



HOSPITAL QUALITY: INGREDIENTS FOR SUCCESS— OVERVIEW AND LESSONS LEARNED

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ABSTRACT: Hospitals across the country are searching for ways to improve quality of care and promote effective quality improvement strategies. This research study identifies and describes the key factors that contributed to the success of four high-performing hospitals across the country. Essential elements of a successful strategy, according to the study, include developing the right culture, attracting and retaining the right people, devising and updating the right in-house processes, and giving staff the right tools to do the job. External influences, such as local market competition and public or private health quality initiatives and standards, also have an impact. Through information gleaned from site visits and in-depth interviews with these high-performing hospitals, the study assesses quality drivers, internal processes, and challenges, and offers guidance and actions steps to help hospitals move in the right direction.

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ABOUT THE ECONOMIC AND SOCIAL RESEARCH INSTITUTE

The Economic and Social Research Institute (ESRI) is a nonprofit, nonpartisan organization that conducts research and policy analysis in health care and in the reform of social services. ESRI specializes in studies aimed at improving the way health care services are organized and delivered, making quality health care accessible and affordable, and enhancing the effectiveness of social programs. For more information, see <http://www.esresearch.org>.

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ABOUT THE SEVERYN GROUP

The Severyn Group, Inc., specializes in conducting qualitative and quantitative research, and writing and producing publications on a wide range of health care management issues. In addition to printed materials, The Severyn Group has created Web site content and electronic presentations for training and education purposes. Severyn's clients include a broad spectrum of organizations that represent virtually all aspects of health care, including financing, management, delivery, and performance measurement.

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EXECUTIVE SUMMARY

Hospitals across the country are searching for ways to improve quality of care and promote effective quality improvement (QI) strategies. The findings from this study offer guidance and action steps to help hospitals move in the right direction. To promote greater use of practices and policies that enhance quality and QI in hospitals, this research study identifies and describes the key ingredients that have contributed to the success of four high-performing hospitals. Through site visits and in-depth interviews with each of these top performers, we assessed specific internal factors and external pressures that drive quality. Additionally, we considered supportive tools and processes, challenges the hospitals face, and lessons they offer other hospitals. (Full case study reports are available at <http://www.cmwf.org>.) Based on our synthesis of these findings and the results of telephone interviews with additional hospitals, we have developed an overarching set of factors that strongly support high-quality care and successful QI programs in hospitals.

The key elements of a successful strategy can be organized into the following categories:

1. developing the right *culture* for quality to flourish;
2. attracting and retaining the right *people* to promote quality;
3. devising and updating the right in-house *processes* for quality improvement; and
4. giving staff the right *tools* to do the job.

Also at play are external influences, such as local market competition, and public or private health quality initiatives and standards. Further, there seems to be greater scrutiny of hospital quality and safety resulting from the Institute of Medicine's (IOM's) reports that have documented widespread problems in this area.

Instill a Supportive Culture and Policies

Top-performing hospitals have a striking degree of motivation and commitment to ensuring high-quality care and fulfilling the QI mission. They are not just going through the motions or conducting QI activities because they are under outside pressure to do so. This commitment is reflected in and nurtured by: active leadership and personal involvement on the part of the CEO, other top managers, and the Board of Trustees; an explicit quality-related mission and aggressive quality-related targets; standing and ad hoc quality committees; regular reporting of performance indicators with accountability for improved results; and the promotion of a safe environment for reporting errors.

Manifestations of such commitment among the hospitals we examined include: administrators coming in on weekends to help out on patient floors; a CEO who stresses the importance of QI at every orientation for new employees; and performance indicators for every department with specific targets related to quality, service, people, and finances.

Attract and Retain the Right People

High-quality physicians, nurses, administrators, and ancillary staff are critical to producing high-quality outcomes and effective quality improvement. Top-performing hospitals stressed the need for selective hiring, credentialing, and re-credentialing. Successful recruitment and retention of nursing staff was tied to an absolute respect for and empowerment of nurses—who must be treated as full partners in patient care and given opportunities for advancement. All are expected to be good team players, able to participate in multidisciplinary teams for both QI and patient care management.

Among the hospitals studied, examples of dedication to attracting and retaining the right people include: preservation of nurse–patient ratios even during layoffs and at the expense of revenues; a policy that results in loss of staffing privileges for physicians who do not show respect for nurses; and a QI residency elective to introduce medical residents to QI philosophy and techniques.

Develop Effective In-House Processes

The best hospitals not only collect data on outcomes and cost, but also pull apart the numbers on surgeries, tests, and other procedures to identify each step in the process where less-than-optimal medicine is practiced. QI departments are adequately staffed, have credibility with physicians, and are trained to facilitate the problem-solving process (e.g., two of the hospitals studied have QI departments headed by physicians; another hospital has seven QI consultants who are assigned to facilitate QI in specific service lines). Deficiencies in outcomes are not hidden or ignored, but instead are used to inspire an iterative process of discovery followed by corrective actions and accountability. Effective problem-solving leads to the development of evidence-based protocols and critical paths, and enhanced efficiencies such as reduced turnaround time for test results and reduced errors related to standardization of supplies and procedures.

Another important process involved team-based care management. A key to success involves making sure physicians and other caregivers accept the case manager's or team leader's role in coordinating and facilitating care. One hospital studied promotes such acceptance through a physician-based model where physicians are assigned case managers who work with all of their patients.

Provide the Right Tools to Do the Job

The best hospitals also give their physicians, nurses, and other staff the tools and support they need to practice high-quality medicine on a daily basis and to identify and investigate quality problems when they do surface. This includes investments in Information Technology (IT) as well as QI/Performance Improvement departments with qualified staff who abstract medical records, analyze data, and facilitate the QI process. It also includes access to guidelines and protocols, and support to physicians in developing a consensus around their own evidence-based best practices so they have tools they are actually willing to use. Other tools involve external training, peer networking, and conferences.

Information and data tools play a critical role. We found that successful IT strategies employed by the top-performing hospitals studied involve four main commitments: a willingness to invest in IT; working with physicians and others to customize an information system to meet specific needs and culture of the institution (e.g., some of the hospitals studied had IT directors who were physicians themselves as well as IT experts); nurturing and encouraging buy-in so that new systems will be utilized and their benefits realized; and devising IT systems that provide real-time feedback to providers (including access to patient history, test results, computerized reminders/alerts, etc.) as they are caring for patients.

★ ★ ★

Our research team has found that many hospitals around the country are taking up the challenge of improving quality of care and patient safety. Initiatives in these areas are not limited to the narrow domain of a few leaders. This means that the efforts of the IOM, leading hospitals and physicians, and a few purchasers¹ to put quality on the radar screen of American hospitals are succeeding. What distinguishes the leading hospitals from the others is that these hospitals do not simply address the issue, but back up their words with concrete actions and dig more deeply beneath the surface to identify the root causes of quality problems, develop practical solutions, measure impact, and hold themselves accountable for improvement. Willingness to invest and focus on long-term change and comprehensive quality integration (e.g., into all service lines and from the top of the institution to the bottom) are essential.

HOSPITAL QUALITY: INGREDIENTS FOR SUCCESS— OVERVIEW AND LESSONS LEARNED

INTRODUCTION

This report summarizes the findings from a study of the ingredients that contribute to excellence in hospital quality. The Economic and Social Research Institute (ESRI)² has combined quantitative research with case studies and telephone interviews to develop a typology of the key factors driving the achievement of good results and successful quality improvement (QI) efforts in hospital care.

While quality is the principal focus of this study, we also incorporated cost management into our study design. We searched for hospitals that consistently produce good health outcomes across a wide range of services and also deliver those services at less-than-average costs in their communities. This combination of excellence in quality and reasonable costs defines good value for patients and health care purchasers.

The purpose of our research was to identify the strategies that enable hospitals to achieve excellent clinical outcomes at reasonable costs. Having identified four strong yet diverse performers, we assessed the various factors that appeared to contribute to the hospitals' high quality levels, the barriers they face in maintaining their high standards, and strategies for overcoming these barriers. We then used these findings to develop a series of action steps that could help other hospitals move toward these leaders on the quality spectrum. The ultimate goal of this report is to promote the widespread adoption of best-practice, quality-enhancing activities by hospitals throughout the country.

BACKGROUND

The U.S. health care system is plagued by widespread preventable errors, unnecessary tests and procedures, and misused and underused services. These manifestations of poor-quality care have led to unacceptably high numbers of avoidable deaths and preventable injuries. The federal government's Agency for Healthcare Research and Quality (AHRQ) is releasing its *National Healthcare Quality Report* that documents these problems.³ Earlier, the IOM report entitled *To Err Is Human: Building a Safer Health System* estimated that 44,000 to 98,000 individuals die unnecessarily each year in the inpatient setting from medical errors.^{4,5} In the 2001 Commonwealth Fund Health Care Quality Survey, more than one of five Americans reported they or a family member had experienced a medical error of some kind. Based on these results, the authors believe that the IOM figures may represent the tip of the iceberg with respect to injuries from medical errors.⁶

There is mounting evidence of overuse, misuse, and underuse of the health care system. Overuse, including unneeded surgeries, tests, and other procedures, unnecessarily puts patients at risk while driving up health care expenses.⁷ Misuse can be seen in the failure of many hospitals to adopt information technology that reduces medical errors and in various forms of inappropriate care.⁸ Underuse of needed services is widespread and creates quality problems as well. The failure of the health care system to routinely provide certain preventive, screening, and acute care services leads to illnesses, relapses, complications, and other conditions that could have been avoided altogether or caught earlier to minimize the impact on health status and on the costs of treatment.^{9,10} Examples of underuse and their implications are prevalent in the literature.^{11,12}

Minorities appear to be disproportionately affected by quality problems within American health care. A 2002 IOM report found that “racial and ethnic minorities tend to receive lower-quality health care than whites do, even when insurance status, income, age, and severity of conditions are comparable . . . differences in treating heart disease, cancer, and HIV infection partly contribute to higher death rates for minorities.”¹³ AHRQ’s new *National Healthcare Disparities Report* documents additional evidence of such disparities.¹⁴

Poor-quality care not only results in unnecessary deaths and injuries, but also adds significantly to the costs of patients and the organizations that finance care. Wennberg, Fisher, and Skinner have shown that unjustified variation in the use of certain services has been largely responsible for excessive costs in the Medicare program; costs could be lowered by 29 percent—with no impact on health outcomes—if risk- and age-adjusted spending in all geographic regions were brought down to levels found in the lowest-cost areas.¹⁵ A study by the Midwest Business Group on Health (conducted in collaboration with Juran Institute and The Severyn Group) estimates that 30 percent of all health care expenditures by public and private purchasers—roughly \$390 billion in 2000—are the direct result of poor-quality care. The study found that the indirect costs of poor quality (e.g., reduced productivity) are also substantial, adding an estimated 25 percent to 50 percent to this figure.¹⁶

The bottom line is that the quality of American health care is far below what it could be, and, as a result, the nation is suffering. As the landmark 2001 IOM study, *Crossing the Quality Chasm: A New Health System for the 21st Century*, concluded:

The American health care delivery system is in need of fundamental change . . . the frustration levels of both patients and clinicians have probably never been higher . . . health care today harms too frequently and routinely fails

to deliver its potential benefits . . . quality problems are everywhere, affecting many patients . . . between the health care we have and the health care we could have lies not just a gap, but a chasm.¹⁷

METHODOLOGY

ESRI developed a three-stage methodology to perform this study. First, we used two data sources to identify top-performing hospitals based on both health outcomes and cost. We selected four of these hospitals for in-depth study, factoring in the desire to have some balance by geographic region, size, and teaching status. Second, we conducted in-depth site visits to these hospitals to learn how they are achieving good results. Third, we interviewed more typical hospitals around the country to determine the extent to which they also had some of the ingredients of success in place, and what steps might be needed to replicate some of the successful approaches found in our case study sites.

Data Analysis

As noted above, ESRI selected the case study sites by using data from two sources. First, we worked with CareSciences, a Philadelphia-based research organization specializing in hospital quality improvement. Second, we used research findings from an analysis prepared by Professor Sir Brian Jarman at the Imperial College in London, England.

The CareSciences database includes nearly 20 million patient records from 2,697 hospitals in 18 states that report hospital data for all payers. Data from 1999 were used to develop an initial list of high-quality hospitals. Hospitals had to have at least 100 beds to qualify for inclusion. For each hospital, CareSciences calculated quality scores for individual ICD-9 codes based on risk-adjusted adverse outcome rates for mortality, morbidity, and complications. These measures were then combined into a single quality measure for individual disease categories. Length of stay (LOS) was used as a proxy for cost or resource use, since hospitals are presumed to spend more on patients who stay longer. While there are some clear limitations to using this measure of cost, the strength is that LOS is recorded very accurately for each patient.

CareSciences developed what amounts to a five-by-five matrix for each disease category, with hospitals ranked by quintile on both quality and cost. CareSciences designated 56 disease categories (41 ICD-9 codes and 15 broad diagnosis groups in which various codes were combined to avoid a problem of small cell size) that collectively cover more than 90 percent of all cases in the 18 states. A matrix was developed for each disease where there were more than 200 qualifying facilities, defined as facilities with 100 beds or more that treat at least 100 patients with this disease. Each of these disease-specific matrices consists of 25 cells, with the upper-right four cells designated as the “Select

Practice” area (see Figure 1 below). In other words, hospitals that score in the top two quintiles on both quality and cost (low LOS) are designated as Select Practice hospitals for that specific disease category. Across all of the 2,697 hospitals included in the database, almost half did not qualify for Select Practice *in any disease areas*.

Figure 1. LOS/Quality Matrix:
CareSciences’ Identification of Select Practice
(lower quality) **Quality** (higher quality)

LOS	(lower cost)					
	(higher cost)					

Note: Length of Stay (LOS) is used as a proxy for Cost.

Because ESRI was interested in hospitals achieving good health outcomes across a broad range of services, we asked CareSciences to identify the hospitals with 25 or more Select Practice designations in various disease categories. This produced a list of 30 best-performing hospitals.

In order to obtain a second opinion of the hospitals’ performance, ESRI then asked Dr. Jarman to score these 30 hospitals using his own methodology and data, which covers the 1997 to 2000 period. Jarman has estimated case-mix adjusted death rates for over 1,700 U.S. hospitals and also has assembled a measure of reimbursement to reflect costs. His work on reimbursement focuses on about 140 diagnosis groups that account for about 90 percent of payments.

For each hospital, Jarman calculates a hospital standardized mortality ratio (HSMR), which is defined as the ratio of the actual number of deaths to the expected number of deaths multiplied by 100. This adjusted death rate controls for such variables as age, gender, race, and admissions source (e.g., from the emergency department, transfer patient, admitted by physician). As noted, Jarman’s HSMR scores helped us comparatively

assess the 30 hospitals that emerged as Select Practice hospitals in the CareScience data analysis. We targeted those hospitals that scored well under both analyses—while striving for balance in region, teaching status, and size—for in-depth case studies.¹⁸

Case Studies

We then conducted site visits and used qualitative, case-study analysis to examine factors, strategies, and “ingredients” behind high quality and successful QI programs at the following four top-performing hospitals:

- [Beth Israel Deaconess Medical Center](#), Boston, MA
- [El Camino Hospital](#), Mountain View, CA
- [Jefferson Regional Medical Center](#), Pittsburgh, PA
- [Mission Hospitals](#), Asheville, NC

During the site visits, we met with directors of QI or performance improvement (PI) departments, CEOs, CFOs, CIOs, board members, physician and nurse leaders, information technology specialists, pharmacists, case managers, and other members of both administrative and clinical staffs. We attended various meetings of quality committees, senior administrative staff, and relevant clinical committees. In addition, we met with representatives of organizations outside the hospitals that interact with or have knowledge of the hospitals’ quality-related activities. These included representatives of insurers or managed care organizations, employer coalitions, and regulatory agencies.

Research by David Kindig on value-based purchasing reaffirms that case studies provide an ideal tool to assess those organizations and initiatives that are in the forefront of quality improvement. Instead of measuring predefined variables, Kindig was able to examine the most prevalent cross-currents of successful purchasers while still keeping the contextual information unique to each. Case studies allow the researcher to account for the many and varied factors affecting the success of quality improvement initiatives, and permit organizations to see themselves in the entities studied.¹⁹

In preparing interview guides for the site visits, ESRI reviewed literature on the organizational features of hospitals and other health care organizations that promote good performance. This included the work of Shortell, Nerenz and Neil, Kindig, Bradley, and others. Mitchell and Shortell have done considerable work assessing the internal and external factors that contribute to successful program management within organizations. They developed a typology for effective community partnerships aimed at improving health outcomes that features the role of governance and identified principles that

organizations should use to achieve their objectives.²⁰ Bradley and colleagues, studying the factors that contribute to the effective use of beta blockers after myocardial infarction, also developed a typology featuring six broad factors and specific content contributing to success.²¹ Nerenz and Neil developed a set of tools and criteria for judging the success of health systems in improving performance.²² We also examined the criteria for performance excellence used by the Baldrige National Quality Program in selecting awards for health care institutions.²³

Telephone Interviews

To test our findings from the case studies, ESRI also conducted detailed telephone interviews with QI/PI directors at five additional hospitals that were not on the top-performer lists produced by CareSciences. These hospitals were chosen from a group that was considered average or typical from the perspective of quality and cost. These discussions helped us gauge the extent to which our findings regarding successful strategies in top-performing hospitals were different from the practices and policies found in more typical hospitals. These hospitals were in different regions of the U.S., and included both teaching and non-teaching institutions.

FINDINGS: KEY ELEMENTS PRODUCING HIGH-QUALITY HOSPITAL CARE AND SUCCESSFUL QUALITY IMPROVEMENT

For each of the four top-performing hospitals we examined, we assessed specific external pressures and internal factors driving quality. We also considered supportive tools and processes, challenges faced, and lessons for other hospitals. These findings are described in the full case study reports available at <http://www.cmwf.org>. Based on our synthesis of these findings and the results of our telephone interviews with additional hospitals, we have developed an overarching set of factors that strongly support high-quality care and successful quality improvement (QI) programs in hospitals.

Two important caveats are warranted. First, case study analysis involves tradeoffs. It allows a depth and richness of information that is not possible through broad survey instruments and quantitative analysis. However, the small sample size means that it is impossible to generalize the findings to all hospitals with certainty. Thus, this research should serve as a starting point for further study on quality and QI at hospitals.

Second, we want to state that there was not a clear and distinct set of differences between the four top-performing hospitals and the other, more typical hospitals we examined. Quality-enhancing activity is not an all-or-nothing phenomenon. In fact, all the hospitals we contacted are involved in various types of efforts to improve quality. They are collecting data (sometimes in response to JCAHO accreditation requirements),

asking questions, establishing quality committees and mission statements, comparing themselves to various benchmarks, and beginning to invest in better information technology.

What distinguishes the leading hospitals is not that they are taking on challenges that others are either unaware of or not participating in. Rather, the top performing hospitals are marked by the *depth and breadth of their commitment*. This was reflected in leadership that practiced as they preached; willingness to invest in high-quality staff, processes, and supportive tools; and institution-wide commitment to dig beneath surface measures to uncover causes of quality problems and to press relentlessly for solutions.

We have determined that the key elements of a successful strategy can be organized into the following categories:

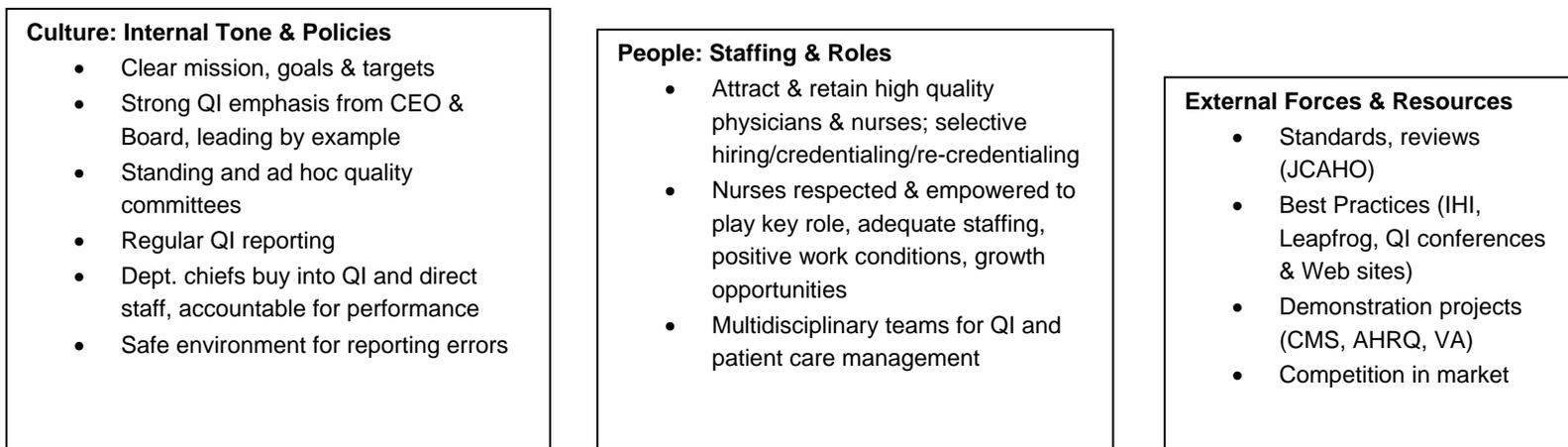
1. developing the right *culture* for quality to flourish;
2. attracting and retaining the right *people* to promote quality;
3. devising and updating the right in-house *processes* for quality improvement;
4. giving staff the right *tools* to do the job.

Certain forces external to the institution, such as local market competition and standards and resources developed by outside organizations (e.g., Institute for Healthcare Improvement, CMS, AHRQ) also play a role in successful quality and QI.

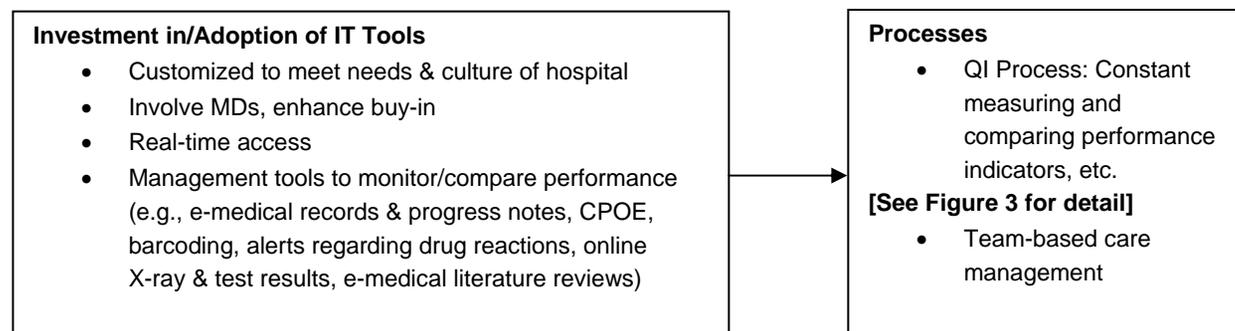
The following diagrams organize and summarize our key findings. Figure 2 illustrates the relationships among the essential ingredients and outcomes. Figure 3 illustrates the key components and relationships of a successful QI process. The diagrams are followed by a description of the ingredients, interspersed with selected examples from the case study sites. We then present action steps that may help lead other hospitals in the direction of the top performers.

Figure 2. Ingredients for Hospital Quality Outcomes and Mission

Supportive
Culture,
People,
and External
Forces



Processes &
Tools



Apparent
Outcomes

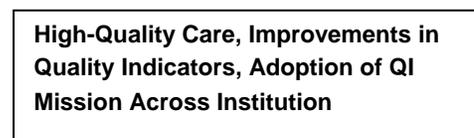
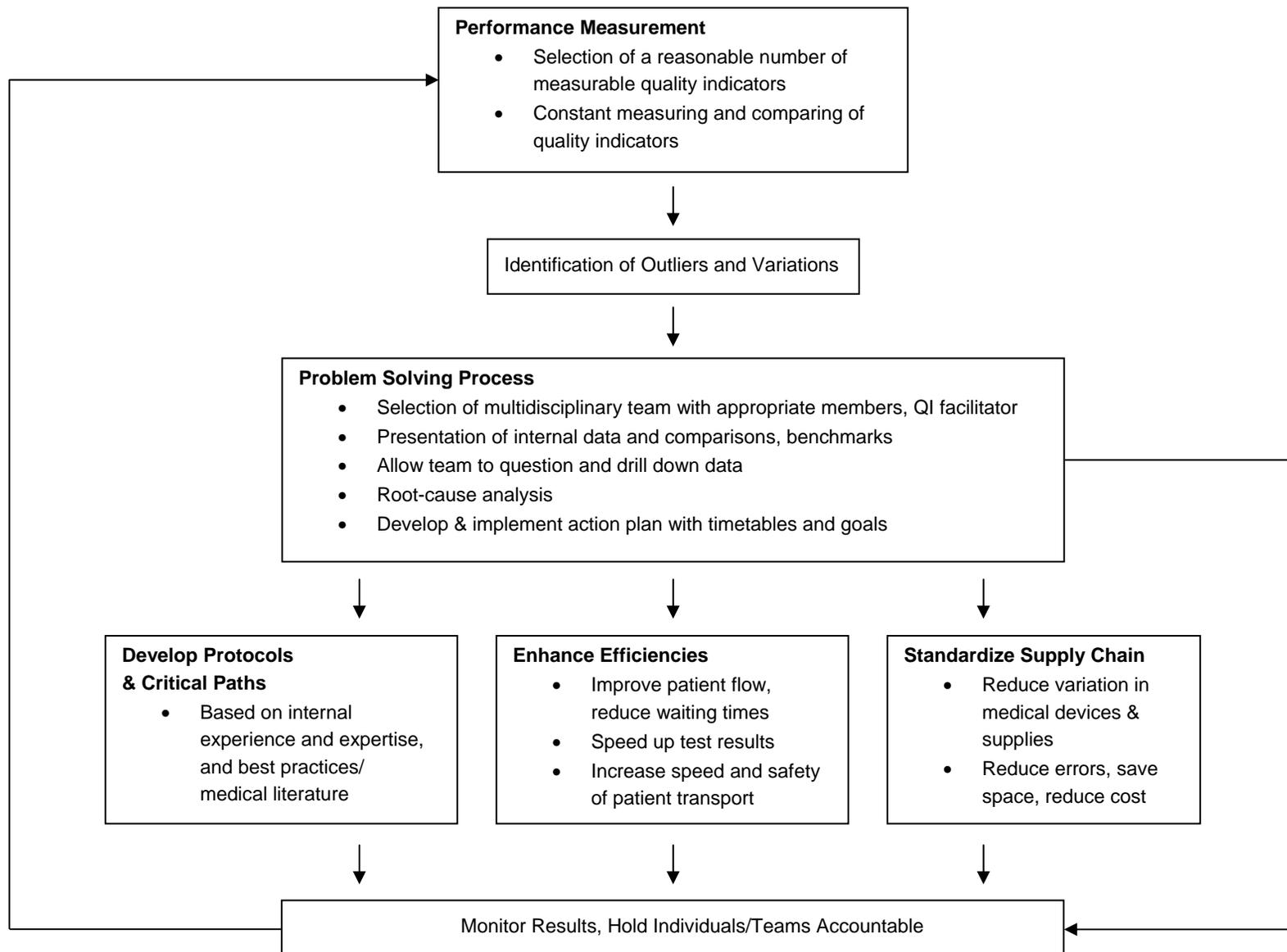


Figure 3. Elements of a Successful Quality Improvement Process



The Right Culture

The right organization culture is essential to achieving a successful approach that creates good hospital outcomes and effective QI. We found that merely going through the motions of QI—whether due to outside pressure (e.g., JCAHO accreditation reviews) or directives from the top of the organization—will not likely bring significant results. Rather, the culture of the entire organization must reflect true motivation and commitment to quality across the institution. Though the term “culture” is somewhat amorphous, we identify concrete actions that seem to both instill and support a culture of quality. They include the following features:

1. Establishment of a clear, quality-related mission, and performance measurement and targets consistent with the mission.
2. Strong leadership from Board of Trustees and CEO. Specifically, this involves:
 - Regular reporting of quality “dashboards”²⁴ reflecting select performance indicators to senior management and Board of Trustees;
 - Setting targets for improvement and follow-through via monitoring progress;
 - Leading by example and personal involvement;
 - Making QI part of employees’ daily functions, rather than an extra burden on top of routine responsibilities; and
 - Holding senior staff accountable for meeting quality goals and making appropriate improvements.
3. Leadership and QI buy-in among department chiefs, with expectations that they will work with physicians in their departments to change practice patterns where necessary and ensure that certain practices are followed.
4. Supportive organizational structures such as standing and ad hoc quality-related committees.
5. Clear communication and rules that encourage physicians, nurses, and technicians to report errors. This requires ensuring that those who report errors may remain anonymous and not be penalized.

Leading by personal involvement was exemplified by the CEO at Mission Hospital discussing the importance of QI at every orientation for new employees. Also, administrators at Jefferson Regional Medical Center come in on weekends and help out

on patient floors. An example of the institution-wide emphasis on performance is El Camino Hospital's "dashboard" system, described in Box 1.

Box 1. El Camino Hospital's Ongoing Monitoring via Dashboard Indicators

El Camino continuously monitors performance via use of "dashboard" indicators for every major department. The dashboard includes a handful of measures that are intended to give a snapshot of the department's performance. For each measure, there are specific performance targets. These dashboard indicators are organized into categories based on the five "pillars" of the institution—quality, service, people, finance, and growth. Not all departments have an influence over each of these areas, so some department's dashboards will not include measures/goals for all five categories.

For example, the nursing department's key indicators relate to four of the five pillars, as outlined below:

- People indicators: RN/LVN vacancy rate; percent of non-licensed nurses.
- Service indicators: percentage of patients rating quality of nursing as excellent within the inpatient setting and the Emergency Department (ED); percentage of patients rating pain management as excellent within the ED; percentage of patients rating total time spent in the ED as excellent; median wait time in the ED.
- Quality indicators: patient fall rate per 100 patients (while reducing use of sitters); ED diversion time (with no computed tomography); use of angiotensin-converting enzyme (ACE) inhibitors at discharge for heart attack patients; use of ACE inhibitor at discharge for congestive heart failure (CHF) patients; Medicare LOS for acute medical/surgical patients.
- Financial indicator: expenses as a percentage of gross revenues.

The leadership at Jefferson Regional Medical Center exemplifies an approach, described in Box 2, which combines establishing a clear mission, and then backing it up with actions, practices, policies, and in a number of cases, financial outlays, that support high-quality care.

**Box 2. Practices and Policies That Promote Quality and QI
at Jefferson Regional Medical Center**

- Preserving nurse staffing, even at the expense of revenues: The hospital has established a standard for nursing hours per patient day that it will not violate, even if that means temporarily closing down nursing units to new patients, thus negatively affecting hospital revenues. Enforcing this standard serves a dual purpose. First, it ensures that patients receive adequate attention from nurses. Second, it leads to a better, more productive nursing staff, both because the standard helps reduce the likelihood that nurses will be overworked and burnt out, and because it sends a strong signal of the value that the hospital places on its nurses.
- Preserving patient care staff, even during layoffs: After decades of financial stability, the Jefferson system began running operating deficits and experiencing negative cash flow a few years ago. The system’s leadership brought in The Hunter Group to help address the situation. Using Hunter Group guidelines on staffing, the system began a series of cost-cutting measures that netted \$7.5 million in savings on a \$130 million expense base. Yet none of these cuts resulted in a decline in the amount of patient care staff available to serve patients. Cuts were concentrated in administrative areas; any cost-cutting in patient care services was the result of changes, such as reductions in use of agency nurses, that had minimal impact on staff hours among those delivering patient care.
- Absorbing “denied” days when necessary: Jefferson maintains an aggressive case management program that seeks to discharge patients as soon as clinically appropriate and to challenge payer “denials” of days that Jefferson’s staff believes to be clinically necessary. But Jefferson’s administrative and clinical leaders—from the chief financial officer to the nurse case manager team leaders—are willing to absorb the costs of denied days in situations where they disagree with a payer decision to deny a day. In short, no patient will be discharged until the physicians and other patient care staff believe that discharge is appropriate, regardless of whether the payer will provide additional reimbursement.
- Leading by example: The administrative leaders at Jefferson make it clear that they are part of the team. The administrative physician leaders share the burden of being on call to the emergency room. Top management takes its turn helping out in emergencies on the floor and executives come in to eat lunch at the hospital on weekends.
- Lighting a fire for quick action: When necessary, Jefferson’s leaders make it clear that certain quality problems will not be tolerated. For example, after several instances when Jefferson’s emergency room was on divert status due to a lack of inpatient beds, the CEO declared that such diversions would no longer be accepted (both because of the quality implications for the community and the loss of revenue opportunities for the hospital). Given this charge, staff members came up with the idea of developing an admission holding area unit that specializes in caring for short-stay patients—those either waiting for an inpatient bed or those who need only minor treatment before being discharged. The 40-bed unit treats an average of 75 patients a day, and has helped the hospital to avoid divert status.

The Right People

The case study hospitals place great emphasis on recruiting and retaining top-level physicians and nurses. This is accompanied by an effort to encourage these professionals to form working teams, including case managers, pharmacists, social workers, and others, to promote quality. We found the following specific features of successful strategies:

1. Selective hiring, credentialing, and retention of physicians and nurses, even in an era of shortages (e.g., Jefferson Regional Medical Center rejects about 10 percent of physicians who apply). This includes monitoring of doctors on staff (or with privileges) and ensuring that they must continue to meet certain performance and practice standards to retain credentials.
2. Ability to attract and employ an adequate number of high-quality nurses through specific approaches to human resource management such as:
 - Generous staffing levels that ensure a reasonable caseload; this includes setting minimum staffing ratios and abiding by them (e.g., closing down units if there is not adequate nurse staffing). As described in the Appendix, comparing hospitals in terms of nurse-to-patient ratios is problematic. However, top-performing hospitals do place a great emphasis on keeping staffing levels high and vacancy rates low (See Box 3);
 - Competitive salaries;
 - Deserved reputation of respect for and empowerment of nurses. For example, at El Camino Hospital, respect for nurses is expected and enforced; non-complying physicians are given warnings and if those warnings are ignored, they lose staff privileges;
 - Residency programs and relationships with nursing schools to ensure an ongoing supply of nurse trainees and graduates; and
 - Opportunities for continuing education and advancement, as well as opportunities to be true partners with physicians in caring for patients.
3. Establishment of multidisciplinary teams to manage and coordinate patient care and to conduct QI analysis and projects with IT support. Nurses are often given a key role in the QI process as team leaders with authority and accountability. All staff are expected to be team players.

Box 3. Attracting and Retaining Top-Notch Nurses at Jefferson Regional Medical Center

“The floor nurses and case managers run the place. We have good people on the front lines doing what they are supposed to do. That’s the key to our success in offering high-quality care.”

— Jefferson’s chief financial officer

Good nurses come to (and stay at) Jefferson for many of the same reasons that physicians want to practice there. Like the medical staff, nurses and other JRMC employees often live in the local community and think of the hospital as their own. This feeling of ownership is no accident, as the administration has made a strong commitment to support nurses in their efforts to provide high-quality care. The CEO is described by the head of nursing as being very supportive of nurses. Perhaps the best testimony of this commitment can be seen in the hospital policies of not allowing any nursing unit to fall below a certain standard with respect to nurse-to-patient staffing ratios, and of making cuts to direct patient care staffing largely off limits during the hospital’s recent cost-cutting campaign.

As of October 2003, Jefferson’s year-to-date vacancy rate was roughly 6 percent, and the average turnover rate was 1.9 percent. By comparison, the Voluntary Hospitals of America in 2002 reported an average vacancy rate of 9.2 percent and an average turnover rate of 2.6 percent for its East Coast members. Also, patient-to-nurse ratios at Jefferson are reported (anecdotally by new recruits) to be lower at Jefferson than elsewhere (i.e., Jefferson nurses are required to take care of fewer patients than are nurses at other hospitals). Jefferson maintains a ratio of one nurse to five patients on its medical and surgical units.

Beth Israel Deaconess Medical Center (BIDMC) is developing the “right people” by using a QI residency elective to introduce medical residents to the philosophy and techniques of QI. Most residents who have participated in the program described it as their first exposure to QI, and reported an improved understanding of quality in health care and a better understanding of QI at BIDMC. Many have gone on to teach their peers what they learned. BIDMC is now working to develop the curriculum into a more comprehensive QI and patient safety program. (See Box 4.)

Box 4. BIDMC's QI Residency Curriculum

In 2000, BIDMC designed and implemented a quality improvement elective for internal medicine residents. The program's goals are:

- To increase understanding among residents of quality improvement concepts; and
- To allow application through investigation of a medication safety incident and a quality improvement project.

Residents may choose to participate for three weeks and are assigned to a faculty member who serves as a resource and mentor. Residents attend regularly scheduled tutorials with faculty members and receive supplemental readings on QI tools and processes, healthcare as a system, and medication safety systems.

They participate in a three-part practicum, which includes the following elements:

- Attending department QI committee and hospital patient-safety meetings;
- Developing and executing a QI project within the department;
- Investigating a medication error that has occurred on the inpatient service.

Examples of QI projects include a study of dye-induced renal failure that led to changes in how all radiology exams are ordered, and a study of telemetry use that led to a decrease in inappropriate use from 35 percent to 13 percent. Residents interview participants, review the record, and complete a root cause analysis, which they ultimately present to a hospital QI committee. Part of the process involves practicing how to interact with colleagues in a non-judgmental manner and becoming more familiar with an interdisciplinary approach to quality healthcare.

Source: *BIDMC Progress Report: Development of a House Officer Rotation in Quality Improvement*, March 2003.

The Right Processes

The QI Process

The leading hospitals engage in a quality improvement process marked by constant measuring, comparing, and problem solving; a combination of customization and standardization; and a commitment to holding individuals accountable for improvement (illustrated earlier in Figure 3).

Performance measurement is a key component of the QI process. Keys to doing it right include:

1. Selecting a *reasonable* number of *measurable* quality indicators.
2. Dedicating qualified staff to work with and analyze the data.
3. Comparing indicators with evidence-based medicine and benchmarks within and outside the hospital. This involves developing reliable data and learning how to slice it in different ways (e.g., across hospitals in a multi-hospital system; by service line, such as all thoracic surgeons in a hospital compared to the Society for Thoracic Surgeons national database; by individual physicians compared to their peers).
4. Identifying medical practice variation and outliers, and distinguishing between temporary blips and more chronic areas of sub-optimal care.
5. Reporting performance data both up and down the administrative and clinical ladders.

Once performance improvement opportunities are identified, problem-solving techniques are employed. Key components of this process that drive success include:

1. Developing multidisciplinary teams that include representatives of all clinical or administrative areas that play a role in the problem being examined.
2. Enabling the team to question, drill down, and pull apart the data, and helping them use the data to identify and explore possible factors contributing to sub-optimal performance. The depth of this process was particularly striking at the case study hospitals.
3. Developing and implementing an action plan (e.g., a plan to reduce variation and to change the practice patterns of physicians who are shown to be outliers in the data analysis) with timetables and goals.
4. Continued monitoring to ensure the intervention was successful, and holding appropriate department chiefs or staff accountable for implementing the plan and improving outcomes.
5. Incorporating successful interventions into processes and policies, such as:
 - Protocols and critical paths, based on internal experience and expertise as well as best practices;
 - Policies that enhance efficiency (e.g., improved patient flow, reduced turnaround time for test or lab results);
 - Standardization in medical devices, procedures, and supplies, which reduces errors, saves space, and reduces costs; and
 - Communication about successful interventions across departments to extend the impact beyond the original QI initiative.

We also found that top-down mandates were viewed as ineffective. Instead, the top-performing hospitals prefer to use QI staff or designee to *facilitate* rather than *mandate* the QI process. They stressed that QI should not be perceived as being forced upon staff or as an admonishment by upper management. Rather, QI staffers do their homework, present data and foster an interactive, participatory process with department leaders and staff taking the lead in developing solutions. The facilitator includes concrete timetables and goals to foster accountability.

We did not find that the top-performing hospitals created direct financial incentives for QI in the form of performance-based compensation. One of the hospitals faced strong staff opposition when it was proposed and another is considering incorporating it in the future. However, a few did stress the importance of celebrating QI successes through non-financial rewards such as employee recognition.

The Performance Improvement (PI) Department at Mission Hospitals has several distinct features that appear to play important roles in the success of QI activities, as described in Box 5.

Box 5. Striking Features of Mission Hospitals' PI Department

The PI Department has several unusual features:

Size. Compared to other hospitals, Mission's PI Department is relatively large. The department is structured around core activities: six full-time equivalent (FTE) clinical data abstraction employees; one FTE patient safety employee; one FTE patient satisfaction employee; one FTE management engineering employee; one FTE clerical employee; and seven FTE service line-based consultants.

Emphasis on management engineering. The PI Department has developed a systematic approach to balancing the methods and principles of management engineering with the needs and concerns of clinical practice. This balance is apparent in its staffing and its information output, which reflects the application of engineering concepts not just to financial issues but to quality issues as well.

Combination of standardization and customization. Rather than rely on staff with patient responsibilities, the PI Department assigns dedicated individuals, or consultants, to support specific clinical departments in measuring and improving the quality of care they provide. This approach is key to achieving two goals. First, it ensures that each clinical department approaches the quality improvement process in a standardized and systematic way. Second, it allows each department to use the consultant to get support and detailed data that may be unique to its needs.

Beth Israel Deaconess Medical Center's Cardiac Surgery Performance Improvement Initiative, described in Box 6, exemplifies the above-mentioned features of an effective QI process and the positive outcomes that can result.

Box 6. Cardiac Surgery Performance Improvement Initiative at BIDMC

After the Beth Israel and Deaconess hospital merger in 1996, there was much rearranging and turmoil among clinical teams. Evaluation of coronary artery bypass graft (CABG) surgery revealed erosion of performance-related mortality and sternal infection rates as compared to benchmarks. There was high variation in practices, supplies, and OR times, and there were delays caused by inefficiencies in communication. In response, BIDMC decided to rebuild a cardiothoracic surgery team, and enhance CABG patient care along the following dimensions:

- Effectiveness: Decrease in mortality
- Safety: Decrease in infections
- Timeliness: Decline in cath-CABG delays
- Efficiency: Improved resource utilization
- Patient-Centeredness: Improved patient satisfaction

An in-house, multidisciplinary team was assembled and met regularly to structure the components of an ideal episode of care, decide what was realistic, and make it happen. This task involved building a real-time management database for tracking relevant measures. Based on research and experience, and working with the Northern New England Cardiovascular Disease Study Group, a number of guidelines and actions steps were developed and implemented:

Pre-op:

- If risk exceeded 10 percent, seek a second opinion
- Continue aspirin therapy through start of surgery
- Standardize scrub night before surgery
- Standardize prep and drape just prior to surgery

Operating Room:

- Reduce cardiopulmonary bypass time (surgeons scrub together, observe practice, and standardize practice to reduce variation)
- Use internal mammary artery for bypass in nonemergent cases
- Increase use of endoscopic leg vein harvest

Box 6 (continued)

Post-op:

- Increase intensity of care following surgery through such means as protocols listing triggers for notifying attending physician and consulting, on-site nurse practitioners, and physician assistants in the Cardiac Surgery Recovery Unit
- Tight glucose monitoring for patients who also have diabetes

In addition, the surgeons agreed to standardize intraoperative devices (e.g., valves) and supplies to standardize practice in the OR, improve safety, and decrease unnecessary cost by consolidating to one or two supply vendors. Improvements were made in nearly all of the targeted dimensions. The process for fixing CABG procedures became the model for improvements in other areas as well.

Similarly, Mission Hospitals' project charter for an effort to reduce emergency department lab turnaround time illustrates that hospital's method for organizing and planning performance improvement initiatives (See Box 7). Once the charter has been agreed upon by team members, the team implements a quality improvement process using the FOCUS-PDCA, or Find, Organize, Clarify, Understand, Select-Plan, Do, Check, Act, methodology). Each member of the team receives an assignment and reports back, so everyone participates in the QI process. Ideas for process improvements may come from many sources, including other service lines and other hospitals. Emergency department staff noted that great ideas may also come from contract labor, who may introduce practices learned at other institutions.

Box 7. Mission Hospitals' Performance Improvement: Sample Project Charter

Team: ED/LAB Turnaround Time

Facilitator: *(name of PI Consultant)*

Administrative Champion: *(name)*

Project/Team Leader: *(name)*

Team Members: *(multiple names—includes nurses and physicians)*

Box 7 (continued)

Opportunity Statement:

Observed the following opportunities to decrease the time it takes to evaluate, diagnose, and treat ED patients:

- Improve ED/lab turnaround times
- Improve communication between ED and lab
- Increase staff efficiency
- Decrease incidence of hemolyzed specimens
- Improve collection methods
- Decrease incidence of unnecessary lab repeats

Goal or Charge of the Team:

- Decrease ED/lab turnaround time
- Data sources reflect increased patient satisfaction related to ED visit time
- ED/lab turnaround times more in line with benchmark sources
- Staff report improved communications between ED/lab
- Physicians report increased satisfaction related to receipt of lab results

Benefit Analysis:

Decreasing ED/lab turnaround time will allow patients to be evaluated, diagnosed, and treated in a timelier manner

Project Scope:

This project, expected to benefit patients on the Mission and St. Joseph's campuses, will require collaboration between the ED, lab, and physicians. Improved throughput will allow the ED to continue seeing over 90,000 patients per year and at the same time improve patient, physician, and staff satisfaction and increase patient safety.

Proposed Time Line and Key Dates:

- Tracking of ER time-of-order started March 2003
- Team initiated 4/1/03
- All ED St. Joseph's Campus lab work sent to Mission Campus as of 4/1/03 (during renovations)
- Lab team currently investigating issues related to hemolysis
- Within one year, turnaround times will be in line with benchmark.

Team Care Management

Another process that promotes high-quality care involves the use of case managers and multidisciplinary teams to coordinate patient care. Depending on the patient's circumstances, the team may include a nurse, physician, pharmacist, specialists in OT and PT, social worker, and discharge planner. The hospitals generally designate a nurse "case manager" to coordinate care and serve as the team leader. This individual is responsible for ensuring communication among clinicians and family members, and for ensuring that patients get appropriate care in a timely fashion.

A key to effective case management is making sure that physicians and other caregivers accept the case manager's role in coordinating and facilitating care. Jefferson Regional Medical Center, for example, has a physician-based model where physicians have assigned case managers who work with their patients. Physicians view this model favorably (compared with disease- and unit-based case managers) and see it as an advantage to working at the Center. Overall, Jefferson has made a substantial investment in case managers and case management team leaders (who oversee inpatient and emergency room case managers). Jefferson benchmarks its staffing for case managers to the best practices of case management programs around the country.

The Right Tools

The case study hospitals appear to give their physicians, nurses, and other staff the tools and support they need to practice high-quality medicine on a daily basis, and to identify and investigate quality problems when they surface. This includes investments in IT and in QI/PI departments with qualified staff that abstract medical records, analyze data, and facilitate the QI process. It also includes access to guidelines and protocols, and offers support to physicians in developing a consensus around their own evidence-based best practices so that they have tools they are actually willing to use. Other tools involve external training, peer networking, and conferences that provide guidance and feedback.

In order for physicians, nurses, case managers, and other hospital personnel to make their policies and procedures work effectively, they need a modern information system producing real-time data on patient health status, test results, and other key factors. A recent General Accounting Office (GAO) report documents the benefits realized by 10 health care organizations resulting from the use of IT, including cost savings from reduced medication errors and improved clinical care.²⁵

ESRI found that a successful strategy employed by the top-performing hospitals involves four main commitments:

1. A willingness to invest in IT;
2. Working with physicians and others to customize an information system to meet specific needs and culture of the institution;
3. Nurturing and encouraging buy-in so new systems will be utilized and their benefits will be realized; and
4. Devising IT systems that provide real-time feedback to providers *as they are caring for patients*.

The main ingredients of a real-time system involve timeliness. Hospitals want to develop a system that allows all caregivers to have access to relevant information as soon as it is available. To that end, the case study hospitals have or are adopting applications that do the following:

1. Reduce time lags in getting lab and imaging results. This can reduce length of stay and may reduce iatrogenic disease;
2. Deliver information on test results, history, health status, etc., to the bedside while providers are treating patients so that treatment decisions can be made based on the latest information; and
3. Make user-friendly guidelines and recommendations readily accessible to physicians, based on the latest medical research on specific conditions, procedures, medications, etc.

El Camino Hospital places much emphasis on getting the right information to the right people at the right time, resulting in demonstrable quality improvements, as described in Box 8.

Box 8. Timely IT at the Patient Bedside: El Camino Hospital

The IT system at El Camino Hospital facilitates quality on a daily basis by allowing for the near-instantaneous transfer of information across departments. This means that clinicians seldom must spend time tracking down test results or other vital information from a patient's medical record or history/physical, and are seldom forced to make medical decisions without such information or are delayed in making decisions due to a lack of information. For example, information flow between nurses and physicians is seamless at El Camino because of IT. This also has the benefit of driving good nurse-physician relations. Patient notes are not sitting in a nurse's pocket until he or she gets around to placing them in a paper chart, as can occur at other institutions. The net result is that patients are more likely to get the right care because physicians and other caregivers make more informed decisions in a timely manner.

El Camino's IT system not only facilitates quality through the fast flow of information across the hospital, it also directly increases quality through built-in safeguards against errors. These include computerized physician order entry of pharmacy orders, which reduces transcription errors, and automatic screening of drug orders to identify and prevent adverse drug reactions (e.g., allergic reactions or drug-drug interactions). The new Pyxis dispensing system is helping to further minimize errors and speed up delivery times, and the new barcoding system will make the drug ordering and dispensing system virtually error proof.

The Pyxis automated dispensing system not only boosts quality by minimizing the risk of dispensing errors, it also frees up a tremendous amount of pharmacists' time that is now spent on other quality-enhancing activities. Before the new system went into place, most of El Camino's 12 full-time-equivalent pharmacists spent roughly one-half of their days dispensing medications and ensuring that the orders they had filled matched the orders made by physicians. Only two pharmacists were available to conduct rounds (i.e., review patient charts on the units in an effort to catch medical errors). These two pharmacists were only able to cover two units of the hospital, primarily by conducting spot checks on the floor. Thanks to the new system, many more pharmacists can now spend time on the floors, allowing the department to cover 10 units more comprehensively. In addition, where in the past only two pharmacists were in a position to answer questions caregivers had about drugs, now all pharmacists have the information needed to answer these questions.

Getting the right care at the right time has led to demonstrated results at El Camino. The dispensing medication error rate for fiscal year 2002 was 0.003, with only 40 reported errors out of 1,274,516 administered doses. Moreover, 39 of these 40 reported errors were classified as minor (not clinically significant and with no adverse patient outcome). The remaining error was classified as moderate (clinically significant but no adverse patient outcome).

Whether an information system is completely home-grown or purchased off the shelf, the case study hospitals emphasized that IT must be customized to incorporate and meet the particular needs and circumstances of the hospital. This is not a one-time process, but one that must engage clinicians and administrators to adapt and refine systems over time. In our case study hospitals, we found a reluctance to purchase proprietary information systems that might be difficult to shape to the culture, patient mix, and staffing of the hospital.

Engaging physicians and nurses in developing or adapting IT serves to ensure that the resulting system meets the needs of clinicians. It also encourages buy-in, and helps create IT champions among the staff, who then teach and encourage their colleagues to use the new system.

The state-of-the-art information systems we witnessed at the case study hospitals were generally not in place at the time these hospitals were measured for Select Practice designation used in our selection process. However, we suspect that the newer IT systems reflect the hospitals' commitment and willingness to invest in the tools that promote quality. The kinds of quality-related IT investments that the case study hospitals have made or are in the process of making include:

1. Moving to a paperless system that provides real-time information across the health system (e.g., electronic medical records, e-hospital notes with input at bedside);
2. Moving toward barcoded medications and automatic dispensing;
3. Coordinating patient admissions with bed capacity, immediate tracking of filled beds, and daily changes in nursing needs;
4. Using electronic dashboards linked to patient records that alert staff to test results and unresolved issues;
5. Enabling physicians to view imaging results and other test results on a PC in hospitals and in their offices;
6. Investing in Computerized Physician Order Entry (CPOE) and other types of decision support software to remind physicians about procedures or tests that are indicated and to reduce medication errors (e.g., through alerts about potential dosage errors and drug interactions);
7. Providing clinicians with computer access to up-to-date scientific and medical literature summaries on specific diseases, procedures, etc.; and
8. Developing management tools for monitoring and comparing performance of physicians, units, procedures, etc.

External Forces and Resources

While competition from other hospitals was a force for some case study hospitals, we generally did not find that outside pressure from *purchasers* was a major factor driving quality in the hospitals we examined (with one exception, discussed below). But hospitals did note some degree of cooperation concerning quality with both purchasers and external review organizations. One hospital mentioned that purchasers have just recently become more active in pursuing quality.

Hospitals pay attention to JCAHO reviews, but the case study hospitals felt that these standards represent a rather low bar. Other external review groups noted were Medicare's Quality Improvement Organizations (QIOs). In addition, several of the hospitals we spoke with mentioned AHRQ, CMS, and VA quality standards and pilot projects. And almost all the hospitals cited the Leapfrog Group and the Institute for Healthcare Improvement (IHI) as important sources of information and standards on quality. Many attend IHI meetings and some have invited the Institute's president, Donald Berwick, M.D., to meet with their Boards of Trustees. Top-performing hospitals are also likely to take the six IOM domains seriously, and actively work to fulfill the spirit of each one.

The activities of the Leapfrog Group clearly have garnered some attention to CPOE and ICU care in general. Mission Hospitals, for example, is adopting the Leapfrog standards even though it is under no pressure to do so. BIDMC examined the Leapfrog standards and determined that it is already meeting the standards or has surpassed them.

Of the four case study hospitals, only Jefferson Regional Medical Center described an initiative by local purchasers as an important influence on QI. The Pittsburgh Regional Health Initiative (PRHI), a regional coalition of major employers and providers, seeks to drive quality within selected clinical areas. Jefferson actively participates in PRHI workgroups and process improvement activities.

ACTION STEPS FOR HOSPITALS

To help hospitals around the country incorporate the lessons learned from studying these top-performing hospitals, ESRI has developed the following set of actions steps:

1. Develop a clear mission statement that incorporates quality and back up that mission with structures and resources.
2. Develop and use performance-related criteria for hiring, credentialing, and retaining physicians and nurses.

3. Establish relationships with nursing schools for workforce supply and improve working conditions for nurses. This should include training and advancement opportunities, adequate staffing, empowerment, and respect for nurses, with real consequences for noncompliance.
4. Establish team-based case management and work to ensure that physicians and other caregivers accept the role of team leaders or case managers in coordinating and facilitating care.
5. Emphasize QI in new staff orientations (e.g., directly from CEO) and regular staff meetings; establish QI training and activities as part of daily responsibilities rather than an extra burden on top of other tasks.
6. Incorporate QI into strategic plans, involving nurse leaders, department chiefs, and key staff in process.
7. Using a participatory process, select a few broad quality indicators that are measurable and for which there are benchmarks or standards.
8. Establish regular, periodic reporting on quality to the Board of Directors.
9. Set specific quality goals at the Board and CEO levels and hold staff accountable for progress toward these goals.
10. Select departmental leaders who buy into and champion the QI philosophy and can influence staff physicians. These clinical chiefs are the enforcers who must ensure that new policies designed by committees are implemented.
11. Establish multidisciplinary working quality committees and the ability to create ad hoc committees to address quality issues when they arise.
12. Use dedicated data analysts to monitor quality indicators, identify outliers and variations within the institution, and compare performance with evidence-based standards and regional and national benchmarks to determine areas needing improvement (e.g., individual physicians who need to change practice patterns).
13. Allow clinicians to question, debate, and disaggregate the data that indicate possible problems.
14. Use multidisciplinary teams to conduct root-cause analysis to identify sources of deficiencies, develop specific plans to correct deficiencies with timetables and goals, and continuously monitor progress towards these goals, with consequences if improvements are not realized.

15. Develop internal protocols and critical paths. Physicians favor—and are more likely to adhere to—home-grown protocols and standards, albeit those that are guided and informed by literature and external best practices.
16. Manage human resources (e.g., nurses, technicians), equipment and devices, and physical plant to improve safety, reduce errors, enhance efficiencies through standardization, and streamline supply chains and procedures.
17. Incorporate IT when feasible. IT should support clinicians in providing high-quality care on a daily basis through timely access to relevant data and by providing reminders or alerts based on evidence-based protocols.
18. In designing IT for a hospital, emphasis should be placed on ensuring that the system:
 - Is adapted to the specific culture and priorities of the institution;
 - Builds value for the physicians (e.g., allows them to do things more quickly and efficiently);
 - Incorporates the input and participation of hospital physicians;
 - Includes a process for educating and obtaining buy-in from staff; and
 - Is integrated, flexible, and secure.

CONCLUSION

This report identifies and categorizes the factors and ingredients driving selected top-performing hospitals to provide high-quality care and to perform successful quality improvement. ESRI found hospitals are generally taking QI seriously—it is on their radar screens. Most hospitals are committed to reducing inappropriate care, improving patient safety, and achieving good health outcomes for patients while holding down costs. By observing the leaders in the field, we have identified a series of best practices. The quality problems in the health care system highlighted at the outset of this report, and so thoroughly documented by the IOM, can only be reduced if the best practices of the leaders are more widely disseminated and adopted. Hospitals and other providers who are not adopting these best practices should be encouraged to do so with information, technical assistance, incentives, and pressures.

One such method of encouragement would involve financial incentives in the form of reimbursement policies that reward, rather than penalize, hospitals for improving quality. Government could play a role not only as the largest purchaser (i.e., of Medicare and Medicaid services), but also through continued activity in standardizing quality measurement and reporting mechanisms.²⁶ Government could also invest more resources

in providing technical assistance to hospitals and supporting their investments in quality-related IT.

As discussed in this report, the case study hospitals were generally not feeling much pressure from private purchasers—employers, insurers, managed care organizations—to improve quality. In this area, performance-based reimbursement and quality partnerships could make a difference. But hospitals need not and should not wait. They can begin to take a number of action steps on their own—establishing the right culture, people, processes, and tools to move in the right direction.

APPENDIX. NURSING LEVELS AND PATIENT CARE

Many of the conversations we had with hospital staff focused on the size, proficiency, and level of satisfaction among the nursing staffs. Throughout this report, we make note of nurse-to-patient ratios at case study hospitals and, in some instances, we mention vacancy and turnover rates. Because there are no reliable national statistics on such ratios, it is difficult to tell how these high-quality institutions measure up to other hospitals across the country or in their respective regions.²⁷ The one caveat is that California has established a legal requirement of one licensed nurse to every six patients beginning in 2004, moving to a one-to-five ration in 2005. El Camino, the hospital we looked at in California, already meets or exceeds this standard in most of its units.

In two studies by Linda Aiken and colleagues, nurse staffing levels and nurse education levels were shown to have significant and independent effect on mortality rates in hospital surgical units.²⁸ Aiken et al.'s results indicate that each additional patient in a nurse's workload increases the risk of mortality by 7 percent. Compared to those hospitals with four or fewer patients per surgical unit nurse, hospitals where nurses were responsible for six or more patients had a 14 percent greater risk of mortality among surgical unit patients. In hospitals where the nurse workload was eight patients or more the risk was 31 percent greater. In a separate study, Aiken et al. estimated that in a hospital where 60 percent or more of nurses held bachelor's degrees the 30-day odds of mortality would be 19 percent lower than in hospitals where only 20 percent of the nurses held bachelor's degrees.

The top-performing hospitals we interviewed took great pride in their nursing staffs. Some mentioned that they believed their turnover rates to be lower than at other area hospitals. This suggests the level of satisfaction among nurses at these institutions may be higher than what we might expect based on national surveys, such as those conducted by the American Nursing Association. Further, it may be assumed that satisfied workers perform better. Lower patient loads, proper training, and professional autonomy were all themes that we heard during our interviews. More research is needed to determine whether these factors truly drive hospital quality, as many of those we spoke with suspect.

RELATED PUBLICATIONS

In the list below, items that begin with a publication number can be found on The Commonwealth Fund's website at www.cmwf.org. Other items are available from the authors and/or publishers.

#754 *Beyond Return on Investment: A Framework for Establishing a Business Case for Quality* (forthcoming). Michael Bailit and Mary Beth Dyer.

#751 *Achieving a New Standard in Primary Care for Low-Income Populations: Case Studies of Redesign and Change Through a Learning Collaborative* (forthcoming). Pamela Gordon and Matthew Chin.

#731 *Recommendations for Improving the Quality of Physician Directory Information on the Internet* (forthcoming). Linda Shelton, Laura Aiuppa, and Phyllis Torda, National Committee for Quality Assurance.

#767 *Exploring the Business Case for Improving the Quality of Health Care for Children* (July/August 2004). Charles Homer et al. *Health Affairs*, vol. 23, no. 4. *In the Literature* summary forthcoming; full article available at <http://content.healthaffairs.org/cgi/content/full/23/4/159>.

#768 *Overcoming Barriers to Adopting and Implementing Computerized Physician Order Entry Systems in U.S. Hospitals* (July/August 2004). Eric G. Poon, David Blumenthal, Tonushree Jaggi, Melissa M. Honour, David W. Bates and Rainu Kaushal. *Health Affairs*, vol. 23, no. 4. *In the Literature* summary forthcoming; full article available at <http://content.healthaffairs.org/cgi/content/full/23/4/184>.

#700 *Quality of Health Care for Children and Adolescents: A Chartbook* (April 2004). Sheila Leatherman and Douglas McCarthy. The researchers use 40 charts and analyses to outline the current state of children's health care, arguing that the health care system has devoted far less attention to measuring the quality of care for children and adolescents than it has for adults. Download the chartbook at http://www.cmwf.org/publications/publications_show.htm?doc_id=225395

#702 *Use of High-Cost Operative Procedures by Medicare Beneficiaries Enrolled in For-Profit and Not-for-Profit Health Plans* (January 8, 2004). Eric C. Schneider, Alan M. Zaslavsky, and Arnold M. Epstein. *New England Journal of Medicine*, vol. 350, no. 2. *In the Literature* summary available at http://www.cmwf.org/publications/publications_show.htm?doc_id=221468

#701 *Physician—Citizens—Public Roles and Professional Obligations* (January 7, 2004). Russell L. Gruen, Steven D. Pearson, and Troyen A. Brennan. *Journal of the American Medical Association*, vol. 291, no. 1. *In the Literature* summary available at http://www.cmwf.org/publications/publications_show.htm?doc_id=221467; full article available at <http://jama.ama-assn.org/cgi/content/full/291/1/94>.

#699 *Malpractice Reform Must Include Steps to Prevent Medical Injury* (January 6, 2004). Stephen C. Schoenbaum and Randall R. Bovbjerg. *Annals of Internal Medicine*, vol. 140, no. 1. *In the Literature* summary available at http://www.cmwf.org/publications/publications_show.htm?doc_id=221474

#686 *Obtaining Greater Value from Health Care: The Roles of the U.S. Government* (November/December 2003). Stephen C. Schoenbaum, Anne-Marie J. Audet, and Karen Davis. *Health Affairs*, vol. 22, no. 6. In the Literature summary available at http://www.cmwf.org/publications/publications_show.htm?doc_id=221475; full article available at <http://www.healthaffairs.org/CMWF/Schoenbaum.pdf>.

#636 *Value-Based Purchasing: A Review of the Literature* (May 2003). Vittorio Maio, Neil I. Goldfarb, Chureen Carter, and David B. Nash. From their review of the literature, the authors conclude that value-based purchasing will only be effective when financial incentives are realigned with the goals of high-quality care and performance measures address purchasers' particular concerns.

#635 *How Does Quality Enter into Health Insurance Purchasing Decisions?* (May 2003). Neil I. Goldfarb, Vittorio Maio, Chureen Carter, Laura Pizzi, and David B. Nash. According to the authors, public and private purchasers may be able to hold physicians and insurers accountable for the quality and safety of the health care they provide. Yet, there is little evidence that current value-based purchasing activities—collecting information on the quality of care or selective contracting with high-quality providers—are having an impact.

#614 *The Business Case for Tobacco Cessation Programs: A Case Study of Group Health Cooperative in Seattle* (April 2003). Artemis March, The Quantum Lens. This case study looks at the business case for a smoking cessation program that was implemented through the Group Health Cooperative (GHC), a health system and health plan based in Seattle.

#613 *The Business Case for Pharmaceutical Management: A Case Study of Henry Ford Health System* (April 2003). Helen Smits, Barbara Zarowitz, Vinod K. Sahney, and Lucy Savitz. This case study explores the business case for two innovations in pharmacy management at the Henry Ford Health System, based in Detroit, Michigan. In an attempt to shorten hospitalization for deep vein thrombosis, Henry Ford experimented with the use of an expensive new drug, low molecular weight heparin. The study also examines a lipid clinic that was created at Henry Ford to maximize the benefit of powerful new cholesterol-lowering drugs.

#612 *The Business Case for a Corporate Wellness Program: A Case Study of General Motors and the United Auto Workers Union* (April 2003). Elizabeth A. McGlynn, Timothy McDonald, Laura Champagne, Bruce Bradley, and Wesley Walker. In 1996, General Motors and the United Auto Workers Union launched a comprehensive preventive health program for employees, LifeSteps, which involves education, health appraisals, counseling, and other interventions. This case study looks at the business case for this type of corporate wellness program.

#611 *The Business Case for Drop-In Group Medical Appointments: A Case Study Luther Midelfort Mayo System* (April 2003). Jon B. Christianson and Louise H. Warrick, Institute for Healthcare Improvement. Drop-in Group Medical Appointments (DIGMAs) are visits with a physician that take place in a supportive group setting, and that can increase access to physicians, improve patient satisfaction, and increase physician productivity. This case study examines the business case for DIGMAs as they were implemented in the Luther Midelfort Mayo System, based in Eau Claire, Wisconsin.

#610 *The Business Case for Diabetes Disease Management at Two Managed Care Organizations: A Case Study of HealthPartners and Independent Health Association* (April 2003). Nancy Dean Beaulieu, David M. Cutler, Katherine E. Ho, Dennis Horrigan, and George Isham. This case study looks at the business case for a diabetes disease management program at HealthPartners, an HMO in Minneapolis, Minnesota, and Independent Health Association, an HMO in Buffalo, New York. Both disease management programs emphasize patient and physician education, adherence to clinical guidelines, and nurse case management.

#609 *The Business Case for Clinical Pathways and Outcomes Management: A Case Study of Children's Hospital and Health Center of San Diego* (April 2003). Artemis March, The Quantum Lens. This case study describes the implementation of an outcomes center and data-based decision-making at Children's Hospital and Health Center of San Diego during the mid-1990s. It examines the business case for the core initiative: the development of a computerized physician order entry system.

The Business Case for Quality: Case Studies and An Analysis (March/April 2003). Sheila Leatherman, Donald Berwick, Debra Iles, Lawrence S. Lewin, Frank Davidoff, Thomas Nolan, and Maureen Bisognano. *Health Affairs*, vol. 22, no. 2. Available online at <http://content.healthaffairs.org/cgi/reprint/22/2/17.pdf>.

#606 *Health Plan Quality Data: The Importance of Public Reporting* (January 2003). Joseph W. Thompson, Sathiska D. Pinidiya, Kevin W. Ryan, Elizabeth D. McKinley, Shannon Alston, James E. Bost, Jessica Briefer French, and Pippa Simpson. *American Journal of Preventive Medicine*, vol. 24, no. 1 (*In the Literature* summary). The authors present evidence that health plan performance is highly associated with whether a plan publicly releases its performance information. The finding makes a compelling argument for the support of policies that mandate reporting of quality-of-care measures.

#578 *Exploring Consumer Perspectives on Good Physician Care: A Summary of Focus Group Results* (January 2003). Donna Pillittere, Mary Beth Bigley, Judith Hibbard, and Greg Pawlson. Part of a multifaceted Commonwealth Fund-supported study, "Developing Patient-Centered Measures of Physician Quality," the authors report that consumers can understand and will value information about effectiveness and patient safety (as well as patient-centeredness) if they are presented with information in a consumer-friendly framework.

#563 *Escape Fire: Lessons for the Future of Health Care* (November 2002). Donald M. Berwick. In this monograph, Dr. Berwick outlines the problems with the health care system—medical errors, confusing and inconsistent information, and a lack of personal attention and continuity in care—and then sketches an ambitious program for reform.

#534 *Room for Improvement: Patients Report on the Quality of Their Health Care* (April 2002). Karen Davis, Stephen C. Schoenbaum, Karen Scott Collins, Katie Tenney, Dora L. Hughes, and Anne-Marie J. Audet. Based on the Commonwealth Fund 2001 Health Care Quality Survey, this report finds that many Americans fail to get preventive health services at recommended intervals or receive substandard care for chronic conditions, which can translate into needless suffering, reduced quality of life, and higher long-term health care costs.

NOTES

¹ Although the majority of purchasers are not incorporating quality into their decision-making in a major way, the actions of a few purchasers, such as those in the Leapfrog Group and the Centers for Medicare and Medicaid Services, appear to be having a broader influence.

² Assisted by The Severyn Group, Inc.

³ Agency for Healthcare Research and Quality. *National Healthcare Quality Report*, prepublication copy, <http://www.ahrq.gov/qual/nhqr03/nhqrsum03.htm>.

⁴ L. T. Kohn, J. M. Corrigan, and M. S. Donaldson, (Eds.). 1999. *To Err Is Human: Building a Safer Health System*. Institute of Medicine, published by National Academy of Sciences.

⁵ E. C. Becher and M. R. Chassin, "Improving the Quality of Health Care: Who Will Lead?" *Health Affairs* 20 (Sept./Oct. 2001): 164–79.

⁶ K. Davis, S. C. Schoenbaum, K. S. Collins, K. Tenney, D. L. Hughes, and A.-M. J. Audet, *Room for Improvement: Patients Report on the Quality of Their Health Care*, The Commonwealth Fund, 2002. Available at http://www.cmwf.org/publications/publications_show.htm?doc_id=221270.

⁷ Becher and Chassin cite research conducted from 1987 to 1997, finding that roughly 30 percent of the care for acute conditions and approximately 20 percent of the care for chronic conditions were provided without appropriate clinical indications. Such errors are also responsible for many injuries; extrapolating from studies of patients hospitalized in Colorado and Utah, Becher and Chassin estimate that errors cause injury to more than 300,000 patients each year. (Becher and Chassin).

⁸ For example, a study at Brigham and Women's Hospital in Boston found that 6.5 percent of admitted patients suffer adverse drug events (ADEs), and 28 percent of those are preventable. Each preventable ADE costs an estimated \$4,500, which amounts to \$2.8 million for this 700-bed hospital. When Computerized Physician Order Entry (CPOE) was installed, ADEs dropped by nearly 80 percent, from 140 ADEs to 30 per 1,000 inpatient days. CPOE saved the hospital from \$5 million to \$10 million annually due to reduced ADEs and increased efficiency in the use of drugs and tests. This compares with a one-time investment of \$1.4 million and \$500,000 in annual maintenance costs. J. M. Teich, J. P. Glaser, R. F. Beckley, M. Aranow, D. W. Bates, G. J. Kuperman et al., "Toward Cost-Effective, Quality Care; the Brigham Integrated Computing System," *Proc. 2nd Nicholas E. Davies CPR Recognition Symposium*. Washington, D.C.: Computerized Patient Record Institute. 1996: 3–34. D. W. Bates, N. Spell, D. J. Cullen, E. Burdick, N. Laird, L. A. Petersen et al., "The Costs of Adverse Drug Events in Hospitalized Patients. Adverse Drug Events Prevention Study Group," *Journal of the American Medical Association* 1997: 277: 307–11.

⁹ For example, in 1998 only 55 percent of eligible Medicare patients with atrial fibrillation received the drug warfarin, which is highly effective in preventing stroke and other complications [American Health Quality Association (AHQA). 2000. *A Measure of Quality: Improving Performance in American Health Care*. October. AHQA: Washington, D.C.]

¹⁰ The Agency for Healthcare Research and Quality (AHRQ) estimates that expanded use of warfarin could reduce the number of strokes in patients with atrial fibrillation by 50 percent (from 80,000 to 40,000), thus saving an estimated 25,000 lives and \$600 million annually. D. B. Matcher et al., "Medical Treatment for Stroke Prevention," *Annals of Internal Medicine* 121 (July 1994): 54–55.

¹¹ Although a number of treatments—including appropriate and timely administration of aspirin, beta-blockers, ACE inhibitors, and reperfusion therapy—have been shown to reduce mortality rates significantly for heart attack victims, they are consistently underutilized. Greater use of ACE inhibitors has the potential to reduce mortality in elderly heart failure patients (80 percent of whom are ideal candidates for the drug) by 25 to 33 percent, potentially saving an estimated 36,000 lives each year and improving functional capacity and quality of life for heart failure patients. [Institute of Medicine (IOM). 2002. “Minorities More Likely to Receive Lower-Quality Health Care, Regardless of Income and Insurance Coverage.” National Academy of Sciences press release announcing release of new IOM study, *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. The full press release and report are available at <http://national-academies.org>.]

¹² Influenza and pneumococcal disease are responsible for 20,000 to 40,000 deaths each year, primarily among the elderly. An estimated one-half (10,000 to 20,000) of these deaths could be eliminated through wider use of annual flu shots and one-time pneumococcal vaccinations (for the elderly). J. E. Wennberg, E. S. Fisher, and J. S. Skinner, “Geography and the Debate Over Medicare Reform,” *Health Affairs* Web Exclusive, (Feb. 13, 2002): W96–W114.

¹³ National Academy of Sciences, “Minorities More Likely to Receive Lower-Quality Health Care, Regardless of Income and Insurance Coverage,” 2002. Press release announcing new Institute of Medicine (IOM) study, *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. The full press release and report are available at <http://national-academies.org>.

¹⁴ Agency for Healthcare Research and Quality, *National Healthcare Disparities Report*. July 2003. Available at <http://qualitytools.ahrq.gov/disparitiesreport/documents/Report%207.pdf>.

¹⁵ J. E. Wennberg, E. S. Fisher, and J. S. Skinner, 2002.

¹⁶ Midwest Business Group Health (MBGH), *Reducing the Costs of Poor-Quality Health Care Through Responsible Purchasing Leadership*. Chicago: MBGH, 2002.

¹⁷ IOM, *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, D.C.: National Academies Press, 2001.

¹⁸ We recruited for this study two hospitals with the best (lowest) HSMRs among the 30 hospitals scored by Jarman. One of these hospitals also had a low cost score (based on Jarman’s adjusted reimbursement measure); the other hospital had a high cost score, related in part to its being in a high-cost medical and urban area (Boston). The two additional hospitals recruited for the study scored in the midrange (among the 30 hospitals) on Jarman’s HSMR and cost measures; they were selected in part to achieve balance in terms of region, teaching status, size, etc.

¹⁹ D. Kindig, *Value Purchasers in Health Care: Pioneers or Don Quixotes?* Milbank Memorial Fund, 2001.

²⁰ S. Mitchell and S. Shortell, “The Governance and Management of Effective Community Health Partnerships: A Typology for Research, Policy, and Practice,” *The Milbank Quarterly* 78 (2000): 241–89.

²¹ E. Bradley, E. Holmboe, J. Matters, S. Roumanis, M. Radford, and H. Krumholz, “A Qualitative Study of Increasing Beta-Blocker Use After Myocardial Infarction: Why Do Some Hospitals Succeed?” *Journal of the American Medical Association* 85 (May 23, 2001): 2604–11.

²² D. Nerenz and N. Neil, *Performance Measures for Health Care Systems*, May 2001. Commissioned paper for the Center for Health Management Research.

²³ Baldrige National Quality Program, *Health Care Criteria for Performance Excellence*, National Institute of Standards and Technology, United States Department of Commerce, 2003.

²⁴ Hospital “dashboards,” like instrument panels in cars or airplanes, indicate whether things are working as they should.

²⁵ United States General Accounting Office, *Information Technology: Benefits Realized for Selected Health Care Functions*, October 2003.

²⁶ AHRQ has guideline and quality measure “clearinghouses” and emphasizes the translation of research into practice.

²⁷ Groups such as the American Hospital Association and the American Nursing Association do collect statistics on the number of full- and part-time nurses at hospitals across the country as well as the number of admissions and staffed beds. However, these organizations acknowledge that it is impossible to tell from these numbers how many of these nurses are involved directly in patient care, as opposed to holding administrative positions. Also not accounted for in these numbers are contractual workers and others who may not fit into given categories.

²⁸ L. H. Aiken, S. P. Clarke, D. M. Sloane, and J. H. Silber, “Education Levels of Hospital Nurses and Surgical Patient Mortality,” *Journal of the American Medical Association* 290 (Sept. 24, 2003): 1617–23; and L. H. Aiken, S. P. Clarke, D. M. Sloane, J. Sochalski, and J. H. Silber, “Hospital Nurse Staffing and Patient Mortality, Nurse Burnout, and Job Dissatisfaction,” *Journal of the American Medical Association* 288 (Oct. 23/30, 2002): 1987–93.