

CHAPTER 1

Performance Improvement in Healthcare

These Are the Best of Times, These Are the Worst of Times . . .

No not *that* book! We are talking about the state of healthcare not just in the United States but around the world. Even though we are at the forefront of the most advanced ability to heal, a great many people are deprived of the best of care either because they cannot afford it or because they are otherwise denied access to treatment. This book is not about the social aspects of that state but about what every healthcare leader and his or her organization can do to make healthcare more available, more affordable, with better outcomes . . . and yes, if desired, more profitable.

The United States spends more on healthcare than any other nation in the world, yet 50.7 million people in the United States have no health coverage. In 2008, \$7,681 was spent for every U.S. resident on healthcare, some \$2.3 trillion, as reported by the Centers for Medicare and Medicaid Services, yet the average life expectancy in the United States is shorter than that in many developed and developing nations. In a study of the healthcare systems of seven industrialized countries, the Commonwealth Fund ranked the U.S. healthcare system as the most costly, spending almost twice as much per capita than average.

How can this be?

The healthcare system in the United States is in shambles. Emergency departments are overflowing with the uninsured. There is a shortage of primary care providers driven by lifestyle and reimbursement pressures and a rush to specialize. The Affordable Care Act could extend health insurance coverage to 32 million uninsured U.S. citizens. There are fears that there

won't be enough doctors to treat the newly insured because the United States could face a deficit of as many as 150,000 doctors in the next 15 years, according to the Association of American Medical Colleges. Like doctors, nurses have been working more overtime and take care of more and more patients, leading to the exit of experienced nurses from the profession because of burnout and exhaustion. Forty percent of practicing nurses are 50 years old or older. In the journal *Health Affairs*, Rother and Lavizzo-Mourey project that within the next 15 years, the U.S. nursing shortage will reach a shortfall of 260,000 registered nurses. Dedicated physicians and nurses are already working against impossible odds to achieve improbable results. How will care be provided to this expanding population of patients?

The answer is *not* by working harder.

The United States has more modern hospitals, more skilled physicians, more specialists, and more professional nurses than any other nation in the world. Most of the advances in healthcare technology, pharmacology, and medical science have originated in the United States. Applicants to medical schools in the United States compete with applicants from other nations seeking the world's best medical education. The American Recovery and Reinvestment Act (ARRA) of 2009 allocated about \$30 billion to develop a national health information technology (IT) infrastructure. Yet the expected return on investment in technology, unlike advances in pharmacology and medical science, has not been fully realized. In the book *Curing Health Care: New Strategies for Quality Improvement*, Dr. Donald Berwick and colleagues wrote, "[T]ens of billions of dollars have gone into IT systems in healthcare, . . . but patients and care providers have very little to show for it."

The answer is *not* by spending more.

What Is the Answer?

If working harder and spending more is not the answer, what is? Healthcare systems are full of waste and experience an enormous amount of variation and many preventable mistakes. Furthermore, constraints and bottlenecks need careful management to get the most value for the money spent. The ailments of healthcare today are comorbid. Hence a direct, concentrated triage of the system is needed.

Other afflicted industries have found effective remedies for similar challenges. While acknowledging the uniqueness of humans and the

complexity of healthcare delivery, three industrially based methodologies have been applied successfully in healthcare systems worldwide to achieve dramatic results. These are

1. **Lean**—a systematic approach to eliminate waste
2. **Six Sigma**—a rigorous, data-driven process to reduce variation and eradicate defects
3. **Constraints Management**—a breakthrough methodology to focus efforts and manage a system's bottlenecks and other constraints

Of the three, Lean applications in healthcare appear to be the most popular among U.S. and U.K. hospitals. More than 50 percent of hospitals in the United Kingdom are reporting the implementation of Lean methodology related to service improvement in their 2007 and 2008 annual reports. Six Sigma applications follow closely. According to an American Society for Quality (ASQ) survey of 77 hospitals, of about 5,000 hospitals nationwide, 53 percent apply Lean and 42 percent apply Six Sigma at some level, and 37 percent take the hybrid approach of Lean Six Sigma. On the other hand, Constraints Management applications in healthcare are at their infancy in the United States, but breakthroughs by effectively managing constraints are documented at hospitals in the United Kingdom, Israel, the Netherlands, South Africa, Singapore, and New Zealand.

Although each of these methodologies has its merits, a careful integration of them promises much more effective results than practicing any single methodology in isolation. For healthcare executives and midlevel managers who are dissatisfied with the status quo of hospital operations in terms of patient outcomes and experience, financial viability, and employee satisfaction, this book offers a best of breed integration of the latest advances in performance-improvement approaches.

A healthcare system is complex and composed of many subsystems with many interdependent processes. It includes payers, providers, inpatients, outpatients, and ancillary services, to name a few. A systems thinker sees a hospital “not as the sum of its parts, but primarily as the product of its interactions,” as Dr. Russell Ackoff originally wrote and as the book *The Nun and the Bureaucrat* described. While the goal is to boost performance across healthcare organizations, the path is through identifying system constraints and improving the processes associated with them that are not meeting expectations. Unlike *one size fits all* or dogmatic approaches, such

as Lean *only* or Six Sigma *only* or Constraints Management *only*, an integrated approach uses these three methodologies and others. By focusing on what is critical to the organization and by using the right tool for the right problem at the right time, faster results and greater return on investment can be realized—especially in these turbulent times.

The pace of change in healthcare is accelerating. Better tools are needed to provide front-line staff with the ability to better respond to those changes. Adaptation is happening, but just not fast enough to keep pace with the times. Currently, hospitals tend to use find-organize-clarify-understand-select (FOCUS)—plan-do-check-act (PDCA) supplemented, in some instances, with an industrial engineering approach to performance improvement. This outside-in approach allows only a minimal involvement of clinical staff. These are the individuals who do the work, know the process, deal with the problems, and need to be a part of the solution.

The problems with and the solutions to the healthcare crisis are not about people nor technology nor science. They are about transforming the system. Fifty percent of \$2.3 trillion spent per year on healthcare in the United States is wasted because of inefficient processes. Therefore, the answer is to fix the *system* of inefficient processes, to prevent mistakes, and to manage the bottlenecks better by focusing on the right problem with the right tool at the right time—in other words, to use an integrated approach to performance improvement.

Is it possible for a hospital to improve outcomes while improving its performance as a business at the same time?

It's All About . . . the Patient . . . the Money— Why Not Both?

At the end of the day, when all is said and done, performance improvement is all about doing what is right for one patient while ensuring that the organization has the resources to continue doing what is right for the next patient. The entire healthcare industry is in the business of providing the right care to the right patients at the right time and in the right place. Performance improvement is about making that possible. As one hospital CEO put it: “Hospitals are a business; they are in the business of caring for patients and families. I’m here to help my hospital’s business of improving

the quality of care to my patients wherever and whenever possible.” In *Managing in the Next Society*, management professor, writer, and guru Peter Drucker declared that “health care is the most difficult, chaotic, and complex industry to manage today” and that the hospital is “altogether the most complex human organization ever devised.”

Healthcare professionals have been trained to provide care, and many of them have internalized it as their chosen vocation—not just *a job*. It is what gets them excited—ready to get up each day to devote their time, energy, and expertise. Physicians, nurses, technicians, healthcare administrators—all have prepared themselves during their early college and postgraduate years for learning how a hospital functions, how to render high-quality medical and nursing care to the sick, and how to maximize the most effective use of their skills. Now they are being told that they must factor in costs in a significant way. It is often difficult for healthcare professionals to internalize the business aspects of patient care.

Healthcare is an intensely competitive business climate. Given that, is improving the quality of patient care compatible with reducing costs? Is it possible on the one hand to increase the hospital’s clinical outcomes or performance and still improve business performance? Examples of clinical outcomes or performance include

- ▲ Reducing patient falls
- ▲ Reducing pressure ulcers
- ▲ Reducing readmissions
- ▲ Decreasing hospital-acquired infections
- ▲ Decreasing inappropriate lengths of stay

The question becomes: Should attention be paid to these outcome improvements or to cost savings? Then again, maybe this question is moot.

The Cost and Quality in Healthcare

Recent changes in reimbursement for pressure ulcers make addressing this issue critical. Knapp Medical Center in Weslaco, Texas, attributes approximately \$2.8 million in savings through performance improvement. In one year, Knapp’s reductions in average length of stay resulted in eliminating 1,304 days of unnecessary care. The hospital also saved 98 days through eliminating readmissions, 27 deaths were prevented, and it avoided complications in 28 patients.

Hospital-acquired infections is another area that recent changes in reimbursement have affected. In an article from *Hospital Topics*, Hassan and colleagues estimated that a hospital-acquired infection increases the hospital care cost of a patient by \$10,375, and it increases the length of stay by 3.30 days. These costs vary based on the nature of the infection, ranging from \$600 for a urinary tract infection to \$50,000 for prolonged bloodstream infection. Overall, medical errors add huge costs to the delivery of care. An examination of patient safety indicators (PSIs) showed that 90-day expenditures that are likely attributable to PSIs ranged from \$646 for iatrogenic problems (i.e., accidental lacerations, pneumothorax, and so on) to \$28,218 for acute respiratory failure, with up to 20 percent of these costs incurred after discharge. With a third of all 90-day deaths occurring after discharge, the excess death rate associated with PSIs ranged from 0 to 7 percent. The excess 90-day readmission rate associated with PSIs ranged from 0 to 8 percent. Overall, 11 percent of all deaths, 2 percent of readmissions, and 2 percent of expenditures likely were due to these PSIs. In a *Health Services Research* article, William Encinosa and Fred Hellinger posit that medical error studies that focus only on the inpatient stay can underestimate the impact of patient safety events by up to 20 to 30 percent.

Linking outcomes and patient safety to cost is at the forefront of current healthcare literature. What about the broader link between quality management and organizational performance—specifically, financial performance? In a recent study entitled, “Impact of Quality Management on Hospital Performance: An Empirical Examination,” in *Quality Management Journal*, Carter and colleagues clearly demonstrated the connection. While the broader association between product or service quality and cost across virtually all industries is widely accepted and supported in the literature, the relationship as it pertains directly to healthcare was examined in an analysis of 175 hospitals. In addition to the link itself, the possible moderating effects of environmental uncertainty and hospital size were studied. The study found that there was a relationship between quality management and organization performance. While this is not surprising—and supports findings across most industries—there were a couple of additional conclusions worth addressing.

The first is that hospital size did make a difference in the strength of the relationship between quality management and organization performance. The relationship is not as strong for larger hospitals perhaps

because of the need for smaller hospitals to pay attention to performance issues—both quality and financial. Despite their limited resources, smaller hospitals take a more strategic approach to quality as opposed to relying on more ad hoc practices.

The second conclusion is that environmental uncertainty also has a moderating effect. In examining the effects of environmental uncertainty, including factors such as government regulations, the financial market, the general economy, and public opinion, it was found that there was a stronger relationship between quality management and organization performance during times of low environmental uncertainty. The authors of the study posited that during times of high environmental uncertainty, leadership focus is diverted away from quality management to what the leaders view as more pressing issues.

Carter and colleagues summarize their findings by stating, “. . . it is important for managers in the healthcare community to include both quality practices and quality context in their quality management activities to improve overall hospital performance based on financial performance, market development, and quality outcomes.”

On a final note about the financial issues facing healthcare in general and hospitals more specifically, *New York Magazine* published an article detailing the history and demise of St. Vincent’s Hospital. St. Vincent’s had accumulated \$1 billion in debt and was losing \$10 million per month. Having treated victims from the time of the *Titanic* through 9/11, nothing could save this landmark hospital. Neither could the fact that it was the only hospital on Manhattan’s West Side below 59th Street and left 200,000 New Yorkers without their community hospital, as shown in Figure 1.1. As a result of financial mismanagement, St. Vincent’s was closed on April 30, 2010. It was the seventeenth hospital to close in New York City since 2000. From an outcomes perspective, there is one certainty: Hospitals cannot provide quality care if they are closed!

The History of Performance Improvement in Healthcare

“Those who cannot remember the past are condemned to repeat it.”

—GEORGE SANTAYANA, SPANISH-AMERICAN
PHILOSOPHER AND WRITER



Figure 1.1 Closed doors of St. Vincent's Hospital.

Florence Nightingale

In order to better understand where we are today, it is helpful to revisit the evolution of performance improvement in healthcare. Its genesis can be traced back to the efforts of Florence Nightingale and her team. As Neuhauser recounted in *Florence Nightingale: A Passionate Statistician*, in November of 1854, Nightingale and her team of 38 nurses arrived at the British hospital in Üsküdar on the Asian side of Istanbul, Turkey, to care for the soldiers wounded in the Crimean War (1853–1856). When they arrived, they found the sanitary conditions of the hospital to be totally unsatisfactory. A British soldier had a better chance of surviving the war than surviving the filthy conditions of the hospital. Infectious diseases killed more soldiers than war wounds. A passionate statistician, Nightingale recorded that in the first seven months of the campaign, 60 percent of the soldiers died from infections. She and her team focused on improving cleanliness, sanitation, nutrition, administrative order, and patient care.

In the following three years, Nightingale and her team drastically improved the conditions for the care of soldiers, reducing the death rate among patients by two-thirds. Her careful data collection, analysis and reasoned conclusions

were instrumental in her success, along with her leadership skills. With aristocratic connections and established access to funding and media, Nightingale enjoyed the support of top leadership, Queen Victoria. Her book, *Notes on Hospitals*, is credited as the only book on modern hospital management in the nineteenth century. Her recommendations influenced hospitals worldwide. Building on Nightingale's achievements, many others contributed to the evolution of performance improvement in healthcare, such as Ernest Codman, W. Edwards Deming, Walter Shewhart, Avedis Donabedian, and Joseph Juran.

In the fall of 1987, Dr. Donald Berwick and the aforementioned Juran launched the National Demonstration Project (NDP) as a new and rigorous approach to improving hospital performance with Total Quality Management (TQM), a variant of Continuous Quality Improvement (CQI). Twenty-one American healthcare organizations joined as members of the NDP. Hosted by the Harvard Community Health Plan, project participants experimented with using TQM tools, which were being implemented successfully by other industry leaders such as Toyota, Mitsubishi, Honda, Sony, Xerox, and Motorola. Their findings were summarized in *Curing Health Care: New Strategies for Quality Improvement*. Some of the NDP hospitals succeeded with respectable results. As the success stories of NDP spread, numerous other hospital CEOs started experimenting with TQM. However, although Berwick was quoted as saying that as many as 1,000 U.S. hospitals had begun TQM efforts, he did qualify by saying, "But I'd be surprised if there are 100 that are really serious." Dr. Berwick later transformed the NDP into the Institute for Healthcare Improvement (IHI).

Naval Medicine

The Naval Regional Medical Center San Diego (NRMC SD), which is the U.S. Navy's largest hospital, and the Navy Bureau of Medicine & Surgery (BUMED) were key members of the NDP from 1989 to 1995. In 1989, Vice Admiral James Zimble, the Navy Surgeon General at BUMED, introduced TQM to his commanding officers. Rear Admiral Robert Halder, the commanding officer of NMSC SD, was a participant at this introductory meeting. Rear Admiral Halder indicated that he was ready to lead a very ambitious deployment of TQM for his command of 5,000 employees and eight other region-wide hospitals. He wrote, "This was what I had been

looking for. . . . I was leading a good organization—but this was the way to make it great.” Both Zimble and Halder saw the promise of TQM and CQI, understood the FOCUS-PDCA model, and knew that healthcare, in general, had to change all across the spectrum. They stepped out quickly, and Navy Medicine became a vigorous proponent of TQM throughout the NDP.

The military embraced Total Quality Management (TQM) in 1988 throughout the Army, Navy, Air Force, and Marine Corps. In 1990, the Chief of Naval Operations changed the Navy’s use of TQM to Total Quality Leadership (TQL) to emphasize the critical importance of leadership in improving any process. TQM or TQL was considered an overarching cornerstone and became almost synonymous with Continuous Quality Improvement (CQI).

To ensure that it would not become a fleeting flavor-of-the-month program, in 1989, Rear Admiral Halder set up a separate office at the NRMC SD to focus completely on the transformation to TQL. To demonstrate highest-level leadership of this transformation, Rear Admiral Halder required the TQL office director, then-Commander Charles Mount, one of this book’s coauthors, to report directly to him, thereby bypassing the normal bureaucratic layers in Navy Medicine. These two officers met each morning at 7 A.M. TQL success was the top priority. The goal was to have the TQL office operate in coordination with the NRMC SD’s traditional Quality Assurance and Improvement (QA&I) Department. Interestingly, both areas were directed to work hand in hand to bring the concepts of CQI to all levels of hospital staff, especially those who actually touched the patients (in Navy terms, this was called the *deck plate*). This was a novel approach. In previous years, the quality assurance functions were performed by a few QA&I experts at the directorate or department level. It was only during times of inspection by the Joint Commission on Accreditation of Healthcare Organizations that QA&I activities reached down to the department level. Since the TQL and QA&I offices complemented each other, the concepts of performance improvement became widespread among the hospital staff.

Implementing CQI at such a large medical center required more than just creating a TQL office. Training was provided to hundreds, if not thousands, of healthcare professionals. No one hospital could create such a large training system. To create such a system would require participation by numerous San Diego area hospitals. Rear Admiral Halder also asked Commander Charles Mount to gain that participation by creating a community-wide coalition. The

Naval Regional Medical Center offered direction and support, inviting the CEOs of 26 hospitals in the San Diego area and the commanding officers of the 6 Navy hospitals to form the Southern California Coalition for Improving Health Care Quality. Rear Admiral Halder told them, “I cannot do this alone. I need you to join me.”

Twenty-four civilian and military hospitals chose to join the Southern California Coalition for Improving Healthcare when it commenced in November 1989. During the first three years of deployment at NRMC SD, the cumulative success of over 60 teams working on both administrative and clinical processes yielded a cost reduction of \$22 million while significantly improving internal and external customer satisfaction and quality of care at the same time. Similar successes were achieved by many of the coalition’s civilian facilities. Ultimately, thousands of patients were positively affected by the work of the coalition. The coalition lasted until 1995, sponsoring numerous CQI conferences in San Diego and fulfilling its mission of acculturating hospitals with the tools, methodologies, and training to sustain CQI. Attendees at the conferences included healthcare professionals from across the United States.

What’s in a Name?

While the name fluctuated between TQM, TQL, CQI, and Continuous Process Improvement (CPI) and a relative amount of success was achieved, hospital executives in the United States were becoming dissatisfied, according to a survey conducted in 1992. Initially in separate offices, as staffing issues arose, most hospitals integrated TQM and CQI into the hospitals’ QA&I offices. The goal was to conserve resources and place all process-improvement activities in a single area under a single leader or manager. Unfortunately, many QA&I offices were already overloaded with Joint Commission initiatives, reporting quality indicators, Healthcare Effectiveness Data and Information Set (HEDIS) measures, risk management and safety functions, and attending and taking minutes at myriad committee meetings. Larger hospitals could afford to hire sufficient personnel to divide up such tasks. Smaller hospitals reduced the QA&I staffing to one to three people. Thus the attention needed to sustain these TQM or CQI efforts was diverted elsewhere, diminishing overall effectiveness.

As has been the Joint Commission’s philosophy for more than 20 years, it promoted the CPI or performance-improvement moniker. In so doing, it

wanted to foster the collaborative use of toolsets, whatever they are titled, throughout the entire hospital structure and ultimately to see results that improve patient outcomes. Specifically, the Joint Commission was interested in nursing, medical, and ancillary personnel working together as a team rather than in silos, as they had functioned traditionally. Only by working in a cooperative atmosphere, the Joint Commission surmised, would hospitals gain any traction in solving persistent problems and actually improve patient-care processes. At the tactical level, Deming's plan-do-check-act (PDCA) cycle had arisen as the primary improvement approach. As described in the following section, PDCA (also referred to as plan-do-study-act, or PDSA) is no longer sufficient to address the performance-improvement challenges of today's hospitals as healthcare costs skyrocket.

FOCUS-PDCA

"The definition of insanity is doing the same thing over and over again and expecting different results."

—ALBERT EINSTEIN

Although plan-do-check-act (PDCA) was developed originally by the father of statistical quality control, Walter A. Shewhart, W. Edwards Deming, who was his student, later went on to develop Total Quality Management (TQM) and became a founding father of management science in his own right. Deming's application of PDCA (and PDSA) called for managers to hypothesize, develop, and *plan* improvements; implement and *do* the improvements, almost as if performing a scientific experiment; *checking*, studying, and evaluating the outcomes and results; and then *acting* based on considered analysis to instill the change on a continued basis until it could be improved further. In so doing, Deming applied the principles of scientific management to the aim of perpetually improving organizations. Supplementing PDCA with FOCUS, Hospital Corporation of America added yet another acronym to the vernacular—find-organize-clarify-understand-select (FOCUS). In the FOCUS-PDCA paradigm, preceding PDCA, FOCUS calls for *finding* an improvement opportunity, *organizing* an improvement team, *clarifying* the current state of the process, *understanding* the causes for variation in the process, and *selecting* the improvement.

Is the traditional FOCUS-PDCA sufficient to truly solve today's healthcare problems and transform the industry? Hospitals have long used the tools and methodologies of FOCUS-PDCA for performance improvement. Hospital Corporation of America (HCA) adapted Deming's PDCA and added the FOCUS portion specifically to help hospitals select their most inefficient and troublesome areas for improvement. This methodology was started in the late 1980s and has been expanded across the entire industry over the past 20 years.

If PDCA were sufficient, then the United States would not be in a healthcare crisis. The United States has the most costly healthcare system in the world, and its performance ranks poorly in comparison with other countries. In a study where the United States and six other industrialized countries (Australia, Canada, Germany, the Netherlands, New Zealand, and the United Kingdom) were compared, the United States ranked last or next-to-last in all five of the primary dimensions considered:

- ▲ Quality care
- ▲ Access
- ▲ Efficiency
- ▲ Equity
- ▲ Long, healthy, productive lives

These poor rankings by the United States have been consistent in the 2004, 2006, 2007, and 2010 studies. The United States pays dearly for its poor performance, with per capita expenditures far exceeding those in the other countries, as shown in Figure 1.2. These monetary costs do not take

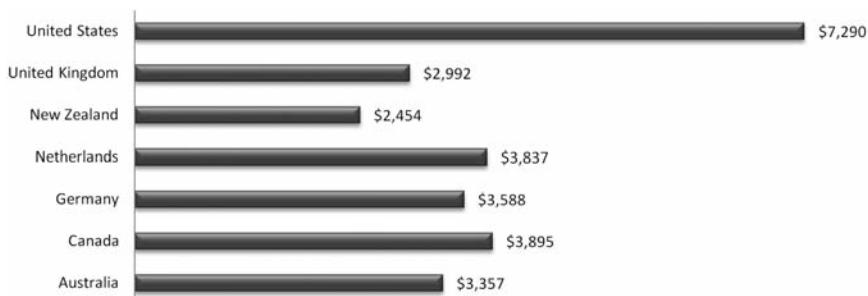


Figure 1.2 Comparison of costs.

into account the unquantifiable value of human life and patient satisfaction squandered by an underperforming healthcare system.

FOCUS-PDCA continues to be used by many hospitals as the primary performance-improvement approach they employ to meet the requirements of the Joint Commission for its three-year accreditations. The Joint Commission's mission is to improve the safety and quality of care provided to the public through the provision of healthcare accreditation and related services that support performance improvement in healthcare organizations. While the Joint Commission does not mandate which methodology is used, it has included Lean and Six Sigma as methodologies to improve its own internal processes. Joint Commission President Dr. Mark Chassin is a certified Lean Six Sigma practitioner.

Historically, FOCUS-PDCA has shown some degree of success in improving healthcare processes. Still, most of these successes have been reactive in nature and generally have not improved financial results. FOCUS-PDCA does not cultivate the breakthroughs for which an integrated approach to performance improvement is ideally suited. In essence, it is no longer adequate. For example, at Seattle Children's Hospital, staff would stockpile supplies. A nurse in the intensive-care unit (ICU) was concerned about having the tools she needed for her patients, so she began stashing them away. The hoarding of supplies in the ICU was the tipping point in creating supply-chain issues, which correspondingly resulted in even more shortages. This is the type of problem that is not normally addressed by FOCUS-PDCA. FOCUS-PDCA does not yield the breakthroughs that are being realized by an integrated approach to performance improvement.

No Quick Fix Today's healthcare processes involve extensively broken or misplaced steps with multiple handoffs, too many decision points, and a host of inadequately managed constraints. If they can be resolved with traditional FOCUS-PDCA, then all is well and good. Typically, however, all is not well. For so many of today's hospitals, the improvements are often short-lived and require endless rework. Deming saw this situation repeated over and over again across many industries. He cautioned against reaching for the quick fix or Band-Aid but rather encouraged a walk through the entire process. The primary fault lies not with the hospital staff. Quite frankly, no individual or group of people is at fault. No matter how hard

people try, until the underlying system is fixed, sustained improvement will be impossible.

In their article, “Moving Quality to the Top of the Hospital Agenda,” Byrnes and Fifer state that a quiet revolution is taking place that places quality improvement and overall performance improvement as the link between better outcomes (i.e., patient safety and delivery of care) and lower costs. This revolution includes the allocation of resources for quality programs and the discussion of quality at the operational meetings of executive leadership teams.

Despite this increased level of activity in performance improvement, improvements are not being sustained. There are at least three reasons for this:

- ▲ Time pressures create the desire for fast solutions.
- ▲ Attention spans are short and easily overcome by tomorrow’s priorities.
- ▲ Problems cut across multiple departments with no single owner of the process.

What is needed, then, is a methodology that is sufficient to achieve true sustainment. It must be robust, involve disciplined thinking, and focus heavily on data. It therefore must be strong enough to break through healthcare’s *hidden factory* and uncover the true cost of poor quality. This is illustrated in Figure 1.3.

What lies above the waterline in Figure 1.3 is where much of the day-to-day performance improvements are focused:

- ▲ Inventory difficulties
- ▲ Treatment errors
- ▲ Redundant tests
- ▲ Lost revenue

What lies *below* the waterline are all the issues that prevent processes from being resolved permanently, including such items as long cycle times, unused capacity, planning delays, and excessive employee turnover. Because they are below the water surface and thus hidden, they exhibit five characteristics that are difficult to resolve:

- ▲ Murky and therefore challenging to readily see
- ▲ Deep and complex, requiring advanced tools
- ▲ Tough to extract, entrenched as if stuck in the muck of a river bed



Figure 1.3 The hidden factory of healthcare.

- ▲ Rarely, if ever, come to the surface for easy analysis
- ▲ Loaded with multiple other problems and difficult to break apart into bite-sized chunks

FOCUS-PDCA has not shown that it is capable of breaking through the hidden factory. A reactive approach only works sporadically and results in limited long-term sustainability, which is far less than optimal. An integrated performance-improvement deployment has sufficient rigor to assess the issues below the water line accurately and raise the dangerous and most inefficient or costly processes to the surface, where they can be resolved. Without a structured and rigorous performance-improvement program that is supported by the executive leadership team, many broken healthcare processes remain that way. Occasionally, they rise to the surface for a fast fix, only to sink back down into the submergence of the hidden factory.

For example, trying to improve patient flow in the Emergency Department (ED) can be a daunting undertaking. There are multiple departments; a host of physicians, nurses, technicians, and clerks involved; and exhaustive resources required to manage multiple flows. In such a

complex system, quality and cost issues are sure to be present. When they do arise, time constraints tend to result in temporary fixes instead of more enduring solutions that make fundamental changes in root causes. Initially, the issue appears to be resolved: The flow of patients improves or the quality issue seems to be fixed. However, it is only a matter of time before the quick fix unravels, and the patient flow reverts back to its original state or the same quality issue resurfaces.

True sustainment requires a permanent fix—a fundamental change to the underlying process. That is the weakness of FOCUS-PDCA as it has evolved in healthcare today. While the basic theory does provide for the requisite rigor, it lacks a documented application process, as well as specific application of the tools necessary to drive both quality and financial improvements at both the process and system levels. Rather than being a failure of the intent behind PDCA, its failure lies in a lack of a *rigorous* process mandating the commitment of upper management to enforce the suggested procedures. Soft skills were not given the attention that they deserved to manage change successfully. There are so many stakeholders prevalent in healthcare processes, and prior improvement methods did not have the capability to achieve the buy-in necessary to initialize and sustain the change. Instead of being taken as a responsibility of management itself, performance improvement was relegated to a separate silo: the Quality Department.

The move to improve the quality and cost-effectiveness of healthcare is gaining momentum due to its skyrocketing costs. Healthcare reform is being debated widely regarding its efficacy in its current form. In his *ASQ Quality Progress* article, Edmund states that quality and patient safety advocates say that it will help to improve quality of care, delivery of care, and patient safety. For healthcare organizations to keep their doors open, leadership must realize that both quality and financial performance must improve.

Complementary (Core) Methodologies

As TQM was losing its popularity in the manufacturing industry, Lean, Six Sigma, and Constraints Management, which is based on the theory of constraints (TOC), emerged as three schools of thought for performance improvement during the mid-1980s. By relegating these proven methodol -

ogies to only being applicable in manufacturing, healthcare delayed embracing them and thus adopted them even more slowly than other service and transactional industries.

Performance improvement in healthcare started to catch up with the other industries beginning in the early 1990s. The first application of Constraints Management in healthcare on record was at the University of Pretoria Medical School in 1991 in South Africa. Mount Carmel Health in Columbus, Ohio, was one of the first healthcare organizations to implement Six Sigma throughout its entire organization. Its Six Sigma deployment started in July 2000. Vickie Kamataris, one of this book's coauthors, applied Six Sigma in healthcare within General Electric for the first time in 1997. Her story appears in the Preface. In 2002, executives from Virginia Mason Medical Center visited Japan and began their journey to implementing Lean principles. Their success is encouraging other hospitals to implement Lean, especially in the United States and the United Kingdom.

Until the late 1990s, Lean, Six Sigma, and Constraints Management methodologies were like three different religions—coexisting but independent of each other. As late business process management pioneer and father of the swim-lane diagram, Dr. Geary Rummler, said, there are “turf wars between competing process-improvement philosophies, methodologies and technologies.” Then Lean and Six Sigma were integrated and became the leading approach in the early 2000s, whereas integration of Lean and Constraints Management also were applied in manufacturing and defense. Constraints Management is arguably the least known among these three methodologies, especially in the U.S. healthcare industry. An informal survey conducted by NOVACES shows that very few U.S. hospital executives have even heard of Constraints Management.

On the other hand, Constraints Management applications have been resulting in major improvements in the hospitals of the United Kingdom, New Zealand, South Africa, Singapore, and Israel and is remarkably popular in Dutch healthcare. If a hospital in the Netherlands has a process-improvement methodology applied, then one-third chooses Constraints Management. Constraints Management is significantly more popular in Dutch hospitals than in Dutch manufacturing. Breakthrough potential is even greater when Constraints Management is carefully integrated with Lean and Six Sigma.

Three Windows: Constraints Management, Lean, and Six Sigma

Three methodologies—Six Sigma, Lean, and Constraints Management—have risen to the forefront and bridged the gap between manufacturing and service/transactional industries—especially the ever-expanding healthcare environment. These three approaches are very complementary. Lean and Six Sigma are primarily process-improvement approaches. On the other hand, Constraints Management takes a system perspective at a higher level by looking at the interdependencies among processes and their dynamics for system improvement.

When separated, Lean tools cannot bring a process under statistical control, and Six Sigma cannot improve cycle time dramatically, as Michael George states in his book, *Lean Six Sigma*. Lean promotes elimination of waste everywhere without necessarily a focus on the overall system, and Six Sigma has an inherent risk of local optimization. Constraints Management highlights where to *focus* improvement efforts for system-level impact by offering a dynamic holistic view where bottlenecks and the weakest links of healthcare organizations become not only visible but also manageable for maximum value. Lean and Six Sigma tools allow teams to produce solutions to better manage constraints. Constraints Management is excellent in providing a step-by-step approach to direct improvement efforts, but it does not tell you how to get the most mileage out of the bottleneck. Once the direction is set, Lean and Six Sigma tools help an organization reach its destination.

The integrated approach is analogous to looking through three windows into a system: Lean, Six Sigma, and Constraints Management windows. The Constraints Management window is like looking at the forest from a hot air balloon and selecting the best tree from which to pick fruit. The Lean window shows the simplest way to pick the low-hanging fruits as well as the fruit on the floor with very little effort. And the Six Sigma window shows how to consistently pick the bulk of the sweeter fruits, without bruising them, at higher, difficult-to-reach branches of the tree.

Essential principles of these three methodologies are introduced in this chapter. Since Constraints Management applications in healthcare are in their infancy, a more detailed description is provided in Chapter 2.

A Primer on Six Sigma and Its Applications in Healthcare

Traditionally, improvement of processes through a structured methodology largely has been the domain of industrial or quality engineers. Over the past two decades, a transition has taken place. Numerous methodologies have been implemented to operationalize performance improvement. Business Process Reengineering focused a great deal of emphasis on the use of technology in making processes more efficient. One set of philosophies focused on empowerment and worker involvement. Another focused on the importance of the use of tools and methods in conjunction with understanding the process.

W. Edwards Deming, along with others, began emphasizing the need to understand variation through the use of statistical tools such as Pareto and control charts. This latter concept, known as *Total Quality Management* (TQM), also shifted responsibility for quality improvement to those directly involved in the process. It was not until Six Sigma came along that all these concepts were combined into a single methodology. While Deming focused on the cultural transformation of businesses, other management pioneers, such as Joseph Juran and Philip Crosby, addressed the management and cost of quality, respectively. From Crosby's perspective, expenditures associated with improving quality should be offset by the resulting savings in warranties, scrap, rework, and other costs of poor quality.

Six Sigma has emerged as the primary vehicle for improving both manufacturing and service or transactional business processes. Six Sigma has been defined in many ways. The following definition, taken from *The Six Sigma Handbook*, by Thomas Pyzdek, is perhaps the most inclusive:

Six Sigma is a rigorous and systematic methodology that utilizes information (management by facts) and statistical analysis to measure and improve a company's operational performance, practices and systems by identifying and preventing "defects" in manufacturing and service-related processes in order to anticipate and exceed expectations of all stakeholders to accomplish effectiveness.

Six Sigma applies a five-step method called Define-Measure-Analyze-Improve-Control (DMAIC). Each letter represents one of the steps in the methodology, as shown in Figure 1.4.

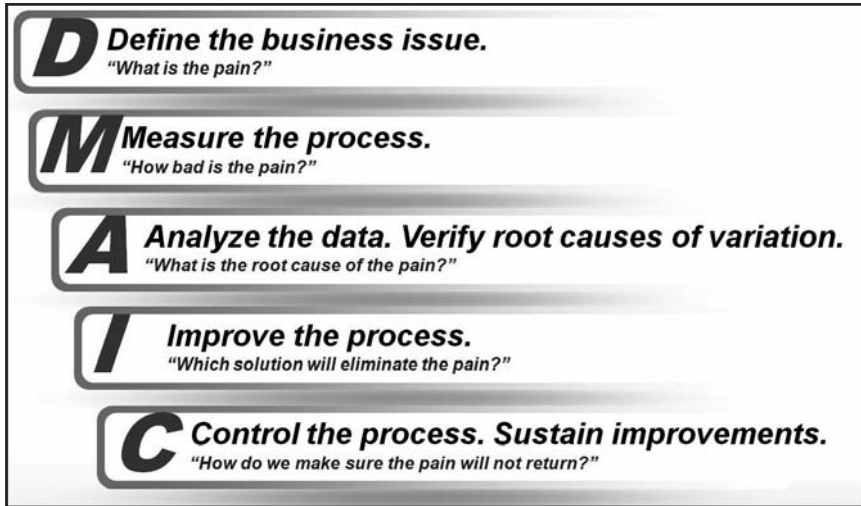


Figure 1.4 The DMAIC methodology.

The methodology includes the application of a full range of statistical tools yet recommends that it be implemented by teaching these statistical methods to workers throughout an organization—not limiting it to statisticians or industrial engineers. While the DMAIC methodology emphasizes the use of statistical tools, the strength is in the methodology itself. DMAIC is discussed further in Chapter 6.

Certain industries have been slower to accept certain quality tools and methods from manufacturing despite more than 50 years of successful application. It is critical to note that the finding is about acceptance, not applicability; for example, while control charts have been used extensively in manufacturing since the 1920s, they are slow to be accepted in direct patient care.

In healthcare, a Six Sigma project saves \$500,000 annually, according to an article by David Frabatto in *Managed Healthcare*. However, in our experience, such claims cannot be taken for granted, but assuming that the project selection process is attuned, \$500,000 or even more is achievable realistically. For example, a project within our deployment portfolio on a credentialing process for contracted healthcare workers resulted in validated savings of \$789,000 per year and a replication potential to save an additional \$114 million dollars. When a senior Six Sigma practitioner, called a Black

Belt, normally leads four to eight projects per year, annual savings from a single Six Sigma Black Belt could exceed \$3 million dollars. As indicated by the positive financial impact that typically far surpasses its associated costs, quality improvement can be a major factor in a business's success.

It is very interesting that the same article in which Frabatto cited the \$3 billion revenue gap also stated that New York hospitals would save \$3.4 billion annually by reducing length of stay to national standards. Length of stay is just one performance gap where the root cause is unknown and where applying the right tool to the right problem at the right time makes a lot of sense.

The power of Six Sigma is its ability to identify root causes of complex problems and reduce variation, both of which are central to the improvement of processes. Examples of Six Sigma applications in healthcare include reduction of infection rates, patient falls, and missed appointments, as well as enhanced medication reconciliations and coding.

A Primer on Lean and Its Applications in Healthcare

Prior to the 1950s, one could argue that the United States *owned* the automobile market worldwide. Then, in 1950, a Japanese engineer named Eiji Toyoda spent three months at Ford's Rouge Plant in Detroit. This was the seminal point in the evolution of Lean. Between 1937 and 1950, Toyota had produced 2,685 automobiles total, compared with the almost 7,000 produced daily at the Rouge Plant.

In an effort to compete in the marketplace, Toyoda—along with others—adapted what he saw at Ford into the beginning of what came to be called the *Toyota Production System*. In 1990, Womack, Jones, and Roos coined the phrase *Lean Manufacturing*, and nothing has been the same ever since.

According to the Lean Enterprise Institute, Lean as a concept includes five basic principles:

- ▲ Specify value from the end customer's perspective.
- ▲ Identify all the steps in the value stream for each service, eliminating non-value-adding steps.
- ▲ Make the value-adding steps flow without interruption to the customer.
- ▲ Implement a pull system based on customer demand.
- ▲ As value is specified, value streams are identified, non-value-added steps are removed, and flow and pull are introduced, go back to back to step 1 and continue it until a state of perfection is reached with no waste.

In alignment with these principles, all processes should—*must*—add value to the customer, include only value-adding steps, and flow continuously from customer order to delivery. This *Lean archetype*, along with recognition that perfection is a journey, is equally applicable to manufacturing, services, and healthcare.

Efforts to apply Lean are focused on addressing specific issues or wastes. Seven *deadly wastes* have been identified. While these were developed originally for applicability within manufacturing, they are equally relevant in healthcare. An explanation of wastes as they relate to healthcare appears in Figure 1.5.

- ▲ **Transport.** Any time people, materials, or information must be moved, it is defined as waste. Moving patients from room to room is an example of waste. While in many cases necessary, this transportation nonetheless is viewed as waste. Use of a spaghetti diagram may help to minimize this type of waste.
- ▲ **Inventory.** While it is necessary to maintain inventories to ensure availability, anything short of just-in-time (JIT) availability is categorized as waste. Tools such as kanban can mitigate this kind of waste.

Wastes	Examples
Transport	1. Moving patients from room to room 2. Charts not centrally located 3. Poor layouts, lab located a long distance from the ED
Inventory	1. Overstocked medications on units/floors 2. Multiple locations for consumable goods 3. Multiple suppliers of surgical supplies 4. Any work in progress
Motion	1. Heavy items on top shelf, light items on bottom 2. Excessive bending, reaching, walking to complete a process step
Waiting	1. Specimens waiting analysis 2. Patients waiting to make appointments 3. Patients waiting to be seen for an appointment 4. Time lag with physician orders 5. Patients on hold for admission
Over-Production	1. Duplicate charting 2. Copies of reports sent automatically 3. Multiple forms with same information
Over-Processing	1. Clarifying orders 2. Increased size of patient records 3. Multiple blood specimen collections
Defects Requiring Rework or Scrap	1. Label on the wrong tube 2. Over/under coding 3. Decrease in revenue based on insurance claims 4. Decrease in patient satisfaction scores

Figure 1.5 The seven deadly wastes of Lean.

- ▲ **Motion.** A nurse's station with a desktop computer at one end and a printer at the other that requires nurses to move excessively to pick up printouts is an example of waste. Good ergonomic practices and more efficient workspace layouts can moderate this waste.
- ▲ **Waiting.** This waste is endemic to healthcare. We even call our primary customers patients—is this because it is an expectation? Elimination of non-value-adding activities can diminish this waste.
- ▲ **Overproduction.** Running too many tests and printing too many copies of paperwork are examples of overproduction. Reviewing standard lab panels or pursuing paperless processes can mitigate this type of waste.
- ▲ **Overprocessing.** Requiring excess approvals and running the same test twice are examples of overprocessing. The elimination of non-value-adding activities can lessen this sort of waste dramatically.
- ▲ **Defects.** When a product or service does not meet specification or customer expectations, it is a defect. Defects often result in rework, and the associated costs frequently go unaccounted for.

A *process-level value-stream analysis* (PVSA) and *rapid improvement workshop* (RIW) are often applied toward eliminating or reducing these wastes. These aspects will be addressed in much more detail in Chapter 6.

The power of Lean is its ability to eliminate waste and improve flow, which is central to the simplification of processes and reduction of delays and handoffs. Examples of Lean applications include reduction of non-value-added steps in the delivery of care, mistake-proofing hand sanitation, and standardizing referral management.

A Primer on Constraints Management

Constraints Management is a management philosophy encompassing an integrated suite of techniques used in operations and supply-chain management, project management, conflict resolution, and strategic planning. Dr. Eliyahu Goldratt began its development in 1979 with the production scheduling software OPT, and has led its evolution into three interrelated areas—logistics/production, performance measurement, and problem-solving/thinking tools.

The basic concepts of Constraints Management were introduced to the public as the theory of constraints in Goldratt's landmark book, *The Goal*. It was written as a novel, facilitating accessibility of the concepts to a wide

audience. The text has been translated into over 21 languages, sold more than 5 million copies, and is still used to teach Constraints Management in college classrooms across the globe.

In *The Goal*, Goldratt details a systematic approach to managing complex organizations by identifying and controlling key leverage points within a system or process. By managing these key control points, healthcare organizations can focus on areas that drive system-level improvement instead of trying to manage every element of a process, which can lead to local optimization without systemic impact.

A *constraint* is anything that limits the system from achieving higher performance relative to its goal. In healthcare, a constraint is anything that impedes the ability or means to provide or deliver care. H. William Dettmer, author of numerous books on Constraints Management, defines seven basic constraint types:

- ▲ Market
- ▲ Resource
- ▲ Material
- ▲ Supplier/vendor
- ▲ Financial
- ▲ Knowledge/competence
- ▲ Policy

He also adds that a policy is most likely behind a constraint from any of the first six categories. On the other hand, Dr. Boaz Ronen, a business administration professor at Tel Aviv University and coauthor of the book, *Focused Operations Management for Health Services Organizations*, defines only four types of constraints in a managerial system:

- ▲ Resource
- ▲ Market
- ▲ Policy
- ▲ Dummy

The *Theory of Constraints International Certification Organization (TOCICO) Dictionary* calls policy constraint a common misnomer because “Bad policies are not the constraint; rather they hinder effective constraint management by inhibiting the ability to fully exploit and/or subordinate to the constraint.” Regardless of how constraints are classified, the Constraints

Management body of knowledge provides tools to identify and manage all types of constraints.

Because of its simple yet robust methodology, Constraints Management has been applied to manufacturing, project management, retailing, supply-chain management, and process improvement with breakthrough results. A partial list of companies employing Constraints Management includes ABB, Delta Airlines, 3M, Amazon, Boeing, Ford Motor Company, Intel, and Microsoft; however, many Constraints Management adopters state an unwillingness to disclose improvements for competitive reasons. Not-for-profit and governmental organizations such as the British National Health Service, the United Nations, NASA, the U.S. Department of Defense, and the Israeli Air Force also have employed Constraints Management solutions successfully. Published studies from practitioners indicate that Constraints Management systems produce substantial benefits in terms of greater output while reducing inventory, manufacturing lead time, and the standard deviation of cycle time. Healthcare systems worldwide are learning a great deal about Constraints Management from these organizations.

Constraints Management is a *systems approach* that recognizes that every system has a goal and a set of necessary conditions that must be satisfied to achieve that goal. As such, Constraints Management begins by identifying the critical success factors necessary to realize the goal and aligns the system to attain greater levels of performance while minimizing waste. Goals may range from reaching superior levels of profitability now and in the future for a for-profit organization to increased coverage or availability of provided services for a not-for-profit company or government agency.

Because it is grounded in systems thinking, Constraints Management looks at materials, information, and money flows and encompasses techniques useful for production and logistics (e.g., drum-buffer-rope, critical chain project management, and buffer management), performance measurement (e.g., throughput accounting), and problem solving (e.g., thinking processes). It therefore breaks through the “silo mentality” of many organizations, focusing all efforts on satisfying end-user requirements. Dr. Kevin Watson of Iowa State University sees Constraints Management as focused, robust, scalable, and generalizable, as described in the next few paragraphs.

Constraints Management is *focused*, recognizing that the system’s ability to attain its goal is inhibited by a limited set of variables or constraints.

Constraints Management focuses attention and concentrates resources at the point in the system where they may be leveraged to achieve the highest level of goal attainment. Constraints Management allows the system to achieve optimal output and increase flexibility and responsiveness, all while minimizing waste. This synergistic effect results from subordinating the system to the constraint and creating protective capacity at nonconstrained resources, thereby better enabling the system to deal with the consequences of variability.

Constraints Management tools are *robust*. Systems managed under Constraints Management strategically buffer against variability, do not impose rigid material-handling rules, and schedule only strategic control points in the system. Therefore, Constraints Management systems are better able to mitigate the effects of uncertainty than similar JIT systems. This makes Constraints Management adaptable for highly variable manufacturing and for the purpose of managing supply chains.

Constraints Management techniques are *scalable* and *generalizable* to a wide set of operations and supply-chain environments. Techniques that are useful at the process level are applicable at higher levels of aggregation. Constraints Management tools are also generalizable to applications far beyond production and logistics as they were presented originally in *The Goal*. The thinking processes used in the resolution of unstructured problems are applicable to decision making in such widely varying environments as conflict resolution, quality control, continuous improvement, contract negotiation, policy reengineering, and strategy development. Once managers understand the basic concepts, they are able to apply that knowledge with little additional training to a wide range of applications, for example, manufacturing and supply-chain environments—from control of a manufacturing cell, to project management, to distribution and logistics management.

Constraints Management Tools System improvements under Constraints Management seek to identify (1) what to change, (2) what to change to, and (3) how to cause the change. This follows a *process of ongoing improvement* (POOGI) comprised of two prerequisites and five steps that underlie all Constraints Management production techniques. The prerequisites for Constraints Management process improvement are (1) define the boundaries of the system and its goal, and (2) determine a means to measure goal attainment. While these steps appear obvious, failure to

explicitly identify the scope and purpose of the system and measure how the system performs in achieving that goal can result in dysfunctional behavior. Having satisfied the prerequisites, system improvement proceeds according to the *five focusing steps* sequence:

1. *Identify* the system constraint(s). What limits the performance of the system now? What is the weakest link in the system?
2. Decide how to *exploit* the system's constraint(s). How can the most performance be achieved from a constrained step in the process without additional investment? Here, *exploit* means "use, develop, make use of, take advantage of, and make the most of."
3. *Subordinate/synchronize* everything else in the system to the above decision. Set up and implement rules to maximize the capacity of the system based on the speed of the system's constraint. In this step, all parts of the system that are *not* constraints are required to do whatever they can to support the exploitation plan. Additionally, all nonconstraints must not do anything that would interfere with the exploitation plan for the constraint. And most important, all nonconstraints (most of the system) must recognize that their own efficiency is not as important as supporting the system constraint, which requires measurement changes.
4. *Elevate* the system constraint. To physically increase the capacity of the system through the acquisition of or investment in more resources. Always remember to predict where the constraint will be after elevation and its resulting impact on global performance. The location of any new constraint definitely will affect an organization's elevate strategy.
5. *Go back* to step 1. This will ensure that improvement is ongoing and never ceases. It also helps to avoid inertia by keeping at bay the relentless tendency to accept established precedent. Even the most transformational improvements, once established, become the status quo.

Originally applied to manufacturing organizations, the concepts of Constraints Management have branched out successfully to many business environments, including service organizations, project-based companies, not-for-profits, and most recently, healthcare. By introducing Constraints Management, hospitals can gain significant insight into which areas to focus their performance-improvement efforts. In addition, there are many tools in the Constraints Management body of knowledge that can be used to

improve flow, lead time, profits, return on investment, and project lead time, as well as to reduce inventory and operating expenses.

Figure 1.6 shows a process flow for inpatient procedures at a local community hospital. By mapping out the process flow and going through step one of the five focusing steps, the system constraint clearly can be identified to be housekeeping as it prepares the bed for the next patient. Although other steps in the process have significantly more capacity than nine patients per day, the real capacity of this process is determined by the capacity of the constraint, which is only nine patients per day. In fact, allowing any step in this process other than housekeeping to run at full capacity will result in suboptimization and patient dissatisfaction as patients wait endlessly for the housekeeping staff to prepare the next bed.

In steps two and three of the five focusing steps, our integrated approach deploys Lean and Six Sigma tools to increase the capacity of the constraint through process improvement by revealing the hidden capacity of doctors, nurses, beds, and operating rooms and by making sure that other steps in the process do not go faster than the constraint. If the demand on the process was still greater than the capacity of the constraint, then proceeding to step four, elevate, would be considered. This would entail adding additional resources—in this case, hiring more housekeepers.

Although a simplistic example, ask yourself how many times you have attempted to improve a step in a process that was more than likely a nonbottleneck step. Did the capacity of the entire process improve? This is the heart of suboptimization, and it is supported by many metrics that are used to measure processes that are centered on improving the output of each and every step in the process. Measurements such as capacity utilization and cost per process step encourage local optimization at the expense of the whole system. Constraints Management challenges these types of metrics and introduces a new set of metrics designed to ensure that

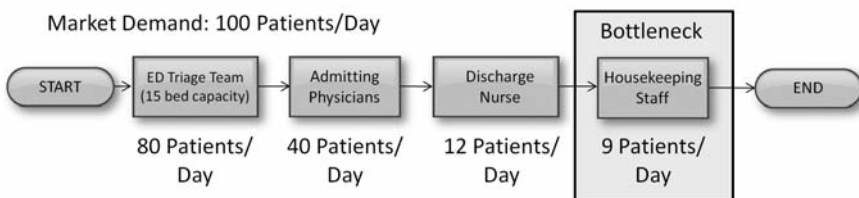


Figure 1.6 Process flow for a sample hospital.

holistic decisions are made. These use a technique called *throughput decision support*, which is described in more detail in Chapter 2.

The goal of steps one, two, and three is to get the most out of existing resources without spending additional money. Frequently these steps alone result in process improvement and the revelation of enough increased free capacity that incurring additional expense isn't necessary, and step four can be skipped entirely.

For example, suppose that a hospital's accounts receivable process is always delayed. By applying the five focusing steps, the constraint in that process is discovered to be the Coding Department. With the help of a *current reality tree*, root causes of payment delays are identified as errors within the Coding Department. By applying Lean and Six Sigma tools, three solutions arise, which include

- ▲ Establishing operational definitions for codes and procedures
- ▲ Developing coding lists with insurance companies
- ▲ Refining processes for the proper coding of procedures

As a result, coding errors become minimized, and the Coding Department is no longer the constraint in the accounts receivable process. The normal progression of the five focusing steps to step four is no longer necessary and can be bypassed by proceeding to step five and verifying that the hospital has sufficient capacity to satisfy the output of its accounts receivable process required by customers.

The power of Constraints Management is its ability to focus improvement efforts on the system constraints, preventing suboptimization and maximizing throughput. The five focusing steps, as well as much more about Constraints Management, will be examined more deeply in Chapter 2.

Conclusion

Healthcare faces shrinking budgets and decreasing reimbursements at an unprecedented scale. An aging population with ever-increasing demand for care—in both quality and quantity—will further exacerbate these issues. This is especially true in the United States, where more than 32 million people are expected to become insured because of healthcare reform. Outcomes need to be improved. Capacity needs to be increased. Costs need to be contained. Cost cutting, denying treatment, and meeting standards

rather than pursuing excellence cannot possibly address these colossal challenges.

Transforming healthcare will not be accomplished overnight. The problems in healthcare have evolved over many years. While solutions may not be apparent today, what should be apparent is that the same approach that has been applied in the past is not the best way of moving forward. What also should be evident is that the more tools one has and the better the tools are applied, the better are the outcomes. You can use a screwdriver to open a can, but it will be difficult and messy. Integrated methodologies result in breakthrough solutions, which can be realized only through synergy rather than the application of a single methodology—out of the box and through three windows. The integrated approach allows it to be about the patient *and* the money.

Imbued throughout the integrated approach is an ability to get past the noise of competing objectives in order to concentrate on where it matters most. The philosophy, tools, and applications of Constraints Management exemplify this concept and can be found next in Chapter 2.

