CHAPTER

1

HEALTHCARE QUALITY AND THE PATIENT

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uality in the US healthcare system is not what it should be. Even before evidence was available, people had long been aware of the numerous failings of the healthcare system from personal stories and anecdotes. At the end of the twentieth century, many reports revealed strong evidence of widespread quality deficiencies and highlighted a need for substantial change to ensure high-quality care for all patients. The major reports highlighting the imperative for quality improvement included the following:

- "The Urgent Need to Improve Health Care Quality" by the Institute of Medicine (IOM) National Roundtable on Health Care Quality (Chassin and Galvin 1998)
- IOM's *To Err Is Human: Building a Safer Health System* (Kohn, Corrigan, and Donaldson 2000)
- IOM's Crossing the Quality Chasm: A New Health System for the 21st Century (IOM 2001)
- *National Healthcare Quality Report*, published annually by the Agency for Healthcare Research and Quality (AHRQ) since 2003
- National Priorities and Goals: Aligning Our Efforts to Transform America's Healthcare by the National Priorities Partnership (NPP 2008)

More than a decade since some of them were first published, these reports continue to make a tremendous statement. They draw attention to current gaps in care, call for action, and identify opportunities to significantly improve the quality of care in the United States.

Before we discuss these reports, let us first define quality and describe its evolution and implications for our work as healthcare professionals.

Avedis Donabedian, a pioneer in the field of quality assurance, discussed in detail the various definitions of quality as it relates to perspective. One of Donabedian's conceptual constructs of quality rang particularly true: "The balance of health benefits and harm is the essential core of a definition of quality" (Donabedian 1980). Balance between benefits and harm is essential in medicine: It is one part science and one part art (Donabedian 2001).

The IOM Committee to Design a Strategy for Quality Review and Assurance in Medicare has developed an often-cited definition of quality (Lohr 1990):

Quality of care is the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge. . . . How care is provided should reflect appropriate use of the most current knowledge about scientific, clinical, technical, interpersonal, manual, cognitive, and organization and management elements of health care.

In 2001, IOM's *Crossing the Quality Chasm* stated powerfully and simply that healthcare should embrace six dimensions: It should be safe, effective, efficient, timely, patient centered, and equitable. This six-dimensional aim, discussed later in this chapter, is the best known and most goal-oriented definition (or at least conceptualization) of the components of quality today.

Important Reports

"The Urgent Need to Improve Health Care Quality"

Published in 1998, the IOM's National Roundtable report "The Urgent Need to Improve Health Care Quality" included two notable contributions. The first was an assessment of the state of quality: "Serious and widespread quality problems exist throughout American medicine. These problems . . . occur in small and large communities alike, in all parts of the country, and with approximately equal frequency in managed care and fee-for-service systems of care. Very large numbers of Americans are harmed" (Chassin and Galvin 1998). The second contribution was the categorization of quality defects into three broad categories: underuse, overuse, and misuse. This classification scheme has become a common nosology for quality defects:

- Underuse is evidenced by the fact that many scientifically sound practices are not used as often as they should be. For example, biannual mammography screening in women aged 50 to 75 has been proven to be beneficial, yet fewer than 75 percent of women report receiving a mammogram in the past two years (CDC 2012). That is, nearly one in four women does not receive treatment consistent with evidence-based guidelines.
- Overuse occurs when treatments and practices are used to a greater extent than evidence deems appropriate. Examples of overuse include imaging studies for diagnosis of acute asymptomatic low-back pain and

the prescription of antibiotics when not indicated (e.g., for viral upper respiratory infections).

• *Misuse* occurs when clinical care processes are not executed properly—for example, when the wrong drug is prescribed or the correct drug is prescribed but incorrectly administered.

Many reports have identified and quantified the gap between current and optimal healthcare practice. Findings range from evidence that specific processes are falling short of the standard (e.g., children are not receiving all their immunizations by age 2) to overall performance gaps (e.g., fivefold variation of risk-adjusted mortality rates in hospitals) (McGlynn et al. 2003).

To Err Is Human: Building a Safer Health System

Although the healthcare community had been cognizant of these many quality challenges for years, the 2000 publication of the IOM report *To Err Is Human* exposed the severity and prevalence of these problems in a way that captured the attention of a large variety of key stakeholders for the first time.

The executive summary of *To Err Is Human* begins with these headlines (Kohn, Corrigan, and Donaldson 2000):

The knowledgeable health reporter for the *Boston Globe*, Betsy Lehman, died from an overdose during chemotherapy. . . . Ben Kolb was eight years old when he died during "minor" surgery due to a drug mix-up. . . .

[A]t least 44,000 Americans die each year as a result of medical errors.... [T]he number may be as high as 98,000....

Total national costs . . . of preventable adverse events . . . are estimated to be between \$17 billion and \$29 billion, of which health care costs represent over one-half.

These headlines focus on patient safety and medical errors as perhaps the most urgent forms of quality defects. Although many had spoken about improving healthcare in the past, this report focused on the negative in an unprecedented way. It framed the problem in a manner that was accessible to the public and defined the status quo as unacceptable. One of the foundations of this report was the Harvard Medical Practice Study I conducted more than ten years earlier, which revealed that approximately 4 percent of all hospitalized patients experience an in-hospital adverse event and nearly 30 percent of these adverse events occur as a result of negligent care (Brennan et al. 1991). For the first time, patient safety (i.e., ensuring safe care and preventing mistakes) became a unifying cause for policymakers, regulators, providers, and consumers.

Crossing the Quality Chasm: A New Health System for the 21st Century

In March 2001, soon after the release of *To Err Is Human*, IOM released *Crossing the Quality Chasm*, a more comprehensive report that offered a new framework for a redesigned US healthcare system. *Crossing the Quality Chasm* provides a blueprint for the future that classifies and unifies the components of quality through six aims for improvement. These aims, also viewed as six dimensions of quality, provide healthcare professionals and policymakers with simple rules for redesigning healthcare (Berwick 2002):

- 1. *Safe:* Care should be as safe for patients in healthcare facilities as in their homes.
- 2. *Effective:* The science and evidence behind healthcare should be applied and serve as standards in the delivery of care.
- 3. *Efficient:* Care and service should be cost-effective, and waste should be removed from the system.
- 4. *Timely:* Patients should experience no waits or delays when receiving care and service.
- 5. *Patient centered:* The system of care should revolve around the patient, respect patient preferences, and put the patient in control.
- 6. *Equitable:* Unequal treatment should be a fact of the past; disparities in care should be eradicated.

The six aims for improvement can be translated into respective outcome measures and goals. The following points are examples of the types of global measures that can be used to track IOM's six aims:

- 1. *Safe* care may be measured by overall mortality rates or the percentage of patients experiencing adverse events or harm.
- 2. *Effective* care may be measured by how well evidenced-based practices are followed, such as the percentage of time that patients with diabetes receive all recommended care at each doctor visit. Effective care may also be measured through indicators of harm, such as the percentage of patients who contract hospital-acquired infections and the percentage of patients who develop pressure ulcers (bed sores) while in a nursing home.
- 3. *Efficient* care may be measured by analyzing the costs of care by patient, by organization, by provider, or by community.
- 4. *Timely* care may be measured by wait times to receive needed care, services, and test results.
- 5. *Patient-centered* care may include measures such as patient or family satisfaction with care and service.

6. *Equitable* care may be assessed by examining differences in quality measures (e.g., measures of effectiveness and safety) by race, gender, income, or other population-based demographic and socioeconomic factors.

The healthcare system comprises four levels, each of which requires change for the healthcare system to achieve the IOM's six aims for improvement. *Level A* is the patient's experience. *Level B* is the microsystem where care is delivered by small provider teams. *Level C* is the organizational level—the macrosystem or aggregation of microsystems and supporting functions. *Level D* is the external environment, which includes payment mechanisms, policy, and regulatory factors. Exhibit 1.1 illustrates these four levels. The environment affects how organizations operate, operations affect the microsystems housed within organizations, and microsystems affect the patient. True North in the model lies at Level A, in the experience of patients, their loved ones, and the communities in which they live (Berwick 2002).

National Healthcare Quality Report

Since 2003, AHRQ has published the *National Healthcare Quality Report*. Mandated by the US Congress to focus on "national trends in the quality of health care provided to the American people" (42 U.S.C. 299b-2(b)(2)), the report highlights progress that has been made toward improving healthcare quality and identifies opportunities for improvement. This report is developed in combination with the *National Healthcare Disparities Report*. Recognizing that alleviating healthcare disparities is integral to achieving quality



EXHIBIT 1.1 The Four Levels of the Healthcare System

Source: Ferlie and Shortell (2001). Used with permission.

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goals, Congress further mandated that this report focus on "prevailing disparities in health care delivery as it relates to racial factors and socioeconomic factors in priority populations" (42 U.S.C. 299a-1(a)(6)). The combined report is fundamental to ensuring that improvement efforts simultaneously advance quality in general and work toward eliminating inequitable gaps in care.

The report uses national quality measures to track the state of healthcare quality and addresses three questions:

- 1. What is the status of healthcare quality and disparities in the United States?
- 2. How have healthcare quality and disparities changed over time?
- 3. Where is the need to improve healthcare quality and reduce disparities greatest?

In 2010, for the first time the report centered on national priorities identified by the US Department of Health and Human Services' National Strategy for Quality Improvement in Health Care. Thus, the report is now organized into nine chapters that are closely aligned with IOM's six dimensions of care. These chapters and examples of national metrics include the following:

Chapter 1. Introduction and Methods

- Chapter 2. Effectiveness of Care (e.g., inpatient deaths per 1,000 adult hospital admissions following a heart attack)
- Chapter 3. Patient Safety (e.g., rate of hospital-acquired infections per 1,000 central-line days)
- Chapter 4. Timeliness (e.g., number of adults who required immediate care in the past 12 months but only sometimes or never received immediate care)
- Chapter 5. Patient Centeredness (e.g., percentage of adults and children who reported poor communication at the doctor's office)
- Chapter 6. Care Coordination (e.g., percentage of patients who received adequate hospital discharge information)
- Chapter 7. Efficiency (e.g., average cost per inpatient stay)
- Chapter 8. Health System Infrastructure (e.g., indicators of adoption and use of health information technology; percentage of the population living in a health professional shortage area)
- Chapter 9. Access to Health Care (e.g., percentage of the population under age 65 with health insurance)

To further demonstrate alignment, numerous chapters or segments of chapters are aligned with the National Quality Strategy priority areas (see Exhibit 1.2).

Each report also features spotlights on care received by one of AHRQ's priority populations: women, children, persons with disabilities, low-income individuals, and the elderly. Recent reports also include examples and case studies of initiatives and strategies to improve quality and reduce disparities to further accelerate transformation of the delivery system.

National Priorities and Goals: Aligning Our Efforts to Transform America's Healthcare

The National Priorities Partnership (NPP), convened by the National Quality Forum, comprises 28 leading national healthcare organizations and a variety of key stakeholders, including healthcare professionals, patients, payers, community members, suppliers, government entities, and others. In 2008, NPP released its landmark report *National Priorities and Goals* to further underscore the pressing need to develop, implement, and assess change initiatives. The report focuses on national performance improvement efforts that address four major challenges: eliminating harm, eradicating disparities, reducing disease burden, and removing waste. It stresses that bringing together a wide variety of perspectives to create a shared vision is critical to achieving widespread transformation across public and

National Quality Report Chapter	National Quality Strategy Priority Area
Chapter 3: Patient Safety	Making care safer
Chapter 5: Patient Centeredness	Ensuring person- and family-centered care
Chapter 6: Care Coordination	Promoting effective communication and care coordination
Chapter 2: Effectiveness of Care (cardiovascular disease)	Promoting effective prevention and treatment of leading causes of mor- tality (beginning with cardiovascular disease)
Chapter 2: Effectiveness of Care (lifestyle modification)	Working with communities to pro- mote wide use of best practices to enable healthy living
Chapter 7: Efficiency Chapter 9: Access to Health Care	Making quality care more affordable

EXHIBIT 1.2 National Quality Report

Quality Report Chapter and Corresponding National Quality Strategy Priority Area private entities. A shared vision is fundamental to successful improvement efforts.

NPP identifies six priority areas:

- 1. Engaging patients and families in managing their health and making decisions about their care
- 2. Improving the health of the population
- 3. Improving the safety and reliability of America's healthcare system
- 4. Ensuring patients receive well-coordinated care within and across all healthcare organizations, settings, and levels of care
- 5. Guaranteeing appropriate and compassionate care for patients with lifelimiting illness
- 6. Eliminating overuse while ensuring the delivery of appropriate care

The report further highlights the primary strategies that drive improvement in care: performance measurement, public reporting, payment systems, research and knowledge dissemination, professional development, and system capacity development. Yet the *National Priorities and Goals* report is only a first step toward achieving the shared aim of transforming US healthcare to a well-functioning, high-performing industry. While it provides a multidisciplinary framework for improvement, ongoing assessment and implementation will be essential to accomplishing the outlined goals in communities across the United States.

A Focus on the Patient

All healthcare professionals and organizations exist to serve their patients. Technically, medicine has never had more potential to help patients than it does today. The number of efficacious therapies and life-prolonging pharmaceutical regimens has exploded. Yet the system falls short of its technical potential. Patients are dissatisfied and frustrated with the care they receive, providers are overburdened and uninspired by a system that asks too much and makes their work more difficult, and attempts to reform payment models and implement regulations too often add unwarranted complexity and chaos to the system.

Demands for a fundamental redesign of the US healthcare system are ever increasing. IOM has proposed that a laser-like focus on the patient must sit at the center of efforts to improve and restructure healthcare. Patient-centered care is the proper future of medicine, and the current focus on quality and safety is a step on the path to excellence. Patients' perception of the quality of our healthcare system is not favorable. In the context of healthcare, *quality* is a household word that evokes great emotion, including the following:

- *Frustration and despair* among patients who experience healthcare services firsthand or family members who observe the care of their loved ones
- Anxiety over the ever-increasing costs and complexities of care
- *Tension* between individuals' need for care and the difficulty and inconvenience of obtaining care
- *Alienation* from a care system that seems to have little time for understanding, much less meeting, patients' needs

To illustrate these issues, later in this chapter we examine the insights and experiences of a patient who has lived with chronic back pain for more than 50 years. We use this case study to demonstrate the inadequacies of the current delivery system and highlight the potential for improvement.

Lessons Learned in Quality Improvement

We have noted the chasm in healthcare as it relates to quality. This chasm is wide, and the changes to the system are challenging to implement. But changes are being made, and patient and community health outcomes are improving in many instances. Let us take this opportunity to highlight examples of improvement projects and the progress that has been made.

Improvement Project: Reducing Surgery-Related Mortality and Complications

One improvement project success story comes from the University of Washington Medical Center. The project was part of a larger patient safety effort that has spread both across Washington State and to numerous countries around the world. The University of Washington Medical Center, a 450-bed academic medical center in Seattle, is part of the greater University of Washington Health System. Approximately 7,200 inpatient surgeries and 8,000 outpatient surgeries are performed annually in the facility's 24 operating rooms.

Leaders at the hospital and in the division of general surgery are highly engaged in quality improvement initiatives. In 2005, high variation in surgical quality across and within institutions prompted an investigation of innovative strategies to reduce mortality and prevent complications that arise from a high degree of variability in care. They also found that a dearth of data on surgery and outcomes hindered improvement efforts.

Dr. E. Patchen Dellinger, chief of the division of general surgery, began participating in the World Health Organization's (WHO) Safe Surgery Saves Lives campaign—an international initiative to develop and implement a surgical safety checklist—in 2005 after attending a presentation by Johns Hopkins Hospital clinicians. The clinicians had described the potential for improvements in surgical outcomes from developing and using standardized surgical team briefings and debriefings before and after each surgical procedure.

The WHO Surgical Safety Checklist includes three primary time frames: (1) before induction of anesthesia, (2) before skin incision, and (3) before the patient's departure from the operating room (see Exhibit 1.3). Dr. Dellinger led the implementation of the checklist at the University of Washington.

After the development of the initial checklist, the University of Washington Medical Center served as one of the eight WHO Surgical Safety Checklist international pilot sites. The checklist includes four major steps:

- 1. Team member introductions and initial discussion
- 2. Confirmation of patient identity, procedure, and surgical site
- 3. Pre-incision and role-specific review of necessary preparations
- 4. Debriefing after the surgical procedure

While Dr. Dellinger and the project implementation team initially encountered resistance to the checklist from physicians and nurses, most clinicians were highly supportive of the checklist after implementation. One general surgeon stated, "At first the checklist seemed somewhat burdensome due to its length. It now takes me about one minute to run through the list, which I don't think is at all excessive." A nurse reflected, "I was probably one of the most negative nurses at the start of this project because I thought it was just one more piece of paper to fill out. But now I find it very helpful, especially if the surgeon takes the lead and actively requests the participation of everyone in the room."

Qualitative surveys found that nine in ten respondents "indicated that they would want the checklist-guided process used if they were undergoing surgery" and that "surgeons, anesthesiology teams, and surgical nurses believe the program improved team communication and coordination, their impressions of patient safety, and their comfort level in reporting safety concerns to colleagues."

Dr. Dellinger, who donated his time to the program's development, spearheaded numerous strategies that largely influenced the program's success at the medical center, including the following:

Surgical Safety Checkli	st	World Health Patient Safety Organization
Before induction of anaesthesia (with at least nurse and anaesthetist)	Before skin incision (with nurse, anaesthetist and surgeon)	Before patient leaves operating room (with nurse, anaesthetist and surgeon)
Has the patient confirmed his/her identity, site, procedure, and consent? Yes Is the site marked? Yes Not applicable Is the anaesthesia machine and medication	 Confirm all team members have introduced themselves by name and role. Confirm the patient's name, procedure, and where the incision will be made. Has antibiotic prophylaxis been given within the last 60 minutes? Yes Net annicable 	Nurse Verbally Confirms: The name of the procedure Completion of instrument, sponge and needle counts Specimen labelling (read specimen labels aloud, including patient name) Whether there are any equipment problems to be addressed
 cneck comprete? Yes Yes Is the pulse oximeter on the patient and functioning? Yes Does the patient have a: 	Anticipated Critical Events To Surgeon: What are the critical or non-routine steps? How long will the case take? What is the anticipated blood loss?	To Surgeon, Anaesthetist and Nurse: What are the key concerns for recovery and management of this patient?
 Known allergy? No Yes Pifficult airway or aspiration risk? No No Yes, and equipment/assistance available Risk of >500ml blood loss (7ml/kg in children)? No Yes No No Yes 	To Anaesthetist: Are there any patient-specific concerns? To Nursing Team: Has sterility (including indicator results) been confirmed? Are there equipment issues or any concerns? Fessential imaging displayed? Yes Not applicable	
his checklist is not intended to be comprehensive. Additions	s and modifications to fit local practice are encouraged.	@ WHO, 2009

EXHIBIT 1.3 WHO Surgical Safety Checklist Source: WHO (2009). Used with permission.

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- Securing leadership support
- Obtaining clinician buy-in
- Recruiting surgeon and nurse champions
- Engaging all relevant clinicians, including surgeons, nurses, and anesthesiologists, in process development
- Creating and displaying checklist posters in all operating rooms
- Pilot testing the project and then spreading it across the hospital
- Incorporating new processes into the current workflow
- Amending the checklist as necessary for specific surgical cases

Results from the project indicated that the surgical checklist decreased length of stay, reduced surgery-related mortality, reduced surgical-site infections and unplanned operations, and improved adherence to evidence-based care steps. Among colectomy patients, improvements included the following:

- The percentage of colectomy patients requiring a reoperation decreased from 7.8 percent to 3.4 percent.
- The percentage of colectomy patients requiring postoperative antibiotics or wound opening decreased from 22 percent to 9 percent.
- Use of deep vein thrombosis prophylaxis, a nationally recommended treatment, increased from nearly 50 percent to 80 percent among all patients.
- Use of anastomosis testing, also a recommended treatment, increased from 11 percent to 94 percent among eligible patients.

As a result of the success at the University of Washington Medical Center, the checklist was expanded to more than 50 hospitals in the state of Washington in 2008 through the Surgical Care and Outcomes Assessment Program (SCOAP). SCOAP is a voluntary hospital collaborative that aims to reduce variability and improve quality and outcomes in surgical care across the state. SCOAP enhanced the checklist by adding items that were inconsistently applied across its member hospitals and enlisted the aid of the Washington State Hospital Association and other third parties to promote checklist adoption. The latest version of the checklist is featured in Exhibit 1.4.

Other hospitals that adopted the checklist experienced results similar to those of the University of Washington Medical Center, such as a decline in length of stay from 8.5 days to 7.5 days for colon resections and 3 days to 2 days for gastric bypass surgery and a reduction in the percentage of colorectal surgery patients requiring a second surgery from 7 percent to less than 4 percent. Results from the WHO Surgical Safety Checklist pilot, a program that was implemented in sites around the world, suggest similar improvements,

SC Surgical CH "A System	Version 3.4 Decklist Initiative for Safer Surgery"	
Step 1: Operative Preparation (Nursing and Anesthesia) With Patient Confirm: Identity Site and site marked (or N/A) Procedure Consent Allergies Anesthesia Confirms: Identity Site and site marked (or N/A) Procedure Consent Allergies Patient Position Patient Position Airway/aspiration risk assessment completed If increased risk, needed equipment available, plan described Eor Clean-Contaminated Cases Confirm that skin pren is with chlorbexedine unless contraindicated		
Step 2: Briefing—Prior to Skin Incision (All Team Members) Image: Team members introduce themselves by name and role Image: Surgeon, Anesthesia, Nursing/Surgical Tech Team: Confirm Patient (at least 2 identifiers), Site, Procedure Image: Personnel exchanges discussed (timing of and plan for announcing exchanges)		
Anesthesia Team Reviews Concerns (airway, special meds [beta blockers], rel	evant allergies, conditions affecting recovery, etc)	
Surgeon Reviews		
 Brief description of procedure and anticipated difficulties Expected duration of procedure Expected blood loss Need for instruments/supplies/IV access beyond those normally used for the procedure Nursing/Surgical Tech Team Reviews Equipment issues (e.g., instruments ready and trained on, requested implants available, gas tanks full) 		
 Sharps management plan reviewed Other patient concerns 		
Step 3: Process Control—Prior to Skin Incision (Surgeon Leads)		
 Antibiotic prophylaxis given in last 60 minutes 		
Active warming in place	□ N/A	
Case expected to be less than 1 hour?	 CASE EXPECTED TO BE ≥ 1 HOUR: Glucose checked for diabetics Insulin protocol initiated if needed DVT/PE chemoprophylaxis plan in place If patient on beta blocker, post-op plan formulated Re-dosing plan for antibiotics Specialty-specific checklist 	
Step 4: Debriefing—At Completion of Case (All Team Members)		
 (Surgeon and Nursing) Before closure: Are instrument, sponge, and needle counts correct? (Surgeon and Nursing) If specimen, confirm label & instructions (e.g., orientation, 12-lymph nodes for colon CA) (All) Confirm name of procedure (All) Equipment issues to be addressed? No Yes, and response plan formulated (Who/When) (All) What could have been better? Nothing Something, with plan to address (Who/When) (Surgeon and Anesthesia) Key concerns for recovery (e.g., plan for pain management, nausea/vomiting) 		
Adapted from the WHO "Safe Surgery Saves Lives" campaign • SCOAP is a program of the Foundation for Health Care Quality <u>www.scoapchecklist.org</u> rev 2/11/2010		

Source: SCOAP (2010). Used with permission.

such as a decrease in surgery-related mortality rate from 1.5 percent to 0.8 percent among the eight international pilot sites (see Exhibit 1.5).

Furthermore, the WHO pilot sites realized stark reductions in surgeryrelated complication rates, from 11 percent to 7 percent (see Exhibit 1.6). EXHIBIT 1.4 SCOAP

Surgical Safety Checklist, Version 3.4

EXHIBIT 1.5 Changes in Mortality Rate Before and After Implementation of the WHO Surgical Safety Checklist at **Eight Pilot** Sites*



*Percentage of all eligible surgical patients. Source: Data from Haynes et al. (2009).

Surgical-site infection dropped from 6.2 percent to 3.4 percent (see Exhibit 1.7). Finally, unplanned reoperations fell from 2.4 percent to 1.8 percent among surgical patients (see Exhibit 1.8).

One of the key lessons learned from the WHO and SCOAP efforts is that continuous emphasis on patient safety is critical. To those who were hesitant about the project, Dr. Dellinger posed the following question: "How



*Percentage of all eligible surgical patients. Source: Data from Haynes et al. (2009).

Changes in Surgery-Related Complication **Rates Before** and After Implementation of the WHO Surgical Safety Checklist at **Eight Pilot**

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EXHIBIT 1.7

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Changes in Surgical-Site Infection Rate Before and After Implementation of the WHO Surgical Safety Checklist at Eight Pilot Sites*

*Percentage of all eligible surgical patients. *Source:* Data from Haynes et al. (2009).

many of you sitting here would be willing to board an airplane knowing that the pilot was not going to go through his checklist before takeoff?" There were no volunteers. He then asked, "How many of you think that having an operation is safer than flying in an airplane?" Dr. Dellinger quickly gained the support of those who initially resisted, and the program continues to



^{*}Percentage of all eligible surgical patients. *Source:* Data from Haynes et al. (2009).

serve as a landmark quality improvement success story at the University of Washington Medical Center.

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Improvement Story: Stopping Catheter-Related Blood Stream Line Infections at the Johns Hopkins University Medical Center and Hospitals Across the United States

A second improvement story derives from growing evidence that medical errors result in part from the lack of a patient safety culture—a culture that encourages detection of quality problems—and from poor communication and teamwork in addressing quality problems. In response to these findings, in 2001 a team of researchers at the Johns Hopkins University Quality and Safety Research Group developed an innovative, comprehensive program to improve patient safety at the Johns Hopkins Hospital. The Johns Hopkins Hospital, a 1,015-bed tertiary care facility, treats more than 268,000 patients annually from across the United States and around the world.

The efforts of the Johns Hopkins team led to the creation of the Comprehensive Unit-based Safety Program (CUSP), designed to

• be implemented sequentially in work units,

- improve the culture of safety,
- enable staff to focus safety efforts on unit-specific problems, and
- include rigorous data collection through which tangible improvements in patient safety are empirically derived to educate and improve awareness about eliminating central line–associated bloodstream infections (CLABSI).

CUSP is a continuous measurement, feedback, and improvement program. It engages frontline staff and uses a combination of tools and compliance reports to achieve improvement goals. Implementation of CUSP consists of five major steps:

- 1. Train staff in the science of safety (e.g., basic strategies for safe design, including standardized processes and independent checklists for key processes).
- 2. Engage staff in identifying defects (e.g., ask staff how the next patient could be harmed on their unit).
- 3. Perform senior executive partnership/safety rounds (i.e., hospital executives interact and discuss safety issues with staff on hospital units).
- 4. Continue to learn from defects by answering four questions:
 - a. What happened?
 - b. Why did it happen?
 - c. What was done to reduce risk?
 - d. How do we know that risk was actually reduced?
- 5. Implement tools for improvement (e.g., morning briefs, daily goals checklists, operating room debriefings).

A detailed flowchart of CUSP is provided in Exhibit 1.9.

The program was first piloted in two Johns Hopkins Hospital surgical intensive care units (ICUs). Errors are more common in ICUs because of the severity of patients' conditions. Furthermore, significant adverse outcomes may occur in the event of errors among this high-risk patient population.

To implement the program, at least one physician and one nurse from each unit are required to participate. These individuals should be able to dedicate four to eight hours per week to implement CUSP and serve on the improvement team. Program expenses are the costs associated with CUSP team members' time.

Upon initial investigation of the work, researchers uncovered stark findings:



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- *Length of stay (LOS):* LOS decreased from 2 days to 1 day in one unit and from 3 days to 2.3 days in the other unit.
- *Medication errors:* The medication error rate dropped from 94 percent to 0 percent in one unit and from 40 percent to 0 percent in the other unit.
- *Nursing turnover:* The nurse turnover rate decreased from 9 percent to 2 percent in one unit and from 8 percent to 2 percent in the other unit.
- *Safety culture:* The percentage of staff who self-reported a positive safety climate increased from 35 percent to 52 percent in one unit and from 35 percent to 68 percent in the other unit.

Due to the considerable success of the pilot program, CUSP was implemented in approximately 170 clinical areas across the Johns Hopkins Hospital. Subsequently, CUSP was implemented at hospitals across the state of Michigan in collaboration with the Michigan Health and Hospital Association's Center for Patient Safety and Quality.

A total of 108 ICUs initially participated in the Michigan program. The program brought about dramatic decreases in CLABSI rates in Michigan hospitals, from a mean of 2.7 infections per 1,000 catheter days to 0 infections per 1,000 catheter days 18 months after implementation.

The success of the program did not go unnoticed. AHRQ awarded the Health Research & Educational Trust (HRET), a nonprofit research and educational affiliate of the American Hospital Association, an \$18 million contract to spread CUSP to hospitals across the United States to reduce CLABSI. The new program—On the CUSP: Stop BSI—was implemented in 44 states as well as throughout Spain and England. More than 1,000 hospitals and 1,800 hospital units across the 44 states, the District of Columbia, and Puerto Rico have collectively reduced the national CLABSI rate from a baseline of 1.915 infections per 1,000 line days to 1.133 infections, a relative reduction of 41 percent (see Exhibit 1.10).

The percentage of participating units with a 0 percent CLABSI rate also increased drastically, from 30 percent to 68 percent of all units (see Exhibit 1.11). Additionally, the percentage of units reporting a CLABSI rate of less than one per 1,000 line days increased over time from 45 percent to 71 percent.

Building on the success of the On the CUSP: Stop BSI program, HRET also led the implementation of a neonatal CLABSI prevention program in partnership with the Perinatal Quality Collaborative of North Carolina (PQCNC). This effort resulted in a decrease in CLABSI rates from 2.043 at baseline in August 2011 to 0.855 in August 2012, a 58 percent relative reduction.



Source: AHRQ (2013). Used with permission.

In addition to the expansion of the CUSP program to reduce CLABSI in numerous care settings, the CUSP toolkit is now being applied to address other hospital-acquired infections, most notably catheter-associated urinary tract infections (CAUTI). HRET is working with numerous partners on the On the CUSP: Stop CAUTI project to reduce CAUTI rates by 25 percent over 18 months.



Percentage of

Reporting Units with CLABSI Rate of o/1,000 or Less than 1/1,000 Central Line Days

Source: AHRQ (2013). Used with permission.

The path to improvement has not been simple; it has required collaboration between many multidisciplinary stakeholders. The perseverance of clinical leaders and organizations across the United States continue to make the On the CUSP: Stop BSI program and its many successive iterations a notable success.

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Case Study: Mr. Roberts and the US Healthcare System¹

Mr. Roberts is a 77-year-old gentleman who is retired and living in Florida with his wife. A child of the Depression, he grew up to become an accomplished, affluent person. At age 13, he began working as a longshoreman and barracks builder. He started to experience back pain in his early 20s. At that time, he did not receive particularly good medical advice and did not pursue alternative therapies. World War II, 25 years in Asia, and life as a busy executive took priority, and the pain became a constant but secondary companion.

At age 50, the pain became unbearable. He returned to New York and spent the better part of a year "on his back." In 1980 he underwent the first of four major spine surgeries. Since then, he has had multiple intervertebral discs partially or completely removed. Despite these operations, his pain has been worsening over the past two to three years and his functional status has been decreasing.

It is hard to live with pain, and Mr. Roberts is not sure he deals with it very well. He does not want to take narcotics because they interfere with his ability to stay sharp and active, and his stomach problems prohibit the use of many non-narcotic medications. Most of the time he experiences only mild or temporary relief of his pain.

Despite the pain, Mr. Roberts is active and gets out as much as he can. Although it has become more difficult, he still takes his wife dancing on Saturday nights. The pain is exhausting and limits his ability to do what he wants. The worst part about the pain is that it is changing—worsening—and he is uncertain of its future trajectory. As the pain increases, how will he survive? What are the possibilities that he will remain active and independent?

Mr. Roberts states that he has had "reasonably good" doctors. He feels he is privileged because he has connections and advocates for himself. These assets have enabled him to expand his healthcare options and seek the best providers and institutions. He is also well informed and assertive and has been an active participant in his healthcare. Although his overall experience in the healthcare system has been favorable, many instances of care have been less than ideal.

Communication Deficits and Lack of a Team Approach

Mr. Roberts has observed that the lack of communication between providers is a huge problem. He has multiple specialists who care for different parts of his body; however, no one person is mindful of how these systems interact to create the whole person or illness. He is never sure whether one physician knows what the other is doing or how one physician's prescriptions might interfere or interact with another's. The physicians never seem inclined to "dig deeply" or communicate as team members treating one person. On many occasions, physicians have recommended therapies that have already been tried and failed. On other occasions, they disagree on an approach to his problem and leave Mr. Roberts to decide which advice to follow. No system is in place to encourage teamwork. "Unless the physician is extremely intelligent, on the ball, or energetic, it just doesn't happen," he says.

Seldom do physicians listen to his full story or elicit his thoughts before jumping to conclusions. Mr. Roberts suggests that physicians should carefully analyze their therapeutic personalities. They cannot assume that all patients are alike or that they will react similarly to a given intervention. Each patient needs to be treated as an individual, and service needs to be respectful of individual choice.

Record keeping and transfer of information are also faulty. Despite the fact that physicians take copious notes, the information is not put to use. Mr. Roberts has expended a great deal of time and energy ensuring that his medical records are sent to a new consultant's office, only to find within a few minutes of the encounter that the consultant has not reviewed the chart or absorbed the information. This realization has affected how he uses care. For instance, at one point Mr. Roberts's stomach problems were worsening. His gastroenterologist was away on vacation for four weeks, and there was no covering physician. The thought of amassing his patient records for transfer to another physician (who likely would not review them and would suggest the same tests and therapies) was so unpleasant that he chose to go without care.

Removing the Question Mark from Patient–Provider Interactions

Mr. Roberts is particularly concerned with patients' inability to know the true qualifications of their physicians or judge their prescriptions. At one point, he was experiencing severe arm and finger pain. Assuming these symptoms were related to his spine, he sought the advice of a highly recommended chief of neurosurgery at a premier academic center. After eliciting a brief history and performing a short examination, the chief admitted him to the hospital.

The following day, an anesthesiologist came into the room to obtain his consent for surgery. Mr. Roberts had not been told that surgery was under consideration. He asked to speak to the neurosurgeon and insisted on additional consultations. Three days later, a hand surgeon reassured him that his problem was likely self-limiting tendonitis and prescribed conservative therapy. Within a few weeks, his pain had resolved. Mr. Roberts was grateful that he had followed his instinct but was concerned for other patients who might not have asserted themselves in this manner.

Mismatch Between Supply and Demand

Mr. Roberts also stated that there is a profound disconnect between supply and demand in the healthcare system. In 1992 his pain had become particularly disabling, and his mobility was extremely restricted. His physicians suggested that he see the only neurosurgeon in the county. Despite his health emergency, he was not able to make an appointment to see this neurosurgeon for more than ten weeks. No other solutions were offered. In pain and unable to walk because of progressively worsening foot drop and muscle weakness, he sought the help of a physician friend.

This friend referred him to a "brash, iconoclastic" Harvard-trained neurologist, who in turn referred him to a virtuoso neurosurgeon at a county hospital 100 miles away. After only 20 minutes with this neurosurgeon, he was rushed to the operating room and underwent a nine-hour emergency procedure. Apparently, he had severe spinal cord impingement and swelling. The neurosurgeon later told him that he would have been a paraplegic or died had he not undergone surgery that day.

He subsequently had a series of three more spinal operations. Postoperative care was suboptimal; he had to travel 100 miles to see the surgeon for follow-up. Eventually, this surgeon chose to travel to a more centralized location twice per month to accommodate his patients in outlying areas.

Mr. Roberts states that we need to "overcome petty bureaucracies" that do not allow matching of supply with demand. The ready availability of quality care should be patient driven and closely monitored by a third party that does not have a vested interest in the market.

Knowledge-Based Care

Mr. Roberts is concerned about the status of continuing medical education. He guesses that it is probably easy for physicians in large, urban teaching hospitals to keep abreast of the latest diagnostic and therapeutic advances. However, the majority of physicians may not have similar opportunities. The system does not necessarily encourage physicians to keep up to date. This lack of current, in-depth knowledge is particularly important as issues of supply and demand force consumers to seek care in "instant med clinics." For example, Mr. Roberts believes emergency care to be an oxymoron. On many occasions, he has gone to the emergency department and has had to wait four to five hours before being treated. This experience is unpleasant and forces people to seek alternative facilities that may not provide the best care for complex, chronically ill patients.

Mr. Roberts also feels that we need to learn from our errors as well as from our successes. We should require that groups of physicians regularly review cases and learn how to deliver care in a better way. This analysis needs to occur internally within institutions as well as externally across institutions. Ideally, the analysis would directly involve patients and families to gain their perspectives. In addition, the learning should be contextual; we should not only learn how to do better the next time but also know whether what we are doing makes sense within our overall economic, epidemiological, and societal context.

Mr. Roberts believes that quality healthcare is knowledge based. This knowledge comes not only from science but also from analysis of mistakes that occur in the process of delivering care. Patients should be involved in the collection and synthesis of these data. The transfer of knowledge among patients, scientists, and practitioners must be emphasized and simplified.

Nonphysician/Nonhospital Care

Mr. Roberts has been impressed with the quality of the care he has received from nonphysician clinicians, and he believes the growth of alternative healthcare provider models has been a definite advance in the system. As an example, Mr. Roberts cites the effectiveness of his physical therapists as healthcare providers; they are alert, patient conscious, conscientious, and respectful. Mr. Roberts believes that their interventions "guide people to better life," and his functional status has improved as a result of their assistance. In addition, these providers are careful to maintain close communication with physicians. They function as members of a team.

Postoperative care also has improved. At the time of his first surgery more than two decades ago, Mr. Roberts spent two weeks in the hospital. Now, after three days he is discharged to a rehabilitation facility that is better equipped to help him recuperate and regain full function.

Mr. Roberts knows how crucial his family and friends are to his medical care. Without their support, recommendations, constant questioning, and advocacy, his condition would be more precarious. The system needs to acknowledge patients' other caregivers and involve them in shared decision making and knowledge transfer.

Conclusion

The previous sections provide brief insight into some successful improvement projects. We could also find many examples of failed improvement projects and the lessons learned from them. Although the gaps between current practice and best practice can be daunting, improvement is occurring, albeit in pockets. We must continue to make quality a necessity, not just a nicety, in healthcare. Pervasive quality challenges played a critical role in the passage of recent healthcare reform legislation, which is encouraging the transformation of healthcare from a quantity-driven industry to a valuedriven industry.

Improvement does not develop from viewing healthcare through one lens; disparate silos must be bridged to provide high-quality care. As depicted by the improvement projects featured in this chapter, widespread quality improvement necessitates the sharing of successful efforts among institutions, and national leadership must work to spread and appropriately adapt these strategies to institutions across the United States.

The aim of this textbook is to provide a comprehensive overview of the critical components of the healthcare quality landscape. Numerous case studies highlight the complex interactions between multiple systems and stakeholders that are necessary for success in quality improvement efforts. We will need to improve these systems at every level—from the patient to the external environment—to truly transform healthcare. You, as readers and leaders, should use this text as a resource and framework for understanding the connectivity of multiple aspects of healthcare quality from the bases of science, patient perspective, organizational implications, and environmental effects. This chapter sets the stage by highlighting the following:

- The current state of healthcare quality
- The importance of the patient in goals and results
- Promising evidence of the great capacity for significant improvement in systems of care
- Examples of breakthrough improvements
- A call to action for all healthcare stakeholders to continue to rethink and redesign our systems to achieve better health for all

Study Questions

- 1. Identify five ways in which patients can gain more control over their care.
- 2. Think of an experience you, a family member, or a friend has had with healthcare. Gauge the experience against IOM's six aims, and identify any opportunities for improvement.
- 3. You are the CEO of a hospital, and the local newspaper has just run a story on "how bad healthcare is." How do you respond to the reporter asking you to comment on the situation? How do you respond to your employees?

Note

1. This patient story was edited by Matthew Fitzgerald, center director, Center for Health Data Analysis at Social & Scientific Systems, and was originally composed by Heidi Louise Behforouz, MD, assistant professor of medicine, Harvard Medical School; associate physician in the Division of Global Health Equity at Brigham and Women's Hospital; and medical and executive director of the Prevention and Access to Care and Treatment Project.

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