients. Interestingly, we heard about a stated commitment to serving a community from only 1 HHS-owned practice. This was a clinic located in a small, community far from the primary health care facility that served an elderly community.

## Discussion

Practices that deliver higher quality clinical chronic disease care reported taking steps to be responsible for their patients' health. This can be seen in their use of strategies like empanelment, where a clearly delineated connection between a clinician, team, and patient was established, and ensuring continuity of care - to the extent possible - in an effort to keep patients connected. This included taking responsibility for and being accountable to their patients, which included activities to prepare for patient visits and outreach to patients who were overdue for a visit, as needed. For some practices, this responsibility and commitment to their patients and surrounding communities was a stated mission, and included the dedication to keeping *their* patients healthy,[43] which influenced how practices approached care delivery, and in turn was likely connected to chronic care clinical quality.[44–46]

For primary care practices leaders and policy makers, this study describes different paths toward higher quality chronic disease prevention and management. Over the past thirty years,[47] efforts to understand primary care's contribution to the persistent gap in clinical quality have been plentiful. At the policy level, initiatives to improve this situation in primary care have focused on implementation and use of EHRs, the introduction of new quality standards and merit-based initiatives to incentivize achievement of these targets, and efforts to transform primary care delivery (eg, PCMH). Nevertheless, gaps in chronic disease prevention and management persist,[1,2,5,8] and improvements in chronic disease management, in some cases, seem to have stalled.[3] We identify operational functions that have already been adopted by a varied group of higher performing practices, which suggests that they can be implemented and adapted by other practices to fit their local

**Table 6. Functions and Attributes of Practices with Higher Performance on Chronic Disease Care across Practices**

| | Clinics | | | | | | | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Hospital-Health System | | | | Clinician-owned | | | | | | | | CHC | | | | | | | | | |
| Functions / Attributes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 19 | 20 | 21 | 22 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| **Commitment to community** | | | | | | | | | | | | | | | | | | | | | | |
| Stated mission to support the health of the community | • | | | | • | • | | • | • | | • | | • | | | • | | • | • | • | • | |
| **Engaged leadership and culture of teamwork** | | | | | | | | | | | | | | | | | | | | | | |
| Supports active QI committee | | • | | | | | • | | | | • | • | | • | | • | • | | • | | | • |
| Encourages use of proven strategies | • | • | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| Protected time and resources for improvement | • | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| Distributed leadership / Culture of teamwork | • | | • | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| **Data-driven improvement** | | | | | | | | | | | | | | | | | | | | | | |
| Internal data source | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| Insurer and/or ACO data source | | | | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| **Team-based care** | | | | | | | | | | | | | | | | | | | | | | |
| Core clinical team | | • | | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| Expanded team | | | | • | | • | | | • | • | | • | • | • | • | • | • | • | • | • | • | • |
| Standing orders | | | | | | | | • | | | | | • | • | • | • | • | • | • | • | • | • |
| **Empanelment** | | | | | | | | | | | | | | | | | | | | | | |
| Defined panels | • | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| Panel management | | • | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| **Population management** | | | | | | | | | | | | | | | | | | | | | | |
| Engage patients in appropriate follow-up care — Periodically check registry | • | | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| Engage patients in appropriate follow-up care — Prescription renewal tied to visits | • | • | • | • | • | • | • | • | • | • | • | • | | • | | | | • | | | • | |
| Review health maintenance screen in EHR | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| Behavior changes and self-management support | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| Complex care management | | | | • | • | | | | | | • | | | | | • | • | • | • | | • | • |
| **Continuity of care** | | | | | | | | | | | | | | | | | | | | | | |
| Consistent patient scheduling | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| **Comprehensiveness and care coordination** | | | | | | | | | | | | | | | | | | | | | | |
| Referral coordination | | • | | | • | | • | | | • | | | • | • | • | • | • | • | • | | | • |
| Care coordination | • | | | • | | | | | • | • | • | | • | • | • | • | • | • | • | • | • | • |

Abbreviations: CHC, Community Health Centers.

circumstances and improve chronic disease prevention and management.

The functions that we identify– with some modification and expansion – are already "packaged" in the 10 Building Blocks,[42] which can further expedite promotion, dissemination and implementation. The Building Blocks have informed practice improvement, and implementation science research; Perry et al. show that implementation of this framework can be associated with improvement in clinical quality performance.[48] As practices and implementation scientists consider using this package to support improvement, our study identifies 3 important additions. First, consider the importance of fostering a commitment to community among practice members. This study highlights the important connection that some practices, particularly CHCs and clinician-owned practices, have with their surrounding community, and how this is linked to practice health care advocacy for their patients. We also show that HHS-owned practices, who are also higher performing, do so without such stated commitment. This may be because they serve affluent patients who are, themselves, able health care advocates. Second, create a culture of team work in practice. Teaming and creating a culture of teamwork is not a new idea in health care.[49–51] Investigations of this organizational attribute establish its connection to performance in other settings,[52–54] as well as in primary care. Our work supports and extends those findings to chronic care clinical performance. Third, foster data resourcefulness. This idea is not captured by the function of data-informed quality improvement, which assumes the availability of data. While much has been written about the need for better data to inform quality improvement in primary care,[55,56] a subset of clinician-owned and HHS practices in this cohort of higher performing

practices had poor data infrastructure, yet their teams engaged in a range of workarounds (eg, manually abstracted EHR data; partnered with payers and/or ACOs) to get the information they needed to avoid having patients slip through the cracks and to inform their quality improvement efforts. This work should be recognized, as should the role that payers/ACOs in support clinician-owned practices with accessing needed data.

This study's findings should be considered in the context of its limitations. First, while we sought to include a diverse sample of high performing practices, our sample is not representative. One important attribute of our practice sample is that they were purposively selected to be high performing. The approach to studying "bright spots" or positive deviants as a way to identify grounded, actionable solutions to health care problems is well supported.[36,37] As Lawton et al. note, "the focus on error detection and its management has not produced the expected gains in patient safety, primarily because these methods are not well suited to a complex adaptive system such as health care."[36,37] Nevertheless, the study strength may also be a limitation, as we do not study low performing practices. Second, there are more details to be learned about each of the areas we identified as important. For example, panel management is 1 example of an operational area where we were able to identify its importance but where more detail might be beneficial to practice managers and leaders to inform operational decisions. As such, there are areas where more research may be warranted. Third, there are some elements of the Building Blocks that we do not discuss. This includes what is termed "patient-team partnership," "prompt access to care" and "template of the future." Because the Building Blocks were not used to guide data collection, we did not explore these areas, and they did not emerge during our interviews. Future researchers might set out to investigate how these aspects of practices are connected to quality. Finally, we describe practice functions and attributes that are largely present among a cohort of practices with higher performance in certain types of chronic care clinical quality. We cannot claim that these functions and attributes are associated with performance. Different research methods would be needed to establish such an association and further a causal relationship, which is beyond what we can and do claim in this work.

## Conclusion

We identify a set of functions that were in place among a varied group of practices with guideline-concordant chronic care delivery. More research is needed to examine if widespread adoption of these functions by primary care practices can create the organizational systems that are needed to promote equity and improve chronic disease prevention and management.

*To see this article online, please go to: http://jabfm.org/content/ 00/00/000.full.*

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# Appendix

### *Interview Guide*

### *Greeting*

Hi.

My name is. . .

This is [introduce interviewer 2].

Thank you for welcoming us into your practice and agreeing to do this interview.

### *Information Sheet Review/Consent*

Have you had a chance to look at the Information Sheet that I sent you? I also brought a copy if you need 1. Do you want to take a look? What questions can I answer for you?

### *Permission to Record*

Do I have your permission to record this interview? Great. I am going to turn on the recording device and ask you that question again for the record.

[Turn on the recording device.]

Do I have your permission to record this interview?

### *Purpose of the Interview*

We are speaking with you today because your practice was identified as a high-performing practice based on a range of clinical quality measures. We are interested in learning what you believe drives this high level of performance in your practice.

***Introduction of Interviewers.*** *We'd like to start by telling you a little bit about ourselves. I am [name]. I work at [name] and I am a [name role and describe what you do]. I am really excited to talk with you today because I am very interested in how primary care is delivered and particularly how practices, like yours, achieve such great quality.*

[Introduce interviewer 2. Interviewer 2 offers a similar introduction.]

[Invite respondent to introduce him/herself]

### 1. Tell me about yourself.

[Say something like: *That is wonderful or That is so interesting. Alternatively, thank you so much for that introduction. It is so nice to meet you.*]

*As I mentioned earlier, one of the reasons why we wanted to talk to you is that your practice achieves good clinical outcomes on quality care measures such as diabetes management and blood pressure control.*

### 2. Tell me about what makes your practice great.

### 3. What do you think contributes to your practice's high performance?

Probe: *Please share some specific examples.*

*CHRONIC DISEASE MANAGEMENT. That is really helpful. Thank you. I would like to explore your experiences a bit more. Please think about how your practice manages patients with chronic disease like hypertension and diabetes. It might be helpful if you think about a recent patient or 2. Would it be helpful if I gave you a minute to think about it?*

[Wait a minute, giving the person a minute to think.]

### 4. Please walk me through how your practice manages patients with chronic diseases like hypertension and diabetes.

Listen carefully and probe if something is unclear or to get more information when that is needed.

### 5. What systems does your practice have in place to support the management of patients with chronic diseases?

Probes:

- *How, if at all, is your practice's EHR used to support managing patients with chronic disease?*
- *Does your practice use patient registries? Does this support chronic disease care? Can you describe how this is done?*
- *Does your practice do pre-visit planning? Does this support chronic disease care? Can you describe how this is done?*
- *Does your practice do risk stratification? Does this support chronic disease care? Can you describe how this is done?*

*I'd like to know more about how your practice is staffed and how the design of your clinical teams may support chronic disease management.*

### 6. Can you describe for me the composition of your clinical team?

Probes:

- *How did you build a good team?*
- *What do you (or others in the practice) do to support this team?*

### 7. How does the clinical team help with chronic disease management?

Probe:

*Ask about the specifics of different roles that are named, if these are not shared.*

### 8. What self-management resources does your practice provide to patients who are managing chronic diseases?

Probes:

- *Ask about patient education, if it doesn't come up*

- *Ask about how these materials are distributed to patients, if this is not shared.*

**9. What kind of community linkages do you have to refer patients for additional resources, support, or further education?**

*POPULATION MANAGEMENT. Now, I'd like you to think about the patients with chronic disease that may not come into your practice or may not come into your practice frequently enough or at the right times.*

**10. Please describe the population management activities that your practice engages in related to caring for patients with chronic diseases.**

Probes

*General probes:*

- *Can you tell me more about how your practice identifies when there is a gap in care quality?*
- *Can you tell me more about how your practice ensures patients come in for follow-up care, as needed? Probe about use of text, portals, emails, phone calls, letters.*

*Specific probes:*

- *Panel Management:*

    - *Does your practice assign clinicians' panels?*
    - *Does your practice engage in panel management?*
    - *Does this support chronic disease care?*
    - *Can you describe how this is done?*
- *Outreach: Does your practice do patient outreach? Does this support chronic disease care? Can you describe how this is done?*

*PREVENTION AND SCREENING. Now I want to shift gears to a different type of patient outcome to learn more about what you do in terms of general primary care, things like vaccinations and screenings for cancer, depression, and smoking status.*

**11. What systems does your practice have in place to ensure patients are receiving recommended preventive care services?**

Possible Probes: *Decision support, alerts, tracking for cancer, depression, and smoking status*

*QUALITY IMPROVEMENT (QI).* [Note to Interviewer: There are at least 2 possibilities here. (1) The participant has already touched on what the practice does for QI and (2) the participant has not mentioned this. We recommend a slightly different flow for each situation.

Participant has brought up QI in prior answers:

*Scenario #1: Thank you so much! Now, I'd like to shift gears a little bit and learn more about what your practice does to ensure high quality care for your patients. You talked a little about how your practice engages in quality improvement. This is really interesting, and I would like to learn more about the specific details.*

**12A. Can you tell me more about how your practice approaches quality improvement?**

[These probes can help investigate a QI process more deeply, when the participant's responses suggest there are such processes:]

- *Who is involved in the QI process?*
- *What tools do you use to address and improve quality?*
- *What motivated your practice to establish these processes?*
- *What quality improvement or practice redesign initiatives has your practice been involved in over the last couple of years?*

Participant has not brought up QI in prior answers:
*Scenario #2: Thank you so much! Now, I'd like to shift gears a little bit and learn more about what your practice does to ensure high quality care for your patients.*

**12B. Can you tell me how your practice approaches quality improvement?**

[Probes to investigate if participant is struggling:]

- *How does your practice know when the practice or a clinician is having a problem with clinical quality? For instance, maybe hypertension management metrics are low overall or low for one or two doctors.*
- *What tools does your practice have to address and improve quality when this happens?*

[These probes can help investigate a QI process more deeply, when the participant's responses suggest there are such processes:]

- *So, it does sounds like your practices has some QI processes. Can you tell me more about these?*
- *Who is involved in the QI process?*
- *What motivated your practice to establish these processes?*
- *What quality improvement or practice redesign initiatives has you practice been involved in over the last couple of years?*

*CLOSING QUESTIONS. You have shared so much wonderful information with us today. We talked a lot about what your practice has in place to support clinical care quality. Here is what I am wondering: Let us say*

*another practice wanted to replicate your successes in improving clinical outcomes for its patients with chronic disease.*

**13. Based on your experience, what would be the most important elements of care that this practice should implement to improve clinical performance?**

[Turn to Interviewer 2: You have been so patient. Thank you. What questions do you have for [fill-in name]]?

[Interviewer 2 asks questions. Then, gives floor back to Interviewer 1.]

**14. Before we close, what have we not asked about, but should know, about how your practice delivers high quality clinical care to patients with chronic disease?**

Probe or Alternative Q: *What did we miss?*

*Thank you so much for taking the time out of your busy schedule to meet with us. We learned so much today about how your practice delivers high quality clinical care, and your insights were invaluable.*

[Turn off the recording device.]
[Provide incentive as appropriate.]