

A Guide to the Medical Home as a Practice-Level Intervention

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Overview

The medical home (also known as patient-centered medical home or advanced medical home) is a composite policy construct applied to interventions intended to revitalize primary care practices and improve patient care. It is hoped that these interventions will increase the appeal of primary care as a medical career and improve healthcare quality, patient experience, provider worklife satisfaction, and costs of care. This article is intended as a guide for policymakers, healthcare purchasers, and physicians who are thinking about facilitating, paying for, or engaging in medical home interventions.

The phrase “medical home” has multiple definitions, and each definition contains many components. There can be confusion over what is meant when somebody proposes participation in (or reports having engaged in) a medical home intervention. To facilitate comparisons between medical home definitions, we classify their components into resource inputs, specified processes, and desired outcomes. We then apply a parallel classification system to the descriptions of medical home interventions that have already reported results. This review summarizes the findings and discusses their implications for future work.

Definitions of the Medical Home

The term *medical home* originated in a 1967 proposal from the American Academy of Pediatrics (AAP) intended to establish centralized, accessible medical records for medically complex, chronically ill children.¹ Since then, physician professional societies have expanded the definition of the medical home to include a broader array of practice capabilities and elements of the Chronic Care Model, culminating in the 2007 Joint Principles of the Patient-Centered Medical Home issued by the American Academy of Family Physicians (AAFP), AAP, American College of Physicians, and American Osteopathic Association.^{2,3} As an idealized vision of primary care, the medical home is supported by stakeholders including employers, health professional societies, health plans, not-for-profit entities, and government agencies.⁴

Despite wide acceptance, the Joint Principles have not easily translated into concrete actions. Some principles describe processes to be undertaken by physician practices, but others describe new goals for a patient’s total healthcare experience (ie, goals compatible with an idealized vision of primary care). The Joint Principles do not provide

Abstract

The medical home (also known as patient-centered medical home or advanced medical home) is a composite policy construct representing a set of interventions intended to revitalize primary care practices and improve patient care. As an idealized vision, the medical home has gained the support of stakeholders including employers, health professional societies, health plans, not-for-profit entities, and government agencies. Expectations of the medical home include improvements in healthcare quality, patient experience, provider worklife satisfaction, costs of care, and increased recruitment of medical students into primary care careers. However, multiple definitions of the medical home exist, and the degree to which some often-cited examples of “medical home” successes match these definitions is unclear. Scant evidence currently supports the effectiveness of practice-level medical home interventions for improving quality and reducing costs, but demonstration projects are only recently under way. Carefully specifying the exact components of “medical home” interventions—and interpreting their results in the context of these specifications—will help build a coherent body of evidence to guide the revitalization of primary care.

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Table 1. Major Medical Home Definitions: Specified Processes Corresponding to Each Desired Outcome^a

Desired Outcomes in the Joint Principles	Processes Included in the Joint Principles	Selected Processes Included in Operational Definitions ^a
First contact, continuous, comprehensive care	Not specified	Scheduling procedures to maximize continuity with personal physician Written agreement between practice and patients ^b
Care that is coordinated across the healthcare system and community	Patient population registries Information technology Health information exchange	Medication reconciliation Referral tracking Care management by nonphysician staff Facilitate information transfer
Culturally, linguistically appropriate care	Not specified	Identify communication issues Provide language services
Safe, high-quality, evidence-based care	Practice advocates for patients Patient participation in decision making Clinical decision-support tools Information technology Performance measurement Quality improvement activities Participation in a recognition program that certifies practice capabilities	Patient self-management support Electronic health record with clinical data, prescribing, and decision support Condition-specific registries Physician and patient reminders for preventive services Test tracking and follow-up Identify common diagnoses and risk factors in the practice Performance measurement on quality and patient experience Quality improvement activities
Enhanced access	Open scheduling Expanded hours Secure e-mail and telephone consultation	Offer same-day appointments Offer 24-hour communication options Interactive Web site
Not specified	Use of a care team led by a personal physician	Use of structured templates for office notes Many written policies

^aOperational definitions contributing care processes are from the National Committee for Quality Assurance, the planned Medicare Medical Home demonstration, and TransforMed. Selected processes are those common to 2 or more of these definitions.

^bMedicare demonstration only.

Sources: References 3, 5-7, and 9.

a complete action path for primary care practices seeking to reach these idealized goals. Instead, many practices and demonstration projects rely on an operational definition developed by the National Committee for Quality Assurance (NCQA): the Physician Practice Connections–Patient-Centered Medical Home (PPC-PCMH).⁵ The NCQA provides certification that individual primary care practices possess specific structural capabilities and partake in certain processes, and offers 3 levels of medical home recognition. In some medical home demonstrations, this certification process is used to determine whether participating practices qualify for enhanced payments. A variant of this NCQA definition was devised for use in the planned Medicare medical home demonstration authorized by the Tax Relief and Health Care Act of 2006.^{6,7}

Another operational definition was developed by TransforMed, an AAFP subsidiary originally intended to facilitate the practice transformations envisioned in the

AAFP’s 2004 report “The Future of Family Medicine.”⁸ With the advent of the medical home, TransforMed’s mission evolved to include a prominent National Demonstration Project that uses its own medical home definition.⁹ Similar to the NCQA definitions, TransforMed’s definition applies to individual primary care practices.

Components of the Medical Home

Each medical home definition comprises a set of specific components for primary care practices. The elements of these definitions fall into 3 fundamental categories: desired outcomes (ie, characteristics of care received by patients), specified processes for primary care practices to follow, and resource inputs to support these processes.

Desired outcomes. Desired outcomes expressed in the Joint Principles include first contact, continuous, comprehensive

Table 2. Major Medical Home Definitions: Resource Inputs

Resource Inputs	Joint Principles	PPC-PCMH ^a	Medicare Demonstration	TransforMed
Additional payment				
Per-patient per-month payment	X		X	
Payment for use of HIT	X		X	
Practices share in savings generated by medical home activities	X		X	
Payment for improvement on quality measures	X			
In-kind investments				
Technical support to facilitate practice transformation			X	X
<small>HIT indicates health information technology; PPC-PCMH, Physician-Practice Connections–Patient-Centered Medical Home. ^aBy design, the PPC-PCMH definition excludes consideration of resource inputs. Sources: References 3, 5-7, and 9.</small>				

care; care that is coordinated across the healthcare system and community; culturally and linguistically appropriate care; safe, high-quality, evidence-based care; and enhanced access (Table 1). Although not mentioned in the Joint Principles, medical homes are expected to reduce costs of care, improve provider worklife satisfaction, and draw more medical students into primary care.¹⁰ Better cost control can result from processes such as enhanced access (eg, so that patients can substitute away from high-cost care in emergency departments) and care management.^{11,12} Increased payments to medical homes may result in higher take-home incomes for primary care physicians, or not.¹³ Higher incomes, coupled with improved professional satisfaction, may increase the number of medical students choosing primary care careers.¹⁴

Specified processes. The processes of care specified in the major medical home definitions can be classified into categories corresponding to the desired outcomes expressed in the Joint Principles (Table 1). The Joint Principles do not specify which processes would enable practices to achieve first contact, continuous, and comprehensive care. To produce these outcomes, the PPC-PCMH and TransforMed definitions have focused on improving continuity through new appointment scheduling procedures. Recognizing the importance of mutually understood responsibility, the Medicare demonstration would require written agreements between patients and medical homes that delineate the expectations of each party.⁷

Coordinated care can be achieved through processes such as care management by nonphysician staff and the use of information technology. A variety of specified processes are intended to achieve safe, high-quality care: advanced

electronic health records, test tracking, and targeted quality improvement activities. The processes intended to achieve enhanced access include “open scheduling” (to allow same-day appointments), expanded office hours, and enhanced telephone and electronic communications.

Some specified processes are not clearly tied to any particular desired outcome. The Joint Principles call for the use of a physician-led care team, and other definitions encourage structured templates for office notes and written policies for practice governance.⁵

Resource inputs. To support investment in medical home processes, payers and demonstration collaboratives provide resource inputs to participating practices. These resources take the form of additional payment (included in both the Joint Principles and planned Medicare demonstration), in-kind investments (not included in any major definition), and technical support for practice transformation (included in the Medicare and TransforMed definitions) (Table 2). Of note, the PPC-PCMH definition—primarily intended as a practice certification tool—does not specify any resource inputs to primary care practices. These inputs are left to the payers and demonstration collaboratives that will facilitate each medical home intervention.

Will Medical Home Interventions Produce the Desired Outcomes?

Each medical home intervention consists of a combination of resource inputs and specified processes applied in a particular practice setting. Numerous studies of individual inputs and processes of the medical home have been published, and many of these individual components—

■ **Table 3.** Components of “Medical Home” Interventions With Published Results

Intervention	Group Health Cooperative (GHC)	TransforMed	Geisinger ProvenHealth Navigator
Practice setting	One practice of an integrated insurer/multispecialty group	36 Volunteering family practices in 24 states	Predominantly practices in an integrated insurer/multispecialty group
Resource inputs			
Additional payment	Physician salaries were exempted from RVU-based adjustments. Without this exemption, physician salaries would have been lower as daily visit counts were reduced.	None	Monthly payments to practices: \$1800/physician, \$5/Medicare beneficiary Pay-for-performance on quality measures Practices share in savings
In-kind investments	Additional physicians Mean panel size reduction from 2327 to 1800; 50% reduction in per-physician daily visit count New practice nonphysician staff	None	Nurse care managers employed by Geisinger Health Plan and embedded in primary care practices Electronic health record provided to practices
Technical support	Not specified	All practices given access to a practice improvement Web site 18 Practices received on-site technical assistance	Not specified
Specified processes	Selected processes: Systematic follow-up of emergency visits and hospital discharges Patient self-management workshops Standard office visit lengthened from 20 to 30 minutes Team-based care, team huddles Scheduled “desktop medicine” time E-mail and telephone visits Group visits Real-time specialist consultations via electronic health record Electronic health risk assessment	Selected processes: Engage in change management; become a learning organization Leadership development Same-day appointments Group visits Patient engagement and education Coordination arrangements with other providers Care transition management Quality improvement activities Team-based care Use of electronic health record with registries, e-prescribing, patient portal	Selected processes: 24-Hour access to case management Transition management Hospital discharge follow-up calls Patient and family education Analysis of readmissions Home-based telemonitoring Use of electronic health record templates and electronic decision support
PMPM indicates per member per month; RVU, relative value unit. Sources: References 18-25.			

especially those included in the Chronic Care Model—have been associated with favorable effects on clinical outcomes, clinical processes, and quality of life.^{15,16} The use of health information technology, studied primarily in a few large academic institutions, was also associated with favorable effects on quality of care.¹⁷ These studies of individual inputs and processes have helped guide the creation of medical home definitions, but they may not accurately predict the effects of more complex medical home interventions.

From the perspective of stakeholders considering a medical home intervention, the best guidance is likely to come from published evaluations of practice transformations that include multiple medical home components. These evaluations measure the overall effects of medical home interventions, net of any synergistic or antagonistic interactions among their components. In reviewing the results of published medical home evaluations, there are 3 main questions to ask. First, what were the intervention components (ie, what were the resource inputs and specified processes, and

Intermountain Healthcare Care Management Plus	Geriatric Care Resources for the Assessment and Care of Elders (GRACE)	Community Care of North Carolina (CCNC)
7 Primary care clinics within a large integrated delivery system	6 Community-based health centers within a larger university-affiliated medical group	14 Regional networks of ~1200 primary care practices, hospitals, and local community partners
None	None	Enhanced case management fees: \$2.50 PMPM to practices and \$3 PMPM to networks
Nurse care managers employed by the study were placed within intervention clinics Specialized information technology tools	3 GRACE support teams (an advanced practice nurse and a social worker) employed by the larger medical group; each support team assigned to specific physicians Only some physicians within a clinic were randomized to receive these inputs	Networks employ case managers for selected enrollees
Not specified	Not specified	Networks provide technical assistance to practices
Physicians referred medically complex patients to nurse care managers Nurse care managers completed patient assessments and performed case management using electronic protocols, guidelines, and a care management tracking database	Selected processes: GRACE support teams assess patients GRACE interdisciplinary team develops care management plans Primary care physicians approve care plans GRACE support teams implement care plans with electronic health record support	Selected processes: Network clinical directors disseminate quality improvement initiatives Networks do rapid-cycle quality improvement, share best practices Each enrollee designates one practice as "medical home" Pharmacy management Disease management for certain chronic conditions

how completely did the intervention components match the major medical home definitions)? Second, what outcomes did the intervention produce? Third, what is the strength of the evidence, and how well do the findings generalize?

Components of Reported Medical Home Interventions: Settings, Inputs, and Processes

A small number of medical home interventions have already reported results: the Group Health Cooperative (GHC), TransforMed, Geisinger Health System’s Proven-

Health Navigator, Intermountain Healthcare Care Management Plus, Geriatric Care Resources for the Assessment and Care of Elders (GRACE), and Community Care of North Carolina (CCNC) (Table 3).¹⁸⁻²⁰ These interventions began before the March 2007 publication of the Joint Principles of the Patient-Centered Medical Home as well as the major operational definitions of the medical home. In a sense, these interventions have been rebranded as medical home interventions, and vary in the extent to which they match the major medical home definitions.

■ **Table 4.** Published Results of “Medical Home” Interventions

Intervention	Group Health Cooperative (GHC)	TransforMed	Geisinger ProvenHealth Navigator
Outcomes	<p>At 12-month comparison to control practices: Improvements in patient experience ratings, performance on global quality measure composite, and staff burnout ratings No significant differences in overall costs</p>	<p>Initial qualitative lessons: Practice transformation is a whole-practice endeavor Electronic health record adoption is difficult Personal transformation of physicians is required Change fatigue is a problem Transformation pathways vary among practices</p>	<p>Preliminary results from 2 pilot practices: All-cause hospital admission rate decreased by 20% Increased medication adherence, generic use Increased compliance with evidence-based care 7% Overall cost savings</p> <p>Preliminary results from 11 expansion practices: Decreased hospital readmission rate 4% Overall cost savings</p>
Strength of evidence	Peer-reviewed publication Complete description of intervention and evaluation methodology	Peer-reviewed publication Results are preliminary	Not peer-reviewed Results are preliminary Methodology incompletely described
Generalizability	Atypical practice setting Single intervention practice	Settings typical of most primary care practices	Atypical practice setting

Sources: References 21-23, 26, and 28-30.

Practice settings. Among these 6 interventions, 3 (GHC, Geisinger, and Intermountain) occurred in practices that were part of large, integrated delivery systems (Table 3).²¹⁻²³ The GRACE and CCNC interventions both involved levels of provider organization beyond the primary care practice.^{24,25} Only TransforMed’s intervention took place within independent primary care practices.⁹

Resource inputs. Three of the interventions (GHC, Geisinger, and CCNC) provided additional payment to participating practices, with Geisinger being the most generous.²² Two of the interventions provided technical support to participating practices (TransforMed and CCNC). Excepting TransforMed, all interventions provided in-kind investments, most commonly in the form of additional staff to perform case management.

Specified processes. The 6 medical home interventions have also varied in the extent to which their specified processes have matched the medical home definitions. By default, the processes of the TransforMed intervention constitute a perfect match to a major medical home definition. However, TransforMed’s preliminary qualitative findings suggest that performing the specified processes (eg, adopting electronic health records) has been difficult, and practices have exhibited change fatigue.²⁶ The number of practices

able to successfully perform TransforMed’s processes has not yet been published.

The GHC and Geisinger interventions each included multiple processes of the medical home, particularly those related to care management, patient self-management support, and use of electronic health records. As with TransforMed, GHC practices reported difficulties in changing the work processes of professional staff.²⁷ The Intermountain, GRACE, and CCNC interventions, however, involved fewer specified processes of the major medical home definitions. The Intermountain and GRACE interventions included care management processes that were provided by the same care managers who constituted the practice inputs. Each Medicaid enrollee in CCNC was required to designate one practice as a “medical home.” However, most processes of the CCNC intervention were performed by network staff; CCNC has not expected redesign of its participating practices.²⁵

Have the Desired Outcomes Been Achieved in Demonstration Projects?

The GHC’s intervention is the only “medical home” intervention that includes a wide variety of medical home components and has produced a peer-reviewed evaluation. At 12 months, the GHC intervention reported improvements in multiple domains of patient experience (including coordination of care and access) and a global composite measure of

Intermountain Healthcare Care Management Plus	Geriatric Care Resources for the Assessment and Care of Elders (GRACE)	Community Care of North Carolina (CCNC)
<p>Compared with matched controls: Trend toward lower all-cause mortality at 2 years (16.6% among controls vs 13.1% with intervention; $P = .07$) More emergency department visits</p>	<p>Compared with usual care: Improved health-related quality of life Lower 2-year rates of emergency department use (1785 visits per 1000 patients receiving usual care vs 1445 with intervention; $P = .03$) Lower hospital admission rates (in a predefined subgroup of patients most likely to be hospitalized)</p>	<p>Mercer Consulting reports: Estimated savings of up to \$240 million in 2005 and \$314 million in 2006, compared with fee-for-service Medicaid enrollees</p>
Peer-reviewed publication	Peer-reviewed publication Randomized at physician level	Not peer-reviewed Incomplete description of methodology for calculating savings
Atypical practice setting	Not a practice-level intervention	Not a practice-level intervention

technical quality of care (Table 4).²¹ There was no detectable effect on overall healthcare costs. However, with only one intervention practice and an integrated insurer/multispecialty group (with salaried physicians at baseline) as the intervention setting, the generalizability of these findings to independent primary care practices may be limited.

As noted earlier, TransforMed released preliminary qualitative results,²⁶ but full evaluation results have yet to be published. Preliminary results from the first 2 pilot practices in Geisinger’s medical home intervention included a 20% drop in hospital admissions, improvements in guideline adherence, and a 7% reduction in overall costs of care.^{22,28} The Geisinger medical home intervention was subsequently extended to another 21 Geisinger-owned practices and 4 independent practices, and preliminary results from a subset of these expansion practices include a 4% reduction in costs of care.²⁸ The methodology underlying these cost estimates has not been completely described, nor have these estimates been presented in a peer-reviewed scientific publication. As with the GHC evaluation, the generalizability of Geisinger’s findings to independent primary care practices may be limited.

Compared with matched controls, medically complex patients in Intermountain Healthcare’s Care Management Plus intervention practices exhibited a trend toward lower 2-year all-cause mortality (16.6% among controls vs 13.1% in the intervention, $P = .07$).²³ Compared with patients receiving usual

care, elderly indigent patients receiving the GRACE intervention reported higher health-related quality of life and had lower 2-year rates of emergency department use (1748 vs 1445 visits per 1000 patients; $P = .03$).²⁹ CCNC’s outcomes have included hundreds of millions of dollars in estimated annual savings to North Carolina’s Medicaid program.³⁰ Neither the Intermountain, GRACE, nor CCNC interventions closely matched the medical home definitions, so their generalization to proposed medical home interventions bears scrutiny. In addition, the methodology used to estimate the savings attributed to CCNC has not been completely described in publicly available materials, and these estimates, which have some skepticism,³¹ have not been presented in a peer-reviewed scientific publication.

Summary State of the Evidence

Currently, there is limited evidence that the medical home, as a multifaceted practice-level intervention, will produce the results expected by its stakeholders. Comparing Table 1 to 3 demonstrates that some interventions cited in support of the medical home bear little resemblance to the major practice-level medical home definitions—particularly in the degree of practice transformation required. Other interventions occurred in unusual organizational settings, and some prominent results have not been peer-reviewed.

To take advantage of current political opportunities, policy-level decisions about transforming primary care practices

will be running ahead of the evidence. However, medical home pilot projects in several states are under way, and many others are planned.^{7,32} Although their diversity may frustrate efforts to pool results, these pilots offer a chance to carefully examine which combinations of medical home settings, inputs, and processes are likely to produce the best results.

Guidance for Stakeholders

Beyond the need to test the medical home, there is a need to clearly specify what is being tested: for each intervention, exactly what are the practice settings, practice inputs, and specified processes?³³ Without careful identification of medical home components, the use of the phrase “medical home” risks transmitting the appearance of failure (or success) across interventions that have little else in common. For example, practice transformation that is facilitated by significant practice inputs and in-kind support from an integrated health system may lead to desirable outcomes. However, these outcomes may not accurately predict the results of interventions on independent primary care practices (or interventions lacking significant practice resource inputs). Stakeholders who expect a proposed medical home intervention to produce GHC- or Geisinger-like results should ask: to what extent are the setting, practice inputs, and specified processes of the proposed intervention congruent to these prior examples?

Because of its common use in medical home pilots, it is worth pointing out that the NCQA’s PPC-PCMH, as a certification instrument silent on practice inputs, cannot completely define a medical home intervention. In addition, the PPC-PCMH does not completely specify the combination of processes expected of primary care practices. Each level of NCQA medical home certification can be achieved in many different ways. If medical home pilots require NCQA certification but give no further guidance about which particular PPC-PCMH elements are expected, the resulting intervention may need to be analyzed as a heterogeneous family of experiments.

The Medical Home in the Context of Overall Primary Care Reform

Well-respected observational research supports the superiority of a primary care-oriented healthcare delivery system.^{34,35} Based on existing evidence, it is unclear whether the transformation of individual primary care practices is the best path to this goal. Other avenues can simultaneously be explored. For example, the recently announced Medicare-Medicaid Advanced Primary Care Demonstration Initiative will evaluate interventions including the majority of primary

care practices in each participating state.³⁶ The proposed expansion of the Medicare Physician Group Practice Demonstration may create accountable care organizations that integrate individual primary care practices into full-service health systems.³⁷ Accountable care organizations may enhance the ability of primary care practices to perform core medical home processes and to share in savings generated across all care settings.³⁸ Results from these new efforts and ongoing medical home demonstrations will provide valuable guidance to the overall revitalization of primary care.

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