Organizational Change and Learning

How Improving Practice Relationships Among Clinicians and Nonclinicians Can Improve Quality in Primary Care

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Researchers and practitioners in the health care community continue to explore strategies for improving health care quality. Studying health care organizations (HCOs) as complex adaptive systems (CASs) contributes to the development of new strategies for their improvement.[1] Applying CAS theory to HCOs can help one see that efforts aimed at improving health care quality should consider the role of the relationships among organizational members.

Our research group has studied primary care practices for more than 15 years. We have focused on understanding change in primary care practices,[2,3] on primary care practices as "jazz groups,"[4] and on building relationships in primary care practices.[5] In this article we present research findings demonstrating the role of relationships in primary care practice performance and discuss the role of relationships in improving health care quality. Drawing on four data sets, we developed a model of practice relationships that identifies seven characteristics of relationships. We also discuss how these seven characteristics interact with reflection, learning, and sensemaking (unraveling surprising events) to influence quality of care.

Noting that quality of care emerges from the relationships among members of an HCO, we use CAS theory to discuss quality as an emergent property of HCOs. Although much existing research on relationships in health care is dominated by studies of only patient-physician relationships,[6,7] the research that we review considers practicewide relationships, including all clinical and nonclinical roles. Finally, we offer strategies for improving relationships among members of HCOs.

Quality as an Emergent Property

CAS theory is grounded in systems thinking, which emphasizes, in part, the role of interdependencies in system outcomes. We chose a CAS perspective,[1] as opposed to a complex responsive processes perspective,[8] because we believe a CAS (systems) perspective provides a more suitable structure for studying relationships in HCOs. CAS theory is a more comprehensive theory and has been more widely used for studying organizations.

Article-at-a-Glance

Background: Understanding the role of relationships in health care organizations (HCOs) offers opportunities for shaping health care delivery. When quality is treated as a property arising from the relationships within HCOs, then different contributors of quality can be investigated and more effective strategies for improvement can be developed.

Methods: Data were drawn from four large National Institutes of Health (NIH)–funded studies, and an iterative analytic strategy and a grounded theory approach were used to understand the characteristics of relationships within primary care practices. This multimethod approach amassed rich and comparable data sets in all four studies, which were all aimed at primary care practice improvement. The broad range of data included direct observation of practices during work activities and of patient-clinician interactions, in-depth interviews with physicians and other key staff members, surveys, structured checklists of office environments, and chart reviews. Analyses focused on characteristics of relationships in practices that exhibited a range of success in achieving practice improvement. Complex adaptive systems theory informed these analyses.

Findings: Trust, mindfulness, heedfulness, respectful interaction, diversity, social/task relatedness, and rich/lean communication were identified as important in practice improvement. A model of practice relationships was developed to describe how these characteristics work together and interact with reflection, sensemaking, and learning to influence practice-level quality outcomes.

Discussion: Although this model of practice relationships was developed from data collected in primary care practices, which differ from other HCOs in some important ways, the ideas that quality is emergent and that relationships influence quality of care are universally important for all HCOs and all medical specialties.

CASs are typically thought of as being made up of agents that are diverse and that interact in nonlinear ways. CASs display emergent properties, self-organize, and co-evolve with their environment. Table 1 (right) defines these key characteristics of CASs. We pay particular attention in this article to the property of *emergence.*

Emergent properties are system-level properties that arise over time from the local interactions among agents. Leadership[9] and strategy[10] are examples of organizational-level attributes that have been studied as emergent properties, and new understandings of these phenomena have been generated by studying them this way. Using a CAS perspective enables a helpful view of health care quality as an emergent property in HCOs.

Practice improvement efforts such as continuous quality improvement, which aim to improve organizations one component or one process at a time, are often less effective than expected. We believe that this is due to a misconceptualization of quality as something that can be achieved using strategies rooted in reductionism (a perspective that quality is improved by focusing on the parts/components of a system). In contrast, a CAS perspective enables a view of health care quality as an emergent property. Emergent properties cannot be explained by separately analyzing parts of a system.[11] Thus, with a CAS perspective it becomes clear that one cannot understand practice-level quality by understanding the quality of individual parts of a practice. We suggest that to improve health care quality, health care professionals must examine quality in holistic ways. Viewing quality as an emergent property provides health care professionals with an alternative way to make sense of successes and failures. For example, rather than trying to locate the individual responsible for a missed diagnosis, a practice can use the mistake as a way to think about the problem in terms of how the practice missed the diagnosis. This view also provides health care professionals with an alternative frame for designing and implementing quality improvement efforts (Table 2, page 459).

Individual components/processes are important for improving quality. Yet when one understands quality as an emergent property of HCOs, the relationships among its members become key levers for performance improvement. Efforts aimed at improving health care quality would focus on improving the relationships among the members of an HCO, rather than solely on improving individual components or individual processes of these systems. When quality is treated as a property arising from the relationships within the HCO, then different contributors of quality can be investigated and more effective strategies for improvement can be developed.

Table 1. Descriptions of Key Characteristics of Complex Adaptive Systems

Agents
- Parts or components
- Continuously acting and reacting to other agents
- Learn over time through interactions with other agents
- A source of diversity

Examples: atoms in a molecule, people in an organization, departments in an organization, businesses in an industry, cars on a highway, ants in a colony, subprocesses of a process

Nonlinear Interactions
- Situations where small changes/inputs can generate large consequences/outputs, or vise versa, where large changes/inputs can generate small consequences/outputs
- Generate uncertainty and unpredictability in complex adaptive systems

Examples: reaping small benefits from large investments in technology (e.g., electronic medical records), a small gesture that makes a patient feel important, similarities among patients exist and clinicians can learn from past experience but each patient is unique

Self-Organization
- Process through which agents interact locally and over time form stable patterns
- Occurs without hierarchical, or formal, control mechanisms
- Can be influenced, but not controlled

Examples: flocking behavior of birds, development of automobile traffic patterns, formation of peer groups, informal division of labor (e.g., when practice members decide among themselves who will do work tasks)

Co-Evolution
- Process of ongoing adaptation to the current environment
- Often discussed in terms of a landscape on which agents must sometimes move down into a valley before moving up to a higher peak

Examples: corporate strategies (e.g., for entering new markets or for gauging consumer interest), conversation with a patient, research programs, political campaigns

Emergent Properties
- Complex phenomena that arise from agents interacting using simple rules
- Properties that cannot be understood by studying parts, nor that can be explained by summing the properties of parts
- Arise from local nonlinear interactions of agents

Examples: wave patterns in waterways, results of a chess game, colonies created by insects, profitability, quality, safety

Methods

We drew data from four large National Institues of Health (NIH)-funded studies and used an iterative analytic strategy and a grounded theory approach to understanding the characteristics of relationships within primary care practices. These four studies were aimed at improving primary care practices.

Table 2. Two Views of Quality

Quality Is Designed/Imposed/Planned	Quality Is Emergent
Parts	**Relationships**
Quality is improved by focusing on improving the parts of a system.	Quality is improved by focusing on improving relationships among the parts of a system.
A system performs well when individual parts perform well.	A system performs well when relationships among its parts perform well.
Parts, or components, are valued.	Interdependencies are valued.
Scripted	**Improvised**
Quality arises through well-designed initiatives.	Quality arises through unfolding conversations.
Requires skills for carrying out predetermined plans	Requires empathetic listening skills
Encourages old patterns of interaction	Encourages new patterns of interaction
Diversity	**Diversity**
A threat	An opportunity
Inhibits learning	Enhances learning
People work based on old information about their environment	People pay attention to their environment and work based on new information.
Supports dominant discourses	Challenges dominant discourses
Achieved	**Evolves**

Methods consisted of direct observation of practices during work activities, direct observation of patient-clinician interaction, individual in-depth interviews with each clinician and other key staff members, surveys of patients and practice staff, structured checklists of the office environment, graphical representation of patient pathways during office visits, and chart reviews for clinical endpoints. This multimethod approach to observing practices amassed rich and comparable data sets in all four projects. The four studies are summarized in Table 3 (page 460), and a detailed overview can be found in Appendix 1 (available in online article).

Analysis of Relationships

We worked from case summaries prepared for each practice from each study. We performed a secondary analysis of project data, working iteratively from these sets of data. We developed our theory from these observations. We then looked to another set of data, the Using Learning Teams for Reflective Adaptation (ULTRA) study, to test and refine the emerging theory. After we identified a core set of relationship characteristics, we tested them in the ongoing ULTRA study.

Throughout this process we used several strategies to increase the rigor and quality of analysis. Analysis involved people with diverse roles (practice change facilitators, lead researchers, statisticians, nurses, administrators, educators, doctoral students) and from multiple research sites (Case Western Reserve University, Robert Wood Johnson Medical School, Lehigh Valley Hospital, the University of Texas at Austin, and University of Colorado). Analysis occurred in two interdependent phases—identification of characteristics and model building—both taking place during approximately a two-year period (January 2004–December 2005).

Model-Building Process

We met often to identify key relationship characteristics—that is, those that distinguish high- from low-performing practices in terms of patient outcomes—from the data and to develop a model of practice relationships. Our resulting model named *mindfulness, communication, tight and loose coupling, respectful interaction,* and *stable patterns of interacting*. We later included *trust* on the basis of the experience of practice facilitators. Similarly, notions of *tight and loose coupling* evolved during multiple discussions to *social and task relatedness*. We also noted the need to include *heedfulness* as a distinct characteristic, capturing different behaviors than those captured by mindfulness. As we worked on identifying key characteristics of practice relationships, we examined relevant literature and used it to guide both our inquiry and the refinement of the set of characteristics. After multiple discussions and returning to the data, we named the "Magnificent Seven" as follows: (1) trust, (2) mindfulness, (3) heedfulness, (4) respectful interaction, (5) diversity, (6) social and task relatedness, and (7) rich and lean communication.

We then connected these seven characteristics to the activities of reflection, sensemaking, and learning. We engaged facilitators on the ULTRA project in verifying our model by

Table 3. An Ongoing Federally Funded Research Program to Understand Primary Care Practice Change and Improvement*

Project Name (Acronym)	Funding Source and Dates	Aim	Design and Sample	Findings
Direct Observation of Primary Care (DOPC)	NCI R01 CA60862 (PI, Stange) 1994–1997	Understand the content and context of primary care practice with a particular focus on preventive service delivery	Multimethod study of 4,454 patient visits to 138 physicians from 84 practices in Ohio	The value of the complexly related processes of primary care is from integration of breadth, depth, bridging boundaries, and guiding access.
Prevention and Competing Demands in Primary Care (P&CD)	AHRQ R01 HS08776 (PI, Crabtree) 1996–1999	Understand preventive service delivery within the context of the competing demands of primary care practice	Ethnographic comparative case studies of 18 practices in Nebraska	Each practice is unique because of history and initial conditions, particular agents, patterns of nonlinear interactions among agents, the local fitness landscape, and evolving regional and global influences.
Study to Enhance Prevention by Understanding Practice (STEP-UP)	NCI 2R01 CA60862 (PI, Stange) 1997–2001	Improve preventive service delivery through practice-individualized interventions	Group randomized trial of 80 Ohio practices	Practice-individualized, facilitated intervention can result in sustained improvement in preventive service delivery.
Using Learning Teams for Reflective Adaptation (ULTRA)	NHLBI R01 HL70800 (PI, Crabtree) 2002–2008	Improve to enhance relationships and cardiovascular disease care through Reflective Adaptive Processes	Group randomized trial of 60 New Jersey and Pennsylvania practices	A Reflective Adaptive Process can improve practice communication and processes, but these changes may not be reflected in narrowly construed process measures of quality of care.

* NCI, National Cancer Institute; PI, Principal Investigator; AHRQ, Agency for Healthcare Research and Quality; NHLBI, National Heart Lung and Blood Institute.

checking it against emerging data—applying the model of relationships to primary data from the ULTRA study in real time. Facilitators returned to the field to look for these characteristics, contradictory examples, and alternative characteristics. It was this ongoing, iterative process that enabled us to continually see new things in the data and to refine our model accordingly. Figure 1 (page 461) illustrates the model-development process.

We then held three additional face-to-face discussions with practice change facilitators from three research institutions. These discussions helped us assess the extent to which the characteristics identified accurately represented key characteristics of relationships in other primary care practices. A detailed time line of the model-building process can be found in Appendix 2 (available in online article).

Findings

The Seven Relationship Characteristics

In a majority of the cases, all seven relationship characteristics were present in practices that met the outcome goals of our studies, that is, practices that were high performers. We believe these seven characteristics to be important in both practice improvement and in the achievement of high-quality health care. We now describe each characteristic in detail. Table 4 (page 462) provides definitions of the relationship characteristic and examples of how each appears in the practices.

Trust. Trust is exhibited when one individual is willing to be vulnerable to another individual. Trust is particularly important in health care because the relationships among members of health care teams are highly collaborative and interdisciplinary. Trust can be difficult to foster; the culture of health care delivery often works against the development of trusting relationships.[12] Policies and procedures in HCOs may lead to distrust. Risk of litigation and clinical documentation requirements can also erode trust. A study of trust in the context of telemedicine showed that physicians must trust each other before physicians will use telemedicine in caring for patients.[13] We believe that practices with high levels of trust will be able to have difficult conversations and will be able to openly discuss and learn from successes, failures, and near failures.

Mindfulness. Mindfulness is a social characteristic exemplified by the openness to new ideas and multiple perspectives,[14] a fully engaged presence,[15] a rich awareness of discriminatory detail,[16] and the seeking of novelty, particularly in seemingly routine situations. Mindfulness is a purposeful cultivation of

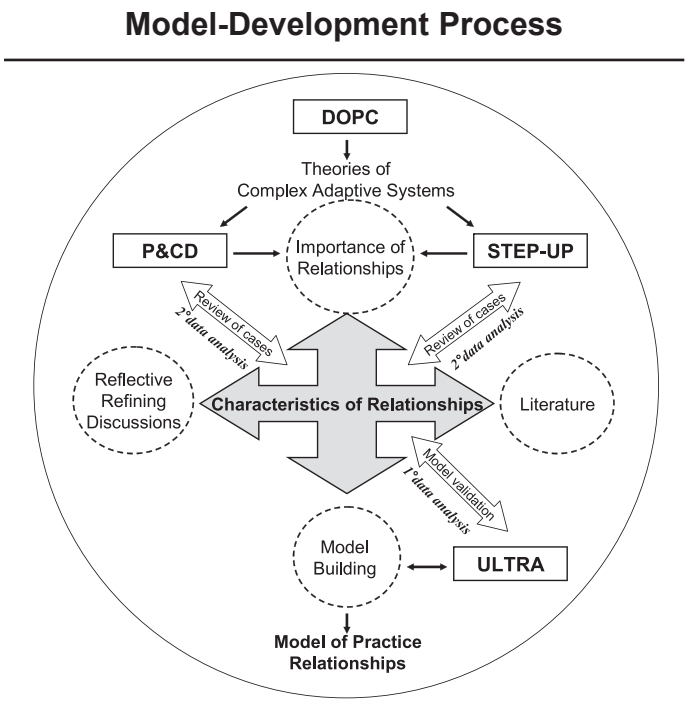

Figure 1. *The figure illustrates the model-development process. DOPC, Direct Observation of Primary Care (DOPC) study; P&CD, Prevention and Competing Demands in Primary Care study; STEP-UP, Study to Enhance Prevention by Understanding Practice; ULTRA, Using Learning Teams for Reflective Adaptation study.*

awareness. People in practices must be aware to be open to novelty. Mindfulness has been shown to be critical in the effective practice of health care.[17–19] Mindful approaches are characterized by a continuous creation of new categories, openness to new information, and implicit awareness of more than one perspective.[20] Mindfulness—which must be practiced because it is not innate—occurs when people question their assumptions about the nature of the world.

Heedfulness. Heedfulness occurs when an individual pays attention to his or her specific task at hand[21] as well as to the task of the larger group. In heedful practices, people watch to see how their actions influence the actions of the group, and they seek awareness about how their actions are intertwined with the actions of other members of the practice. Heedfulness is difficult to achieve because of the many competing demands placed on health care professionals. Fostering heedfulness, however, might be an effective strategy for reducing medical errors because "when heed is spread across more activities and more connections, there should be more understanding and fewer errors."[21(p. 366)]

Respectful Interaction. Respectful interaction is characterized by honesty, self-confidence, and appreciation of others. In relationships characterized by respectful interaction, new meanings often emerge through interaction.[21] For example, in a staff meeting where practice members are interacting respectfully, it is likely that the solution to a particular problem will be created by the group, as opposed to an individual. Medical errors are an unfortunate part of the health care delivery process, but respectful interaction can enable learning from mistakes. Practices can learn from mistakes when people actively seek out and value the opinions of others (appreciation of others), freely share opinions even when these opinions may be unpopular (honesty), and willingly change their minds in response to new meaning created within the practice (self-confidence).

Diversity. Primary care practices are made up of diverse people. Here we focus on *cognitive* diversity. Cognitive diversity is the differences in perspectives and world views of individuals (how people think). Moderate levels of diversity can help organizations operate effectively in competitive environments, process information, and learn in real time.[22] Too little diversity can block creativity and innovation, and too much diversity can block communication. Diversity in a primary care practice can increase people's capacity for making sense of the world and broaden the range of available solutions for problems.

Social and Task Relatedness. Both social and task relatedness are important in practice relationships. Social relationships are personal in nature and are often based on friendships or family relationships that extend outside of work. Task relationships are focused on work issues. Members of a practice characterized by high task relatedness rarely discuss non-work-related topics with one another. The data from the four studies indicated that practices with relationships that were too socially oriented (conversations were dominated by personal topics) and practices with relationships that were too task oriented (conversations were dominated by work topics) tended to perform more poorly than practices with a mixture of social and task relatedness. Our findings suggest that social and task relatedness is not an "either/or" attribute. We suggest that both social and task relatedness are needed for practices to deliver high-quality health care.

Rich and Lean Communication. We noted the following commonly used communication channels (in the order of richest to leanest) in primary care practices: (1) face-to-face, (2) telephone, (3) personal documents (for example, letters, e-mails, reminders), (4) impersonal documents (mass e-mails and impersonal memos), and (5) numeric documents (appointment schedules and budgets). When ambiguity is high, practices should use face-to-face communication channels, which allow for rapid information flow and for the clarification of meaning

Table 4. Definitions and Practical Applications: How Relationships Appear in Practice

Characteristic	Definition	Practical Application: Examples of How Characteristics Appear in Practice
Trust	Willingness of an individual to be vulnerable to another individual	■ Practice members seek input from each other and use others' input in decision making. ■ Physicians have confidence in using standing orders. ■ Practice managers make decisions based on opinions received from staff. ■ Practice members can have difficult conversations. ■ Practice members can openly discuss successes, failures, and near failures to enhance learning.
Mindfulness	■ Openness to new ideas and different perspectives ■ Fully engaged presence ■ Rich discriminating awareness ■ Seeking novelty (even in routine situations) *Any 1 of these 4 descriptors represent mindful relating.*	■ Practice members freely question their own assumptions about the nature of the world. ■ Practice members seek novelty in situations to learn and improve. ■ Practice management encourages staff to share their ideas about ways to improve patient flow or preventive care delivery. ■ Practice members participate in a continual refinement of expectations and an ongoing search for nuance in each context faced.
Heedfulness	Interaction where individuals are sensitive to the task at hand (the job they are doing) and are paying attention to the way their roles and actions fit into (affect) the roles and actions of the entire group *Both descriptions must be true for heedful interrelating to be present.*	■ Nurse managers take seriously their responsibility to continually look for and anticipate moments where they might be needed to support practice staff. ■ Practice members watch for opportunities to clarify misunderstandings, e.g., between a patient and another member of the practice staff. ■ More experienced medical assistants not only perform their job well but also look for opportunities to help fellow medical assistants perform well. ■ Physicians pay attention to how their work-flow patterns are affecting the work-flow patterns of other physicians in the practice.
Respectful Interaction	Honest, self-confident, and appreciative interaction among individuals; often creating new meaning *Respectful interaction is often the most difficult of the seven characteristics to observe.*	■ Practice members actively seek out and value the opinions of others (appreciation of others). ■ Practice members feel free to share their own opinions even when their opinions may be unpopular (honesty). ■ Practice members are willing to change their minds in response to new meaning co-created with others in the practice (self-confidence).
Moderate Level of Diversity	Differences in individual perspectives, thoughts, and views of the world that enhance group problem solving and creativity	■ Differences in individual perspectives pertaining to issues such as the value placed on practice management, approaches to problem solving, attitudes regarding conflict resolution, and beliefs about how patients fit into the health care system ■ The presence of tension between mental models held by individuals in a practice
A Range of Social and Task Relatedness	*Social relatedness* is characterized by non-work-related conversations and activities. *Task relatedness* is characterized by work-related conversations and activities.	■ Practice members take a genuine interest in each others' lives outside of work—e.g., their marriages, children, parents' health. ■ Practice members discuss work-related issues in an effort to provide high-quality health care. ■ In combining work (task) and personal (social) aspects of health care delivery, primary care practices can provide medical care characterized by community, connectivity, and intimacy.
Communication Effectiveness: A Mixture of Rich and Lean Channels	Face-to-face conversation is a form of rich communication and is most effective when messages are highly uncertain or ambiguous. Impersonal documents are lean forms of communication and are most effective when messages are clear and non-threatening.	■ When ambiguity is high (e.g., a pending change in health plan coverage), practice members should use channels that allow for rapid information flow and that enable the clarification of meaning in real time (e.g., one-on-one conversations, small-group meetings) ■ Less ambiguous messages (e.g., routine outcomes of staff meetings, practice hours during holidays) can be communicated using a leaner channel (e.g., memo, e-mail).

Conceptual Model Depicting the Relationship Between Seven Characteristics of Practice Relationships, Reflection, Sensemaking and Learning, and Practice Outcomes†

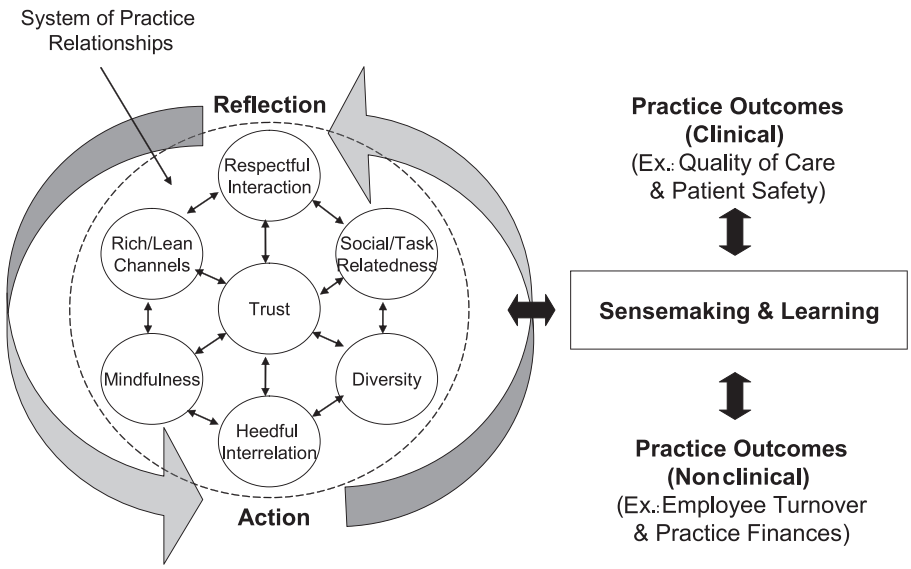

Figure 2. *This figure represents work underlying Figure 2 published in Safran D.G., Miller W., Beckman H.: Organizational dimensions of relationship-centered care: Theory, evidence, and practice.* J Gen Intern Med *21(suppl. 1):S9–S15, Jan. 2006. The original work is acknowledged there. Model building occurred iteratively through the identification of relationship characteristics. Although secondary analysis of P&CD and STEP-UP data was performed before primary analysis of ULTRA data, both primary and secondary data analyses informed model building.Ex, example.*

in real time (one-on-one conversations and small-group meetings). Less ambiguous messages can be communicated using a leaner channel (memo or e-mail). The medical record—electronic or paper—is often a major communication channel in primary care practices, and its richness/leanness varies depending on the user and the specific context in which it is being used.

A Model of Practice Relationships

How do relationships support the emergence of health care quality? We believe that for relationships to contribute to an emergence of high-quality care, practices must participate in effective reflection and learning and sensemaking. The model shown in Figure 2 (above) integrates our current understanding of how relationships support the emergence of health care quality.

Reflection. Reflection is a dynamic, conscious process that occurs when individuals attempt to make sense of and/or learn from challenging situations.[23] Both reflection-in-action and reflection-on-action[23,24] are important in mediating the relationship between practice relationships and practice outcomes. A model previously published by our group[3] demonstrates that reflection on key actions by practice members can both improve practice outcomes and change the nature of relationships among practice members. The model we present here builds on that previous research.

Sensemaking and Learning. Sensemaking and learning are particularly useful strategies for dealing with the kinds of ambiguity that often arise in HCOs. For a practice to grow, change, or improve it must be able to make sense of and learn from its environment. Sensemaking is a social act of retrospectively unraveling a surprising flow of events.[25] Qualitative differences can exist in the sense that is made from an event, and not all sensemaking is beneficial to organizations. Because sensemaking is a social activity, we believe that practice relationships are critical to the quality of the sense that is made from unexpected events.

Learning is also a social act. One way to improve health care quality is to encourage a culture of learning—learning from mistakes, learning by doing, and learning by experiencing history richly.[26] Our model relies on the logic that effective learning can improve the quality of care delivered by a practice.

Improving the relationships among practice members is one way to improve sensemaking and learning. People in a practice

who trust one another will be more likely to admit when they are unsure about how to solve a particular problem, increasing the likelihood that learning will occur. Clinicians relating heedfully with others will be more likely to recognize when a front-office staff member needs more information about the patient to do his or her job well. A diverse practice is more likely to have a broader set of perspectives with which to observe and make sense of important practice issues. Effective sensemaking and learning can improve a practice's capacity to make decisions and take actions that lead to better health care quality.

Discussion

Although this model of practice relationships was developed from data collected in primary care practices, which differ from other HCOs in some important ways, the ideas that quality is emergent and that relationships influence quality of care are universally important for all HCOs and all medical specialties. All HCOs are made up of people who learn and make sense of their experiences. The importance of relationships has been recognized by the Accreditation Council for Graduate Medical Education, whose general competencies place significant emphasis on communication and interpersonal skills, systems-based practice, and professionalism.[27] Similarly, the recent review of the United States Licensing Examination has brought forth recommendations to change the examination to include measurement of a broader array of competencies that will include domains related to our findings.[28]

Table 5 (page 465) provides vignettes of two primary care practices, one practice with good relationships and one practice with relationships that need improvement. Tables 4 and 5 can be used to help practices assess their relationships and to guide strategies for improving practice relationships.

Periodic assessment of practice relationships can be used to indicate progress in achieving good relationships.[5] Practices need to evaluate trust as a precondition for using relationships to improve health care quality. Lack of trust may be most apparent when staff are hesitant to speak up and offer perspectives. Willingness to speak up and become vulnerable, particularly in discussing an error in care, might not happen overnight. Rather, it will likely require steady attention of practice leadership to create and nurture a practice culture that values candor and new ideas.

To enhance diversity, practices should avoid the tendency to hire people just because they "fit in" and should take advantage of the range of experience that may be available. A balance of social and task relatedness can be apparent in conversations that take place, and a healthy work environment will find staff talking about both job-related tasks and their social lives outside the office. Similarly, practice leadership should ensure that modes of communication are appropriate to the message—a posted memo may be most appropriate for communicating routine administrative detail but would be inappropriate for communication around plans to downsize.

Attending to mindfulness, heedfulness, and respectful interaction present more of a challenge. Encouraging interactions among people in practices who don't normally interact can help foster relationships that are mindful, heedful, and respectful. Physician leaders, in particular, need to make an effort to seek input from practice staff with whom they don't routinely interact.

Finally, practice leaders must understand that learning and sensemaking are influenced by patterns of relating that occur in their practice. Practice management needs to provide time and space for reflection. It is difficult in the hectic daily routine of health care to avoid the pitfall of believing that one is too busy to take time to understand what is going on around one and how one's efforts to improve are playing out in real time. If we believe that health care practices are CASs and that quality of care is emergent, then strategies that focus on relationships, and the time to use them, become important in efforts to improve health care.

We need to reduce our tendency to train health care professionals in isolation from one another and consider ways of integrating training programs so that health care professionals can come to a better understanding of their interdependence. The analysis presented in this article suggests a need for training efforts designed to enhance the ability of health care professionals to work together to achieve the goals of the practice. Training used to help businesses improve interpersonal communications may also be applicable in efforts to improve relationships in HCOs.

Evidence confirming the model of practice relationships is limited. Research is needed to test the interdependencies among the constructs in the model. For example, is trust required for progress in the other characteristics? Previous research in ICUs, operating rooms, and nursing homes has shown the importance of relationships for improved performance. Additional research, however, in multiple health care settings that examines specific characteristics of relationships is needed. Research is also needed that helps us understand the ways in which promotion of these seven relationship characteristics can improve health care quality. More broadly, HCOs' participation in such research will depend on their willingness to examine the behavioral aspects of health care delivery. J

Table 5. Vignettes of Two Practices Showing Examples of Each Relationship Characteristic*

Characteristic	Practice Alpha	Practice Beta
Trust	■ "She [the administrator] asked me [office clerk] what I thought about it and I told her and the next week she did just that." ■ "When the managers are away from the office, we pretty much run the clinic."	■ "We don't have any say in the decisions around here." ■ "They never ask our input." ■ "They do ask our input and don't use it."
Mindfulness	■ "I like to sit with front office staff when they are learning something new so that I can learn, too." ■ "I rely on my employees to tell me what they think so we can do better."	■ "That's not the way we do it here." ■ "I can't think of a situation that there's not a procedure for."
Heedfulness	■ "Before I make a new policy or change an existing one I talk with everyone to see how it would impact their day." ■ "I think we should spend more time with people in different roles so that we can see how what we do impacts others."	■ "I don't have a good feel for how my work fits in back there [the clinical side]." ■ "We're so busy back here that we don't have time to check how we impact each other."
Respectful Interaction	■ Every morning, clinic members hold a "huddle" where people openly participate and share ideas about the day before and the day ahead. ■ "I encourage people to speak up and share their thoughts so that we can all improve and learn."	■ "I don't feel comfortable sharing my opinion about things here." ■ "People here don't take my ideas seriously so why should I speak up?" ■ "When people try to make improvements here, they are seen as a negative thing."
Diversity	■ "We need people who think differently from the rest of us. If they weren't here, we'd probably be doing the bunny hop down the hallway." ■ Each nursing unit had one person that stood out from the rest in terms of how they approached their work and how they got work done.	■ "It's a shame that those two were broken up. They worked really well together and were doing really interesting, new things." ■ "We can't have each of our care teams doing different things." ■ "If we do things differently here, we are penalized."
Social/Task Relatedness	■ A mixture of social and task relatedness was observed. ■ We observed that people in Alpha were open with each other in discussing personal/social matters.	■ Very little social relating was observed; high task relatedness. ■ "When we get too close, we are separated." ■ "People here view this as a job…that's it."
Rich/Lean Communication	■ People tended to use face-to-face communication when they had questions or need a nonroutine problem solved ■ Depending on the issue, people used a telephone, overhead pager, and/or face-to-face meetings to address problems.	■ "I often miss important messages because I hear about them over e-mail—I hear nothing about it until I need to know and then it's too late." ■ "It's a waste of time to sit in meetings and be given information that's not relevant to my job."
Practice Relationships Profile Summary	At Alpha, all practice members were given the responsibility and authority to do the work of the practice. Practice member input was seen as necessary for getting the work of Alpha done well. This culture was palpable in the front office and back office alike. Members of Alpha talked about mistakes. They freely self-organized around the work and were encouraged to do so as long as the work was accomplished well. People at Alpha used humor to relate with each other and to do their work. Alpha's relationship system enabled a positive practice environment and facilitated high-quality health care.	Standardization of care delivery was an overarching goal for Beta. Beta management worked to dampen self-organization that did not fit with the formal rules, structures, and procedures of Beta. Nursing staff were regularly asked to rotate through teams to discourage ways of doing things that deviated from the way things were normally done at Beta. Because people at Beta could not self-organize openly, they found different, sometimes destructive, ways to self-organize. Beta's push for standardization created an environment of care where practice relationships were lost and quality of care suffered.

* These vignettes represent composites of typical behaviors in the primary care practices that were examined in the DOPC, P&CD, STEP-UP, and ULTRA Studies (see Table 3). The Alpha and Beta practices are both fictional, Alpha representing an idealized example of a practice with good relationships and Beta an example of a practice with relationships that need improvement.

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Appendix 1. Overview of Four National Institutes of Health–Funded Studies

Appendix 2. Timeline of Model-Building Process

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Appendix 1. Overview of Four National Institutes of Health–Funded Studies

DOPC and P&CD Studies

The first two studies were observational and provided rich data from relatively small, autonomous primary care practices. The Direct Observation of Primary Care (DOPC) study included intense observation of more than 4,000 outpatient visits in 84 Ohio practices. The DOPC data provided insights into the diversity of physician, patient, and practice characteristics that needed to be understood and the necessity for understanding practices as Complex Adaptive Systems (CAS).

Emerging insights from the DOPC study led to the design of a more detailed study to better understand the organization of primary care practices and the variation seen in the delivery of preventive services. The Prevention and Competing Demands in Primary Care study (P&CD) studied 18 Nebraska family practices using a multimethod ethnographic design that involved extensive observational field notes of clinical encounters and the office system. Existing practice personnel, their roles and duties, and their relationships and interactions with other staff members were characterized in a practice genogram.

STEP-UP and ULTRA Studies

Insights from these observational studies were used to design two subsequent intervention studies aimed at enhancing the quality of care being delivered in practices. These subsequent studies incorporated key concepts from CAS theory to understand and improve preventive care in primary care practices. The first intervention study, Study to Enhance Prevention by Understanding Practice (STEP-UP), was a group randomized clinical trial of 80 family practices in Ohio. In this intervention, a facilitator observed practice operations and patient visits and conducted key informant interviews, focusing on the practice's values, structures, and processes. This assessment was used to help practices reflect on their goals and alter their practice structures and processes to enhance preventive service delivery in ways congruent with their core values. The intervention concentrated on having practices choose and implement change from a menu of tools and approaches that had been found to be effective in previous studies. Results from the STEP-UP trial revealed substantial variation across practices in terms of their ability to make improvements in cancer screening in both intervention and usual care groups. Following up on this study, we performed a systematic comparative case analysis of STEP-UP qualitative data and used these insights to develop a model of organizational change. The model emphasizes practice stakeholder motivation, external motivators, opportunities for change, and practices' intrinsic resources for change. The latter includes a wide array of strengths, skills, resources, and competencies such as leadership and decision making, culture, communication and relationships, management infrastructure, and access to and use of information.

On the basis of a developing understanding of the dynamics of change in primary care practices, the Using Learning Teams for Reflective Adaptation (ULTRA) study was launched as a group randomized clinical trial of 60 primary care practices in New Jersey and Pennsylvania. The ULTRA trial introduced a facilitated Reflective Adaptation Process (RAP) to engage practices in analyzing and solving their own problems. RAP also engaged patients on cross-functional practice improvement teams. After a two-week multimethod baseline assessment, practice improvement teams were guided through 8–12 weekly sessions by an ULTRA facilitator who, in addition to guiding practice improvement efforts, emphasized improved communication and relationships among practice personnel. Although data from ULTRA are still being analyzed, there are initial suggestions that the practices were able to engage with the intervention, improve relationships, and make changes that should improve quality of care.

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Formal reports of these studies are included in the following publications:

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Appendix 2. Time Line of Model-Building Process

January 9, 2004. At a collaborative team meeting in San Antonio, Texas, we identified mindful relationships and patterns of relationships that were too "tight" or "frozen" in our existing data set. We retained mindfulness but subsequently dropped the latter characterization after looking more closely at the data and not seeing this characterization consistently part of what seemed to be distinguishing high from low performers.

January 17, 2004. After several sessions of in-depth, explorative discussion, we named *mindfulness, communication openness, tight and loose coupling* (refinement of above "frozen" patterns), *respectful interaction* and *stable patterns of interacting* at a research meeting in Austin, Texas.

August 27, 2004. While discussing the data at a Using Learning Teams for Reflective Adaptation study (ULTRA) consultant retreat in New Jersey, we added *trust* to the set of characteristics and rejected *tight and loose coupling* and *stable patterns of interacting* as we found these characteristics to be inconsistent with the data.

September 2, 2004. During a collaborative team meeting in Denver, continued examination of the data using our model of relationships led us to identify "The Fabulous Four"— *trust, mindfulness, mutual respect,* and *tight and loose connections*—with an emphasis on having a diverse mixture of connections.

November 10, 2004. During discussions at an ULTRA consultant retreat, the 4th characteristic evolves into *diverse connections.* At this point, we have four relationship characteristics in our model of work relationships: *mindfulness, mutual respect, trust,* and *diverse connections.* We then set out to test this model in the new ULTRA data set.

December 5, 2004. While exploring alternative characteristics and refining our model using the ULTRA data set, we asked ourselves, what about the roles of (1) practice member perception of psychological safety, (2) the degree of language sharing among practice members, and (3) the level of participatory decision making in practices in distinguishing high from low performers?

January 5, 2005. At an investigators' retreat, we noted the need to include *heedfulness* as a distinct characteristic, capturing different behaviors than those captured by mindfulness, and heedfulness was added to the model. At this time, we rejected the three alternatives generated on December 5, 2004, on the basis of lack of congruence with the data.

January 12, 2005. A special ULTRA research meeting was held in New Jersey for the purpose of discussing the work on relationships. At this meeting, we named the "Magnificent Seven"—(1) *mindfulness*, (2) *respectful interaction*, (3) *trust*, (4) *diversity*, (5) *heedfulness*, (6) *strong and weak ties* and (7) *rich and lean communication*—and begin constructing a grounded theory. We connected these seven characteristics to sensemaking, improvisation, and learning and called this model the "Reflective Practice Model." At this meeting, we specifically and deliberately asked the research facilitators on the ULTRA project to reflect on these seven characteristics and provide us with explicit feedback about the ability of this model to capture key factors that seemed to distinguish high from low performers. Finally, we created items for each of the seven characteristics to be included on the ULTRA practice staff questionnaire.

Late Winter 2005. *Trust* was dropped from the model because we were not convinced that it was not already fully captured in the concept of respectful interaction.

Spring 2005. *Trust* was restored by facilitator feedback with clearer differentiation from others involved in the research and from the literature on both trust and respectful interaction.

August 16, 2005. During discussions at an ULTRA consultant retreat in New Jersey, the concept of strong and weak ties evolved into *social and task relatedness*. This new conceptualization on practice member connectedness, or network, seemed to reflect more clearly what we were observing in the data.

December 5, 2005. An extensive review of the literature generated refined definitions of the seven characteristics and resulted in a more formalized model of work relationships in primary care practices.