

# Care Coordination Over Time in Medical Homes for Children With Special Health Care Needs

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## abstract

**OBJECTIVES:** To explore how care coordination changes conceptually and practically in primary care practices when implementing the medical home and to identify reasons for different types of changes.

**METHODS:** Six years after a 2003–2004 national learning collaborative to implement the medical home model for children with special health care needs, we examined care coordination in 12 pediatric practices with the highest postintervention Medical Home Index scores, indicating high level of adoption of the model. Data included interviews of 48 clinicians, care coordinators, and parents and medical record reviews of 60 patients with special health care needs receiving care in these practices.

**RESULTS:** Initially, care coordination activities were prompted by patients' acute problems, and over time activities, tools, and policies were implemented to avert many such problems and expand the scope of services offered to patients. Example activities were making previsit calls with families, writing care plans, developing relationships with community agencies, and tracking referrals. Although some activities were common across practices, the persons involved and efforts toward different activities varied with practice context. Drivers included motivation and creativity of medical home teams, organizational changes, funding to expand care coordinator positions, protected time for such activities, and adoption of electronic record systems.

**CONCLUSIONS:** In high-performing medical homes, care coordination activities changed from being mostly reactive to patients' episodic needs to being more systematically proactive and comprehensive. This shift was promoted by factors external and internal to the practice. Ensuring these factors in medical home implementation may accelerate adoption of proactive care coordination activities.

**WHAT'S KNOWN ON THIS SUBJECT:** Care coordination is a central part of the medical home model. Little is known about how care coordination is implemented in pediatrics and how it changes over time in primary care practices successfully adopting medical home principles.

**WHAT THIS STUDY ADDS:** In high-performing medical homes, care coordination evolved toward designing and carrying out routine activities and policies that aimed to forestall disruptions in care delivery. Investing in medical home teams, engaging electronic medical record systems, and improving workflow supported these changes.

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The medical home model is being broadly implemented in pediatric and adult practices.<sup>1</sup> A key component is care coordination, particularly for children with special health care needs (CSHCN).<sup>2</sup> The scope and definition of “care coordination” have evolved,<sup>3–7</sup> and the 2014 American Academy of Pediatrics policy statement offers a framework, emphasizing patient- and family-centeredness, working in teams across medical and other settings, and enhancing families’ capabilities.<sup>8</sup>

This was part of a larger study to examine change toward the medical home model.<sup>9</sup> We used a positive deviance approach<sup>10,11</sup> and mixed methods<sup>12,13</sup> to examine successful practices that had participated in a national medical home learning collaborative in 2003 to identify factors or processes that contributed to implementation that could then be translated to other practices. Here, we focus on how care coordination evolved after the learning collaborative.

The research questions were as follows: After the learning collaborative, what did successful practices adopt or change to provide care coordination? How were these changes selected and made? and What elements, factors, or events in the practice allowed for or hindered these changes? Understanding how practices change to provide care coordination will inform programs implementing the medical home and entities that hold practices accountable for doing so.

## METHODS

### Design

This is a mixed-methods convergent parallel design study<sup>14,15</sup> using concurrent data collections of interviews, practice self-assessments, and patient medical records. We used a positive deviance approach to select practices, meaning, we selected those that performed exceptionally well to uncover solutions others can adopt.

### Context

In 2003–2005, 45 practices participated in a multistate learning collaborative to implement medical homes for CSHCN, funded by the US Maternal and Child Health Bureau. The Center for Medical Home Improvement and the National Initiative for Children’s Healthcare Quality used the Breakthrough Series Model for Improvement<sup>16</sup> and the Chronic Care Model<sup>17</sup> for learning collaborative content. The learning collaborative involved creation of a medical home “team” for each practice, in-person group sessions, monthly activities, and periodic phone conferences to report plan-do-study-act (PDSA) cycles. Medical home-related improvements were measured using the Medical Home Index (MHI)<sup>18</sup> before and after the collaborative. The MHI is a practice self-assessment that characterizes local context on 6 domains related to medical home principles.

### Practice Selection and Visits

We invited 15 practices with the highest postcollaborative MHI scores, and 12 participated. From November 2010 through May 2011, 2 or 3 members of the research team visited each practice for 1.5 days.

### Interview Procedures

We conducted interviews with the medical home “champion,” or the physician most involved in medical home implementation; a parent; care coordinator or staff member most involved in carrying out care coordination activities; and a second primary care provider. Many interview participants had attended the original learning collaborative. We used a preset list of questions that differed by the interviewee’s role, but domains were the same. We asked what distinguished the practice as a medical home, how changes had come about, and what barriers, facilitators, and other factors helped or hindered the process. Interviews were audiotaped and transcribed.

### Practice Self-Assessments

Before visits, a member of each practice completed a questionnaire about the practice (eg, practice type, panel size), specific medical home activities (eg, patient registries), and an MHI to indicate the current state of “medical home-ness.”

### Medical Record Reviews

We asked 6 practices with the highest scores on the postcollaborative MHI to identify 10 patients with medical complexity who received care coordination from the practice. Patients’ primary care records were abstracted for medical and demographic information and care coordination activities. We adopted a tool developed by Antonelli and colleagues<sup>19</sup> and used their definition of a care coordination encounter (an activity or task carried out by practice staff that contributed to the development or implementation of a plan of care). We excluded visits and phone calls to medically evaluate symptoms, preventive visits, and medication refills. We abstracted activities in the year before the visit. A chart abstraction guide was used, and 2 abstractors overlapped on 20% of records to validate consistency.

### Overall Data Analysis

The interviews were the primary data source. Other data were examined to confirm or clarify information in interviews and explore discrepancies and differences in perceptions of participants from the same practice and among different practices.

### Interview Data Analysis

Three coauthors (KK, AAB, JV) read a sample of transcripts and developed a scheme of codes, which coauthors (JW and WCC) revised. Three transcripts from each practice (1 medical home champion, 1 care coordinator, and 1 parent) were coded by 2 authors using software for qualitative data analysis.<sup>20</sup> Discrepancies were resolved through discussion until  $\kappa \geq 0.8$  for 80% of codes assigned during that interview.

We reviewed passages coded as “care coordination/planned care” and for the following activities mentioned in these passages: family-centered activities, care plans, previsit planning, and registries. We reviewed passages coded for staff capacity, reimbursement, leadership, and special health care needs because these passages overlapped with “care coordination/planned care.” We generated preliminary themes; passages were then examined by practice to determine its progression toward current care coordination activities.

### Medical Record Data

We generated descriptive statistics about who participated in care coordination activities, communication medium used (eg, phone, letter), and related medical condition(s) in aggregate and by practice.

### Merging Data Sources

For each practice, the current MHI, practice questionnaires, transcript of the second physician interview, and medical record data were examined to see where each aligned or conflicted with

the impressions relayed through initial interview analyses. Conflicting information that could not be explained was discussed with the larger research group. Where chart review, interview, or self-assessment data from 1 practice deviated from others, we examined that practice’s total data to see if this deviation could be explained by contextual factors or patient population. We then finalized the themes.

## RESULTS

### Characteristics of Practices

Practices varied in structure, size, and location (Table 1). There were 5 private practices, 5 practices affiliated with a practice network or integrated health system, 1 academic/teaching practice, and 1 community health center. Five were suburban, 5 were urban, and 2 were rural practices, and practices were located throughout the United States. Eleven had a dedicated care coordinator.

How practices organized and administered medical home programs varied. In many practices, it was a distinct program that patients enrolled in. In others, services were

delivered more organically, with no official identification as a “medical home” patient. In a few practices, CSHCN were ranked using a complexity scale. In others, patients were identified qualitatively as complex (eg, those with “thick charts”) or were referred when they presented with complexity (eg, a new diagnosis of a serious condition, or psychosocial complexity that exacerbated a less serious condition).

We report several themes:

### Theme 1: Change Toward “Proactive” Care Coordination Activities

At first, practices had care coordinators address patients’ acute needs. Over time, practices institutionalized “proactive” care coordination procedures to prevent these acute events or minimize their disruptive effects on families’ lives and practice flow.

When care coordinators started, they focused primarily on addressing families’ active issues or problems. While this continued, medical home teams also tested tools, policies, strategies or programs designed to

**TABLE 1** Practice Characteristics

Practice	Self-Described Practice Model	US Region	No. of Physicians in Practice	No. of PAs or NPs	% Patients With Public Insurance or Self-Pay	Total No. of Pediatric Patients	Practice Has EMR	Practice Has Dedicated Care Coordinator	MHI Total Score <sup>a</sup>
A	Affiliated with a health system <sup>b</sup>	Mid-Atlantic	12	0	5	22 500	Yes	Yes	169
B	Hospital-based group practice <sup>b</sup>	Midwest	4	0	40	13 300	Yes	Yes	142
C	Hospital owned <sup>b</sup>	Midwest	16	3	3	76 000	Yes	Yes	173
D	Independent, small	West	3	1	10	525	No	No	133
E	Hospital owned	Northeast	4	3	85	7000	No, but planning to obtain	Yes	142
F	Independent, large <sup>b</sup>	South	12	0	8	12 000	Yes	Yes	172
G	Independent, large	Midwest	8	0	7	9000	No, but planning to obtain	Yes	150
H	Private group practice	West	7	1	24	13 500	Yes	Yes	145
I	Community health center <sup>b</sup>	South	8	2	93	13 400	Yes	Yes	155
J	Hospital owned	Mid-Atlantic	5	1	15	6000	Yes	Yes	133
K	Independent, large <sup>b</sup>	Midwest	7	3	13	13 000	No	Yes	149
L	Academic training practice	West	32	0	34	4500	Yes	Yes	77

NP, nurse practitioner; PA, physician assistant.

<sup>a</sup> Maximum score = 200.

<sup>b</sup> These practices participated in the medical record reviews.

anticipate these problems, and successful preventive measures were adopted broadly. We termed these measures “proactive activities,” meaning they were designed to control a situation by causing something to occur instead of responding to an event. Examples of proactive activities (Table 2) included previsit assessments via phone, structured questionnaires to elicit family priorities and goals, and written care plans or health summaries. Ideas typically stemmed from medical home teams repeatedly encountering the same problem. Devising and implementing solutions involved collaborating with several groups, including parent advisors, outside entities (eg, schools, emergency departments), and other practice staff; resource allocation and/or infrastructure building; dedicated time for preimplementation planning; and a process for incorporating the activity into daily practice. Changes were usually introduced 1 at a time and measured via PDSA cycles.

Proactive care coordination activities were seen as beneficial for several reasons. First, reducing acute events made families’ lives more stable. For example, written health summaries available to emergency department staff reduced reporting burden for parents. The investment in proactive activities resulted in the perception that practices were more efficient. Care coordinators appreciated a more predictable workflow and felt that proactive activities were an effective use of their time and skill set. Finally, medical home teams found creating a single process that could be applied to multiple families or situations highly rewarding, which contributed to job satisfaction and strengthened relationships among team members.

### Theme 2: Practice Context and Types of Care Coordination Activities

Variation in characteristics of care coordination activities could be explained by practice contextual factors.

**TABLE 2** Examples of Proactive Care Coordination Activities and Rationale

Proactive Care Coordination Activity or Process	Rationale With Supporting Quote(s)
Previsit phone calls with families to obtain updates, assess needs, and set visit agendas	“Because what happens when we don’t have that [previsit phone call], for example, a provider walks into a visit, realizes we don’t have records. You know, the nurse might be spending time calling, the provider may be spending time.” (Care coordinator) “She [the physician] is ready with all that information, so her time is well spent, <i>my</i> time is well spent, and we really do address a lot of different things for [my child].” (Parent)
Written care plans or health summaries	“This care plan, this is for their use, for bringing to specialists’ visits so that they don’t have to be so much of a historian when they’re there.” (Care coordinator) “We got roomed [at the Emergency Department], the nurse came in with the care plan, she said, “Give me 5 minutes, I’m reading through your care plan right now,” so she knew everything that she needed to know when we got there, and then by the time the doctor—we saw the doctor, too. He had also read through our care plan and said, “Well, you know,” he kind of ticked off several things right off the top, ‘cause he could see from the care plan that certain things did or didn’t need to be addressed.” (Parent)
Identifying charts of medically complex patients and scheduling longer visits	“Nobody likes to look at their schedule and see the [patient] name that you know is going to take you out. But now you look and you see you have 20 minutes, or 30, and we have a couple that take 40, but if that’s what it takes, that’s what it takes.” (Physician)
Brief daily huddles between care coordinators, nurses, and physicians about patients scheduled for visits that day	“So we sit down at the beginning of every session, and we click on every single patient who’s scheduled and review what’s going to happen. It’s a well visit. What are the vaccines she needs? Let’s look at this. Hey, this isn’t documented.” (Care coordinator)
Organizing family-oriented materials for common problems or scenarios (eg, transition to adult settings, special education services)	“We fight pretty hard to get them what they need either in their IEP [Individualized Education Plan] or 504. Because you know, if we’re not advocating for them, parents ... they get overwhelmed. They throw their hands up. We do a lot of ... we do a lot of resource providing for education. I have a packet that I put together for what your rights are for the IEP or 504.” (Care coordinator) “We do have a transition packet that’s been put together for pediatrics—questions to ask starting at 14, as kids go from junior high to senior high. To start talking about those needs, to get the patients as involved as possible and aware of their care.” (Parent, speaking about her role as a “parent partner” to the practice)
Creating processes to streamline communication with specialists, schools, community agencies	“I developed a form because we weren’t getting ... from Early Intervention, we couldn’t get them to understand ... we were ordering ten thousand different ways when we wanted a medical eval for a developmental issue, and we wouldn’t get it.” (Care coordinator) “There’s good communication. ... There was definite interaction [between the specialist and the primary care pediatrician]. I know that from when, at one point they were worried about his heart again. There was some medication, lifting up his heartbeat or something. I remember the cardiologist coming in and saying, “I just spoke with Dr. C [the primary care pediatrician].” (Parent)
Establishing a system for tracking referral completion	“My sister works in a doctor’s office, and she said, for referrals, ‘We fax a sheet of paper over, and the patient calls, and it’s done.’ And for us, we normally set up the appointment for the parent, give them the information, follow up, make sure they went, get the report to the doctor, follow up with the parent.” (Care coordinator)

In medical records of 60 children with medical complexity, we recorded 508 care coordination encounters (Table 3). The nature of activities, persons involved, and medium used ranged among the practices. This variation appeared to correlate with differences in practice environment

**TABLE 3** Care Coordination Activities for 60 Children With Medical Complexity in 6 Practices

	% (n = 508) <sup>a</sup>	Range Among 6 Practices (%)
Nature of activity		
Initial referral	7.2	2.7–22.8
Follow-up of referral (retrieving record and/or discussing with family)	13.9	0–28
Medication issue (refills excluded)	16.9	4.0–33.8
Transfer of information from 1 setting to another	39.3	24.3–43.3
Scheduled team meeting	0	0–0
Individualized, written care plan	12.6	4.1–23.0
Completion of form or letter	27.8	14.3–54.6
Person(s) involved		
Primary care provider	62.2	44.1–80.0
Other nonclinical practice staff	42.2	4.4–83.7
Care coordinator	37.8	5.8–67.8
Parent or patient	34.9	9.3–60.7
Community agency	23.8	7.7–45.0
Other physician	16.2	3.4–20.0
School	8.3	4.8–28.9
Insurer	6.4	0–13.1
Medium used		
Written correspondence to the practice from another entity	38.0	8.7–72.9
Written correspondence from the practice to another entity	35.4	10.8–63.5
Phone call	29.9	9.5–66.0
E-mail	3.2	0–18.9
In person	2.7	0–9.5
Medical condition that was the focus of the activity		
Other chronic condition	31.7	14.9–64.9
Medical complexity (eg, issue with specialized equipment)	30.1	10.8–46.7
Developmental delay	14.2	7.2–28.7
Acute illness	8.9	3.1–17.5
Not specified	8.6	1.4–16.2
Social, legal, or financial issue	2.6	0–5.4
Asthma	1.4	0–5.4
Other mental health issue	1.0	0–3.9
ADHD	0.6	0–2.7

<sup>a</sup> Categories are not mutually exclusive.

and resources, as reported in interviews and practice questionnaires. For example, 23% of care coordination activities were writing care plans in 1 practice, but another practice rarely did these. In the former, several providers worked part time in a large practice, and care plans made visits with less familiar providers more efficient. In the other practice with fewer, full-time providers, care plans were less useful because patients rarely saw an unfamiliar provider. Another example: in 1 practice, the care coordinator was involved in 68% of documented activities but in another practice, the coordinator was involved in only 6% of activities in

another practice. The former practice was receiving additional reimbursement for medical home certification, and this nurse-trained care coordinator was a full-time employee. In the latter, the care coordinator was part time and, because she was trained in social work, her activities had a different focus.

### Theme 3: Factors Promoting Faster Adoption

Five factors promoted faster adoption and expansion of proactive care coordination activities (see Table 4 for supporting quotes).

#### 1. Initial External Funding for Care Coordinator Positions and Protection of Care Coordinators' Time

Most practices secured a 1-time grant to support care coordinators initially. When these funds were depleted, practices maintained positions through support from the larger health system, other grants, or general practice revenues. Often, financial support came from several sources. Care coordinators were often selected from existing staff, and there was a tendency for them to be called to urgently fill in for absent staff. Loss of care coordination time to practices' day-to-day needs (eg, rooming patients, giving immunizations) detracted from proactive care coordination activities. Sometimes this created conflict among staff members. Strategies to resolve this included directives from practice leadership and providing the care coordinator with separate physical space.

#### 2. Creative Problem Solving by Medical Home Teams, and Practice Environments That Encouraged Organizational Improvements

Care coordinators, physician champions, and parent partners described positive team dynamics, support from practice leaders, and allocation of time for regular meetings as key elements of implementing and improving care coordination. Care coordinators perceived themselves as critical to the change process, frequently identified patterns of problems in the course of daily work, and collaborated with parents and physicians to devise solutions. Regular meetings provided opportunity to review data from PDSA cycles and discuss whether changes were having the intended effect.

#### 3. Electronic Medical Record Enhancements

Adoption of an electronic medical record (EMR), although associated with lengthy implementation, facilitated activities through automation, easy information retrieval, and text-searching capabilities. For example, many



**TABLE 4** Theme 3: Structures, Processes, Decisions that Enabled Implementation of Proactive Care Coordination Activities

Structures, Processes, Decisions	Explanatory Quotes	Specific Care Coordination Activity or Activities Enabled
External funding for care coordinator positions and protection of care coordinators' time	<p>"I don't know that we would really have a care coordinator in our office if we hadn't had 4 years of the national grant paying for her services, you know, supplementing her salary to show us how valuable it could be. Because at the end of the 4 years, then it was a 7-person, 6-person decision. "Okay, are you willing to keep this as a full-time position and pay?" This is ... now, we're going to have to pay this salary. And it was unanimous." (Physician in a practice that elected to support the care coordinator position after grant funding expired)</p> <p>"I tried for years to do both [care coordination and triage nurse], but I'd be out there, patients were calling; I'd be in here, they're calling. Everybody was unhappy. So then that was the decision—we're going to commit to this or we're not because I can't work both halves." (Care coordinator describing the tension between urgent practice needs and care coordination activities)</p>	Previsit phone calls, care plans, organizing materials, streamlining communication
Creative problem solving by medical home teams, and practice environments that encouraged organizational improvements	<p>"And it's . . . Dr. K [physician champion] will have a great idea and then she'll meet with us, run it by us . . . and we're ultimately behind the scenes, planning of all her stuff. . . . It's always about teamwork and we . . . I think we utilize our strengths very well. We know who's extremely compassionate, versus extremely knowledgeable, versus extremely whatever else." (Care coordinator, describing the medical home team dynamics)</p> <p>"[Before,] we didn't even have a physician referral sheet; they would just grab a piece of paper, write the doctor's name on it, and we'd look up their phone number. That's like reinventing the wheel each and every single time. But that's how it was done. I worked around trying to develop some of the tools that we use today and we take for granted." (Care coordinator, describing how she identifies recurring issues for improvement)</p> <p>"But, just . . . the group of doctors that we meet with, once a month. Just kind of say, "Here's what we're working on. Here's what people are saying. Here's what." You know, just to kind of meet with them . . . just empowers." (Care coordinator, describing how she communicates ideas for improvement)</p> <p>"I think . . . we continue to do quality improvement projects and different things because I think that really, kind of, keeps us focused that way. So when opportunities come along to do something like the youth in transition project and things like that—it's made me look at my own newborn screening processes and what have you. Those, I think, kind of keep us energized." (Physician champion)</p>	Organizing family-oriented materials, streamlining referral/communication processes
Visible improvements in everyone's efficiency	<p>"I think a huge big deal was when we started running on time. Consistently." (Physician colleague of the medical home physician champion)</p> <p>"I think everyone, kind of, realizes how much it helps and makes our lives easier from the doctor's standpoint. That we will have someone in this position, I think, always." (Physician champion)</p>	Previsit phone calls, flagging charts for longer visit times to more patients
EMR enhancements	<p>"Gosh, that was one of the, the big things that we had with creating our new care plan, which pulls as a report in our system—that was, huge involvement with that. We have a meeting where there would be people who worked with the computer system, would come to that and then there was nurses, providers, care coordinators, everybody kind of coming together to figure out how we could create a tool that would work for us." (Care coordinator in a practice that recently implemented an EMR)</p>	Tracking referrals, care plans
Commitment to attaining medical home recognition	<p>Within the past year, this whole program has taken off so much more, and I think that what allowed it to do that was having the [medical home] certification process. . . . I think it makes it a lot easier for everybody to get onboard when you have something to work from. (Physician in a practice receiving enhanced reimbursement from a state-level medical home program)</p>	Previsit calls, care plans, referral tracking

practices used EMR templates to write care plans. Care coordinators in practices sharing EMRs with specialty care centers and emergency departments noted that they spent less effort on ensuring information

exchange and had more confidence that care plans would be used by other providers.

**4. Highly Visible Improvements in Everyone's Efficiency and Quality of Care**

Proactive care coordination activities resulted in noticeably improved efficiency and perceived quality of care. Although most doubted impact on some aspects of quality of care (eg, immunizations), participants

perceived that families receiving care coordination services had better experiences and received more appropriate care. For example, care plans helped facilitate urgent visits for medically complex children not seeing their usual provider. Identifying patients as “medically complex” and scheduling longer visits gave families more time for discussion while clinicians adhered to their prescribed schedules. When everyone noticed day-to-day workflow improvements, the work of the medical home teams was more highly valued. This boosted morale of medical home teams and was a key reason in some practices for allocating practice resources toward the care coordinator position.

#### 5. Commitment to Formal Medical Home Certification

Four practices were receiving or anticipating enhanced payments for certification from the National Committee for Quality Assurance or another entity, which spurred changes not otherwise made (eg, in 1 practice, creating a system to track referrals) and in some cases motivated reluctant providers and office staff. In other practices, certification requirements did not match with priorities of medical home teams, and teams felt the effort toward certification was not worth any expected benefit and would detract from activities deemed more important.

## DISCUSSION

We performed a mixed-methods, retrospective analysis of transformation of pediatric practices into medical homes, focusing on evolution of care coordination services over time. We report several findings. First, practices moved from reactive to proactive activities that planned for future events while also addressing patients’ current concerns. Second, decisions about which activities to implement stemmed from perceptive medical home teams prioritizing and solving

system-wide problems, taking into account practice context. Third, several key organizational factors, such as protecting the care coordinator’s time, supporting medical home team improvement efforts, and utilizing EMR enhancements, enabled or accelerated this evolution.

After completion of a medical home learning collaborative, care coordination activities evolved, with practices dedicating more resources toward proactive activities that anticipated patients’ needs and reduced systematic problems and recurring events (Theme 1). This is consistent with recommendations from the American Academy of Pediatrics’ policy statement on care coordination.<sup>8</sup> Previous studies examined care coordination at 1 point in time, capturing the range of activities, volume, and cost to practices,<sup>21</sup> but not how care coordination changes as a practice’s medical home model matures. We found that creation and installation of tools and practices for proactive activities typically followed some study or consideration of recurring issues faced by care coordinators and planning, including some trial and error, by medical home teams. Efforts to mentor, supervise, train, and incentivize care coordinators and medical home champions toward diagnosing and resolving systematic problems will likely accelerate adoption of proactive care activities. This approach may conflict with certification processes because some organically derived solutions may contradict or compete with certification requirements if they are specific.

We studied care coordination activities across a subset of practices using medical record reviews. The proportion of types of activities and who performed them varied. Combined with qualitative data, this analysis indicated that selection of which activities to adopt was driven by a combination of a practice’s contextual factors and patient/family

needs (Theme 3). The latter was influenced by the larger environment or “neighborhood,” including schools, local specialty groups, and community agencies, and led to a unique operationalization of the medical home model. This finding is consistent with Alexander and colleagues’ experience with measuring medical home implementation<sup>22</sup> and has implications for creating accountability of medical home programs.

We found several common factors that advanced implementation of proactive care activities (Theme 3), and findings were consistent with previous studies.<sup>10,21,23</sup> As in our study, others have reported associations between successful implementation and a general culture of improvement,<sup>24–26</sup> support for care coordinators’ time and regular team meetings to promote reflection,<sup>27</sup> and buy-in among clinicians and practice staff when improvements in care were visible,<sup>28</sup> which can result in a shift in perceived practice norms.<sup>21</sup>

Financial support for activities was frequently mentioned, reflecting debate about value and financial incentives for medical home transformation.<sup>29</sup> Medical home champions acknowledged that care coordination services were an added expense, and practices had various strategies to cover these expenses and prevent dismantling of their programs. Because providers and staff perceived that care coordination facilitated better job performance and satisfaction, and higher quality care, care coordination activities were valued and their expense justified and sustained. Although evidence suggests that enhanced primary care payments can “bend the cost curve,”<sup>30</sup> participants in this study could not explicitly report whether their services directly resulted in more efficient utilization or changed specific quality metrics.

There were several limitations to this study. Participants’ reports are subject to recall bias and a tendency toward

socially desirable answers, which we addressed, in part, with quantitative data. Medical record reviews may have missed important activities not documented (eg, from e-mails or encounters in which the medical record is inaccessible). There was no control group, preintervention data were not reliably available, and we could not study effects on quality metrics or utilization. Although practices varied on geography, size, and structure, we studied 1 learning collaborative; findings from other interventions may differ. The sample of 12 practices is small but appropriate for a mixed-methods study, which permits an in-depth understanding of practice transformation.

## CONCLUSIONS

Practices implementing medical home principles will likely find that care coordination activities evolve toward elements of proactive care. In this study, many changes in care

coordination activities were prompted by complex patients interacting with the combined resources of their practice, subspecialty center, and/or community. Such changes may be lost with emphasis on uniform requirements for medical home certification because these resources are unique to each practice. This may slow practice-level adoption, as differences in care experienced by other providers and staff fueled support for care coordinators and the changes they instituted. These differences may have been more noticeable because changes were directed at specific problems in caring for children with complex needs, and changes for a broader, healthier population might be less obvious. Recent work by Friedberg and colleagues<sup>31</sup> suggests that simply doing practice-level process changes without investment in proactive care coordination may not improve quality outcomes. We

sought factors, events, or conditions associated with change that could be replicated in other practices. Some, such as external funding for care coordinators, may be easier to attain as a result of health care payment reforms. Others, such as ensuring a creative, invested, and passionate care coordinator, could be bolstered by training, mentoring, and supervision strategies. Research to determine how best to allocate financial resources toward these strategies would inform future implementation programs.

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## Care Coordination Over Time in Medical Homes for Children With Special Health Care Needs

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