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Accelerating Care Integration

Report of the
Lucian Leape Institute Roundtable
On Care Integration

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Lucian Leape Institute
at the National Patient Safety Foundation

The Lucian Leape Institute at NPSF, established in 2007, is charged with defining strategic paths and calls to action for the field of patient safety, offering vision and context for the many efforts under way within health care, and providing the leverage necessary for system-level change. Its members comprise national thought leaders with a common interest in patient safety whose expertise and influence are brought to bear as the Institute calls for the innovation necessary to expedite the work and create significant, sustainable improvements in culture, process, and outcomes critical to safer health care.

National Patient Safety Foundation

The National Patient Safety Foundation (NPSF) has been pursuing one mission since its founding in 1997—to improve the safety of care provided to patients. As a central voice for patient safety, the Foundation is committed to a collaborative, multistakeholder approach in all that it does. NPSF is an independent, not-for-profit 501(c)(3) organization. Information about the work of the National Patient Safety Foundation may be found at www.npsf.org.

ACKNOWLEDGMENTS

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PREFACE

Since 2007, the Lucian Leape Institute has concentrated its mission on providing a strategic vision for improving patient safety. The Institute's primary focus has been to identify new approaches to improving patient safety and to encourage key stakeholders to assume significant roles in advancing safe health care practices.

In particular, the Institute has identified five vital transforming concepts that require system-level attention and action: medical education reform; active consumer engagement in health care; transparency as a practiced value in everything we do in health care; integration of care within and across care delivery systems; and restoration of joy and meaning in work and ensuring the safety of the health care workforce (Leape et al. 2009). This report addresses the issue of care integration with the aim of outlining the major barriers to effective integration and providing a framework for further consideration and action among stakeholders.

In the course of conducting research for this report, the Leape Institute convened a Roundtable to explore the issue in depth. This diverse group addressed a number of questions: Why has care integraton been so difficult to achieve? What are the chief obstacles to accelerating care integration at the level of individual care systems as well as at the national level, as a matter of public policy? What levers can accelerate the formation of integrated care solutions and move the nation to a system capable of delivering consistently high levels of safety, effectiveness, and efficiency?

This report builds on the insights that emerged from the Roundtable's discussions, as well as research from the field and the experience of the Leape Institute members. It should not be viewed as a consensus document, but rather as a summary of the Leape Institute's position on this important issue.

OVERVIEW

Although the link between poor integration and preventable errors in patient care is a recent finding, recognition of the importance of integration dates back at least 80 years. In 1932, the members of the independent Committee on the Costs of Medical Care argued that greater specialization required close attention to coordinated and integrated solutions (Perkins 1998). In 1973, the Health Maintenance Organization (HMO) Act emphasized the importance of care integration to improve care for patients and lower costs (Public Law 93-222, 42 U.S.C. § 300e), a theme that was repeated in the unsuccessful Health Security Act of 1993 sponsored by the Clinton Administration (H.R. 3600, I.H., 1993).

Lack of care coordination and integration was identified as a major contributor to the frequency of avoidable errors in patient care in the Institue of Medicine (IOM) report *To Err Is Human* (Kohn et al. 1999). Care integration was presented as the cornerstone for achieving high quality in the subsequent IOM report *Crossing the Quality Chasm* (2001). The Agency for Healthcare Research and Quality (AHRQ) has included care integration and patient safety in its scope of work since early in this decade. Federal government administration arguments for the Patient Protection and Affordable Care Act of 2010 included numerous references to this issue.

Poor integration affects patient safety in different ways depending on the care requirements of a specific patient and is driven by such factors as illness, expectations, custom, and culture. Most failures of coordination occur during care transitions, when there is a failure to transfer key pieces of information during handover and to ensure the completion of essential tasks of care (Bodenheimer 2008). Examples include failure to transfer the results of medical tests and even the medical record as a whole, specialists receiving little or no information from referring primary care providers, and inadequate or missing discharge summaries.

Handover-related failures are made more likely by increasing size and diversity of the teams involved in the care of individuals, and in the delivery organizations involved in the care of populations. These problems are exacerbated by the growing

diversity of the patient population in terms of both clinical and sociocultural requirements. In poorly integrated systems clinicians rarely address complex clinical problems through shared, real-time discussions and cooperative problem solving among themselves. Even less frequently does shared decision making include the patient and family. Instead patients are "tossed" from one specialized professional or service to the next. The result for the patient and family can be conflicting therapies, increased risk of drug-drug interactions, confusing instructions, and uncoordinated treatment follow-up requirements.

Modern care delivery is extraordinarily complex. To protect the patient and avoid errors requires a planned, coordinated, and fully integrated approach to care. In addition to the complexity inherent in modern treatment for patients with difficult and often multiple conditions, complexity is found throughout the care experience: in the number of physicians involved, the number of professionals and support personnel required, the multiple venues where care is provided, and the diverse requirements and expectations of patients.

The more serious the illness, the greater the likelihood that the patient will suffer multiple related illnesses, receive care from multiple caregivers in multiple settings, need ongoing care, and require multiple drugs each with the potential to harm if taken incorrectly or not monitored carefully (Pham et al. 2007). Each transition requires another handover, either to another provider or another part of the system. Even for the same provider, it may be difficult to maintain accurate information over time. Coordination of care requires that information flows with the patient, insights are shared, treatments are coordinated, and decisions are transparent and collaborative. Failure to operate this way increases the potential for harm (Sutcliffe et al. 2004).

> *Coordination of care requires that information flows with the patient, insights are shared, treatments are coordinated, and decisions are transparent and collaborative.*

Complexity is also driven by the changing disease burden that society bears. Already the majority of care in the United States is directed to patients with chronic illnesses, often with multiple conditions. Advances in diagnostic precision and therapeutic effectiveness are accompanied by greater complexity and risks to the patient when these advances are used inappropriately. This is especially true in the case of the more serious chronic illnesses like diabetes, heart disease, stroke, and mental illness. As our society ages, and as the effectiveness of health care continues to improve, we can expect to see further growth in the prevalence of chronic illnesses and corresponding growth in the complexity of the care processes they require.

The growth in specialization adds further challenges to the care process. Since the end of World War II, the number of medical specialties has grown from 12 to more

than 130 (Donini-Lenhoff and Hedrick 2000). For the past four decades, medical students have gravitated to higher-paid, technology-oriented specialties. In 2010 graduates were four times more likely to choose to train and practice in a specialty or subspecialty than in primary care or family practice (Jeffe et al. 2010). Specialization has also affected the supporting professions, as the number of categories of support personnel in health care has grown from 10–12 just after World War II to more than 200 today (Ruzek et al. 1999).

Changes in primary care are of particular concern because of the role primary practitioners have played historically in coordinating the care of their patients, as well as expectations of the new role they might play in the future in the medical home model of primary care (Friedberg et al. 2009). Traditionally, specialists have played a minimal role in coordinating the patient's overall care. Not only are the primary practitioners of today reduced in number, those in practice have increasingly less time to devote to care coordination (Bodenheimer and Pham 2010). In addition, few insurance plans pay for coordination of care.

While some argue that rebuilding the primary care infrastructure can offset the negative impact of specialization on care integration by providing a medical home for the patient and greater care coordination among the various specialists and service providers, the numbers do not add up. The Association of American Medical Colleges (AAMC) predicts a shortage of 50,000 primary care physicians by 2025, part of an overall shortage of 157,000 physicians by that time (AAMC annual meeting 2008). Promising pilots are under way. However, the cost and time required to create a new delivery model driven from primary care providers make this alternative highly challenging. In the absence of effective primary care, disruptive direct-to-consumer solutions are emerging that are unrelated to the medical care system and that can further fragment care, at least in the shorter term (Goldsmith 2002).

In addition to the above, a host of other factors add further complexity to medical care. For example, the nation's public and private R&D establishment carries out more than $100 billion of health-related research and development work each year, producing a fire-hose-like stream of innovations, discoveries, new treatments, new diagnostic tools, and new devices annually that have overwhelmed the ability of doctors and the delivery system to incorporate them safely and cost effectively (Research!America 2011). Many service innovations are associated with the creation of new commercial entities, such as disease management and wellness companies, that further increase the number of players involved in the care of an individual patient and the complexity of organizational boundaries that must be traversed to provide seamless, coordinated care. Increasingly patients must navigate through a disjointed and fragmented array of hospitals, clinics, outpatient services, nonphysician solutions (e.g., ready clinics), online support systems, and more, to get their care.

Another complicating factor is the U.S. system for financing health care. Patients and their families face a blizzard of choices of how to pay for their care, as employers shift costs onto employees and their families or offer a widening array of financing solutions. Adding further complexity is the growth of "alternative medicine," also called "complementary medicine," which may offer a series of diagnostic and therapeutic options that lie outside traditional allopathic medical care. Despite potential adverse interactions with allopathic care, patients are often reluctant to disclose their use of alternative treatments to traditional providers (Eisenberg et al. 2001).

Modern health care presents a difficult challenge: as our ability to recognize and treat disease continues to grow, so too does the complexity of delivering those solutions to each patient and to populations. As a consequence, the risks of harm also rise unless careful attention is given to the way care is organized and delivered, that is, to the system of care delivery itself (Shortell and Singer 2008). The system must be designed to protect the patient while ensuring that he or she receives the full benefits of the remarkable advances that have occurred over the past century (Bohmer 2009).

And here we arrive at *care integration, the planned, thoughtful design of the care process for the benefit and protection of the patient.* Unfortunately, physicians and leaders of delivery systems (with notable exceptions such as those at the Mayo Clinic, the Geisinger Health System, and Kaiser Permanente) have been unwilling or unable to embrace greater care integration. As described in *Crossing the Quality Chasm* (IOM 2001), most patient care is fragmented and uncoordinated. Where integration has occurred, it is most often structural: assembling piece parts under a single governance umbrella while leaving the underlying care delivery processes largely untouched (Nolte and McKee 2008).

The care delivery system is struggling to escape the straitjacket of physician autonomy and economic independence, a payment system that reinforces fragmentation and independent decision making, and a regulatory framework that places legal responsibility on the individual professional without corresponding accountability of the team or the system within which that professional works. The medical education system reinforces these expectations and does little to prepare new physicians for the team-based, interdependent work that is required to achieve high-quality and safe care.

This, then, is the challenge. In the following sections we identify the barriers to care integration and discuss actions that could facilitate moving past them. Because we have encountered a variety of definitions and assumptions in our discourse, we begin with a discussion of taxonomy. We then explore the major barriers to greater integration. In the final section we discuss ideas for accelerating the integration agenda in the United States.

WHAT DO WE MEAN BY "CARE INTEGRATION"?

There is little agreement about the term "care integration." It is loosely applied to so-called integrated delivery systems (IDSs) that share structural similarities at the organizational and governance levels. Shortell and colleagues provide a functional definition that emphasizes coordination of care and value to patients, referring to "clinical integration" as

> the extent to which patient care services are coordinated across people, functions, activities and sites over time so as to maximize the value of services delivered to patients. (Shortell et al. 2000)

This definition was referenced in the IOM report *Crossing the Quality Chasm* (2001).

McDonald and colleagues reverse the concepts, using the term integration to describe care coordination as

> the deliberate integration of patient care activities between two or more participants involved in a patient's care to facilitate the appropriate delivery of health care services. (McDonald et al. 2007)

and additionally as

> the responsibility of any system of care (e.g., accountable care organization [ACO]) to deliberately integrate personnel, information, and other resources needed to carry out all required patient care activities between and among care participants (including the patient and informal caregivers). (McDonald et al. 2010)

Singer and colleagues emphasize the importance of the patient's experience, particularly in cases of chronic disease, in defining whether or not his or her own care is successfully integrated. They said, in effect, that care may be coordinated by the organization, but it is not integrated unless it meets the patient's needs. They define integrated care as

> patient care that is coordinated across professionals, facilities, and support systems; continuous over time and between visits; tailored to the patients'

needs and preferences; and based on shared responsibility between patient and caregivers for optimizing health. (Singer et al. 2011)

Burns and Pauly (2002) introduce a different construct that emphasizes organizational structure. They examine the success of efforts to integrate patient care that are either horizontal or vertical. Horizontal efforts refer to activities that focus on building coordinated systems for the care of patients across the care process; vertical efforts refer to the assembling of piece parts—such as people, information systems, physical assets, capital—under a common organizational structure.

Our concern is with care integration, the process and activities through which health care delivery organizations and systems achieve integrated care at the level of the individual patient, so we will focus on "clinical integration" in the sense that Shortell et al. and Singer et al. define the term. To the extent that other approaches to integration can enhance the integration of care processes, we will include them in our analysis.

For practical purposes, care integration includes several critical components:

1. **Handovers:** Practitioners' work is largely independent, but each depends on receiving critical information from another.

2. **Sequencing:** One task or decision often must await completion of another.[1]

3. **Interdependency:** Members of a multidisciplinary team, including the patient and family, engage in the back-and-forth of decision making and task execution and need to know what the others are doing, how the others are thinking, and what alternative conclusions are being considered based on the different perspectives in the team.[2]

4. **Storage and retrieval:** Key information that might be relevant later in a patient's care is stored for future access: medications, allergies, discharge instructions, procedures, observations, and so forth.

These aspects of care integration do not carry the same weight for each patient or clinical circumstance. Their relative importance will vary according to the type of health problem the patient has, the nature of the care they are receiving, and the system in which they are receiving it.

Care integration can occur at two levels: the process of care and the activities that make up these processes. Care processes are of two basic types:

1. **Sequential processes** are those that can be well defined ahead of time and are roughly linear; for example, a care pathway for management of a stable chronic

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[1] Thompson (1967) labeled this "serial" interdependence, when one professional's inputs are another's outputs, and vice versa.

[2] In Thompson's (1967) terms: "reciprocal" interdependence.

disease of adulthood, such as diabetes, in which tasks and decisions occur in a defined sequence and on a predictable schedule.

2. **Iterative processes** are those with multiple feedback loops, branch points, and dependencies ("if this, then that" kinds of processes); for example, the process used in the workup of a patient presenting a diagnostic dilemma or multiple severe diseases whose treatment is contingent on additional information or interim results (Bohmer 2009).

A sequential process is usually found in the execution of a known treatment to a well-characterized problem, whereas an iterative process is typical in the diagnosis and subsequent management of complex or ambiguous health problems. In both, the goal of integration is to connect the activities of the many professionals contributing to the many steps in a care process so that data, activities, and decisions flow smoothly and reliably among them. Integration is most challenging when the diverse members of a multidisciplinary team engage in collective problem solving necessitating shared decision making within the team, among multiple specialists, and with the patient and family, often requiring face-to-face, real-time discussions over long periods of time and in multiple sites of care.

The processes described above are not mutually exclusive. And well-designed care processes of either type can include examples of both individual and collective decision making depending on where the patient is in his or her care journey.

Within these processes there will be circumstances in which coordination among steps in a process can be "programmed" and others in which they cannot. When uncertainty is relatively low, care processes can be standardized, and coordination between steps in a process or multiple processes can be prospectively programmed with protocols, value stream maps, computerized decision rules, and the like. When uncertainty is high—the diagnostic or therapeutic dilemma, for example—processes are more variable, less predictable, and it is more difficult, and dangerous, to prescribe the care.

The choice of methods to integrate care, then, is contingent on the nature of the care that one is dealing with and the clinical processes used to deliver that care. Key considerations include: the *site* where care is given (one site, multiple sites); the *time frame* in which it is delivered (all in one visit, multiple visits, hours/days/months/years); and *predictability*—that is, the degree to which care needs and processes can be predicted ahead of time rather than developed in response to information and reactions in the care process itself. The fully integrated care process will vary, then, depending on the specific condition, the population, individual patient biology and values, and the extent to which care can be predicted based on existing medical science.

APPROACHES TO CARE INTEGRATION

Complex care, by its very nature, crosses multiple professional, organizational, and physical boundaries. In the past, joining multiple care organizations under a single corporate structure—the integrated delivery system—has been proposed as a mechanism of care integration. However, evidence suggests that the care delivered by these institutions is not necessarily more integrated than that delivered in other settings (Tollen 2008); that is, structural integration at the organizational level does not guarantee care integration. Integrated care for individual patients requires intra-organizational structures, processes specifically designed to manage the care across these boundaries, such as pathways, and people with the time and training to make them work, including teams and staff with care coordinator roles.

Integrated practice units (for example, stroke centers and women's health centers) may be suitable to promote integrated management of a specific complex condition with known associated comorbidities. They may be less well suited, though, in circumstances of multiple primary conditions or for patients with long-term chronic conditions for which most of the care is in the community. In these situations patients' providers are integrated only inasmuch as they are part of the same "care ecosystem," and integrating cases requires something more responsive and dynamic than an organizational structure focused on a particular condition.

Options for integrating care across broad ecosystems include assigning someone devoted to the specific role of care integration (often a family member but potentially a "care navigator") and developing an information system that captures essential data and runs predictive algorithms that help plan future care needs. These are, however, only partial solutions. While some evidence suggests these interventions facilitate better care integration (Liang 2010), much more needs to be done to integrate care for patients with complex, chronic conditions.

We conclude that care integration requires multiple approaches in order to respond to the complexity of care for a diverse population. To do so requires care integration on multiple fronts, within and across organizations.

THE BARRIERS

A host of barriers make care integration difficult to achieve in the U.S. health care system. Alone, any one of them poses a formidable challenge; together they form a seemingly impenetrable obstacle to achieving the integration goal. While we acknowledge the difficulties they create, there are specific actions that can overcome them. In this section we discuss the most significant barriers that stand in the way of care integration. In the next, we discuss actions that could accelerate progress on the integration agenda in the face of these barriers.

Physician Autonomy

Deeply ingrained in the profession of medicine is the teaching that a physician has an individual and personal responsibility for his or her patient; this includes providing the best possible treatment and ensuring that he "does no harm" to his patient. This personal responsibility is core to a physician's training and for most defines what it means to be a physician professional. It is also a foundational principle in the code of professional ethics for the medical profession, drives legal accountability in licensure and tort actions, and is reflected in the fee-for-service payment model for doctors (and other health professionals).

This model of the autonomous physician deciding for the passive patient informs the image of the physician that appears in popular culture (e.g., television series such as "ER" and "House"). Patients' dependence on their physicians has been reinforced by the information asymmetry that has existed (and been protected) between the two parties. This construct was appropriate 50 years ago when most care involved a single physician supported by a handful of modestly trained professionals. Then it was important for the safety of the patient that the doctor be the "captain of the ship"; he or she was the best-trained person to do this.

But medical science and technology have advanced far beyond those days. The disease burden in our society has changed as well. Rarely now is a patient cared for by a single physician acting from his office with a small office staff. The majority of

care provided in the United States today is for chronic illness (Vogeli et al. 2007), and the proportion is likely to grow as the population ages and as acute care continues to improve. The average patient with a single chronic illness will be cared for by six to nine physicians, at multiple sites, over a prolonged period of time (Vogeli et al. 2007). Moreover, patients and their families are increasingly better informed and able to take a central role in decision making, effectively becoming "coproducers" of their own care. Especially in chronic illness care, they are their own primary caregivers, managing their medications, lifestyle changes, diets, exercise and physical therapy, as they live with their illnesses 24 hours a day, seven days a week, year round.

Specialization has introduced new standards of care and made it increasingly important that patients receive the benefits of multiple points of view in order to have the best outcomes. Often the situations are complex, requiring professionals to solve problems together, work collaboratively with each other and the patient and family to craft the best solution for a particular patient. In addition, effective chronic disease management requires resources that complement the skills and perspectives of the physician: nurses, pharmacists, health educators, social workers, advocates, community support groups, and more.

The principle of the autonomous physician as articulated in the mid-20th century (described in Starr 1982), then, is ill-suited to address the problems that many

Explicit teaching about teams, teamwork, team membership, and team leadership remains a relatively small part of medical education.

patients have today, where optimal solutions require collaboration, shared decision making, and cooperative care management. Continuing to inculcate in medical students the concept of the autonomy of the physician is a formidable barrier to preparing them for the collaborative activities and interactions required in an integrated care process for the patient. In fact, we believe it may be the largest single barrier that stands in the way of successful care integration going forward.

It is disturbing indeed that, in spite of widespread acceptance that care is increasingly a team-based undertaking (Grumbach and Bodenheimer 2004), explicit teaching about teams, teamwork, team membership, and team leadership remains a relatively small part of medical education (Baker et al. 2006). As noted in *Unmet Needs*, the report published in 2010 by the Lucian Leape Institute on reforming medical education, the physician education process still often involves "shame and blame"—poor building blocks for cooperation and collaboration (Lucian Leape Institute 2010). Students continue to be selected for admission to medical schools on the basis of their achievements in biologic sciences rather than their propensities for, and abilities in, group-based problem solving.

Absence of a Generally Agreed Framework or Management System

A second barrier to the integration of care is the lack of a widely approved approach to the design and management of health care delivery systems and organizations. Numerous authors have offered frameworks for addressing the complexity of modern care delivery. These range from ways to categorize organizations contributing to care delivery (integrated networks, accountable care organizations); to ways to structure an individual care delivery organization (focused factory, integrated practice unit, medical home); to how to design and manage the small-scale operations that are at the heart of any complex delivery organization (microsystems, care platforms); to ways to create incentives for system restructuring (managed and value-based competition, consumer-driven health care).

There is no commonly accepted framework for addressing care delivery in three crucial dimensions related to integration: organizational structure, organizational design, and management system.

Equally confusing has been the plethora of management techniques that have been used to try to improve the process of care. For more than 20 years the Institute for Healthcare Improvement has provided education, networks, learning collaboratives, and campaigns for hospitals, health systems, and clinicians to learn about and share their experiences with a wide range of management tools and philosophies designed to improve the patient care experience.

Wagner and colleagues have defined optimal care processes for chronic disease management and trained more than 100 hospital and health system leaders in how to implement such approaches (Wagner et al. 2001). The Advanced Training Program developed by Intermountain Healthcare (Salt Lake City, Utah) trains practitioners to apply the principles of evidence-based medicine to the improvement of individual care processes. A radical transformation is under way at Virginia Mason Medical Center in Seattle, Washington. The institution has engaged in a decade-long program to implement the Toyota Production System, the original "lean" manufacturing, as its management and operating system, with the goal of producing significantly improved care experiences for its patients through care integration, patient engagement, and deeply analytical planning (Kenney 2011).

In spite of such advances, there is no commonly accepted framework for addressing care delivery in three crucial dimensions related to integration: organizational structure, organizational design, and management system.

Organizational structure. First, we have no clear agreement about the nature of the organizational structures that support or, even better, stimulate the integration of care

at the level of the patient. While a handful of organizations consider themselves fully integrated health systems, efforts to replicate their practices in the rest of health care have, for the most part, failed.

Throughout the last two decades, a number of institutions have assembled piece parts of care delivery under a single ownership. Labeled integrated delivery systems, these share common characteristics, typically integrated ownership and governance and some efforts to achieve economies of scale through purchasing and consolidation of back-office functions (Shortell et al. 2000). But the lack of progress on care integration itself (Burns and Pauly 2002) suggests that these structural steps have little or no relationship to care integration, or else that the barriers to achieving care integration are strong enough to resist this obvious "first step" move of structural integration.

The Patient Protection and Affordable Care Act, signed into U.S. law in 2010, contains incentives for and loose definitions of accountable care organizations (ACOs), which are intended to stimulate the formation of health care systems with accountability for an enrolled population and provide internal incentives to operate in a more integrated fashion. The state of Massachusetts is moving ahead with a similar effort as part of a long-term strategy to transform the care delivery system (Mechanic et al. 2011). In both of these cases it is too early to tell whether or not they will motivate greater integration at the care delivery level.

Organizational design. Second, we have no agreement on the appropriate organizational design of care delivery. Care delivery currently occurs across a growing number of silos: ever-smaller, ever-more-atomized collections of people and support resources that reflect the ongoing march of ever-greater specialization.

Some organizations, such as Intermountain Healthcare, have tried to break down these silos by creating pathology-specific services, such as heart care. In this model, budgets are rolled up from the silos, physicians and others are part of a larger program, and patient care is coordinated more closely within the service. Similar efforts have been applied sporadically across the hospitals and health systems of the country, with the creation of centers that focus on joint replacement or breast disease, for example (Porter and Teisberg 2006). But most of health care looks exactly like its pattern of growth: a haphazard collection of loosely affiliated activities that exist side-by-side within a system and that appeared in response to the next "new thing"—the next advance in medical technology or knowledge, or a new area of specialization.

Historically the division of health care services within a diversified delivery organization has been guided by a 19th-century understanding of gross pathology: observable cardiac, renal, and hepatic pathology driving the creation of departments relating

to heart, kidney, and liver disease, for example. Such an approach has increased the number of boundaries that patients with complex conditions have to cross.

In recent years, managers have experimented with alternative organizing frameworks—for example, disease centers that combine medical and surgical services for a common set of medical conditions or services in which the unifying factor is the similarity of care tasks applicable to many different clinical conditions, such as disease management or screening services. Intermountain Healthcare, mentioned above, is one such example.

Management system. The final issue concerns the lack of agreement on a management system that best supports care integration; that is, the philosophy, tools, analytics, and expertise (see next section) that promote integration. Many approaches in common use are actually counterproductive.

One example is the classical health care delivery system that employs the "expert" model as its management system. This results in a collection of medical staff-driven departments, organized by specialty. Management is shared, with a chief of staff overseeing the medical staff and related clinicians, and a lead administrator who has responsibility for the support functions, capital management, and financial systems. Both report to a board of directors, typically made up of "experts" from the community, the CEO, and representatives from the medical staff. Not surprisingly, this system results in decisions that are weighted toward internal considerations, such as how well one internal interest group stacks up against another, or how well the medical staff is serving its individual physician members. The physician experts dominate in this model. This perspective creates a significant barrier for the cooperation and patient focus required to break down the expert-based silos.

For the past 25 years numerous organizations, most notable among them the Institute for Healthcare Improvement, have introduced a variety of management methods into health care from outside the industry. As a result, many health systems have adopted total quality management approaches, striving to achieve more effective and efficient care within and across departments. Staff have been trained; projects have been started; results have been mixed (Hackman and Wageman 1995).

While these tools have often proven helpful, and have resulted in reported significant improvements in care quality and efficiency, they have been for the most part a collection of tools that help the organization improve without fundamentally transforming the way in which the system is managed, or without attacking the underlying silos and fragmentation inherent in the organization itself. Often the improvements have been reported within a particular department or section of the system; far less frequent have been reports of success across departments, and rarer still are sustained improvements across an entire care process that involves multiple sites or protracted care periods (as for example in chronic disease management).

A variation on the total quality management approach has been incorporated at Cincinnati Children's Hospital and at Denver Health and Hospitals System. In each case, the management teams have become highly developed experts in total quality management. But they have added another component as well—namely, the involvement of patients and families in the design of care delivery processes. At Cincinnati Children's, for example, some 50–60 care delivery processes have been redesigned by teams that include patients, families, experts, clinicians, support staff, and management working together, using the tools of total quality management to support the process.

As mentioned, the most radical application of a new management system has occurred at Virginia Mason Medical Center, where the team has incorporated the philosophy, tools, analytics, and expertise of the Toyota Production System into every aspect of their management of the institution (Kenney 2011). As at Cincinnati Children's, they have engaged patients in the design of their transformation. Virginia Mason's journey, now 10 years old, has enabled the system to create more than 50 fully integrated care pathways, called "value streams," focused on ensuring that each patient receives *the right care at the right time in the right way at the right price*. These are patient-centric solutions designed to bring together all the expertise, support, technology, information, and decision support systems required to meet the needs of the patient, whether in the hospital, the outpatient setting, or the home. Thus Virginia Mason presents by far the most fully developed example of a management system designed to promote care integration.

The lack of a commonly accepted approach to management—including structure, organizational design, and management processes—means that efforts to integrate care have been haphazard, random, and isolated. This is in spite of an evolving consensus among many researchers about what the essential elements of a management approach must be. These include the specification of evidence-based care processes, the differentiation of value-adding and non-value-adding activities, the importance of measuring both adherence to such processes and their impact on individual patients' health, and the importance of aligning the organization's structure and incentives.

This absence of a generally agreed approach to management is the second major barrier to accelerating care integration. For the most part health care systems employ a professional-oriented organizational design even when structural changes have occurred to "integrate" at the institutional level, or when total quality management tools have been incorporated into the ongoing management processes of the institution. Decisions about care are usually made to support the individual physician, often at the expense of the longer-term health of the institution itself, and not always for the benefit of the patient. This approach also means that care integration—which requires cooperation, often sacrifice, and certainly compromise across specialties, professions,

and support teams—cannot move forward. Certainly there is little role for the patient or the community in such systems. But without their perspectives, it is difficult to integrate care to benefit the patient, which remains the ultimate goal of integration.

Lack of Expertise

The contrast between health care and other industrial sectors is striking in the paucity of production design experts involved with the people actually doing the work on a day-to-day basis. Unlike companies such as General Electric, Agilent, or Hewlett-Packard, for example, most health care systems employ few, if any, industrial design engineers. Nor do they provide extensive training or preparation in the use of the tools of production and operational design and management. One exception is the Virginia Mason Medical Center, which has committed significant resources to developing the expertise required to transform its entire management system: over the last eight years, large numbers of the Virginia Mason staff—including doctors, nurses, other clinicians and support staff, and management—have traveled to Japan to participate in a training program at the Toyota Institute and visit plants using lean methodologies. ThedaCare, Denver Health, and Intermountain Healthcare have prepared experts in their own domestic programs and have achieved similar improvements.

Without this expertise it is difficult to see how an industry as complex as health care delivery can hope to achieve greater care integration. A huge deficit exists both in the expertise required to undertake the initial design and transformation, and in the expertise required to measure, analyze, and learn as systems are changed. Both are required to continually improve the processes based on actual experience.

Lack of Leadership

Strong, unwavering leadership—by the board of directors, the senior leadership team, and clinical leaders—is required to implement the frameworks that enable care integration, build the expertise to support organizational transformation, and drive the many difficult changes needed in complex health care institutions. Leaders must present a unified front and carry out a multiyear campaign if they are to be successful at building more fully integrated institutions at the level of care delivery. But aligned leadership is not the norm in health care. Many board members are recruited for their philanthropic contribution more than their expertise in health care or institutional transformation (Kane et al. 2009). They often are not extensively involved in clinical quality but are focused instead on the demands of independent medical staffs and the institution's financial well-being (Jha and Epstein 2010).

Modern leaders face an important conundrum: how to balance the best interests of each individual patient with those of the institution and of the total population of

patients served by the institution. Each is a different imperative and a distinct moral framework. While these imperatives sometimes overlap, they do not always, and so leaders must be prepared to make tradeoffs between the interests of health care's multiple constituencies and decisions that may not serve the interests of the individual physician.

Such tradeoffs often occur around standardization of practice or equipment, alternative sites of care, and the scope of practice of the nonphysician workforce, where what is best for the quality, safety, and efficiency of patient care may cut into the income stream and independence of the doctor. Not only must leaders be well versed in change management, they must also be strong and unwavering enough to withstand the inevitable pushback that occurs when organizations are under stress. Moreover, the experience of leaders in quality and safety has confirmed that fundamental change must be driven from the top.

At Virginia Mason and Cincinnati Children's Hospital, for example, the board of directors is intimately involved in the organization's change processes, in many instances driving them, holding senior leaders accountable, and assessing progress on a regular basis. The system CEOs are secure in their roles as long as they perform as required by the board. Resistance from within the institution is expected. The board and the CEO in both instances are involved in reassuring the organization and providing the leadership required to move beyond the resistance. Responsibility for integrating the organization is not delegated to the CEO or some other leader. The board and the CEO do this together, supported by the experts and the other system leaders.

Reimbursement and Regulation

If the physician culture impedes care integration, the fee-for-service reimbursement system reinforces that culture. Its focus is on rewarding the individual physician, and it places greater value on procedures and interventional medicine. This emphasis is antithetical to the cooperation, coordination, team-based care, thoughtful problem solving, and creation of community linkages that are required for care integration and effective, safe care delivery. Indeed, the current system often creates perverse incentives. Efforts to integrate care, to rationalize the work and patient flow for the benefit of the patient, to create a safe environment for worker and patient alike, may result in lowered revenues or greater legal exposure.

Regulatory frameworks also reinforce the culture of the autonomous physician and the individual practitioner, as well as the culture of blame that inhibits cooperation and collaboration. Professional licensure focuses on the individual professional, not the institution or the team. Tort laws are written to punish the individual professionals who fail in their duties to the patient. Clinical practice rights are hotly disputed as

the professional territory of one group (e.g., physicians) is invaded by another (e.g., nurses). Hospital bylaws provide some tools for institutional oversight over individual practice within the hospital, it is true; but corporate practice of medicine laws in many states also limit the extent to which institutional oversight can be exercised. Nonetheless, increasingly health plans and health systems are being held to account for the care provided by the professionals under contract to them or under their control (Morreim 2001).

While a number of health systems have demonstrated how to move forward in the current environment, the disincentives represent an important barrier to effective integration. This is acknowledged in recent health reform legislation, in that the U.S. Department of Health and Human Services has been directed to develop payment reform demonstrations that encourage team-based care and the formation of accountable care organizations (ACOs) through the use of "bundled" or prospective payment schemes.

Popular Culture, Common Wisdom

A final—and serious—barrier to care integration is the perspective of the public in the United States about their health care. According to a number of national surveys, most people want to be able to choose their own doctor and are satisfied with the one they have (Enthoven et al. 2001). Yet they often cannot get an appointment to see their physician when they need to, and only 60% can identify their personal physician by name (Cabana 2010). In one survey, 57% of respondents described their experiences with the care system as "confusing," "disjointed," a "nightmare to navigate"; this was especially true for those with chronic illnesses, multiple problems, or complex care requirements (Picker Institute 2000). Patients cared for in an organized "system" describe their satisfaction with care as significantly higher than do those cared for in the fragmented, individual physician–based models (Enthoven et al. 2001).

Yet most Americans remain suspicious of organized approaches to care, do not understand what "care integration" means (Mechanic 2001), and are worried about becoming "just a number" in an impersonal care system. At the same time, people report that they are frightened about what will happen when they are diagnosed with a chronic illness, both in terms of the financial burden it will impose, and the lack of coordinated, integrated care that they are likely to receive from the current system (Emanuel et al. 2000). They show their willingness to use alternative care solutions, such as ready clinics and the like, and they utilize emergency rooms increasingly as their primary care of choice, often because they cannot (or are not aware that they can) get in to see their primary physician when they feel they need to (Bazargan et al. 1998).

These confusing points of view pose a major hurdle for leaders who seek to transform care toward more integration, greater coordination, enhanced personalization, more reliable quality, and greater safety. Though slowly changing, popular culture in the United States, with its traditional emphasis on individual effort, reinforces the value of the autonomous doctor. Stories about teams of caregivers who share in solving the complex problems of chronic disease care, who cooperate and collaborate instead of acting as independent agents fighting the system on behalf of the patient, are harder to tell.

It has also proven difficult to communicate about the failings of the current delivery model. While the Institute of Medicine report *To Err Is Human* (Kohn et al. 1999) created a public stir, even outrage, the impact was short-lived. And certainly, the recommendations about greater "systemness" have taken a back seat to efforts to hold individual clinicians more accountable for errors (Wachter 2010). The subsequent IOM report, *Crossing the Quality Chasm*, was deeply critical of the U.S. care system in terms of quality and safety, yet the popular debate over the past 10 years has focused on whether or not the United States has the best health care in the world. That the evidence is to the contrary—the United States ranks low in international comparisons of population health status, health quality, value-for-money, and other factors (see, e.g., Schoen et al. 2007)—appears to be irrelevant to the debate; the root causes for this dismal performance are ignored in favor of "feel good" stories of heroic efforts to prolong someone's life by a few months.

Until the language of care integration creates a positive view that offsets the popular mythology of today, it will be hard for system transformers to carry out their work. Just as physicians fought the power of so-called managed care organizations by stoking the fears of their patients (Enthoven and Singer 1998), clinicians who resist care integration will be able to find allies in the community unless care system leaders are able to build stories that effectively communicate why integration will benefit each individual patient.

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ACCELERATING CARE INTEGRATION

Efforts to promote care integration are rapidly evolving. Thus any discussion about ideas for accelerating the pace with which care integration occurs must be considered a work in progress. Nevertheless, our report on integrating health care would be incomplete without considering steps necessary to confront the formidable barriers that stand in the way. The path forward will undoubtedly be difficult. The diverse, fragmented nature of the care system itself makes it unreasonable to expect a systematic, one-size-fits-all approach, or that a specific agency or organization will assume responsibility for driving the agenda forward. Instead, if integration efforts are to be accelerated, then consumers, multiple agencies, institutions, and care systems will need to be involved to create momentum and raise awareness.

Below we describe several opportunities that relate directly to the preceding discussion. While these ideas address critical issues, we do not mean to suggest that they represent a comprehensive prescription for achieving widespread reform. Rather, they are initiatives that could—especially in combination—begin to accelerate care integration. The six ideas are presented in summary form; only where we believe the rationale for a specific idea may not be obvious from the preceding discussion do we provide a more expansive context.

Shared Understanding

First, we need mechanisms for establishing a shared understanding among public and private stakeholders, from the White House and the Centers for Medicare & Medicaid Services (CMS) to the media and consumer advocacy groups, regarding the link between care integration and patient safety. Such mechanisms might include joint working groups or public forums, any opportunity that would allow open dialogue about consumer needs and experience and strategies for addressing them.

Best practices for improving care integration, including tools that enable consumers to serve as their own advocates for safer care, should be cataloged and promulgated. Tools intended for consumers must be designed in partnership with patients and families to ensure that they are realistic with respect to actions or responsibilities patients and families are comfortable performing.

The shared understanding among stakeholders should also be communicated publicly to raise awareness of the importance of care integration to the public's well-being and that of their families and loved ones. Patients' stories that contrast their integrated care experiences with those in fragmented care systems could be key to an effort to shift expectations. Information about the benefits of an integrated approach for patients' experience and outcomes may be particularly helpful in reaching patients, families, and consumers. Patients and consumers need guidance regarding how to work with their providers to obtain integrated care solutions even when the care itself has not moved to the levels of formal integration described in this report.

Patient Engagement

Patients, their families, and representatives from their communities can play key roles in accelerating movement toward clinical integration, notwithstanding the current general lack of shared understanding about the link between integration and patient safety.

Their impact can occur at three levels. First, when patients and family members are *active participants in process improvement* activities and care redesign efforts, they can identify gaps in integration and offer solutions that are effective—and often more practical and cost effective than those that clinicians design. When patients and families tell their own stories to members of a clinical care system, the organizational culture begins to reflect patient-centeredness. These stories slowly shape the way clinicians speak, think, and behave toward patients, especially if patients participate in conversations at board meetings, leadership meetings, and throughout the organization.

When patients, their families, and representatives of the community participate in reviews of the performance of the organization, their viewpoints shape expectations for patient-centered, integrated performance.

The next level is *organizational accountability*. When patients and their families—and sometimes, depending on the issue, representatives of the community—participate in

reviews of the performance of the organization, their viewpoints shape expectations for patient-centered, integrated performance. This should not occur to the exclusion of the professional or expert perspectives, of course; but it can help the institution achieve a balanced view of what qualifies as excellent performance along the dimensions of clinical integration.

The final opportunity for patient engagement is in *care process design* itself. As highlighted in this report, a number of institutions have successfully incorporated patients, families, and community members on design and problem-solving teams to ensure that solutions balance different perspectives and are patient-centric. These examples demonstrate that patient involvement is both an important consideration in and a potent lever for improved integration. Though patient involvement is a critical component, organizations must not treat it as a panacea for their integration failings. Treating patients as members of the care team will require that they be adequately supported in this role. Integration cannot be outsourced to patients and family members, but rather must be met with internal resources, infrastructure, leadership, and intentionality to bring about needed change.

Measures

We need measurements that gauge care integration and the clinical and economic performance that results from it and that reflect the diversity of patient preferences and needs in U.S. society. Moreover, a clearinghouse of measures that reflect the diversity of integration requirements for distinct patient populations would be beneficial, particularly if coupled with an advocacy effort to incorporate these measures into public reporting systems that are widely available and advertised across the U.S. population. Measures should be continually refined and improved based on experience in use. Organizations like CMS and the Joint Commission should encourage the measurement of care integration in their accreditation requirements as soon as a validated tool becomes available. One step in this direction will be the addition in 2013 of the Care Transition Measure to the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) standard survey required by CMS (CMS Office of Communications 2012).

Evaluation

Robust assessment of delivery system effectiveness could prove critical. A hopeful sign is the inclusion of health care systems, such as those for coordination of care for patients with multiple chronic conditions, among the recommended national priorities of the new Patient-Centered Outcomes Research Institute (PCORI 2012). Significant

investment in such clinical effectiveness research could facilitate the cataloging and promulgating of best practices for integrating care. This could be a significant improvement opportunity because all PCORI funding requires that patients and families be included in the design and implementation of the research. Funding for this "applied" care delivery research, on the order of at least 20–25% of the total federal investment in medical research and development, is the level at which real progress might be achieved.

Education and Training

We need a curriculum for hospital and health system boards of directors and system executives that focuses on the specific issue of patient safety and the broader issue of care integration. Similarly, undergraduate and graduate health professional education would benefit from curricula in care integration that focus on team-based problem solving rather than autonomous decision making. Training adequate numbers of hospital and health system leaders and health professionals (i.e., doctors, nurses, and the array of practitioners that comprise health care teams) will require partnerships with those who can fund and deliver these curricula to the target audiences.

National Spread

Research should define the capacity required to provide the organizational and operational expertise to support care integration throughout the country and explore means to build this capacity. This includes but is not limited to the development of the requisite technology infrastructure and standards for its interoperability.

CONCLUSION

It is a time of great opportunity. The need for more effective integration of health care is clear, and momentum is building to develop the institutions and the system supports that can provide integrated, patient-centered care. While clearly not the only steps necessary for accelerating care integration, improvements in these six areas will accelerate progress. Integration of care must be among the nation's priorities and part of any discussion about the agenda for moving toward a more consistently safe, effective, and efficient health care system.

References

Baker DP, Day R, Salas E. 2006. Teamwork as an essential component of high-reliability organizations. *Health Serv Res* 41(4 Pt 2): 1576–1598.

Bazargan M, Bazargan S, Baker RS. 1998. Emergency department utilization, hospital admissions, and physician visits among elderly African American persons. *Gerontologist* 38(1): 25–36. doi:10.1093/geront/38.1.25

Bodenheimer T. 2008. Coordinating care: a perilous journey through the health care system. *N Engl J Med* 358(10):1064–1071.

Bodenheimer T, Pham HH. 2010. Primary care: current problems and proposed solutions. *Health Aff (Millwood)* 29(5):799–805.

Bohmer RM. 2009. *Designing Care: Aligning the Nature and Management of Health Care*. Boston: Harvard Business Press.

Burns L, Pauly M. 2002. Integrated delivery networks: a detour on the road to integrated health care? *Health Aff (Millwood)* 21(4): 128–143.

Cabana MD. 2010. Parental satisfaction and the ability to recall the physician's name. *Clin Pediatr (Phila)* 49(6):525–529. doi:10.1177/0009922809351571

CMS Office of Communications. Aug 1, 2012. CMS Issues Final Inpatient Payment Rule: Final rule increases payments to hospitals; strengthens link to quality care [press release]. Washington, DC: US Dept. of Health and Human Services, Centers for Medicare & Medicaid Services.

Donini-Lenhoff FG, Hedrick HL. 2000. Growth of specialization in graduate medical education. *JAMA* 284(10):1284–1289.

Eisenberg DM, Kessler RC, Van Rompay MI, et al. 2001. Perceptions about complementary therapies relative to conventional therapies among adults who use both: results from a national survey. *Ann Intern Med* 135(5): 344–351.

Emanuel EJ, Fairclough DL, Slutsman J, Emanuel LL. 2000. Understanding economic and other burdens of terminal illness: the experience of patients and their caregivers. *Ann Intern Med* 132(6):451–459.

Enthoven A, Schauffler H, McMenamin S. 2001. Consumer choice and the managed care backlash. *Am J Law Med* 27(1):1–15.

Enthoven AC, Singer SJ. 1998. The managed care backlash and the task force in California. *Health Aff (Millwood)* 17(4):95–110.

Friedberg MW, Lai DJ, Hussey PS, Schneider EC. 2009. A guide to the medical home as a practice-level intervention. *Am J Managed Care* 15(10):S291–S299.

Goldsmith J. 2002. Integrating care: a talk with Kaiser Permanente's David Lawrence. *Health Aff (Millwood)* 21(1):39–48.

Grumbach K, Bodenheimer T. 2004. Can health care teams improve primary care practice? *JAMA* 291(10):1246–1251.

Hackman JR, Wageman R. 1995. Total quality management: empirical, conceptual, and practical issues. *Admin Sci Q* 40(2):309–342.

Jeffe D, Whelan A, Andriole D. 2010. Primary care specialty choices of United States medical graduates, 1997–2006. *Acad Med* 85(6): 947–958.

Jha AK, Epstein AM. 2010. Hospital governance and the quality of care. *Health Aff (Millwood)* 29(1):182–187.

Institute of Medicine. 2001. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academy Press.

Kane NM, Clark JR, Rivenson HL. 2009. The internal processes and behavioral dynamics of hospital boards: an exploration of differences between high- and low-performing hospitals. *Health Care Manage Rev* 34(1):80–91.

Kenney C. 2011. *Transforming Health Care: Virginia Mason Medical Center's Pursuit of the Perfect Patient Experience*. New York: Productivity Press.

Kohn LT, Corrigan J, Donaldson M, eds. 1999. *To Err Is Human: Building a Safer Health System*. Washington, DC: National Academy Press.

Leape L, Berwick D, Clancy C, et al., for the Lucian Leape Institute at the National Patient Safety Foundation. 2009. Transforming healthcare: a safety imperative. *Qual Saf Health Care* 18(6):424–428. doi:10.1136/qshc.2009.036954

Liang L, ed. 2010. *Connected for Health: Using Electronic Health Records to Transform Care Delivery*. San Francisco: Jossey-Bass.

Lucian Leape Institute Roundtable on Reforming Medical Education. 2010. *Unmet Needs: Teaching Physicians to Provide Safe Patient Care*. Boston: National Patient Safety Foundation.

McDonald KM, Schultz E, Albin L, et al. 2010. *Care Coordination Measures Atlas*. Rockville, MD: Agency for Healthcare Research and Quality. AHRQ Publication No. 11-0023-EF.

McDonald K, Sundaram V, Bravata D, et al. 2007. *Closing the Quality Gap: A Critical Analysis of Quality Improvement Strategies*. Rockville, MD: Agency for Healthcare Research and Quality. AHRQ Publication No. 04(07)-0051-7.

Mechanic D. 2001. The managed care backlash: perceptions and rhetoric in health care policy and the potential for health care reform. *Milbank Q* 79(1):35–54. doi:10.1111/1468-0009.00195

Mechanic RE, Santos P, Landon BE, Chernew ME. 2011. Medical group responses to global payment: early lessons from the 'Alternative Quality Contract' in Massachusetts. *Health Aff (Millwood)* 30(9):1734–1742. doi:10.1377/hlthaff.2011.0264

Morreim EH. 2001. *Holding Health Care Accountable: Law and the New Medical Marketplace*. New York: Oxford University Press.

Nolte E, McKee M, eds. 2008. *Caring for People with Chronic Conditions: A Health System Perspective.* Maidenhead, Berkshire, UK: Open University Press.

Patient-Centered Outcomes Research Institute (PCORI). Jan 23, 2012. Draft National Priorities for Research and Research Agenda Version 1. Washington, DC: Patient-Centered Outcomes Research Institute.

Perkins BB. 1998. Economic organization of medicine and the Committee on the Costs of Medical Care. *Am J Public Health* 88(11): 1721–1726.

Pham HH, Schrag D, O'Malley AS, Wu B, Bach PB. 2007. Care patterns in Medicare and their implications for pay for performance. *N Engl J Med* 356(11):1130–1139. doi:10.1056/NEJMsa063979

Picker Institute. 2000. *A Report by the Picker Institute for the American Hospital Association: Eye on Patients.* Boston: Picker Institute.

Porter ME, Teisberg EO. 2006. *Redefining Health Care: Creating Value-Based Competition on Results*. Boston: Harvard Business School Press.

Research!America. [2011]. 2010 U.S. Investment in Health Research. Alexandria, VA: Research!America. http://www.researchamerica.org/uploads/healthdollar10.pdf. Accessed Sep 10, 2012.

Ruzek JY, Bloor LE, Anderson JL, Ngo M, and the UCSF Center for the Health Professions. July 1999. *The Hidden Health Care Workforce: Recognizing, Understanding and Improving the Allied and Auxiliary Workforce.* San Francisco: UCSF Center for the Health Professions.

Schoen C, Osborn R, Doty MM, Bishop M, Peugh J, Murukutla N. 2007. Toward higher-performance health systems: adults' health care experiences in seven countries, 2007. *Health Aff (Millwood)* 26(6):w717–w734.

Shortell SM, Gillies RR, Anderson DA, Erickson KM, Mitchell JB. 2000. *Remaking Healthcare in America*. 2nd ed. San Francisco: Jossey-Bass.

Shortell S, Singer S. 2008. Improving patient safety by taking systems seriously. *JAMA* 299(4):445–447.

Singer SJ, Burgers J, Friedberg M, Rosenthal MB, Leape LL, Schneider EC. 2011. Defining and measuring integrated patient care: promoting the next frontier in healthcare delivery. *Med Care Res Rev* 68(1):112–127.

Starr P. 1982. *The Social Transformation of American Medicine*. New York: Basic Books.

Sutcliffe KM, Lewton E, Rosenthal MM. 2004. Communication failures: an insidious contributor to medical mishaps. *Acad Med* 79(2):186–194.

Thompson JD. 1967. *Organizations in Action: Social Science Bases of Administrative Theory.* New York: McGraw-Hill.

Tollen L. April 2008. *Physician Organization and Its Relation to Quality and Efficiency of Care: A Synthesis of Recent Literature*. New York: The Commonwealth Fund.

Vogeli C, Shields AE, Lee TA, et al. 2007. Multiple chronic conditions: prevalence, health consequences, and implications for quality, care management, and costs. *J Gen Intern Med* 22(Suppl 3):391–395.

Wachter RM. 2010. Patient safety at ten: unmistakable progress, troubling gaps. *Health Aff (Millwood)* 29(1):165–173. doi:10.1377/hlthaff.2009.0785

Wagner EH, Austin BT, Davis C, Hindmarsh M, Schaefer J, Bonomi A. 2001. Improving chronic illness care: translating evidence into action. *Health Aff (Millwood)* 20(6):64–78.