Medical Home Transformation in Pediatric Primary Care—What Drives Change?

Jeanne W. McAllister, BSN, MS, MHA
W. Carl Cooley, MD
Jeanne Van Cleave, MD
Alexy Arauz Boudreau, MD
Karen Kubilbau, PhD

1Center for Medical Home Improvement, Crotched Mountain Foundation, Concord, New Hampshire
2Center for Child & Adolescent Health Research and Policy, Massachusetts General Hospital, Boston, Massachusetts

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CORRESPONDING AUTHOR
Jeanne W. McAllister, MHA
Center for Medical Home Improvement
Crotched Mountain Foundation
8 Low Ave, Ste 1
Concord, NH 03301
mcallisterjeanne3@gmail.com

ABSTRACT

PURPOSE The aim of this study was to characterize essential factors to the medical home transformation of high-performing pediatric primary care practices 6 to 7 years after their participation in a national medical home learning collaborative.

METHODS We evaluated the 12 primary care practice teams having the highest Medical Home Index (MHI) scores after participation in a national medical home learning collaborative with current MHI scores, a clinician staff questionnaire (assessing adaptive reserve), and semistructured interviews. We reviewed factors that emerged from interviews and analyzed domains and subdomains for their agreement with MHI and adaptive reserve domains and subthemes using a process of triangulation.

RESULTS At 6 to 7 years after learning collaborative participation, 4 essential medical home attributes emerged as drivers of transformation: (1) a culture of quality improvement, (2) family-centered care with parents as improvement partners, (3) team-based care, and (4) care coordination. These high-performing practices developed comprehensive, family-centered, planned care processes including flexible access options, population approaches, and shared care plans. Eleven practices evolved to employ care coordinators. Family satisfaction appeared to stem from better access, care, and safety, and having a strong relationship with their health care team. Physician and staff satisfaction was high even while leadership activities strained personal time.

CONCLUSIONS Participation in a medical home learning collaborative stimulated, but did not complete, medical home changes in 12 pediatric practices. Medical home transformation required continuous development, ongoing quality improvement, family partnership skills, an attitude of teamwork, and strong care coordination functions.

INTRODUCTION

The patient- and family-centered medical home grounds US Maternal and Child Health Bureau policy and represents a strategic priority of the American Academy of Pediatrics.1,2 The Academy states that all children deserve a medical home—a source of accessible, continuous, comprehensive, family-centered, coordinated, compassionate, and culturally effective care. To date, little is known, however, about enablers of successful medical home change and whether quality improvement (QI) is an essential tool for transformation.3 We studied 12 practices showing high performance after their participation in a QI learning collaborative to characterize attributes of transformed pediatric medical homes.

METHODS

In 2003, the Center for Medical Home Improvement and the National Initiative for Children’s Healthcare Quality conducted 2 year-long, nationally based learning collaboratives to foster implementation of the medical
Teams consisted of a pediatric physician champion, 2 “parent partners,” and, optionally, a care coordinator. They completed the validated Medical Home Index (MHI) before and after learning collaborative participation (data points 1 and 2). Core components of the learning collaborative included the Chronic Care Model translated for pediatrics as the Care Model for Child Health in a Medical Home, which promotes a team approach to population care and family-centered care coordination.6,7

Sample
We used a modified positive deviance approach to select 15 high-performing practices from 2 collaborative cohorts based on postcollaborative MHI scores at the end of the collaboration.8 Of the 15 invited, 2 had lost their physician champion and 1 was unable to gain administrative approval, thus, 12 practices agreed to participate. The geographic distribution, urban-rural location, and practice type of the studied and nonstudied sites did not differ. Research funding allowed for 15 practices with no retrospective comparison. To further verify practice quality, we collected additional data in 6 practices with the highest MHI scores. We performed pediatric quality care audits of patient charts and administered the Modified Consumer Assessment of Healthcare Providers and Systems Health Plan Survey 4.0 Version: Child Medicaid Questionnaires (CAHPS) to assess the family perspective.9-12

Clinician Staff Questionnaire
The clinician staff questionnaire was completed by the physician champion and the care coordinator or staff member.13 We added a question to this questionnaire to measure adaptive reserve, the team’s ability to make and sustain change. Twenty-three items address QI, teamwork, and problem solving using a 5-point Likert scale. We converted total mean scores to a 100-point scale to allow comparison with MHI scores. Higher values indicate greater levels of the attribute.

Semistructured Interviews
Two researchers conducted semistructured interviews at each of the 12 practices between November 2010 and May 2011. Interviews were conducted individually with the physician champion, 2 parent partners having children with special health care needs, and a care coordinator. Interviewees were original learning collaborative team members or someone currently in their role. All physician champions were previous collaborative participants. If original parent partners were unavailable, parents currently involved with medical home QI effort were invited, as occurred in a single practice. Coordinators interviewed were current staff.

The focus of interviews was to identify factors that facilitated adoption of the medical home model, and understand its impact on the practice, children, and families. Questions were designed to assess factors that enabled medical home improvements; characteristics that currently made the practice a strong medical home; and impact of the medical home on parents, children, clinicians, and staff.

Data Management
MHI and adaptive reserve scores were electronically reported to the Center for Medical Home Improvement’s secure database; confidential results were password protected and accessible only to the research team. Interviews were recorded, transcribed, and entered into NVivo software version 9.0 (QSR International Pty Ltd) and held securely by the Center for Adolescent Research and Policy at Massachusetts General Hospital.

Analysis
We used a deductive approach to analyze the interview data. We applied a coding scheme developed by study authors having prior understanding of medical home innovations.5,14-17 Coding domains included (1) helpfulness of the original medical home learning collabora-
tive, (2) key internal and external factors affecting transformative change, (3) key medical home manifestations in practice, and (4) impact on children, families, and practices. We added subdomain factors when new concepts emerged.

We considered coding factors consistently as to whether they presented barriers to or facilitators of improvement, but rejected that approach because factors proved to be more nuanced. Initial coding therefore simply captured the presence of a factor; valance was addressed and integrated across themes and attributes. We attempted to capture the dominant views and values of interviewees while discussing alternative perspectives.

All authors participated in interviewing; 2 authors coded interviews from each practice. We analyzed adaptive reserve for physician champions and coordinators as total mean scores and as uncoupled individual scores, allowing for comparison. Interview coding intensity was examined for emphasis of emergent themes. We reviewed coding domains and subdomains, and analyzed them for their agreement with MHI and adaptive reserve subthemes. This strategy allowed for the triangulation of the MHI and adaptive reserve to dominant qualitative interview domains.18

RESULTS

Practice Characteristics

Characteristics of the practices 6 to 7 years after their participation in the national medical home learning collaborative are shown in Table 1. The practices were diverse. One-third did not have any source of supplemental support for medical home initiatives.

Quantitative Results

Figure 1 shows the practices’ total, transformed MHI scores at the precollaborative, postcollaborative, and current (2010) time points. Scores had improved from baseline by 21% at the end of the collaborative. Furthermore, scores improved an additional 13% from the postcollaborative time point to the current time point. The greatest improvement was seen in the domains of care coordination and chronic condition management, followed by the QI domain.

Figure 1 also shows the practices’ adaptive reserve scores (transformed to a 100-point scale) in relationship to their MHI scores. The adaptive reserve total mean score of 75.0 was correlated with the current MHI total scores (Pearson coefficient = 0.867). Adaptive reserve was higher for physicians than coordinators for perceived time for improvement, professional growth, and teamwork. Care coordinators scored higher for learning from mistakes.

Qualitative Results

Table 2 summarizes the interview data analyzed according to our coding scheme, counted quotes, and factor emphasis. A total of 7,302 interview quotes were counted and coded. Interrater reliability was good with \( \kappa \) scores ranging from 0.81 to 0.94 (physi-
cian champions), 0.81 to 0.95 (care coordinators), and 0.88 to 0.96 (parent partners). The thematic findings are described below, with some examples of comments by interviewees.

Quality Improvement
Physicians benefited from peer-based learning, identifying the learning collaborative as “what got them started” using an ongoing QI process. Eleven of 12 practices developed formalized QI team processes including active parent partner participation. All expressed the need for standards and structures to guide their improvement efforts, and time for reflection and planning. They viewed their QI processes as crucial, but indicated that substantial personal time and working on multiple fronts were required to make headway.

I think medical home is a process. I don’t think it’s an endpoint, it’s constantly evolving; if you get one thing going, there’s always something else you can improve upon. QI should be a way of practice life (physician champion, practice 6).

Family-Centered Care
Family-centered care was a theme supported by all 3 primary data sources. The MHI specifically inquires about staff understanding and applying family-centered concepts; 75% responded that they had “full knowledge and regularly applied family-centered concepts.”

Adaptive reserve does not address family centered-ness, but we added a relevant statement to the questionnaire: “Youth/family involvement in planning and quality improvement is routinely valued and practiced here.” The mean score for this statement was 80%, reflecting strong agreement. Interview data supported how practice teams valued parent partner participation.

Parent partners told their stories, expressed goals and needs, suggested changes, and shared community resources; all benefited. Physician champions found this parental involvement motivating but acknowledged that the recruitment, orientation, and engagement of parent partners were difficult. Most parent partners still used the practice for care and helped with QI efforts. One example shows how parents contributed to team learning:

There was that independence piece for my daughter. She’s going to have to do this all her life. So we talked with our medical home team. We needed to work on her independence, starting with checking herself in for appointments. I helped with the training, and the front desk was very good about letting her act for herself at future visits (parent partner, practice 6).

Team-Based Care
Team-based care is a concept integrated across the MHI; higher scores reflect stronger team qualities. The adaptive reserve mean score of 75% suggests a high level of team-based communication/collaboration, representing a combined ability to make, tolerate, and sustain change. Teamwork and attitude were emphasized in interviews as energizing and critical to quality. Interviewees described the spread of teamwork across clinicians and staff.

It starts as the family walks off that elevator. Everybody—patients and staff—understand that this is a medical home. Teamwork really drives the whole concept; everyone is involved from every level (care coordinator, practice 4).

I have a partner in the complex care of my child, the team here, they have our backs (parent partner, practice 9).

Care Coordination
For the 6 MHI indicators in the care coordination domain, mean scores nearly doubled from before the collaboration (3.82) to after the collaboration (6.39), demonstrating an improvement. Adaptive reserve scores reflect the combined achievement of clinicians and coordinators. Almost one-half of coded domains and subdomains, or 3,429 of them, were related to coordination, 59% of these domains/subdomains were associated with team-based, planned, coordinated care. Care plans developed in partnership with families were attributed with outcomes including safety, reliability, and reduced wastefulness.

At the onset of the collaborative, none of the 12 practices had a coordinator position; by 2011, all but

| Registry of Number of CYSHCN | Practice-Based Coordinator Role | Supplemental Medical Home Supporta |
|-----------------------------|---------------------------------|-------------------------------------|
| No                          | Yes                             | Coordination grant from medical school |
| Yes                         | No                              | No extra support                    |
| Yes                         | Yes                             | No extra support                    |
| Yes                         | Yes                             | Limited Medicaid PCCM               |
| Yes                         | Yes                             | Small AUCD/LEND contract for care coordination |
| Yes                         | Yes                             | No extra support                    |
| Yes                         | Yes                             | No extra support                    |
| Yes                         | Yes                             | Medicaid $3-$5 PMPM to “keep population well” for complex patients |
| Yes                         | Yes                             | Medicaid payment for 300 complex patients |
| Yes                         | Yes                             | Small PMPM                         |
| Yes                         | Yes                             | Health plan P4P                     |
| Yes                         | Yes                             | PMPM for complex patients           |

*Neurodevelopmental & Related
the smallest practice supported this position within their budget, with external grant funding, or both. Adding the role of care coordinator increased capacity to be proactive, support families, and reach out to communities. Physicians said they would “not go back” to their previous care model.

Coordination of care, using care plans, is amazingly effective. We have a well-child visit and create a care plan; then 6 months later hold a chronic care visit, it’s like the problems melt away; unplanned hospitalizations tend to go away (physician champion, practice 12).

We saved that family unnecessary visits and tests—that was a result of having a coordinator to help right the ship a little bit (physician champion, practice 4).

Care coordination support is so helpful, it is all I would do. Our family has benefited, I can be a parent (parent partner, practice 2).

Care Quality and Satisfaction
Parents whose children live with chronic conditions described having a “second home” and “trusting relationship” with their care team. Inclusion as “partners” demonstrated professional respect of the parent viewpoint and of their major role in their child’s life. As one noted, “This practice is my lifeline” (parent partner, practice 7).

Practices reported important care improvements tailored to complex patients, but also described how their efforts stretched to improve preventive and acute care for all children/youth.

I would have told you in the beginning that the medical home was coordination for kids with special needs; making a smooth transition from medical home to specialist; making sure they have medical information when hospitalized; receiving follow-up care. But a medical home is ensuring children who need well-child checks, good access to care.
Drivers of Medical Home Transformation

Clinicians and coordinators described an enhanced sense of professional satisfaction. The pediatric medical home became a special niche and more gratifying career path for them.

I love what I do, in part because of the medical home, I have more time with my patients, I earn less, but am happier (physician champion, practice 10).

It makes my life rich working with these kids; the medical home provides an innovative area of interest for me, a challenge; no condition scares me anymore—this is my new frontier (physician champion, practice 11).

Alternatively, supports for pediatric improvement were described as minimal and QI was described as strenuous. Physicians worried about inequitable levels of risk exposure as a consequence of caring for complex patients. They were disturbed about sustaining their mission while coping with practice standards demanding an unsupported level of quality.2,19 There was concern that the pediatric medical home was being left behind in the midst of initiatives focused on cost savings for chronically ill adults.20–22 Operationally, medical home activities could be overwhelming and required the personal time of many nights and weekends.

Professional standards call us to meet quality indicators not supported by the payment system (physician champion, practice 4).

Leadership here is a volunteer activity (physician champion, practice 11).
Triangulated Results

Table 3 shows results of the triangulation of the MHI and adaptive reserve to the dominant qualitative interview domains.

DISCUSSION

Data from this study suggest several important points relevant to factors that enable transformation, including 4 essential medical home attributes: (1) a culture of QI, (2) the delivery of family-centered care, (3) the value of team-based care, and (4) a focus on care coordination.14-16,23-25 Care quality and satisfaction were also evident.

Rapid medical home transformation, leading to a point-in-time metamorphosis, did not resonate with physician champions, parent partners, or care coordinators. Rather, a vigilant, ongoing process of family-centered QI resulting in continued transformation did resonate. The original learning collaborative was credited with initiating change but not completing it. Ongoing QI, family participation, teamwork, and care coordination were articulated and supported as necessary pediatric medical home attributes. Delivering care within a family-centered medical home proved highly satisfying to physicians and coordinators. As efforts expanded, professional gratification and staff resilience appeared linked. Family satisfaction was evident in interviews and surveys, contrasting with neutral findings in other demonstration evaluations.26

Today the medical home is promoted in pediatrics as a standard of quality care for all children. Our results reflect this shift. A former perspective of “our medical home children with special health care needs” is shifting to “our medical home system of care for all children and youth.”

Care coordination was described as “probing, intense, detective work” helping families navigate the health care system. Lack of payment for care coordination was troubling and on each physician champion’s mind.

Our results are similar in some respects to those of the Medical Home National Demonstration Project27 but more limited in resources and scope. Participants in that project described the importance of adaptive reserve, motivated team members, and positive impacts of facilitation on practice change.28,29 Ongoing facilitation was not available to our 12 teams. Both studies show almost identical levels of adaptive reserve.28 Alignment with medical home characteristics, variation of model element implementation, and evolving shifts of personal thinking about quality are similar.19 Larger system and policy supports for primary care are commonly stressed needs.

Limitations

Several factors must be considered when interpreting these results. Two of the authors (J.W.M., W.C.C.), as developers of the MHI and faculty members for the original learning collaboratives, may have introduced bias. The engagement of neutral researchers (J.V.C., A.A.B., and K.K.) in all aspects of study design may have mitigated this bias to some degree. The selection of high-performing practices allowed a focus on positive attributes associated with successful transformation. Information gleaned by studying less successful
practices may have augmented our factors and allowed for comparison; such a study would be an important next step. The practices we studied had multitaled teams and strong parent partners providing lessons perhaps not generalizable to practices nationally. Interviews targeted only the physician champion and care coordinator as informants, possibly limiting reports. Finally, contextual factors undoubtedly influenced the study results and may affect the ability to transport the findings to other settings. These factors are summarized in the Supplemental Appendix (available online at http://annfammed.org/content/11/Suppl_1/S90/suppl/DC1).

Implications

Our findings suggest that efforts to build and cultivate the pediatric medical home will benefit all children, their families, and clinicians alike, while enhancing care quality. Despite the above limitations and a potential need for broader study including more practices and staff, we feel ours is an important initial effort to identify critical transformative factors within pediatric primary care. Our results suggest that successful improvement toward the pediatric medical home model will require (1) QI supports with capabilities to drive change, (2) skill development to engage families as care and improvement partners, (3) competencies to ensure effective team-based, comprehensive care, (4) care coordination functionalities, and (5) payment aligned with the delivery of high-quality care.

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