History of the Quality Improvement Movement

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Chapter 1: History of the Quality Improvement Movement

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Early Effects to Improve Clinical Care and Medical Education

The evolution of quality improvement has been a steady response to the need to correct errors. Consider Florence Nightingale, a public health pioneer who addressed the link between paltry hospital sanitation and the high — 60 percent — fatality rate among wounded soldiers during the Crimean War of 1854. Germ theory was gaining traction in Europe and pointing to the link between high morbidity and mortality rates and the lack of basic sanitation and hygiene standards. Nightingale, while serving as a nurse at the Barrack Hospital in Istanbul, developed practices — hand washing, sanitizing surgical tools, regularly changing bed linens and making sure all wards were clean — that are standard in hospitals today. She also promoted good nutrition and fresh air. By the time this forerunner of evidence-based medicine left Barrack Hospital, mortality had plummeted to 1 percent.1,2

A continent away, concern about the state of American medicine mounted. In 1847, the American Medical Association (AMA) emerged, in response to the need for a tougher, standardized medical education system. Medical education and the practice of medicine in colonial America were haphazard at best. According to Paul Starr, in The Social Transformation of American Medicine, “All manner of people took up medicine in the colonies and appropriated the title of doctor…,” including “a Mrs. Hughes, who advertised in 1773 that besides practicing midwifery, she cured ‘ringworms, scald heads, piles, worms’ and also made ladies’ dresses and bonnets in the newest fashion.” During the American Revolution, 400 of the nation’s estimated 3,500 to 4,000 physicians had formal medical training, and only half held medical degrees, which weren’t worth much, since they required, at most, only 6 to 8 months of medical school and 3 years of apprenticeship. And yet, medical school diplomas often were accepted as licenses to practice medicine.3

In its drive to reform medical education, the AMA in 1904 created the Council on Medical Education, which asked the Carnegie Foundation for the Advancement of Teaching to conduct a study of medical schools. The Foundation assigned the study to education expert Abraham Flexner, who wrote in his 1910 report, Medical Education in the United States and Canada, “Touted laboratories were nowhere to be found, or consisted of a few vagrant test tubes squirreled away in a cigar box; corpses reeked because of the failure to use disinfectant in the dissecting rooms. Libraries had no books; alleged faculty members were busily occupied in private practice. Purported requirements for admission were waived for anyone who would pay the fees.”3
Medical education underwent dramatic transformation after the publication of Flexner’s report. Many schools closed, some consolidated, and all tightened their entrance requirements. Length of study and training increased and incorporated biomedical studies in biology, chemistry and physics with strict, supervised clinical training.\(^4\)

While just 50 percent of medical school graduates moved on to hospital training in 1904, an estimated 75 to 80 percent were taking internships by 1912.\(^3\)

As Flexner’s report revolutionized the medical education system, Ernest Codman, a surgeon from Harvard Medical School and Massachusetts General Hospital, applied his “End Result System of Hospitalization Standardization Program,” a three-step approach to quality assurance, to improving hospital care. Codman’s system used quality measures to determine if problems stemmed from patients, the health care system or clinicians; quantified the lack of quality; and, remedied problems to prevent them from happening again.\(^5\) In 1917, the American College of Surgeons (ACS) adopted his “End Result System” for its Hospitalization Standardization Program, which set minimum standards for hospital care. These standards required that, among other things: all hospital physicians are well-trained, competent and licensed; staff meetings and clinical reviews occur regularly; and, that medical histories, physical exams and laboratory tests are recorded.\(^6\)

In 1918, the ACS began using its newly established minimum standards to inspect hospitals. Of 692 hospitals, only 89 met the minimum standards. However, by 1950, the Hospitalization Standardization Program approved more than 3,200 hospitals.\(^7\)

**Improvements to Maternal Child Health Trigger Other Efforts**

While much concern about health care quality in the early 20th century revolved around hospitals, America’s high maternal and infant mortality rates, longtime indicators of quality, were also claiming attention. In 1921, Congress passed the Sheppard-Towner Act, which granted states funds to improve access to maternal and child health services. In 1935, Congress passed Title V of the Social Security Act, to equip and finance pediatric and primary care services for hospitals in underserved areas. The Emergency Maternity and Infant Care program followed, financing care for 1.5 million women and infants of United States soldiers during World War II. And, in 1946 came the Hill-Burton Act, which awarded grants to states to build hospitals.\(^8\)

Efforts to provide women, children and the underserved with more and better care led to the creation of numerous programs, including Medicare and Medicaid.

By the mid-1900s, improving the quality of health and hospital care was an idea with a century of effort behind it. It was after World War II, however, when the concepts of modern quality improvement emerged, initially focusing not on health outcomes but on systems change in business and industry.

**The Revolution of Quality Improvement in Business and Industry**

Beginning in the mid 1920s, Walter A. Shewhart and W. Edwards Deming, both physicists, and Joseph M. Juran, an engineer, laid the groundwork for modern quality improvement. In their efforts to increase the efficiency of American industry, they concentrated on streamlining production processes, while minimizing the opportunity for human error, forging important quality improvement concepts like standardizing work processes, data-driven decision making, and commitment from workers and managers to improving work practices.\(^6\)

These elements of systems change, first applied to business and industry, ultimately trickled down to the American health care system as awareness of its need for improvement grew.\(^9,12\)
History of the Quality Improvement Movement

Systems Change Reaches American Medicine
In 1951, the American College of Surgeons, the American College of Physicians, the American Hospital Association, the American Medical Association, and the Canadian Medical Association formed The Joint Commission on Accreditation of Hospitals as a not-for-profit organization to provide voluntary accreditation to hospitals. Early on, The Joint Commission used the minimum standards of ACS’s Hospital Standardization Program to evaluate hospitals. In time, however, The Joint Commission, which became The Joint Commission on Accreditation of Healthcare Organizations in 1987, adopted more rigorous standards, which reflected the structure-process-outcomes model that Avedis Donabedian presented in his 1966 article, *Evaluating the Quality of Medical Care*. Who provides care and where (structure); how care is provided (process); and the consequences of care (outcomes) are all needed to measure quality, Donabedian argued.13

By the mid-1990s, The Joint Commission introduced into the accreditation process the elements of system change derived from the work of Deming, Shewhart and Juran: the role of organizational leadership, data-driven decision making, measurement, statistical process control, a focus on process, and a commitment to continuous improvement.

Process was especially important to quality management expert Philip Crosby, former vice president of corporate quality for International Telephone and Telegraph, who espoused the value of preventing errors altogether by doing things right the first time. Crosby’s “zero defects” approach to quality improvement set the stage for two other models that focused on eliminating waste: Toyota’s “lean” operations and Six Sigma.14

Toyota’s lean operations, introduced in the 1980s, standardized work processes to avoid wasting resources, time and money. Six Sigma, which Motorola developed in the late 1980s, also strives to improve quality during the process stage. It refers to a statistical measure of variation, but instead of using percentages, Six Sigma assesses “defects per million opportunities” and aims for fewer than 3.4 defective parts per million opportunities.15

The Role of NCQA in Improving Quality of Health Care
In the late 1980s, corporate purchasers had fixed on a strategy of the accountable health plan to contain their health care costs. Led by many of the Fortune 500 companies that had adopted the principles of total quality management (e.g., Xerox, Ford, General Motors, Bank of America) or continuous quality improvement, they were seeking to enroll their employees in health plans that would measure their quality and continuously improve it. In 1988, the National Committee for Quality Assurance (NCQA) changed its governance to put health plans in the minority on the board, and developed a multistakeholder board, including these corporate purchasers, consumers and quality experts. NCQA worked with these corporate leaders and with health plan quality leaders to develop standards for what a true Health Maintenance Organization would be. NCQA’s accreditation standards were developed around many of Deming’s and Juran’s ideas, and the program was launched in 1991.

At the same time, NCQA took on a project that had been developed by a number of health plans and purchasers to standardize quality measurement. In 1993, NCQA published its first Health Plan Report Card, using the Healthcare Effectiveness Data and Information Set (HEDIS). For the first time, it was possible to compare health plans on the effectiveness of care that their members received. HEDIS and NCQA accreditation were parallel projects for a number of years. In 1999, NCQA made HEDIS (including standardized patient experience results) an official part of its accreditation program,
In Crossing the Quality Chasm, the IOM charged the health care system with frequently lacking “…the environment, the processes, and the capabilities needed to ensure that services are safe, effective, patient-centered, timely, efficient, and equitable,” qualities it calls “six aims for improvement.” In addition to achieving these aims, the IOM recommended: improving patient safety and reducing medical error by establishing a national focus on leadership, research, tools and protocols about safety; expecting mandatory and voluntary reporting of errors; raising safety standards by involving oversight organizations, purchasers and professional societies; and creating safety systems inside health care organizations.18

Hospital Quality Measurement Leads to Major Improvement

The development and implementation of standardized quality measurement for hospitals in the first decade of the 21st century led to substantial improvements in performance across a wide variety of evidence-based measures. The Joint Commission convened experts who reviewed and summarized evidence, and produced the first nationally standardized quality measures for hospitals for patients with acute myocardial infarction, heart failure, pneumonia and pregnancy. The Joint Commission required all accredited hospitals to collect and report performance data on at least two of these groups of measures in 2002 and began publicly reporting the data two years later. The Centers for Medicare and Medicaid Services (CMS) initiated a program to penalize hospitals financially if they did not report to CMS the same data they were reporting to The Joint Commission and began a public reporting program the next year. Both The Joint Commission and CMS programs expanded their reporting requirements over the second half of that decade.

Hospitals resisted the collection and reporting of these data at the beginning. The American Hospital Association, the Federation of American Hospitals and the...
Association of American Medical Colleges vigorously supported the effort to collect and publish data on nationally standardized measures of hospital quality of care.\(^{20}\) As public reporting increased, hospitals increasingly directed resources to improve the clinical processes of care in order to enhance performance on the public measures. The results have been impressive. Throughout the 1990’s, it was not uncommon for hospitals to exhibit rates of performance on these quality measures of 40 to 60 percent, with substantial variability among hospitals.\(^{21-23}\)

By 2009, hospitals had achieved very high levels of performance on many of these measures, and variation among hospitals was markedly reduced.\(^{24}\) For example, the national average of performance by hospitals on discharging eligible acute myocardial infarction patients on a beta blocker was 98.3 percent, up from 87.3 percent in 2002. Also in 2009, on that same measure, 96.8 percent of hospitals exhibited rates of performance over 90 percent, compared to 75.2 percent in 2006.

In addition, the need for improvement in hospital quality measurement became clear by 2010. While many measures worked well to promote improvement activities that led clearly to improved outcomes for patients, others did not. In 2010, The Joint Commission adopted new criteria that define a higher standard for quality measures that are used in accountability programs such as accreditation, public reporting and pay for performance.\(^{25}\) These criteria are designed to maximize the likelihood that improved health outcomes will result when hospitals work to improve their performance, while minimizing unintended consequences and the unproductive work that often results when the design of measures makes it easier to create “paper compliance” than to truly improve clinical care. The Joint Commission perinatal care measures, which meet the new criteria for accountability measures, were adopted for voluntary use by hospitals in 2009 and are discussed in Chapter 11 of this monograph. If widely used by hospitals, they offer the opportunity to greatly improve perinatal care in America’s hospitals by employing this model of measurement-driven improvement, which has already delivered consistent excellence across many valid measures of hospital quality of care.

Since the publication of the IOM reports, health care organizations and providers have been exploring ways to improve their practices. Many, like those featured in this monograph, are implementing plans designed to reduce errors and improve patient safety and health care quality. There will always be concerns about individual blame and the threat of litigation. But, as *Toward Improving the Outcome of Pregnancy III* illustrates, clinicians are committed to improving health care delivery. The following chapters will show that improving our system of perinatal care is not just possible; it is happening.
References

