Facilitators and Barriers to Providing Patient-Centered Chronic Disease Care to Patient Populations at Risk for Health and Health Care Disparities in Safety Net Settings

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PROJECT TEAM

Bianca Perez, PhD

Senior Project Manager

Linda Cummings, PhD

Vice President of Research
Director, Essential Hospitals Institute

Janelle Schrag, MPH

Research Intern

Holly Mead, PhD

Department of Health Policy
George Washington University

Mariellen Jewers

Doctoral Student
Trachtenberg School of Public Policy and Public Administration
George Washington University

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Executive Summary

The purpose of this landscape review is to investigate care models in the safety net that aim to provide high quality, equitable, patient-centered chronic illness care to underserved populations. This report reviewed literature on two prominent models: the patient-centered medical home (PCMH) and the accountable care organization (ACO). The findings of the literature review served to generate interview questions for 60 individuals including hospital administrators, staff, and patients at six safety net systems. Ultimately, this report aims to inform the potential development of PCORI targeted funding announcements to improve patient-centered chronic disease outcomes for safety net patients.

The literature review revealed mixed results about the impact of ACOs and PCMHs on the safety net. While there is evidence that PCMHs can improve outcomes for some chronic diseases (e.g., heart disease, diabetes), there is little evidence to support that they improve health equity and provider experience. Additionally, a significant number of studies have evaluated the impact of PCMHs on patient-centered outcomes but have shown conflicting results. Our review of the ACO literature revealed major gaps in our understanding of their impact on chronic diseases, patient-centered outcomes, provider experience, and health equity. However, in discussing the opinions of experts in the area of delivery system reform who point out a number of shortcomings and unintended consequences associated with each model, we conclude that further research is needed to inform the next phases of ACO and PCMH development.

Integration of the interview findings and literature reviews revealed five major factors that characterize effective chronic disease care models for vulnerable patients: *Communication Tailored to Vulnerable Populations, Team-Based Care, Customized and Personalized Care, Addressing Special Populations' Needs,* and *Use of Data and Measurement.* We also describe some specific barriers and facilitators to caring for chronically ill patients in the safety net, as well as contextual factors that enable or impede the success of these models. Finally, we offer our recommendations for future research by pointing out overall research gaps and specific research questions related to chronic disease management, patient needs, provider needs, and ACO/PCMH development.

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Introduction

The World Health Organization has identified several elements for improving primary health care, including reducing health disparities and organizing health services around people's needs and expectations (2013). While insurance reform is a primary focus for change, new approaches to care delivery are also emerging to improve quality, lower costs, and increase the efficacy of healthcare while addressing the evolving needs of the population. Disparities in healthcare and an aging population have placed health equity and chronic disease management among the most significant areas of interest. Furthermore, underserved populations are at a disproportionate risk of facing chronic illnesses and experiencing lower quality health care. The safety net, therefore, is critical to ensuring that those most at risk receive high quality, patient-centered care.

The purpose of this landscape review is to investigate models of safety net health care delivery systems that aim to provide high quality chronic illness care, reduce disparities and deliver patient-centered care for underserved patient populations. Within this context, we identify unique opportunities for the Patient-Centered Outcomes Research Institute (PCORI) to fund comparative effectiveness research to address current gaps in evidence related to providing high quality care to patients with chronic conditions who receive their care in safety net settings. This landscape review/topic refinement activity will inform the potential development of PCORI targeted funding announcements to improve patient-centered health outcomes in safety net settings.

For further reference, the "safety net" will be defined as: "...the not-for-profit CCHCs (Community Clinics and Health Center), county health departments, public hospitals and other health care providers that share a common mission to serve everybody who walks through their doors, regardless of their ability to pay" (COCCC, 2002). The safety net population includes anyone, whether insured or uninsured, who relies on safety net providers for care (COCC, 2002). This population experiences social and clinical vulnerabilities that make them challenging patients in healthcare, as depicted in **Figure 1.**

Figure 1: Qualities of Vulnerable Patients

Socially Disadvantaged:
- Racial and ethnic minority
- Live in Native American community
- Immigrant
- Live in impoverished neighborhood
- Have low incomes
- Have low levels of education
- Have low health literacy
- Reside in rural area
- Homeless
- Non-English-speaking
- Dual-eligible beneficiaries
- Uninsured/underinsured
- Have low social supports

Highly Vulnerable

Clinically Vulnerable:
- Have complex chronic illnesses
- Have acute serious illnesses
- Have multiple chronic conditions
- Disabled
- Mentally ill
- Substand abusers
- Cognitively impaired
- Frail elderly
- Patients nearing end of life
- Pregnant women
- Very young children
- High-utilizer patients
- High-cost patients
- Dual-eligible beneficiaries

(Lewis et al., 2012)

These patients often repeatedly present to the emergency department or incur multiple readmissions within a given period of time (i.e. one year), placing a substantial burden on the health care system. This patient subgroup is often referred to as "super-utilizers": "…individuals whose complex physical, behavioral, and social needs are not well met through the current fragmented health care system. As a result, these individuals often bounce from emergency department to emergency department, from inpatient admission to readmission or institutionalization…" (Diane Hasselman 2013).

This report to PCORI provides a landscape of what information we have—and what information is missing—on effective strategies in the safety net around caring for chronically ill patients at risk for health and healthcare disparities. The following sections are based on an extensive literature review and exploratory interviews with leadership and staff from six safety net hospitals.

Our Approach

The literature review examined the evidence on ACOs and PCMHs and was used as a starting point for understanding the features of delivery models that are critical to chronic disease management in the safety net. We anchored the literature review in the patient-centered medical homes (PCMH) and accountable care organizations (ACO) delivery models for two reasons: 1) ACO and PCMH models of care are highlighted in the Affordable Care Act as innovative systems of care that could increase quality, equity, and patient-centeredness; and 2) ACOs often incorporate PCMHs, which are widely supported by experts and practitioners as a viable delivery care model for underserved patients with chronic diseases.

We also used the literature review to generate interview questions for clinicians, staff, and hospital leaders from five Essential Hospital member sites as well as one non-member site. In order to capture a greater diversity of approaches to chronic disease care in the safety net, interview sites included not just ACO and PCMH models, but also an ACO-like integrated delivery system for children with special healthcare needs, as well as a community-based diabetes intervention program (see **Table 1**). We interviewed a total of 60 physicians, nurses, pharmacists, mental health professionals, community health workers, patient navigators, care coordinators, as well as administrators to hear their perspectives on their delivery system's strengths and challenges in delivering quality care to vulnerable patients. We also interviewed 10 patients from three sites in order to hear their preferences and expectations of chronic disease care.

Table 1: Summary of Site Visit Health Systems

Name of Hospital	Care Model Name	Care Model Type
University of Chicago	South Side Diabetes Initiative	Community-based diabetes intervention program
Denver Health	N/A	FQHC-based PCMHs
Hennepin County Medical Center	Hennepin Health	ACO
Memorial Healthcare System	Contract with Florida Children's Medical Services ("Little CMS")	Community-based integrated delivery system for children with special health care needs (CSHCN)
San Francisco General Hospital	San Francisco Health Network	PCMH model within an integrated delivery system
Santa Clara Valley Medical Center	Valley Homeless Healthcare Program	PCMH for homeless populations

The main section of this report integrates key findings from both the interviews and literature review, identifies the prominent barriers to providing high quality, equitable, patient-centered chronic disease care, and identifies important research gaps and research questions. We append to this report the full review of relevant peer-reviewed articles and studies as well as white papers and policy briefs on how PCMH and ACO delivery models function in the safety net, the extent to which these models improve outcomes for underserved and disadvantaged populations, and for people with disabilities, and how they impact the quality of provider work life (Appendix A). In addition, we include a brief report on our site visits and interviews (Appendix B), full tables summarizing the PCMH evaluation literature (Appendix C), a table describing ACO Medicaid demonstrations throughout the country (Appendix D), as well as the interview guides for provider and patient interviews (Appendix E).

Factors Characterizing Effective Chronic Disease Care Models in the Safety Net

This section of the report integrates key findings from both the interviews and literature reviews. Although this landscape review is centered around understanding models of safety net care delivery and their impact on chronic diseases, patient-centered outcomes, clinician outcomes, and disparities, what emerged are five factors that are critical to providing high-quality, patient-centered chronic illness care. These factors were discussed among our interviewees across *all* care delivery models, suggesting their importance regardless of operational systems. The factors are: Communication Tailored to Vulnerable Populations, Team-Based Care, Customized and Personalized Care, Addressing Special Populations' Needs, and Use of Data and Measurement. Throughout this section, we also describe a number of specific barriers and facilitators to caring for chronically ill patients within the models of care delivery we examined (See **Table 2**).

Communication Tailored to Vulnerable Populations

Building Relationships with Patients: The providers we met with greatly appreciated the importance of building relationships with safety net patients but also understood the inherent challenges of earning their trust and generating their commitment to a care plan.

For instance, one physician described the dangers of focusing exclusively on quality and utilization scores – outcomes which are important to staff but of no importance to patients: "What is the burden of treatment we put on patients when we push them and push them to try and get their blood pressure down, to try and get diabetes scores down? We just keep doing all these things to get their scores better, but they don't always like that. That's hard - that's a lot of medicines and a lot of visits and a lot of pokes and a lot of dietary changes. We have to try to make our hospital a place they want to come to, not an extra responsibility. We have to minimize the disruption we impose on people's lives." The focus on quality scores also tends to forget the financial burden that multiple health care visits pose for underserved patients and may be undercutting patients' ability to adhere to treatment regimens.

> **"What is the burden of treatment we put on patients when we push them and push them to try and get their blood pressure down, to try and get diabetes scores down? We just keep doing all these things to get their scores better, but they don't always like that. That's hard - that's a lot of medicines and a lot of visits and a lot of pokes and a lot of dietary changes. We have to try to make our hospital a place they want to come to, not an extra responsibility. We have to minimize the disruption we impose on people's lives."**
>
> *-Provider at Hennepin County Medical Center*

Safety net providers are more attuned to meeting patients on their terms and understanding how the context of financial hardship and other socio-economic drivers can significantly impact their health and health care. One nurse commented that many providers make the mistake of telling patients "you need to do x, y, and z." While some patients will respond to this type of communication, others will not. For example, one homeless patient refused treatment by saying:

"No, no. I've been on my own for so long. I've been living on the street. I don't even know how to operate my own apartment if you give me one." Nurses believe that their role is not to tell patients what to do; rather, they focus on meeting patients where they are and building care plans as a team. "If a patient tells me that they're not ready to give up drinking, my response is to say okay, then how do we help you find a place where you can drink and be safe?"

Another nurse noted the importance of listening to patient narratives. "One of the things that I learned is that clients have great narratives. If you invest the time into listening to their narratives, within those narratives are teaching moments. I really let my client lead me."

"Nobody cares how much you know, until they know how much you care." -*Patient at University of Chicago*

Several providers identified strategies for improving communication and building relationships between providers and safety net patients. For example, building social networks of care among patients and providers can be an effective way to build trust and generate commitment to treatment plans. The South Side Diabetes Initiative organizes cooking and exercise classes for patients. Class sizes are kept small so patients can get to know one another as well as their providers. A provider from the Initiative mentioned that these social activities have been helpful in terms of building patient confidence in small, achievable ways, and that they have helped patients "move from awareness to action in terms of behavior change." These activities also provide safety net patients – whose social needs are often unmet – opportunities to build friendships, receive affection, and have fun, while learning how to reduce risk and improve health. It is equally important to make patients aware that social programs are available to them, and to reassure them that they are safe and effective (e.g., one patient was concerned about the location of the food pantry and whether it was a safe area to be in).

Another provider from the South Side Diabetes Initiative also mentioned text messaging as an effective way to communicate with patients to remind them to check on their diabetes. Patients say that the text reminders make them feel cared for, more engaged in their care, and more likely to take providers' advice. To providers' surprise, most patients were willing to text message their blood sugar levels on a regular basis. Interestingly, Latino use of smart phones has increased significantly in recent years, and their cell phone use is said to be on par with other racial and ethnic groups (Lopez, Gonzalez-Barrera, & Patten, 2013). Therefore, the use of texting and apps to manage chronic disease might be an effective way to manage diabetes and other chronic diseases for Latinos as well as other racial and ethnic groups.

One significant challenge to building effective relationships among safety net patients is the issue of cultural and linguistic barriers. Staff of safety net organizations should be culturally and linguistically aligned with patients, which is not always realistic given the large array of ethnic patients served by safety net providers**.** One challenge noted during our interviews is dealing with patients who speak rare dialects, for example, Chin which is a dialect of Burmese. The costs for translating documents are high and safety net providers already face serious financial constraints. Providers mentioned that pictures and animated television shows in patient rooms can sometimes circumvent the need for written documents, but these are hard to come by. Therefore, there is a

significant need for visual-based communication tools to teach patients about their care plans for a wide range of chronic diseases.

Customized Care Plans: Care plans are an important tool that can be used to help chronically-ill patients manage their conditions and adhere to treatments and risk reduction behaviors. However, care plans must be useful to patients in order to be effective. For some patients, especially those with complex socio-economic challenges, care plans should consist of small, attainable goals. One community health worker described her care plan in the following way: "Right now we have a questionnaire that we call the Lifestyle Overview, and once the patient answers all of those questions, that helps us to identify those areas where they might have more needs, and then we talk with the patient about a plan to work on those areas. We have short term goals, things that need to be done right away or next week, and then we have the long term goals, like if they want to lose 50 pounds, that can't happen today, so what are we going to do in the short term to reach that weight loss in a year or two years or whatever."

Some providers suggested that care plans for complex patients should not be static documents – rather, they should evolve over time as the patient's health condition evolves and as new treatment options become available. Providers also expressed a need to explore alternative care plans. "The care plan should not be a piece of paper. Rather the care plan of the future should be a YouTube video, for example, where everyone has the chance to say what they think this patient needs, and all of the patient's caregivers provide input."

Some providers pointed out that part of the care plan discussion should involve addressing economic factors that impact care, especially for low income patients who are considering expensive treatments. Multiple medications, repeat visits to health care providers, and numerous tests can become an extravagance that low-income patients simply cannot afford. Including this context in the care plan would make patient adherence much more realistic. Some even stated that going beyond addressing clinical treatment costs (e.g., talking about the costs of cigarettes) would enable safety net patients to make better healthcare decisions.

Empanelling and Engaging Free-Floaters: Providers stated that they are looking for outreach strategies that are effective at engaging safety net populations in primary care. They mentioned the need for strategies to identify and empanel "free floaters" in the community – chronic disease patients who do not have a regular physician. There were questions about dealing with disengaged populations– migrants, drop-outs, and those reluctant to enroll. Having a large disengaged population creates significant challenges around measuring the impact of chronic disease care programs.

Providers mentioned the need for more targeted outreach communications and moving away from strategies targeting *adult populations at or below 75% of the FPL*, for instance. Within this population, there are those with chemical dependency, homelessness, mental health issues, etc. who have very different problems and needs. Providers are looking for specific communication strategies that subpopulations are more likely to respond to.

Team-Based Care

Multidisciplinary Teams: The establishment and use of multidisciplinary teams figured prominently in our discussions of patient-centered delivery models for chronically ill, complex patients. In addition to a primary care physician, our interviewees stressed the importance of teams that often included clinical and non-clinical providers, such as nurses, care coordinators, patient navigators, social workers, community outreach personnel, psychiatrists and other mental/behavioral health workers, and pharmacists. These additional team members can help address the complex and multifaceted needs that chronically ill, underserved patients face but that may fall outside the typical clinical interaction.

For example, use of multiple medications is among the biggest barriers to effective chronic illness management for low-income patients. Pharmacists, when integrated in care teams, are a valuable resource for primary care physicians who often feel confused about patients' medications, especially for co-morbid chronic disease patients. There is some evidence to suggest that including pharmacists in care teams can also improve health outcomes, specifically glycemic control and diabetes care, chronic hypertension, heart failure, and anticoagulation therapy (Choe, et al., 2012; Gerber, et al., 2010). Seeing that medications are the most common treatment modality for chronic conditions, the inclusion of pharmacists could be especially useful for meeting quality improvement benchmarks (Smith, Cannon-Breland, & Spiggle, 2013), while also addressing questions and concerns that patients might have about their medications. One pharmacist described the importance of having patients bring their medications into the clinic to identify prescription duplicates and medication misuse. Co-location of pharmacies in primary care clinics may also be beneficial for medication management and chronic disease outcomes as this enables providers and patients to keep track of medication use.

In the safety net, there is a strong need to integrate behavioral health into PCMH settings. One clinician reported, "Many of our patients have semi- to serious mental health illness and that has to be a critical element to complex care. If you don't integrate primary and mental health, you won't get good outcomes." Caring for mental health patients in primary care poses a number of challenges, thus presenting the need for behavioral health staff. For example, primary care doctors may feel inadequate as far as caring for patients with mental health disorders. "This patient came in, had all these medicines, and I don't understand what they are, and he wanted me to refill them. What am I supposed to do?" A psychiatrist consultant could support primary care doctors and assist with medication management for psychiatric drugs. Furthermore, the inclusion of mental health providers offers a fresh perspective for physicians in providing better patient care, and can also be a resource for staff in terms of moral support.

Patient navigators are also essential members of multidisciplinary teams. Their work is critical to helping underserved patients navigate a very complex health care system and can help ensure care is both effective and efficient by helping patients enroll in insurance plans, coordinate care and reduce redundancies. However, providers expressed some challenges as far as credentialing, training, and standardizing their work. Because patient navigators do not require an advanced degree, their academic backgrounds vary widely from holding a GED to being physicians trained in

foreign countries. We also heard a comment that there is high turnover among patient navigators, which may or may not be related to differences in training backgrounds.

Some providers expressed that multidisciplinary teams should include an even wider array of professionals. In light of the complex medical and social needs of safety net patients, providers felt that they would benefit from establishing more formal relationships with personnel from the local housing authority for patient housing needs, as well as the Department of Health and Human Services for assistance with disability applications and identifying other eligibilities. **"'**It takes a village to do this effectively', the village including not just health plans and health systems and mainstream providers, but also social service organizations (housing, childcare, education, financial assistance) and other critical community groups (correctional facilities, faith-based organizations, schools)" (Hasselman, 2013). However, some providers felt that they lack public relations and marketing skills to be able to forge these types of community relationships.

Many safety net institutions are also academic health centers and therefore experience high resident turnover, as well as cultural differences that accompany resident training (Tallia & Howard, 2012). This presents a challenge as far as establishing multidisciplinary teams due to disruptions in continuity of care. One provider reported, "...because the eye of the clinic is on teaching, it's hard to keep everybody informed when your residents are coming in one day a week, and keep continuity of care." Providers also felt that most residents are not prepared to address the social determinants of health and tend to reflexively apply a purely medical approach to patient care. As one physician said, "Once you come out of your residency training, you are woefully undereducated in thinking holistically about patient care." However, with a team-based approach, some of the continuity issues can be addressed through the continuous care provided by mid-levels, such as nurse practitioners and physician assistants.

Although providers agree that team-based care should include a range of clinical and non-clinical workers, they are still not clear on how best to design teams that are focused on caring for chronically ill patients who often present with many socio-economic challenges. Providers are asking: What is the ideal composition of this team? What is the best way for the team to interact? How do we define each member's role? How do we include community partners on the team?

Creating Team Cohesion: Safety net providers may have an advantage as far as readiness to implement team-based care in that they are accustomed to working with other healthcare professionals as alternatives to physicians (Witgert & Hess, 2012). As far as enhancing team performance, several teams we met with expressed the importance of carving out time on a daily basis to "huddle"- even if for a few brief moments in the morning and at the end of the day - to prepare for upcoming appointments, discuss anticipated challenges, and reflect on whether protocols need to be changed. The literature suggests that regular huddles allow PCMH team members to be on the same page (Martinez-Gutierrez, et al., 2012), and as one clinician put it, "without a huddle, everyone would go off and do their own thing."

> **"What would my care be like without my social worker as part of the team? Well, I wouldn't be able to get my say-so. Other people would be talking for me instead of me talking for myself!"** *-Patient at Hennepin County Medical Center*

One team appeared to be particularly high-functioning and conveyed to us that over time they had developed a strong sense of camaraderie. During our interview with the team, they made statements like "everyone jumps in to help everyone else out", and "we all have each other's backs." Interestingly, when asked how they were able to form such a strong team, they offered the following explanation: "It starts with space. One of the reasons we became so integrated was we had an office about a quarter the size of this room, for about 8 people. And that was it, so we're on top of each other. It wasn't like this grand design, but once you get used to it, even when you get more space, it's like oh, I don't want to be this far away." While the lack of space in this instance spurred the interactions of the team, the point is that constant interaction and communication among team-members - however, it is accomplished – is critical to team cohesion and a better care experience for chronically-ill, vulnerable patients.

Benefits of Team-Based Care: While primary care staff eventually recognize the benefits of team-based care, they often are initially hesitant about financial implications, staff burnout and turnover, and short-lived tendencies of such restructuring (i.e., "trendiness") (Quinn, et al., 2013). This was found to be true at most of the sites, where physicians were initially resistant but eventually saw that coordinating care with a team is best for patients and providers.

One physician said, "I think for me, as a narcissistic physician, I always thought that I was supposed to do everything and that I was supposed to be the best at doing everything. And then working with other people, it kind of made me realize, wow, others can teach patients better than I can. And they'll do it in a way that patients really appreciate more than when I try to. Everyone on the team has a skill I don't have, and I can let them do that piece of it and not try to do it myself." A team member reported that working in the presence of other clinicians is awkward at first and makes them feel self-conscious, but eventually everyone gets used to it. He went on to say, "If it wasn't like this, I would not be working here." Multidisciplinary teams allow providers to use their time more effectively because they can rely on their team members for help. The whole team takes ownership of the patient's health and feels that they each play a significant role in the care process. This translates to patients feeling truly cared for, and therefore more willing to improve their health behaviors. As Jeffrey Brenner recently commented, "High-utilizer work is about building relationships with people who are in crisis. The ones you build a relationship with, you can change behavior" (Gawande, 2011, quoting Jeffrey Brenner on the Camden Coalition of Healthcare Providers).

Safety net institutions are highly susceptible to staff burnout and turnover due to high-demand and limited resources (Quinn, et al., 2013). This may be especially true for clinics that serve over 30% minorities (Varkey, et al., 2009; Lewis, et al., 2012). However, multidisciplinary team-based care may act as a buffer in such challenging and stressful work environments. In general, providers feel more satisfied and less stressed when working in teams because they feel that care is more effective and efficient. "We feel like we're all making a difference and that we are empowered." Working in a team also creates a sense of accountability and companionship. One provider stated, "If somebody burns out or melts down or something, that's going to affect everybody else, and so we do have a sort of responsibility to each other too."

Additionally, team-based care can provide patients with a sense of empowerment. Upon describing what her care would be like without a social worker as part of her care team, one patient stated, "Well, I wouldn't be able to get my say-so. Other people would be talking for me instead of me talking for myself!" This patient went on to describe how, with the help of her care team, she is able to maintain her autonomy and independence.

Customized and Personalized Care

"Frontloading" Socio-Economic Needs: Providers were well aware of the myriad of socio-economic problems that exacerbate poor health outcomes for safety net patients. As one care coordinator put it, "This is pretty much how patients see the world: What's going on today in my life is more important than what's going to happen in five years or a month. So it is a very interesting and very difficult population. But when you have successes it's very rewarding… because it's like a miracle." As a result, care teams tend to prioritize interventions that address patients' basic needs (e.g., food, housing, jobs) over medical interventions. For instance, they realize the futility of addressing diabetes in homeless patients who do not have a refrigerator to store insulin.

Providers point out that they have dual roles – one to address patients' basic survival and social needs, the other to address medical needs. In general, the care models we reviewed seem to recognize the importance of mitigating the harmful consequences of social factors that contribute to health disparities. Providers are determined to figure out how to care for patients whose disparities have caused them to have worse outcomes, for instance, by routinely screening for social determinants of health during medical visits.

Safety net providers pointed out that research on chronic disease management in underserved populations tends to fall short in two ways: First, very few studies address the impact of the social determinants of health (e.g., food insecurity) on health outcomes (e.g., diabetes management). Second, chronic disease management research tends to focus on patients with single chronic diseases. However, this is not reflective of the reality in the safety net, where it is very common to find patients with co-morbidities as well as a host of socio-economic challenges. Therefore, there is a significant need for studies that will identify effective chronic disease management programs that take into consideration co-morbidities and socio-economic impediments to health.

Risk-Stratified Healthcare: Some experts have suggested that it is unclear whether the PCMH model is appropriate for complex or high-risk patients. Despite the medical home being theoretically conceived to eliminate fragmentation of care and enhance outcomes for patients with complex needs, as complexity increases so do the challenges of delivering care to complex patient populations (Mead, Andres & Regenstein, 2013). These findings may suggest that tailoring the PCMH according to practice size, patient population, diseases, and other factors may be more appropriate (Berenson, et al., 2008; Stevens, Pickering, & Laqui, 2010).

In several cases, the hospitals we visited had tailored their medical homes by stratifying patients according to illness severity and presence of complicating factors (e.g., co-morbidities and socio-economic challenges). Typically, the highest tiered patients are those who have poorly controlled

chronic diseases, and other complicating factors, and therefore require the most intensive, personalized care.

According to providers, patients love the attention they receive at the high intensity clinic and point out that patient satisfaction scores are now "off the charts." In describing their healthcare experiences before joining the high intensity clinic, one patient told us: "It feels like every time I come, I feel like I'm a Ping-Pong ball, thrown from one specialist to another, and no one knows what's going on. And here [at the high intensity clinic] I come and every single time something continues to happen." It is not surprising that patients are very satisfied with this care model, as continuity and care coordination are both high. Safety net patients often suffer from family dysfunction, mental illness, disability, and homelessness, may also appreciate this model as it fulfills their needs for attention, social interactions, and affection in hospital settings (Kangovi, 2013).

Providers are confident that the high intensity clinic is greatly improving patient experience, and as for health outcomes, their sense is that patients are "getting better fast"; however, because most of these programs are in their infancy, it is too soon to determine exactly how risk stratification will impact chronic disease outcomes, warranting the need for future research in this area.

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Capacity to Provide Customized Care: Research shows that care coordination and integration, especially for chronic disease management, requires significant technical assistance and staffing changes (Rittenhouse, et al., 2013), and that patients with co-morbidities are more expensive to treat (Hoff, 2010). Providing high-intensity care for complex patients is especially labor and resource intensive. Therefore, an obvious challenge and frustration that arises relates to scalability: how do you take a highly individualized, unique program to scale? At Hennepin Health for instance, the highest risk group clinic cares for only 200 patients even though many others in the community would benefit from this care model. A related challenge has to do with determining panel size: what is the ideal caseload that would allow providers to effectively care for highly complex, disadvantaged patients, without experiencing burnout or compromising on providing individualized, patient-centered care?

Providers at San Francisco General Hospital pointed out the advantage of serving patients within a small contained geographical area: "I believe we have a good system because it's small, you know, 7 by 7 miles. Would we have been able to do this in LA where the geographical area is magnified by a factor of 10? It's hard to say because I think part of what helps is the regionalization and the understanding of communities, geographically, ethnically, and socially. I don't envy the systems in LA." Therefore, another potentially fruitful area of research is to investigate the impact of a system's geographical expanse on clinical and patient-centered outcomes.

Enhanced Access: The literature describes that safety net providers are often faced with the dilemma of choosing between unfettered access for all new patients and limiting access to better address complex patient needs (Rittenhouse, et al., 2013). In addition, having to spend more time with patients who have complex medical and socio-economic needs means that continuity of care is sometimes compromised. At times, patients are unable to see their usual providers – presumably because they are tied up with other complex patients – leading patients to be seen by different providers. One provider said, "In terms of challenges, capacity is a big issue. We want to spend enough time with each individual patient so we can actually make a difference, because if we're not doing that we're completely wasting our time. But that means limiting how many patients you can enroll at any given time in our program."

Teams discussed one way to overcome this challenge - being flexible with their schedules and appointments in order to accommodate patients with more complex needs. For example, if a provider ends up seeing one patient for only five minutes, they will spend extra time with patients requiring more extensive visits.

> **"In terms of challenges, capacity is a big issue. We want to spend enough time with each individual patient so we can actually make a difference, because if we're not doing that we're completely wasting our time. But that means limiting how many patients you can enroll at any given time in our program."** *–Provider at San Francisco General Hospital*

Another issue that challenges access to care relates to high no-show rates. One way to remediate the problem is to rely exclusively on same-day appointments. However, patients tend to complain about this, and furthermore, same-day appointment scheduling tends to discourage the use of preventive care (Beal, et al., 2007; Beal, Hernandez, & Doty, 2009; Parker, et al., 2012). At the same time, scheduling future appointments increases no-show rates and consequently inhibits providers from using their time efficiently. The providers we met with expressed a lot of frustration around this issue as well as a need for effective yet patient-centered scheduling strategies.

For safety net providers, enhanced access also means emphasizing face-to-face provider-patient interactions, ideally in the patient's community. Although some patients are uncomfortable with the idea of letting providers into their homes (especially low SES patients who might feel embarrassed to show their living conditions), home visits are an effective way for providers to understand and eliminate environmental barriers to health. For example, in a recent review of high super-utilizer programs, it was found that medication management is more effective in the patient's home rather than in the clinic.

Addressing Special Populations' Needs

Hoff (2010) recommends that the next phase of PCMH evolution should focus less on "supply-side" definitions where the emphasis is on infrastructure, personnel, IT, and organization of care delivery. Instead, the focus should be "demand-sided" where implementation takes into account what the consumer wants and meaningful differences across consumer cohorts. To achieve this, it is important to seek input from patients so that the care model can be tailored to the needs, preferences, and expectations of various patient groups.

Safety net providers face unique challenges in terms of dealing with specific populations that have greater needs and are harder to reach. During our site visits, we noticed that patient and family advisory groups figured prominently in the organization and that patient opinions and preferences of chronic disease care are weighed heavily by leaders. Safety net providers pay close attention to meeting the needs of specific patient cohorts and expressed a number of successes and challenges in addressing particular disease states.

Mental Health Patients: Mental health patients who are depressed or anxious, or who have more severe mental illnesses, may have difficulties making phone calls to schedule appointments, traveling to a clinic, sitting through a visit with a care team, or receiving care at home, which further completes the ability to provide high-quality, equitable care. One provider described a patient who would walk to the bus stop on their way to an appointment, but just before boarding would return home because the journey would trigger an anxiety attack. Additionally, home care may not be a good alternative for some patients, especially low-income patients, who may not want to let others see their poor living conditions.

End of Life (EOL) Patients: Providing palliative care to EOL patients is another area that safety net providers found to be challenging, especially when it comes to having EOL conversations that go beyond discussing resuscitation. Overall, they expressed that palliative care is underutilized with safety net patients which compromises the quality of EOL care. Providers sometimes feel like they are unsure about how to broach the subject and are often concerned that an EOL conversation will make patients feel that they are being "written off." Patients may not even be aware of the concept of palliative care, therefore safety net providers are looking for strategies that will help them educate EOL safety net patients on palliative care options.

Chronic Pain Patients: Patients with highly complex medical conditions often experience chronic pain, which frequently goes hand-in-hand with narcotic use. Providers are unsure of the impact of narcotic use on medication adherence and chronic disease management but feel that narcotic use can create both opportunities and hindrances to chronic disease care. On one hand, narcotic use can complicate care because the patient is so focused on their pain that they neglect their other medical needs and misuse their medications. On the other hand, providers believe that narcotic use is an opportunity to strengthen adherence to care plans because pain brings patients into the clinic more frequently and regularly.

Providers from the Santa Clara Valley Homeless Healthcare Program (VHHP) described how caring for chronic pain patients is challenging and burdensome for providers. One provider told us: "Chronic pain patients would come into the clinic and it would be this chaos every time. These patients were calling every day, coming in every day, so the entire clinic staff was exhausted and frustrated and didn't know what to do to help them." Providers at VHHP re-organized care for chronic pain patients by creating group sessions. This set-up now allows patients to seek support from other patients and helped providers feel less burdened. "…While it was still hard, it was only hard for an hour at a time as opposed to all day, sometimes all week. And so everybody liked it."

Geriatric Patients: In some cases, earning trust and building rapport with elderly patients can be difficult. One social worker pointed out that geriatric patients are afraid to lose their autonomy and

independence. They are skeptical of their providers and believe that their provider's goal is to place them in a nursing home. Some have suggested that elderly patients have different expectations of team-based care. Many prefer to be seen by a single authoritative physician as they believe that physicians are more competent than nurses and other health professionals (Hoff, 2010). However, a clinical social worker at a geriatric clinic reported, "I think I would say that the majority of the time people really respond well to [team-based care]. Especially the geriatric population, it seems like most folks really like that and they really feel like it goes back to 'people are hearing my needs, or are taking me seriously.'"

Persons Living with HIV/AIDS (PLWHA): High-risk patients, such as PLWHA, are much more difficult to retain in primary care (Sitapati, et al., 2012). Especially within the safety net, PLWHA who have chaotic social factors such as homelessness, concurrent substance abuse, mental illness, or all of the above, tend to have poor levels of ongoing engagement. Conversely, there are some sub-populations of PLWHA, such as foreign-born Latinos/Latinas, that connect to care exceedingly well and have been proven to remain more engaged than other groups. Therefore, certain PLWHA populations require much greater and more ongoing outreach efforts. More research is needed to determine who these populations are and what type of outreach would be most effective.

Homeless Patients: The most significant issues for homeless patients are access to care and use of preventive services. Transient populations require flexible scheduling options, especially same-day access. However, this type of scheduling presents a significant problem: Relying exclusively on same-day appointments means that transient populations are less likely to be proactively managing their care and receiving preventive services (Martinez-Gutierrez, et al., 2012). While providing same-day access is convenient for homeless patients, it also encourages them to only see their providers during acute stages of illness or injury. The Santa Clara VHHP has created a system that incorporates both walk-ins and scheduled appointments. "We have designated times that are kind of appointment slots, and they're for patients that have to come because their prescription is up or due, and then even then, we often will give patients the choice. Like, 'This is an option for you, will that work for you? Or is that too much pressure for you? Is that too hard for you?'"

Many homeless patients find scheduled appointments to be stressful and therefore prefer walk-ins. One reason homeless patients have trouble accessing care relates to transportation limitations. Co-locating services offers a solution to this problem, as well as dispersing clinics throughout the city so that they are within walking distance. At the Santa Clara VHHP patients truly appreciated the co-location of the shelter, primary care services, mental health services, and community-based resources. "I have everything I need all in one place, and that is typically hard to find."

Because homeless patients tend to move from one place to the next, VHHP provides care via mobile vans and backpackers. VHHP is so strongly committed to serving homeless patients that providers will drive around the region in a mobile unit to provide care for those in need. Occasionally, transient populations will settle in areas (e.g., creeks) that make it impossible to vehicles to access. In these cases, VHHP will send backpackers carrying medical supplies to hike into these areas and provide care.

Use of Data and Measurement

Access to Real-Time Data: Many providers emphasized the need for real-time data, such as a fully integrated electronic health system that keeps providers informed of the most current patient information, including notifications of ED visits and inpatient admissions. Real-time data is especially important when designing and tailoring care for super-utilizer patients.

San Francisco General Hospital implemented a patient survey technique that allows them to receive real-time, continuous feedback on patient experience. Patients are given a poker chip and asked a CG CAHPS related question. Upon leaving an appointment or being discharged, patients drop their poker chip into a wall display that provides two answer choices: yes or no. One provider reported, "...At the end of the clinic, whoever is assigned can just count how many said yes or no to something and see, in kind of real time, whether the improvement that the clinic is working on is making a difference."

One provider described the remarkable impact of real-time data on staff members. "Data at their fingertips, a wall where we were tracking data that they went to everyday because they wanted to see if they were they making a difference in mammograms, waiting eagerly for the next set of data to come out... that was such a motivating factor for teams, and so there was just such an uptake. Even people that weren't maybe operating at their highest level or skill set were all of the sudden taking interest."

In addition to real-time data, there is also a need for data that will allow providers to determine their community's needs. "What about patients we're not taking care of? How can we quantify the bigger universe of patients?" Seeing that safety net populations often present with medical and social complexities, being able to map and trend chronic diseases, especially mental health disorders, is vital as far as designing care models that are appropriate for these patients.

Alternative Assessments: Evaluating the successes of integrated delivery systems, especially in regard to specific core components of PCMHs and ACOs, requires the development of new evaluation measures. Providers are asking, "How do you measure and quantify the quality of care coordination? It's a component highly emphasized in all models, but it's the first thing to be dropped because it has so far been unjustifiable in effectiveness with data and results." As was shown in the literature, there is a lack of evidence about which processes actually improve care quality and reduce the cost of care (Sidorov, 2008). Regarding team-based care, providers are wondering how to go about measuring effective collaboration among multidisciplinary teams. As was discussed in the literature review annexed to this report (see Appendix A), core PCMH and ACO components such as *collaboration* and *coordination* are murky concepts and therefore are interpreted and applied differently in different settings.

One provider mentioned the need for an assessment of patient *happiness*, in addition to quality of life and patient experience. "I would like a measure of patient happiness, not satisfaction with the clinic, but with their overall happiness. And to see if it changes as their health improves... Because I think there will be some kind of correlation [between happiness and health]."

An assessment of behavioral motivation and willingness to engage in care is another instrument that providers would find especially helpful for serving safety net patients. With complex patients, it can be hard for providers to know when to "give up"– at what point do you cease care because the patient is not willing to engage, and is furthermore draining resources, both financial and emotional? A behavioral motivation assessment would also help providers determine the elements in the provider-patient interaction that may trigger patients to engage or disengage in their care.

Table 2: Summary of Specific Barriers and Facilitators to Delivering High Quality, Equitable, Patient-Centered Chronic Disease Care

	Facilitators	Barriers
Communication Tailored to Vulnerable Populations	• Listening to patient narratives • Building social networks among patients and providers • Using text messaging as a means of continuous communication with patients • Cultural and linguistic alignment between patients and providers • Customized, dynamic care plans with small, attainable goals	• Focusing exclusively on performance metrics, e.g., quality and utilization scores which do not matter to patients • Static care plans that exclude patient input • High costs for translation services, especially for rare dialects • Lacking specific communication strategies that subpopulations are likely to respond to
Team-Based Care	• Establishing multidisciplinary teams with a wide array of clinical and non-clinical providers • Performing daily team huddles • Creating environments to foster team building (i.e. small group work spaces)	• Lacking integration between medical and behavioral health • Standardizing the credentialing, training, and work of patient navigators • Lacking team integration with local government authority and services • Lacking public relations/marketing skills to establish relationships with potential community partners • High resident turnover rates • Residents are unprepared to provide holistic care/address social determinants of health • Uncertainty about the ideal composition of care teams

	Facilitators	Barriers
Customized and Personalized Care	- Addressing patients' social, behavioral and medical needs - Risk-stratified care and implementation of high intensity clinics - Serving patients within a small geographic area - Flexibility in scheduling and appointments - Incorporating home visits to identify environmental barriers to health	- Limited understanding of the impact of the social determinants of health on health outcomes - Limited strategies on caring for comorbid patients - Scaling high intensity care programs to larger groups of patients - Limited staff capacity - High no-show rates
Addressing Special Populations' Needs	- Tailoring care models to meet the needs of specific patient cohorts - Groups sessions to treat chronic pain patients - Colocation of medical and behavioral health services, as well as community-based resources	- Some populations have difficulties scheduling or showing up to appointments - Palliative care is underutilized with safety net patients - Chronic pain patients are burdensome to providers - Difficulty earning trust and building rapport with geriatric patients who may be uncomfortable with team-based care - HIV/AIDS patients are harder to retain - Homeless populations face challenges regarding access to care and use of preventive care
Use of Data and Measurement	Access and use of real-time data	- Lacking resources to establish coordinated data systems - Lacking data to address broader community needs - Limited evaluation tools for measuring impact of care models - Lacking assessment tools for measuring patient happiness, behavioral motivation, and willingness to engage

Contextual Facilitators and Barriers to Effective Chronic Disease Care Models in the Safety Net

Chronic disease care takes on a new meaning in safety net settings where patients typically present with numerous medical and social complexities. Throughout the synthesis, we discussed Communication Tailored to Vulnerable Populations, Team-Based Care, Customized and Personalized Care, Addressing Special Populations' Needs, and Use of Data and Measurement as the five key features of effective chronic disease care models. However, we also uncovered three contextual facilitators that give rise to the features associated with effective chronic disease care models, as well as two contextual barriers that impede the success of these models.

Contextual Facilitators

Leaders recognize that a one-size-fits-all approach to delivering chronic disease care can have negative repercussions on certain populations. A standardized approach prevents systems from fully aligning with the needs and preferences of different patient cohorts. In safety net settings, there are a number of "on-the-ground" constraints that surface when dealing with high-risk, complicated patient groups. Care models are therefore designed and implemented from a patient perspective and sensitive to a population's specific needs and challenges.

> **"We can't keep people well without investing in them upfront. The system can only be developed by hiring the people to provide intense, coordinated, personal care. It is our complete firm and literature based conviction that this is an effective way to do it."** *-Physician Leader at Hennepin Health*

Leaders are willing to invest the resources needed to make an impact on one patient at a time. When implementing PCMH and ACO-like models, leaders go above and beyond the formal standards to ensure that their population's needs are met. They encourage providers to adopt a holistic approach to care by paying attention to each patient's specific medical, behavioral, social, and economic circumstances. At the center of chronic disease care delivery we find multidisciplinary teams consisting of clinical and non-clinical workers - some employed by the hospital, others employed by the community - but *all* focused on addressing the social determinants of health.

The main emphasis is on people rather than systems or infrastructure. The key to delivering equitable, high quality, patient-centered chronic disease care is realizing people drive change while infrastructure is used to support change. In the PCMH sites, staff acknowledged that formal PCMH recognition does not automatically result in care that is truly patient-centered; rather, the key is to work with providers who are unwaveringly compassionate, patient, persistent, and flexible as they recognize the time it takes for patients with socio-economic challenges to build trust and engage in care. Likewise, PCMH implementation does not guarantee effective chronic disease management; the key is to enlist physician champions who are passionate about particular disease states.

Contextual Barriers

Care models are limited by human and financial resource constraints. Limited staff capacity is a major impediment to caring for complicated patients who require a lot of individualized attention.

Chronic disease management in safety net settings is extremely labor and resource intensive, especially in high-intensity clinics where the focus is on treating comorbid chronic disease patients who also present with mental health disorders and/or socio-economic challenges. Staff capacity is also a major limiting factor as far as scaling chronic disease programs to larger groups of patients. Though providers have a strong desire to grow and spread these models, they are also aware of the trade-off with providing personalized attention. Financially speaking, implementing and sustaining any chronic disease care program – whether embedded in a PCMH, ACO, or other care models – requires significant costs that are beyond the means of many safety net systems. Seeing that financial constraints will be a continuing reality for safety net providers, the need for chronic disease care programs that are low-cost and easy to implement cannot be overstated.

In addition, many efforts go unrecognized and unrewarded. Safety net providers are driven by a strong sense of social justice and are committed to caring for vulnerable patients simply because "it's the right thing to do." However, much of the "extra" work that is required to coordinate and provide care to medically and socially complex patients often goes unnoticed. In addition, most community-employed partners receive no compensation for teaming up with hospital staff to care for these patients. While many chronic disease programs are fortunate to employ providers willing to work out of the goodness of their hearts, formal recognition and compensation could encourage an even more community partners to participate in caring for vulnerable patients.

Complex, vulnerable patients present unique challenges to chronic disease management. A significant amount chronic disease research and innovations have emerged in recent years, however, we have yet to see programs and treatments that consider two complicating factors - factors that are typical to safety net populations and tend to exacerbate chronic disease outcomes: Co-morbidities and socio-economic challenges.

Safety net patients also present significant challenges around scheduling, engagement, empanelment, and outreach. Factors such as homelessness, cultural and linguistic barriers, drug use, and immigration status make it harder for vulnerable patients to access care, schedule and show up to appointments, and engage in care plans. This in turn creates an additional set of challenges for providers, e.g., high no-show rates cause providers to be less efficient with their time; transient populations make it harder to evaluate program impact; unengaged populations limit the ability to improve population health. In short, chronic disease management for vulnerable patients is a highly complex process requiring deliberate, targeted strategies. Unfortunately, the evidence base that exists to support these strategies is very limited.

Recommendations for Future Research

In this section, we present some recommendations for future research that were identified in the process of reviewing the PCMH and ACO literature as well as the interview reports. Though not exhaustive, these recommendations are intended to convey general directions for future research as well as provide some specific examples of important research questions.

Overall Gaps

- Evaluations of the effectiveness of the PCMH model in the safety net are underway; however, it is unclear whether these evaluations specifically look at issues related to safety net populations such as health equity. Evaluations of the implementation of these delivery system models should include explicit outcomes on disparities as well as other patient-centered outcomes related to safety net populations. Similarly, as evaluations of ACOs begin, measures addressing safety net populations should be explicitly included, particularly when looking at payment systems of this new model.

- Given that ACOs are less likely to form among safety net providers, Medicaid ACO demonstrations and rural and regional ACO collaboratives can prevent ACO ineligibility. At the same time, caring for patients within larger geographical areas may be more challenging, especially in terms of allowing providers to understand their communities' needs and provide chronically ill patients with personalized, intense care. Therefore, research is needed to investigate how different Medicaid and other regional ACOs are structured, and how those structures impact disparities in chronic disease care. Community Care Organizations, which are now emerging in some states as "safety net ACOs" or "medical neighborhoods", might be particularly important study sites, given their emphasis on addressing the social determinants of health and design as a broad cross-section of community partners.

- Team-based care is a major topic of research in the current literature around effective and efficient use of providers. We saw in both the literature and our site visits that in the safety net, team-based care can be used to provide more appropriate and patient-targeted care to complex, chronically ill patients. The best combination of providers on a team, however, has not been adequately tested in the safety net setting. Studies comparing different team compositions could look at outcomes that we heard were particularly important for safety net populations, including behavioral health measures, medication adherence, coordination and continuity and an overall patient-centered index of high quality care.

- Insurance and delivery system reform are critical factors in improving the health care of safety net populations. However, if patients are not aware of their options to enroll in new insurance products or are hesitant to engage in the health care system, these reforms will not work. The literature and interviewees from our site visits identified the importance of reaching out to hard-to-reach populations to facilitate engagement. Studies are needed to examine different outreach strategies to compare their effectiveness in engaging safety net

populations in primary care, and in identifying and empaneling "free floaters" in the community. Outreach strategies should focus on high-needs populations, such as safety net patients with co-morbidities, as well traditionally disengaged populations, including migrants and those reluctant to enroll in the system.

- Both the literature and the site visits suggest the needs of safety net patients, who face unique challenges given their socio-economic situation and often medically complex conditions, may not be adequately met by delivery system models such as the PCMH and ACO. Tools, such as a patient-centered index of high quality care that defines quality according to the patients' needs, are necessary to ensure these patients are getting equitable, high quality care. Such a tool can then be used to compare the effectiveness of existing models of care with high performance including a focus on patient outcomes, as well as more typical quality and cost measures.

- Risk-stratified care is a delivery system used in many disease models of care. Applying the same stratification of care to safety net populations could allow care to be both more targeted and more efficient. Studies comparing risk-stratified clinics to typical care in a safety net setting could test the effectiveness of this concept of care for a new population.

- Care plans can help patients with chronic illnesses manage their conditions. However, as the literature and our interviewees suggest, care plans can be viewed as overwhelming for underserved patients. The development and testing of care plans specifically targeted to the unique needs of safety net patients is warranted given the disproportionate rates of chronic conditions in this population and the concern for non-adherence to treatment plans. Information content and mode of care plan (smartphones, YouTube videos, etc.) should be developed and compared in these types of studies.

- Enhanced access is a strategy often discussed and implemented in safety net settings to improve efficiency and quality of care. However, safety net providers struggle with a sense of "trade-offs" between efficiency and quality when using different access techniques. A systematic comparison of different types of enhanced access, such as open scheduling, group visits, home visits, e-consults or other forms of enhanced access could provide much needed information for providers in terms of how patients respond and whether and how these forms of access improve efficiency and quality.

Specific Research Questions

Chronic Disease Management

- How can we design chronic disease management programs that take into account the impact of co-morbidities and social determinants of health? (See p.11)
- More research is needed to systematically evaluate the effects of risk-stratified healthcare on chronic disease outcomes. What is the impact of risk stratification on health outcomes? (See p.11)

- As technology advances, and becomes ever more portable (e.g. smartphones, tablets), what are alternative ways (e.g., tools or applications) to manage chronic disease? (See p.6)
- What is the impact of the PCMH on COPD, hypertension, rheumatoid and osteoarthritis, osteoporosis, cancer, Alzheimer's/Dementia, multiple sclerosis, lupus, obesity, and depression/anxiety? (See p.A8)

Provider Needs

- Many providers have expressed feelings of inadequacy when it comes to caring for patients with mental health needs. How can primary care providers feel more supported in this area so that they can better care for their patients? (See p.8)
- In addition to standard measures such as quality of life, some providers are asking for an assessment of patient "happiness." Similarly, is there an effective way to measure "burden of care", and how providers might account for achieving performance and quality outcomes while still respecting patients' preferences? (See p.16)
- What type of behavioral assessments would help providers determine the elements in the provider-patient interaction that may trigger patients to engage or disengage in their care? (See p.16)
- What is the general impact of different delivery system models (e.g., PCMH and ACO) on quality of provider work life and staff retention? (See p.A13)
- What is the ideal composition of a multidisciplinary team in the safety net? What is the best way for them to interact? How do they define each member's role? How do they include community partners on the team? (See p.9)
- What are strategies that may be useful in training the patient navigators in order to create standardization despite their diverse qualifications; and what accounts for high turnover among patient navigators? (See p.8)
- By what means can the medical education system, or resident training, better prepare residents for practice in the safety net? (See p.9)
- What are effective measures/assessments of care coordination and collaboration? How will providers know they have succeeded with these measures? (See p.16)
- What is the best way to engage disengaged populations ("free-floaters", migrants, and those reluctant to enroll)? What are specific outreach communication strategies that subpopulations are likely to respond to? (See p.7)

Patient Needs

- How can patients be meaningfully included in the process of transforming a practice into a PCMH in order to establish a medical home that is truly patient-centered? (See p.13)
- What are effective strategies for scheduling appointments in such a way that balances staff productivity and patient satisfaction while still encouraging use of preventive care, especially for underserved populations? (See p.15, A5)
- How can care plans be designed so that they are dynamic rather than static, and reflect patients' evolving needs, as well as the preferences and opinions of all caregivers? (See p.7)

- What is the ideal caseload that would allow providers to effectively care for highly complex, disadvantaged patients, without experiencing burnout or compromising on individualized, patient-centered care? (See p.A5)
- What are effective visual-based communication tools to teach patients about their care plans for a wide range of chronic diseases? (See p.7)
- What is the best way to provide care for super-utilizer patients in terms of interventions, settings, and providers? Which interventions are appropriate for which patients, and in which settings? (See p.A5)
- What strategies would help providers in discussing the economic impact of treatments with vulnerable patients? (See p.7)
- Some patients may suffer from severe anxiety disorders that may make traveling to a clinic, receiving care at home, or sitting through a visit with a care team very challenging. What strategies can primary care providers use to better provide care for these patients? (See p.14)
- What are effective strategies for communicating and providing palliative care to safety net patients? (See p.14)

Health Equity

- What strategies can assist pharmacists' use of non-literary-based communications techniques? (See p.A10)
- How can the social determinants of health be better integrated into healthcare research and clinical interventions? (See p.A14)
- How do the PCMH and ACO models apply to specific populations such as geriatrics, pediatrics, or the homeless, and how can providers tailor their services to provide appropriate and effective care? (See p.13)
- How do you expand highly individualized, super-utilizer programs to larger groups or subpopulations? What is the impact of a system's geographical expanse on clinical and patient-centered outcomes? (See p.12)
- What is the impact of the PCMH and ACO models on reducing disparities? (See p.A14, A25)
- What is the true impact of capitated payments on disparities, and what will this mean for the ACO model? (See p.A25)
- The literature theorizes that FQHCs may be uniquely positioned to adopt the PCMH model and ultimately reduce disparities. What is the true impact of FQHC-based PCMHs on health disparities? (See p.A6)
- Community care organizations (CCOs) have emerged in some states as ACOs tailored to the safety net. What is the ideal ACO for the safety net? What community-based organizations should be included on the community health team? How do you create an integrated network of community groups? What is the best way for them to interact? (See p.A20)

Informing the Next Phases of PCMH and ACO Development

PCMHs and ACOs were generally designed to improve quality of care, patient experience, and reduce healthcare costs. However, a number of real-world constraints come into play when

implementing these models, especially in the safety net. Researchers and other experts in the area of delivery system reform have pointed out a number of shortcomings and unintended consequences associated with each model as they pertain to population health, health equity, and implementation in safety net settings. Although some of the issues presented in **Table 3** are speculative, they highlight the need for research to investigate whether ACOs and PCMHs will fall short in important areas. ACOs and PCMHs are still in their infancy and further research could potentially inform the next phases of their development.

Table 3: Shortcomings and Unintended Consequences of PCMH and ACO

	PCMH	ACO
Implementation in the Safety Net	**Access to care is limited** Employees often are faced with the dilemma of choosing between unfettered access for all new patients and limiting access to better address complex patient needs, suggesting that providers in safety net settings are faced with decisions that force trade-offs between PCMH core components (Rittenhouse, et al., 2013) **Enhanced quality improvement is a challenge** Inadequate supply of well trained staff dedicated to QI (Rittenhouse, et al., 2013); Higher PCMH ratings lead to higher costs and safety nets are resource constrained (QI is expensive) (Nocon, et al., 2012) **NCQA Certification harder to pursue** Many safety net providers do not have time or resources to apply for PCMH recognition. (Berry, et al., 2013)	**Shortages in primary and specialty care** Generally speaking, safety net providers (e.g. FQHCs, community clinics, public hospitals) have difficulty attracting primary care physicians and specialists due to low reimbursement rates (Shortell, 2012: blog) **High financial risk profiles and disadvantaged populations.** Safety net providers are less attractive to ACOs not led by safety net providers. ACOs might have incentives to attract partners that have low-risk patient populations, which would make safety net health care providers unattractive because of their high financial risk and disadvantaged patient profiles (Bachman, 2011) **Limited the technological capacity** Safety net providers may lack the technology to collect and report data on quality metrics. This may prove additionally challenging, as "Over time, participating providers are expected to undertake more sophisticated steps to improve care, which will require more advanced health IT capabilities and involve clinical data…" (McClellan, et al., 2010) **ACO start-up costs are high** The startup costs, such as those needed for HIT, are often lacking in the safety net. The Medicare Advance Payment Initiative may present an option for safety net providers to overcome these financial barriers (Lewis, et al., 2012)
Population Health	**PCMH performance is not based on prevention and wellness** Measures of PCMH performance focus on how well the practice cares for patients who are sick and injured; not on how well it encourages wellness and prevention, or successes with community interventions (Wong, 2012)	**ACOs serve a restricted "population"** There are concerns about the meaning of population health in ACOs as referring to their patient populations, not the broader population based on geography, as well as not having tools to develop guidelines for preventative care that would improve geographic population health. If the definition is changed from geographic area to patient population, and ACOs are judged on the health of their patient population, it will be unclear what impact ACOs have on vulnerable populations in their communities (Nobel & Casalino, 2013; Hacker & Walker, 2013; Calman, et al., 2012)

	PCMH	ACO
Health Equity	**PCMH standards not are not focused on health equity** Of seven prominent PCMH definitions only one mentions the need to provide culturally and linguistically appropriate care. **PCMH sees patients as independent health consumers** as opposed to patients that are part of a community that may present barriers to being healthy (Wong, 2012) **No incentive to partner with community resources** PCMH standards do not require partnering with the community to mitigate the social factors that contribute to health disparities. (Wong, 2012)	**ACOs are less likely to form in the safety net** due high start-up costs, financial constraints, staff shortages, and less technological capacity to report quality data, suggesting that complex, underserved, vulnerable patients may have reduced access to ACOs. **ACOs are not explicitly focused on reducing disparities or partnering with community resources.** Of five prominent ACO definitions only one mentions the need to provide culturally and linguistically appropriate care. ACOs do not require providers to partner with the community to disrupt the socioeconomic barriers to health. **Small safety net providers are less likely to become ACOs** Being unattractive participators in large ACOs could leave many small providers out of ACOs; case studies of 5 pilot projects found that small providers were unable to form an ACO without integrating into a large health care system (Vaughan & Coustasse, 2011), suggesting that complex, underserved patients may have reduced access to ACOs. **Traditional PFP shown to exacerbate disparities** Some literature suggests that disparities increased in rural areas that treat SES disadvantaged populations because of patient profiling, patient dumping and tiered treatment systems (Hart-Hester et al., 2008). Patient Dumping is an issue in incentivized healthcare systems where high-risk patients are referred elsewhere and removed from the ACO in order to maintain quality improvement levels (Lewis, et al., 2012). Thus, rather than dealing with the repercussions of "patient dumping", ACOs may consider excluding those providers that care for such high-risk patient populations. **Some chronic disease programs are too costly** "High volume/low cost chronic diseases, such diabetes, asthma, heart disease, chronic obstructive pulmonary disease are cited as better candidates for cost savings and for 'lower hanging' ACO shared-savings opportunities" (Barkley, 2012). In general, there is a concern that capitated payments widen disparities. "High cost high value treatments like ATV treatments, new recommendations for CT screening for lung cancer, bariatric surgery, and transplantation. These are high value things that are very high cost - we can't afford them under capitation" (Site Visit Interview)

Appendix Contents

Appendix B: Site Visit Summaries

Appendix C: PCMH Evaluation Summary

Appendix D: ACO Demonstrations in Medicaid

Appendix E: Interview Protocols

Definitions and Goals of the Patient Centered Medical Home

The Patient-Centered Medical Home (PCMH), also referred to as an advanced primary care practice or primary care medical home, is a powerful concept that has generated considerable interest among physicians, payers, consumers, patient advocacy groups, and policy makers. Originating in 1967, the American Academy of Pediatrics described the "medical home" as a single, centralized source of a child's care and medical records (Sia, et al., 2004). Since then, the medical home has been defined and redefined by a number of organizations and put into practice as the PCMH.

The purpose of the medical home is to enhance the quality of primary care and patient experience, as well as to reduce costs. The central tenet of the PCMH is patient-centeredness, which has redefined the roles of both the health care team and the patient (Fiscella & Epstein, 2008). Additionally, the PCMH concept emphasizes chronic disease management, shared decision making among patients, families, and providers, and according to some, coordination with community-based services (Weedon, et al., 2012). The PCMH draws on principles from Wagner's Chronic Care Model (CCM), which emphasizes delivery system design, decision support, clinical information systems, patient self-management, integration, healthcare systems organization, and community linkage (Stevens, Pickering, & Laqui, 2010).

Patient empanelment, which The Safety Net Medical Home Initiative defines as: "...the act of assigning individual patients to individual primary care providers (PCP) and care teams with sensitivity to patient and family preference" is a key feature of the PCMH. The idea for the PCMH is that each provider will have a panel of patients that they are responsible for in terms of improving preventive care and chronic condition management (Chen & Bodenheimer, 2011). Patient empanelment shifts patient care from traditional "visit-to-visit" care toward a deliberate focus on a continuous care relationship between a provider and a patient. In theory, empanelment builds upon the core concepts of the PCMH, in that it will foster continuity of care, improve chronic disease outcomes, and reduce workload for clinicians (Safety Net Medical Home Initiative, 2013; Chen & Bodenheimer, 2011).

A number of institutions have defined the PCMH by articulating the key components that constitute a medical home. The most prominent definitions were offered by seven institutions which are summarized in **Table A1.** All seven institutions agree that expanding access to care is a key component, and most institutions agree on the importance of the following key elements: coordinated, continuous and integrated care; continuous quality improvement and performance measurement; use of evidence-based medicine; and team-based care.

Appendix A: PCMH and ACO Literature Reviews

Table A1: Frequency of Core PCMH Components across Definitions/Standards

ƒ	Core Component	AAAHC	ACA	AHRQ	CMS	Joint Stmt	NCQA	URAC
7/7	Expanded Access to Care	✔	✔	✔	✔	✔	✔	✔
5/7	Continuous Quality Improvement	✔	✔	✔			✔	✔
	Coordinated and Integrated Care	✔	✔	✔		✔		✔
4/7	Enhanced Continuity and Timeliness of Care	✔			✔		✔	✔
	Performance Measurement	✔		✔	✔		✔	
	Safe and High-Quality Care through Evidence-Based Medicine	✔	✔	✔		✔		
	Team Based Care	✔		✔			✔	✔
3/7	Comprehensive Care	✔	✔	✔				
	Individual Care Management and Planning				✔		✔	✔
	Patient Centeredness	✔		✔				✔
2/7	Appropriate Use of Health Information Technology		✔		✔			
	Commitment to Transparency	✔						✔
	Patient Self-Management Support				✔		✔	
	Patient-Provider Partnership	✔		✔				
	Payment Restructuring		✔			✔		
	Personal Physicians		✔			✔		
	Specialists Referral Monitoring				✔		✔	
	Test Tracking				✔		✔	
	Whole Person Orientation	✔				✔		
1/7	Cost-Effective Use of Healthcare Resources							✔
	Culturally and Linguistically Appropriate Services						✔	
	Electronic Prescribing				✔			
	Excellent Customer Service							✔
	Effective Governing and Administrative Infrastructure	✔						
	Patient Registry				✔			
	Patient Web Portal				✔			
	Physician Directed Medical Practice					✔		
	Population Management of Patients						✔	
	Systematic Approach to Preventive Services	✔						
0/7	Linkage to Community Services							

Despite consensus on some of its elements, there are also significant variations across definitions. For example, some standards are not consistently mentioned as key components of the PCMH. Notably, absent from most definitions is the provision of family-centered care, culturally and linguistically appropriate care, and the enhanced use of IT. In addition, none of these institutions include linkage to community resources as a key element in their definitions.

Thomas Bodenheimer at the UCSF Center for Excellence in Primary Care, defined an approach to PCMH that seems to incorporate broader themes of primary care transformation (Willard & Bodenheimer, 2012). **Figure A1** illustrates the model in the form of building blocks. The building blocks are a heuristic model to emphasize that certain concepts (i.e. the bottom blocks) must first be put into practice, and that other concepts (i.e. blocks on additional layers) should build on the bottom blocks. Core components that are somewhat unique to Bodenheimer's model include data-driven improvement, engaged leadership, and population management.

Implementation of the PCMH model may look different across different sites. One reason for these differences stems from the ambiguity of components such as "coordinated", "enhanced access", and "whole person orientation." For example, in terms of improving access to care, there are no standards for how quickly phone calls should be returned, or whether providers should be accessible beyond normal business hours.

Figure A1: Bodenheimer's PCMH Building Blocks

1. Engaged Leadership
2. Data Driven Improvement
3. Empanelment
4. Team-Based Care
5. Patient-Team Partnership
6. Population Management
7. Continuity of Care
8. Prompt Access to Care
9. Coordination of Care
10. Template of the Future

(CAPH, 2013)
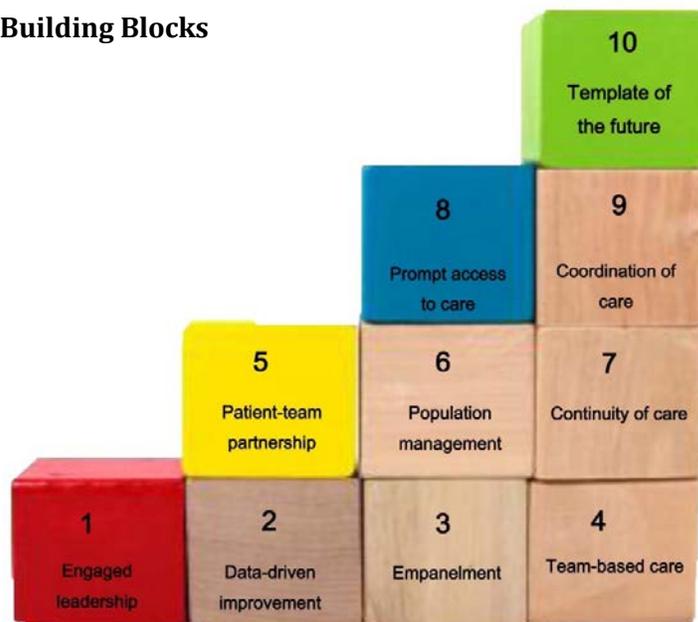
A number of real world constraints come into play during the implementation of the PCMH, calling into question whether a one-size-fits-all PCMH model is appropriate. For example, research shows that "medical homeness" of a practice increases among practices that are larger (Rittenhouse, et al., 2011; Birberg, et al., 2011). In general, large groups have more infrastructure, which makes for an easier transition (Rittenhouse, et al., 2008). Smaller practices may be hindered by smaller patient panels from which to measure performance, limited financial and human resources which are necessary for PCMH recognition documents, physician-centered culture, higher costs for EMR, lack

of patient educators or diverse patient conditions, and poor cohesion with the PCMH care team concept (Rittenhouse, et al., 2008; Berry, et al., 2013; Berenson, et al., 2008). Additionally, it is unclear whether the PCMH model is appropriate for complex or high-risk patients. Despite the medical home being theoretically conceived to eliminate fragmentation of care and enhance outcomes for patients with complex needs, as patient complexity increases so do the challenges of delivering care to such populations. These findings may suggest that tailoring the PCMH according to practice size, patient population, diseases, and other factors may be more appropriate (Berenson, et al., 2008; Stevens, Pickering, & Laqui, 2010).

There is little consensus on the processes that need to be in place in order to be considered a PCMH. Lack of agreement may be attributable, at least in part, to a lack of evidence about which processes actually improve care quality and reduce the cost of care (Sidorov, 2008). Though there is growing enthusiasm for the PCMH, research on its effectiveness is limited and shows mixed results. Because of differences in research designs, study populations, and study measures, strict comparisons of results are not possible (Schmidt, et al., 2013). Additionally, much of the research has been indirect (e.g. inferring that patients are using PCMH, or asking about the anticipated effects of a PCMH).

PCMH Implemented in the Safety Net

PCMHs may hold special promise for safety net systems which face unique challenges to achieving patient trust and cultural competence; moreover, because of resource constraints and highly complex patient populations, they also face obstacles to providing access to highly coordinated care (Schmidt, et al., 2013; Lipson & Naierman, 1996; Abrams, Davis, & Haran, 2009). The structural and process improvements promoted by the PCMH model (e.g., enhanced care coordination and access, quality improvement) could in theory help essential hospitals and health centers deal with these challenges and improve quality of care for minorities and economically disadvantaged populations who tend to receive lower quality care (Schmidt, et al., 2013; Beal, Hernandez, & Doty, 2009; Smedly, Stith, & Nelson, 2002).

Safety net populations are more likely to use the ER for their primary care compared to non-safety net populations (Wilper, et al., 2008; Doran, et al., 2012; Carlson, 2013; Lasser, et al., 2012). Their preference for using the ER over primary care stems from their perception that ERs are more accessible and provide better quality care (Doran, et al., 2012; Fieldston, et al., 2012). Kangovi (2013) found that low SES patients prefer the use of hospitals over ambulatory care because they feel that hospital providers are more skilled at diagnosing and controlling problems, particularly those that they view to be diagnostically challenging.

Kangovi (2013) also found that low SES patients, especially those who suffer from family dysfunction, mental illness, disability, and homelessness, find respite in hospital settings that is unavailable in ambulatory care settings. Some patients confessed that they are lonely and see the hospital as a rare source of support and a place to find someone to talk to. Seeing that team-based care and care continuity are two central tenets of the PCMH, the PCMH could potentially fulfill some patients' unmet social needs, and subsequently reduce their use of the ER for primary care. Initial research suggests that PCMHs may reduce ER visits among safety net populations. One study found that the presence of a PCMH network in the safety net reduces the odds of having an ER visit and reduces the likelihood of additional visits over time (Roby, et al., 2010).

PCMH Challenges in the Safety Net

Safety net providers confront many challenges in caring for complex, vulnerable patients. Due to resource constraints, some providers find it necessary to either restrict access to care by not accepting all new patients, or accepting all new patients but limiting the time they spend to address complex patients' needs. In this sense, providers in safety net settings sometimes find themselves situations that force them to make difficult trade-offs between the PCMH's core components (Rittenhouse, et al., 2013).

As one would expect, quality improvement is costly. Although services are reimbursed at higher rates, resource constrained safety net providers may not have the financial means to achieve PCMH quality benchmarks, or even to apply for PCMH recognition (Nocon, et al., 2012; Berry, et al., 2013). Quinn and colleagues (2013) suggest that, while staff may recognize the benefit of PCMH, they

remain hesitant about the financial implications, staff burnout and turnover, and short-lived tendencies of such restructuring (i.e. "trendiness").

Care coordination and integration, especially regarding chronic disease management, requires significant technical assistance and staffing changes (Rittenhouse, et al., 2013), and generally, safety net providers have a harder time implementing the core PCMH components. Some of the barriers to becoming a PCMH in the safety net include:

- Staff shortages which make it more challenging to find staff that is dedicated to enhancing quality improvement (Nocon, et al., 2012).
- Finding referrals to specialty and inpatient services for uninsured patients is a barrier to care coordination (Coleman & Phillips, 2010).
- Care continuity is a challenge when dealing with transient populations and populations with unstable insurance coverage (Coleman & Phillips, 2010).
- Many safety net institutions are also academic health centers, and may therefore struggle in implementing team-based care and continuous care due to resident turnover, as well as cultural differences that accompany resident training (Tallia & Howard, 2012).
- Safety net providers have more difficulty recruiting physicians, in part because reimbursement rates are lower. However, safety net providers may have an advantage as far as readiness to implement team-based care, in that they are accustomed to utilizing other healthcare professionals as alternatives to physicians (Witgert & Hess, 2012).

Berry et al. (2013) studied PCMH implementation in small safety net practices comprising five or fewer physicians. Overall, the study indicated that "Most small practices achieved the spirit, if not the letter of the law in terms of key PCMH dimensions" (Berry, et al., 2013). Practices provided patients with timely access and communication, as well as off-hour coverage. Additionally, more than half had implemented QI efforts to improve patient satisfaction. However, few had formal care teams due to staff shortages, and few reported having a "great deal" of cultural competency, though most had strategies in place to communicate with patients that had limited English proficiency.

In 2008, the Commonwealth Fund launched a 5-year demonstration project called the Safety Net Medical Home Initiative, which helped 65 primary care sites become high functioning medical homes. Early results showed that less than one third of providers had a system for reminding providers about needed services at the point of care. This low rate of clinician reminders was true for many chronic conditions, including asthma, diabetes, depression, cardio disease, and age appropriate immunizations (Coleman & Phillips, 2010).

FQHCs as PCMHs

Federally Qualified Health Centers (FQHC) might be especially qualified to adapt to the PCMH model due to existing FQHC requirements: they must serve an underserved area or population, offer a sliding fee scale, provide comprehensive services, have an ongoing quality assurance program, and have a governing board of directors (HRSA, 2013). The Institute of Medicine has

recognized them as effective and efficient care delivery models to reduce disparities and manage chronic disease. Indeed, evidence on FQHCs suggests that they are accustomed to tailoring their services to the unique health, cultural, and environmental needs of their patient populations. FHQCs have been found to emphasize multidisciplinary teamwork and collaboration more than typical private practices. Research suggests that FHQCs engage in formal QI and system redesign at higher rates than other practices. This high rate makes sense, as FQHCs require at least half the board to be current of past users of the health centers (Coleman & Phillips, 2010). FQHCs' boards are often community-majority and administrative rather than physicians, which puts them in a better position to build community linkages. Finally, FHQCs have key infrastructure for care coordination, such as electronic health records and registry functions, self-management programs, and staffing models to improve chronic disease (Anderson & Olayiwola, 2012).

Chronic Diseases & PCMH

In 2008, 11.4 million working-age Americans with chronic conditions were uninsured (Wilper, et al., 2008). This includes 16.1% of adults with cardiovascular disease, 15.5% of adults with hypertension, and more than 16.6% of adults with diabetes (Wilper, et al., 2008). The PCMH incorporates elements of the Chronic Care Model (CCM) that may uniquely position them to provide excellent chronic disease care and management (Berenson, et al., 2008). Earlier approaches to managing chronic disease such as "disease management", "chronic care management", and "case management" have yielded poor results, and some have suggested that the coordinated and integrated system of the PCMH may be more effective (Berenson, et al., 2008). For example, one study showed that chronic diseases are more prevalent in children who do not have a medical home (BeLue, et al., 2012). Additionally, Beal et al. report that PCMH access enhances the management of chronic diseases (2007).

Challenges of Chronic Disease Management in PCMH

Chronic disease management continues to be a challenge for providers, including those working in a PCMH. Key challenges highlighted in the literature are:

- The enrollment processes to receive cancer screenings is cumbersome (Martinez-Gutierrez, et al., 2012). Providing screening services is expensive, and there is often inadequate funding for preventative service (Martinez-Gutierrez, et al., 2012).
- Providers are often times constrained, and patients with chronic conditions and co-morbidities require more time to provide quality care. In addition, community outreach, such as offering screenings and info at health fairs, are time-consuming activities (Martinez-Gutierrez, et al., 2012)
- It is especially difficult to provide preventative care to transient populations (Martinez-Gutierrez, et al., 2012).
- High-risk patients, such as HIV/AIDS patients, are hard to retain (Sitapati, et al., 2012).

> **Cardiovascular Disease Table Summary**
>
> A total of 14 articles were reviewed in this section. Study designs were primarily quasi-experimental PCMH intervention studies. The most notable successes had to do with the achievement of healthy cholesterol, blood pressure, and hemoglobin levels. In addition, PCMH influenced healthy lifestyle changes associated with disease management and prevention.

Although these challenges will continually present themselves in the safety net, there are solutions that have been put into practice that have yielded positive results.

- To use time more efficiently, morning "team huddles" allow physicians, nurses, med assistants to meet daily to discuss the needs of each patient and identify available prevention services (Martinez-Gutierrez, et al., 2012)
- Offering site services specific to LEP patients helped providers overcome communication barriers associated with referrals (Martinez-Gutierrez, et al., 2012)
- Some have found that HIV patient retention can be improved with repeated follow-up phone calls (Sitapati, et al., 2012)

Disabilities & PCMH

"Due to the complexity of their ongoing medical and behavioral health needs, medical homes provide particular benefits to patients with developmental disabilities" (Weedon, et al., 2012)

Challenges include:
- Recruiting providers with the expertise and desire to work with individuals with developmental disabilities
- Additional staffing in pediatric psychiatry

(Weedon, et al., 2012)

Pharmacists' Roles in Chronic Disease Care for Vulnerable Patients

Successful chronic disease management depends on adherence to medication regimens, suggesting that pharmacists play a vital role in managing chronic diseases. However,

Asthma Table Summary

Three studies investigated the impact of PCMH on asthma outcomes. Study designs included one observational cohort study, one secondary analysis of a national survey, and one quasi-experimental PCMH intervention study. The research indicates that PCMH utilization is associated with greater use of asthma control medications, reduction of emergency department (ED) visits, and reduction of readmissions after hospitalization.

Developmental Disabilities Table Summary

Two studies have investigated the impact of PCMH on developmental disabilities: One survey study and one secondary analysis of a national survey. The results indicated significant decreases in ED visits, average monthly hospital bed days, and average length of hospital stay. There were also positive clinical outcomes for disease management and preventive services.

pharmacists are rarely included as part of clinical care teams (Moczygemba, et al., 2011; Nielsen, et al., 2012). There is some evidence that the inclusion of pharmacists in clinical care teams improves health outcomes such as glycemic control and diabetes care, chronic hypertension, heart failure, and anticoagulation therapy (Choe, et al., 2012; Gerber, et al., 2010).

Pharmacists interact with limited English proficiency patients, immigrants, and poor health-literacy patients on a regular basis, yet are often unable to communicate with them effectively. Language barriers and poor health-literacy have been reported as the biggest challenges pharmacists face when interacting with vulnerable patients (Dilworth, Mott, & Young, 2009; Collum, et al., 2012; Blake, et al., 2010; Bradshaw, Tomany-Korman, & Flores, 2007; Phokeo & Hyman, 2007; Cleland, et al., 2012; Callahan, et al., 2013; Feichtl, et al., 2003; Gerber, et al., 2010). Effective patient-pharmacist communication with vulnerable populations can be difficult for a number of reasons:

> **Preventive Care Table Summary**
>
> A total of 12 articles have investigated the impact of PCMH on preventive care. Study designs included two case studies, one industry report, six secondary analyses using a national survey or patient registries, one telephone interview study, one survey, and six controlled PCMH intervention studies. Overall, patient connection to a medical home was associated with increased screening rates related to cancer, cardiovascular disease, and diabetes. Additionally, PCMH has had a positive impact on immunization rates for children, adolescents, and adults.

- Low income, urban patients have low expectations of pharmacists in terms of using literacy-based communication. For example, no patients in this study expected their pharmacist to ask them to explain how they were going to use their medications (i.e., teach back) (Collum, et al., 2012)
- Immigrant patients present unique challenges: Pharmacists are unsure whether information conveyed to or from immigrant patients is accurate; pharmacists suspect immigrant patients are taking medications from their home countries but not disclosing this; pharmacists feel pressured by other customers who are frustrated that they are spending extra time with LEP patients; immigrant patients expect that medications will be available over-the-counter, as they are in their home countries (Cleland, et al., 2012)

At the same time, patients who are likely to benefit the most from comprehensive medication therapy management are those who have difficulties following their regimens, are frequently admitted to the hospital, and have chronic diseases (Nielsen, et al., 2012). These findings suggest that pharmacists should be integrated into care teams, but should also develop ways to improve their communication with vulnerable patients (Phokeo & Hyman, 2007; Callahan, et al., 2013; Gerber, et al., 2010).

Diabetes Table Summary

A total of 16 studies investigated the impact of PCMH on diabetes outcomes. Study designs were primarily quasi-experimental PCMH intervention studies. The results were similar to those related to CVD, i.e., improved hemoglobin, cholesterol, and blood pressure levels. Additionally, there were significant increases in the utilization of preventive services (i.e., screening for comorbidities associated with diabetes), as well as significant reductions in ED visits and hospital admissions. Studies also reported improvements in diabetes self-management.

(Please see full chronic disease tables in Appendix C)

Patient-Centered Outcomes & PCMH

Research on the effects of PCMH on patient-centered outcomes showed conflicting results. Some research shows a positive relationship between patient-centered outcomes and PCMH implementation. Boudreau et al. (2012) found that medical home treatment was associated with positive family functioning in terms of parental aggravation, lower likelihood of experiencing childcare/work issues, and fewer missed school days. In addition, some studies found that PCMH patients were more satisfied with accessibility to care and patient/practice relationship (Patient-Centered Primary Care Collaborative, 2012; Beal, et al., 2007; Fishman, et al., 2012; Solberg, et al., 2011; Bade, et al., 2008).

Evidence also shows that PCMH implementation can have no impact or negative impacts on patient centered outcomes. One study found that PCMH implementation was linked to lower patient-rated scores for PCMH related components (Jaen, et al., 2010). Additionally, another study found that only 1/3 of patients reported high levels of satisfaction with the coordination of their care and that patient ratings of accessibility to care (in small clinics only) and confidence in quality/safety (in large clinics only) were not associated with higher PCMH scores (Schmidt, et al., 2013). There may also be an inverse relationship between PCMH scores and confidence in quality and safety of care, which may be due to QI work being more behind the scenes and not visible to patients (Schmidt, et al., 2013). Finally, another study concluded that although improvements in patient experience were linked to access to care, they were not related to the other 6 domains of PCMH (Kern, et al., 2013).

Patient Preferences Regarding PCMH

Of the two studies that have investigated patient preferences regarding PCMH processes, they found that patients emphasized the importance of improved communication, more time with providers, and better coordination. Self-management was also important to patients. Van Berckelaer, et al. (2012) found patients appreciated having more active roles in their own care and increased community involvement.

> ### Patient-Centered Outcomes Table Summary
>
> A total of 25 articles investigated the effects of PCMH on a wide range of patient-centered outcomes. Study designs are primarily case studies and survey research. Overall, there were conflicting results regarding patient-centered outcomes and PCMH.
>
> Seven studies examined the effects of PCMH on patient-centered outcomes for Children with Special Health Care Needs (CSHCN). Results showed reductions in missed school/work days, satisfaction with patient/practice relationship, and significant improvements in family functioning and decreased parental aggravation.

(Please see full patient-centered outcome table in Appendix C)

Clinician Outcomes & PCMH

Some research finds that the PCMH model has benefits for medical staff and suggests that these benefits are enhanced in safety net settings. Due to the high-demand and limited resources of safety net medical centers, they are highly susceptible to staff burnout and turnover (Quinn, et al., 2013). Compared with clinics serving less than 30% minorities, clinics that serve over 30% minorities have more challenges and stressful workplace environments (Varkey, et al., 2009; Lewis, et al., 2012). This includes:

- Less access to medical supplies, referral specialists, and examination rooms
- Patients are more medically and socially complex
- Staff shortages
- Chaotic work environment
- Decreased work control and job satisfaction

Evidence suggests that the PCMH may be a viable solution to these problems. Some research shows the potential for improvements related to burnout, job satisfaction, and morale (Quinn, et al., 2013; Lewis, et al., 2012). For example, **Table A2** displays findings from three studies that investigated these outcomes. Though there is still some skepticism about the potential for the PCMH model to improve clinician outcomes (Baxter & Nash, 2013; Sidorov, 2008), the overall findings suggest that the PCMH model has a positive impact on the quality of provider work life.

Table A2: Clinician Outcomes Associated with PCMH Implementation in the Safety Net

	Year	Study Design	Results
Reid *et al.*	2010	Survey	• Emotional exhaustion scores 12.2 points lower than control group (p<.001) • Depersonalization scores 1.6 points lower than control group (p=.03)
Reid *et al.*	2009	Case Study	• At 12 months, emotional exhaustion was less frequent at the PCMH clinic • 20% lower reports of high burnout compared to controls in physicians and physician assistants
Lewis *et al.*	2012	Survey	• 10% increase in quality improvement scores was associated with: o Higher morale (Provider OR=2.64, Staff OR=3.62) o Greater job satisfaction (Provider OR=2.45, Staff OR=2.55) o Freedom from burnout (Staff OR=3.62) • Total PCMH score was associated with higher staff morale (OR=2.32), but lower provider freedom from burnout (OR=0.48)

Disparities & PCMH

Effect of PCMH on Disparities

Overall, there is very little evidence showing the impact of PCMH on reducing health and health care disparities. To date, researchers have found that:

- Access to a PCMH reduces or eliminates disparities in preventive services (Beal, et al., 2007)
- Access to a PCMH does not alter the disparity between black and white children for receiving a developmental history from their provider (Aysola et al., 2013)
- Access to a PCMH disproportionately reduced ER use among Latinos and Vietnamese with mental illness and/or musculoskeletal problems compared to whites (Roby, et al., 2010)

While some have argued that the PCMH model can theoretically reduce disparities (Patient-Centered Primary Care Collaborative, 2012; Fiscella & Epstein, 2008), there are also strong arguments that the model lacks critical components that would facilitate reductions in disparities. According to Wong and colleagues (2012), weaknesses in the PCMH model include:

- Measures of PCMH performance focus on how well the practice cares for patients who are sick and injured; not on how well it encourages wellness and prevention, or successes with community interventions.
- The model does not address how the practice considers the environments and other social structures from which patients originate. As written, PCMH standards consider patients in a narrow sense, that is, as independent health care consumers rather than as members of a community that has its own set of strengths and challenges. This is an important element because environment moderates the ability to adhere to treatment.
- Each community has its own set of challenges and strengths that practices need to be aware of. PCMHs should partner with community stakeholders and think about how the environment can disrupt the barriers to good health. The PCMH standards should include a component on actively addressing the social determinants of health.

Disparities in PCMH Access

Overall, patients were much more likely to have a PCMH if they fell into one or more of the following demographic categorizations:

- US Born
- Non-Hispanic White
- Above the Federal Poverty Level (FPL)
- Privately insured
- English speaking
- Parental education is beyond high school

Latino subgroups are the population least likely to have a PCMH, specifically Mexican/Mexican American and South/Central Americans. Older patients are less likely to be technologically savvy and users of the internet and email on a regular basis, which hinders the kinds of novel patient access approaches that are part of the PCMH model. (Beal, et al., 2007; Beal, Hernandez, & Doty, 2009; Boudreau, et al., 2012; Fulda, et al., 2009; Singh, et al., 2009; Strickland, et al., 2011; Stevens, Pickering, & Laqui, 2010; Stevens, et al., 2009; Diedhiou, et al., 2010; Aysola, et al., 2013; BeLue, et al., 2012; Hoff, 2010; Lin, Yu, & Hardwood, 2012; Bennett, Rankin, & Rosenberg, 2012; Conrey, et al., 2012; Farmer, et al., 2013)

Disparities in PCMH Access among Children with Special Health Care Needs (CSHCN)

In addition to the demographic factors listed above, there are demographic variables specific to CSHCN that increase their likelihood of having access to a PCMH:

- Live with two parents
- Suffer from only one condition
- Suffer from a less severe condition

Generally speaking, a child with more than one condition is less likely to have a PCMH, and even less likely as the number of conditions rises. Also, the severity of a condition inversely affects access to a PCMH. (Boudreau, et al., 2012; Fulda, et al., 2009; Singh, et al., 2009; Strickland, et al., 2011; Stevens, et al., 2009; Diedhiou, et al., 2010; Aysola, Orav, & Ayanian, 2011; BeLue, et al., 2012; Long, et al., 2012; DeRigne & Porterfield, 2010; Lin, Yu, & Hardwood, 2012; Bennett, Rankin, & Rosenberg, 2012; Conrey, et al., 2012; Farmer, et al., 2013)

Place Based Disparities in Access to PCMH

Research indicates geographic disparities impacting access to PCMH, and these factors are particularly influential for CSHCN. Patients are more likely to have access to a medical home if they reside in the following US regions:

- All US states *except* Alaska, Arizona, Washington DC, Florida, Illinois, Massachusetts
- Northeast
- Not in the South
- Neighborhoods deemed safe by parents
- Neighborhoods with high access to amenities

(Singh, et al., 2009; Strickland, et al., 2011; Stevens, Pickering, & Laqui, 2010; Stevens, et al., 2009; Aysola, Orav, & Ayanian, 2011)

Disparities in Preventive Care

Latino and African American populations are less likely to access preventive services such as screenings or blood work – regardless of having access to a PCMH. These groups are also more likely to miss planned visits and resort to same-day appointments, which has been associated with poorer health outcomes, likely because they are not receiving preventive care and are only seeking care to treat acute problems (Beal, et al., 2007; Beal, Hernandez, & Doty, 2009). PCMHs will increase the availability of same day appointments which may therefore exacerbate health care disparities among Latinos and African Americans (and perhaps other racial/ethnic groups). Several have argued that same-day appointments should not completely substitute planned visits (Beal, et al., 2007; Beal, Hernandez, & Doty, 2009: Parker, et al., 2012).

Definitions and Goals of Accountable Care Organizations

Elliott Fisher and Glenn Hackbarth are credited with creating the term "accountable care organization" in 2006 (Welch, 2011). The term grew out of Fisher's work to identify delivery models that improved the quality of health care while reducing costs (Healthcare Reform Watch). Other experts, such as Shortell and Casalino, expanded the concept during the lead up to health care reform (Welch, 2011). In 2010, the Affordable Care Act advanced the definition and purpose of Accountable Care Organizations (ACOs), especially for Medicare.

According to the August 2013 annual national survey of ACOs, there were 488 ACOs operating in the United States (Peterson, Muhlestein & Gardner, 2013). Medicare ACOs accounted for 52 percent of the 488 ACOs, the others were Medicaid and commercial payer ACOs (Peterson, Muhlestein & Gardner, August 2013). Generally speaking, accountable care organizations (ACOs) coordinate care across the continuum of health care providers (e.g., physicians, hospitals, and clinicians), and establish shared financial incentives among providers to reduce per-patient costs and to improve health care quality (McClellan et al., 2010; Longworth, 2011; Bobbitt, 2011; CMS, 2012; Dorn 2011; Ulrich, 2012). All ACOs use performance benchmarks for financial incentives, collect baseline data, and then track and report progress using comparable data over time (Bobbitt, 2011; CMS, 2012; Vaughan & Coustasse, 2011). Indeed, the potential to change how providers offer services via shared financial incentives is touted as the most innovative and influential component of the ACO delivery model.

The Affordable Care Act provided considerably more operational guidance for Medicare ACOs than Medicaid ACOs, and largely ignored commercial ACOs. The differing legal prescription for Medicare, Medicaid and commercial ACOs led ACOs to develop along different paths according to the payer that they contract with.

Medicare ACOs share common characteristics due to the CMS operational requirements to qualify as a Medicare ACO. CMS's final ruling allows for considerable variation in the types of providers that can come together to form ACOs, but requirements for governing structure, measuring quality, tracking performance, enrolling patients, and educating patients are applied, with minimal adjustments, to all Medicare ACOs.

Individual states are pioneering the standards for implementing and monitoring accountable care models in Medicaid (Kaiser, 2012; McGinnis & Small, 2012). Medicaid ACOs vary across states in nearly all the CMS operational characteristics that unify Medicare ACOs: governance, financial risk/incentives, technology, quality measures, patient enrollment, as well as patient engagement and education (See **Table A4**). Despite the diversity of Medicaid ACOs, there are at least three commonalities among Medicaid ACOs that separate them from their Medicare counterparts. First, most Medicaid ACOs have an explicit geographic focus, which is not prominent in Medicare ACOs (Colorado, Vermont) (McGinnis & Small, 2012). Second, there are clearer distinctions between ACOs and traditional managed care organizations in Medicare than in Medicaid (Kaiser, 2012). Finally, Medicaid ACOs are unlikely to allow for patient choice similar to Medicare ACOs. Due to the

diversity of Medicaid ACOs, few other global distinctions between Medicaid and Medicare ACOs can be made.

Finally, ACOs can form in the private sector and contract with private payers. Commercial ACOs do not have mandated quality indicators for patient-centeredness and preventative services, though other market forces might encourage them to focus on these aspects of care (Kuntz 2012). Experts suggest that commercial payers may want to institute rewards for ACOs for keeping patients healthy, because if they do not, providers might fall short in meeting preventative measures that keep reduce overall costs (Kuntz, 2012).

Appendix A: PCMH & ACO Literature Reviews

Table A4: Frequency of Core ACO Components across Definitions/ Standards

| f	Core Component	ACA	AHRQ	CMS	NCQA	URAC
5/5	Appropriate Use of Health Information Technology	✔	✔	✔	✔	✔
	Continuous Quality Improvement	✔	✔	✔	✔	✔
	Coordinated and Integrated Care	✔	✔	✔	✔	✔
	Effective Governing and Administrative Infrastructure	✔	✔	✔	✔	✔
	Patient Centeredness	✔	✔	✔	✔	✔
	Payment Restructuring	✔	✔	✔	✔	✔
	Performance Measurement	✔	✔	✔	✔	✔
	Personal Physicians	✔	✔	✔	✔	✔
	Safe and High-Quality Care through Evidence-Based Medicine	✔	✔	✔	✔	✔
4/5	Patient Registry	✔		✔	✔	✔
3/5	Commitment to Transparency			✔	✔	✔
	Health Care Information Exchange	✔	✔			✔
	Individual Care Management and Planning	✔			✔	✔
	Population Management of Patients		✔	✔		✔
	Scale of Patients	✔	✔	✔		
	Specialists Referral Monitoring		✔		✔	✔
	Team Based Care		✔	✔		✔
2/5	Appropriate Health Care Utilization	✔				✔
	Comprehensive Care		✔		✔	
	Cost-Effective Use of Healthcare Resources		✔	✔		
	Excellent Customer Service	✔				✔
	Expanded Access to Care	✔		✔		
	Patient Self-Management Support		✔			✔
	Patient-Provider Partnership		✔			✔
1/5	Culturally and Linguistically Appropriate Services					✔
	Electronic Prescribing	✔				
	Enhanced Continuity and Timeliness of Care					✔
	Linkage to Community Services					✔
	Meaningful Use		✔			
	Patient Web Portal					✔
	Population Health Assessments					✔
	Test Tracking					✔
	Whole Person Orientation					✔
0/5	Physician Directed Medical Practice					
	Systematic Approach to Preventive Services					

ACO Implemented in the Safety Net

At least ten states are experimenting with accountable care delivery models including: Colorado, Maine, Minnesota, New Jersey, Oklahoma, Oregon, Texas, Southwest Washington, Utah, and Vermont (McGinnis & Small, 2012; Kaiser, 2012). Utah, New Jersey, and Minnesota call their models ACOs; Coordinated Care Organizations are Oregon's Medicaid counterpart to Medicare ACOs; Colorado has two separate organizations in its Medicaid accountable care system: Accountable Care Collaboratives (ACC), which are members of Regional Care Collaboratives. Colorado's accountable care model predates the ACA and is modeled after North Carolina's "Community Care of North Carolina." Appendix D further describes these Medicaid ACO-like delivery system models.

Given their state-driven formation, there is considerable variation across Medicaid accountable care models. A common element across Medicaid ACOs, however, is a focus on the patient-centered medical home. Medicaid patients often use emergency services in lieu of primary care, which is far less costly. Therefore, Medicaid ACOs expect to reduce costs by anchoring patients' health care utilization to primary care providers. Patient-centered medical homes are used to assign patients to a Medicaid ACO, and act as both coordinator and gatekeeper for specialists.

Community Care Organizations (CCO) have recently emerged in some states (e.g., New Jersey, Oregon) as ACOs tailored to the safety net. CCOs focus specifically on the needs of a safety net community and seek to address the social determinants of health (e.g., poverty, unemployment, homelessness, poor housing, and neighborhood violence). Taking into account both the community residents and preexisting services, CCOs are typically comprised of: hospitals, FQHCs, public health departments, social service agencies, oral health providers, community mental health providers, substance use disorder treatment facilities, child welfare and family resource centers, school systems, housing and homeless service providers, and job training and employment support organizations. CCOs aim to organize a "Healthcare Neighborhood" that will help a community move forward in meeting the triple aim goals. Ideally, CCOs will create an integrated network of community groups consisting of medical facilities, social services, and other non-community based organizations that may be restrictive or high-cost with an overall focus of health, wellness, and recovery. CCOs are grassroots in nature, and as one leader in rural Oregon said in regards to their CCO: "We know our neighbors and what they need and it's up to us to redesign the healthcare system in our community" (Jarvis, 2011). **Figure A2** below illustrates an example of the participants of a CCO (ACMHA, 2011).

Figure A2: Community Care Organization Participants
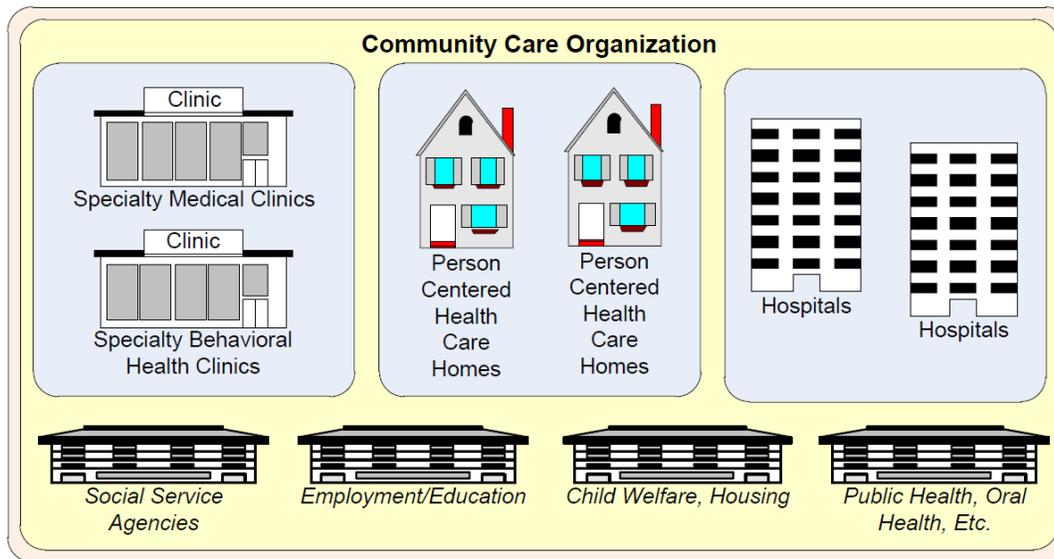
(ACMHA, 2011)

ACO Challenges in the Safety Net

Generally speaking, safety net providers (e.g. FQHCs, community clinics, public hospitals) have difficulty attracting primary care physicians and specialists due to low reimbursement rates, which make them unattractive for ACO formation (Shortell, 2012). U.C. Berkeley law professors administered 51 surveys to safety net providers in two California counties on their readiness to form ACOs. Safety net providers reported lack of readiness in terms of having sufficient primary and specialty care doctors, and limited technological capacity to collect and report data on quality metrics. This may prove additionally challenging, as "Over time, participating providers are expected to undertake more sophisticated steps to improve care, which will require more advanced health IT capabilities and involve clinical data…" (McClellan, et al., 2010).

The most significant challenges were in the regulatory and legal area: "Respondents gave the lowest [readiness] scores to legal and regulatory issues. These included how they would protect their 501C3 tax exempt status, how they would distribute savings to avoid inducing physicians to reduce or limit medically necessary care, and how they would address a number of federal compliance issues" (Shortell, 2012).

In addition, ACOs might have incentives to attract partners that have low-risk patient populations, which would make essential health care providers unattractive because of their high financial risk profiles and their disadvantaged patient profiles (Bachman, 2011). Being unattractive participators in large ACOs could leave many small providers out of ACOs; case studies of 5 pilot projects found that small providers were unable to form an ACO without integrating into a large health care system (Vaughan & Coustasse, 2011). Along with this is the concern of "patient dumping", an issue

in incentivized healthcare systems where high-risk patients are referred elsewhere and removed from the ACO in order to maintain quality improvement levels (Lewis, et al., 2012). Thus, rather than dealing with the repercussions of "patient dumping", ACOs may consider excluding those providers that care for such high-risk patient populations.

FQHCs & ACOs

FQHCs and rural health clinics (RHC) can form independent ACOs, and CMS' final ruling mandates a higher shared savings percentage for ACOs that include FQHC and RHCs in Medicare ACOs (CMS, 2011). According to the CMS press release on Medicare ACOs, approximately 20 percent of ACOs include community health centers, rural health clinics and critical access hospitals that serve low-income and rural communities (CMS, 2013). The inclusion of smaller providers into larger health system ACOs may provide a gateway to larger-scale benefits (Norman & Schulte, 2011). For example, a larger health system, when partnered with practitioners in rural or underserved markets, can provide such clinics with necessary technological advances, connection to emergency services, access to larger disease registries, and more established EHR (Normal & Schulte, 2011).

In the Twin Cities, ten FQHCs have joined together to form the Federally Qualified Health Center Urban Health Network (FUHN), which is one of the first ACOs that consists exclusively of safety net providers. FUHN is partnered with the Minnesota Department of Human Services and will be eligible to share in cost-savings through meeting quality and cost benchmarks for Medicaid patients. Overall, FUHN will meet its goals through 1) data analytics and technology, 2) performance improvement specialists, and 3) patient-centered medical home certification. FUHN seeks to build an integrated network for their patient population, who are culturally diverse, economically disadvantaged, and clinically complex (Optum, 2013).

Despite the apparent financial advantages of RHC involvement in ACOs, as well as the opportunity for distinct population health outcomes (Gourevitch, et al., 2012), these institutions are similarly faced with challenges surrounding readiness. Many RHCs lack the financial and information technology capital to implement ACO participation (Oritz, et al., 2013).

Chronic Diseases & ACOs

Challenges of Chronic Disease Management in ACO

Little evidence exists on the capacity for ACOs to improve quality for patients with chronic illnesses. A Cancer Center Business Summit 2011 survey of providers suggested that some chronic diseases, and their associated practices, are more attractive candidates than others in an ACO initiative (Barkley, 2012). "High volume/low cost chronic diseases, such diabetes, asthma, heart disease, chronic obstructive pulmonary disease (COPD) are cited as better candidates for cost savings and for 'lower hanging' ACO shared-savings opportunities" (Barkley, 2012). Watnick et al., (2012) writing about end stage renal disease (ESRD), state that lack of evidence-based quality measurements for ESRD outcomes will make it difficult for ACOs to establish appropriate performance metrics for care. Additionally, studies on the impacts of ACO structure for reimbursement on end-stage renal disease and photon therapy suggest that ACOs will limit care or reduce services to complex cases, even though complex cases are where treatment is most effective (Nissenson, 2013; Elnahal, 2013; Pauly, 2012).

The other possibility is that specific populations with complex or special health needs will be assigned to specific ACOs or be exempted from ACO performance measures and financial incentives. In many states, managed care organizations are exempted from assuming full cost of care provided for patients with complex co-morbidities, and it is unlikely that states will eliminate these exemptions for newly established Medicaid ACOs (Kaiser, 2012). For example, in Colorado, Medicaid patients that are in the third trimester of pregnancy or that have complex co-morbidities are not part of the patient population that can be assigned to a Medicaid accountable care organization.

Pharmacists' Roles in Chronic Disease Care

Just as pharmacists are speculated as potentially beneficial members of care teams according to the PCMH literature, this opinion is even more present in literature concerning ACOs. Considering the aims of the ACO in regards to the financial incentives surrounding clinical outcomes and integrated care, the incorporation of pharmacists is key to achieving those goals (Kaldy, 2012; Smith, Cannon-Breland, & Spiggle, 2013, Fisher, 2013). With many of the quality improvement benchmarks riding on chronic disease management, the integration of pharmacists in the care team is essential given that medications are the most common treatment modality for chronically ill patients (Smith, Cannon-Breland, & Spiggle, 2013).

Patient-Centered Outcomes & ACOs

Research investigating patient-centered outcomes in ACOs is significantly lacking. However, it is again speculated that the results will be similar to those in the PCMH literature due to the similarities between the two care models, such as enhanced care coordination, care continuity, and access.

A study of four Premier ACOs showed positive results for patient outcomes in two locations. AtlantiCare saw a twofold increase in patient satisfaction, and 88% of patients at Fairview Health Services said they would recommend the institution to others (Damore, et al., 2013). McCarthy reported that pioneer organizations scored higher patient satisfaction ratings than those seen by Medicare fee for service providers (2013).

Patient Choice and Engagement

A significant issue surrounding the implementation of ACOs is patient choice. In some ACOs, predominantly Medicare, patients are "assigned" retrospectively based on how much primary care they received from the ACO within a given time frame. Seeing that assignment is retrospective, some patients are not even aware that they belong to an ACO (Zimmer, 2011). Additionally, the regulations of ACOs may limit a patient's ability to leave the ACO or switch to a different physician (DeCamp, 2013).

These issues have sparked conversations not only around patient choice, but also around patient engagement. Rather than assigning patients to ACOs, some providers incentivizing care to make their ACO more attractive to patients, especially in the long run (Young, 2011; Forster, et al., 2012). Patient participation in ACOs needs to be a two-way street, "...an ACO must give people tools, educational materials, and incentives to become engaged health care consumers. They must introduce and explain the ACO model of care delivery" (Forster et al., 2012). This may be particularly important for patients in the safety net who may be less likely to advocate for their own care given varying levels of health literacy and other socio-economic challenges (Forster, et al., 2012).

Disparities & ACOs

Access to ACOs

ACOs are less likely to form in the safety net due high start-up costs (Lewis, et al., 2012), staff shortages (Shortell, 2012), and less technological capacity to report quality data (McClellan, et al., 2010)). Also, safety net providers are less attractive to ACOs led by non-safety net providers (Bachman, 2011). Collectively, this suggests that complex, underserved, vulnerable patients may have reduced access to ACOs. Lewis et al. (2012) suggest several policies to prevent such unintended disparities, including appropriate risk adjustment, well-designed systems of rewards, effective performance measurement, monitoring patient populations, and timely evaluations.

Another barrier to ACO access relates to payment reforms. A review of traditional pay-for-performance literature suggests that disparities increased in rural areas and among providers that treat SES-disadvantaged populations because of patient profiling, patient dumping and tiered treatment systems (Hart-Hester et al.,2008). Hester et al. suggest that economic incentives related to procedural best practices as opposed to outcomes could avoid this problem. Medicare ACOs will use the adjusted payment system currently employed by Medicare to adjust for high-risk populations. However, if adjustments are not sufficient to compensate ACOs for risks or complexities of those with special needs, socio-economic disadvantages, or adequately consider the needs of diverse communities, then these populations might experience limited access to care in ACOs (Chesney & Lindeke, 2012; Homer, et al., 2013).

Population Health

Three articles noted concerns about the use of population health in ACOs as referring to their patient populations, not the broader population based on geography, as well as not having tools to develop guidelines for preventative care that would improve geographic population health.

"Although 'population health' is one of the Institute for Healthcare Improvement's Triple Aim goals, its relationship to accountable care organizations (ACOs) remains ill-defined and lacks clarity as to how the clinical delivery system intersects with the public health system. Although defining population health as 'panel' management seems to be the default definition, we called for a broader 'community health'" (Hacker & Walker, 2013). Calman et al. suggest that ACO patient attribution should be changed so that the denominator of patients refers to the geographic area in which the ACO operates, as opposed to the total patients in claims data (2012). By changing the denominator for attribution, ACOs would have incentives to care about the health of the geographic population where they exist, as opposed to the population health of the patients that they manage (Calman, et al., 2012).

San Francisco General Hospital

System Overview

San Francisco General Hospital (SFGH) is part of an integrated delivery system that cares for a large population of Asian, Pacific Islander, and Hispanic patients residing within the city of San Francisco. Additionally, Healthy San Francisco, which began in 2006, specifically targets the uninsured population within the city and county. SFGH is a long-standing safety net hospital located in downtown San Francisco, California with 645 licensed beds, a level 1 trauma center, and a full range of inpatient, outpatient, emergency, diagnostic and psychiatric services for adults.

The hospital partners with other local healthcare systems in order to create an integrated delivery system called the San Francisco Health Network, which was formally rolled out in October 2013. This Network consists of SFGH, The San Francisco Department of Public Health, San Francisco Health Plan, San Francisco Community Clinic Consortium, University of California San Francisco, jail health, Laguna Honda Hospital and Rehabilitation Center, Healthy San Francisco, and 12 community primary care health centers referred to as the Community Oriented Primary Care (COPC). Additionally, the majority of the Network functions on a single electronic medical record (EMR), a crucial component to their implementation and success with integrated care. San Francisco Health Network functions more as a "closed system", in that their primary care patient population is more strictly defined, and this is partially a result of their small geographic area from which patients are pooled.

Healthy San Francisco is a health access program designed for the uninsured population of San Francisco, and includes a network of 37 medical homes that are primarily linked to either the San Francisco Department of Public Health or the San Francisco Community Clinic Consortium. The widespread implementation of the PCMH model in the San Francisco Health Network has been led by a three year CMMI grant. Along with implementing the PCMH, the Network has also implemented a risk stratification model that categorizes patients based on their healthcare needs and assigns them to appropriate clinics. High risk patients receive care from the Complex Care Management program, which includes intensive care for chronically ill complex patients. This program was created to address the patients who were repeatedly presenting to the ED and incurring multiple hospital stays each year.

To date, the San Francisco Health Network has seen positive results. Clinicians report that patients are engaging and responding well to the latest service excellence initiatives. Additionally, patients who are involved in Healthy San Francisco are very satisfied, and in a recent survey 92% said that they would recommend the program to others. Some of the most impressive results come from the Complex Care Management program which has seen a 48% reduction in hospital stays among their patients since its implementation in February 2012, as well as patients reporting feelings of being more in control of their health. Furthermore, the program has made quality improvements and is quickly approaching their goal for breast cancer screening, and has achieved their goal for LDL screening.

Site Visit Details

On October 8, 2013, Linda Cummings, Bianca Perez, and Janelle Schrag from America's Essential Hospitals visited the SFGH campus from 10:00am to 4:00pm.

Individual and Group Interviews were held with the following staff from SFGH:

Alice Chen, MD – *SFGH Chief Medical Integration Officer, Medicine*
Shannon Thyne, MD – *Chief of Medical Staff, Pediatric*
Alice Kurniadi – *Health San Francisco Program*
Albert Yu, MD – *Medical Director for Chinatown Public Health Center*
Elizabeth Davis, MD – *Assistant Medical Director, General Medicine Clinic*
Fern Ebeling, RN – *Complex Care Management*
Kathryn Horner – *Program Director, Department of Medicine*
Baljeet Sangha – *Patient Experience Officer*
Rosaly Ferrer – *Nurses Manager at Adult Medical Clinic*
Jackie Haslam – *Principle Business Analyst*
Nwando Olayiwola – *Associate Director, Center for Excellence in Primary Care*
Jan Bactad – *Medical Assistant, General Medicine Clinic*
Reena Gupta, MD – *Assistant Medical Director, General Medicine Clinic*
Sue Schwartz, *Director of Performance Improvement*
Laure Marshall - *Manager of Quality Management Data Center*
Hillary Seligman, MD – *Department of Medicine*
Hali Hammer, MD – *Chief of Family Practice*
Dean Schillinger, MD – *Department of Medicine, Center for Vulnerable Populations*

The site visit began with an initial two hour meeting where SFGH staff presented on SFGH's integrated delivery system, Healthy San Francisco and the primary care medical home, the role of health information technology, Complex Care Management, as well as Lean and service excellence. A lunch meeting was then conducted with two quality improvement staff. This was followed by another presentation from an SFGH staff member on food insecurity issues. The final presentation of the day was on the topic of SFGH's Patient Advisory Board, which was followed by attendance at a Patient Advisory Board meeting. We were able to speak with six members of the Patient Advisory Board to hear their experiences as patients and board members at SFGH. The day ended with an interview with the founder and Communications Director of the Center for Vulnerable Populations.

Santa Clara Valley Medical Center (Focus on Valley Homeless Healthcare Program)

System Overview

Santa Clara Valley Medical Center (SCVMC) is a safety net hospital in the San Jose, California area. In addition to offering a wide variety of medical services, including a state of the art rehabilitation center, they have proven themselves as innovators in delivery system reform. In 2005, staff at SCVMC began to change their thinking around primary care after participating in a research project with Ed Wagner's chronic care model, as well as investigating a new idea called ambulatory care ICUs. Subsequently, a competition was held between care teams to create an innovative delivery system that would care for the system's most complex patients. One care team designed a model very similar to the PCMH and upon approval began to implement their innovative design. Since then, SCVMC has spread this model to their other clinics, sought out formal NCQA recognition, and begun to create an integrated healthcare network.

In 2003, SCVMC launched the Valley Homeless Healthcare Program (VHHP), which implements formal PCMH standards and offers patient centered care for migrant populations. The program offers medical care co-located with transitional housing and a wide array of social services including transportation, job support, and financial assistance. VHHP also has mobile vans and backpackers who seek out migrant populations and provide on-site care.

Many of SCVMC'S primary care sites have implemented the PCMH model, and have either attained or are seeking formal NCQA recognition. The Santa Clara VHHP has seen excellent results in terms of clinical outcomes, patient satisfaction, and provider experience. Recent scores on patient satisfaction have been very positive and staff feel like their patients are very engaged and comfortable voicing their opinions. Puentes Clinic, the main primary care center at VHHP, has seen decreases in ED and urgent care use among patients with paralleled uptake in primary care utilization (Kwan, et al., 2008). Additionally, redesigning the care delivery system has had a positive impact on providers who feel less burdened and greater fulfillment from their work, primarily due to the system's emphasis on team-based care.

Site Visit Details

On October 9, 2013, Linda Cummings, Bianca Perez, and Janelle Schrag from America's Essential Hospitals visited the SCVMC campus from 7:45am to 3:00pm.

Individual and group interviews were held with the following staff from SCVMC:

Clifford Wang, MD – *General Practice and Internal Medicine (Chairperson 2013-14, Board of Directors, Essential Hospitals Institute)*
Margo Maida – *Executive Director, Ambulatory and Managed Care*
Sabrina Valade – *Ambulatory Care Manager*

Rene Santiago – *Deputy Director, Santa Clara Valley Health and Hospital System*
Sara Doorley, MD – *Medical Director of Homeless Healthcare Program*
Marcie Levine, MD – *Chief of Primary Care*
Janet Kohl, RN – *Respite Nurse Coordinator*
Charles Preston, PhD - *Director of Psychology Services of the Homeless Healthcare Program*
Monica Cramer – *Assistant Nurse Manager*
Amber, RN - *Respite Center Nurse*
Lorna Linda – *Medical Social Worker*
Michael Elliot – *Associate Director, The VMC Foundation*
Ann Perkins, MA – *Manager of Rehabilitation Relations*

Two morning interviews were conducted with SCVMC staff to obtain general information about the hospital system and PCMH implementation. This was followed by a presentation given by one staff member at a meeting for the VHHP team (30+ attendees). Following the presentation was an interview with seven staff members of the VHHP, who discussed the successes and challenges of their primary care site. Next, we visited the Medical Respite Center, a clinic within the VHHP, and were given a tour by one of the nurses. The tour ended with a 15-minute discussion with three homeless patients at the Respite Center. Finally, we met with the Manager of Rehabilitations Relations to discuss innovations in rehabilitative care.

Memorial Healthcare System (Focus on Children's Medical Services Contract)

System Overview

Memorial Healthcare System (MHS) is one of the three largest safety net providers in Florida, located in South Broward County. It serves a large Spanish speaking population, as well as undocumented families. The system includes six hospitals, five community centers, one nursing home, and home health services. MHS is also part of the Premier Quest collaborative which promotes and tracks quality improvement measures.

In 2005, Florida's Children's Medical Services ("Little CMS"), which manages children (both Medicaid eligible and non-Medicaid eligible) with special needs, approached MHS to improve efficiency in coordinating care and to save money by reducing waste and mismanagement for the health care of non-Medicaid eligible children with complex special needs in Broward County. MHS had been providing services to Medicaid eligible children with special needs before the proposed partnership, and the Children's Medical Services had been determining eligibility and struggling with care coordination. Together, MHS and Children's Medical Services operate as an integrated delivery system for this population of children. The partnership transferred more responsibilities to MHS for the coordination, management and payment of care for Medicaid-eligible children with complex medical needs, and the Children's Medical Services now assigns each child a "care coordinator", who focuses on determining eligibility and following the families of eligible children.

In 2006, MHS expanded its catchment area beyond Broward County, and currently provides care to children with special needs, both eligible and ineligible for Medicaid, from the Florida Keys to Orlando. MHS also collaborates, though not through a contractual partnership, with North Broward hospital district, another safety net hospital in the county.

MHS's contract with Children's Medical Services has so far seen impressive results in terms of patient outcomes and provider experience. The partnership has resulted in less burnout among Children's Medical Services staff, largely due to the colocation with MHS staff and shared responsibility of duties. In addition, MHS has been able to transition some of their patients back into regular school settings rather than settings for the developmentally disabled. Furthermore, the integrated system has observed slight decreases in ED, inpatient, and outpatient utilization, although no statistical significance can yet be determined (Marcu, et al., 2013).

Phone Interview Details

On October 23, 2013, Mariellen Jewers and Holly Mead from George Washington University, as well as Janelle Schrag from America's Essential Hospitals, conducted a phone interview with MHS from 1:00pm to 2:00pm.

The interview was held with the following staff from MHS:

Olunwa Chisara Ikpeazu, MD - *Pediatric Medical Director*
Barbara Williamsonm, RN – *Director of Utilization Management and QI*
Jessica Lerner - *Executive Director, Memorial Integrated Healthcare*

MHS staff provided brief descriptions of their roles and tenure at MHS. The remainder of the phone interview included a discussion of the history of their integrated delivery system, their target population, program impacts on patient and provider satisfaction as well as health disparities.

Hennepin County Medical Center (Focus on Hennepin Health)

System Overview

Hennepin County Medical Center (HCMC) is a large safety net hospital located in downtown Minneapolis with 462 licensed beds, as well as level 1 trauma centers for both adults and pediatrics. The patient population of Hennepin County is very diverse and includes a significant population of Somali refugees, Hmong immigrants, as well as a large homeless population.

Hennepin Health is a 2-year CMS demonstration that launched in January 2012 and involves a PCMH model functioning in an established ACO. The ACO is comprised of Hennepin County Medical Center (HCMC), NorthPoint Health & Wellness Center (FQHC), Human Services and Public Health Department, and Metropolitan Health Plan (HMO). In addition, Hennepin Health contracts with 85 affiliated providers to round out geographic coverage and offer services not available through the partners. The model was designed to care for the system's "super-utilizers" by addressing their complex medical and socio-economic needs.

Hennepin Health aims to integrate medical care, behavioral health, and human services in a patient-centered way. Upon enrollment, patients are immediately connected with a care team that consists of a physician or advanced nurse practitioner, care coordinator(s), pharmacist, and community health worker. Housing assistance, food stamps, transportation, and even pre-paid telephones are some of the services patients can expect to receive. Hennepin Health's goal is to address patients' holistic needs in order to reduce excessive or unnecessary costs. Hennepin Health also uses a risk stratification system to assign patients to the most appropriate form of care. For example, a patient who repeatedly presents at the ER will be designated as tier-III and treated at the Coordinated Care Center (CCC), an intensive care clinic with extensive medical and behavioral health services.

Hennepin Health has been able to accomplish impressive outcomes since its recent inception in 2012. They have exceeded their goals of both a 10% decrease in admissions and readmissions, as well as a 10% reduction in emergency department visits. They are also seeing slow improvements in their goals to increase in primary care utilization by at least 5% and reduce overall patient churn. Patients have also reported feeling very satisfied with the care they receive at the CCC. Providers are also experiencing greater satisfaction, especially through the small successes they are able to achieve with complex patients.

Site Visit Details

On October 28, 2013, Linda Cummings, Bianca Perez, and Janelle Schrag from America's Essential Hospitals visited the HCMC campus from 4:00pm to 5:20pm, and again on October 29, 2013 from 7:45am to 11:00am.

Individual and group interviews were held with the following staff from Hennepin Health:

Mark Linzer, *MD – Internal Medicine*
Pam Clifford – *Director Center for Healthcare Innovation*
DeAnn Rice – *Clinical Care Coordinator*
Kim Nguyen – *Unit Supervisor with Hennepin Health Social Services Navigation Team*
Nancy Garrett – *Chief Analytics Officer*
Marsha Zimmerman – *EHR IT Director*
Tom Zachary – *Revenue Development Director*
Ross Owen – *Hennepin Health*
Eugene Galbrayhk – *Clinical Care Coordinator for Medicine Clinic*
Mariela Ardemagni-Tollin – *Community Health Worker*

The first day of the site visit consisted of a meeting with eight Hennepin Health staff members. This meeting included a broad overview of Hennepin Health's history, structure, successes, and challenges. The following day included five interviews with individual staff members. Individual interviews allowed for more detailed discussion of the two core elements of Hennepin Health: addressing patients' medical and social needs. The final interview was held with a community health worker, accompanied by one of their patients who had been treated by HCMC for three and a half years.

Denver Health (Focus on PCMH System)

System Overview

Denver Health is the primary safety net institution for the state of Colorado. They serve approximately 25% of Denver residents, almost half of whom are uninsured. Denver Health has long practiced the integration of ambulatory and inpatient healthcare, and today the system includes the Denver Department of Public Health, 12 school-based clinics, five dental health clinics, an HMO, emergency paramedic services, a 100-bed substance abuse treatment facility, correctional care, and a call center for poison control and nurse advice. Although Denver Health does not have a direct mental health branch, they are closely partnered with the Mental Health Center of Denver where patients with severe mental health needs are referred. Thus, while they are not recognized as an ACO, Denver Health functionally operates in similar ways, including an ACO-like financial system (i.e. predominantly capitated).

In 2012, Denver Health was awarded a 3-year CMMI grant which allowed them to move forward in delivering integrated care. A major result of this award was the introduction of patient navigators into the primary care system. They are also participants of a CMS demonstration project which transitioned three of their eight FQHCs into formally recognized PCMHs. Furthermore, Denver Health uses a system that allows them to allocate resources based on the complexity of patients' medical, social, and behavioral health needs. The most complex patients are designated as tier-IV and receive care at the Intensive Outpatient Clinic (IOC). This clinic builds upon the resources of the lower tiers, including team based care and HIT, and offers the patients increased access and a wide array of resources for their social needs. There is also a separate tiering system for pediatric patients where the top tier clinic is for children with special health care needs.

Denver Health has seen positive results in terms of clinical outcomes, patient experience, and provider experience. Especially at the IOC, patients have reported positive feelings about the level of social support they are receiving. Likewise, providers also feel satisfied with this form of care, despite some initial apprehension and resistance to change. An innovative pharmacy program, which involved contacting patients post-discharge about their medication regimens, resulted in a 30% decrease in readmissions (Anderson, et al., 2013). Furthermore, patient navigation, a direct result of Denver's CMMI awarded grant, has already impacted prevention outcomes. A recent study reported that patients who received navigation had better outcomes in mammography, colorectal, and prostate cancer screening (Raich, et al., 2012).

Site Visit Details

On October 30, 2013, Linda Cummings, Bianca Perez, and Janelle Schrag from America's Essential Hospitals visited the Denver Health campus from 9:00am to 5:00pm, and again on October 31, 2013 from 9:00am to 4:00pm.

Individual and group interviews were held with the following staff from Denver Health:

Paul Melinkovich, MD – *Executive Director of Community Health Services*
Lucy Loomis, MD – *Director of Family Medicine*
Simon Hambidge, MD – *Director of General Pediatrics*
Josh Blum, MD – *Internal Medicine*
Rachael Slaughter – *Clinical Social Worker*
Holly Batal, MD – *Director of General Internal Medicine*
Rachel Meir – *Clinical Director of Behavioral Health and Wellness Services*
Sara Anderson – *Clinical Pharmacy Specialist*
Bill Burman, MD – *Director of Denver Public Health*
Erica Tovar – *Patient Navigator at Westside Family Health Center*
Muhanned Soud – *Patient Navigator II at Lowry Family Health Center*
Jennifer Hudson, RN – *Eastside Pediatrics*
Christina Quayle, RN – *Webb Pediatric Nurse Care Manager*
Ray Estacio, MD – *Associate Medical Director for Quality and Research*
Tracy Johnson, PhD – *Directory of Health Care Reform Initiatives*

This site visit consisted of a series of individual interviews lasting between thirty minutes to an hour. Of the 11 interviews, one was a group interview with two Denver Health staff members, and another was a group interview with four Denver Health staff members.

Chicago's South Side Diabetes Initiative

System Overview

The South Side Diabetes Initiative was chosen as a community-based intervention program for this review. The initiative specifically aims to reduce diabetes-related disparities for African Americans. With regards to the investigative outcomes of this review, this site can inform successes in reducing disparities, as well as chronic disease outcomes for African-American patients.

Chicago's South Side Diabetes Initiative started in 2009 and is a seven-year project funded by the Merck Company Foundation, the Alliance to Reduce Disparities in Diabetes, and the National Institute of Health. The three major aims of the project are to 1) reduce widely documented disparities in diabetes, 2) increase awareness of diabetes issues, and 3) empower the South Side community to use its knowledge, collaborators and resources to combat this disease. The project facilitates these aims through patient education and empowerment, provider workshops, clinical system redesign, and community collaborations. The project specifically targets the African American population of Chicago's south side to improve their diabetes outcomes.

The program involves collaboration between six health centers, all of whom are striving toward system-level quality improvement. Four of these health centers are FQHCs and two are academic clinics affiliated with the University of Chicago. In addition to their QI efforts, these health centers are focused on culturally tailored patient education, provider communication training, and community partnerships that support diabetes self-care.

Three years in, the South Side Diabetes Initiative is showing positive results. There have been improvements in patients' self-efficacy, self-care behaviors, and diabetes control, including significant decreases in HA1c levels. There have also been increases in both patient enrollment in self-management education, as well as provider enrollment in cultural awareness training. (Alliance to Reduce Disparities in Diabetes, 2013).

Interview Details

On November 18 2013, Linda Cummings and Bianca Perez from America's Essential Hospitals visited the Chicago area. They conducted an l interview with Monica Peek, MD, MPH, an Assistant Professor in the Division of General Internal Medicine at the University of Chicago and Principle Investigator for the South Side Diabetes Initiative.

Preventive Services

PCMH Demonstration	Study Design	Focus On Vulnerable Patient Populations?	Years Of Data Review	Study Size And Participant Characteristics	Improvements/Measures	Disparities Among Demographics	Other Results
Horizon BCBSNJ (BCBS of New Jersey) (PCPCC, 2012)	PCMH vs. Non-PCMH control	No	2011	52 physicians at 22 practices within ten counties; number of non-PCMH members participating not available	• 6% increase in breast and cervical cancer screening • 24% increase in LDL screening	Not addressed	N/A
Colorado PCMH Pilot (Bojadzievski & Gabbay, 2011)	Pre-PCMH vs. Post-PCMH	No	2009-2012	Between 3 and 14 family medicine and internal medicine practices reporting annually (out of 16 practices in initiative)	• Increase in breast cancer screening rate from ~50% to ~55% • Increase in colorectal cancer screening rate from ~35% to ~51% •Increase from 48.1% to 70.1% of patients screened for diabetic nephropathy •Increased Depression Screening	Not addressed	N/A
ProvenHealth Navigator model (Geisinger Health System) (Hughes & Thomas, 2012)	Pre-PCMH vs. Post-PCMH	No	2005-2008	11 intervention primary care practices serving 8,634 Medicare Advantage enrollees	• 74% improvement in quality of overall preventive care including preventive screenings for colon, breast, and cervical cancer	Not addressed	N/A

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WellMed Medical Home Transformation (PCPCC, 2012)	Case Study	Yes - Medicare Advantage patients, many of whom have complex health conditions such as diabetes, congestive heart failure, ischemic heart disease, chronic obstructive pulmonary disease and asthma	2000–2008	21 practices	• Increase in mammography screening rates from 19% to 40% • Increase in colon cancer screening rates from 11% to 50% • Increase in LDL screening rate for all patients from 47% to 70% • Increase in LDL screening rate for diabetic patients from 53% to 78% • Increase in BP screening rate for all patients from 38 to 76% • Increase in LDL screening for ischemic heart disease patients from 53 to 76% • Increase in BP screening for high BP patients increased 46 to 88%	Not addressed	N/A
Community Care of North Carolina (CCNC) (PCMH) (Wheeler, et al., 2013)	Secondary Analysis of NC Central Cancer Registry and Medicaid Claims	Yes - All patients were enrolled in Medicaid	2003-2007	840 women aged 18-64 years old with breast cancer diagnosis; approximately half enrolled in CCNC	•The number of months of CCNC enrollment was significantly positively associated with receipt of follow-up mammogram within 15 months post diagnosis (p=.021) •CCNC participation was significantly positively associated with receipt of a follow-up mammogram within 15 months post-RT completion (p=.031)	Not addressed	N/A
BCBS of Tennessee PCMH Initiative (PCPCC, 2012)	Pre-PCMH vs. Post-PCMH	No	2009–2012	15 practices	• 7% increase in patients receiving diabetes retinal exams • 14% increase in patients receiving diabetes nephropathy exams • 4% increase in patients receiving lipid exams	Not addressed	N/A
Healthy Outcomes Medical Excellence (HOME) (Weedon, et al., 2012)	Survey	Yes - All patients were enrolled in Medicaid	2009	820 Enrollees	•Increased adherence rates for HepB vaccine series (88%) and MMR vaccine (83%)	Not addressed	N/A

National Survey for Children's Health (NSCH) (Aysola, et al., 2013)	Secondary Analysis Using National Survey	No	2007-2008	91,642 children aged 0-17 years; About 58% of the children in our cohort had primary care services that satisfied the criteria for a PCMH	•Children with a PCMH had better adjusted rates for preventive medical services, having a provider obtain a developmental history, receiving formal developmental screening exams, and receipt of provider recommended human papillomavirus (HPV) vaccine	Not addressed	•Children with and without a medical home did not differ significantly in obtaining preventive dental services, tetanus booster immunization, or the meningococcal vaccine
The Commonwealth Fund 2006 Health Care Quality Survey (Beal, et al., 2007)	Telephone Interviews	Yes - Ethnic minorities and low income	2006	3,535 adults age 18-64 in continental US	• Regardless of race or ethnicity, about two-thirds of all adults who have a medical home receive preventive care reminders • Two-thirds of both insured and uninsured adults with medical homes receive preventive care reminders, compared with half of insured and uninsured adults without medical homes •Those with a medical home also reported higher rates of prostate cancer screening: nearly four of five (77%) men with a medical home were screened for prostate cancer, compared with only 47% of men who have a regular provider but not a medical home and 34% of men without a regular provider or source of care • Men who received a reminder were screened for prostate cancer at twice the rate (70%) as those who did not get a reminder (37%).	• More than half of insured adults (54%) received a reminder from a doctors' office to schedule a preventive visit, compared with only 36% of uninsured adults.	N/A
The PCMH National Demonstration Project (TransforMed) (Jaen, et al., 2010)	Case Study	No	2006	36 practices	N/A	Not addressed	•Absolute improvements in prevention scores were not statistically significant

National Survey of Children's Health (NSCH) (Long, et al., 2012)	Secondary Analysis Using National Survey	No	2003-2004	70007 non-special health care needs children aged 0-18 with a personal doctor or nurse (PDN)	•Children with medical homes had increased odds of having had a preventive care visit in the previous 12 months (aOR=1.32)	Not addressed	N/A
Empire BCBS PCMH Initiative (DeVries, et al., 2012)	PCMH vs. Non-PCMH control	No	2009	247 physicians at 10 PCMH practices (86 locations) within five boroughs of New York City and its suburbs; 4048 physicians at 202 non-PCMH practices (898 locations) within same region	•Larger proportion of patients in PCMH cohort receiving LDL screening compared with the non-PCMH cohort (75.9% vs 73.5%)	Not addressed	N/A
The Chronic Care Model (Gabbay, et al., 2011)	Pre-PCMH vs. Post-PCMH	No	2009	32 Practices	•The percentage of patients who received a yearly foot assessment for neuropathy increased significantly from 50% to 69% •The percentage of patients receiving yearly screenings for nephropathy and diabetic retinopathy as well as administration of pneumonia and influenza vaccines also improved	Not addressed	N/A
National Immunization Survey (NIS) (Smith A. L., 2003)	Secondary Analysis Using National Survey	Yes - Medicaid eligible children, American Indian/Alaska Native children, uninsured children, underinsured children	2001-2002	24596 children aged 19-35 months	•VFC-eligible children with a medical home had significantly more visits to vaccination provider than those without a medical home •VFC-eligible children with a medical home have a significantly higher vaccination rate than those without a medical home •VFC-eligible children who received all their vaccinations at their medical home were significantly more likely to be up-to-date on vaccines	Not addressed	•Among children with a medical home, VFC-eligible children were significantly less likely to receive all of their vaccinations form their medical home than non-VFC-eligible children

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Wisconsin Longitudinal Study (Pandhi, et. al., 2012)	Secondary Analysis Using National Survey	No	2003-2006	5507 adults aged 40-86	•Experiencing more first-contact access components was significantly associated with a higher rate of receiving cholesterol tests, flu shots, and prostate exams	Not addressed	•Experiencing more first-contact access components was not significantly associated with a higher rate of receiving mammograms
National Survey of Children's Health (NSCH) (Test, Caskey, & Rankin, 2013)	Secondary Analysis Using National Survey	No	2007	15965 girls aged 12-17 with non-missing data for HPV responses and a medical home variables	•Girls with a medical home were significantly more likely to have received at least one HPV vaccine injection than those without a medical home •Among girls in households with income levels less than 300% FPL, those with a medical home were more likely to receive at least one HPV vaccine injection (OR=1.72)	•Despite medical home status, girls with insurance were much more likely to receive HPV vaccine (OR=1.54)	N/A

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Diabetes

PCMH Demonstration	Study Design	Focus On Vulnerable Patient Populations?	Years Of Data Review	Study Size And Participant Characteristics	Improvements/Measures	Disparities Among Demographics	Other Results
Air Force Family Health Initiative (FHI) (PCPCC, 2012)	Pre-PCMH vs. Post-PCMH	No	2009–2011	32 medical treatment facilities serving 340,000 enrolled patients	• Improved glycemic control for 77% of diabetic patients at Hill Air Force Base	Not addressed	N/A
BCBS of Tennessee PCMH initiative (PCPCC, 2012)	Pre-PCMH vs. Post-PCMH	No	2009–2012	15 practices	• 3% increase in patients receiving diabetes exams • 7% increase in patients receiving diabetes retinal exams • 14% increase in patients receiving diabetes nephropathy exams • 4% increase in patients receiving lipid exams • 6% increase in prescriptions for coronary artery disease medications	Not addressed	N/A
CareOregon Primary Care Renewal (PCPCC, 2012)	Pre-PCMH vs. Post-PCMH	Yes - includes dual-eligibles, disabled, homeless, migrant and low-income patients	2007–2009	Multnomah County Health Department's Mid County Clinic, serving 9,000 culturally and ethnically diverse patients	• Increase in diabetes patients with HbA1c <8 from 45% to 65%	Not addressed	N/A
Colorado PCMH Pilot (Bojadzievski & Gabbay, 2011)	Pre-PCMH vs. Post-PCMH	No	2009-2012	Between 9 and 14 family medicine and internal medicine practices reporting annually (out of 16 practices in initiative)	•Decrease in diabetes patients with HbA1c >9 from 27.1% at baseline to 14% •Increase in diabetes patients with BP <130/80 from 39.4% at baseline to 53.8% •Increase in diabetes patients with LDL <100 from 27% at baseline to 42% •Increase in LDL and AIC documentation from 69.4% to 82.6% and 76.4% to 91.7%, respectively •Increase from 35.2% to 73% of patients receiving statins •Increase from 48.1% to 70.1% of patients screened for diabetic nephropathy	Not addressed	N/A

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Empire BCBS PCMH Initiative (DeVries, et al., 2012)	PCMH vs. Non-PCMH Control	No		2009	247 physicians at 10 PCMH practices (86 locations) within five boroughs of New York City area; 4048 physicians at 202 non-PCMH practices (898 locations) within same region	•Significantly larger proportion of diabetic patients in PCMH group receiving HbA1c testing compared with non-PCMH group (82.1% vs. 77.7%) •Significantly greater proportion of non-PCMH diabetic patients receiving medical attention for nephropathy	Not addressed	•More than half of the diabetic patients who had recorded test results achieved A1C control and LDL-C control in both PCMH and non-PCMH groups
Health Partners Medical Group BestCare (Bojadzievski & Gabbay, 2011)	Pre-PCMH vs. Post-PCMH	No		2004-2009	Not specified	• Improvements in HbA1c, blood pressure, and LDL cholesterol • 129% increase in patients receiving optimal diabetes care •39% decrease in emergency department visits and 24% decrease in hospital admissions per enrollee between 2004 and 2009	Not addressed	N/A
Health Partners Medical Group (Solberg, et al., 2011)	PCMH vs. Non-PCMH Control	No		2005-2007	20 PCMH and non-PCMH primary care clinics	• 3.1% increase per year in performance on quality measures for diabetes *Diabetes measures include HbA1c <7%, blood pressure <130/80 mm Hg, , LDL cholesterol <100 mg/dL, documented nonsmoking status, regular use of aspirin for those older than 40 years of age	Not addressed	N/A
Horizon BCBSNJ (BCBS of New Jersey) (PCPCC, 2012)	PCMH vs. Non-PCMH Control and Pre-PCMH vs. Post-PCMH	No		2011	52 physicians at 22 practices within ten counties; information on non-PCMH controls not provided	•8% higher rate in improved diabetes control (HbA1c) for PCMH than non-PCMH Within PCMH: • 8% improvement in HbA1c levels • 31% increase in ability to effectively self-manage blood sugar • 24% increase in LDL screening	Not addressed	N/A
MediQHome Quality Program (BCBS of North Dakota) (PCPCC, 2012)	Pre-PCMH vs. Post-PCMH	No		2005–2006	Not specified	• 6.7% improvement in BP control • 10.3% improvement in cholesterol control • 64.3% improvement in optimal diabetes care. • 53.8% improvement in optimal diabetes control	Not addressed	N/A

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Pennsylvania Chronic Care Initiative (Bojadzievski & Gabbay, 2011)	Pre-PCMH vs. Post-PCMH	No	2008-2009	25 practices targeting diabetes in the Southeast Pennsylvania (SEPA) collaborative (out of 102 practices in initiative)	•Increase in patients reaching recommended LDLc target of < 100 •Increase from 35% to 57% of patients receiving statins, ACE inhibitors, and angiotensin receptor blockers •Increase from 20% to nearly 70% of patients with established self-management goals Statistically significant improvements in key clinical parameters for BP and cholesterol levels, including: •8.5% absolute increase in the percentage of patients with LDLc < 130 •4% absolute increase in the percentage of patients with BP < 140/90 •2.5% absolute decrease in the percentage of patients with HbA1c > 9.	Not addressed	N/A
ProvenHealth Navigator model (Geisinger Health System) (Bojadzievski & Gabbay, 2011)	Pre-PCMH vs. Post-PCMH	No	2005-2008	11 primary care practices serving 8,634 Medicare Advantage enrollees	•34.5% improvement in diabetes care •Increase in patients with HbA1c <7% from 32.2% to 34.8% •Increase in patients with blood pressure <130/80 mmHg from 39.7% to 43.9% •18% reduction in hospital admissions relative to controls: 257 admissions per 1000 members per year in PCMH patients vs. 313 admissions per 1000 members per year in controls (p<.01). Within PCMH cohort, admission rates decreased	Not addressed	N/A
Rhode Island Chronic Care Sustainability Initiative (Bojadzievski & Gabbay, 2011)	Pre-PCMH vs. Post-PCMH	No	2008-2010	5 primary care practices (out of 13 sites in initiative)	•Increase in diabetes patients with HbA1c <7 from 33% at baseline to 40% •Increase in diabetes patients with BP <130/80 from 18% at baseline to 40% •Increase in diabetes patients with LDL <100 from 27% at baseline to 42%	Not addressed	N/A

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The PCMH National Demonstration Project (TransforMed) (Bojadzievski & Gabbay, 2011)	Pre-PCMH vs. Post-PCMH	No	2006-2008	36 family medicine practices	• 5% increase for percentage of recommended measures met for diabetes mellitus, hypertension, hyperlipidemia, and coronary artery disease (combined chronic care measure) *Diabetes measures include: LDL cholesterol measured in previous year, LDL cholesterol <100 mg/dL, retinal examination by eye professional in previous year, HbA1c measured in the previous year, HbA1c <9%, last blood pressure <130/80 mm Hg, foot examination in the previous year, aspirin prophylaxis	Not addressed	N/A
UPMC Health Plan Medical Home Pilot (PCPCC, 2012)	PCMH vs. Non-PCMH Control	No	2009	6 practices serving between 8,500 and 9,000 patients	• 20% more effective long-term blood sugar control for PCMH than non-PCMH • Greater percentage of diabetic patients in PCMH with cholesterol control for PCMH compared with non-PCMH (60% vs. 23%)	Not addressed	N/A
WellMed Medical Home Transformation (PCPCC, 2012)	Case Study	Yes - Medicare Advantage patients, many of whom have complex health conditions such as diabetes, congestive heart failure, ischemic heart disease, chronic obstructive pulmonary disease and asthma	2000–2008	21 practices	• Increase in diabetes patients with control of HbA1c levels from 81% to 93% • Increased control of BP levels from 67% to 90% • Increase in diabetes HbA1c testing rate from 55% to 71% • Increase in LDL screening rate for all patients from 47% to 70% • Increase in LDL screening rate for diabetic patients from 53% to 78% • Increase in BP screening rate for all patients from 38 to 76%	Not addressed	N/A
Group Health (Liss, 2012)	Case study	No	2007-2008	37938 patients aged 18-85	•Patients were 1% more likely to receive HbA1c testing (p=.03), 3% more likely to have HBA1c under 9.0% (p<.001) and had a mean HBA1c 0.15% lower than controls (p<.001)	Not addressed	See Cardiovascular Table

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Cardiovascular Disease

PCMH Demonstration	Study Design	Focus On Vulnerable Patient Populations?	Years of Data Review	Study Size And Participant Characteristics	Improvements/Measures	Disparities Among Demographics	Other Results
Health Partners Medical Group BestCare (PCPCC, 2012)	Pre-PCMH vs. Post-PCMH	No	2004-2009	Not specified	• 48% increase in optimal heart disease care.	Not addressed	N/A
Health Partners Medical Group BestCare (Solberg, et al., 2011)	PCMH vs. Non-PCMH control	No	2005-2007	20 PCMH and non-PCMH primary care clinics	• 7.4% increase per year in performance on quality measures for coronary artery disease (CAD) *CAD control composite measure assesses control of lipids, blood pressure, and smoking, and daily aspirin use in patients with CAD	Not addressed	N/A
MediQHome Quality Program (BCBS of North Dakota) (PCPCC, 2012)	Pre-PCMH vs. Post-PCMH	No	2005–2006	Not specified	• 8.6% improvement in BP control for CAD management • 9.4% improvement in cholesterol control for CAD management • 8% improvement in blood pressure control for hypertension management	Not addressed	N/A
MediQHome Quality Program (BCBS of North Dakota) (PCPCC, 2012)	Case Study	No	2009-2012	Not specified	• Improvement in quality of care scores for cardiovascular disease care measures from 14.7% to 27.9% • Increase in percentage of adult patients with BP control from 63% to 67.4%	Not addressed	N/A
Humana Queen City Physicians PCMH pilot (PCPCC, 2012)	Case Study	No	2008–2010	18 physicians at 4 internal medicine practices serving 5,200 patients	•22% decrease in patients with uncontrolled blood pressure •10 percent improvement in diabetic management •15 percent improvement in blood pressure control	Not addressed	N/A

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ProvenHealth Navigator model (Geisinger Health System) (Bojadzievski & Gabbay, 2011)	Pre-PCMH vs. Post-PCMH	No	2005-2008	11 primary care practices serving 8,634 Medicare Advantage enrollees	• 22% improvement in quality of care for patients with CAD *CAD measures include adherence with guideline-based treatment of LDL and BP •18% reduction in hospital admissions relative to controls: 257 admissions per 1000 members per year in PCMH patients vs. 313 admissions per 1000 members per year in controls (p<.01). Within PCMH cohort, admission rates decreased	Not addressed	N/A
The Commonwealth Fund 2006 Health Care Quality Survey (Beal, et al., 2007)	Ongoing PCMH Evaluation, PCMH vs. Non-PCMH Data	Yes - uninsured, underinsured, and minorities included	2006	3,535 adults age 18-64 in continental US, focused on African American, Hispanic, and Asian American households	•>50% of hypertensive adults with a medical home reported checking their blood pressure on a regular basis, compared with 42% of hypertensive adults with a regular provider but not a medical home. •42% of hypertensive adults with a medical home reported that they regularly check their blood pressure and that it is well controlled, compared to 25% of hypertensive adults with a regular source of care, but not a medical home	Not addressed	N/A
Colorado PCMH Pilot (Bojadzievski & Gabbay, 2011)	Pre-PCMH vs. Post-PCMH	No	2009-2012	Between 9 and 14 family medicine and internal medicine practices reporting annually (out of 16 practices in initiative)	•Increase in patients with BP <140/80 from 60.7% at baseline to 74.9% •Increase in patients with LDL <100 from 27% at baseline to 42% •Increase from 59.7% to 68% of patients with lipid profiles •Increase from 56.3% to 64.2% of patients prescribed lipid lowering therapy •Increase from 41% to 65% of tobacco cessation interventions •Increased Aspirin use from ~68% to ~98%	Not addressed	N/A

Empire BCBS PCMH Initiative (DeVries, et al., 2012)	PCMH vs. Non-PCMH Control	No	2009	247 physicians at 10 PCMH practices (86 locations) within five boroughs of New York City and its suburbs; 4048 physicians at 202 non-PCMH practices (898 locations) within same region	•Lower proportion of patients with cardiovascular disease in PCMH compared to non-PCMH cohorts (1,367 vs. 32,193) •Larger proportion of patients in PCMH cohort receiving LDL screening compared with the non-PCMH cohort (75.9% vs. 73.5%) •Higher percentage of patients with cardiovascular disease achieving LDL <100 in PCMH compared to non-PCMH cohorts (64.7% vs. 57.3%) •After risk adjustment, the PCMH cohort had significantly lower rates of hospitalization and ED use compared with the non- PCMH cohort in both the adult and the pediatric populations	Not addressed	N/A
WellMed Medical Home Transformation (PCPCC, 2012)	Case Study	Yes - Medicare Advantage patients, many of whom have complex health conditions such as diabetes, congestive heart failure, ischemic heart disease, chronic obstructive pulmonary disease and asthma	2000–2008	21 practices	• Increase in heart disease patients with LDL levels under control from 51% to 95% • Increase in LDL screenings for ischemic heart disease patients from 53 to 76%. • Increase in BP screenings for high BP patients increased from 46 to 88%.	Not addressed	N/A

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MTM Pharmacy Medical Home (Berdine, 2012)	Case Study	No	2007-2011	200 Patients with various medical conditions, mean age was 52.8 years old	• Statistically significant changes in LDL Cholesterol (p=.007) at Year 3 to achieve healthy levels • Statistically significant changes in Triglycerides (p=.002) at Year 2 and Year 3 (p=.008) to achieve healthy levels • Statistically significant changes in A1C (p=.006) at Year 2 to achieve healthy levels • Statistically significant changes in Systolic Blood Pressure (p=.010) at Year 1 to achieve healthy levels • Changes in BMI were also statistically significant • Systolic and Diastolic blood pressure was fairly well controlled at the outset for most patients	Not addressed	N/A
The Chronic Care Model (Gabbay, et al., 2011)	Pre-PCMH vs. Post-PCMH	No	2009	32 Practices	•In Year 1, there was significant improvements in evidence-based care guideline adherence and clinical outcomes •8.5% absolute increase in the percentage of patients with LDLc<130 •4% absolute increase in the percentage of patients with BP<140/90 •2.5% absolute decrease in the percentage of patients with A1C>9 •More patients achieved the recommended LDLc target of <100	Not addressed	N/A
Group Health (Liss, 2012)	Case study	No	2007-2008	37938 patients aged 18-85	•Patients were 11% more likely to have LDL below 100mg/dL (p<.001) and had mean LDL cholesterol 2.20mg/dL lower than controls (p<.001)	Not addressed	•Among patients with hypertension there were no significant differences
Comprehensive Care Practice Improvement Module (Gray, Weng & Holmboe, 2012)	Case study	No	2007	14457 patients from 592 physicians	•There was a significant increase (4.2%) in blood pressure control associated with excellent care quality rating	Not addressed	N/A

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Asthma

PCMH Demonstration	Study Design	Focus On Vulnerable Patient Populations?	Years of Data Review	Study Size And Participant Characteristics	Improvements/Measures	Disparities Among Demographics	Other Results
Empire BCBS PCMH Initiative (DeVries, et al., 2012)	PCMH vs. Non-PCMH Control	No	2009	247 physicians at 10 PCMH practices (86 locations) within five boroughs of New York City and its suburbs; 4048 physicians at 202 non-PCMH practices (898 locations) within same region	•Greater use of long-term controller medication among PCMH-treated asthma patients compared with non-PCMH–treated asthma patients (99.4% vs. 97.9%)	Not addressed	N/A
Parents' Perception of Primary Care (P3C) (Auger, et al., 2013)	Observational Cohort Study (1 Year)	Privately Insured vs. Medicaid populations	2008-2009	601 children aged 1-16 hospitalized for acute asthma exacerbation	•Children with lower level access to PCMH had higher risks of readmissions compared to the best level access (HR=1.56) •Children with poor access used the ED as their primary source of acute asthma care more frequently than children with good access (53% vs. 33%) •34% of children with good access visited or called their PCP in the week before admission compared to 21% of those with poor access	•Children with private insurance and good access had the lowest rate of readmission (18.1%) and those with Medicaid and poor access had the highest rates (25.9%)	N/A
National Survey of Children with Special Health Care Needs (NSCSHCN) (Diedhiou, et al., 2010)	Secondary Analysis Using National Survey	No	2005-2006	14916 Children between the ages of 6-17 currently with asthma	•Children who received medical home care had significantly fewer ED than their peers without such care (7%)	•Asthma severity was inversely related to the likelihood of receipt of medical home care	N/A

Developmental Disabilities

PCMH Demonstration	Study Design	Focus On Vulnerable Patient Populations?	Years of Data Review	Study Size And Participant Characteristics	Improvements/Measures	Disparities Among Demographics	Other Results
Healthy Outcomes Medical Excellence (HOME) (Weedon, et al., 2012)	Survey	No	2009	820 Enrollees	•Significant decreases in average monthly hospital bed days (29.5%) •Significant decreases in average length of stay following implementation of case management (41%) •Increased adherence rates for HepB vaccine series (88%) and MMR vaccine (83%) •77% of patients with diabetes met the goal for maintaining a A1C at or below 6.5%	•All participants were on Medicaid	N/A
National Survey of Children with Special Health Care Needs (NSCSHCN) (Raphael, et al., 2009)	Secondary Analysis Using National Survey	No	2005-2006	35301 CSHCN aged 3-17	•Children with a medical home had lower odds (OR=0.81) of having at least 1 emergency care visit in the last 12 months compared to those children without a USC or medical home	Not Addressed	N/A

Patient-Centered Outcomes

PCMH Demonstration	Study Design	Focus On Vulnerable Patient Populations?	Years Of Data Review	Study Size And Participant Characteristics	Improvements/Measures	Disparities Among Demographics	Other Results
National Survey for Children's Health (NSCH) (Aysola, et al., 2013)	Secondary Analysis Using National Survey	No	2007-2008	91,642 children aged 0-17 years; About 58% of the children in our cohort had primary care services that satisfied the criteria for a PCMH	•Children with medical homes also had significantly lower rates of unmet medical needs (P < 0.001) •Among children with asthma, those with a medical home reported fewer missed school days compared with those without	• Having a medical home was associated with substantially and statistically significant less unmet health care needs in each racial/ethnic group compared to white children	•Among those children requiring mental health services, those with a PCMH were less likely to receive needed services (P < 0.01)
"Oklahoma: Oklahoma Medicaid (2011)(58)" (PCPCC, 2012)	Case Study	No	2008–2010	Not Addressed	Improved access over one year period: • Reduction from 1,670 to 13 patient inquiries related to same-day/next-day appointment availability • 8% increase in patients "always getting treatment quickly."	Not addressed	N/A
Washington: Regence Blue Shield (Intensive Outpatient Care Program with Boeing) 2012(40) (PCPCC, 2012)	Case Study	No	2007–2009	Not Addressed	• 14.8% improved patient reported physical and mental functioning • 65% reduced patient reported missed workdays	Not addressed	N/A
The Commonwealth Fund 2006 Health Care Quality Survey (Beal, et al., 2007)	Telephone Interviews	Yes - Ethnic minorities and low income	2006	3,535 adults age 18-64 in continental US	• The vast majority (74%) of adults with a medical home always get the care they need, compared with only 52% of those with a regular provider that is not a medical home and 38 percent of adults without any regular source of care or provider.	Not addressed	N/A

					• Regardless of race or ethnicity, about two-thirds of all adults who have a medical home receive preventive care reminders • Two-thirds of both insured and uninsured adults with medical homes receive preventive care reminders, compared with half of insured and uninsured adults without medical homes • Adults with a medical home reported better coordination between their regular providers and specialists. Among those who saw a specialist, 75% said their regular doctor helped them decide whom to see and communicated with the specialist about their medical history, compared with 58% of adults without a medical home •>50% of hypertensive adults with a medical home reported checking their blood pressure on a regular basis, compared with 42% of hypertensive adults with a regular provider but not a medical home. •42% of hypertensive adults with a medical home reported that they regularly check their blood pressure and that it is well controlled, compared to 25% of hypertensive adults with a regular source of care, but not a medical home		
The PCMH National Demonstration Project (TransforMed) (Jaen, et al., 2010)	Case Study	No	2006	36 practices	N/A	Not addressed	•No significant improvements in patient-rated outcomes, including ratings of the 4 pillars of primary care, global practice experience, patient empowerment, and self-rated health status

Group Health Cooperative Medical Home Pilot/ Washington: Group Health of Washington (Seattle, WA) (Fishman, et al., 2012)	Case Study	No	2007	6,187 patients aged 21-85 from 1 Seattle PCMH clinic and two control clinics	•After 12 months, medical home patients reported better care experience on six scales, and these trends continued after 24 months •Improvements patient satisfaction •After 21 months, inpatient visits were significantly reduced (p=.007)	Not addressed	N/A
Group Health of Washington (PCPCC, 2012)	Case Study	No	2006–2007 & 2008	Not Addressed	Improved medication management: • 18% reduction in use of high-risk medications among elderly • 36% increase in use of cholesterol-lowering drugs • 65% increase in use of generic statin drug Improved patient experiences in one clinic: • 83% of patient calls resolved on the first call compared to 0% pre-PCMH(79) •29% fewer ED visits •11% fewer hospitalizations for ambulatory care-sensitive conditions	Not addressed	N/A
Group Health Cooperative PCMH Pilot (Fishman, et al., 2012)	Survey	No	2007-2009	1622 seniors with at least 90 days of Group Health enrollment	•Patient receiving care in the pilot clinic had higher satisfaction measurements at baseline, 12 and 24 months relative to patients at the control clinics •Pilot and controlled clinics differed significantly in improvements in shared decision making at 12 months and continuity of care and access to care at both 12 and 24 months	Not addressed	N/A

Appendix C: PCMH Evaluation Summary

Patients Unable to Follow Up . . . Found (PUFF) (Sitapati, et al., 2012)	Case Study	Yes - urban patients with HIV and AIDS	2010	2776 HIV-positive patients from the Owen Clinic	•The PUFF specialist was directly responsible for the return of 16.2% of poorly retained patients •Patients were generally pleased by the called they received from PUFF specialists	Not addressed	•The majority (15.2%) of patients lost was due to incarceration, followed by being "too busy" (12.6%)
General PCMH Investigation (Kern, et al., 2013)	Survey	No	2009-2011	387 Patients	•Patients' experience with access to care improved significantly over time, with 69% of respondents giving the most favorable rating at follow-up, up from 61% (P = .02) •There was a trend toward improved experience with office staff, with 72% of respondents giving the most favorable rating at baseline and 78% doing so at follow-up (P = .06).	Not addressed	• Patient experience with follow-up of test results was reduced - 76% giving the most favorable rating at baseline and 69% doing so at follow-up (P = .06) • Improvements with patients' experience regarding access to care were driven by improvements in availability of appointments for urgent problems and decreases in wait time to be seen once at the office
Aligning Forces for Quality Consumer Survey (AF4QCS), 2nd National Survey of 2276 HSR: Health Services Research 47:6 Physician Organizations (NSPO2), the National Survey of Small and Medium Physician Practices (NSSMPP) (Martsolf, et al., 2012)	Secondary Analysis Using National Surveys	No	2006-2009	1697 Consumers and physician practices	•Patients were significantly more likely to express positive perceptions of interpersonal exchanges with providers if the practice in which they received care was jointly owned by physicians and a hospital compared to those in a purely physician-owned practice	Not addressed	•Based on the estimated coefficients, the use of PCMH processes was not significantly associated with any of the three measures of patient experience •No practice characteristics were significantly associated with patients' perceptions of the quality of treatment goal setting with their providers •No practice characteristics were associated with patients' perceptions of out-of-office contact with providers

New Orleans Safety Net (Schmidt, et al., 2013)	Survey and In-Person Interviews	Yes - 49% of patients were uninsured; 73% were less than college educated	2009	1573 patients served by the 26 clinics, all ages	•There was a strong, positive association between PCMH score and a positive patient rating on the coordination of care •There were positive associations between the PCMH scores of clinics and patient ratings on coordination in small-sized and medium-sized clinics, and no associations among large clinics •Only patient ratings of care coordination were consistently and positively related to PCMH level	Not addressed	•Patient ratings of accessibility were inversely associated with PCMH score •The relationship between PCMH status and patient ratings on accessibility and confidence in quality/safety was generally negative except in large clinics •Notably, in small clinics, patient ratings of accessibility were inversely associated with the clinic's PCMH score
Health Partners Medical Group BestCare (Solberg, et al., 2011)	Survey	No	2005-2009	20 PCMH and non-PCMH primary care clinics	•The clinics in this group achieved a 1% to 3% increase per year in patient satisfaction, and 2% to 7% increase for quality	Not addressed	•The yearly increase in satisfaction after adjustment for clinic-level patient case mix in each year was positive for all 7 items but significant for only 3 of them
National Survey of Children's Health (NSCH) (Stevens, Pickering, & Laqui, 2010)	Secondary analysis using national survey	No	2007-2008	6357 school aged children six years or older currently with asthma	Without Adjustment: •Favorable association between PCMH and number of contacts by the school for child problems (p <.01) •Patients associated with PCMH were more likely to have more exercise days in the past week (p < .05), playing sports (OR=1.18) and volunteering (OR=1.26). With Adjustment: •There was a positive association between PCMH and exercise days (p <.05) and greater likelihood of having volunteered in the past year (OR= 1.16) •Comprehensive care was associated with all measures of school engagement: fewer school days missed (p < .001), fewer contacts by the school (p < 0.05), and lower odds of having repeated a grade (OR = 0.89) •Family-	Sought to include patients with low socio-economic status or poor neighborhood safety, but not specifically addressed	N/A

					centered care was also associated with fewer contacts by the school, as well as favorably associated with number of days exercised (p < .001) and playing sports (OR = 1.09)		
Healthy Kids Programs (Stevens, Vane, & Cousineau, 2011)	Cross-Sectional Survey	Yes - Latino children in low income, undocumented, Spanish-speaking families	2008-2009	3258 children aged 2-18 years currently enrolled or on the waiting list for Healthy Kids	•Positive association between PCMH quality scores, as well as access features, and PedsQL scores for physical, social, emotional and school/daycare HRQOL subdomains •PCMH quality scores were positively associated with school related measures, including: missing less than three school days due to injury (OR=1.12), excellent or above average school performance (OR=1.10), reading (OR=1.13), and math (OR=1.10) •PCMH access was positively associated with higher odds of performing well in school and reading	Not addressed	N/A
National Survey of Children's Health (NSCH) (Long, et al., 2012)	Secondary Analysis using national survey	No	2003-2004	70007 non-special health care needs children aged 0-18 with a personal doctor or nurse (PDN)	•Children with medical homes had decreased odds of having had an outpatient sick visit (aOR=0.70) •Children with medical homes were more likely to receive a parental global health assessment of "excellent/very good" compared to "good/fair/poor" (aOR=1.29) •Children with medical homes had significantly greater odds of being read to daily (aOR: 1.46), getting sufficient sleep daily (aOR: 1.56), always using a helmet (aOR: 1.18, and watching 2 hours of screen time daily (aOR: 1.12)	Not addressed	•The medical home was no longer significantly associated with increased parental global health rating for children aged 2 to 5 years

Diabetes Assessment Service (Edwards, et al., 2012)	Case Study	No	2010-2011	131 Patients with upcoming appointments aged 18-85	•The average face-to-face time with each patient was 27.9 ± 10.5 minutes	Not addressed	N/A

Appendix C: PCMH Evaluation Summary

Patient-Centered Outcomes Specific to Children with Special Health Care Needs (CSHCN)							
National Survey of Children's Health (NSCH) (Boudreau, et al., 2012)	Cross-Sectional Secondary Analysis Using National Survey	No	2007-2008	18352 children aged 0-17 with special health care needs	•Families with a PCMH experienced significantly lower difficulty with parental coping (0.6%) and parental aggravation (6.2%). •Prevalence of childcare or work issues in families with a medical home (28.4%) was lower than families without a medical home (35.0%). •The prevalence of 11 or more missed school days was also lower among children with a medical home (4.1%) compared to those without (7.8%). When adjusted for covariates, these results still remained. •Parents of children with a medical home were less likely to report having difficulty with parental coping (OR=0.26), parental aggravation (OR=0.54) and childcare or work issues (OR=0.72). •Children with a medical home were also less likely to have 11 or more missed school days (OR=0.87). These associations may indicate more positive family functioning.	Not addressed	N/A
National Survey of Children with Special Health Care Needs (NSCSHCN) (DeRigne & Porterfield, 2010)	Secondary Analysis Using National Survey	No	2005-2006	23380 children with married parents, 8814 children with single-mothers	•In both married-parents and single-mother families, children with a medical home are positively associated with parents NOT changing employment status. Care coordination services significantly influence the relative risk of changing employment status with the probability of reducing work hours 43% lower for married	Not addressed	N/A

					parents and 39% lower for single-mothers IF their child receives care coordination services as part of their medical home		
National Survey of Children with Special Health Care Needs (NSCSHCN) (Willits, et al., 2012)	Secondary Analysis Using National Survey	No	2005-2006	35230 CSHCN 6-17 years of age	N/A	Not addressed	•Access to a medical home was not associated with decreasing missed school days (aOR=2.46)
Pediatric Medical Home Program (Hamilton, et al., 2013)	Questionnaire	All participants were on Medicaid	2003-2007	41 Enrollees	•Questions regarding Family Centeredness received the highest scores	•More positive responses from Spanish speaking families	•Questions regarding Care Plans received the lowest scores
General PCMH Investigation (Golnik, et al., 2012)	Survey	No	2009-2010	46 children aged 0-18 with ASD, 157 children aged 0-18 without ASD	•At the end of the intervention period, subjects had 250% greater odds of reporting that their care met criteria of a medical home compared to controls •PCMH patients reported higher satisfaction (p=.0004) and shared decision making (p=.-0005) than non-PCMH patients	Not addressed	•Family stress related to the child's condition was not significantly lower among the PCMH group
National Survey of Children with Special Health Care Needs (NSCSHCN) (Ghandour, et al., 2011)	Secondary Analysis Using National Survey	No	2005-2006	40465 CSHNC aged 3-17	•Families with a medical home had a lower frequency of financial problems than those families without a medical home (10.5% vs. ~25%) •Access to a medical home and 3 of its 5 components was associated with a lower prevalence of family burden	Not addressed	N/A
Healthy Outcomes Medical Excellence (HOME) (Weedon, et al., 2012)	Survey	All participants were on Medicaid	2009	820 Enrollees	•Patients were highly satisfied (90%+) with the knowledge attentiveness and courtesy of their clinicians; abilities and courtesy of the staff; follow-through on treatment team commitments; clinic wait times; and overall quality of the program.	Not addressed	•Areas of improvement include: increased availability of follow-up appointments and more rapid responses to phone messages

Appendix D: ACO Demonstrations in Medicaid

Demonstration	Location	Targeted Population	Overview	PCMH Related Components
Regional Care Organization (RCO)	Alabama	Majority of the state's Medicaid population (~800,000), not including dual eligibles	An organization "of health care providers that contract with the state Medicaid agency to provide a comprehensive package of Medicaid benefits to Medicaid beneficiaries within a defined region of the state. They will coordinate care for the majority of the Medicaid population and manage Medicaid benefits including physical, behavioral, and pharmacy services"	"Federally Qualified Health Centers (FQHCs) are also expected to play a role in the development of both the RCOs and Patient Care Networks of Alabama (PCNA) as critical primary care providers"
Accountable Care Collaborative (ACC) and Regional Care Collaborative Organizations (RCCO)	Colorado	Medicaid fee-for-service and Primary Care Physicians Program beneficiaries, not including dual eligibles or patients enrolled in Medicaid managed care	The ACC program is "responsible for providing medical management, care coordination among providers and services, and support to providers, and are accountable for quality and cost through utilization-based incentive payments and a shared savings program. The ACC Program offers the regular Medicaid benefit package to enrollees who belong to a Regional Care Collaborative Organization (RCCO) through their 'Primary Care Medical Provider,' which serves as the enrollee's medical home"	"RCCOs are expected to work with patients' Primary Care Medical Providers to coordinate care, ease care transitions between settings, and connect beneficiaries with specialist services as needed"

Demonstration	Location	Targeted Population	Overview	PCMH Related Components
Accountable Health Care Alliance of Rural Oahu (AHARO)	Hawaii	50% of patients are enrolled in the Hawaii Medicaid program - QUEST	"A 'virtual accountable care organization' formed in late 2010 between three Federally Qualified Community Health Centers. Together, these community health centers on Oahu contracted with two Medicaid managed care plans to identify quality goals and shared savings"	"Contracts with the two participating Medicaid managed care plans support 'health care home' standards (additional standards, beyond NCQA patient-centered medical home recognition, for care enabling services, cultural proficiency, community involvement, and workforce and economic development), performance-based reimbursement, and shared savings partnerships"
Care Coordination Innovations Project	Illinois	In accordance with a legislative mandate, "50 percent of Medicaid beneficiaries [will be] enrolled in coordinated care by 2015."	"Alternative models of care delivery based on two structures: Care Coordination Entities (CCEs) and Managed Care Community Networks (MCCNs)." "A CCE is a collaboration of providers and community agencies (organizations), governed by a lead entity that receives a care coordination payment in order to provide care coordination services for its Enrollees." "A MCCN is an entity other than a Health Maintenance Organization, that is owned, operated, or governed by providers of health care services within Illinois and that provides or arranges primary, secondary and tertiary managed health care services under contract with the Department exclusively to persons participating in programs administered by the Department."	"Under Public Act 096-1501, care coordination must include providing or arranging for a majority of care around the patient's needs, including a medical home with a primary care provider…"

Appendix D: ACO Demonstrations in Medicaid

Demonstration	Location	Targeted Population	Overview	PCMH Related Components
Bayou Health	Louisiana	"Participation in coordinated care networks in Louisiana is mandatory for categorically needy children up to 19 years of age and their parents; pregnant women; aged, blind, and disabled adults; uninsured women under the age of 65 who have been identified as being in need of treatment for breast and/or cervical cancer; uninsured women eligible through the Louisiana Children's Health Insurance Program Prenatal Option; and medically needy individuals and families. Participation is voluntary for Native Americans/Alaskan Natives and foster care children"	A Medicaid managed care program that includes 1) a prepaid risk bearing managed care organization model and 2) a coordinated care network and shared savings model.	"The state defines coordinated care networks as organized health care delivery systems designed to improve access to care and the quality of services, as well as to promote healthier outcomes for Medicaid recipients through the establishment of a medical home system of care"
Accountable Communities (MaineCare)	Maine	"Accountable Communities will serve all fully Medicaid eligible MaineCare members, including dual eligibles"	"A value-based purchasing strategy centered on three components: creating 'Accountable Communities', improving transitions of care, and strengthening primary care. Under the MaineCare Accountable Communities initiative, Medicaid providers will enter into alternative contracts directly with the Maine Department of Health and Human Services. These contracts will use a shared savings model, with the amount of shared savings linked to provider attainment of quality benchmarks"	"Among the state's goals for this initiative are to…Spread the patient-centered medical home model of enhanced, integrated primary care…"

Appendix D: ACO Demonstrations in Medicaid

Demonstration	Location	Targeted Population	Overview	PCMH Related Components
Health Care Delivery Systems Demonstration	Minnesota	State Medicaid enrollees, not including blind or disabled dual eligible or enrollees who receive benefits on a medial spend down basis	A demonstration with goals that include: "encouraging providers to innovate to deliver higher-value care to Medicaid enrollees; supporting robust primary care and care coordination; testing payment models that increase provider accountability; implementing projects in different parts of the state; allowing both larger and smaller provider groups to participate; and creating alignment with similar initiatives across payers"	"Under the state's State Innovation Model grant, three existing multidisciplinary, locally-based Community Care Teams will be expanded to support fifteen Accountable Communities for Health. They will leverage community partnerships to focus on including non-health care providers in the state's accountable care organizations, integrating care, and building on the state's patient-centered medical Health Care Home model"
New Jersey Medicaid Accountable Care Organization Demonstration Project	New Jersey	"Each organization applying for certification as an Accountable Care Organization (ACO) must cover 'a municipality or defined geographic area in which no fewer than 5,000 Medicaid recipients reside.' All Medicaid beneficiaries within an ACOs defined geographic range are eligible to receive services from the ACO…"	"Under the 3-year demonstration program, [ACOs] will assume responsibility for Medicaid populations within a designated area…ACOs are expected to be integrated into their communities so that they can assist in coordinating community-based services for enrollees. Regulations issued in 2013 specify that the demonstration's objectives include increasing access to primary care, behavioral health care, pharmaceuticals and dental care"	"ACOs are required to obtain the support of all general hospitals in the designated area, at least 75 percent of the primary care providers in the designated area, and at least four qualified behavioral health providers in the designated area"

Demonstration	Location	Targeted Population	Overview	PCMH Related Components
Community Care of North Carolina (CCNC)	North Carolina	"These networks primarily serve the Medicaid population but currently, thanks to many pilot projects, are expanding to serve state employees, Medicare beneficiaries and dual-eligibles"	"A comprehensive plan… that incorporates performance metrics with accountable budget and shared savings payment models…Providers, practices, hospitals, care managers and community resources coordinate primary care and case management for patients through the medical home model of care delivery"	Utilizes the PCMH care model in its delivery
Coordinated Care Organizations (CCO)	Oregon	"Nearly all Oregon Health Plan enrollees, including Medicaid beneficiaries who are dually eligible for Medicare will be enrolled in Coordinated Care Organizations (CCO)s. The only Oregon Health Plan enrollees not subject to mandatory enrollment requirements are: noncitizens, American Indians/Alaska Natives, dual eligibles enrolled in a PACE program, enrollees who receive an exemption, and individuals who reside in an area not served by a CCO"	A delivery system that consists of a statewide network of CCOs "that provides integrated and coordinated health care for Oregon Health Plan enrollees. CCOs will operate under a fixed global budget, with quality incentives to be phased in over time"	"A Patient-Centered Primary Care Home Technical Assistance Institute will reside under the Transformation Center is planned for launch in the fall of 2013"

(NASHP, 2013)

Key Informant Interview Guide for Staff

Interviewee Background

1. What is your current position?
2. How long have you been in your current position?
3. What is your role in the ACO/PCMH?
4. Were you involved in its conceptualization or implementation?

About your health system and the PCMH model

5. Please describe what you had to do to transform to a ACO/PCMH?
6. What were the most important reasons your organization decided to transform to a ACO/PCMH? What issues were you trying to address? Did you or an external institution initiate the transformation?
   Probes:
   a. Population health issues (chronically ill?)
   b. Delivery system organization issues (efficiency)
   c. Reimbursement/payment issues
   d. Quality and disparities in care issues
7. What patient population are you targeting?
   a. How has your ACO/PCMH impacted/expanded access to care in your community particularly for racial/ethnic minorities? For low-income populations? For geographically isolated populations?
8. Please describe what you see as the core characteristics of the ACO/PCMH?
   Probes:
   a. Expanded Access to Care
   b. Continuous Quality Improvement
   c. Coordinated and Integrated Care
   d. Team Based Care
9. How does the ACO/PCMH strategically fit into the overall health system organization?
10. Please describe your payment model
11. Given the ACO/PCMH's payment model, how has that changed how you provide care?
    Probes:
    a. Chronically Ill Patients
    b. Patient-Centered Care
    c. Disadvantaged populations
12. What changes have you seen among your staff in terms of morale and job satisfaction post-implementation
    Probes:
    a. If too early to tell, what do you anticipate will be the effect?
    b. Do you have any strategies in place to measure clinician job satisfaction?

    c.   What trends have you seen in staff burnout and retention since ACO/PCMH implementation?

    d.   Research shows that among clinicians, ACO/PCMH have been thought to be just a fad and/or a potential increase in work burden. Do you share similar concerns?

    e.   What kind of staff resistance have you encountered in implementing your ACO/PCMH?

13. How has the ACO/PCMH improved your overall chronic disease management?

    Probes:

       a.   How do you measure this?

       b.   Do you have data?

       c.   What are the most significant barriers in your community in terms of providing high quality chronic disease care to patients?

14. How has your ACO/PCMH impacted patient experience?

    Probes:

       a.   How do you measure patient experience?

       b.   Do you have data?

15. What types of disparities do you think face your community regarding healthcare?

    Probe:

       a.   Do you collect data?

       b.   Do you have any other strategies in place to specifically address these issues of disparities? Please describe.

       c.   Do you think implementation of the ACO/PCMH positively impacted disparities in your institution?

       d.   Do you have any concerns about care in your community negatively impacting disparities?

16. How does the ACO/PCMH ensure coordinated care? How do you share information with providers?

    Probes:

       a.   EMR

       b.   Health information exchanges

       c.   Other strategies

17. How does the ACO/PCMH integrate or incorporate community resources?

    Probes:

       a.   Insurance outreach and enrollment

       b.   Resources for SSI, disability benefits

       c.   Other

18. Describe how your ACO/PCMH facilitates continuous care

    Probes:

       a.   Care teams?

       b.   Do you have any strategies in place to incorporate non-physician clinicians into patient care teams? If so, what has been the impact?

       c.   Patient navigators

       d.   Pharmacists

      e.   Social workers

19. What communication strategies and tools does the ACO/PCMH use to share information with its patients?

    Probes:

      a.   Personal health records

      b.   Care management plans

      c.   Email or other alternative communication

20. How does the model support quality improvement efforts?

21. Describe the main challenges you faced (or anticipate facing) in implementing the ACO/PCMH?

22. What would you say is the largest gap between what you had conceptualized for the ACO/PCMH when planning it and what you realized?

    Probes:

      a.   In terms of quality of care

      b.   In terms of cost

      c.   In terms of coordination

23. What would you say has been the most substantial impact of the ACO/PCMH on care in your community?

24. What would you say are the biggest challenges your ACO/PCMH faces?

25. What unanticipated impacts do you think the ACO/PCMH has had on care in your community either positive or negative?

    Probes:

      a.   Unintentionally increasing disparities because healthier, wealthier have access to ACO/PCMH, which is higher quality, while sicker, poorer don't

      b.   Increase in cost

      c.   No impact at all

Key Informant Interview Guide for Patients

1. Please tell us your name, how long you have been a patient at this hospital, and what your main reason has been for attending. [*If coming from a Patient and Family Advisory Council, ask why they joined the PFAC*)
2. What kinds of doctors do you typically see for your care?
3. When you go in for a single appointment, who all do you interact with/receive care from?
4. Can you please describe the ways in which your providers coordinate/manage/communicate in your care?
5. What can your doctor do to help you know everything you need to know about your health?
6. What more could your provider do to help you reach your health goals?
7. What difficulties do you have accessing/receiving health care services at this hospital?
8. How would you describe the quality of care you receive from your provider?
9. If you could change anything about your health care, what would it be?

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