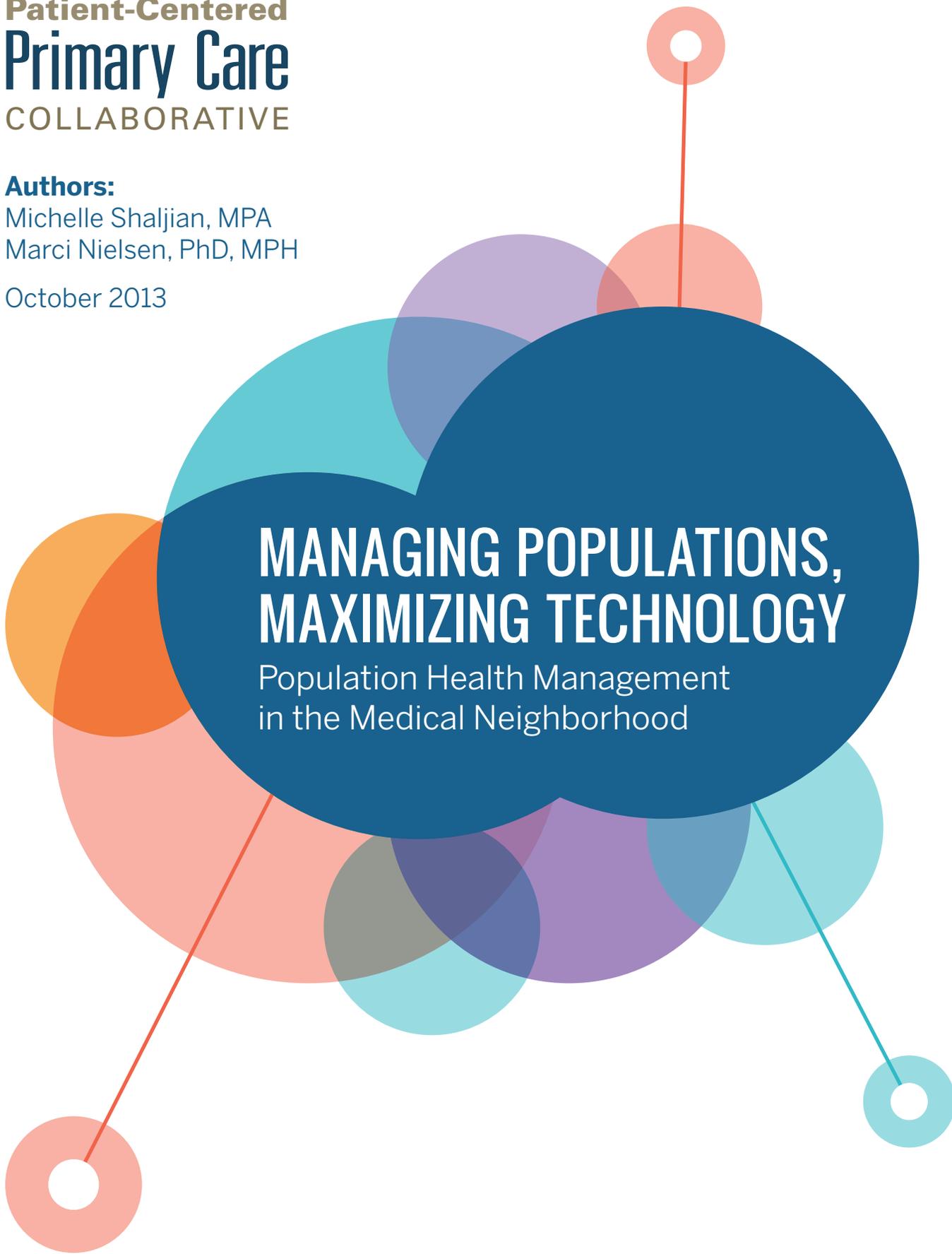


Patient-Centered
Primary Care
COLLABORATIVE

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October 2013



**MANAGING POPULATIONS,
MAXIMIZING TECHNOLOGY**

Population Health Management
in the Medical Neighborhood



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About the Patient-Centered Primary Care Collaborative (PCPCC)

Founded in 2006, the PCPCC is dedicated to advancing an effective and efficient health care system built on a strong foundation of primary care and the patient-centered medical home (PCMH). The PCPCC achieves its mission through the work of its five Stakeholder Centers, which convene experts and thoughts leaders focused on key issues to drive health system transformation.

For more information, visit www.pcpcc.org.

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SECTION 1: EMBRACING A POPULATION HEALTH APPROACH

Introduction

A significant portion of the \$2.8 trillion we spend on health care is allocated to direct medical care services, although the availability and quality of medical care services account for just 10 to 15 percent of health outcomes.¹ In contrast, an estimated 40 percent of deaths are caused by behaviors that could be modified by preventive, population-based interventions, but only account for a fraction of health spending.² These include behaviors such as smoking, violence, physical inactivity, poor nutrition, and substance abuse – factors that our current health care system addresses unreliably or not at all.

Recognizing this disproportionate investment in illness after it has occurred, and faced with continuous pressures to reduce health care spending, health reforms in the US have increasingly aimed to redesign and better invest in primary care. This includes the health industry's consensus around achieving the goals of the Triple Aim. Developed by the Institute for Healthcare Improvement (IHI), this framework identifies three objectives: improve population health, improve the quality of health care, and control health care costs.

Improving population health presents a major cultural, operational, and financial shift across a broad range of stakeholders. **Population health** is defined as the health outcomes of a group of individuals, including the distribution of such outcomes within the group.³ A population health approach requires collaboration across a number of groups – patients, providers, health plans, employers, government, the private sector, and the local community – to strengthen care delivery and improve the well-being of individuals and families. While our current system is designed to respond to the acute needs of individual patients, it must transition to one that anticipates and shapes patterns of care for populations, and addresses the environmental and social determinants of health.

At the center of this large ecosystem – the medical neighborhood – is the **patient-centered medical home** (PCMH). The PCMH connects to traditional health care providers (e.g., primary care, specialists, hospitals, home health, mental health), and community organizations that encourage healthy living, wellness, and safe environments (e.g., YMCAs, schools, faith-based organizations, employers, and public health agencies). While strengthening the medical neighborhood requires significant efforts in governance, finance, community organizing, and public policy, we believe a critical tool in this effort will be the widespread adoption of health information technology (health IT).

Health IT offers a structure to help primary care practices in and across the medical neighborhood provide better access to care, better communicate, and enhance teamwork. Implemented effectively, it also has tremendous potential to identify health trends in local communities, exchange information across organizations, coordinate care as patients transition between providers, and enables secure communications between providers and their patients and families.



Recognizing these opportunities for improvement in care delivery, many clinicians and providers are adopting **population health management (PHM)** tools and strategies. PHM is defined as a set of interventions designed to maintain and improve people's health across the full continuum of care—from low-risk, healthy individuals to high-risk individuals with one or more chronic conditions.⁴

Despite upward trends in health IT adoption, there is still a lag in implementing a sophisticated PHM approach. For example, in an international comparison, 50 to 90 percent of doctors in developed countries routinely use advanced health IT tools, such as computerized alerts, reminder systems to notify patients about preventive or follow-up care, and prompts to provide patients with test results.⁵ In the US, just one in four doctors in the US has such a system, and 40 percent or more reporting they have neither a manual nor electronic system for such tasks.⁶

In response to these challenges, this report provides an overview of the role of health IT in supporting PHM in the medical neighborhood, specifically as an approach to gather, interpret and use patient data to have a direct and tangible impact on patient experience and health outcomes. Given the critical role of the PCMH, we also provide a set of potential health IT tools that enhance the five key attributes of the PCMH and strengthen key connections with patients, providers, practices, and organizations throughout the medical neighborhood

Health IT in the Patient-Centered Medical Home

As outlined earlier, the PCMH acts as the primary care “hub” or focal point for primary care services, and essentially serves as the gateway to the larger health system should an individual's health care needs extend beyond the primary care setting.

As defined by AHRQ, the PCMH is a model for offering a deeply personal level of care to individuals and their families, and is defined by five key attributes: person-centered, comprehensive, coordinated, accessible, and committed to safety and quality improvement. Each of the five attributes may incorporate varying levels of health IT support as indicated in **Table 1** on the next page.

Table 1: Five Attributes of the PCMH and Health IT Strategies

PCMH ATTRIBUTE	DEFINITION	SAMPLE HEALTH IT STRATEGIES
Person-centered	A partnership among practitioners, patients, and their families ensures that decisions respect patients' wants, needs, and preferences, and that patients have the education and support they need to make decisions and participate in their own care.	<ul style="list-style-type: none"> • Care teams use EHRs to capture patient needs and medical history, document care plans, as well as information about language, culture, family support, and communication preferences. • Shared decision-making and other patient-support tools are made available through patient portals and patient communication.
Comprehensive	A team of care providers is wholly accountable for a patient's physical and mental health care needs, including prevention and wellness, mental health, acute care, and chronic care.	<ul style="list-style-type: none"> • Care teams used structured data fields, custom reporting, and analytics tools to track patient outcomes and gaps in care. • Automated outreach is sent to patients for gaps in recommended care; and notifications are sent to providers when patients fail to fill prescriptions or miss scheduled immunizations.
Accessible	Patients are able to access services with shorter waiting times, "after hours" care, and/or same day.	<ul style="list-style-type: none"> • Telephone or e-mail consultations are available with clinicians during evenings and weekend hours. • Patient portals or mobile apps allow online appointment scheduling and email with providers.
Coordinated	Care is organized across all elements of the broader health care system, including specialty care, hospitals, home health care, community services and supports.	<ul style="list-style-type: none"> • Primary care providers are alerted when a patient is admitted or discharged from the hospital. • Interoperable EHRs exchange and capture information shared between specialists and primary care providers.
Committed to quality and safety	Clinicians and staff enhance quality improvement through the use of health IT and other tools to ensure that patients and families make informed decisions about their health.	<ul style="list-style-type: none"> • Clinical decision support tools are used to specify order sets for diabetic patients. • Population health management tools stratify patients by risk level to determine level of attention from care coordinator.

Given the alignment of PCMH features and health IT as a supportive tool, many PCMHs will find they are well-positioned to extend their reach into the larger medical neighborhood. As clinicians and providers increasingly adopt health IT, and as coordination in the medical neighborhood becomes more feasible through technology, providers and clinicians will be more aware of their patients' health system experience, and may offer better support for patients and their families to manage their own health.

SECTION 2: BUILDING HEALTHY COMMUNITIES

Defining the Medical Neighborhood

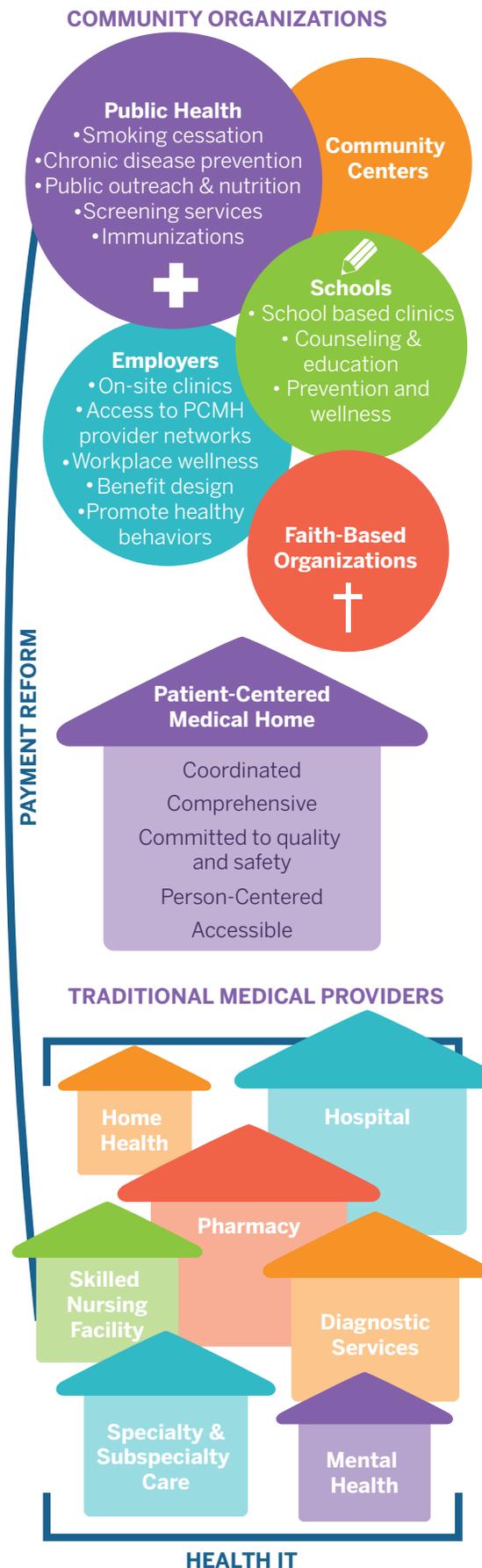
The purpose of the **medical neighborhood** is to serve as a continuous and coordinated ecosystem that begins with the patient's PCMH, and links to the broader community, while accounting for the social and environmental factors that impact health. AHRQ states that a successful medical neighborhood will "focus on meeting the needs of the individual patient, but also incorporate aspects of population health and overall community health needs in its objectives."⁷ For example, key medical neighbors may include community centers, faith-based organizations, schools, public health agencies, YMCAs, and employers that promote fitness, healthy behaviors, and healthy environments and workplaces.

As a subset of the medical neighborhood, **Accountable Care Organizations** (ACOs) are expected to play a leadership role in improving population health. Formally arranged through contractual agreements, an ACO is comprised of clinicians, hospitals, and other health care organizations that share mutual responsibility for a population of patients with the goal of improving quality and health outcomes, and reducing health costs and inefficiencies. As defined by the Centers for Medicare and Medicaid Services (CMS), primary care is the foundational must-have element in an ACO. Alternatively, a hospital system, physician group, or an independent physician association can form a clinically integrated network (CIN) that adheres to a single set of clinical protocols, and leverages a similar health IT infrastructure to strengthen the delivery of care.

Different ACO models are currently being implemented and evaluated, and are testing various risk-sharing agreements. ACOs that deliver more cost-effective care for a given population as compared with baseline estimates, will share with Medicare any savings generated on a percentage basis. When an ACO takes financial risk for care, it must have tools for evaluating both clinical and financial performance. To track care provided outside of the network, health plan claims data is also required. As ACOs and ACO-like structures continue to emerge, PHM will be an increasingly valuable tool in assessing health costs, understanding which populations are contributing to costs, and informing financial risk.

Population Health Management in the Medical Neighborhood

As outlined above, numerous stakeholders across the medical neighborhood are invested in improving the population's health – and PHM tools and strategies are key to operationalizing these improvements. As defined by the Care Continuum Alliance, PHM is as a set of interventions designed to maintain and improve people's health across the full continuum of care—from low-risk, healthy individuals to high-risk individuals with one or more chronic conditions.⁸ While PHM interventions frequently overlap with the



goals of chronic disease management, preventive services, and health promotion, they differ both in scope of services and definition of target populations.

PHM programs are typically designed to meet the needs of insured population subgroups as opposed to geographic regions, and are often delineated by health benefit sources such as an employer, health plan, or other purchaser. Examples of subgroups include a population of patients with a specific disease (e.g., all of the diabetic patients in a practice), a group with gaps in care (e.g., all female patients without up-to-date breast cancer screening), or simply, all patients in Dr. Smith’s panel.

Table 2: AHRQ’s Five Domains of Population Health Management

DOMAIN	DESCRIPTION	SAMPLE HIT APPLICATIONS
Identify subpopulations of patients	Identify subgroups of patients that will benefit from additional services or demonstrate gaps in care	<ul style="list-style-type: none"> Apply evidence-based guidelines to integrated population data sets that continuously identify preventive and chronic care opportunities Use predictive models for risk stratification
Examine detailed characteristics of identified subpopulations	Information management systems identify patients in greatest need of services, using flexible criteria that filters critical patient information	<ul style="list-style-type: none"> Provide care teams with tools to filter populations of patients by criteria such as disease status, recent hospitalizations, and multiple chronic conditions
Create reminders for patients and providers	Information management systems can be used to create automated communications that remind patients, clinicians and staff about patient care needs	<ul style="list-style-type: none"> Provide customized notifications for patients via letters, telephone/text messages, emails, electronic reminders) Generate automatic alerts for providers and care teams about patients who meet criteria for preventive care or disease management at the point of care and between encounters
Track performance measures	Provides information that allows clinicians, staff, and systems to track quality and outcomes against national guidelines, peer groups, and to demonstrate longitudinal improvements	<ul style="list-style-type: none"> Produce real-time reports on how practices, providers, and care teams, are meeting quality, financial and utilization goals Profile clinical patterns within practice by provider (risk level, most frequent diagnoses, number of smokers, etc.) Allow practices to identify individual patients needing intervention to improve overall performance
Data is available in multiple forms	Information is most helpful and effective to practices when it can be printed, saved, or exported and if it can be displayed graphically	<ul style="list-style-type: none"> Facilitate data-sharing within organizations and health information exchange (HIE) with external providers Allow providers, care teams and patients to view and understand health care data and trends in real-time

Strategies & Health IT Tools for Population Health Management

In this section, we crosswalk the five attributes of the PCMH philosophy with practical health IT tools and strategies that can support PHM in the medical neighborhood.

QUICK GUIDE: Ten Recommended Health IT Tools to Achieve Population Health Management

1. **Electronic health records.** EHRs document diagnoses, vital signs, tests and treatments, populate registries, and create the structured data needed for advanced analytics.
2. **Patient registries.** The central database of PHM, registries are used for patient monitoring, patient outreach, point-of-care reminders, care management, health risk stratification, care gap identification, quality reporting, performance evaluation, and other purposes.
3. **Health Information Exchange.** Enables effective coordination of care across the medical neighborhood and between care team members. Secure messaging that uses the standardized direct protocol is another way to exchange information from one provider to another.
4. **Risk stratification:** Analytic tools used to classify patients by their current health status and their health risk. Risk stratification and predictive modeling applications enable providers to intervene appropriately with high-risk patients and those who might become high-risk.
5. **Automated outreach.** By applying analytics to registries, organizations can generate automated messaging to patients who need preventive or chronic disease care, according to standardized clinical protocols.
6. **Referral tracking.** Referral management tools help practices keep track of referrals to other providers and make sure that they receive the results back from those consultations.
7. **Patient portals.** Web portals attached to EHRs help providers share records with patients and engage patients in self-management. They are also important to the process of continuous care, an essential component of PHM.
8. **Telehealth/telemedicine:** Remote examination and treatment of patients using audio and video conferencing are another method of engaging and caring for patients between face-to-face visits and can also reduce the need for those encounters.
9. **Remote patient monitoring:** Whether patients are monitored at home or using mobile devices, this approach makes it possible for providers to intervene quickly when high-risk patients show signs of distress. Remote monitoring can also help patients control chronic conditions such as diabetes and hypertension.
10. **Advanced population analytics:** Applied to the data in registries and data warehouses, these analytics can be used to evaluate how different segments of patient populations are doing and to assess the clinical and financial performance of individual providers, sites of care, and the organization as a whole.

TEN RECOMMENDED HEALTH IT TOOLS TO ACHIEVE PHM:

1. Electronic
Health Records

2. Patient
Registries

3. Health
Information
Exchange

4. Risk
Stratification

5. Automated
Outreach

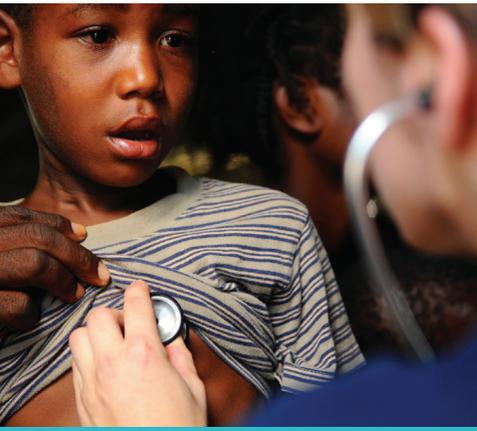
6. Referral
Tracking

7. Patient Portals

8. Telehealth /
Telemedicine

9. Remote Patient
Monitoring

10. Advanced
Population
Analytics



1. Person-Centeredness

While the term population health might be seen as implying a disassociation or a distancing from the person-centered model of the PCMH, in fact the opposite is true. The PHM approach strongly emphasizes **person and family-centeredness**. PHM interventions are tailored to meet the health needs of the individual, and are evaluated and placed on a continuum of health risk, from low to high. Interventions are also tailored to meet each individual where they are on the scale and develop a care plan that accommodates environmental factors, such as levels of family support, culture, socioeconomic status, and even access to transportation. By tracking meaningful patient information, the care team can improve the effectiveness of interventions both for individuals and for entire populations.

Electronic health records (EHR) help facilitate the capture of rich patient information, including clinical and social factors. Transitioning to an EHR can provide easy and continuous access to patient information for the entire care team within a practice or throughout a health system with multiple sites, while many practices will continue to be challenged by a lack of interoperability.

Patient portals are also becoming increasingly popular for patients to engage in their own care, by providing a mechanism to receive lab results, prescriptions, and provider e-mails.

Patient Registries provide a central database for quality improvement and PHM, by identifying patients with specific conditions and their disease status. Some registries also include tools that facilitate disease management and allow care team members to identify and proactively manage patients with multiple morbidities, including chronic conditions, and/or behavioral and mental health needs. Registries can also provide feedback to clinicians to track their own performance and support their continuous improvement efforts.

A registry can show when the person was last seen, who provided what care to that patient, the patient's current health status, and when the patient is due to visit again. Applied to a population, the registry can show, for example, how all of a particular provider's patients with type 2 diabetes are doing, which diabetic patients are out of control, or how well an entire organization is treating patients with that condition. Registries can also provide the care team with reminders and alerts, and prioritize interventions with high-risk patients, create pre-visit care plans, and customize educational materials to patients in certain categories. Registries can also be integrated with tools such as automated messaging systems or clinical decision support, and combined with analytic tools, can be used for health risk stratification, care gap identification, quality reporting, and performance evaluation.

For additional information, see **Case Study: Registries and Disease Management in the PCMH**, Union Health Center (page 21).

2. Comprehensive, Team-Based Care

A critical solution for successful PHM is the transition to a **care team** model. A team-based model of care ensures that all patients from the lowest risk level to the highest risk level are cared for in the right place, at the right time, and in the manner most appropriate for the patient. Teams may include any configuration of physicians, nurses, care coordinators, medical assistants, social workers, diabetes educators, nutritionists and/or health coaches.

To assess population health at a particular point in time care teams can use clinical and patient-reported data, such as how many patients with diabetes received an annual eye exam, or have blood pressure under control. By tracking these metrics longitudinally, the team can determine if population health is improving, and design mutually agreed upon care plans or interventions to curb risk factors and control chronic conditions.

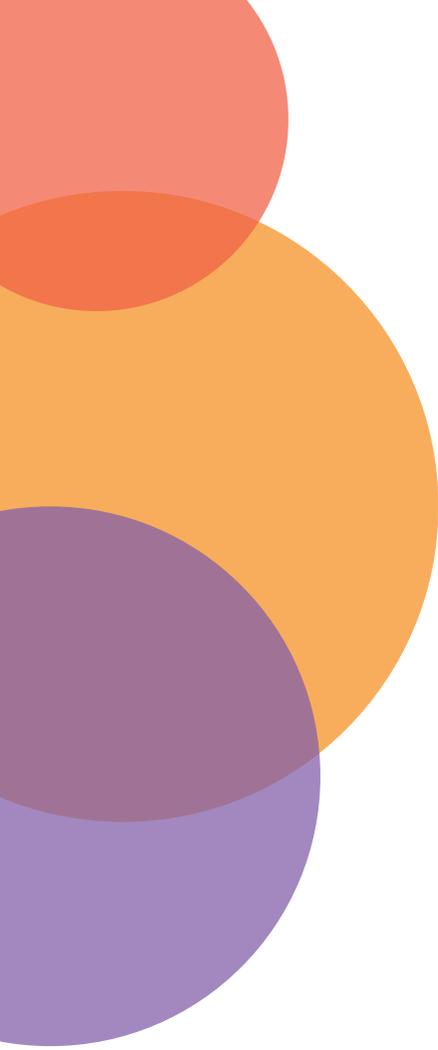
The care team in the PCMH and the medical neighborhood play a key role in managing high-cost, complex patients. Without access and continuity of care, high-need patients will often delay seeking necessary care for several reasons – they lack access to specialized services, are not aware of their condition, or are held back by social or environmental factors. For example, nearly 60% of those who do receive treatment for mental illness will seek those services in a primary care setting.⁹ Recognizing the importance and value of filling this gap in care, many primary care practices have taken the initial steps to integrate care management, behavioral health and other services by redesigning their care delivery model.

For additional information, see **Case Study: Behavioral Health Management through the Care Team**, Twin City Pediatrics (page 16).

3. Access and Continuity

A PHM approach strongly encourages providers to proactively outreach to patients, families, and caregivers, that may have gaps in care, such as appointment no-shows, or non-adherence to care plans or medication instructions. Oftentimes, practices will offer 24/7 access and alternatives to traditional face-to-face visits, such as e-consults and group visits. Care teams are also using **telehealth**, which allows clinicians to check in with moderately to severely ill patients, as well as a newer forms of **distance monitoring** for patients with stable chronic conditions. Providing adequate access requires a sophisticated equilibrium between demand for visits and capacity to provide them. The transition to advanced access or after-hours care presents a major hurdle for most small practices, given the need to revamp scheduling processes and workflows, and to adopt new technologies. In addition, many commercial or public payers do not generally reimburse non-face-to-face visits that are essential for continuous access.

In addition, a **registry** populated with EHR and administrative data can provide the foundation for **automated outreach**, and evidence-based guidelines that inform the system when patients are due or overdue for particular services. The same kind of automation tool that triggers appropriate and timely messaging to patients can also be used to alert physicians and care managers that patients need a service or intervention. Studies have demonstrated that computerized reminder systems for preventive care showed improvement in clinical processes, as well as diabetes care, immunizations, and blood pressure screening. One study showed that diabetic and hypertension patients were 2-3 times more likely to attend a chronic care visit if successfully contacted using automated provider communications.¹⁰



4. Care Coordination

To successfully implement PHM interventions and effectively care for populations, the medical neighborhood must embrace a strong culture of **care coordination**. Partners must also determine the availability of many resources and tools necessary to accomplish PHM or patients will continue to “fall through the cracks.” For example, just 17 to 20 percent of primary care physicians report that they’re routinely notified of discharges; 20 to 40 percent say they receive discharge summaries two weeks or more after their patient leaves the hospital.¹¹

The increased availability of **health information exchange (HIE)** resources that facilitate exchange of patient information, including **Regional Extension Centers (RECs)** and **Regional Health Information Exchanges (RHIOs)**, are helping to make relevant health care information available where and when it is needed. A recent study found that 30 percent of hospitals and 10 percent of ambulatory practices participate in such HIEs, which most often traffic lab results, clinical summaries, and discharge summaries.¹² HIE provides a critical connection point for an organized, standardized process for data exchange across local, regional and state-wide health IT initiatives; provides the means to reduce duplication of services; and facilitates reduced operational costs by enabling automation of many administrative tasks.

Another source of patient information for those receiving care outside provider networks is to collect health plan **claims data**. Health plans are increasingly finding ways to share this data with providers to help them reduce variations in care and manage population health. Claims data can help an organization calculate the total cost of providing care, a feature that is particularly helpful for ACOs and other organizations managing financial risk that are dependent on the health outcomes. However, claims data is less actionable than clinical data because it may have a significant time lag, may exclude clinical lab results and other pertinent information captured in the clinical record.

Care Transitions: While some PCMHs do not receive a discharge summary until days or weeks later, lack of follow-up care after hospital discharge can result in complications, worsening of patients’ conditions, and a higher chance of readmission. A key step is ensuring that hospitals alert practices when patients are discharged, and that primary care teams follow up with patients shortly thereafter. Organizations can also use an application that connects with patients shortly after hospital discharge. This type of solution can be used to ask patients if they have questions about their discharge instructions or medications, automatically transfer patients to a care team member, or trigger outbound calls from their physician or primary care practice.

Referral Tracking: Referrals from primary care physicians to specialists also represent an opportunity for improved care coordination. Only 62 percent of primary care physicians report getting consultation results from specialists, although 81 percent of specialists claim to send information back to the referring doctors. Conversely, 69 percent of primary care providers (PCPs) report sending a patient’s history and the reason for consultation to specialists, while only 35 percent of specialists report receiving that information.¹³ One lever for improving these communications is included in Meaningful Use (MU) stage 2 regulations. These require providers to exchange care summaries at transitions of care, including hospital discharges and specialty referrals.¹⁴

Health IT solutions that support improved referrals include referral management applications that can be used to make and track referrals. For example, Northwest Physicians Group uses a web-based referral service that allows specialists to inform primary care practices of what information is necessary for a referral, and also enables a chat function for providers through secure messaging.¹⁵ The Wright Center for Primary Care in Archbald, PA, which uses its EHR to create an “open referrals” tracking sheet that a staff member is responsible for monitoring. When a referral is sent, it is classified as emergent, priority or routine on the tracking sheet, and if a specialist recommends a test, the referral is kept open until the results have returned.¹⁶

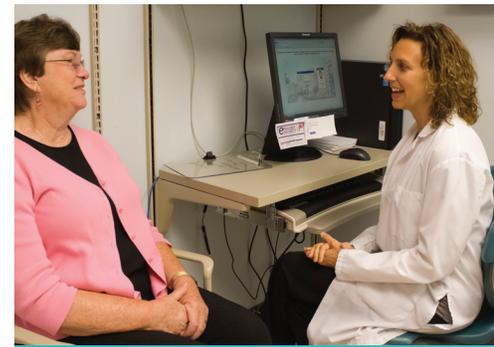
5. Committed to Safety and Quality Improvement

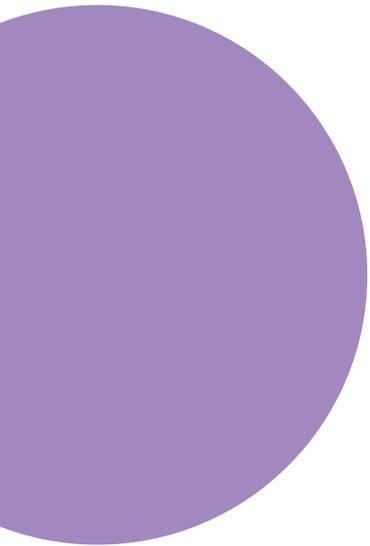
With 5 percent of the population accounting for nearly half of all health costs,¹⁷ it is critically important for organizations to know which patients account for those costs, particularly organizations that take on financial risk in efforts to improve quality and outcomes, such as ACOs. **Risk stratification** refers to the periodic and systematic assessment of each patient’s health risk status, using criteria from multiple sources to develop a personalized care plan. A patient’s health status may be reflected by a score or placement in a specific category, based on the most current information available. The identification of a patient’s health risk category is the first step towards planning a personalized, mutually agreed upon care plan. For some, the plan may address a need for more robust care coordination with other providers, intensive care management, or education about community resources.

While medical condition has historically been the primary factor for stratification, meshing severity data with social and environmental factors, as well as levels that indicate patient activation or confidence can help care managers determine the priority they assign to their patients and the type and level of support required. For example, high-risk patients may need more personalized attention, whereas those in the medium-risk category may only require automated messaging and online education. Low-risk patients may simply be prompted to maintain their health and get appropriate preventive care.

To evaluate its performance, an organization that engages in PHM can also leverage a **data warehouse** and **advanced population analytics** needed to convert its data into useful intelligence. Teams and organizations should be capable of determining population trends, such as chronic disease prevalence, population risk levels, changes in health trends over time, and identify high-cost, high-utilizers. Understanding these variables will not only help organizations determine how to distribute resources, but also understand the performance and efficiency of providers and clinicians and the effectiveness of care interventions.

For additional information, see **Case Study: Managing Patient Risk in an ACO**, Bon Secours Medical Group (page 20).





SECTION 3: LOOKING AHEAD: ADDRESSING THE CHALLENGES

While PHM and health IT hold tremendous potential for healthy system transformation, several financial, technical and cultural barriers stand in the way. In order to accelerate adoption of a population health model, critical issues of payment reform, health IT product improvements, workforce education and training, and patient engagement must be addressed.

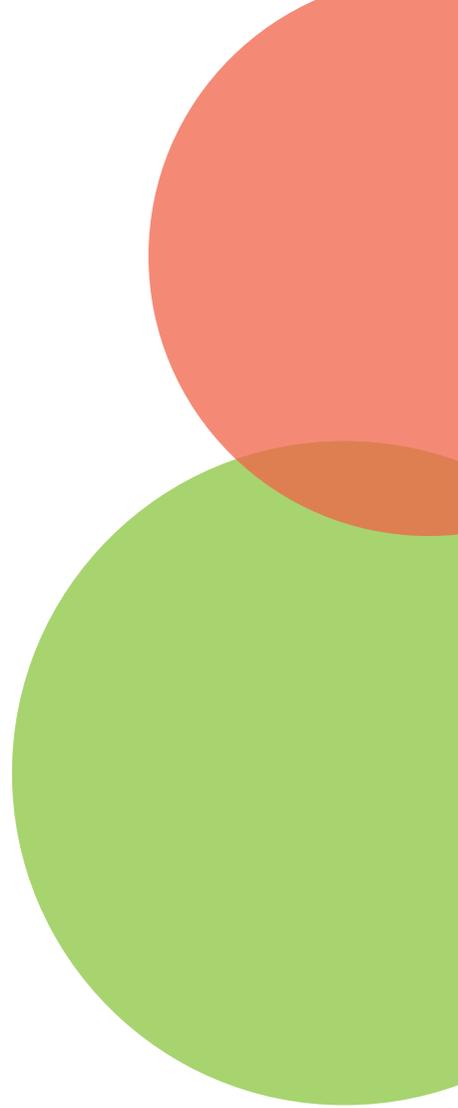
Payment reform that encourages population approach: Widespread adoption of a population approach and PHM strategies will not be possible until new financial incentives in health care evolve and become prevalent. The current fee-for-service payment system, a significant portion of the primary care workload is not reimbursed, particularly PHM strategies, including preventive care, disease management, patient education, and care coordination. This model discourages providers from caring for patients outside of face-to-face encounters or proactively seeking out patients with gaps in their preventive or chronic disease care.

Improvements to Health IT products: Vendors should be encouraged to provide health IT products that better suit the PHM needs of organizations in the medical neighborhood. This includes having “out of the box” features that enable manipulation of data to stratify lists; reminders that occur in the future; details to track performance measures longitudinally; manage performance; ability to identify subpopulations; and the ability to easily manipulate and export data in multiple formats.

Enhance workforce education and training: The primary care workforce and the medical education system are largely unprepared for a shift to the use of PHM tools. We recommend that resources be made available to educate physicians, nurses, and other primary care professionals that are new to PHM, as well as technical assistance and training to effectively adopt EHRs and PHM tools. Further training will be required to effectively use those systems, create and interpret reports, redesign current workflows and processes, patient engagement, make informed decisions, capture data efficiently, and use exception codes. It will also be critical to incorporate the PHM and meaningful use model into medical school curricula and accreditation exams.

Engage Patients: In general, patients and consumers are not adequately informed about the value and benefit of improved care delivery models, or their role in managing their own health or disease status. Patients should be encouraged to engage in their health experience by having easy access to tools, patient health data, and other resources mentioned earlier. In addition, patients should be encouraged to use mobile apps and cloud or web-based solutions that encourage healthy behaviors, including mechanisms to support nutrition, healthy weight, or fitness, trigger alerts, or monitor chronic disease measures. These apps may also include mechanisms for sharing data with providers that helps aggregate patient-reported data, and monitoring patients across different disease states.

Overall, a critical step will be redesigning and supporting a strong primary care system that anticipates and shapes patterns of care for populations, while addressing the environmental and social determinants of health. Specifically, PCMHs should be encouraged to serve as the hub for collaboration among a number of providers and organizations in the medical neighborhood, in a way that strengthens care delivery, coordinates care across the continuum, and encourages accountability for the health and well-being for all individuals and families. It is clear that a strong health IT infrastructure will enhance connections between traditional health providers and community organizations, and offers a network of support for patients and families to improve their care experience and better understand the impact of integrated medical, social, and community support services.



SECTION 4: CASE STUDIES IN POPULATION HEALTH MANAGEMENT

Case Study: Behavioral Health Management through the Care Team

Twin City Pediatrics Winston-Salem, North Carolina

Provider Type	Pediatric practices (total of three locations)
Patients	Serve approximately 5,000 patients; 10-15% Medicaid

Caring for a child with special needs or mental illness presents many new challenges for parents, and can be a frustrating health care experience, especially when coordinating across multiple health care providers, managing complex care plans and medication regimens, and dealing with a lack of educational resources or support systems.

Recognizing these challenges, the team at Twin City Pediatrics wanted to create a positive experience for children, their parents, and caregivers in a patient-centered medical home environment. Initially, the main focus for Twin City was putting the right team in place, and identifying the proper roles and skill sets to accommodate the patients' primary care and mental health needs.

One of Twin City's most successful strategies was including mental health professionals on the care team. For example, Twin City's care team now includes a care coordinator who works directly with children with ADHD and other behavioral health conditions. A former school counselor, the care coordinator also works directly with parents and caregivers to assist with appointment scheduling, prescription fulfillment and medication plans, reviews and signs school-required forms, and advises on therapy and other specialty visits.

Twin City also worked with parents and families to align ADHD patients' care plans with critical points on the school year calendar. For example, ADHD patients are advised to visit with their care team three times annually for well visits; summer visits focus on reviewing and modifying medication plans for the upcoming school year; a fall visit occurs 4-6 weeks after the school year begins to check on progress and effectiveness; and a spring visit provides a check-in before end-of-year testing.

The ADHD care plan also monitors the following quality metrics:

- Percent of patients with new ADHD diagnosis seen for follow-up within one month of starting medication.
- Percent of patients with established ADHD diagnosis seen at least twice in nine months.
- Percent of patients with ADHD in maintenance phase, defined as a follow-up visit on medication forms that show adequate symptom control and acceptable side effect profile.

STRATEGIES & HEALTH IT TOOLS USED:

Electronic health records

Team-Based Care

Risk Stratification

Advanced Analytics

Patient registry

Structured Data Fields

Risk Stratification

Patient/"Parent" Portal

eHealth Strategies

Enhance communication and access to medical staff. Twin City quickly realized that families wanted online access to the medical staff, educational materials, and other resources to learn more about their child's condition and care requirement. In response, they launched a website with basic information, such as office hours and services, physician and staff bios, and office updates. Twin City added new features to the website every three to six months, such as health literacy materials; educational *podcasts*; a physician blog titled: "*Shot Hurts Less*"; and information and guidelines from the American Academy of Pediatrics (AAP). In addition, to improve access to medical staff, Twin City launched online appointment scheduling, email alert capabilities, and access to an online patient portal. The patient portal gives parents access to patient-provided medical information such as questionnaires, and will eventually provide access to the child's clinical records and lab results.

Adopt patient registries to improve population management. Twin City also uses a patient registry program that is accessible across all three locations, and is designed to improve population health management for all patients. Due to limitations of their EHR's population management features, the registry is not linked to the practice's EHR, but instead functions as a supplementary tool. Dr. Gretchen Hoyle, a Twin City pediatrician, developed a custom-designed, online registry solution to supplement the EHR's capabilities.

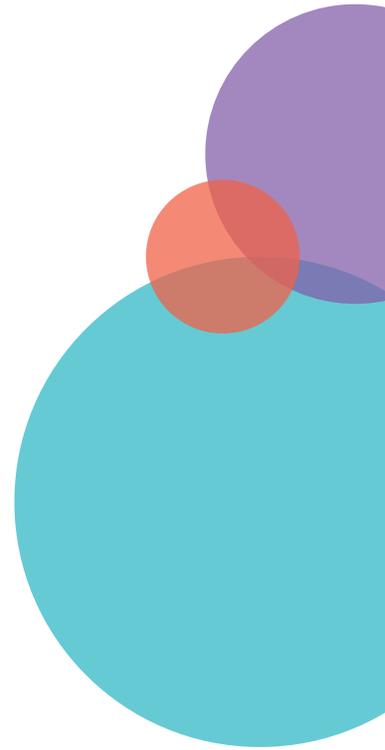
The registry is used to document administrative data, clinical data (e.g., current health status, diagnoses), and preventive care information, such as date of the last well-child visit, results of screenings, etc. The registry also allows the team to identify gaps in care, encourage care improvements, and streamline administrative work. For example, one of the care coordinators added a custom field for the patient's school fax number to simplify outreach for Twin City staff. In addition, medical staff can easily create customized filters to screen and list patients according to different characteristics (e.g., disease, condition, age, primary provider), which then enables them to use the registry as a clinical decision support tool.

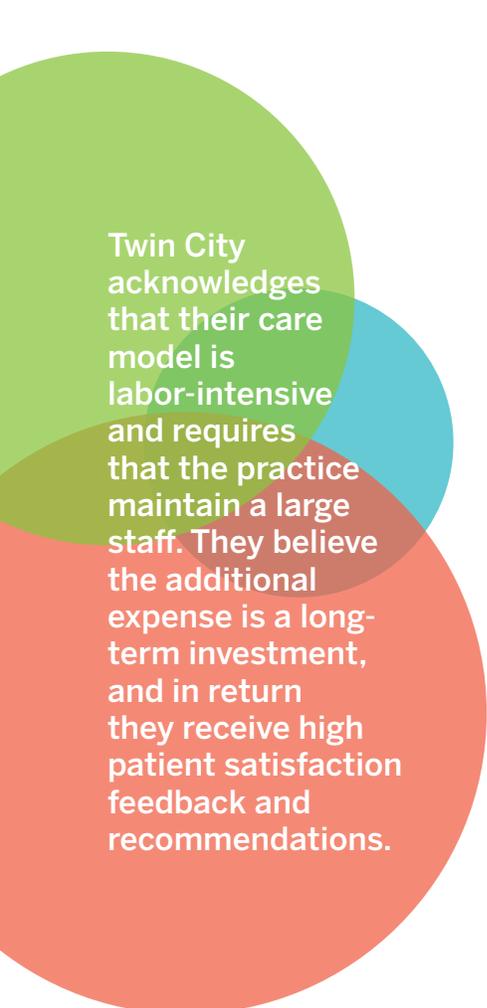
The use of a registry has also been effective for Twin City's asthma patients. Prior to the registry, just 10% of patients had a documented care plan, and after implementation the number increased to 81%. Twin City intends to further enhance the registry by including characteristics such as subspecialty referrals and expanded information about mental health status.

Adopt a patient risk stratification model to monitor patient health.

Twin City uses a risk stratification system to assign patient "complexity scores." The scores are used to identify the level of care each patient should receive, and patients are then separated into one of the following groups:

- **Group 1:** Patients who require only routine care.
- **Group 2:** Patients with one common chronic disease, such as asthma, ADHD, or obesity.
- **Group 3:** Patients with more than one common chronic disease.
- **Group 4:** Patients with one or more uncommon chronic disease, (e.g. seizure disorder, autism, Down syndrome).
- **Group 5:** Patients who depend on technology (such as a feeding tube or home ventilator) to live at home and/or have significant home health care needs.





Twin City acknowledges that their care model is labor-intensive and requires that the practice maintain a large staff. They believe the additional expense is a long-term investment, and in return they receive high patient satisfaction feedback and recommendations.

Twin City estimates that approximately 70% of patients are assigned to Group 1, while less than 1% are in Group 5. In order to ensure the most complex patient needs are met, a nurse with pediatric intensive-care experience is assigned as a care coordinator. The care coordinator will, on average, spend half of a day per week ordering home health care, working with families, and communicating with specialists and hospitals as necessary.

Twin City acknowledges that their care model is labor-intensive and requires that the practice maintain a large staff. They believe the additional expense is a long-term investment, and in return they receive high patient satisfaction feedback and recommendations. They anticipate that forthcoming payment reforms rewarding medical home competencies and behavioral health will enhance their return on investment. Indeed, the future alignment of care delivery innovations and payment reform will continue to strengthen the role of Twin City, and many more medical home practices, as valuable partners in the medical neighborhood.

Case Study: Managing Patient Risk in an ACO

Bon Secours Virginia Medical Group Richmond, VA

Provider Type	Multi-specialty group practice
Locations	140
Patients	25,000 (Virginia)

A pioneer in implementing medical home and accountable care initiatives, Bon Secours has dedicated itself to implementing a sustainable care delivery model that is in alignment with health care reform across its providers and locations. Bon Secours' transformation into an organization that embraces population health management is the result of a systematic strategy to reengineer primary care practices, integrate new technologies into care team workflows, and engage patients in their care.

Bon Secours took a 'leap of faith' in implementing these changes, acting on the belief that payers would come to them if they built a viable model. And payers did. The organization was selected as an early participant in the Medicare Shared Savings Program. It has also signed value-based contracts with two commercial payers – CIGNA and Anthem – and is in negotiations with several more. These contracts provide a financial mechanism to expand and scale the medical home initiative and support ACO models. This case study examines in more detail Bon Secours' approach to position itself to achieve quality outcomes and financial success in the changing health care environment.

Bon Secours' Care Team Model

The foundation of Bon Secours' strategy for value-based care is its medical home initiative – the Advanced Medical Home Project. The project began as a pilot in June 2010. Since that time, eleven practices have earned NCQA recognition as patient-centered medical homes. One of the most significant objectives of the Advanced Medical Home Project is to improve capacity – making it possible for care teams to double the size of their patient panel without overburdening themselves or sacrificing quality of care.

At the heart of this medical home strategy is the effort to reengineer practices by creating high-performance physician-led care teams, which requires changes in workflow, new care coordination activities, and defined delegation of clinical responsibilities across the care team. To facilitate this process, Bon Secours has invested significantly in embedding care managers into the primary care team. These nurse navigators are Registered Nurses (RNs) who are either board-certified case managers or actively working toward certification.

Each nurse navigator is assigned a panel of approximately 150 high-risk patients. He or she cultivates a personal relationship with these patients, usually through repeated phone contacts. Although most outreach is telephonic, navigators have the skill to assess which patients require face-to-face intervention. And because they are embedded in the practice, they can spend time with these patients doing assessments, care planning, and education.

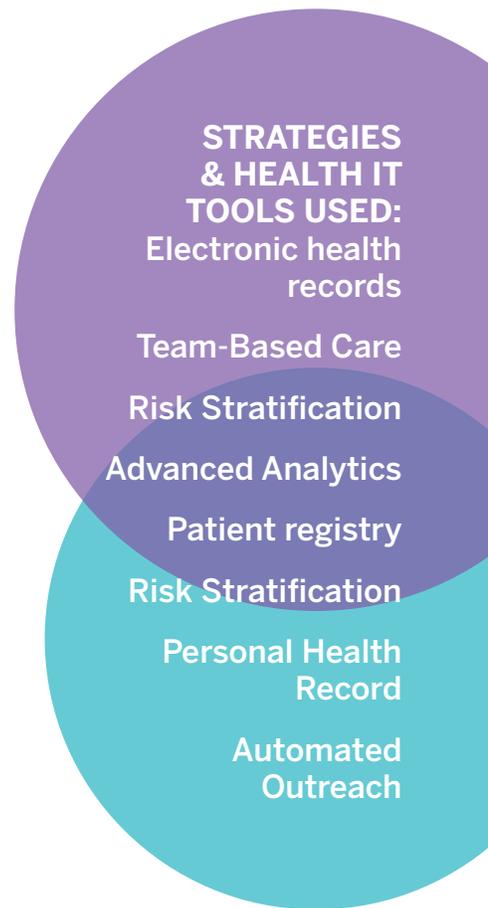
Bon Secours' eHealth Strategies

An important aspect of Bon Secours' strategy is implementing health information technology that empowers the care team to efficiently manage the health of their populations. They consider this technology – standardized across the medical group – as the key to enabling them to scale their system for value-based care. As a first step, Bon Secours implemented an EHR and all its modules in every practice within the system. This gave them a strong foundation for documenting care and accessing health records across the enterprise.

Risk Stratification: They were able to build a registry that could identify high-risk and high-utilization patients based on data such as number of medications or frequent visits to the emergency department. However, the organization recognized the need for a more robust, scalable registry that would drive efficient population health workflows in their practices and enable analytics and predictive modeling across multiple clinical conditions.

Integrating their EHR with a population health management platform, Bon Secours is able to aggregate all source data into a population-wide registry that enables the organization to implement multiple quality-improvement programs simultaneously. The registry stratifies the population by risk – providing a total population view while enabling each care team to drill down to the data they need about cohorts and individual patients. The system allows care teams within the practice to monitor their patients' health status and take action by delivering timely and appropriate care interventions. Because the system automates these interventions, care teams are able to communicate with many patients at once.

Automated Outreach: A significant priority for Bon Secours has been preventing 30-day readmissions. The medical group uses an automated outreach system to identify discharged patients, link them to a primary care provider (PCP) and pinpoint those who are at high risk for readmission. Flagged patients are then called within 24-72 hours to reinforce discharge instructions, make sure their medications are reconciled, and an appointment is scheduled with the primary care team within 5-10 days of discharge. Bon Secours will soon implement a readmissions solution to automate the process of calling discharged patients, asking them to complete a short assessment, and escalating cases as needed based on their feedback.



INNOVATION IMPACT

- 30-day readmission rate for medical home patients < 2% for two years
- Patient engagement scores (the CE11) were in the 97th percentile
- Patient outreach efforts generated approx. 40,000 unique patient visits for preventive, follow-up or acute care, leading to \$7 million increased revenue

Personal Health Records: Another strategy for patient engagement is activating patients on a personal health record (PHR), which allows patients to view clinical results and communicate conveniently with their caregivers via email. Bon Secours works to gain physician consensus on policies that drive the use of PHR: physicians agreed to allow automatic release of normal results to the PHR, but abnormal results are held for 24 hours to enable the care team to contact the patient. The organization is relying on physicians and staff to get patients active on the PHR to help them sign up on the spot in the exam room.

Challenges and Lessons Learned

Gaining physician buy-in for reengineering practice workflow. The concept of the care team can be difficult for some physicians because they see themselves as the clinician and the rest of the team as support staff. To help physicians embrace the care team and delegate patient-care tasks, Bon Secours placed tremendous emphasis on physician education. The organization also allows physicians to adjust some of the standardized care-team protocols to fit the needs of their practice, which fosters ownership of the process and assures physicians that they remain in control.

Paying for the transition to value-based care. As mentioned previously, Bon Secours implemented its medical home model with the hope that payers would come to them if they built a viable program. CIGNA currently gives the organization a per-member per-month (PMPM) adjustment for care coordination. Anthem, the group's biggest payer, pays a care coordination fee and will change to PMPM in the coming year. Several more commercial payers are lined up to sign contracts with the group. However, this payer involvement is a relatively new development. For the first few years of the project, Bon Secours shouldered the expense. The organization is now poised to reap the rewards of its investment.

Bon Secours is also demonstrating significant progress managing its CIGNA population. In the first six months of their value-based contract, they have achieved a 27 percent reduction in readmissions and are \$1.8 million below their projected spend. They have hit many of their care quality metrics and need to improve their gap-in-care metrics only slightly to achieve the index necessary to qualify for gain sharing with CIGNA – a development that will bring a projected annual savings of \$4 million.

Bon Secours' mantra for the future is "health care without walls." The organization is aggressively pursuing remote, noninvasive monitoring for highly acute case management. Their vision is to bring care outside the four walls of the hospital into the patient's home using technology. They are operationalizing a geriatric medical home that will allow patients to age in place with home visits for preventive and acute management. They are also expanding their implementation of the PHM platform to include performance measurement at the group, site and provider levels, feedback to providers on variance in care, and quality reporting. This added functionality for analytics and insight on both the clinical and administrative level will help the organization ensure that it is meeting the Triple Aim.

Case Study: Registries and Disease Management in the PCMH

Union Health Center (UHC) New York, NY

Provider Type	Community Health Center
Medical Home	NCQA Level 3
Patients	11,000
Office Visits	55,000

UHC's Care Team Model

UHC embraced the patient-centered care team model very early on, which helped ease the transition to new workflows, processes, and features that are critical to change management and quality improvement. UHC clinicians and staff are assigned to clinical care teams, comprised of physicians, nurse practitioners, physician assistants, nurses, medical assistants, and administrative staff. The practice uses a full capitation model with standard fee-for-service, and a fee-for-service plus care management payment model.

In 2005, UHC instituted the California Health care Foundation's *Ambulatory Intensive Caring Unit Model* (AICU), which emphasizes intensive education and self-management strategies for chronic disease patients. The model relies heavily on the role of medical assistants (called "patient care assistants" or PCAs), and health coaches. Working closely with other members of the care team, PCAs and health coaches review and update patient information in the record, conduct personal outreach and self-management support, and certain clinical tasks. For instance, all PCAs have been trained to review measures (HgbA1C, blood pressure and LDL Cholesterol), provide disease education, and set and review patient health goals. A subset of higher-trained health coaches work more intensely with recently diagnosed diabetic patients, or those patients whose condition is not well managed.

UHC's eHealth Strategies

Patient Registries: UHC uses patient registries to identify patients with specific conditions to ensure that those patients receive the right care, in the right place, at the right time. In some instances they use registries to target cases for chart reviews and assess disease management strategies. For example, patients with uncontrolled hypertension helps identify treatment patterns, reveal any need for more provider engagement, and may indicate the need for care team workflow changes. In the future, UHC would like to construct queries that combine diagnosis groups with control groups and stratify patients by risk group. For example, care teams could pull a report of all patients over the age of sixty-five with multiple chronic conditions or recent emergency room admissions.

Maximizing Time and Expertise: UHC uses technology such as custom EHR templates to support primary care assistants (PCAs) and free up clinicians for more specialized tasks and complex patients. For example, a PCA or health coach taking the blood pressure of a high-risk diabetic patient has been trained to determine whether or not BP is controlled. If it is not controlled, the health



Above: Union Health Center

**STRATEGIES
& HEALTH IT
TOOLS USED:**
Electronic health
records

Custom EHR
templates

Team-Based Care

Risk
Stratification

Patient registry

Structured
Data Fields

Risk
Stratification

INNOVATION IMPACT

- 46% reduction in overall annual health costs
- 18% reduction in total cost of care
- Significant decline in emergency room visits, hospitalizations and diagnostic services
- Significant improvements in clinical indicators for diabetic patients

coach checks the electronic chart for standard instructions on how to proceed, and may carry out instructions noted in the record. Or, if no information is available they will consult with another provider to adjust and complete the note. Following all visits with PCAs or health coaches, the patient's record is electronically flagged for review and signed by the primary care physician.

Working with Medical Neighbors: The teams also collaborate with on-site specialists, pharmacists, social workers, physical therapists, psychologists, and nutritionists to enhance care coordination and “whole patient care.” UHC has also adopted “curbside” consultations and e-consults to reduce specialty office visits. For example, if a hypertensive patient has uncontrolled blood pressure, the record is flagged by the PCA for further follow up with a physician or nurse practitioner, who may opt for an e-consult with the nephrologist to discuss recommendations. UHC also has a “Specialty Coordination Team” comprised of 2 primary care physicians, 1 Registered Nurse, 1 PCA and 1 Health Coach, which functions as a liaison between primary and specialty providers.

Customized Reporting: With their most recent upgrade to a meaningful use-certified version of their EHR, UHC will have the capacity to generate standardized meaningful use reports. UHC intends to construct queries that generate reports that group diagnosis groups with control groups, and identify and manage sub-groups of high-risk patients (or risk stratification). For example, care teams can run a report of all patients with diabetes that have an elevated LDL and have not been prescribed a statin.

Challenges and Lessons Learned

- **Recruiting staff with IT and clinical informatics expertise:** Over the years, UHC has faced challenges in identifying and recruiting staff with the right mix of IT and clinical informatics skills. While effective in troubleshooting routine issues and hardware maintenance, UHC felt there was a clinical data analysis gap. To resolve this, UHC works closely with an IT consultant, and also recruited a clinical informatics professional to work with providers and performance improvement staff.
- **Consistent data entry:** UHC's lack of consistent data entry rules and structured data fields led to several challenges in producing reports and tracking patient subgroups. The problem stems from UHC's lack of internal data entry policies, as well as the record's design. For instance, UHC cannot run reports on patients taking aspirin because this information may have been entered inconsistently across patient records. Moving forward, UHC will be implementing data entry rules and work closely with their vendor to maximize data capture.
- **Real-time data capture:** UHC realized that by the time data reaches the team, it may no longer be current. As a workaround they considered disseminating raw reports to clinical teams in real-time, followed by tabulated, reformatted data. They are exploring the possibility of purchasing report writing software to streamline the process.
- **Managing multiple data sources:** Like many practices, UHC pulls data from its billing system and clinical records, causing issues with data extraction. For example, pulling by billing codes does not provide the most accurate data when it comes to clinical conditions, health status, or population demographics. UHC recognized that to reduce errors in identifying patients and subgroups this will require custom reports.

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