Advancing Primary Care through the Patient-Centered Medical Home Model and Optimization of Health Information Technology

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Authored by:

Jeff Hummel, MD, MPH

Peggy C. Evans, PhD, CPHIT, PCMH CCE



Executive Summary

Healthcare policymakers have focused on the Patient Centered Medical Home (PCMH) model for primary care as the most promising strategy to provide better, coordinated, and continuous care for patients, with the goal of achieving the Triple Aim.

A framework for becoming a successful medical home was developed by the MacColl Center for Healthcare Innovation and Qualis Health, which includes eight comprehensive change concepts for transforming the delivery of care[1] , each of which can utilize health information technology (IT) in numerous ways.

At the same time, the widespread deployment of electronic health records (EHRs) has rapidly transformed the landscape of ambulatory care in this country. The ability of EHRs to capture of a wide array of demographic and clinical information as structured data makes it increasingly possible for a care team to measure indicators of clinical quality and engage in efforts to systematically improve clinical quality across a wide range of topics. In addition, EHRs have made it easier to share the tasks of gathering and entering information with non-provider care team members as well as patients. Using EHR technology, providers are better able to access and use information from other healthcare entities, thereby reducing the waste of redundancy and improving the accuracy of clinical decisions.

Most importantly, EHRs have functionality to support the application of evidence-based care in the form of clinical decision support (CDS) tools to ensure that patients receive the right care at the right time. The appropriate use of CDS can increase patient safety and provide better care for populations while making it easier for providers and their care team to find crucial information.

This white paper provides guidance to organizations engaged in the work of becoming a PCMH by showing how health IT can strengthen PCMH objectives using the framework of the eight change concepts. For each of the change concepts, we provide an overview of how health IT can be configured to best support front line care teams and their patients.

Introduction

With evidence mounting of widespread healthcare quality gaps[2-4] and soaring healthcare costs that currently exceed 17% of gross domestic product[5], the United States healthcare system is in desperate need of an overhaul. In recent years, policy makers have focused on transforming the healthcare system into one that can be more sustainable by focusing efforts on the Triple Aim, which specifically targets the quality and experience of care for individuals, the health of populations, and at the same time, the reduction of costs[6] . In order to achieve the Triple Aim, greater emphasis must be placed on primary care and preventive medicine in order to keep populations healthier and reduce avoidable costs associated with preventable complications of poorly managed chronic conditions.

Efforts to improve primary care have coalesced around the Patient Centered Medical Home (PCMH) model of care, which is designed to provide comprehensive, coordinated and continuous care for patients. The PCMH model has received endorsement from national primary care associations[7] and has undergone widespread testing through different public and private initiatives designed to better understand how the model can best be implemented, reimbursed, and evaluated.

A conceptual framework for understanding the components of medical home was recently developed by the MacColl Center for Health Care Innovation and Qualis Health through the Safety Net Medical Home Initiative. These components, referred to as "Change Concepts"[1] were derived from reviewing the literature, discussions with leaders in quality improvement and primary care, and extensively testing the concepts in clinical practices.



Each change concept entails three to five "key changes" that provide specific tactics for improvement for practices undergoing PCMH transformation.

There have also been a number of important federal policy initiatives through the Health Information Technology for Economic and Clinical Health Act (HITECH) Act of 2009 that have created powerful financial incentives for healthcare delivery systems to implement and optimize the use of health IT to improve care, such as through the "meaningful use" of electronic health records (EHRs). While health IT alone may not result in better care, the information management tools contained in EHRs and the standards for their use are well designed to provide foundational support for the PCMH[8] . For example, a PCMH without health IT risks attempting to engage in cultural change without the necessary tools for measuring care, managing populations, providing improved access for patients, or engaging patients in self-management efforts. Without health IT, measuring quality of care is too costly to serve as an effective catalyst for change.

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Engaged Leadership and Support of Health IT

The transition to a PCMH represents a significant cultural shift, and there is an art to leading an organization successfully through changes of this magnitude. The job of leadership is to use data to articulate the case for change. When data are displayed graphically, they can tell a story of why the present way of doing business is unsustainable. Leadership can use data to describe a preferable future-state and clearly describe a plan to get from the current state to the future-state. In the midst of change, leadership should use data from health IT systems to demonstrate improvements in efficiency and quality resulting from workflow changes, as well as indicate improved financial health of the organization resulting from new lines of business and new work.

In order to lead with data, the organization's data must be timely, accurate, and reliable. Leading with data requires that two frequently overlooked issues become top organizational priorities. First, the workflows by which key data are gathered and entered into the EHR must be standardized. It is leadership's job to assure that everyone in the organization understands and adheres to standard data entry workflows for data elements on which the organization depends. Second, leadership must assure that sufficient resources are allocated to building, testing, and validating clinical reports that are used for the organizations quality improvement strategy.

Using Health IT for Quality Improvement Strategies

Quality improvement begins by defining a specific outcome goal, identifying metrics for managing quality, and then changing process to improve outcomes. This is often framed in terms of the Model for Improvement[9], which poses three questions:

1) **What are we trying to accomplish?** Quality improvement strategy can be applied to nearly any activity in healthcare. Invariably, the goal is to close a gap between a desired outcome and the outcome that the current process is producing. EHRs have expanded the possibilities for improvement goals, since EHRs can capture data efficiently and generate data reports based on that data. Simply having time/date stamps for key actions in problematic workflows makes it possible to better define what a particular process is expected to accomplish and set explicit performance expectations. For example, "Our goal is for 80% of medication reorder requests to be completed by the end of the day on which they were received." Once the goal is defined, the next step is to create a report showing actual performance to determine whether a quality improvement goal is being met.

2) **How will we know a change is an improvement?** To manage quality one must be able to measure it. The ability to write reports from structured EHR data has transformed quality improvement in healthcare by making it easier to measure many aspects of our work. The outcome report that quantifies a gap in care can also be used to measure improvement, but there are often other process metrics that are more useful for quickly telling whether a workflow change is having the desired effect long before a change would be detectable in the overall outcome. For example a report may reveal that the longest wait time in processing medication reorder requests is the time the request spends in a provider's electronic in-basket. An intervention targeting the way providers manage their in-basket may successfully reduce that wait time, and yet have only minimal effect on the total time because of one or more additional factors.

There are other data sources in addition to the EHR that can serve to determine whether a change results in an improvement including:

- Registries
- Practice management and billing software
  - Patient satisfaction surveys
  - Staff and provider satisfaction surveys
  - Staff turn-over data
  - Observations and communication from within the organization
- Financial data
- Business Intelligence software reporting out of a relational database

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3) **What changes could we make that might result in an improvement?** The most powerful strategy for improving outcomes involves redesigning workflows, and changing the way information is used to support workflows. Workflows determine how information is gathered and how it is entered into the EHR. There may be more than one place to enter the same information resulting in confusion for front-line staff, and some workflows may produce more data errors than others. In a PCMH, where care teams have a strong incentive to achieve set clinical outcome goals, much of the effort to redesign workflows involves standardizing the processes for entering information to assure its accuracy.

Just as getting reliable information consistently into the EHR is necessary for a care team to be able to rely on the information, good clinical decisions are dependent on the way information is presented to decision makers in the course of delivering clinical care. Tools that do this are called clinical decision support (CDS). To be effective, CDS must get the right information to the right person at the right time, using the right medium and with the right formatting[10]. There are many types of CDS tools in EHRs, including:

1) Documentation forms and charting templates
2) Relevant data presentation, including dashboards, charts, graphs, and flow sheets
3) Order and prescription facilitators, including drop down lists
4) Protocol pathway support
5) Reference information and guidance
6) Alerts and reminders

Rarely is a change that might result in an improvement perfect the first time someone tries it. The repeated cycle of Plan, Do, Study, Act (PDSA)[9] has become the standard for testing ideas for improvement, and modifying them based on a series of small-scale tests. Workflow redesign, clinical decision support and rapid process improvement cycles are the quality improvement foundations for using the EHR to support the higher-level PCMH change concepts.

How Health IT Supports Empanelment

Empanelment is the process by which each patient is assigned to a specific provider and care team that is responsible for that person's care. By assigning all patients to a specific provider and his or her care team, empanelment removes any ambiguity about the patients for which a care team is accountable, and which care team a patient identifies as their medical home. Empanelment allows patients and their care teams to recognize each other as partners in care. From a clinical reporting perspective, empanelment is the basis for data transparency by defining the denominator for quality reporting at the provider level.

Although many aspects of empanelment are possible without the use of an EHR, health IT simplifies the task. The more dependent primary care practices become on value-based payment models, the greater will be the need for them to manage their patients using the same metrics by which their performance is measured. Empanelment allows precise measurement of quality gaps on a scale that care teams can impact in real-time, which allows them to quickly close those gaps.



EHR Features and Workflows Supporting Empanelment:

- **Primary Care Provider Data Definition:** The data field in which the primary care provider (PCP) is recorded and displayed is the data definition for panel assignment.
- **Initial Attribution Strategy:** The organization will need to use reports on past utilization patterns as an initial step for attributing patients to providers (see Empanelment: Establishing Patient-Provider Relationships for a full empanelment methodology).
- **Panel Reports:** The organization must be able to produce reports showing the current panel of patients for each provider/care team.
- **Inactivating individual patients:** Criteria and corresponding data definitions must be developed for excluding inactivate patients (such as deceased or not seen within an agreed upon period of time) so they can be removed from a panel. A query using these criteria should be run at specified intervals.
- **Changing attribution for blocks of patients:** The software should support moving groups of patients from a provider who is leaving a practice to another provider who is joining the practice.
- **Demographic Panel Size Adjusters:** There should be a mechanism to adjust panel size based on age/sex normalized expected utilization.
- **Disease complexity:** There can be a mechanism to identify special populations of patients independent of age/sex adjustment methodology (including language needs, homeless individuals, multiple chronic diseases, etc.) that may be unevenly distributed across panels to enable appropriate allocation of resources to care teams.
- **Matching patients with providers:** Technology might be used to match patients to providers and care teams based on provider characteristics (specialty, preferred population, FTE, availability, etc.), and patient preferences.
- **Assessing panel characteristics:** Panel reports can be used to create dashboards to display discrepancies in panel size and complexity.
- **Supply and demand:** Reports should allow panel size determination based on supply and demand for service, as well as monitoring no show appointments.
- **Continuity:** Once patients are empanelled, the practice can monitor how often patients see their own PCP/care team and how often PCP/care teams care for their own patients.

Supporting Continuous Team-based Care with Health IT

A PCMH will be most effective in meeting the Triple Aim if the care teams are configured to meet the needs of the panel of patients for which they are accountable through a team-based care approach. The amount of work required to support improved care at lower costs is beyond the capacity of a single provider working in isolation with limited support staff, whose only role is to room patients and carry out orders. Growing evidence suggests that one of the most effective ways to improve provider satisfaction and prevent burnout is to share the care among members of a multidisciplinary team[11,12]. Health IT can play a vital role in sharing the care, serving as the primary medium by which care team members communicate and share information.

Sharing the Care: Providers' progress notes are essential for documenting a clinical work-up, justifying billing for services, and serving as defense evidence in malpractice lawsuits. It is no wonder therefore, that physicians often resist sharing control of their progress notes. EHRs have continued the tradition of separating providers' chart notes from the notes of medical assistants and nurses. A PCMH care team must find a way to integrate information gathering and documentation so that the care, including clinical decision-making, can be shared among care team members including the patient.

The EHR can do this in many ways, but it cannot replace face-to-face communication, both in meetings in which care teams plan and adjust their plans for delivering care, and in handoffs between care team members during a busy clinic day. One of the most powerful uses of the EHR in sharing the care is for the Medical Assistant (MA) to assemble and organize information during the rooming process, then set up the chart in ways that make it easier for the provider to remember to complete important tasks. For example, an MA can determine that a patient with diabetes is overdue for an eye exam and place a referral to optometry for a dilated retinal exam in the chart, making it easy for the provider to sign.

Team Meetings: Among the most important characteristics distinguishing PCMH care teams from traditional care teams are team meetings attended by all care team members, of which there are three basic types.

1) *Monthly quality planning meetings:* Teams need to spend perhaps 30 minutes each month planning and reviewing progress on major initiatives aligned with organizational strategic goals. This is time to review the team's performance in meeting quality objectives. Much of this work involves redesigning workflows and reassigning specific tasks from providers to non-provider team members. This requires assuring that training and protocols are in place to support sharing the care safely. Health IT supports clinical quality improvement work by allowing teams to review panel level reports for different sub-populations and considering ways they might alter their care processes to close care gaps. Empanelment is a prerequisite for this level of reporting, as care teams can identify, prioritize, and close gaps through action reports combined with lists of patients overdue for specific interventions.

2) *Weekly course correction meetings:* Care teams meet once a week for no more than 15 minutes to assess the results of the most recent rapid process improvement cycle, modify workflow and initiate the next cycle. The health IT system is one of many potential sources of information to tell if a change is resulting in an improvement.



View this video produced by Qualis Health for an introduction to the huddle.

3) *Huddles:* The huddle is a short meeting of the care team at the start of each clinic day to quickly review patients on the schedule and prepare for their visits. Ideally an MA "scrubs" the charts prior to the huddle to assure that gaps in preventive and chronic illness care are identified. The care team may use health IT to:

- Spot problem list omissions by viewing it next to the medication list.
- Identify missing information required for the visit by reviewing un-resulted recent orders for imaging tests, or referrals.
- Prepare special resources required for the visit including translation services, with demographic and social history data.
- Identify gaps in preventive and chronic illness care using a health maintenance dashboard.
- Identify care transition visits following an emergency department or hospital discharge with data from the health information exchange.

The Health IT Basis of Organized Evidence-Based Care

Organized, evidence-based care means applying quality improvement methodology to population health by leveraging health IT to turn evidence-based guidelines into practice. The easiest way to prevent being overwhelmed by the complexity of the task is to stick to the quality improvement framework as shown below.

What are we trying to accomplish?

1. **Define the target population and health condition.** The first task is to define the patient population and the clinical issue to be addressed. An example would be to assure that all patients with persistent or moderate/severe intermittent asthma receive care that is consistent with current evidence-based guidelines. Most populations can be identified by standard reports using demographic information to define its members and a problem list entry as a definition for a clinical condition. Other structured data, such as order results and medication list, are useful for identifying patients with the target condition that is not on the problem list.

2. **Identify the evidence-based guideline(s) to use for the condition.** For common conditions, there are usually several guidelines from which to choose. A PCMH may elect to combine elements from several guidelines depending on the goals the organization is trying to achieve. Most guidelines can be identified in the web-based National Guideline Clearinghouse (www.guideline.gov).

   Identify the specific elements of the guideline to put into practice. Every guideline is comprised of individual elements. It is essential to list each element of the selected composite guideline in a way that represents a specific action that a care team (including the patient) will be expected to perform. For example, the practice will need to assure that all patients with asthma are classified according to disease severity and level of control so that the care team can place an order, perform a

task, document information, provide counseling, or change a behavior, based on those classifications. It is important to pick actions that are documented as structured data in the EHR because actionable elements in the guideline will serve as the numerators in quality reports. A guideline may call for the care team to counsel smokers about smoking cessation. Unless an order is placed for smoking cessation, or a checked box indicates that smoking cessation was discussed, the fact that the action was carried out will not be measurable, even if it is mentioned in the chart note.

How will we know a change is an improvement?

1. **Create a data-definition for each element of the evidence-based guideline.** Nothing can be managed unless it can be measured. Once the standard for providing evidence-based care is defined, a reliable way to measure it must be developed. This requires writing a report in the EHR. The first step in writing a report is to agree on a "data definition" for each element of the guideline that requires an action. The clinical concept of "moderate persistent asthma" for example must be documented as structured data in the chart if the number of patients with this diagnosis is to be measured. In this example, the data definition would be an agreed upon SNOMED, or ICD-10 diagnosis for asthma appearing on the problem list that captures disease severity and control.

Nothing can be managed unless it can be measured.

2. **Write and validate a report for each element.** Once each element of a guideline is defined, the next step is to write a report to measure it. This requires using not only the data definitions for each element, but also a set of "rules" that define the logic of the report. Each report has a denominator, which may be the entire sub-population with the condition (e.g., every patient with asthma), or some segment of that population depending on purpose of the report. Each report must be validated, which means conducting a careful review of a number of patients in the report to assure that the data in the report corresponds exactly to the information in the EHR from which it was derived. It also means conducting a search for patients who should be in the report, but are not. In the case of asthma, there may initially be only a small percent of patients for whom the problem list reflects severity and control. The report can be written so that the denominator represents patients with any code (From SNOMED, ICD-9 or ICD-10) for asthma as an encounter diagnosis, and the numerator represents all patients with a categorized asthma diagnosis on the problem list. This defines a starting point for improvement and may suggest ways to increase the percent of patients who are properly categorized. The process of validating the report will commonly reveal problems with the data definition, with attribution of patients to providers, or with rules in the report that will need to be corrected before the report can be regarded as accurate.

3. **Use the reports to prioritize the work of closing quality gaps.** Once reports have been written and validated, the outcomes they reveal are used to prioritize quality improvement efforts. Start by focusing on a limited number of high-priority guideline elements. It may make sense to select a facet of care for which the gap between current outcomes and the evidence-based guideline is the greatest. It might also make sense to prioritize elements of the guideline for which there is the greatest variation across different practices. If one of the elements of an asthma care program is that each patient will have a yearly planned care visit for asthma to deliver a standardized set of interventions, the job of assuring that a patient with asthma has his or her disease properly categorized could be combined with scheduling newly categorized patients for a planned care visit.

What changes might result in an improvement?

1. **Define the information required for each clinical decision.** Framing each element of an evidence-based guideline as a set of actions, or decisions that someone makes serves to focus attention on the "5 Rights" of clinical decision support (CDS): Presenting the right information to the right person, at the right time, through right medium, formatted the right way[10]. Clinical decisions often are orders for tests, treatments or referrals. They can also be a decision to give advice, or in the case of asthma, to update the problem list to include disease severity and control. An example of CDS for categorizing asthma severity would be a preference list showing the categorized asthma diagnoses and a definition for each category that appears when the term "asthma" is entered into the problem list.

2. **Workflow/Information Flow Redesign:** The starting point for workflow redesign is to map in detail the workflow producing the current outcome. Once the current state is defined, care team members need to design a future state workflow that meets two objectives. The first objective is to design a workflow to accomplish the desired tasks with as little waste as possible. The second objective is to integrate clinical decision support into the future state workflow.

   For asthma, a testable future state workflow might include having an MA identify at the start of the day every patient on the schedule with a prescription for an asthma medication, or non-severity-classified asthma diagnosis on the problem list, prior to the huddle. The MA might notify the front desk to give the patient a set of questions to answer that will help define the symptom severity of the patient's asthma. During the daily huddle, the care team would review the patients on the schedule who will need their asthma categorized. While rooming the patient, the MA can place the answers to the patient's symptom severity questions on the provider's note, making it easy for the provider to remember to update the problem list with the severity categorized diagnosis.

3. **Test and modify the future state workflow on a small scale.** Future state workflows and the associated CDS tools may make sense on paper, but they don't always work as intended. The first task is to test a future state on a small scale, such as with one care team over one week, as a proof-of-concept test to see what happens, taking care to measure the change in outcomes. The design will probably need to be modified, followed by retesting in the rapid process improvement cycle. After several cycles, the refinements tend to be smaller resulting in smaller improvements, making measurement of intermediate outcomes imperative to tell if a change is actually an improvement. After repeated refinement, the rapid process improvement cycle reaches a point of diminishing returns and the team settles on a stable workflow. Eventually the report that identified the care gap in the first place will show improvement, meaning that a portion of the evidence-based guideline is now part of the care team's practice, and the improved workflow with the associated CDS tools needs to be spread to other care teams.

Using Health IT to Support Patient-Centered Interactions

When computers were first introduced into clinical settings, many observers expressed concerns that the technology would interfere with the relationship between providers and their patients. One of the major contributions to informatics from the patient-centered perspective of the medical home has been the emphasis on ways to make the computer in the exam room more inclusive of patients and their families. There are several ways to do this.

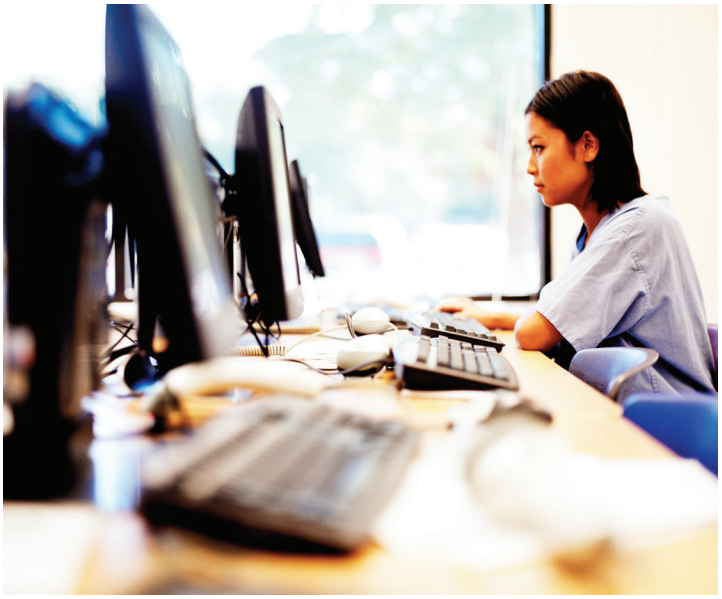
1. **Patients before computers:** Review the chart before going into the room so the initial focus is on the patient, not the computer. The health IT system can also help maintain better personal relationships if care team members review fields describing who the patient is, including type of work the patient does (or did), educational background, family and interests, before entering the exam room. On entering the room, make eye contact and focus on the patient, inquiring about their job or family before logging in to the computer.

2. **Engage Patients in their own data:** Position the screen so it is visible to the patient, and encourage them to look at their information. Applying the patient-centered care adage, "nothing about me without me,"[13] each member of the care team should consider themselves to be the patient's guide to their record. Tell the patient what you are doing and ask them to correct any errors they see in their record or the progress note. Use data displays that are visually explanatory such as graphs and flow sheets, and point out what those visual displays show. When an alert appears, pause to review it with the patient, and explain both what it means, and the logic of your response. Admit what you don't know. Include patients in reviewing guidelines and other decision support, including looking on the internet for information or clinical pictures.

Applying the patient-centered care adage, ***"nothing about me without me,"*** each member of the care team should consider themselves to be the patient's guide to their record.

3. **A Patient-Friendly Patient View:** Actively seek patient input into the design of both the patient portal and any materials that are intended for patients to see, including visit summaries and printed instructions. Let patients see providers' progress notes through the portal.

   The EHR can also serve as a tool for self-management of chronic conditions. Stage 2 meaningful use certification requires EHRs to be able to include a patient care plan, which might include patient goals and plans for exercises that span multiple conditions, and be visible to patients through their portal. The care team should be able to review and update patient care plan, not only with each office visit, but also during virtual visits as well. Care plans should help reduce the fragmentation of information buried in progress notes.



Enhancing Access with Health IT

The PCMH has several options for enhancing patient access to care, which generally use fewer resources than office visits without jeopardizing quality. These include group visits, telephone visits, asynchronous messaging, direct feeds from patient controlled technology, and telemedicine, with some types of access better suited to certain clinical contexts and patient preferences than others. Health IT serves as the medium for some types of access, and the information platform for all types of expanded access. It also has the potential to optimize the efficiency through which patients schedule and receive care, and allows the team to systematically adjust its capacity for each kind of access to the panel's demand for care.

Health IT serves as the medium for some types of access, and the information platform for all types of expanded access.

Office visits: There are many kinds of face-to-face encounters including office visits, planned chronic illness visits, wellness visits, and group visits. Health IT can improve office visit efficiency in several ways:

- Allowing patients to directly schedule appointments online, including same-day access, reduces time and effort spent processing appointment requests.
- A streamlined check-in process, in which patients swipe an electronic card with demographic, registration and insurance eligibility information reduces the work of checking in patients at the front desk.
- Real-time location systems (RTLS) can be used to let front desk personnel send a patient directly to an open exam or procedure room, thereby reducing patient waiting and eliminating costly waiting room space. RTLS also lets care team members easily identify the location of other team members, patients, and crucial equipment such as ECG or nebulizer machines, thereby eliminating time wasted looking for people and things.
- Vital sign devices can transmit data directly to the EHR, reducing work and data entry errors.
- Proximity badges can automatically unlock and log care team members into computers reducing time wasted repeatedly typing in passwords.
- Modular charting templates designed for any combination of clinical problems can minimize changeover work with patients who have a variety of acute and chronic issue to address.
- Allowing charts of multiple patients to be open at the same time on the same computer workstation simplifies group visits.
- Clinical decision support tools present information to care team members in ways that make it easier to find information and recognize important patterns for decision-making. CDS can help create checklists to assure that every patient leaves an office encounter with the important gaps in their care addressed.
- Hyperlinks within the EHR to commonly used external data sources can reduce time spent looking for reference information, records in affiliated hospitals or specialty offices, or state registries for immunizations and controlled substance prescriptions.
- Real-time drug formulary checkers eliminate the rework of phone calls from a pharmacy to authorize substitutions.
- A well designed after visit summary, and care plan helps patients remember the most important content of the visit, and leave with a list of action items.

Group visits and shared medical appointments:
Patients with chronic illness often benefit by participation in group-visits because they spend more time with their healthcare provider, and benefit from social support from other patients. Health IT can facilitate group visits by:

- Identifying patients with similar conditions and similar demographics
- Creating scheduling blocks to ease logistics
- Using distributions lists to invite and/or remind patients about visits and any possible "pre-work"
- Using templates for group visits that allow a scribe to document in each patient's chart.

Telephone Visits:
Telephone advice calls during clinic and after hours: When patients call the care team for clinical advice, the two most common sources of waste are 1) telephone tag and 2) making a patient talk to someone who can't answer the question. Health IT can be used to the reduce waste of telephone advice calls in a number of ways.

- Telephone log reports reveal temporal patterns to advice calls that can be used to schedule providers and nurses to answer calls directly during the times of greatest frequency.
- Tools for documenting and responding to questions computerized provider order entry (CPOE) and Clinical Decision Support (CDS) should be part of the telephone counter.
- Providers, nurse triage lines and emergency/hospital personnel need remote access to the EHR 24/7.
- Document telephone encounters in the EHR so patients don't have to retell their story with subsequent calls and during follow up.

Scheduled telephone visits: Most scheduled telephone visits can be completed in a fraction of the time required for an office visit. To optimize phone visits, consider the following:

- The daily schedule should show all visit types on a single screen.
- Text messaging can alert both the provider and patient 10 minutes before a scheduled phone appointment, to assure both parties are on time for the appointment. Such a text alert can also include a message for patients to prepare for the visit by signing onto the patient portal or finding their medication list.

Telemedicine: Telemedicine can function as a phone visit with a camera for patients with multiple chronic diseases who have difficulty keeping appointments or making it to an office visit because of transportation issues. Telemedicine is particularly important in obtaining consultation with specialists for providers working in remote areas.

Asynchronous Secure Messaging (ASM):
Communication between the patient and the care team that doesn't require a direct conversation for clinical decision-making and is not time sensitive can often take place with secure messaging[14]. To protect privacy, the patient (or care giver) must log in through a portal to view portions of the electronic record. The willingness of patients to activate their account and use this technology often depends on how clearly the clinician articulates its importance for communications with the care team. This technology can be optimized with a number of Health IT features:

- Receipt notification informs the care team that the patient has read an outgoing message and can reduce errors caused by a false assumption that a patient received a message.
- Easily accessible instructions explaining whom to contact, when, how, and for what situations, can improve communication accuracy between patients and the care team.

- Patient portal links to reliable medical knowledge databases make it easier for patients to find information without using clinic resources and reduce the risk that patients will not find what they need or become confused by irrelevant or erroneous information.
- When key information including demographics, problem list, medications, allergies, and family history are made easily visible through the portal, patients can quickly identify and report information errors in their record, of which the care team may not be aware.
- If patients know that that diagnostic test results will be available on the patient portal, they are less likely to call the clinic.

Text messages: The security of text messaging is insufficient to protect privacy of protected health information. However, test messages may useful for appointment reminders. Likewise, for some patients with chronic diseases, periodic text message reminders may help support behavior changes or self-monitoring activity[15].

Home monitoring devices: As patients increasingly use home devices to monitor daily weights, blood pressure, blood sugar or peak expiratory flow, the value of the information from these devices depends on how well patients and their care teams use it to guide clinical decisions. Increasingly, information from these devices can be transmitted to the care team and auto-entered into the patient record with a mechanism to alert the care team to dangerous trends such as weight gain in patients with heart failure.

The optimal mix of scheduled interactions, primarily office visits, planned care visits, group visits, telephone visits and time for asynchronous messaging, in a PCMH will vary depending on the panel of patients and the innovation of care team members. As enhanced modes of access are added, the care team will need to "feel its way" using reports for each modality comparing demand to supply. The goal of the PCMH is to gradually move portions of the panel's care needs to, less resource intensive visit types and respond to patient preference. Office visits with clinicians should be used predominantly for diagnostic problems, patients with multiple or complex chronic conditions, and transitions of care. Because the optimal appointment mix will likely be different from panel to panel, the best tactic is to begin by opening up a new line of access, such as scheduled telephone encounters to follow up patients started on anti-depressants. Likewise, optimizing the number of same day appointments (SDAs) held for provider visits is best done by holding a small number until 24 hour prior to the time and expanding the number until they start to go unfilled. Monitoring the use of different visit is crucial role in pursuing this strategy.

Some ways in which health IT can support better patient access

Office visits – online scheduling, clinical decision support tools, and after visit summaries

Group visits – identifying similar grouping of patients, and templates for group visits

Telephone visits –documenting telephone advice calls, temporal logs to understand patterns of advice calls, and telemedicine.

Asynchronous secure messaging – usage of patients portals for key information, including lab and test results.

Text messaging – periodic text message reminders.

Home monitoring devices – information from home monitoring devices can be incorporated into the EHR.

The Role of Health IT in Care Coordination

The complexity of high quality modern medical care requires primary care providers to refer patients to specialists and facilities where advanced imaging and other specialized services can be performed. These referrals for services that cannot be provided in primary care contribute to the fragmentation of care that is dangerous from a patient safety perspective. Likewise transitions of care between the medical home and a hospital or an emergency department carry a high risk of information loss, with particular confusion about medications and care plans. The work in a PCMH of coordinating care to prevent avoidable adverse outcomes falls into four general categories, in all of which health IT plays an important role.

- Assuming accountability for care coordination
- Providing support for patients through transitions of care
- Developing and maintaining referral relationships and agreements with outside providers
- Ensuring appropriate information transfer to support care coordination

Assuming accountability for care coordination: It is the job of the PCMH care team to let patients know what to expect when the referral in made, and what to do if anything in the process goes wrong. This set of expectations should be included in the after visit summary and made available on the patient portal.

The PCMH should use time/date stamps in the EHR to track all orders to assure they are either carried out as expected, or cancelled due to changing need for the service. For referrals and orders for services performed in other facilities, this will require assuring that patients are scheduled for procedures and referrals, keep their appointments, and that the consult results come back to the ordering provider in a useful format in a timely fashion. Ideally time/date stamp data for intermediate steps marking the progress of the referral (patient scheduled, date of appointment, patient seen) will be available to the PCMH for referral tracking, through a health information exchange.

PCMH care teams need to know when one of their patients is seen in an emergency department, or admitted to, or discharged from a hospital. The PCMH health IT system facilitates this by receiving data from the Admission/Discharge/Transfer (ADT) system that every hospital facility maintains. The PCMH should use this information to support internal workflows to communicate with hospital-based providers, contact patients after discharge, and plan care transitions activities.

A visit template for care transitions visits can be set up in the EHR with a structure to prompt providers to focus on the highest priorities. These priorities will vary with the condition, but will include assuring that changes in the medication and allergy lists are accounted for, diagnoses resulting from the hospital or ED visit are adequately reflected in the outpatient record problem list, and that care plans are updated and understood by the patient and caregivers. Changing certification standards are forcing EHRs to better integrate information gathered in different encounters across the time frame of a condition, though such features as the continuity of care document (CCD) and care plan. The template for care transition visits in primary care should include a process for updating these continuity documents in the patient record.

Efforts to improve care coordination need to be monitored to assure they are meeting standards that have been set. EHR time/date stamps can be used to monitor the percent of referrals in which the patient was seen, or in which the report was received by the referring provider after the patient was seen, within the agreed upon time frames.

Providing patient support: Communications should be clear to both care teams and to patients that the PCMH is responsible for supporting patients during referrals and care transitions. Whenever possible the PCMH should try to schedule referrals and tests before the patient leaves the clinic from which the referral was made. The after visit summary should not only include a listing of the referral, but also some explanation for what to expect, the timeframe in which processes should be completed, and what to do if something doesn't happen as expected. These instructions are best developed with input from patients. The same information should be available to patients through the EHR portal.

It is important to have a clearly mapped process for managing transitions of care after patients are discharged from hospitals and emergency departments. The EHR should be viewed as a framework for embedding clinical decision support tools into the workflow to assure direct communication with patients recently seen in the ED or discharged from a hospital. Useful tools include a report for the care coordinator to call listed patients discharged in the past 24 hours, and a check-list embedded in a telephone visit template for the care team to use in calling the patient the day after discharge.

Developing relationships and agreements with key outside providers: The process of relationship building and agreeing on standards for service between a PCMH and specialty facilities is a political process that is not driven by technology. However technology can assure a common understanding of the agreement by all parties by creating workflow or process diagrams and other supporting documents to serve as resources to assure that organizational agreements operate smoothly.

Decision support should be built into referral orders to assure that patients arrive at the specialist's office with the necessary information for the consultation. For optimal use of resources, it is important to build into the referral process a mechanism by which the referring provider and the consultant have the option of discussing the patient by telephone before the patient is seen, which allows both parties to prepare for the consultation that may be unique to the patient, or may obviate the need for a specialty visit all together.

Establish connectivity that ensures appropriate information transfer: An array of technologies has emerged to facilitate the transfer of information between care teams in a PCMH and hospitals, emergency departments, specialty consultants and imaging centers, which are often on different information technology platforms. These technologies include health information exchanges that may be based on centralized data repositories, or direct transmission through a hub. There may be point-to-point sharing of data with frequent trading partners, or features to allow different users of the same EHR to look in each other's records after patient identity has been confirmed and patient permission has been documented. The actual technology used to exchange information is less important from a patient care perspective than is the information content included in the exchange and how the formatting of the information affects its ease of use in coordinating care. In general, the less a provider needs to leave one platform and log onto another, the greater the ease of use. The trend is toward incorporating information obtained from another facility into the PCMH EHR, however much of the value to patient care is achieved by simply being able to see key information required for important decisions.

Each of the approaches to health information exchange assumes that information from various sources can be assembled at a time and place coinciding with the patient and the provider who will use that information. As it becomes easier for patients to get copies of their own health information, the most effective way to coordinate information at the point of care may be to make the patient the keeper of their continuity of care document and other information in a patient health record that the patient brings to every encounter with every provider.

Conclusion

As clinical settings prepare for value-based reimbursement and face increasing accountability for quality and cost, the job of transitioning primary care practices to become patient-centered medical homes and the job of implementing, upgrading, and optimizing health information technology have become completely intertwined.

Health IT has the ability to enhance all aspects of the PCMH, generating and providing useful data that can be applied to practice transformation efforts. Additionally, health IT in various forms (e.g., EHRs, phone calls, texting, patient portals, etc.) allow for better communications with all members of the care team, including specialty consultants, and most importantly, the patient.

While it is not necessary to possess robust health IT systems to become a PCMH or to facilitate practice transformation, it is also clear that PCMH practices that do not have health IT are at a significant disadvantage because they will require a greater number of resources and manual processes in order to generate the same information and outcomes as a practice with highly functioning health IT. And as value-based reimbursement becomes a more certain reality for healthcare organizations, the ability to generate accurate quality reports and upload the data through various mechanisms will be mission critical.

At the same time, it is possible to build toward health IT capacity by starting off with a few key items. The higher level change concepts—including organized evidence-based care, patient-centered interactions, advanced access and care—are very difficult to sustain without having first established a strong foundation with engaged leadership, quality improvement strategy, empanelment, and working in teams. For this reason, initial efforts to implement health IT should focus on reports that can be used to define and close quality of care gaps and support empanelment. In the rapidly evolving healthcare landscape, it has become increasingly important to take even small steps toward a sustainable practice transformation approach to be prepared for larger changes that will occur in the immediate future.

About Qualis Health

Qualis Health is one of the nation's leading population healthcare consulting organizations, partnering with our clients to improve care for millions of Americans every day. We work with public and private sector clients to advance the quality, efficiency and value of healthcare.

Qualis Health headquarters are in Seattle, Washington, with regional offices located in Alabama, Alaska, California, Idaho and the District of Columbia.

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