Patient-Centered Medical Home

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Introduction

The patient-centered medical home (PCMH) is a conceptual framework and operational model for primary care service delivery that began over a decade ago in response to a progressively fractionated and dysfunctional health-care system in the United States [1]. At that time, the Institute of Medicine published a landmark report, *Crossing the Quality Chasm*, which described a care delivery system that lagged behind medical science and technology, and did not adequately manage the complex medical and psychosocial disease burden of the population [2]. The report directed attention to poorly organized and uncoordinated care models and strategies that inconsistently delivered evidence-based interventions and resulted in worse health outcomes that were especially disproportionate for vulnerable patients and those with chronic illness [2].

Reimbursement indexed to fee-for-service models and a production-based orientation that sought to maximize each unit of health-care service further added to a dysfunctional care delivery system [2]. This reimbursement model drove health-care providers, such as physicians, hospitals, and health-care systems, to provide as much care, to see as many patients, and to do as many procedures, as possible. Health-care services that had demonstrated value, such as facilitated communication between providers, chronic disease self-management, and integrated behavioral health care, were not supported through existing payment models and, invariably, were not standardized and operationalized [2]. From a workforce perspective, medical and associated health-care learners were not entering into primary care careers, emphasizing the need to attract and sustain such a workforce [2].

The PCMH model grew in response to these forces and is now the dominant care delivery model in primary care [3]. This chapter provides an introduction and overview to the PCMH. The first section outlines the intellectual roots that led to development of the PCMH model. The middle portion of the chapter describes key functions of the medical home and assesses the emerging evidence base for this care delivery framework. The subsequent section provides an overview to implementation strategies for PCMH in primary care before the chapter closes with future directions of the PCMH within a changing health-care landscape.

Intellectual Roots of the Patient-Centered Medical Home

The concept of a medical home for patients has been in the primary care intellectual space for decades [4]. The origin of the term "medical home" can be linked to the 1967 American Academy of Pediatrics (AAP) *Standards of Child Health Care*, which described the lack of a complete record and a medical home as a major deterrent to adequate health supervision for children [5]. In some states in the 1970s, however, the term became controversial as legislators misinterpreted the concept as impinging on parental rights and responsibilities. Pediatricians addressed and reframed this orientation and, throughout the 1980s, continued to press the need for accessible care that would be coordinated for children through a medical home [6]. The AAP published the first policy statement about the medical home in 1992 in an attempt to frame the concept and offer an operational definition [6]. The statement clarified that the medical home sought to provide care for children that was accessible, family centered, continuous, comprehensive, coordinated, compassionate, and culturally effective [6].

There was a parallel movement emerging in international health-care circles. The World Health Organization's (WHO) International Conference on Primary Health Care at Alma-Ata

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T.P. Daaleman, M.R. Helton (eds.), *Chronic Illness Care*, https://doi.org/10.1007/978-3-319-71812-5_28

in 1978 outlined a scope of primary care and incorporated concepts that are visible in the contemporary PCMH model: access to care, continuity of care, comprehensiveness and integration of care, patient education and participation, team-based care, and public policy that supports primary care [7]. About that time, the Institute of Medicine (IOM) defined primary care as care that was accessible, comprehensive, coordinated, continuous, and accountable, key principles which informed a report, *Primary Care: America's Health in a New Era*, that would be published two decades later [8]. The report promoted the role of primary care and clarified that it was not a defined group of clinicians but rather a function of health care which would be responsible for providing integrated, accessible health-care services and accountable for addressing a majority of health needs in the context of families and communities [8].

The IOM report emphasized the role of primary care in providing continuity of care and broadened the concept to include continuity or ongoing, sustained care, delivered by a clinical team of professionals with an array of expertise focusing on improving the quality of care [8]. To achieve these aims, the IOM identified the need for new financing mechanisms to support primary care clinician training, to provide access to primary care for all patients, to advance practice-based primary care research networks, and to improve evidence-informed medical decision-making [8]. Barbara Starfield further advocated for primary care as the foundation of a health-care system with several features: the first point of entry to a health-care system; the provider of person-focused (not disease-oriented) care over time; the care provider for the majority of conditions; and key components of the system that integrate and coordinate care [9].

In the late 1990s and early 2000s, Ed Wagner and colleagues at the MacColl Institute for Healthcare Innovation developed the Chronic Care Model as a framework to improve the management of complex and chronic disease [10]. The foundational principles of the care model focused on developing prepared teams of clinicians to proactively deliver care to informed, activated patients [10]. The key concepts of team-based care, care coordination, and quality care that are outlined in the Chronic Care Model are foundational concepts of the patient-centered medical home [10].

The Chronic Care Model and medical home concepts helped inform leading national family medicine organizations of ways to think about transforming ambulatory care delivery and led to the Future of Family Medicine (FFM) project and a new model of practice [1]. The new model outlined several goals: (1) implementing a patient-centered team approach, (2) eliminating barriers to access, (3) utilizing advanced information systems including electronic health records, (4) redesigning practice settings to be more functional, (5) focusing on quality and other specified outcomes, and (6) enhancing practice finance and payment models to support new care delivery [1].

In 2007, four national physician organizations representing over 300,000 physicians and primary care stakeholders—the American Academy of Family Physicians (AAFP), the American Academy of Pediatrics (AAP), the American College of Physicians (ACP), and the American Osteopathic Association (AOA)—issued the joint principles of the patient-centered medical home, a foundational document that helped stimulate the transformation of health care in the United States [11]. The joint principles identified seven principles, and these are presented in Table 28.1.

Table 28.1 Joint principles of the patient-centered medical home (PCMH)

Personal physician	Patients have an ongoing relationship with a personal physician who provides first contact, continuous, and comprehensive care
Physician-directed medical practice	A personal physician leads a team of care providers who collectively take responsibility for a patient's care
Whole-person orientation	The personal physician is responsible for providing all of a patient's health-care needs, including acute, chronic, and preventive services, for all stages of life including end of life care or takes responsibility to arrange for appropriate care with other health-care providers
Care is coordinated and/or integrated	The personal physician and care team coordinate care throughout the continuum of the complex health-care system and the patient's community. Care facilitated by integrated data to assure patients receive evidence-based, culturally appropriate care when and where they need it
Quality and safety: hallmarks of the medical home	Practices provide care that is Based on patient-centered outcomes Compassionate and in partnership with patients and their families Guided by decision-support tools Uses information technology to provide evidence-based care, measures performance, provides patient education, and enhances communication Continuously improved using key principles of quality improvement that involve patients and families at the practice level Responsive to patient feedback
Enhanced access	Patient access to care maximized through concepts of advanced access scheduling, expanded office hours, electronic visits, and new communication options such as patient portals
Payment reform	Payors recognize the value provided by a patient-centered medical home and structure payment models that support non-face-face work including care management and care coordination, use of health information technology for quality improvement, population-based care delivery, and enhanced communication infrastructure and recognize the variation in risk among patient populations in practices

Adapted from Ref. [11]

Table 28.2 National Committee for Quality Assurance patient-centered medical home standards

Standard 1: patient-centered access	Access to team-based care for routine and urgent needs of patients and families at all times
Standard 2: team-based care	The practice provides continuity of care using culturally and linguistically appropriate team-based approaches to care delivery
Standard 3: population health management	The practice uses a comprehensive health assessment and evidence-based decision support based on complete patient information and clinical data to manage the health of its entire patient population
Standard 4: care management and support	The practice systematically identifies individual patients and plans, manages and coordinates care, based on need
Standard 5: care coordination and care transitions	The practice systematically tracks tests and coordinates care across specialty care, facility-based care, and community organizations
Standard 6: performance measurement and quality improvement	The practice uses performance data to identify opportunities for improvement and acts to improve clinical quality, efficiency, and patient experience

Adapted from Ref. [12]

Another group, the Patient-Centered Primary Care Collaborative (PCPCC), was founded in 2006 to promote policies and best practices that support high-performing primary care in achieving the "Quadruple Aim": better care, better health, lower costs, and greater joy for clinicians and staff in the delivery of care [5]. The PCPCC developed eligibility criteria for practices which sought to be recognized as a PCMH in order to create an industry standard and to provide a mechanism for provider reimbursement for PCMH functions [4]. The eligibility criteria for recognition as a PCMH were adopted by the National Committee for Quality Assurance (NCQA) in 2008 and updated in 2011 and 2014 (Table 28.2) [12]. Although the NCQA has been an early leader in PCMH recognition, other accrediting bodies have established recognition programs, including the Accreditation Association for Ambulatory Health Care, URAC (formerly the Utilization Review Accreditation Commission), and The Joint Commission [4].

Key Functions of the Medical Home

The Agency for Healthcare Research and Quality (AHRQ) defines a medical home as an organizational model of primary care that encompasses five functions and associated attributes [13].

Comprehensive Care

The patient-centered medical home (PCMH) is accountable for meeting the large majority of patients' physical and mental health-care needs and requires a team of care providers [13]. Some medical homes may bring together large and diverse teams of care providers, while others link themselves and their patients to providers and services in their communities. Within this framework, the physician is both personal physician and the leader of a team of providers and staff who work together in delivering patient care. In addition to directly managing patients' clinical conditions, physicians practicing within a PCMH need skillsets to both provide care and manage the care provided by other members of the care team [13].

Almost one third of adults with medical disease also have comorbid mental health diagnoses; behavioral and mental health conditions are commonly encountered in primary care [14]. Functional team-based care within the PCMH can operationalize the relationship between medical and behavioral health providers, integrating workflows to support the identification and management of mental and behavioral health disorders, particularly in vulnerable patients. The IMPACT model of depression management is a widely studied and adopted approach to integrating behavioral health approach within primary care [15]. Operationally, this model expands the primary care team to include a care manager, a consultant psychiatrist, and, in some settings, a clinical psychologist to screen and address behavioral health issues, promote evidence-based treatment protocols, and provide direct services when indicated [15]. This team-based approach to managing mood disorders demonstrated a 50% reduction in depression symptoms for half of the patients managed under this model [15].

The evidence base for integrating behavioral health teams into the PCMH compelled 11 major national primary care organizations to endorse the Joint Principles: Integrating Behavioral Care into the PCMH [16]. These groups maintained that patient-centered medical homes could not be successful without systematically addressing key elements of integrated behavioral health care [16] The Behavioral Joint Principles shared characteristics with the principles of PCMH, enhanced access, team-based care, whole-person orientation, coordinated and integrated care, quality, and ultimately payment reform, to address behavioral health needs. In addition, the Behavioral Joint Principles outlined the need for clear role definitions among providers caring for patients' behavioral health needs and interdisciplinary training among care providers and targeted research to identify and implement programs designed to deliver whole-person care in the PCMH [16].

There are other comprehensive care models that are oriented to manage patients who have complex medical needs, significant barriers to care, or other social determinants of health. Peer support, for example, has emerged as a successful strategy to extend care delivery from a medical home into the community and has shown significant outcomes in decreased morbidity and mortality rates, increased life expectancy, improved patient self-efficacy, improved medication adherence, and reduced cost of care through decreased use of emergency services [17]. CommunityRx is another initiative that linked e-prescribing in the electronic health record of primary care practices to a database of local community resources that addressed basic patient services, wellness programs, and community-based disease self-management programs [18].

Patient-Centered

The PCMH ideally provides relationship-based health care that is oriented to the whole person [13]. Partnering with patients and their families requires understanding and respecting each patient's unique needs, culture, values, and preferences. The PCMH recognizes that patients and families are core members of the care team, and medical homes promote patients as full partners in establishing care plans. Personal doctoring is a tenet of patient-centeredness and is based on physicians and patients maintaining meaningful, continuing relationships over time. Continuity of care is central to the medical home and has been demonstrated to improve patient outcomes, including decreased emergency department utilization and hospitalizations, increased preventive services, improved patient satisfaction of care, and reduced cardiovascular mortality [19]. Given the importance of continuity in improving patient outcomes, many medical homes now measure and track continuity in an effort to maximize patient-PCP relationships, balance patient access to care, and actively manage patient panels.

Coordinated Care

The PCMH coordinates care across all aspects of the larger health-care system, including specialty care, hospitals, home health care, and community-based services. Care coordination is particularly critical during transitions of care, such as hospital discharge. Care teams are integral to coordinated care and come in many forms. A care team can be as simple as a physician and one or more medical assistants caring for a panel of patients. The teamlet model enhanced the role of medical assistants to include preplanning for individual patient office visits, promoted patient self-management skills during a visit, and supported patient and provider care goals through after-visit outreach [20]. This approach to team-based care can effectively expand patient access to care when in-office availability is limited [20].

There are other coordinated care models that are designed to manage patients with multiple health-care needs. Physician-pharmacist teams, for example, can manage complex medication regimens that many patents struggle to navigate. Pharmacists who are embedded in medical homes work directly with primary care providers on both direct patient care and population management interventions and have demonstrated improved management of chronic disease and care of patients transitioning out of the hospital [21, 22]. Clinical pharmacists are particularly skilled in simplifying medication regimens, identifying cost effective medications, teaching appropriate medication use such as inhalers and insulin, and identifying current or potentially adverse medication interactions [21].

Accessible Services

The primary care medical home delivers accessible services with shorter wait times for urgent needs, enhanced in-person hours, around-the-clock telephone or electronic access to a member of the care team, and alternative methods of communication, such as email and telephone care [2]. Ideally, the medical home practice is responsive to patients' preferences regarding access [13].

Quality and Safety

High-functioning PCHMs demonstrate a commitment to quality improvement by ongoing engagement in evidence-based medicine and clinical decision-support tools. These approaches can promote individual and practice-based performance measurement and improvement by measuring and responding to the patient care experience, and through population health management strategies [23]. As noted earlier, well-organized care teams can be effective in delivering high-quality patient care. TeamSTEPPS, developed jointly by the Agency for Healthcare Research and Quality (AHRQ) and the Department of Defense, is one model [24]. In this approach, clinicians and staff members have clearly delineated roles and responsibilities, from managing provider schedules to appropriately triaging or responding to patient's phone messages and to providing direct clinical care. TeamSTEPPS concepts promote physician-led care teams, utilizing more staff in direct and indirect patient care, and free up physicians to thoughtfully engage in patients in responding to complex care needs [24].

Evidence Base of the Patient-Centered Medical Home

The Agency for Healthcare Research and Quality (AHRQ) commissioned a study to systematically review the evidence on the effectiveness of the patient-centered medical home (PCMH) model [25]. The review included nearly 500 articles from January 2000 to September 2010 that met the following inclusion criteria: (1) tested a primary care, practice-based intervention with three or more of five PCMH components and (2) conducted a quantitative evaluation of either (a) a triple aim outcome (quality of care, costs (or hospital use or emergency department use, two major cost drivers), and patient or caregiver experience) or (b) health-care professional experience [25]. A total of 14 evaluations from 12 interventions met this criteria, and these are displayed in Table 28.3.

AHRQ developed and applied a formal rating system using rigorous methods and synthesized the evidence of effectiveness that was tied to specific outcomes [25]. Six of the fourteen evaluations were designated with a high or moderate rating for analysis of at least one outcome. The interventions in these studies, such as embedded care managers, varied in their impact on key outcomes. Some had favorable effects on quality and patient and caregiver experience of care while a few unfavorable effects on costs, and many had inconclusive results across all outcomes [25].

- *Quality of care.* In evaluations that were designated as rigorous, there were favorable effects on quality of care: one of three evaluations reported improvements in care processes, and two noted improvements in health outcome measures. The remaining evaluations that measured these outcomes, in addition to evaluations that include mortality, produced inconclusive evidence [25].
- *Cost and service use.* The evidence on cost and service use shows limited favorable effects, some unfavorable effects on cost, and many inconclusive results in the PCMH models that were evaluated. The GRACE initiative (i.e., in-home assessments and care planning by care managers for at-risk geriatric patients) was the only intervention to find evidence of cost savings, and these were limited to the high-risk subgroup of Medicare patients in the latter phases of the intervention [25]. Both GRACE and VA Home-Based Primary Care (i.e., home-based primary care coordinated by interdisciplinary care team) increased total costs during the intervention, while evidence from two other interventions—Guided Care and IMPACT—was inconclusive [25]. Geisinger's ProvenHealth Navigator was the only program to report reductions in hospital utilization for its full panel of patients; two other evaluations (GRACE and VA Home-Based Primary Care) reported

Table 28.3 AHRQ-reviewed patient-centered medical home interventions

Intervention	Description	Reference
Case managers	Nurse case managers in primary care practices to manage Medicare Advantage members and collaborate with the clinical team	Hostetter [44]
Care management plus	Nurse care managers supported by specialized health IT tools embedded within primary care clinics to coordinate care for chronically ill elderly patients	Agency for Healthcare Research and Quality [45]
Community Care of North Carolina	Community-based care management provided through networks of primary care physicians, hospitals, the Department of Social Services, and local health departments	Steiner et al. [46]
Geisinger Health System's ProvenHealth Navigator	Embedded nurse case manager for Medicare Advantage patients in primary care practices to identify high-risk patients, design patient-centered care plans, provide care coordination and care transition support, and monitor patients using patient-accessible electronic health records	Gilfillan et al. [47]
Geriatric Resources for Assessment and Care of Elders (GRACE)	Advanced practice nurse and social worker assess low-income seniors in home and develop and implement a care plan with a geriatric interdisciplinary team, in collaboration with the patient's PCP	Bielaszka-DuVernay [48]
Group Health Cooperative Medical Home	PCMH-informed clinic redesign including changing staffing, scheduling, point of care, patient outreach, health IT, and management, reducing caseloads, increasing visit times, using team huddles, and introducing rapid process improvements	Group Health News [49]
Guided care	Guided care nurse embedded in primary care practice who provides assessments, care plans, monthly monitoring, and transitional care to at-risk Medicare patients	Boult et al. [50]

(continued)

Table 28.3 (continued)

Intervention	Description	Reference
Improving Mood: Promoting Access to Collaborative Treatment for Late-Life Depression (IMPACT)	Behavioral health clinical specialist care manager embedded in primary care practice to provide depression care for elderly depressed patients in coordination with the PCP, a consulting PCP, and a psychiatrist	Hunkeler et al. [51]
Merit Health System and Blue Cross Blue Shield (BCBS) of North Dakota Chronic Disease Management Pilot	Chronic disease management nurse embedded in clinic for diabetic patients to assess the patients' knowledge of diabetes, set goals for disease self-management, facilitate follow-up, and care coordination	Fields et al. [52]
Pediatric Alliance for Coordinated Care	Dedicated pediatric nurse practitioner coordinates the care of children with special health-care needs and make expedited referrals to specialists and hospitals. Parent of a child with special health-care needs provides consultations to the practice	Palfrey et al. [53]
Pennsylvania Chronic Care Initiative	Integrates the Chronic Care Model and the medical home model for patients with diabetes and pediatric patients with asthma	AcademyHealth State Health Research and Policy Interest Group [54]
Veterans Affairs Team-Managed Home-Based Primary Care	Comprehensive and longitudinal primary care provided by an interdisciplinary team that includes a home-based primary care nurse for veterans with complex, chronic, terminal, or disabling diseases	U.S. Department of Veterans Affairs [55]

Adapted from Ref. [13]

cost reductions only for their high-risk subgroups in some follow-up periods [25]. Evidence on hospital use from the other initiatives was inconclusive. Only one program (i.e., GRACE) found reductions in emergency department utilization during a follow-up period, but evidence of cost reductions from the other programs was inconclusive [25].

- *Experience of care.* AHRQ's review of the evidence of the PCMH model on patient and caregiver experience demonstrates some favorable effects, while some areas remain inconclusive [25].
- *Professional experience.* There was a single evaluation on professional experience which was reported as inconclusive [25].

AHRQ concluded that, with the exception of some favorable effects on quality of care, hospital and emergency department utilization, and patient and caregiver experience of care and a few unfavorable effects on costs, the findings on the effectiveness of key PCMH components were largely inconclusive at the time of their review [25]. The review noted limitations and cautioned that the sample size was insufficient to detect plausible effects and that the statistical significance of the effects was potentially overstated owing to lack of adjustment for clustering of patients within practices [25].

Patient-Centered Medical Home Implementation

The Commonwealth Fund, Qualis Health, and the MacColl Center for Health Care Innovation at the Group Health Research Institute initiated a 5-year demonstration project in 2008 to help a network of primary care safety net practices become patient-centered medical homes [26]. The goal of the Safety Net Medical Home Initiative (i.e., the Initiative) was to develop an implementation model for medical home transformation, which called for partnerships between safety net providers and community stakeholders. There were five regional coordinating centers that partnered with 10–15 primary care safety net sites in Colorado, Idaho, Massachusetts, Oregon, and Pennsylvania [26]. The Initiative framework used eight change concepts that were embedded in four stages to guide specific, actionable steps in practice improvement:

- Laying the Foundation: Engaged Leadership and Quality Improvement Strategy
- Building Relationships: Empanelment and Continuous and Team-Based Healing Relationships
- Changing Care Delivery: Organized, Evidence-Based Care and Patient-Centered Interactions
- Reducing Barriers to Care: Enhanced Access and Care Coordination [26]

Engaged Leadership [27]

To facilitate PCMH transformation, leaders needed to be engaged in charting the course for change and support and sustain change efforts. Associated responsibilities included identifying and allocating resources to support PCMH trans-

formation needs and being physically present throughout transformation to sustain staff motivation and to identify and remove barriers to transformation [27]. At the outset, leaders need to make the case for transformation to staff, who need to understand the what, why, and how of PCMH. In addition, to gain financial support for transformation efforts, leaders need to articulate the business case for transformation. Leadership needs to ensure adequate time and resources for transformation work, including quality improvement, team meetings, and other work essential for transformation [27].

Once the burning platform and vision for transformation have been articulated, key tenets of PCMH need to be part of the practice's mission and values, and operationalized into what is expected in everyday work [27]. PCMH concepts should inform hiring and employee performance reviews, since staff will understand expected behaviors and can judge if the practice is a good fit with their own values. Leaders need to identify a team of champions and practice staff who will actively voice support for the initiative through words and actions [27]. These champions can help address areas of concern, refine shared key transformation messages, and act as internal consultants to assist in problem-solving.

Leaders and champions should invest in staff training to ensure that they are prepared to take on new roles and responsibilities and to identify short- and long-term developmental needs [27]. Data are critical to drive and guide improvement, and measures that monitor change and performance need to be vetted and carefully selected [27]. There must be robust data management systems in place that can reliably and expediently collect, analyze, and report clinical quality and operational data [27]. Reports need to provide credible and meaningful data at the team level and dissemination, and communication strategies need to be in place to ensure that staff and other stakeholders can gauge progress toward transformation [27].

Quality Improvement Strategy [23]

Quality improvement (QI) strategies provide the framework and tools to plan, organize, and monitor improvement. Health information technology (HIT) supports the QI information needs of PCMH transformation around operational processes, workflows, and scheduling systems [23]. HIT needs to be deployed and aligned with PCMH transformation strategies to best support processes and workflows. HIT functionalities can include scheduling appointments and monitoring access to care; defining each provider's patient population; tracking care processes, including referrals and abnormal lab/imaging results; maintaining action reports to guide the team's care management activity and a system of outcome reports for monitoring processes of care and population outcomes; optimizing communication between patients and their care team; and promoting decision support at the point of care [23].

To build a QI infrastructure within HIT, it is important to start by creating organizational QI policies that specify quality goals and processes to identify strategic QI priorities [23]. A QI committee or team, with clearly specified roles and responsibilities, should be responsible for organizing, monitoring, and closing out improvement projects. Once a QI team is in place, formal QI models and approaches, such as the Model for Improvement (i.e., aims, measures, and ideas), use of the Plan-Do-Study-Act (PDSA) cycle, or lean methodologies, should be considered [23].

As noted earlier, measurement and data are used to guide and drive improvement. Recognized, standardized individual measures of comprehensive measurement should be selected and employed to reliably capture the work of PCMH transformation. Data can be collected from a variety of sources and is facilitated when data collection is embedded into electronic health record workflows [23]. Once gathered and analyzed, data should be placed in highly visible areas to promote stakeholder engagement. Run charts or line graphs are the most common QI tools, which display performance over time and make it easy to tell if improvements are occurring [23].

Sustaining QI changes require new ways of carrying out the work. It is important to first ensure that change is ready to be implemented and sustained [23]. Time for experimentation allows frontline staff to work through adaptations in new processes while generating support among practice teams. Once new workflows have been adopted and verified by staff, communicate the benefits of the improvement by embedding standardized work processes, where staff follow a defined process [23]. If the change has been successfully adopted and sustained in a clinical unit, seek to spread change throughout the practice or to other parts of the organization/other organizations when you demonstrate success with data and use champions who tested initial changes and who are prepared to help communicate, influence, and train others [23].

Empanelment [28]

Empanelment assigns individual patients to individual primary care providers (PCP) and care teams and is the basis for population health management. The goal of focusing on a population of patients ensures accountability around patient care, which allows the PCP and care team to focus more directly on the needs of each patient [28]. Empanelment affirms the patient-PCP partnership and continuity of care and fosters a health-care environment that allows practices to go beyond disease-specific interventions to address preventive, chronic, and acute patient needs [28]. High-functioning

patient and provider/care team relationships build trust and provide consistency in treatment approaches, controlling costs by reducing duplicate testing, medications, and service orders.

There are specific tasks required for pre-empanelment work. At the outset, policies need to be developed that determine which providers will be empaneled and the reporting metrics and requirements that will be needed [28]. For example, active and inactive patients in the practice need to be identified, as well as the average visits per patient per year (AVPY) [28]. The appropriate panel size for each practice provider (e.g., full-time, part-time, etc.), patient demand for services, and the supply of providers (i.e., number of appointment slots available in the past year) needs to be determined [28].

The four-cut method is one approach to implementing empanelment [28]. In the first "cut," patients who have seen only one provider in the past year are assigned to that sole provider. The second cut identifies patients who have seen multiple providers—but one provider the majority of the time in the past year—and assigns them to the majority provider. The third cut takes patients in which no majority provider can be determined and assigns them to the provider who performed the last physical exam [28]. The fourth cut assigns patients who have seen multiple providers to the last provider seen. Patients need to be informed of their PCP assignment when they first visit the practice or after empanelment occurs; however, they are free to change their PCP/care team if desired or needed [28].

Once panels have been established, they need to be weighted by age, gender, morbidity, or acuity to assure equity across providers [28]. Panel reports are data dependent and need to be analyzed, monitored, and adjusted on a periodic basis. Continuity of care reports, for example, should review the frequency of patients seen by their assigned PCP; the goal is for the patient to achieve 100% continuity by seeing only his/her provider/care team [28]. In addition, the provider appointment supply should be determined at least annual basis or more to ensure that there is availability to meet the demands of current panel size [28].

Continuous and Team-Based Healing Relationships [29]

Care teams are small groups of clinical and nonclinical staff who are responsible for a panel of patients [29]. A care team typically includes the patient; a provider (e.g., physician, nurse practitioner, physician assistant) who is responsible for leading the team; medical assistant(s) who are responsible for pre-visit planning, checking in, and rooming patients, ensuring that post-visit tasks are completed and ensuring patients understand the after-visit plan; nurse(s), pharmacist(s), social worker(s), or health educator(s) who provide self-management support, arrange other resources, and provide care coordination or other services; and front desk staff who facilitate appointments and communication between the patient and care team and who may conduct outreach for preventive services or follow-up care [29].

The empanelment process, which was described earlier, is the first step in implementing team-based care [29]. Patient panels allow the team to recognize each other as partners in care and lays the foundation for time and space to be available for daily huddles and quality improvement meetings [29]. Once teams start meeting regularly, care team members can identify improvement opportunities and respond to common problems for which patients seek care [29].

The care teams should be structured to allow members to function at the maximum of training, skill set, and abilities (i.e., the top of their license), given state regulations for scope of practice [29]. Once these team roles have been designated, infrastructure, skills, and resources need to be in place to sustain high-functioning care teams. Finally, select and monitor metrics, such as continuity and access to care, that can inform improvement efforts and care team processes [29].

Organized, Evidence-Based Care [30]

Organized, evidence-based care (OEBC) is planned and delivered so that the care team optimizes the health of their patient panel [30]. Ideally, OEBC orients each patient encounter to address both preventive and chronic illness needs, using evidence-based guidelines that are embedded into daily clinical workflows [30]. In order to achieve this goal, care must be organized, accurate, and effective, which removes the variability offered by ad hoc decision-making and results in more efficient visits for patients [30]. The concepts behind OEBC were built on more than 15 years of experience in health systems implementing the Chronic Care Model, which was described earlier [10].

Implementing OEBC begins with knowing what patients need and organizing their encounters around delivering those services [30]. Pre-visit planning is an opportunity to create an agenda for the visit including predictable services, such as performing a diabetic foot exam, administering a PHQ-9, or giving a flu shot. These tasks should be prioritized and the patient encounter structured so that specific team members are responsible for identified services [30]. Standing orders are vitally important to facilitate this process and should be guided by evidence-based guidelines and supported by providers and staff in embedded clinical policies. Tools for decision support (i.e., health information technology solutions that help providers in clinical decisions) often use point-of-care reminders based on clinical guidelines [30].

Patients with recurring or complex needs, or who are overdue for services, can be identified via patient registries and engaged prospectively [30]. Unanticipated patient-initiated visits can be mitigated with brief and efficient practice team huddles that can review up-to-date patient information, prioritize patient-directed goals, and outline care tasks for the visit [30]. Care management may be needed for certain segments of the practice population, typically those with high needs and with multiple chronic conditions [30]. In ambulatory practices, care managers can be nursing or social work trained and may be specialized based on patient population (e.g., geriatric care). Care managers are important members of the care team, and their tasks commonly include patient engagement and follow-up, self-management support, the provision of resources for action plans, medication management, counseling and emotional support, and care coordination (see below) [30]. Caseloads should range from 50 to 150 patients, and specific services (e.g., referral facilitation, counseling, etc.) should be delineated by the care team [30].

Patient-Centered Interactions [31]

Patient-centered interactions encourage patients to take ownership in their health-care decision-making, behavior change, and self-management. Collaborating with patients builds patients' skills and confidence in managing their health, especially for patients with chronic conditions, and addresses the needs of patients with low health literacy [31].

Communication barriers can result in low-quality care and poor health outcomes and PCMHs benefit from promoting patient-centered information and skills in providers and staff [31]. At the practice level, the specific cultural and language needs of diverse patient populations can be gauged from patients and families using surveys, focus groups, and point-of-care assessments [31].

Implementing a culture of patient-centered interactions begins by developing meaningful relationships with patients. Dignity, respect, and honoring diverse perspectives can be promoted by providers and staff who communicate and share unbiased information with patients and families in affirming ways [31]. Providers and staff can also build a shared agenda for the visit by opening the patient conversation with concerns and experiences, focusing on patient-identified health goal. Teach-back techniques and literacy resources are other strategies that can help deliver information in a way that patients can understand and use [31]. Brief motivational interview techniques are additional skills that can facilitate patient-identified action plans to improve health outcomes [31].

Many PCMHs are working more meaningfully with their patients to assist in practice-level policy and program development, facility design, and delivery of care [31]. Patient advisory boards are evolving organizational structures that can help guide and conduct quality improvement activities. In these settings, patients draw on their own experiences of care at the facility to inform decisions about changes in care delivery and provide guidance about practice innovations, quality improvement, and other initiatives [31]. Finally, patient advisory boards can add value to practices in very tangible ways: policies and practices for responding to patient messages, guiding telephone protocols, helping decide on office hours including extended hours, and guiding development of patient facing materials including educational, office services and development of patient portals.

Enhanced Access [32]

Enhanced access begins with a commitment to providing patients with 24/7 access to their care team during office hours and access to advice through a live coverage system [32]. Highly functioning PCMHs should have the capacity to provide patients with options that promote practice efficiency and allow the practice to respond to patient needs in ways such as same-day appointments, telephone, email, and group visits [32]. Enhanced patient access is tied to improving patient outcomes and care experience, as well as reducing health-care costs. In addition, it can allow team members to focus on improving patient care and overall practice efficiency [32].

Implementing enhanced access can involve a variety of scheduling options, including extended hours (i.e., night and weekend hours). There are several strategies to promote enhanced access including staggered clinic shifts, which can free up provider weekday availability to the weekend, and on-call systems to connect a patient to the practice during after-hours [32]. This system may utilize an answering service, clinical staff in a local hospital system, a nurse advice line or urgent care clinic, or telemedicine access to a provider after-hours [32]. Robust health information technology systems are critical to allow connectivity between patient and provider, real-time documentation, and closing the communication loop with the primary care team [32]. Finally, some patients have financial barriers to enhanced access, and dedicated staff can assist patients in gaining health insurance coverage through eligibility screening and enrollment assistance. Other patients may face transportation barriers, and PCMH staff can assess and address these concerns and provide alternatives to in-person visits [32].

The PCMH must be able to manage appointment supply and demand to sustain enhanced access. Practice-level policies should address the factors that impact appointment supply and demand (e.g., provider out ill) [32]. Strategies that address and reduce patient no-shows help mitigate variability

in access and should address the root causes [32]. Same-day and next-day appointment templates can meet patient need in real-time, as do telephone, email, and group visits, and telemedicine options [32]. Data can help identify intermediate and long-term trends and identify predictable events that interfere with daily workflow, such as seasonal fluctuations in patient needs [32]. For example, there may be high patient demand on Friday afternoon when providers request time off. Ideally, provider and care team schedules should match patient demand, and coverage plans should prepare for predictable events that may limit supply, such as when a provider is ill or is away.

Care Coordination [33]

Care coordination is becoming a mainstay within the PCMH since it incorporates several activities that reduce care fragmentation and promote integration. PCMHs need to develop relationships with high-value specialty colleagues who provide high-quality, cost-efficient care, hospitals, and community-based services; create protocols to support successful closed-loop referrals and transitions; and develop and maintain information systems to support information transfer [33].

Effective care coordination reduces the risk of communication breakdowns between care providers, unnecessary hospitalizations, duplicate tests and procedures, and medical errors and can increase sharing of common care plans between providers across the continuum of care [33].

Implementing care coordination starts with assuming accountability for patients and populations [33]. A health information technology system should be in place to track and manage health-care services including specialist consults, hospitalizations, emergency department visits, and community-based service agency referrals [33]. Care managers, or other designated staff, should be identified and trained to coordinate referrals and transitions of care and to assess patient's logistical needs and barriers to care (see above).

At the practice level, PCMHs should develop relationship and agreements with specialty groups, hospitals, and community-based service agencies that delineate clear expectations for communication and scope of health-care services [33]. Existing relationships and referral patterns should lead into verbal or written agreements that include guidelines and expectations for referral and transition processes [33]. A shared electronic health record, or other health information technology platform, can facilitate a standardized information flow process, ensuring that referring providers and consultants can efficiently communicate with each other [33].

Future Directions

The patient-centered medical home (PCMH) will be the foundation organizational structure as the US health-care system transforms from volume-based to value-based care. When primary care is well functioning through the PCMH, clinical quality can improve, and utilization and costs of care can decrease, leading to improving the value of care delivered. However, only a portion of care quality and total cost of care is impacted in the primary care ambulatory setting; the majority of cost variation occurs in the post-acute setting, less so for inpatient costs and virtually no variability in ambulatory costs [34]. A reasonable assumption is that the PCMH model is a necessary but not sufficient component to transform the US health-care system. But as part of a larger integrated care delivery system, PCMH may have a more expansive role to improve value, by effectively coordinating care across health-care delivery systems.

The core concepts of PCMH are starting to take hold in patient-centered specialty practices, medical neighborhoods, and health-care systems that are evolving into clinically integrated networks and accountable care organizations. For example, NCQA developed the Patient-Centered Specialty Practice (PCSP) program to recognize specialty practices which invested in systems and care processes that promoted referral and care coordination, communication, access, population-based management, and quality improvement efforts to measure and improve performance [35]. PCSPs will play a key role in evolving medical neighborhoods, particularly for complex conditions that often result in high utilization of health care, such as cancer and end-stage renal disease. Early results are reassuring that specialty practices which adopt the principles of the PCSP improve patient-centered care and value [36, 37].

The medical neighborhood has emerged as a larger organizational concept that seeks to enhance communication and coordinate care between and among all providers who care for a patient, not simply within the medical home [38]. In many medical neighborhoods, provider incentives are not aligned; some providers receive fee for service, while others are partially reimbursed by capitation, episodic care, or other quality incentives. To be successful, care delivery and incentives must be aligned for medical neighborhoods to leverage their networks. Performance needs to be transparent and measured by shared outcomes, including patient experience, which are influenced by all providers in the neighborhood.

Reimbursement models within the neighborhood must ultimately be indexed to value for all providers. The Bundled Payments for Care Improvement (BCPI) initiative, for example, is a Medicare program which pays physicians and hospitals a fixed dollar amount for an episode of care, such as a joint replacement [39]. The payment covers all care provided

within 90 days of the episode, and there are aligned incentives to deliver efficient, quality care among all providers involved. To be successful, providers, hospitals, and post-acute care facilities must have clear lines of communication, promote high-quality care, and minimize adverse events.

The concept of accountable care organizations (ACOs) and accountable care systems (ACS) is another development that seeks to align PCMHs, medical neighborhoods, hospital systems, post-acute care providers, and others in health-care delivery [40, 41]. An ACO is an entity comprised of multiple health-care providers, usually including hospitals and ambulatory providers, that can organize processes across the continuum of care, improve the quality and control the costs of care, and are held accountable for the outcomes [40]. The Affordable Care Act and more recent 2015 MACRA legislation have propelled ACOs into the forefront of health-care delivery organization. For example, the Center for Medicare and Medicaid Services Pioneer ACO, Medicare Shared Savings ACO, and Next Generation ACO models outline strategies and reimbursement schemes to integrate care delivery and enhance clinical outcomes while improving the patient experience of care and reducing the total cost of care. Commercial insurance payors and Medicaid have also followed this lead and are engaging health-care providers in alternative payment models such as ACOs. As of December 2016, nearly 44% of patients in the United States were covered through one form of an alternative payment model (APM) [42].

In summary, the PCMH needs to exist within a high-performing medical neighborhood to achieve the value it promises. Specialists will still need to communicate with primary care providers; primary care providers will still need to provide information to specialists regarding goals for referrals; hospitals and post-acute facilities will need to communicate with all providers when patients are cared for in their facilities. Across these providers and settings, patient care plans will still need to be crafted and shared to ensure efficient, coordinated care that maximizes quality and minimizes error while helping patients navigate a complex health-care system [43].

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