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Quality: The
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p. 41

Blue Skies Ahead

JetBlue's new approach
makes passengers the
priority p. 18

Plus:
**VOC Strengthens
Partnerships** p. 24

**Systems Thinking
Can Save Healthcare**
p. 32



Contents

FEATURES

- 18** CUSTOMER SATISFACTION
Safe Landing
In an effort to improve its service to customers, JetBlue implemented a software program to improve how it analyzes and acts on passenger feedback.
by Bryan Jeppsen
- 24** VOICE OF THE CUSTOMER
High Priority
Improve relationships with your clients and partners with voice of the customer analysis and the Kano model.
by Marc Hamilton and Bob Caruso
- 32** HEALTHCARE
Get the Whole Picture
By applying systems thinking, two healthcare programs identified where process breakdowns occurred and were able to focus on improving operations, saving money and treating patients better.
by Peter J. Sherman
- 41** QUALITY MANAGEMENT
Quality 3.0
Two industry leaders discuss their views on quality's future and how the profession must adapt.
by Greg Kukor

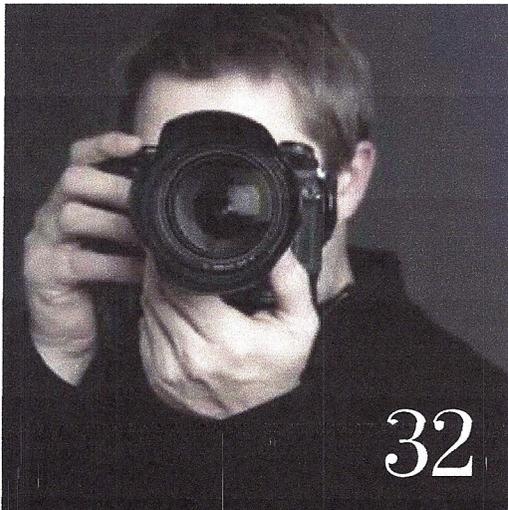
18



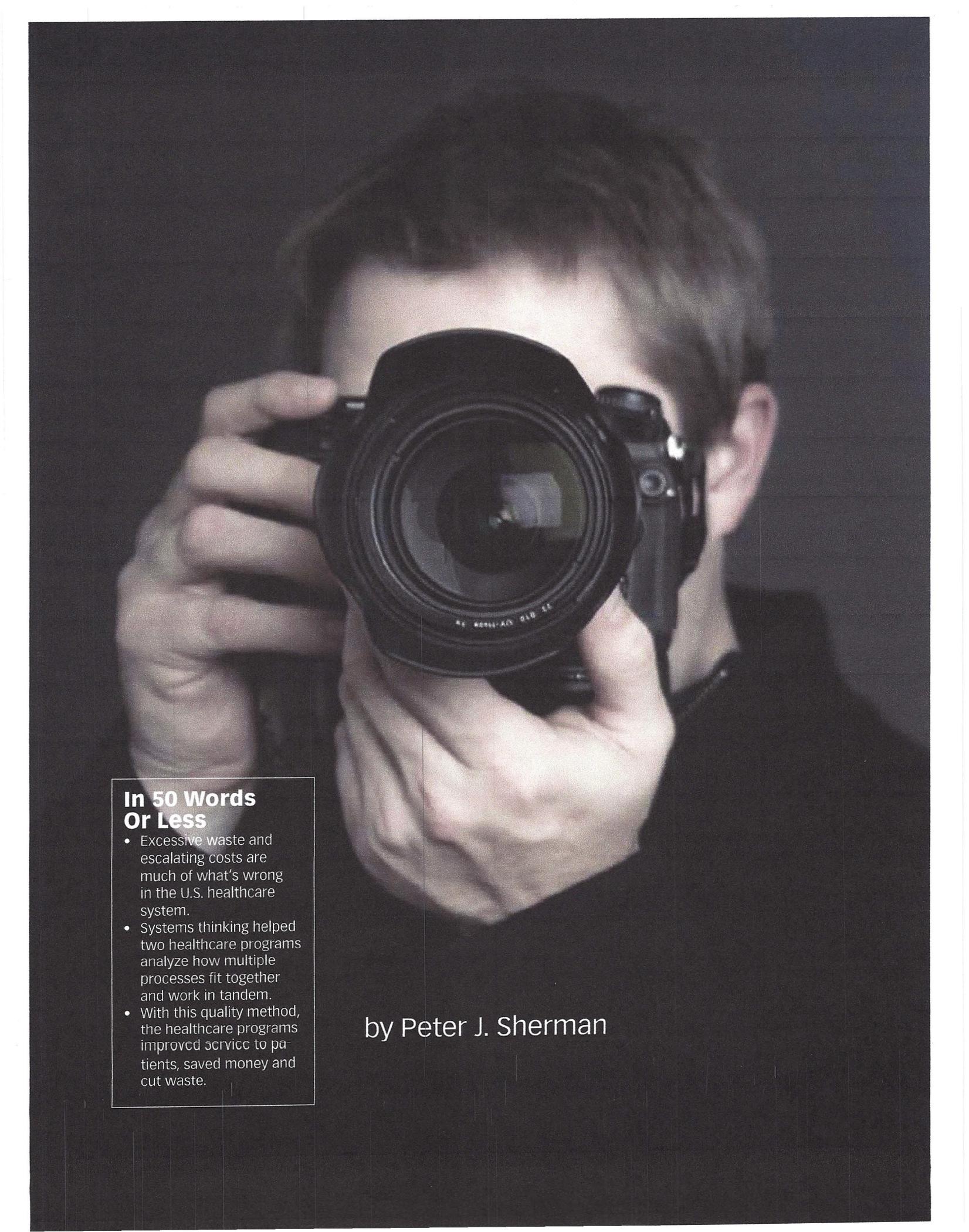
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- 48** TEAMS
In It for the Long Haul
A voice of the customer project at HD Supply enhanced customer loyalty—and saved the company \$3 million.
by Mark Edmund, associate editor



**In 50 Words
Or Less**

- Excessive waste and escalating costs are much of what's wrong in the U.S. healthcare system.
- Systems thinking helped two healthcare programs analyze how multiple processes fit together and work in tandem.
- With this quality method, the healthcare programs improved service to patients, saved money and cut waste.

by Peter J. Sherman

Get the Whole Picture

Systems thinking can help hospitals **save money, lives**

MOST AMERICANS HAVE experienced the country's healthcare system directly. For the last three years, I've acted as my father's primary caregiver. In this role, I've seen firsthand the shortcomings of the U.S. healthcare system in many ways, including patient safety and Medicare drug coverage issues.

But you don't need to have an aging or ill family member to know about today's problems with the healthcare system. We're all tuned in to the excessive waste and escalating costs, as well as the unfortunate accidents and deaths that have occurred in hospitals.

There are success stories, however, that have gone mostly unnoticed. These stories reflect the successful adaptation of a quality method called systems thinking to healthcare, specifically to hospitals.

In 2006, a PBS documentary titled “Good News: How Hospitals Heal Themselves” reported on the depth of the patient safety problem in America and how SSM Health Care in St. Louis and the Pittsburgh Regional Healthcare Initiative (PRHI) embraced systems thinking to save lives and significantly reduce errors and infections, while dramatically lowering costs in a sustainable way (see sidebar, “About SSM Health Care and PRHI,” p. 24).¹

Within the health systems discussed in the documentary, doctors, nurses and administrators learned to apply systems thinking to day-to-day activities. Instead of concentrating on individual jobs, which is typical in most organizations, the health systems began examining how all the people and technological devices in the hospitals worked together on behalf of the patient. When these people learned systems thinking, they applied it to help heal patients, reduce failures and mistakes, and eliminate waste at every level in their organizations.

The state of U.S. healthcare

Before describing systems thinking and how these hospital systems benefited from embracing it, here are a few key facts about U.S. healthcare:

- America spends \$2.5 trillion a year on healthcare, or roughly \$8,000 per person, the most of any country. Healthcare represents 17.6% of the U.S. economy and grows 8 to 10% annually.²
- An estimated 32.7 million surgical procedures were performed in 2006.³ At least 2 million hospital patients got dangerous infections and diseases during their hospital stays. Surgical errors, including improper surgical instruments or techniques, wrong-site surgery, improper anesthesia and improper monitoring contribute to an estimated 98,000 deaths each year at U.S. hospitals.⁴
- Of the more than 3 billion prescriptions filled each year, as many as 5% (or about 150 million) are incorrectly filled. As many as 7,000 deaths in the United States each year can be attributed to incorrect prescriptions.⁵

The magnitude of waste in the healthcare system is staggering as well. Waste comes in the form of duplication, rework, lack of consistency, lack of supplies, overuse of materials (for example, antibiotics for children with ear infections) and underused procedures (for example, mammograms).

The price tag that goes along with the waste and mismanagement is nothing to be taken lightly. Online Table 1 at www.qualityprogress.com highlights a recent study by the New England Healthcare Institute that identified four major categories of waste with high potential for significant cost savings.

Paul O’Neill, former U.S. Treasury Secretary and former CEO of PRHI, and Sister Mary Jean Ryan, current president and CEO of SSM Health Care, contend America could be saving \$800 billion to \$1 trillion a year in healthcare costs if providers could adopt systems thinking and other improvement methods.⁶

“It is possible for our society to reduce the cost of health and medical care by 50% and simultaneously improve the outcomes for individual human beings,” O’Neill said.

Ryan said more than just the dollars and cents are being wasted: “There is 40% waste in the [healthcare] system, and it is wasted time, it is wasted energy. It wastes people’s creativity, their innovation. It wastes everything about the human person. That could possibly be the worst waste. People get so dragged down or pulled into this. It’s very demoralizing.”⁷

Systems thinking

Systems thinking is built on a foundation in system dynamics developed in 1956 by Massachusetts Institute of Technology professor Jay Forrester. The term may sound complicated and technical, but you don’t need a college degree to understand it.

When applied to a complex organization such as a hospital, systems thinking means focusing on the organization as a whole—and transforming it as a whole—rather than merely paying attention to its individual parts or departments. By focusing on the entire system, you can identify solutions that address as many problems as possible. The positive effect of those solutions leverages improvements throughout the system.⁸

Systems thinking is the opposite of linear reasoning or single-event thinking. Traditional analysis focuses on separating the individual pieces of what is being studied. In fact, the word “analysis” comes from the root meaning to “break into constituent parts.”⁹

Not surprisingly, the primary emphasis in systems thinking is the customer or, in a hospital setting, the patient. In the case of SSM Health Care and hospitals involved in PRHI, the shared aim is patient care and safety.

Systems thinking is not about copying other people's successes. It requires changing the process, testing the process, reinventing it and readapting it to meet the particular requirements of each new situation. The foundation of systems thinking is continuous improvement and cooperation, not competition. Its outlook is long term rather than short term.

Experts estimate that 90% of all defects in the delivery of a product or service cannot be traced to an individual, but to a system.

From my own experience in quality and process improvement, I have found the majority of issues that organizations encounter fall into three categories, as shown in Figure 1:

1. **People**—inexperienced or poorly trained personnel, wrong job fit.
2. **Technology**—outdated or poorly maintained equipment and software, inadequate IT infrastructure.
3. **Process**—inadequate methods and procedures, lack of clarity in roles and responsibilities.

While most hospitals have highly skilled and trained staffs and adequate medical technology, the shortfall generally occurs in processes. Systems thinking avoids blaming individuals for failures or looking to technology as a panacea. It focuses on the process and, in doing so, encourages employees to raise issues or problems more freely.

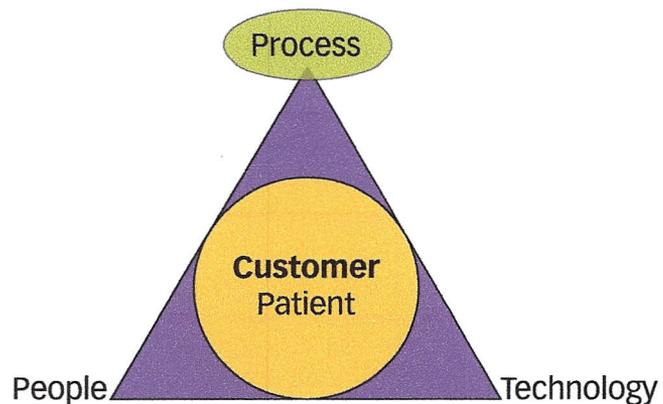
"People felt better if they had one person to blame," Ryan said. "And they believed that if you could get rid of that person in some way, shape or form, then the hospital would be better off. What happens, though, is that people failed to recognize that if the problem was a process breakdown, it doesn't matter who's going to make the same mistake the next time. The process will cause the same thing to happen."¹⁰

Ed Yonick, a registered nurse and team coordinator for PRHI, described how this mind-set no longer exists at his hospital: "It used to be a very big problem within the medical community to report errors because you were going to be punished. At systems involved in PRHI, it's just the exact opposite. You are encouraged to report, and there are no punitive repercussions from that at all. The whole goal is to get to the root of these issues so we can do away with them."¹¹

Linked together

Think of hospitals and healthcare providers as systems made up of key subsystems (for example, admis-

Key issues trilogy / FIGURE 1



sions, emergency department, intensive care unit and surgery) that are inextricably linked together. These subsystems are comprised of processes involving individuals across multiple departments who interact with one another, as shown in Figure 2 (p. 36).

For example, the completion of a standard test such as an echocardiogram (EKG) involves the doctor who writes the order, the nurse who schedules the procedure with the lab technician, the transport worker who moves the patient to the department, the technician who performs the work, the radiologist who reads and interprets the results, the original doctor who makes recommendations based on results and, finally, the billing department, which processes the appropriate charge.

A systems thinker sees an organization, such as a hospital, as the product of its interactions, not merely the sum of its parts. In the framework of systems thinking—with all the players engaged—it becomes easier to identify issues, determine root causes and solve such issues in a systemic manner to deliver consistent, reliable and predictable healthcare.

Process map power

The process map is the key tool used in systems thinking because it shows the links and interactions among different groups within an organization. A process map describes the flow of activity on paper from start to finish in the form of boxes, labels and arrows. Specifically, it identifies key activities, owners, decision points, tools or applications, timing and frequency of

Systems thinking is a simple, compelling quality method that **complements process improvement techniques.**

activities. Process maps are useful because they display bottlenecks, gaps, inconsistencies or redundancies across an entire process.

Online Figure 1 is a real-life example of a process map used in systems thinking. In September 2007, my father was admitted to our local hospital with extremely low blood pressure and pulse rate. As the primary caregiver, I stayed with him throughout the entire four days of his hospital stay. As a certified Lean Six Sigma Master Black Belt and certified quality engineer, I brought a fresh set of eyes to the hospital setting and a systems thinking approach to quality and process improvement.

During his stay, I observed several process breakdowns involving the administration of medications and laboratory diagnostic tests. Rather than complain to the hospital through the usual customer feedback mechanisms, I decided to do something different and more constructive. I used my skills as a quality professional to document my findings in the form of the large process flow map. I requested a meeting with the hospital's CEO to review my findings and the process map.

Within one week, I received a call from the CEO's administrative assistant to schedule a meeting with the

hospital's key staff, including the senior vice president of medical affairs, chief quality officer and chief nursing officer. My intent was not to point blame or seek retribution, but to start a healthy and constructive dialogue with our community hospital via a process map for all to see.

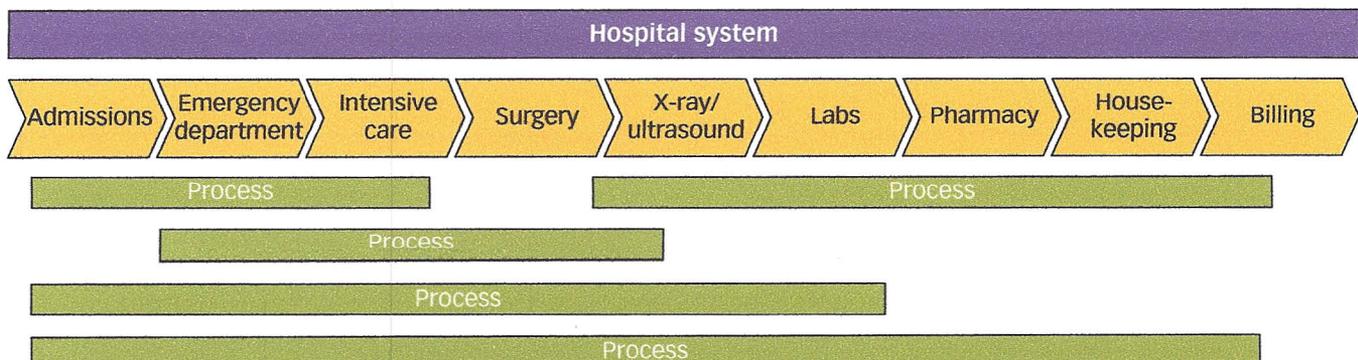
The process map was our means to focus on the facts and issues. The staff's reaction was quite enlightening. A few minutes into the session, all agreed the majority of problems occurred due to breakdowns in processes (known as protocols in hospital terminology) and a lack of communication during critical patient hand-offs.

Through the process map, the key stakeholders could see the hospital organization as a system and better understand how its subsystems and processes interacted.

The hospital officials agreed to follow up on the issues and report progress to me. As of writing this article, I have received regular communications and correspondence from the hospital documenting the changes made.

It is important to reemphasize that the hospital breakdowns were related to process and occurred during patient hand-offs to and from different

Hospital subsystems' processes schematic / FIGURE 2



ABOUT SSM HEALTH CARE AND PRHI

SSM Health Care is one of the largest Catholic healthcare systems in the United States. It owns, operates and manages 23 facilities, including 20 acute care hospitals, and employs nearly 23,000 people.

During the 1980s, SSM Health Care developed a mission statement and announced it was committed to continually enhancing quality. For all its efforts and best intentions, however, SSM Health Care fell short.

Then, in 1989, SSM Health Care discovered the link between quality theories used in manufacturing and how quality methods might be applied to healthcare.

In making that connection, SSM Health Care began its process of self-healing. In 2002, its efforts culminated in earning a Malcolm Baldrige National Quality Award.

The Pittsburgh Regional Healthcare Initiative (PRHI) is a collaborative effort, including hundreds of clinicians, 40 hospitals, four major health insurers, dozens of major and small-business healthcare purchasers, corporate and civic leaders, and Pennsylvania's attorney general.

The central issue PRHI wants to address is the burdening cost of healthcare. Similar to SSM Health Care, PRHI uses systems thinking principles and continual quality improvement methods to achieve its transformation.

Paul O'Neill, former U.S. Treasury Secretary and former CEO of PRHI, turned to the Toyota Production System to reduce medication errors, hospital-acquired infections and patient readmissions.

SSM Health Care and PRHI share several characteristics leading to their success:

1. Both are totally patient focused.
2. Doctors, nurses, technicians and hospital administrators talk freely about how sick their hospitals were, why they got sick and how they learned to heal them.
3. SSM and PRHI healed themselves by using management principles from a most unlikely source—an auto manufacturer, Toyota, which uses systems thinking and quality methods.
4. Both made improvements in reducing hospital-induced patient infections, suffering and deaths while significantly reducing wasted time and wasted dollars.
5. Both maintain the improvements without outside consultants, government assistants, new resources, new hires or other added expenses.

Specific results

Below are some highlights of SSM Health Care's and PRHI's accomplishments:¹

- Coronary bypass readmissions declined 4.7%, saving an estimated \$1.7 million as well as patients' lives.
- Hospital-acquired infections, which can be fatal, have been reduced 85%. It's estimated that each infection can cost \$30,000 to \$90,000.
- Since 2001, central-line infections have been reduced 63%. Half of these infections are fatal. Each infection can cost at least \$30,000 to treat.
- Staph infections were reduced from 26 per 1,000 patients (3.4 sigma) to eight per 1,000 (3.9 sigma). This was reported as short-term sigma (1.5 sigma shift).
- The medication error rate was reduced from 0.16 per 1,000 (5.1 sigma) dosages administered to 0.01 per 1,000 (5.8 sigma). This was also reported as short-term sigma (1.5 sigma shift).
- Intensive care unit mortality has been reduced from 5.5% to 3.3%.
- Acute diabetic complications have been reduced from 13.5% to 5%.
- The average mortality rate from a cardiac surgical bypass procedure was reduced 25% by using a 3-cent aspirin and 50-cent beta blocker in the emergency room. —P.S.

REFERENCE

1. CCM Inc., "Good News: How Hospitals Heal Themselves," 2006.

Using **a process map** allows you to see **the entire landscape** and identify trouble spots.

departments. Faulty processes upstream have a tendency to create bottlenecks and waste downstream. For example:

- The nurse on day two was unaware that the complete list of my father's medications had been inserted into the three-ring binder by the ER nurse the previous day.
- The transport worker probably never realized how much incremental cost (\$1,750 for two extra nights in the hospital) she caused by returning my father to his hospital room after the EKG instead of performing two tests (EKG and a renal ultrasound) back to back as intended.
- Had the ultrasound technician been aware of the end-to-end process, she would have realized a renal ultrasound effectively duplicates the kidney Doppler echogram my father received earlier. The kidney Doppler echogram is also far less expensive than a renal ultrasound.

Using a process map is similar to being a pilot of an airplane. It allows you to see the entire landscape and identify trouble spots. Officials at my father's hospital certainly got a bird's-eye view of their operations.

Change agent

Hospitals are complex, fast-paced and dynamic work environments that are often stressful and involve long hours, but lives are at stake. Hospitals employ dozens of professionals, including physicians, nurses, technicians, dietary specialists and administrative personnel, all focused on pieces of the process.

Based on the successes at SSM Health Care and PRHI, much of which can be attributed to a systems thinking approach, and my own experience at our local hospital, it is clear this quality method is key to more thoroughly understanding troubled areas and healing them in a sustainable way.

While systems thinking is not a panacea cure for every mistake, it is a powerful agent for creating sustain-

able change in an organization, a hospital or otherwise. By focusing on the patient as the customer, quality can be improved significantly, efficiencies gained and costs reduced. Systems thinking offers quality professionals a simple, yet compelling, quality method that complements process improvement techniques such as Six Sigma, lean and *kaizen*.

As one of the largest components of our economy, the U.S. healthcare industry is too critical to America's future prosperity to allow it to fail. For quality professionals, today is an opportunity to apply their expertise beyond their paying day jobs. It means becoming active in their communities and using methods such as systems thinking to help solve healthcare problems. 

REFERENCES

1. CCM Inc., "Good News: How Hospitals Heal Themselves," 2006.
2. Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group, 2009.
3. "U.S. Surgical Procedures Volumes," *Medtech Insight Research*, Feb. 1, 2007.
4. Institute of Medicine, "To Err Is Human: Building a Better Health System," National Academy of Sciences, 1999.
5. "Overdose by Pharmacy Blamed in Boy's Death," *Washington Post*, June 10, 2000.
6. Louis M. Savary and Clare Crawford-Mason, *The Nun and the Bureaucrat—How They Found an Unlikely Cure for America's Sick Hospitals*, CC-M Productions Inc., 2006, p. 26.
7. *Ibid*, p. 27.
8. "Field Guide to Consulting and Organizational Development," Authenticity Consulting LLC, March 2005.
9. Daniel Aronson, "Overview of Systems Thinking," *The Thinking Page*, 1996-1998.
10. Savary and Mason, *The Nun and the Bureaucrat—How They Found an Unlikely Cure for America's Sick Hospitals*, see reference 6, p. 39.
11. *Ibid*, p. 40.



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