



Organizing for Higher Performance: Case Studies of Organized Delivery Systems

Series Overview, Findings, and Methods • July 2009

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ABSTRACT: Fifteen case studies illustrate how diverse types of organized health care delivery systems promote higher performance through information continuity, patient engagement, care coordination, team-oriented care delivery, continuous innovation and learning, and convenient access to care. Those attributes are supported by values-driven leadership, interdisciplinary teamwork, integration and aligned incentives (both at the organizational and provider level), accountability, and transparency. Commonly reported results include improved clinical quality of care and control of chronic diseases, increased patient satisfaction, shorter waiting times, and reduced hospitalizations, emergency visits, and prescription drug expenses. The experience of these organizations supports recent recommendations by The Commonwealth Fund Commission on a High Performance Health System to stimulate greater organization of health care in the United States.



OVERVIEW

In August 2008, the Commonwealth Fund Commission on a High Performance Health System released a report, *Organizing the U.S. Health Care Delivery System for High Performance*, that examined problems engendered by fragmentation in the U.S. health care system and offered policy recommendations to stimulate greater organization for high performance.¹ In formulating its recommendations, the commission identified six attributes of an ideal health care delivery system (Exhibit 1).

The Commission's report included brief profiles of 15 case study sites to illustrate these six attributes in local delivery systems across the United States that have been recognized for their performance in diverse organizational settings (Exhibits 2, 3, and 4). This report summarizes the findings of the case studies, which are being issued separately by The Commonwealth Fund. The case study sites exhibit the six attributes in different ways and to varying degrees, providing multiple perspectives for understanding how the attributes can take shape in real-world settings.

The 15 sites span the continuum of scale and structure, ranging from integrated delivery systems that provide a full scope of health care services and insurance coverage to multispecialty physician group practices and looser networks of independent physicians in private practice.² The sites include public systems, private not-for-profit systems, professional corporations, and public-private collaborations.

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Exhibit 1. Six Attributes of an Ideal Health Care Delivery System

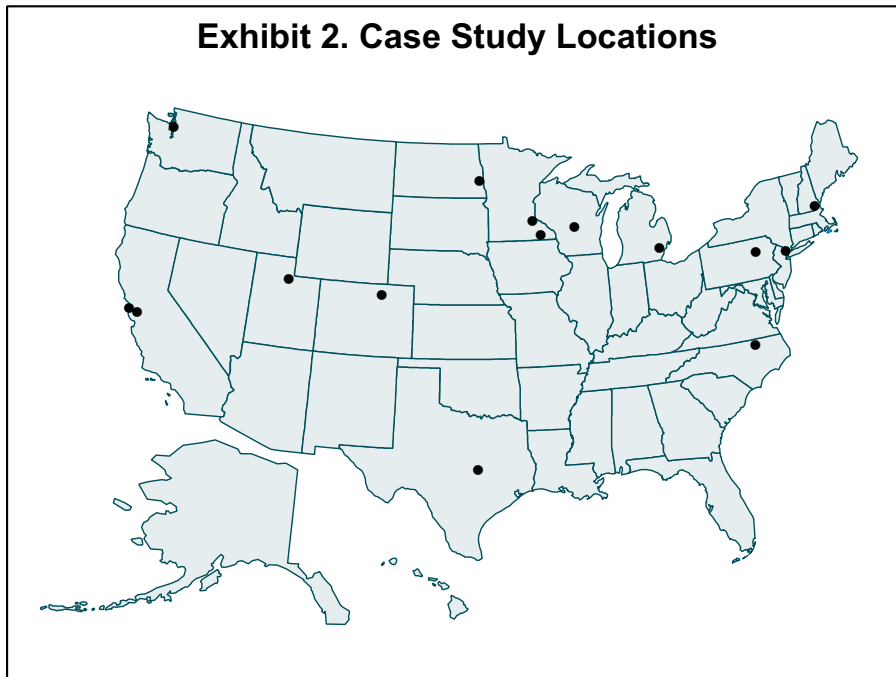
- **Information Continuity** Patients' clinically relevant information is available to all providers at the point of care and to patients through electronic health record (EHR) systems.
- **Care Coordination and Transitions** Patient care is coordinated among multiple providers, and transitions across care settings are actively managed.
- **System Accountability** There is clear accountability for the total care of patients. (We have grouped this attribute with care coordination, since one supports the other.)
- **Peer Review and Teamwork for High-Value Care** Providers (including nurses and other members of care teams) both within and across settings have accountability to each other, review each other's work, and collaborate to reliably deliver high-quality, high-value care.
- **Continuous Innovation** The system is continuously innovating and learning in order to improve the quality, value, and patients' experiences of health care delivery.
- **Easy Access to Appropriate Care** Patients have easy access to appropriate care and information at all hours, there are multiple points of entry to the system, and providers are culturally competent and responsive to patients' needs.

The case study organizations were selected by experts through a ranking process that relied upon the professional literature, performance benchmarking data, and experts' recommendations. Information on the sites was gathered from interviews with organizational leaders, internal material provided by the sites, and external sources. (See [Appendix](#) for more information on methods and sources.)

SUMMARY OF FINDINGS

There are several major themes that speak to each site's ability to organize health care delivery to provide greater value. We first present *overarching themes* that underlie all attributes and work conjointly to enable their attainment. Within each of the attributes, we then describe *dominant themes* exhibited by a majority of the case study sites, and *emergent themes* exhibited by a subset of sites. Because the attributes are interrelated,

Exhibit 2. Case Study Locations



some themes cut across attributes. Consequently, associated examples may appear in different places within the case studies, depending on the context.

Overarching Themes

Values-driven leadership. Organizational and physician leaders appear to motivate the achievement of higher performance among peers and the workforce by inculcating a mission and culture that appeal to common values, such as patient welfare, professional pride, and shared accountability for outcomes. (Sites are often physician-led or run in close partnership between administrators and physicians.) Leaders also set ambitious goals, communicate with and enlist the workforce in carrying out a strategic vision, and marshal resources to support the implementation of agreed-upon strategies.

Interdisciplinary teamwork. Teamwork takes many forms and is a key mechanism in the coordination of care. For example, it facilitates the orchestration of the functions of extended primary care and care management teams (which may include physicians, nurses, pharmacists, psychologists, social workers, and medical assistants), and can bring together experts from across medical and administrative disciplines to develop standardized and evidence-based care processes, thereby fostering continuous improvement.

Integration. Case study organizations are integrating care to bring together services across disciplines and settings for particular conditions or care episodes (e.g., diabetes, cancer, cardiac surgery), and across time and care (e.g., by using every patient contact as an opportunity to schedule needed preventive care). In rural areas, this objective may be met by integrating inpatient and outpatient care in critical-access hospitals and associated community clinics.³

Aligned incentives. Alignment occurs at the organizational level by integrating care and coverage and/or by setting budgets centrally, so that services can be organized in ways that make the most sense

operationally and clinically. Likewise, provider organizations are collaborating with payers and purchasers to create incentives that support and reward higher performance. At the physician level, compensation is aligned with the organization's objectives, values, and market environment.⁴

Mutual accountability. At its best, multispecialty group practice fosters a cohesive group culture that helps to minimize "turf battles" between disciplines and departments as physicians work together and with other staff to achieve common goals based on common values. In some areas, such as North Dakota and Minnesota, this theme takes the form of a spirit of collaboration among different organizations with similar interests that join together to pursue common objectives. In the words of one observer, "Everyone is in the same boat, pulling together."

Transparency. Supporting a culture of accountability, the case study organizations engage in rigorous performance measurement, reporting, and recognition both internally at the unit and individual level and externally at the organizational level. As noted by Alan Aviles, president and CEO of New York City's Health and Hospitals Corporation, transparency fosters honesty, awareness, and commitment to improvement throughout the workforce.⁵

Information Continuity

Dominant themes:

- Electronic health records (EHRs) support coordination of care by making patient information available across providers and settings, promote evidence-based care with decision support and patient education tools, and reduce duplication of laboratory or imaging tests because results are available when needed.
- Electronic prescribing (or computerized physician-order entry) reduces medication errors that result from illegible handwriting, enables reconciliation of medication lists as patients move across care settings, and warns physicians

Exhibit 3. Models of Organizing for High Performance

One important lesson from the case studies is that there are several ways to organize providers to achieve higher performance. Below we identify four models that characterize the case study sites (see Exhibit 4 for site descriptions). Although there are variations within these models, and many organizations cross categories, the Commission on a High Performance Health System found this categorization useful in formulating recommendations to promote better organization.

Model 1: Integrated delivery system or large multispecialty group practice, with a health plan

Description: An integrated delivery system with its own hospitals and other providers and/or a multispecialty physician group practice and a health plan. The insurance function provides flexibility, aligned incentives, and expertise in organizing to deliver high-value care. This is the most common model among the case study sites. However, only Kaiser Permanente is a “closed” model that exclusively serves patients who are members of Kaiser Health Plan. Others are “open” systems that serve patients both within and outside their health plans, or mixed-model health plans that include both an integrated medical group and independent physicians in private practice.

Case Study Sites (principal locations):

Denver Health (Colorado)
Geisinger Health System (Pennsylvania)
Group Health Cooperative (Washington)
HealthPartners (Minnesota)
Henry Ford Health System (Michigan)
Intermountain Healthcare (Utah)
Kaiser Permanente (nine states and District of Columbia)
Marshfield Clinic (Wisconsin)
New York City Health and Hospitals Corporation
Scott & White (Texas)

Model 2: Integrated delivery system or large multispecialty group practice, without a health plan

Description: An integrated delivery system with its own hospitals and other providers and/or a multispecialty physician group practice with no health plan.

Case Study Sites:

Mayo Clinic (Minnesota, Arizona, Florida) and Mayo Health System (Iowa, Minnesota, Wisconsin)
MeritCare Health System (North Dakota)*
Partners HealthCare (Massachusetts)

Model 3: Private networks of independent providers, such as an independent practice association (IPA) or virtual network

Description: A private association that organizes multiple independent providers, or providers who join together to share and coordinate services. An IPA usually contracts with multiple insurers to provide comprehensive health care services on a capitated basis, but makes fee-for-service payments to individual providers. The association or network may provide infrastructure services (e.g., performance improvement and care management) similar to those provided in models 1 and 2.

Case Study Sites:

Hill Physicians Medical Group (California)
North Dakota Rural Cooperative Networks*

Model 4: Government-facilitated networks of independent providers

Description: A public–private partnership in which government takes an active role in organizing independent providers, usually to create a delivery system for Medicaid beneficiaries. These partnerships may develop care coordination networks, provide information technology infrastructure, perform care management, or deliver other services characteristic of an organized delivery system.

Case Study Site:

Community Care of North Carolina

*MeritCare Health System and North Dakota Rural Cooperative Networks were described in a single case study report.

of possible drug allergies and interactions. It also promotes cost-savings through generic drug substitution.

- Patient Web portals expand patients' knowledge, provide convenience, and promote engagement of patients in their care, with features such as online health information, appointment scheduling, prescription refills, and laboratory test results. Some also allow patients to view shared portions of the EHR (e.g., immunization history), send secure messages, and review an after-visit summary of their treatment plan and self-care instructions.

Emergent themes:

- Financial incentives support EHR adoption or e-prescribing by affiliated physicians as part of broader pay-for-performance initiatives.
- Web portals allow authorized community physicians to view records of patients they have in common or make electronic referrals.
- Electronic linkages with contracted hospitals and collaboration with other stakeholders create regional networks for electronic information exchange.
- Physicians and the care team encourage and help patients register to use secure online services as a means of strengthening their bond with the care team (one-third to one-half of health plan members are using these Web portals at the most progressive sites).

Key insights: Although EHRs and e-prescribing may require more of physicians' time for initial data entry and information management, they appear to create efficiencies for the care team or organization as a whole, while enabling patient-panel management and other activities that improve patient care. Most physicians who use EHRs acknowledge this added value when they say that they would never go back to manual systems.

Some organizations have been pioneers in developing their own EHR systems, thereby

maximizing their ability to customize the system to fit local needs. Others have purchased vendor-developed systems but also enhanced them to realize their full potential. In either case, the involvement of physicians in system development or vendor selection was considered by several sources to be essential to the success of these efforts. EHR systems continue to evolve as organizations keep improving them.

While some sites have documented savings or returns on investment from functions such as electronic prescribing, most sites appear to view the EHR as a long-term strategic investment in population health management. The experience of Intermountain Healthcare may be representative of others: Its leaders observed that the organization did not realize the full value of its investment in clinical information systems until the EHR became a key enabler of a broader clinical improvement strategy.

In Their Own Words: EHR-Enabled Decision Support

"Our guidelines are embedded into decision support in the electronic medical record, in terms of reminders, prompts, and smartforms. So the guidelines aren't just passively sitting on a Web site—they actually intervene as the doctor is working with the software and managing the patient. That is an incredibly important part of what we've done in ambulatory care."

Elizabeth Mort, M.D., associate chief medical director, Massachusetts General Hospital, Partners HealthCare

Care Coordination and Transitions: Toward Accountability for the Total Care of the Patient

Dominant themes:

- Population-based care targets services toward patients with preventive care needs and toward those with uncontrolled chronic illnesses and complex conditions that put them at risk of complications, hospitalization, and poor outcomes.

- A team approach to care leverages physician time, with enhanced roles for clinical support staff, in activities such as pre-visit planning and outreach, and for mid-level practitioners, in seeing patients for acute-care needs and follow-up.
- Care managers (nurses, social workers, or pharmacists) coordinate with and are sometimes embedded in primary care teams to support patients in need of disease or medication management, care transitions, and self-care education.

Emergent themes:

- Use of “motivational interviewing” techniques in care management programs helps patients to articulate and resolve ambivalence about their values and to plan small steps to build confidence in setting and adhering to self-care goals.
- Health-risk assessments—some through online linkages to the EHR and some as part of broader work-site wellness programs—identify patients at risk of developing chronic diseases (or those with signs of untreated disease) and offer relevant lifestyle advice, coaching, and referral to services.
- Integration of mental and physical health care enhances primary care physicians’ ability to manage mental health conditions with support from specialists, embeds specially trained nurses and psychologists in primary care to comanage patients with depression, and incorporates mental health in generalist care management programs.

Key insights: Some sites report that routine care management activities are more effective when embedded in or closely linked to primary care teams. This approach is often an important part of efforts to implement a patient-centered “medical home” model of primary care, although elements of that approach are already evident in the primary care emphasis at many sites.⁶ While making significant changes in practice can be difficult, physician leaders involved in enhancing primary care describe it as the opportunity to

create the care experience that both patients and physicians desire.

Centralized care management approaches appear to work well for delivering standardized services (e.g., anticoagulation medication management) to high-risk patients, especially when such patients make up only a small number of any one physician’s patients or when such services benefit from linkage to specialty care. Several sites use intensive services to stabilize patients with uncontrolled conditions and then refer them back to primary care for ongoing management when appropriate.

In Their Own Words: The Value of Performance Feedback

“One has to take the data [collected by the EHR] and turn it into actionable information. While we don’t ever want to lose the individual aspect of patient care, we’re trying to close the loop from the individual back to the population to raise awareness of how the physician is doing with a given disease or constellation of diseases for their entire panel of patients.”

*Theodore Praxel, M.D., medical director
for quality improvement and care management,
Marshfield Clinic*

Peer Review and Teamwork for High-Value Care

Dominant themes:

- Performance feedback and reporting (for physicians, units, and the organization as a whole) and formal and informal mechanisms for peer review (facilitated by the EHR) promote accountability for achieving performance goals and standards.
- Interdisciplinary teams of clinical experts collaborate (internally and in some cases also externally) to develop and spread evidence-based guidelines and standard care processes, which are often embedded in the EHR to promote better coordination of care and quality improvements.
- Physicians are involved in decision-making through formal leadership roles (often in

partnerships, or “dyads,” with administrative leaders) and committee structures that help ensure consideration of clinical and patient perspectives. Physicians also serve as “clinical champions” to promote best practices and improvements among peers.

In Their Own Words: What Drives Performance?

“Thirty percent of driving performance is science: Identify the right thing to do. Seventy percent is sociology: Make the right thing happen, and make the right thing easy to do.”

Sharon Levine, M.D., associate executive director, The Permanente Medical Group

Emergent themes:

- “Prepared practice teams” with carefully orchestrated roles and daily “huddles” to plan the day’s work offer the opportunity to build teamwork and a sense of shared commitment to patient care on a daily basis.
- While sites typically provide individual performance feedback to physicians so that they can compare their performance to that of their peer group (whose identities remain anonymous), some share it in an identifiable, or “unblinded,” manner within a group or department to strengthen peer accountability.

Key insights: Some sites experienced instances when effective innovations did not take hold due to a lack of buy-in among physicians. To help avoid this outcome, organizations develop consensus and momentum for change through physician involvement in committees or work groups to complement vertical management structures. Working as part of a self-governing physician group appears to involve a trade-off in which physicians sacrifice some individual autonomy for the greater good, while also enjoying the clinical freedom from outside micromanagement that group accountability helps protect.

Continuous Innovation and Organizational Learning

Dominant themes:

- Quality improvement is a system property that supports collaborative learning and empowers interdisciplinary teams to identify and spread best practices, redesign care processes, develop innovations, reduce waste, and better meet patient needs. These efforts reflect a culture of constantly striving to do better.
- Defining frameworks for improvement helps to focus efforts on the achievement of high performance, both within the organization and among affiliated community physicians, and sometimes in a collaboration with other stakeholders that leverages expertise, promotes common interests, and creates joint accountability for outcomes.
- Consultative resources support teams in using systems engineering and improvement tools and techniques to design changes. Learning is shared within the organization through in-house journals, award programs, site visits, and “expos” where teams present and receive recognition for their work.
- Research centers at many sites offer collaborative opportunities to evaluate the effects of innovations before taking them to scale. Clinical simulation centers and learning laboratories allow clinicians to practice individual and team-based skills and test new approaches to care in environments that simulate real-world settings.

Emergent themes:

- “Bundles” of evidence-based practices, which have been a mainstay of efforts to prevent infections in hospitals, are increasingly being applied to promote optimal care for a growing number of conditions or treatments such as diabetes, coronary artery disease, cardiac surgery, depression, preventive care, and lifestyle changes.
- Some sites are incorporating patient views into quality improvement initiatives by inviting

patients to share their experiences in formal feedback sessions, by making patients part of redesign teams, and by creating patient and family advisory councils for ongoing advice on operations and programs.

- Several sites are furthering their information systems and research capabilities by undertaking personalized medicine projects that create and analyze “biobanks” of linked genetic and clinical information, with the goal of developing new treatment approaches that can be tailored to individuals’ genetic profiles.

Key insights: Case study sites such as Geisinger Health System appear to be driven to improve by what Geisinger’s leader, Glenn Steele, Jr., M.D., Ph.D., calls “pride of purpose” and a desire to set the standard or demonstrate a model worthy of emulation by others. Some sites have in the past operated mainly from a values-driven culture that stressed doing the right thing. But several reported intensifying their efforts to apply corresponding management discipline by setting goals and measuring outcomes, so as to demonstrate the value of their efforts to purchasers and consumers.

In Their Own Words: The Learning Organization

“A common saying at Mayo Clinic is, ‘No one of us is as smart as all of us.’ Creating and maintaining a learning organization means that teams of medical professionals use information technology and systems engineering to learn from each other in a timely way and do it as part of the ongoing activity of clinical practice.”

Denis Cortese, M.D., CEO, Mayo Clinic

Among the various improvement methods in use, many leaders are enthusiastic about the ability of “lean” techniques—borrowed from the Toyota Manufacturing System—to bring together the people who do the actual work, so they can design its improvement and the measures by which their performance will be evaluated. Clinicians are more amenable to the idea of standardizing their work processes when

they see that it avoids “wasted” time and frees them to spend more time on clinically oriented tasks.

Aligned organizational incentives created through the integration of care and coverage, or through partnership between providers and insurers or purchasers, enable savings through quality improvements—such as avoided emergency visits and hospitalizations—to fund the care coordination activities that brought them about (and that otherwise might not be financially viable). In some cases, however, a broader perspective is needed to consider the value of improved workplace productivity or enhanced quality of life for patients.

Easy Access to Appropriate Care

Dominant themes:

- Sites are engaged in multiple and varied efforts to offer convenient access to care, such as same-day or next-day appointments, after-hours urgent care and nurse-advice call lines, walk-in convenience clinics (linked via the EHR), centralized contact centers, group-oriented visits, and colocation of services.
- Many sites have cultural competency and access initiatives for the underserved that may include language training, interpreter programs, culture-specific clinics or screening programs targeted at minority and underserved populations, and collection of race/ethnicity data to help eliminate disparities in care.

Emergent themes:

- Prepaid care encourages some sites to use telephone visits, secure e-mail, and Web-enabled electronic visits as convenient alternatives to face-to-face encounters for patients with nonurgent needs, and as an efficient means for physicians and the care team to reach out to patients in need of services and conduct follow-up.
- “Telehealth” is being used increasingly for home monitoring of patients with chronic conditions, for remote consultations and pharmacy services for patients in rural areas, and for consultations between primary care and specialty care

physicians. Telehealth linked to a common EHR at both sites creates a powerful combination for delivering virtual care that can equal the quality of face-to-face encounters.

Key insights: Some large organizations may be driven to offer more convenient access—and to demonstrate greater value to consumers generally—in part to counteract a negative perception of clinic-based care or a preference among patients for seeing physicians in traditional private practice. Offering more convenient patient access often requires redesigning care processes, which in turn can improve efficiency of operations.

Case study sites are using or adapting common approaches such as “advanced access scheduling” and developing technologically savvy ways to fit them to their organizational strengths. Patient Web portals and EHRs facilitate after-hours information and access. Advice nurses at the Marshfield Clinic, for example, can view a patient’s treatment plan when speaking to the patient on the phone and include a record of the call in the EHR for the patient’s primary care physician to review and follow up as needed.

In Their Own Words: Putting the Patient at the Center

“Everything we design is based on the question: What does the patient need? It’s amazing how you design things differently when that’s your credo. What would American health care be like if we designed it on the same principle?”

Claire Trescott, M.D., medical director for primary care, Group Health Cooperative

Results

Commonly reported results of the initiatives and programs described above included improved clinical quality of care and control of chronic diseases, increased patient satisfaction, shorter waiting times, and reduced hospitalizations, emergency visits, and prescription drug expenses (see Exhibit 5 for detailed examples). Some of these achievements may represent

the “low-hanging fruit”—the first rewards of a process that will require continuing innovation and application of effort to sustain a trajectory of improvement and broaden its reach across all areas of performance.

All case study sites have earned distinction on one or more of the external performance recognition or benchmarking programs described in the Appendix ([Appendix Table 1](#)). Performance on nationally accepted metrics of ambulatory care quality was a common focus of care among study sites. Among the eight sites with affiliated commercial health plans for which comparable results were available for 2007, more than one-third of clinical quality measures and almost one-quarter of patient experience measures ranked in the top decile (10%) of health plans nationally or regionally. All the plans had one or more measures (a third to half of the measures for two Kaiser plans) that ranked among the top 10 health plans nationally or that ranked the best regionally ([Appendix Table 2](#)).⁷

Among the 11 study sites that own hospitals, more than half of the 70 system hospitals evaluated ranked in the top decile of hospitals nationally on one or more of the four clinical quality topics reported by the federal government’s Hospital Compare Web site for 2007 ([Appendix Table 3](#)). Of the 61 system hospitals that reported on a new national survey of hospital patients’ experiences, one of three ranked in the top quartile and one of five ranked in the top decile of the hospitals reporting results for 2007.

Resource use (as measured by the Dartmouth Atlas Project) was an area of mixed performance. Among a subset of similar chronically ill Medicare beneficiaries who received the majority of their care in the last two years of life at nine “flagship” system hospitals, Medicare spending, hospital days, and physician visits per decedent tended to be lower than the national average, especially at hospitals located in rural areas ([Appendix Table 4](#)). However, spending and hospital days were higher than the national average at some system hospitals located in major urban centers. The Dartmouth researchers observed that institutions characterized by higher-intensity care might learn from

the example of study sites, such as the Mayo Clinic, that appear to make efficient use of resources and provide high-quality care.⁸

Limitations

The identification of areas of excellence does not mean that the case study organizations have achieved perfection across the board, although some have done so in focused areas of care. The case study sites are further along the improvement journey than the vast majority of physician practices in the United States, but performances varied both within and between the systems and across dimensions of performance. In general, case study organizations performed more highly on clinical quality metrics than on patient satisfaction metrics, although several organizations have made strides to improve patient experience in recent years.

While their models of care delivery work well most of the time, these organized delivery systems occasionally fail to live up to their promise. Quality lapses documented at some institutions reinforce the need for these organizations—like others—to enhance continually their capabilities for preventing errors, closing quality gaps, and learning from mistakes that do occur.

Lessons Learned

The experience of the case study sites adds to a body of research documenting how diverse types of integration of providers and services—in combination with effective leadership, aligned incentives, and a supportive organizational mission and culture—facilitate the creation of high-functioning local health care delivery systems.⁹ These system-level enabling factors are often reinforced through mechanisms such as strategic goal-setting, rewards and recognition, physician and staff engagement in process improvement, and performance feedback and reporting.

The organizations in our series were taking multiple paths to integration. Fully integrated systems such as Kaiser Permanente report that owning hospitals and colocating services in medical centers promotes tighter care coordination and efficiency. Likewise,

critical-access hospitals in North Dakota often serve as “one-stop shops” for integrating inpatient and outpatient care for many rural communities. Some systems, such as Group Health Cooperative, report they are able to contract with other hospitals—for example, when there is excess bed capacity in their market—to coordinate inpatient care, which frees them up to focus their expertise on ambulatory care delivery. Although a multispecialty group practice such as the Marshfield Clinic reports challenges in coordinating care with independent hospitals, these have not deterred its physicians from adopting a population-based approach to patient care.¹⁰ Most of the systems also incorporate smaller primary care offices or satellite clinics, in addition to larger “hub” clinics, to meet their patients’ ambulatory-care needs in the local community.

Simply owning the pieces of a system is not enough, however. The experience of organizations such as Henry Ford Health System that have made financial turnarounds indicates that organized delivery systems must actively pursue the opportunities for integration inherent in their model to achieve the desired internal alignment, coordination, and synergy among the parts of the system. A common EHR and other electronic linkages appear to be an important tool for integrating and coordinating care as patients move across these systems, hinting at the possibility of virtual integration if community physicians and other providers were linked with interoperable EHRs.

While building an organized delivery system might seem like a daunting undertaking, Intermountain Healthcare’s experience shows that it is possible to create a multispecialty group practice from scratch in a matter of years, not decades. It found that a medical group recruited from community physicians with a “collaborative bent” and built around core values and common work ethic “self-selects” and becomes a stable unit with a shared culture. By emphasizing value creation based on quality and service rather than on productivity alone, Intermountain allowed physicians the opportunity to develop an internally motivated pride for achieving excellence both clinically and financially.

Most of the integrated systems with health plans contract with community physicians and accept payers other than their own health plan, thereby shifting their orientation away from an exclusive reliance on prepaid practice. These organizations have adapted by developing performance information and incentives to help overcome the limitations of fee-for-service payment. Several sites noted the advantage of being able to influence other providers in the community who practice in their facilities or who contract with their health plans, and of creating a spirit of “competitive excellence” within their organization as they compete for the loyalty of patients who have a choice of provider.

Internal accountability created by multispecialty group practice and by integrated care and coverage is further reinforced by external accountability through public performance reporting in a competitive marketplace. This is especially true in places such as California, where purchasers have structured the market to reward plans that deliver higher value. Kaiser Permanente long enjoyed a price advantage in the California market due to the principles of its model, but its competitors learned to achieve similar gains in part by emulating its strategies. Financial losses in the late 1990s and the advent of public performance reporting, reinforced by unblinded internal performance feedback within the medical group, signaled a wake-up call that energized the organization to demonstrate the potential of its model by making a stronger push for innovation and quality.

Efforts to promote greater organization of care must take into account not only what is most effective but also what is feasible in a given context. Loosely integrated networks such as Community Care of North Carolina and the Hill Physicians Medical Group may not enjoy all of the levers for change available to fully integrated systems, but their approaches may be more adaptable to current unorganized care arrangements. Partners HealthCare, for example, stimulated the adoption of EHRs by nonemployed physicians in its community network through a combination of “carrots” and “sticks”—financial incentives offered in collaboration with a major payer for implementing a preferred

EHR system, along with a deadline for doing so in order to retain participation in the community network.

Market incentives as currently structured do not fully support organized delivery systems in “doing the right thing” for their patients, however. Given their nonprofit or public missions, many case study sites strive to provide care coordination services equally across their patient population, regardless of coverage—helped by their ability to shift costs through global budgeting. However, economic realities have forced some sites to limit (at least initially) certain enhanced services, including care management programs, to their patients who are members of their integrated health plans, or to those patients for whom the system can earn quality-based performance bonuses from third-party payers. Based on the potential for earning such bonuses, some sites have invested in programs and tools that can benefit all their patients.

The type of payment made to medical groups also affected the way sites viewed specific approaches such as secure e-mail between patients and the care team. (Three of four consumers surveyed in 2008 expressed interest in online connectivity with their provider.¹¹) Such alternatives may not seem desirable to medical practices when they are paid only for face-to-face encounters, but they may be more attractive under a payment scheme that rewards efficient and patient-centered practice. Although these technologies are not the most important aspect of organized care delivery, they offer a case in point to illustrate how financial incentives may facilitate or impede innovations that offer greater convenience and potentially better care for patients.

These and other lessons from the case studies support the policy recommendations made in the Commission’s report *Organizing the U.S. Health Care Delivery System for High Performance*. Aligning macro-level system incentives, making changes to the regulatory, professional, and educational environments, and developing supporting infrastructure are critical to stimulating and supporting greater organization so that all Americans can benefit from receiving care in delivery systems that are designed and rewarded for

achieving high performance. These kinds of changes in the macro environment enjoy the support of both consumers and health system leaders.¹²

This discussion is not intended to suggest that the methods for organizing care described in these case studies represent the only ways of doing so. We discovered many variations among study sites, and there are undoubtedly other worthy approaches that we did not study. Organized delivery systems continue to evolve and have yet to achieve their full potential for improving performance. Nevertheless, their successes suggest that the degree and nature of organization can play a vital role in the process of improving the value of American health care. In addition, each case study offers practical ideas, lessons, and insights that may be

helpful to other organizations seeking to improve their capabilities for achieving higher levels of performance.

In Their Own Words: The Need for System Reform

“Ultimately, health care reform should seek not only to ‘defragment’ health care delivery so that it is less chaotic, but also to develop the infrastructure and performance framework that health care organizations will need to achieve their potential for providing optimal care.”

*George Isham, M.D.,
chief health officer, HealthPartners*

Exhibit 4. Description of Case Study Sites

System	Overview
Model 1: Integrated delivery system or large multispecialty group practice, with a health plan	
Denver Health	An integrated health system and Colorado's largest safety-net provider, offering comprehensive care to 160,000 individuals (25 percent of all Denver residents) based on ability to pay (sliding scale) through an urban teaching hospital and regional trauma center, 911 response, a poison and drug center, eight community clinics, 12 school-based clinics, a public health department and clinics, and a health plan serving commercial (Denver Health and Denver public employees), Medicare, Medicaid and SCHIP populations.
Geisinger Health System	A nonprofit, physician-led integrated health system serving an area with 2.6 million people in 43 counties of rural northeastern and central Pennsylvania through three acute/tertiary/quaternary hospitals and an alcohol/chemical dependency treatment center; a multispecialty group practice employing more than 740 physicians; 50 practice sites including 40 community practice clinics; the 220,000-member Geisinger Health Plan, which offers group, individual, and Medicare coverage and contracts with more than 18,000 independent providers including 90 hospitals; the Geisinger Center for Health Research; and medical education programs. Annual patient volume exceeds 40,000 inpatient discharges and 1.5 million outpatient visits.
Group Health Cooperative	A consumer-governed, not-for-profit integrated financing and delivery system that serves 580,000 members in Washington State and Idaho enrolled in group, individual, and public insurance programs. The 900-physician Group Health Permanente medical group contracts exclusively to provide care to two-thirds of GHC members in 31 outpatient medical facilities owned and operated by GHC. Other members receive care from a network of 9,000 community clinicians and hospitals.
HealthPartners	A family of nonprofit, consumer-governed, integrated health care organizations including a teaching hospital and two critical-access hospitals; the multispecialty HealthPartners Medical Group, with more than 600 physicians practicing in 50 clinics; health and dental plans offering group, individual, and public insurance coverage to more than 1 million individuals through a network of 30,000 providers in Minnesota, western Wisconsin, North and South Dakota, and Iowa; a research foundation; and a medical education institute.
Henry Ford Health System	A not-for-profit integrated delivery system serving more than 1 million residents of southeastern Michigan. The system comprises seven hospitals (including a large teaching institution and trauma center); 850 physicians in the multispecialty Henry Ford Medical Group who staff Henry Ford Hospital and practice in 25 outpatient medical centers; community care services including pharmacies and skilled nursing, home health, hospice, and dialysis services; and the Center for Health Services Research. The 545,000-member Health Alliance Plan offers group, individual, and Medicare coverage through a network of contracted providers. The system has more than 3 million patient contacts annually, including 93,000 inpatient admissions.
Intermountain Health Care	A nonprofit integrated delivery system that provides care and coverage in urban and rural areas of Utah and southeastern Idaho through 21 hospitals; 162 clinics and physician offices; 750 physicians in the multispecialty Intermountain Medical Group; the 500,000-member SelectHealth Plan, offering individual, group, and government coverage through contracts with 3,700 physicians and 34 hospitals across Utah; and the Institute for Health Care Delivery Research. The system logs more than 6 million outpatient visits and 128,000 inpatient admissions annually.

System	Overview
Kaiser Permanente	The largest not-for-profit integrated delivery system in the United States. Kaiser Foundation Health Plans serve 8.6 million members through exclusive contracts with physician-governed Permanente Medical Groups in eight regions (14,600 physicians nationwide). Facilities include 35 inpatient medical centers in three states and 431 outpatient medical office buildings located across all regions. Eight affiliated research centers constitute one of the largest nonacademic research programs in the country.
Marshfield Clinic	A not-for-profit clinic serving residents of northern, central, and western Wisconsin through a multispecialty group practice of almost 800 physicians who provide care to 377,000 patients visiting 41 ambulatory clinics in 33 rural communities, a health plan covering 150,000 people living in 32 counties, and related foundations supporting the institution's research and education mission.
New York City Health and Hospitals Corporation	The largest municipal health care system in the U.S., serving 1.3 million patients (400,000 uninsured) regardless of ability to pay or immigration status. A workforce of 39,000 (including 3,000 employed and contracted academic physicians) provides medical and behavioral services through 11 hospitals, four skilled nursing facilities, six diagnostic and treatment centers, 80 community clinics, home health care, and the 317,000-member MetroPlus health plan for Medicaid, Medicare, SCHIP, and New York Child and Family Health Plus coverage programs.
Scott & White	The largest integrated multispecialty health care system in Texas, employing more than 500 physicians who practice in three hospitals, including a new long-term acute-care facility, and in almost 50 regional primary and specialty care clinics in central Texas, providing 1.4 million outpatient visits and more than 30,000 inpatient admissions annually. Scott & White Health Plan enrolls 200,000 members in group, individual, and Medicare coverage programs and contracts with both Scott & White and independent providers. Scott & White is a clinical educational site for Texas A&M Health Science Center College of Medicine.
Model 2: Integrated delivery system or large multispecialty group practice, without a health plan	
Mayo Clinic and Mayo Health System	The world's oldest and largest integrated not-for-profit multispecialty group medical practice, with more than 3,400 clinic physicians and scientists serving 520,000 patients in four owned and managed hospitals and outpatient facilities on three major campuses (Rochester, Minn.; Scottsdale, Ariz.; and Jacksonville, Fla.) and five schools of biomedical education. Mayo Health System is an affiliated network of 17 owned hospitals and clinics with almost 800 physicians serving 2.4 million patients in 70 communities in Minnesota, Wisconsin, and Iowa.
MeritCare Health System*	An integrated hospital and clinic system and the largest multispecialty group practice in North Dakota, with 400 physicians, two regional hospitals in the Fargo-Moorehead area admitting 24,000 patients annually, and 46 ambulatory clinics that provide 1.5 million patient visits each year to residents of more than 30 communities in southwestern North Dakota and northern Minnesota. MeritCare is also the largest regional home health care provider.
Partners HealthCare	A nonprofit, loosely integrated delivery system in which members maintain autonomy while sharing knowledge, resources, and services. Partners HealthCare serves more than 1.5 million residents of greater Boston and eastern Massachusetts through two academic hospitals, four community and three specialty hospitals, community health centers, and home health and long-term care. Partners Community Healthcare contracts with 4,500 physicians in regional service organizations ranging from 14 to 250 physicians.

System	Overview
Model 3: Private networks of independent providers, such as an independent practice association (IPA) or virtual network	
Hill Physicians Medical Group	An independent practice association serving 332,000 patients enrolled in seven health maintenance organizations, two Medicare Advantage plans, and Medi-Cal, California's Medicaid Program, in eight northern California counties through contracts with 2,200 autonomous member-physicians, including 800 primary care physicians and 236 physician owners. Hill member-physicians have practices at 1,600 offices and work in 30 hospitals and 15 urgent care centers.
North Dakota Rural Cooperative Networks*	<p>Several cooperative networks established by health care providers in rural North Dakota to provide local access to quality care by sharing resources, expertise, infrastructure, and service delivery. For example:</p> <ul style="list-style-type: none"> • The Northland Healthcare Alliance is a network of 25 hospitals and long-term care facilities that develop and share services. • The Northwestern North Dakota Information Technology Network is developing electronic medical records to be shared by 11 hospitals. • The Rural Mental Health Consortium provides on-site mental health services in four remote areas through clinical nurse specialists. • The North Dakota Telepharmacy Project is a collaboration between the North Dakota State University College of Pharmacy, the North Dakota State Board of Pharmacy, and the North Dakota Pharmacists Association to “restore, retain, or establish pharmacy services in medically underserved rural communities.” Participants include 21 central pharmacies and 36 remote telepharmacy sites. • West River Health Services provides a full range of health services to more than 35,000 residents in rural communities of North and South Dakota and Montana with a 25-bed critical-access hospital and community clinic, five satellite rural health clinics, and a multispecialty group of 16 physicians.
Model 4: Government-facilitated networks of independent providers	
Community Care of North Carolina	A public–private partnership that provides key components of a medical home and care management for almost 1 million low-income individuals enrolled in Medicaid or the State Children's Health Insurance Program. Community Care of North Carolina (CCNC) is a community-based system of 14 regional networks, each of which is a nonprofit organization consisting of a partnership of local providers including hospitals, primary care physicians, county health and social services departments, and other stakeholders. More than 1,300 primary care practices with 3,500–4,000 physicians currently participate in CCNC networks statewide, representing about half of the primary care practices in the state. The state provides resources, information, and technical support. Physician fee-for-service reimbursement is supplemented by a per-member-per-month (PMPM) fee for case management. Regional networks also receive a PMPM fee to cover the cost of care management and network administration.
*MeritCare Health System and North Dakota Rural Cooperative Networks were described in a single case study report.	

Exhibit 5. Selected Results of Performance Improvement Programs and Initiatives Reported by Case Study Sites

Model 1: Integrated delivery system or large multispecialty group practice, with a health plan

Denver Health

- A computerized physician order entry system reduced the time required to fill medication orders by 85 percent.
- Use of computerized decision support tools contributed to an increase in fully immunized two-year-olds, from 38 percent in 1995 to 85 percent in 2006. Denver Health exceeded the national 90th-percentile benchmark on all five HEDIS (Healthcare Effectiveness Data and Information Set) measures of childhood and adolescent access and quality, including immunization rates, in 2006.
- Following a redesign of the operating room patient flow, using “lean” techniques to streamline procedures and eliminate waste, the number of patients who received antibiotics within the appropriate time frame before surgery increased from 80 percent to 96 percent.
- Implementation of standard order care protocols was associated with a 35 percent reduction in length of stay among diabetic ketoacidosis patients, with no increase in adverse outcomes, such as hypoglycemia. Overall, the average length of an acute-care stay at Denver Health was 4.4 days for Medicaid patients in 2005, versus 5.2 days at other metro Denver hospitals, and the average charge per stay was \$19,331, versus \$30,253.
- “Open access” scheduling at the Westside Family Health Center reduced the patient no-show rate to 15 percent, about half the rate experienced previously using traditional scheduling models.

Geisinger Health System

- Use of an online patient portal to view test results, make appointments, and communicate with physicians is associated with about 5,000 fewer telephone calls to Geisinger Clinic per month.
- The all-cause hospital admission rate fell by 20 percent for patients receiving care at two primary care sites that pilot-tested an advanced medical home model, ProvenHealth Navigator, from 2006 to 2007, contributing to a 7 percent savings in medical costs. The hospital readmission rate fell by 5 percentage points among patients receiving care at 25 primary care sites that implemented the ProvenHealth Navigator model from 2007 to 2008, compared to an almost 1-percentage-point increase among a control group. Overall medical costs declined by 4 percent at the medical home sites after implementation of the model.
- A disease management program for health plan members with diabetes, in which nurse care managers were embedded in primary care sites, documented improvements in care processes and cost-savings of over \$100 per member per month, resulting from 25 percent fewer admissions and 43 percent fewer hospital days.
- Use of a physician compensation plan that includes performance targets for meeting budget, quality of care, patient satisfaction, and citizenship activities contributed to improved productivity (from the 45th percentile to the 78th percentile using the McGladrey Standard for large clinics) and patient satisfaction, with 20 percent of Geisinger physicians placing nationally in the top-performing decile of their peers.
- Four months after implementing a quality and efficiency improvement model, ProvenCare, adherence to a bundle of 40 evidence-based practices for heart bypass surgery increased from 59 percent to 100 percent and has remained close to that level. Associated clinical and financial improvements included a 10 percent increase in patients discharged to their homes, a 16 percent drop in average length of stay, and 5 percent lower hospital charges. Similarly, use of electronic reminders, performance feedback, and financial incentives helped increase compliance with a bundle of nine diabetes measures by nearly 300 percent during a one-year period.
- Outreach to women at risk of developing osteoporosis led to 49 percent scheduling a bone scan, compared to 13 percent of women in two control clinics. Women who participated in a follow-up group visit were more likely to receive osteoporosis medication (100% vs. 69%), to be assessed for vitamin D deficiency (100% vs. 3%), and to be given a prescription for vitamin D and calcium (97% vs. 50%) than those receiving usual care.
- After implementing “advanced access” scheduling, same-day appointments in primary care sites increased from 50 percent in 2002 to 95 percent in 2006, and 84 percent of network sites now have a lead time of one day or less. Improved access was associated with a 48 percent increase in patient satisfaction.

Group Health Cooperative

- Preliminary results from a primary care “medical home” pilot site included significant improvements in measures of patient experience and clinical quality, fewer emergency department visits and hospitalizations for select ambulatory care–sensitive conditions, and reduced staff emotional burnout compared to usual-care sites. Despite higher primary care costs, the model was cost-neutral at one year, owing to the reduction in hospital utilization.
- Participants in a centralized case management program for patients with heart failure had 32 percent fewer hospital readmissions for any cause during the first three years of the program versus those who did not receive case management, and 84 percent of participants achieved stable or improved functional capacity.
- A telephonic anticoagulation management service was credited with increasing the proportion of patients with lab values within target range from 68 percent to 75 percent, reducing adverse events by 25 percent, and saving an estimated \$2.9 million annually from avoided ambulance, hospital, and long-term care.
- A medication use management program increased the use of cholesterol-lowering medications (statins) from 32 percent to 68 percent of patients with diabetes while increasing the use of a generic statin from under 5 percent to over 70 percent of prescriptions written during a one-year period, lowering the cost of a prescription by 40 percent. In 2008, \$3.4 million was saved through cost-effective prescribing supported by electronic alerts, physician feedback, and evidence-based recommendations developed by interdisciplinary expert teams.
- More hypertensive patients participating in a pharmacist-led care management program using Web-based communication strategies achieved target blood pressure control than those receiving usual care (56% vs. 31%).
- Approximately 150 amputations were prevented in one year (primarily among diabetic patients) by using standardized wound care evaluation and intervention protocols developed by a clinical work group of physicians as part of a “content of care” program that aims to reduce variations and implement best practices in care.
- A 2005 actuarial study of the plan’s diabetes care coordination program found that hospital and ER use among diabetic patients was 45 percent lower than in a regional comparison group (200 vs. 365 admissions per 1,000; 308 vs. 575 ER visits per 1,000), while overall costs per member per month were \$350 less. Clinical quality measures also were better (e.g., 83% vs. 51% with annual hemoglobin A1c test).
- Sixty-five percent of patients’ calls to their primary care team are resolved immediately and 99 percent are resolved within two hours as a result of a call management program that links the phone system and the EHR, facilitating direct telephone access to a patient’s primary care team.

HealthPartners

- Systematizing prescribing processes in the EHR and giving clinicians feedback on their prescribing patterns led to an increase in generic prescribing, from 45 percent in 2002 to 72 percent in 2007. Each percentage-point increase in the rate of generic usage translates to \$1 million in savings.
- The proportion of patients receiving optimal diabetes care increased from 4 percent of patients with diabetes in 2004 to 25 percent by the end of 2008 through various quality improvements and the role of a “prepared practice team” to promote consistent adherence to an evidence-based “bundle” of five treatment goals.
- Achievement of cardiovascular risk-reduction targets by one in five patients with diabetes, high blood pressure, or heart disease contributed to 4,000 fewer deaths overall among this group, and to 100 fewer heart attacks, 740 fewer eye complications, and 140 fewer amputations annually among patients with diabetes.
- An economic analysis of HealthPartners’ disease management program for diabetes valued improved quality of life from reduced disease complications (assuming a 1 percent improvement in blood sugar control) at \$31,000 for a patient who participated in the program for 10 years, far greater than the cost of the program.
- The health plan’s CareSpan chronic disease management program was associated with a 6 percent reduction in hospital admissions (for any cause) among participants with asthma or heart failure and a 5 percent reduction for participants with diabetes from 2003 through 2006. Admissions for heart attack, heart bypass surgery, and chest pain were 13 percent lower for participants with coronary artery disease.
- A 17 percent improvement in rates of six-month medication adherence among patients diagnosed with depression was attributed to a disease management program that provides patient education and medication refill reminders for patients and physicians.
- A telephonic case management program for health plan members with behavioral health diagnoses increased ambulatory behavioral health visits by 35 percent, while reducing inpatient behavioral health days by 4 percent and inpatient costs by 18 percent. Estimated return on investment was \$4 in medical cost savings for every \$1 spent on program administration.
- For one employer, a work-site wellness program with counseling and education services led to a 6 percent improvement in employees’ modifiable risk scores and health behaviors, a 3 percent annual reduction in medical claims costs (yielding a 2:1 to 3:1 direct return on investment), and improved workforce productivity valued at \$1 million.
- Tobacco use prevention programs led to increased assessment of health plan members’ tobacco use (from 71% assessed in 1998 to 96% in 2007) and assistance to help smokers quit (from 47% assisted in 2001 to 65% in 2008). Self-reported tobacco use declined by almost half (from 25% using tobacco in 1998 to 13% in 2008), and parent-reported secondhand smoke exposure among children of health plan members fell to a quarter of the former level (from 23% to 5% exposed).
- Implementation of advanced-access scheduling led to a 76 percent reduction in average waiting time at 17 clinics over a two-year period. Advanced-access scheduling also contributed to a 5 percent to 9 percent decrease in urgent care visits and improved continuity of care for patients with certain chronic conditions. All primary care clinics now offer same-day access and almost 30 percent of primary care visits are same-day appointments.

Henry Ford Health System

- Implementation of an electronic prescribing system linked to retail pharmacies will yield projected five-year savings of \$14 million from increased generic drug prescribing (which has risen from 57 percent to 75 percent of prescriptions written), administrative simplification, and reduced adverse events.
- Henry Ford Medical Group patients with uncontrolled diabetes who participated in an intensive nurse-managed ambulatory care service experienced an approximate one percent reduction in hemoglobin A1c levels on average, indicating better control of blood sugar.
- Virtual clinics of nurses and pharmacists monitor patients taking anticoagulation medication and make necessary dosing adjustments using evidence-based protocols and the EHR, leading to a 14 percent improvement in the time it took patients to achieve the target anticoagulation range.
- The suicide rate among Health Alliance Plan members receiving care in the Henry Ford Medical Group fell by 75 percent (from 89 to 22 per 100,000 from 2000 to 2005) following implementation of a planned and collaborative care model and a behavioral health EHR system as part of the “Pursuing Perfect Depression Care” initiative. The group subsequently achieved six consecutive quarters without a single suicide among these patients (through the first quarter of 2009).
- Patient safety improvement projects led by multidisciplinary teams implemented “bundles” of evidence-based practices at Henry Ford Hospital, leading to a reported 50 percent reduction in the surgical site infection rate; a 90 percent reduction in ventilator-associated pneumonia among critically ill patients; and a 33 percent reduction in elapsed time to treatment (“door-to-balloon time”) for heart attack patients.
- Smoking cessation counseling increased from a range of 40–80 percent to 90–100 percent at three acute-care hospitals after nurses assumed responsibility for providing counseling to patients who smoke and are hospitalized with heart attack, heart failure, or pneumonia.
- Use of an “advanced access” scheduling model in 20 primary care clinics led to a 31 percent reduction in patient waiting time (to the third-next available appointment) over a two-year period.
- Breast and prostate cancer screening more than doubled among 3,000 African-Americans through participation in a federal initiative to reduce racial and ethnic disparities in cancer deaths.
- A Web-based asthma education program called “Puff City,” targeted toward minority teens, led to a 50 percent reduction in emergency visits and hospital admissions and 60 percent fewer missed school days within one year of its introduction at a Detroit high school.

Intermountain Health Care

- Elderly diabetic patients managed by a care coordination program called “Care Management Plus” were more likely to have blood glucose under control, had fewer hospitalizations for any cause and for ambulatory care-sensitive conditions, and were less likely to die during the study period than a matched control group of patients. A cost analysis found that the program can more than pay for itself through increased provider productivity.
- Integrating mental health care into primary care resulted in improved detection of depression, no increase in overall costs, and favorable changes in service use among adult patients with depression as compared to usual care, e.g., fewer ER visits (35 percent decrease vs. 28 percent increase), shorter inpatient lengths of stay (40 percent decrease vs. 46 percent increase), and more primary care visits (35 percent increase vs. 26 percent increase) one year after the onset of depression. The mental health integration model also was associated with increased physician productivity and greater satisfaction among patients, physicians, and clinic staff.
- The 65 clinical improvement projects undertaken by attenders at an internal Advanced Training Program were associated with approximately \$30 million in cost savings.
- A discharge medication management program increased prescription rates for recommended cardiovascular medications from a baseline of 40–68 percent to 90–98 percent after one year. Relative risk of death at 30 days decreased by 19 percent, and that of readmission at 30 days by 8 percent.
- Following the implementation of a clinical practice guideline, Intermountain labor and delivery units reduced rates of inappropriate elective labor inductions from 28 percent of elective deliveries to less than 10 percent in six months and subsequently to less than 3 percent, with no adverse clinical outcomes. A prehospital-discharge newborn bilirubin screening program led to an almost 50 percent reduction in the rate of severe hyperbilirubinemia among newborns.

**Kaiser
Permanente**

- Patients in the Northwest region who used online services including secure messaging with the care team made 10 percent fewer primary or urgent care visits than before they had online access (7 percent fewer compared to a control group of patients). The physician visit rate in the Hawaii region fell 26 percent following implementation of the EHR, with a corresponding increase in phone visits and secure messaging with the care team.
- Primary care-oriented cardiovascular disease prevention and care management initiatives in the Northern California region led to a reduction in adult smoking (from 12.2 percent to 9.2 percent of members during a three-year period), increased control of blood pressure (from 36 percent to 77 percent of hypertensive patients over an eight-year period), and increased receipt of preventive medications (from 41 percent to 53 percent of eligible patients over a four-year period). Hospitalization rates declined by 30 percent for coronary heart disease, by 56 percent for heart attack, and by 20 percent for strokes between 1998 and 2007. The heart disease mortality rate decreased by 26 percent from 1995 to 2004; Northern California Kaiser Permanente members had a 30 percent lower chance of dying from heart disease than other Californians in 2004.
- Among patients participating in a cardiac rehabilitation case management program in the Colorado region, cholesterol screening increased from 55 percent to 97 percent, cholesterol control increased from 26 percent to 73 percent, and the relative risk of death was reduced by 76 percent. These improvements prevent an estimated 260 major cardiac events and 135 deaths per year.
- A telephonic care coordination program to improve follow-up care for patients discharged from hospitals or skilled nursing facilities in the Colorado region saved \$4 million through reduced readmissions (2.4% of intervention patients vs. 14% of usual-care patients at 12 months) and ED visits (7% vs. 16%, respectively). Over 90 percent of physicians and 95 percent of patients express satisfaction with the program.
- For patients in the Colorado region taking anticoagulation medication, a telephonic, clinical pharmacist-managed anticoagulation service reduced the risk of therapy-related complications by 39 percent compared to usual care. The relative risk of potentially inappropriate medication dispensing was reduced by 16 percent among elderly patients in the Colorado region through the use of medication information management systems.
- A “Healthy Bones” care management program for patients at risk of hip fractures in the Southern California region was associated with a 37 percent reduction in the rate of hip fractures treated in the region’s medical centers, including a 60 percent reduction in the best-performing center.
- Northern California members’ emergency department visits declined by almost one-third over the course of 12 years, from a rate of 300 visits per 1,000 adults in 1997 to 205 visits per 1,000 in 2008, as a result of initiatives to improve access, care management, clinical processes, and information technology use.

Marshfield Clinic

- The immunization rate among two-year-olds in Wood County, where Marshfield Clinic is located, rose from 67 percent to 91 percent in the 14 months after the Clinic deployed an electronic immunization registry linked with all local community-based providers and public health agencies.
- Through various quality improvements, the proportion of diabetics who received a “bundle” of seven chronic care services—blood pressure measurement, two blood glucose tests, a fasting lipid profile, a microalbumin test, pneumococcal vaccination, and a foot exam—rose from zero in 2004 to 47 percent in 2008, while those achieving three treatment goals—control of blood glucose, blood pressure, and LDL cholesterol—rose from 8 percent to 21 percent during that time.
- The hospitalization rate among diabetic patients fell 12 percent from 2005 to 2007 after the implementation of “bundles” of evidence-based practices. The Clinic estimates that this reduction saved between \$5 million and \$14 million from avoided hospital admissions.
- Patients enrolled in a nurse-led anticoagulation service achieved anticoagulation control more often (77.4% vs. 59.1% of time in the target range), experienced 55 percent fewer anticoagulant-related adverse events (2.98 vs. 6.67 per 100 person-years), and had 41 percent fewer hospital admissions (41.5 vs. 70.2 per 100 person-years) than those receiving usual care. Cost-savings for Medicare beneficiaries were estimated at \$9,443 per avoided hospitalization.
- Programming the electronic prescribing system to require that physicians document why they are not prescribing a “preferred drug” increased the use of such drugs, saving payers \$2.5 million in one year.
- The waiting time to the third-next available appointment fell from 20.3 days to 1.8 days at the Clinic’s Family Practice Clinic in Rice Lake after physicians and staff participated in a Web-based learning collaborative to implement advanced access scheduling. Eleven of Marshfield’s 56 primary care locations offered a third-next available appointment within one day or less during the third quarter of 2008.

New York City Health and Hospitals Corporation

- In the Generations+/Northern Manhattan Regional Network hospitals, electronic medication ordering reduced medication errors by 40 to 70 percent over a two-year period.
- As a result of disease management efforts led by nurse care managers, 52 percent of patients in the Queens Health Network had their blood glucose levels under control at the end of 2007, compared to only 10 percent in 2003.
- For MetroPlus health plan members who receive care from HHC providers, use of asthma self-management “contracts” contributed to a 22 percent decline in the rate of hospital admissions for pediatric asthma and a 45 percent decline in the rate of hospital admissions for adult asthma between 2004 and 2007, while increasing the number of patients’ symptom-free days.
- Patients enrolled during the first seven months of a case management program for heart failure at Bellevue Hospital Center had one-third fewer hospital admissions during the subsequent 12 months, compared with their experience in the year prior to enrolling in the program.
- Critical care teams implemented a bundle of evidence-based clinical practices to prevent hospital-acquired infections, resulting in a 55 percent reduction in observed cases of central line–associated bloodstream infections and a 78 percent decrease in ventilator-associated pneumonia in ICU patients from 2005 to 2007.
- HHC’s unadjusted in-hospital mortality rate fell almost 11 percent systemwide from 2003 to 2007, and was 26 percent below the national average in 2005. This improvement translated to an estimated 550 fewer in-hospital deaths in 2007 and 1,350 fewer deaths since 2003. The average length of hospital stay fell by 40 percent as a result of a decade of work focusing on improving efficiency in services and operations.
- Following HHC’s three-year Ambulatory Care Restructuring Initiative, patient visit cycle times were cut from an average of about 150 minutes (and up to 240 minutes at some clinics) to fewer than 60 minutes at most HHC primary care clinics. In phase 2 of the project, HHC clinics instituted patient-centered “open access” scheduling, which reduced the no-show rate by as much as 50 percent.
- Evaluation of a pilot project targeting cancer screening found that “patient navigators,” in combination with a streamlined referral process, reduced no-shows from 67 percent to 5 percent and were associated with a 10-percent-point increase in the rate of colonoscopy screening.

North Dakota Rural Cooperative Networks: Telehealth Programs

- More than 40,000 rural citizens in 55 percent of North Dakota counties have retained access to pharmacy services in their community through a “telepharmacy” project. The rate of dispensing errors was under 1 percent at telepharmacy sites, compared to a national average of about 2 percent. Each remote telepharmacy site generates about \$500,000 per year for the local community, yielding 40 to 50 new jobs and an estimated \$12.5 million annually that has been added to North Dakota’s rural economy.
- Outcomes in a psychiatry pilot program for treatment of an eating disorder were similar among patients who were randomly assigned to receive treatment via telemedicine or through face-to-face encounters. The average cost of therapy was only \$73 per case for telemedicine compared to \$230 per case for face-to-face care, which typically requires reimbursing providers to drive long distances for each appointment. Patients rated the physician–patient alliance equally well in face-to-face and telemedicine encounters.

Scott & White

- An evaluation of a diabetes care management program that uses health plan nurses embedded in large primary care clinics found that the program was associated with 32 to 35 percent lower hospital use and 15 to 17 percent lower total costs per member in pilot sites versus other practice sites.
- The pneumococcal vaccination rate rose from 20 percent to 95 percent in just over two years as a result of the efforts of dedicated quality coordinators working in conjunction with physician-led multidisciplinary teams.
- Diabetes patients who participated in a six-month intervention using a PDA (personal digital assistant) to enhance self-monitoring activities achieved a decrease in their mean blood glucose measurement of 17.5 percent.
- A universal screening program to prevent methicillin-resistant *Staphylococcus aureus* (MRSA) infection in hospital patients using rapid DNA testing and appropriate infection control measures was associated with a 25 percent reduction in positive MRSA cultures in one year.

Model 2: Integrated delivery system or large multispecialty group practice, without a health plan

Mayo Clinic

- Use of an electronic patient registry and standardized care processes resulted in higher documentation of lung function (peak flow) rates (84% vs. 0%) and asthma severity (63% vs. 12%) in a study group of asthma patients as compared to a control group.
- The Mayo Health System’s Luther-Midelfort Clinic improved performance on an “all-or-none” diabetes measure—including control of blood glucose, blood pressure, and cholesterol, daily aspirin use, and cessation of smoking—since undertaking an improvement initiative that uses an enhanced planned care model and provides unblinded provider feedback, with its rate almost tripling in 16 months from 5.6 percent in January 2008 to 16.1 percent in April 2009.
- Redesigning and streamlining care processes reduced the average “door-to-balloon” time for heart attack patients from 92 to 60 minutes at St. Marys Hospital, Rochester, between 2004 and 2006. The Fast Track for Heart Attack project took this approach to the regional level, achieving a door-to-balloon time of 108 minutes (the national average is 180 minutes) among 28 regional hospitals transporting patients to Mayo Clinic Rochester.
- Medication discrepancies fell by 45 percent in a preventive medicine clinic that asked patients to take all prescription and over-the-counter medications or a current medication list with them to clinic visits, where medications were reconciled in the EHR, with feedback given to physicians.
- A process redesign effort using lean methodology better aligned demand and supply of cardiovascular clinic services and reduced the waiting time to obtain an appointment from 33 days to three days and patient no-shows from 30 percent to 10 percent. Concurrently, the redesign increased the provision of value-added process time for patients from an average of 240 to 284 minutes.

MeritCare Health System

A collaborative pilot project with Blue Cross Blue Shield of North Dakota linked patients with a chronic disease management nurse stationed in a primary care clinic. Results from 2003 to 2005 included the following.

- The proportion of diabetic patients who received a “bundle” of five recommended services—a physician office visit, blood glucose test, eye exam, lipid test, and microalbumin test—increased by 18 percent (from 48.5% in 2003 to 57.4% in 2005) compared to a nonsignificant decline in this rate at a control clinic.
- Outcomes for diabetic patients treated at the pilot site were 5 percent to 15 percent better than those for a comparison group on measures of blood glucose and cholesterol control, tobacco use, and aspirin therapy.
- Hospital admissions decreased by 6 percent and ER visits decreased by 24 percent in the intervention group, while increasing by 45 percent and 3 percent, respectively, in the comparison group.
- Total costs per member per year were \$530 lower than expected in the intervention group in 2005 based on historical trends, saving an estimated \$102,000 for 192 patients in the pilot.

Using lean management techniques to bring clinicians and systems engineers together to map care processes and redesign systems to maximize value and efficiency, the psychiatry department decreased appointment callback time from two hours to five minutes. Another project that reengineered cardiolyte test scheduling reduced appointment waiting time from three weeks to next-day or second-day appointment availability.

Partners HealthCare

- As a result of incentives created by a pay-for-performance initiative, 90 percent of Partners' hospital-based physicians and 84 percent of Partners' specialists use an EHR; adoption among Partners' community-based primary care physicians increased from 9 percent in 2003 to 99 percent in 2008.
- Computerized physician order entry with decision support reduced medication errors by 80 percent and preventable adverse drug events by 62 percent at Brigham and Women's Hospital. Use of an electronic medication reconciliation program and related process improvements led to a 28 percent reduction in the relative risk of a potential adverse drug event at two Partners hospitals.
- Partners instituted electronic systems to ensure that seven vital pieces of information (including reconciled medications) travel with the patient upon discharge from the hospital. At baseline, this was occurring about one-third to one-half of the time; the rate was 87 percent as of December 2008.
- In the first two years of a pay-for-performance contract, Partners-affiliated community care practices achieved significantly greater improvement in diabetes care than other medical groups statewide, such as an increase in the number of diabetic patients receiving eye exams from 62 percent to 81 percent and in the number of patients receiving a blood glucose test from 89 percent to 96 percent. Interventions have included using computerized registries to track patients, establishing patient education programs, and developing decision-support tools to embed clinical guidelines in the workflow.
- Using an electronic registry to help identify appropriate patients with heart failure, the “Identify and Connect” initiative linked 95 percent of hospitalized patients with appropriate heart failure management services at discharge as of September 2008.
- As of June 2008, 99 percent of hospitalized patients received tobacco cessation advice before discharge, a result of efforts to ensure that every hospitalized patient who smokes gets advice and assistance in quitting smoking and post-discharge support to help stay on a smoking cessation program.
- Massachusetts General Hospital instituted an anticoagulation management service that uses standardized algorithms and clinical practice guidelines, resulting in a reduction in length of stay of 4.63 days per admission and improved adherence to national guidelines for warfarin initiation from 20 percent to 100 percent.
- By applying lean process improvement and high-reliability design strategies, Partners' hospitals increased the inpatient administration of pneumococcal vaccination from 26 percent in 2003 to 76 percent in 2007.
- Through tight orchestration of transitions between home, ambulance, and emergency room, the rate of heart attack patients receiving cardiac catheterization treatment within less than 90 minutes improved from 69 percent in 2006 to 90 percent in June 2008.

Model 3: Private networks of independent providers, such as an independent practice association (IPA) or virtual network
Hill Physicians Medical Group

- Primary care physicians used an electronic patient registry system to identify patients in need of preventive care screening and testing, contributing to an increase in chlamydia screening from 43 percent to 56 percent of eligible women from 2006 through 2008.
- Among diabetic patients whose physicians participated in a diabetes-focused clinical quality improvement collaborative, control of blood glucose (hemoglobin A1c test <9%) increased from 57 percent to 81 percent and control of lipids (LDL-C <100) increased from 44 percent to 57 percent between 2005 and 2007.

Model 4: Government-facilitated networks of independent providers
Community Care of North Carolina (CCNC)

- An asthma disease management initiative that standardized assessment and treatment has resulted in a 21 percent increase in severity staging and a 112 percent increase in the administration of flu shots to asthma patients since 2004, and resulted in a 40 percent decrease in asthma-related hospitalizations and a 17 percent decrease in emergency visits between 2003 and 2006. The program is estimated to have saved \$3.5 million between 2000 and 2002.
- A diabetes disease management initiative promoting the use of the American Diabetes Association's Clinical Practice Guidelines promoted optimal control of blood sugar for 47 percent of patients and of cholesterol for 56 percent of patients in 2006, exceeding benchmarks of 40 percent and 36 percent, respectively. The program is estimated to have saved \$2.1 million between 2000 and 2002.
- Use of the Prescription Advantage List, a voluntary effort to promote the use of generic and other less-expensive medications, achieves annualized savings of over \$1 million.
- A nursing home "polypharmacy" initiative to optimize the medication regimens of Medicaid patients in nursing homes resulted in almost 6,000 medication changes and a cumulative savings of \$9 million since 2002, while reducing drug duplications and adverse drug-drug interactions.
- An actuarial analysis estimated that CCNC saved the state between \$284 million and \$314 million in fiscal year 2006. A more conservative estimate suggested savings of \$154 million to \$170 million attributable to CCNC's care management and quality improvement activities in 2006.

Individual case studies described in this report have been or are being published separately from this report at

www.commonwealthfund.org.

NOTES

- ¹ T. Shih, K. Davis, S. C. Schoenbaum, A. Gauthier, R. Nuzum, and D. McCarthy, *Organizing the U.S. Health Care Delivery System for High Performance* (New York: The Commonwealth Fund Commission on a High Performance Health System, Aug. 2008).
- ² An *integrated delivery system* has been defined as “a network of organizations that provides or arranges to provide a coordinated continuum of services to a defined population and is willing to be held clinically and fiscally accountable for the outcomes and health status of the population served” (R. R. Gillies, S. M. Shortell, D. A. Anderson et al., “Conceptualizing and Measuring Integration: Findings from the Health Systems Integration Study,” *Hospital and Health Services Administration*, Winter 1993 38(4):467–89). Our use of the term *organized delivery system* encompasses a broader continuum of organizations ranging from fully to loosely integrated and those that focus exclusively on care delivery. Hybrid forms were common in which only a core set of patients received both care and coverage from the integrated system.
- ³ D. McCarthy, R. Nuzum, S. Mika, J. Wrenn, and M. Wakefield, *The North Dakota Experience: Achieving High-Performance Health Care Through Rural Innovation and Cooperation* (New York: The Commonwealth Fund, May 2008).
- ⁴ Organizations vary in how they define aligned physician incentives—ranging from salary- to productivity-based pay, often supplemented by modest incentive payments for achieving quality and service goals.
- ⁵ D. McCarthy and K. Mueller, *The New York City Health and Hospitals Corporation: Transforming a Public Safety Net Delivery System to Achieve Higher Performance* (New York: The Commonwealth Fund, Oct. 2008).
- ⁶ There are several definitions of a “medical home,” but a common reference point is *Joint Principles of the Patient-Centered Medical Home*, issued in February 2007 by the American Academy of Family Physicians, American Academy of Pediatrics, American College of Physicians, and American Osteopathic Association, <http://www.pcpcc.net/content/joint-principles-patient-centered-medical-home>.
- ⁷ Among sites that own or sponsor health plans, most contract with both an integrated medical group as well as community physicians and thus have opportunity to influence performance in diverse settings.
- ⁸ J. E. Wennberg, E. S. Fisher, D. C. Goodman et al., *Tracking the Care of Patients with Severe Chronic Illness: The Dartmouth Atlas of Health Care 2008* (Hanover, N.H.: The Dartmouth Institute for Health Care Policy & Clinical Practice, 2008).
- ⁹ L. Tollen, *Physician Organization in Relation to Quality and Efficiency of Care: A Synthesis of Recent Literature* (New York: The Commonwealth Fund, Apr. 2008); A. C. Enthoven and L. A. Tollen, eds., *Toward a 21st Century Health System: The Contributions and Promise of Prepaid Group Practice* (San Francisco: Jossey-Bass, 2004); D. C. Coddington, F. K. Ackerman, Jr., E. A. Fischer et al., *The Changing Dynamics of Integrated Health Care: Success Factors for the Future and Case Studies of Market Leaders* (Englewood, Colo.: Medical Group Management Association Center for Research, 2000); S. M. Shortell, R. R. Gillies, D. A. Anderson et al., *Remaking Health Care In America: The Evolution of Organized Delivery Systems* (San Francisco: Jossey-Bass, 2000); L. I. Solberg, S. E. Asche, S. M. Shortell et al., “Is Integration in Large Medical Groups Associated With Quality?” *American Journal of Managed Care*, June 2009 15(6):e34–e41.

- ¹⁰ Population health management can be defined as “the technical field of endeavor which utilizes a variety of individual, organizational and cultural interventions to help improve the morbidity patterns (i.e., the illness and injury burden) and the health care use behavior of defined populations,” (L. S. Chapman, *Health Management: Optimal Approaches for Managing the Health of Defined Populations* (Seattle: Summex Corp., 1997) as quoted by M. Hillman, Testimony Before the Subcommittee on Health of the House Committee on Ways and Means (Washington, D.C.: U.S. House of Representatives, April 16, 2002).
- ¹¹ Deloitte Center for Health Solutions, *2008 Survey of Health Care Consumers* (Washington, D.C.: Deloitte, Sept. 2008).
- ¹² S. K. H. How, A. Shih, J. Lau, and C. Schoen, *Public Views on U.S. Health System Organization: A Call for New Directions* (New York: The Commonwealth Fund, Aug. 2008); K. Stremikis, S. Guterman, and K. Davis, *Health Care Opinion Leaders’ Views on Slowing the Growth of Health Care Costs* (New York: The Commonwealth Fund, April 2009).
- ¹³ Wennberg et al., *Tracking the Care of Patients with Severe Chronic Illness*.
- ¹⁴ Anonymous, “A Higher Standard,” *Hospitals & Health Networks*, July 2007, <http://www.hhnmag.com>.

Appendix. Methods and Sources

Case Study Selection and Information-Gathering Methods

The case study sites were selected through a multistep process. The Commission identified the organizational attributes of interest. Candidate organizations were identified through a review of relevant literature and performance benchmarking data and with the recommendations of experts. A Commission work group then ranked the resulting list of sites to identify those they believed would best illustrate the attributes. We also considered geographical and organizational diversity in arriving at a final list. Some selected sites declined participation or could not be included for other reasons.

To gather information, we conducted telephone interviews with organizational leaders using a semi-structured interview guide to elicit their perceptions of how the organization exemplified the attributes. In some cases, we also made a site visit. We supplemented the interviews with information provided by the site and from presentations, published literature, regulatory filings, and other relevant sources. Sites were offered the opportunity to review and comment on their case study.

To help readers judge the relative merits of programs and innovations, we included data on results reported by the study sites or in the literature. In some examples, the results reflect controlled studies that offer reasonably strong evidence of an effect. In other examples, results represent before-and-after comparisons that may not control for possible confounding factors and, hence, should be considered as suggestive evidence but not definitive proof that an intervention works. Similar results from similar interventions across multiple sites strengthen the evidence for those examples.

When possible, we also described the performance of these organizations using a set of objective, recognized measures of hospital and ambulatory care quality listed below. In general, we indicated whether system-affiliated hospitals or health plans ranked in the top quartile (25%) and top decile (10%) of hospitals or health plans evaluated. We supplemented this analysis with selected third-party benchmarking and recognition programs that publicly reported results using criteria relevant to our inquiry ([Appendix Table 1](#)). We also included state-level or regional comparisons when the results could be summarized in an easily understandable and objective manner. *The use of these results does not represent an endorsement of the sponsoring entity or program.*

Hospital and Ambulatory Care Quality: Analytic Methods

Ambulatory care quality results were gathered from Quality Compass, a database updated annually by the National Committee for Quality Assurance (NCQA). According to the NCQA, “Quality Compass 2008 includes data for 410 commercial public reporting health plan products, covering more than 85 million total lives. Benchmarks and averages are calculated from a total pool of 447 public and non-public reporting health plan products, covering over 89 million lives.” The Quality Compass 2008 data set includes 34 HEDIS (Healthcare Effectiveness Data and Information Set) clinical quality measures and 10 CAHPS (Consumer Assessment of Healthcare Providers and Systems) survey measures of patient experience for the period Jan. 1, 2007, to Dec. 31, 2007 (with some exceptions). We determined whether health plans ranked in the top quartile and decile of health plans (excluding those classified only as preferred provider organizations) for each measure using benchmarks reported by Quality Compass ([Appendix Table 2](#)). (<http://www.ncqa.org>)

Hospital clinical quality of care results are based on an analysis conducted by IPRO, a health care quality review and improvement organization, for The Commonwealth Fund using data reported by the Centers for Medicare and Medicaid Services on its *Hospital Compare* Web site (www.hospitalcompare.hhs.gov). The analysis included 4,440

acute-care U.S. hospitals that reported data from January through December 2007 on 24 Hospital Quality Alliance measures that describe how often hospitals delivered recommended care for the four conditions or topics listed below. The measures are reported for all payers.

IPRO produced five clinical quality summary scores for the analysis:

1. Heart Attack Summary Score (composite of eight process-of-care measures)
2. Heart Failure Summary Score (composite of four process-of-care measures)
3. Pneumonia Summary Score (composite of seven process-of-care measures)
4. Surgical Care Improvement Score (composite of five care processes used to prevent surgical infections and venous thromboembolism among surgery patients)
5. Overall Quality Summary Score (composite of 24 process-of-care measures for the four conditions/topics listed above)

IPRO used a methodology prescribed by the Joint Commission to create the composite scores: the number of times a hospital performed the appropriate action across all measures for that condition/topic, divided by the number of opportunities the hospital had to provide appropriate care for that condition/topic. A hospital was included in the summary score only if it reported on all the measures for each condition/topic (all 24 measures for the overall score) and reported at least 30 patients for at least one of the measures for each condition/topic. Scores are not weighed, except that measures with larger denominators do contribute more weight to the calculation of the mean for that measure. None of the measures is risk-adjusted. We calculated percentile benchmarks to determine which hospitals fell in the top quartile and top decile of hospitals evaluated ([Appendix Table 3](#)).

Hospital patient experience results are based on Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey data reported by 2,592 short-term, acute-care, nonspecialty hospitals for the period January through December 2007. This survey asks a random sample of recently discharged patients about important aspects of their hospital experience. The overall rating is the proportion of adult patients who gave a rating of 9 or 10 when asked how they rate the hospital during their stay on a scale from 0 to 10 (where 10 represents the best hospital possible). We calculated percentile benchmarks and tabulated quartile and decile rankings both for all reporting hospitals and for large hospitals with 300 or more beds that completed 300 or more surveys. HCAHPS is a relatively new survey (CMS began reporting this data in 2008), and hospitals across the U.S. are not yet achieving very high scores across all of the questions. Nevertheless, some hospitals are scoring significantly better than others ([Appendix Table 3](#)).

Medical care efficiency performance was evaluated by querying a database of Medicare cost and utilization data compiled by the *Dartmouth Atlas of Health Care* project. For systems with more than one hospital, we focused the analysis on the system's "flagship" hospital(s), which are typically staffed by physicians from its affiliated medical group and would thus best represent its contribution to achieving organized care delivery. Individual hospital rates were compared to the national benchmark for each indicator and converted to a ratio ([Appendix Table 4](#)). The specific indicators used in the analyses were:

- Total Medicare reimbursements per enrollee during the last two years of life
- Hospital days per decedent during the last two years of life
- Total number of physician visits during the last two years of life

The analysis focuses on Medicare beneficiaries who died over the five-year period from Jan. 1, 2001, to Dec. 31, 2005, and who were hospitalized in an acute-care hospital at least once during the last two years of life for a medical (nonsurgical) condition. The study population was limited to patients who had one or more of nine chronic illnesses associated with a high probability of death: congestive heart failure, chronic lung disease, cancer, coronary artery disease, renal failure, peripheral vascular disease, diabetes, chronic liver disease, and dementia. Patients were assigned to the hospital most frequently used during the last two years of life. Utilization and resource inputs were adjusted for differences in patients' age, sex, race, primary chronic condition, and whether they had more than one of the nine chronic conditions. Although rates include care received from all providers, the authors noted that "the proportion of total hospital care provided by the assigned hospital (loyalty) was high, so the variations in utilization among hospital cohorts primarily reflect clinical choices made by the associated physicians."¹³

Sources of National Performance Recognition Information

The **American Medical Group Association (AMGA) Acclaim Award** honors physician-directed organizations that are "measurably achieving" the Institute of Medicine's aims for health system transformation (safe, effective, patient-centered, timely, efficient, and equitable care) by making "system-wide changes to build a better way of providing care."

The **AMGA Preeminence Award** is presented annually to member groups' physician-administrator leadership teams for exceptional leadership; innovation and vision; contributions to the advancement of quality; effective healthcare delivery practices and structure; and outstanding contributions to the local public community in which the medical group is located. (<http://www.amga.org>)

The **Annie E. Casey Innovations Award in Children and Family Systems Reform** is presented annually by the Ash Institute for Democratic Governance and Innovation at Harvard University's John F. Kennedy School of Government. The award was created in 2004 to highlight successful innovation in public systems affecting children and families, and to encourage other systems to adopt these reforms. Awardees are selected by an esteemed panel of child and family service policy experts.

The **Healthcare Information and Management Systems Society (HIMSS) Analytics Stage 7 Award** honors hospitals that operate in a paperless environment and represent best practices in implementation of an electronic medical record. Tracking their progress over eight stages (numbered 0–7), hospitals can review the implementation and utilization of information technology applications with the intent of reaching Stage 7, representing an advanced patient record environment. (<http://www.himssanalytics.org>)

HealthGrades Distinguished Hospitals for Clinical Excellence identifies hospitals in the top 5 percent nationally on risk-adjusted mortality and complication rates for 27 common Medicare inpatient procedures and diagnoses. The analysis for 2009, for example, used three years of Medicare data (2005–2007) representing 41 million discharges from almost 5,000 nonfederal hospitals. According to HealthGrades, Medicare patients at recognized hospitals had, on average, a 27 percent lower risk-adjusted mortality across 17 diagnoses and procedures, and an 8 percent lower adjusted risk of in-hospital complications across nine procedures. HealthGrades estimated that as many as 152,666 deaths and 11,772 complications could be avoided if all U.S. hospitals achieved the same level of performance. (<http://www.healthgrades.com>)

Hospitals & Health Networks' 100 Most Wired designation is based on the annual Most Wired Survey and Benchmarking Study conducted for *Hospitals & Health Networks* magazine and sponsored by McKesson Corporation, the American Hospital Association, and the College of Healthcare Information Management Executives. Hospitals are named to the list based on a detailed scoring process that queries respondents on how they use information technology to address five key areas: safety and quality, customer service, business processes improvement,

workforce management, and public health and safety (disaster readiness). In comparison to other survey respondents, the 100 Most Wired hospitals achieved significantly better performance in terms of mortality, process quality (core measures defined by the Joint Commission), and average length of stay.¹⁴ (<http://www.hhnmostwired.com>)

The **JD Power and Associates National Health Insurance Plan Study** evaluates member satisfaction among commercial health plans in 17 U.S. states or regions, as measured by seven key factors: coverage and benefits; choice of providers; information and communication; approval processes; claims processing; insurance statements; and customer service. The study included responses from more than 30,000 members of 104 commercial health plans in 2008 and 128 such plans in 2009; individuals were surveyed online. To determine the relative performance of our study sites nationally on this survey (plans ranking in the top quartile and decile), we calculated percentile distributions on the “average rating” reported by JD Power for all included health plans across all regions (JD Power did not report national rankings). State and regional rankings are as reported by JD Power. (<http://www.jdpower.com/insurance/ratings/health-plan-ratings>)

The **Joint Commission Ernest Amory Codman Award** recognizes achievement by organizations and individuals in the use of process and outcomes measures to improve organization performance and the quality and safety of health care. (<http://www.jointcommissioncodman.org>)

Leapfrog Group Top Hospitals is based on responses to the Leapfrog Hospital Quality and Safety Survey (41 hospitals were selected from 1,285 survey respondents in 2007). Top Hospitals meet Leapfrog’s standard for intensive care unit physician staffing, a score for implementation of safe practices endorsed by the National Quality Forum, and either of the following: (1) two or more of eight evidence-based hospital referral (EBHR) areas; or (2) computerized physician order entry plus one of the eight EBHR areas. (<http://www.leapfroggroup.org>)

The **National Business Coalition on Health eValue8** tool uses a standard annual request-for-information survey to identify benchmarks in critical areas such as adoption of health information technology, member and provider communications, disease management, program administration, provider performance, patient safety, pharmacy management, behavioral health, and financial stability. Results for 2007 represent 14 performance measures submitted by 102 health plans profiled in *Connecting the Dots in Health Care: 2007 Report*. The coalition is a nonprofit membership organization of employer-based health care coalitions. (<http://www.nbch.org/eValue8/index.cfm>)

National Committee for Quality Assurance (NCQA) Health Plan Accreditation, Disease Management Accreditation, and Physician Recognition Programs status was obtained from queries of the NCQA Web site (<http://www.ncqa.org>) in August and September 2008. These voluntary accreditation programs are based on an evaluation process that assesses the quality of the key systems and processes that define health care organizations. Voluntary Physician Recognition Programs are designed to recognize physicians who use evidence-based measures to provide excellent care to patients with selected health conditions such as diabetes. We included only clinical sites or entities with a clear affiliation to the designated organized delivery system in the search results. Contracted clinical practice sites and individual physicians were not included. (<http://www.ncqa.org>)

The **NCQA Recognizing Innovation in Multicultural Health Care Award** is presented annually to selected health plans for “exemplary efforts and demonstrated effectiveness in promoting cultural competence and addressing the health care needs of diverse members.” Topic areas address the National Standards for Culturally and Linguistically Appropriate Services in Health Care, developed by the U.S. Office of Minority Health. (<http://www.ncqa.org>)

The **National Quality Forum National Quality Healthcare Award** recognizes health care organizations that exemplify a “proactive and exemplary response to the national call for quality improvement and accountability by successfully using performance measurement to drive quality improvement and manage care for patients with chronic conditions across settings and over time; by fostering a culture of transparency and accountability to patients and the

local community; and by raising the bar of health system performance to achieve safe, effective, patient-centered, timely, efficient, and equitable care for individual patients and populations.” (<http://www.qualityforum.org>)

The **National Research Corporation (NRC) Consumer Choice Award** is based on a nationwide consumer health survey of more than 200,000 households in 190 markets in the United States, representing consumers’ most-preferred hospitals based on quality and image. (<http://hcmg.nationalresearch.com>)

The **Press Ganey Summit Award** is presented to facilities that demonstrate their dedication to improvement and sustaining excellence in both quality of care and employee and physician satisfaction. To receive this award, facilities must sustain a rank at the 95th percentile or above in overall satisfaction measurement in the Press Ganey database for a minimum of three consecutive years. (<http://www.pressganey.com>)

Thomson (formerly Solucient) 100 Top Hospitals follows a “balanced scorecard” approach, and designates the National Benchmarks for Success, using Medicare data to score hospitals on a set of eight weighted performance measures representing clinical excellence, operating efficiency, financial health, and responsiveness to the community. Measures include: (1) risk-adjusted mortality, (2) risk-adjusted complications, (3) risk-adjusted patient safety indicators, (4) core clinical quality measures for heart attack, heart failure, and pneumonia care, (5) severity-adjusted average length of stay, (6) expense per adjusted discharge, case mix- and wage-adjusted, (7) profitability (operating profit margin), and (8) cash-to-total-debt ratio. Performance Improvement Leaders are hospitals that have improved the most over five years in relation to their comparison group. According to Thompson, bringing all U.S. hospitals to the performance level of benchmark hospitals could prevent up to 120,000 deaths and 138,000 complications and reduce expenses by up to \$6.2 billion per year. (<http://www.100tophospitals.com>)

US News & World Report Best Health Plans represent the top-ranking 50 commercial health plans and top-ranking 25 Medicare plans reported by *US News* in 2005, 2006, and 2007 (we did not include Medicaid plan rankings). Rankings are based on HEDIS and CAHPS performance data and accreditation status reported by the National Committee for Quality Assurance. In 2007, scores (from 0 to 100 based on performance compared to other plans) were based on 50 measures for commercial plans and 28 measures for Medicare plans; accreditation status accounted for 15 percent of the score. More than 500 health plans were evaluated in each year. (<http://health.usnews.com/sections/health/health-plans/index.html>)

US News & World Report Best Hospitals represents the top 50 hospitals in each of 16 specialties for 2006, 2007, and 2008. Selection for 12 specialties is based equally on reputation (ranking by a random sample of 200 physicians in each specialty), a severity-adjusted 30-day mortality index, and care measures such as nurse-to-patient ratios and availability of technology. Rankings for four specialties are based on reputation alone. Hospitals are eligible for the rankings only if they are academic/teaching institutions or have a minimum level of technological capabilities, treat a specified number of patients, and are nominated by at least one physician on *US News* surveys. In 2008, for example, 170 hospitals were selected out of 1,569 eligible institutions culled from an initial sample of 5,453 hospitals. The rankings are compiled by the research firm RTI International. (<http://health.usnews.com/sections/health/best-hospitals/index.html>)

SDI Health (formerly Verispan) Top 100 Integrated Healthcare Networks annually recognizes local and regional nonspecialty integrated healthcare networks for their performance across eight categories: integration, integrated technology, contractual capabilities, outpatient utilization, financial stability, services and access, hospital utilization, and physicians. The analysis uses 33 weighted attributes that SDI has determined to be the key indicators for assessing the current and future success of an integrated health network. (<http://www.sdihealth.com>)

Sources of State and Regional Performance Recognition

A growing number of state government agencies and regional organizations are ranking health plans and providers on quality of care. We included such information when we judged that a summary of results would be easily understandable.

California Office of the Patient Advocate (OPA) is an independent state authority that publishes an annual “HMO Report Card” on the quality of HMO services delivered in California. HMO quality scores are derived from HEDIS data. Within the HEDIS data, the OPA takes topic scores associated with a particular health condition and combines them into a summarized rating that is given a performance grade of excellent, good, fair, or poor. Member satisfaction ratings are based upon CAHPS data and are similarly combined into topic scores and a summary score that is given a performance grade of excellent, good, fair, and poor. (<http://www.opa.ca.gov>)

Minnesota Community Measurement Health Care Quality Report publicly reports health care quality information on provider groups and clinics. It relies primarily on HEDIS measures that are aligned with clinical guidelines established by Minnesota’s Institute for Clinical Systems Improvement (<http://www.icsi.org>). The measures have been adapted for use in tracking and reporting the performance of medical groups in Minnesota and surrounding areas. The initiative represents a collaboration among medical groups, consumers, businesses, and health plans. (<http://www.mnhealthcare.org>)

Puget Sound Health Alliance Community Checkup compares health care provided by clinics, medical groups, and hospitals in certain counties of Washington State. Results for medical groups reflect administrative data for 2006. Teams of local physicians and community and medical leaders recommended measures, which are based on those endorsed by the National Quality Forum, the Institute of Medicine, and/or the National Committee for Quality Assurance. The Alliance is a nonprofit “partnership involving doctors, hospitals, patients, employers, unions, health plans and others working together to improve health care in the region.” (<http://www.pugetsoundhealthalliance.org>)

Wisconsin Collaborative for Healthcare Quality (WCHQ) is a voluntary consortium of organizations collaborating to improve the quality and cost-effectiveness of health care for Wisconsin residents. Together with physician groups, hospitals, health plans, health care purchasers, governmental agencies, foundations, and health care associations, WCHQ develops performance measures and guides the collection, validation, and analysis of data related to these measures. WCHQ publicly reports performance results and promotes the adoption of best practices for high-quality health care. (<http://www.wchq.org/>)

Appendix Table 1. Summary of Benchmarking Results and Recognition Received by Case Study Organizations in Recent Years

Recognition or Benchmarking Program	Number of Systems (Hospitals)*
American Medical Group Association: Acclaim or Preeminence Award	4
Annie E. Casey Innovations Award in Children and Family Systems Reform	1
Healthcare Information and Management Systems Society: Analytics Stage 7 Award	1 (11)
HealthGrades Distinguished Hospitals for Clinical Excellence	5 (13)
Hospitals & Health Networks: 100 Most Wired	5
J.D. Power & Associates: National Health Insurance Plan Study	
Top quartile of commercial health plans	6
Top decile of commercial health plans	5
Joint Commission: Ernest Codman Award	4
Leapfrog Group: Top Hospitals or Highest Value Hospitals	4 (8)
National Business Coalition on Health: Evaluate8 Benchmark Plans	3
National Committee for Quality Assurance	
Health Plan Excellent Accreditation	8
Quality Plus Distinctions (various)	6
Physician Recognition Program	5
Multicultural Health Care Award	3
National Quality Forum: National Quality Healthcare Award	4
National Research Corporation: Consumer Choice Award	8 (13)
Press Ganey: Summit Award (top 5% of hospitals)	1
SDI/Verispan: Top 100 Integrated Health Networks	8
Thomson: 100 Top Hospitals (National Benchmarks for Success)	6 (10)
<i>US News & World Report: Best Health Plans</i>	
Top 50 commercial health plans	5
Top 25 Medicare health plans	7
<i>US News & World Report: Best Hospitals</i>	7 (11)

*Note: Recognition may be accorded to the system or to subunits, such as hospitals, clinics, departments, or affiliated health plans. The period examined was generally the past three to five years for annual recognition and longer for one-time awards (counts do not necessarily reflect performance in the most recent year). Case study systems were counted only once in each total, regardless of the number of subunits or the number of times recognized. Numbers in parentheses indicate the total number of hospitals that were recognized within the case study systems. Subcounts such as quartiles and deciles are not mutually exclusive. Of the 15 case study organizations, 10 have affiliated health plans (two primarily serve Medicaid enrollees) and 11 own approximately 95 hospitals. See source notes for methods.

Appendix Table 2. Summary of Ambulatory Care Quality Performance for Commercial Health Plans Affiliated with Care Study Systems, 2007

Case Study System (Health Plan)	Performance in Comparison to Health Plans Nationally or Regionally							
	Clinical Quality				Patient Experience			
	Total Measures	Top Quartile	Top Decile	Top 10 in Nation or Best in Region	Total Measures	Top Quartile	Top Decile	Top 10 in Nation or Best in Region
Geisinger Health Plan	34	21	12	9	10	8	6	2
Group Health Cooperative	34	14	5	2	10	4	1	0
HealthPartners	33	23	13	5	10	2	0	0
Henry Ford Health System: Health Alliance Plan	34	14	6	2	10	5	3	0
Intermountain Health Care: SelectHealth	33	11	7	3	10	5	2	1
Kaiser Health Plan of Colorado*	34	26	23	20	9	1	1	1
Kaiser Health Plan of Northern California*	34	27	23	13	10	3	1	0
Marshfield Clinic: Security Health Plan	34	22	15	8	10	5	2	0
Scott & White Health Plan	33	11	5	3	9	5	4	1
Total Number of Systems*	8	8	8	8	8	8	7	4
Total Number of Measures	303	169	109	65	88	38	20	5
Percent of Measures		56%	36%	21%		43%	23%	6%

*The case study of Kaiser Permanente examined the experience of two of its eight regions: Colorado and Northern California. The two plans were counted as a single case study system.

Note: Counts reflect the number of measures reported by the plan that fall within the top quartile or top decile of health plans nationally or regionally. Regions are those defined by the U.S. Department of Health and Human Services (HHS). Quartile counts include decile counts. See source notes for methods.

Source: Authors' compilation of data from the National Committee for Quality Assurance (NCQA) *Quality Compass* 2008.

Appendix Table 3. Summary of Hospital Quality Performance for System Hospitals Reporting Data to CMS Hospital Compare, 2007

	Clinical Quality						Patient Experience					
	Overall Composite			Any of Four Topics			All Reporting Hospitals			Large Hospitals		
	Hospitals Evaluated	Top Quartile	Top Decile	Hospitals Evaluated	Top Quartile	Top Decile	Reporting Hospitals	Top Quartile	Top Decile	Reporting Hospitals	Top Quartile	Top Decile
Case Study Systems												
Denver Health	1	0	0	1	1	1	*	*	*	*	*	*
Geisinger Health System	3	1	0	3	1	1	3	1	0	1	1	0
HealthPartners	1	0	0	1	1	1	2	1	1	1	0	0
Henry Ford Health System	4	2	2	4	3	3	4	0	0	2	1	0
Intermountain Healthcare	5	0	0	14	5	2	19	9	4	2	0	0
Kaiser Permanente Northern Calif.	14	8	3	15	14	7	15	0	0	5	0	0
Mayo Clinic Health System	6	5	2	13	10	8	12	7	4	4	4	2
MeritCare Health System	1	1	0	2	1	1	1	0	0	1	0	0
New York City Health & Hospitals Corp.	9	5	2	11	10	7	*	*	*	*	*	*
Partners HealthCare	4	4	1	5	5	5	4	3	2	2	2	2
Scott & White	1	1	0	1	1	1	1	0	0	1	0	0
Total Systems	11	8	5	11	11	11	11	5	4	9	4	2
Total Hospitals	49	27	10	70	52	37	61	21	11	19	8	4
% of Hospitals		55%	20%		74%	53%		34%	18%		42%	21%

*Indicates data not available.

Note: "Hospitals Evaluated" is the number of system hospitals that met inclusion criteria for evaluation (a subset of all system hospitals). "Any of Four Topics" means that the hospital ranked in the top decile or quartile on any of four clinical topics (heart attack, heart failure, pneumonia, or surgical care improvement). "Reporting Hospitals" is the total number of hospitals that reported Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey data to CMS. Patient experience is an overall rating of care (9 or 10 on a 10-point scale). Large hospitals are those with 300 or more beds that reported 300 or more surveys. Quartile counts include decile counts. See source notes for methods.

Source: Authors' compilation of analysis by IPRO using data reported by hospitals to the Centers for Medicare and Medicaid Services (CMS) Hospital Compare Web site.

Appendix Table 4. Summary of Resource Use Among Chronically Ill Medicare Beneficiaries Who Received the Majority of Their Care at Selected System Hospitals in the Last Two Years of Life, 2001–2005

System and Selected “Flagship” Hospital	Ratio to U.S. Average		
	Medicare Spending per Enrollee	Hospital Days per Decedent	Physician Visits per Decedent
Geisinger Health System: Geisinger Medical Center	0.83	0.64	0.73
HealthPartners: Regions Hospital	0.99	0.68	0.61
Henry Ford Health System: Henry Ford Hospital	1.15	1.03	0.87
Intermountain Healthcare: LDS Hospital	0.94	0.71	0.64
Mayo Clinic: St. Marys Hospital	1.01	0.90	0.73
MeritCare Health System: MeritCare Hospital	0.85	0.80	0.70
New York City Health & Hospitals Corp.: Bellevue Hospital Center	1.60	1.72	0.35
Partners HealthCare: Massachusetts General Hospital	1.49	1.22	1.07
Scott & White: Scott & White Memorial Hospital	0.83	0.68	0.64
Total Number Lower than National Average (<.95)	4	6	8
Total Number Higher than National Average (>1.05)	3	2	1

Note: Utilization and resource inputs were adjusted for differences in patients’ age, sex, race, primary chronic condition, and whether they had more than one of the nine chronic conditions. Data were not available for Denver Health or Kaiser Foundation Hospitals. See source notes for methods. Hospitals were selected to represent the system’s contribution to organized care delivery (in some cases a system had more than one “flagship” institution and we picked one).

Source: Dartmouth Atlas Project (<http://www.dartmouthatlas.org/>).

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This study was based on publicly available information and self-reported data provided by the case study institution(s). The Commonwealth Fund is not an accreditor of health care organizations or systems, and the inclusion of an institution in the Fund's case studies series is not an endorsement by the Fund for receipt of health care from the institution.

The aim of Commonwealth Fund–sponsored case studies of this type is to identify institutions that have achieved results indicating high performance in a particular area of interest, have undertaken innovations designed to reach higher performance, or exemplify attributes that can foster high performance. The studies are intended to enable other institutions to draw lessons from the studied institutions' experience that will be helpful in their own efforts to become high performers. It is important to note, however, that even the best-performing organizations may fall short in some areas; doing well in one dimension of quality does not necessarily mean that the same level of quality will be achieved in other dimensions. Similarly, performance may vary from one year to the next. Thus, it is critical to adopt systematic approaches for improving quality and preventing harm to patients and staff.

