

## Chapter I: The Need for Lean Hospitals

From the book  
***Lean Hospitals: Improving Quality, Patient Safety, and Employee Engagement, 3<sup>rd</sup> edition***

By: [Mark Graban](#)

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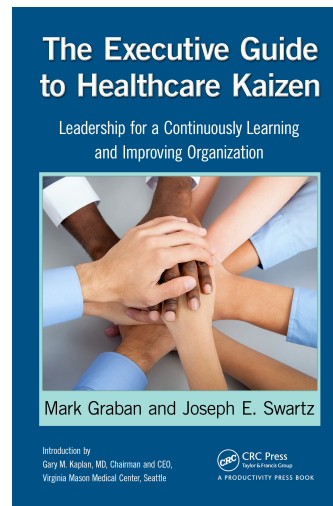
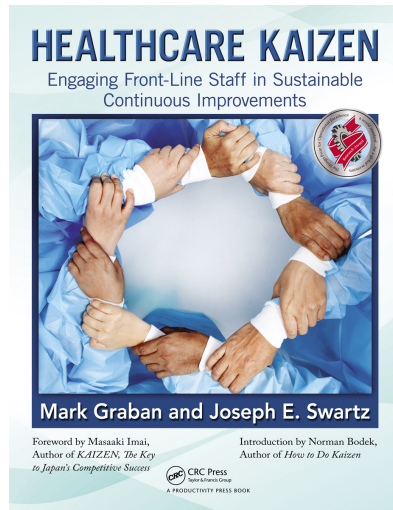
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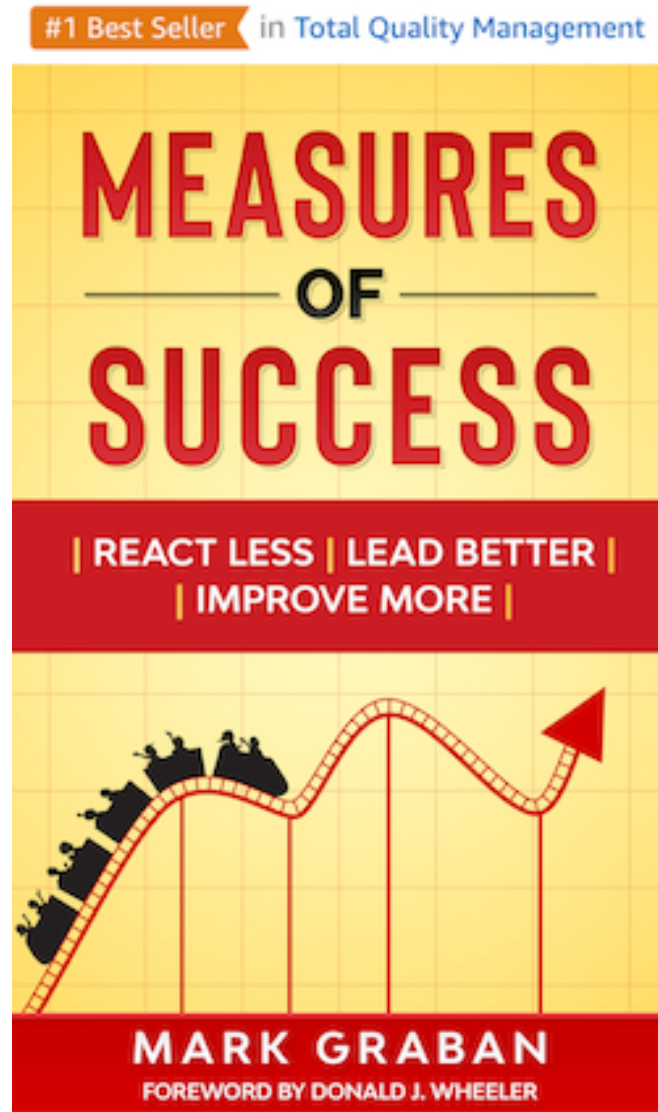
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# LEAN HOSPITALS

Improving Quality, Patient Safety, and Employee Engagement

Third Edition

MARK GRABAN

Foreword by John Toussaint, MD



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# Author

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**Mark Graban** is an internationally recognized expert in the field of “Lean healthcare,” as a consultant, author, keynote speaker, and blogger. Mark is also co-author, with Joe Swartz, of the book *Healthcare Kaizen: Engaging Front-Line Staff in Sustainable Continuous Improvements*. He has been recognized twice (for this book and *Healthcare Kaizen*) as the recipient of the prestigious Shingo Research & Professional Publication Award.

Mark is an experienced change agent, with a background in industrial and mechanical engineering and an MBA from the MIT Sloan Leaders for Global Operations Program. Prior to healthcare, Mark worked in multiple industries, including automotive (General Motors), electronics (Dell), and industrial products (Honeywell). At Honeywell, Mark was certified as a “Lean expert” (Lean Black Belt).

Since August 2005, Mark has worked exclusively in healthcare, where he has coached Lean teams at client sites in North America and the United Kingdom, including medical laboratories, hospitals, and primary care clinics. Mark’s motivation is to apply Lean and Toyota Production System principles to improve quality of care and patient safety, to improve the customer/patient experience, to help the development of medical professionals and employees, to make healthcare more affordable, and to help build strong organizations for the long term.

From June 2009 to June 2011, Mark was a senior fellow with the Lean Enterprise Institute, a not-for-profit educational organization that is a leading voice in the Lean world. In this role, Mark also served as the director of communication & technology for the Healthcare Value Network, a collaboration of healthcare organizations from across North America, a partnership between the Lean Enterprise Institute and the ThedaCare Center for Healthcare Value. Mark continues as a faculty member for the Lean Enterprise Institute and the ThedaCare Center.

In June 2011, Mark also joined the software company KaiNexus to help further their mission of spreading continuous improvement, while continuing his other work and activities. He also serves on the board of the Louise H. Batz Patient Safety Foundation.

Mark was raised in Livonia, Michigan, and currently resides in Texas with his wife, Amy.

To interact with Mark, please visit [www.LeanHospitalsBook.com](http://www.LeanHospitalsBook.com) or [www.MarkGraban.com](http://www.MarkGraban.com).

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# Endorsements

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## Lean Hospitals, Third Edition – Mark Graban

“Leaders of today’s healthcare organizations are on a continuous journey to improve results, requiring a relentless focus on improving the underlying process of care delivery and leadership practices. Mark has written a book that provides compelling ideas to help create better places to work, practice medicine and receive safe, high quality care.”

**Quint Studer**

*Founder of Studer Group, a 2010 recipient of the Malcolm Baldrige National Quality Award,  
Author of Hardwiring Excellence: Purpose, Worthwhile Work, Making a Difference and Results  
That Last: Hardwiring Behaviors That Will Take Your Company to the Top*

“Mark Graban’s book has documented what is now happening in hospitals all across America as we learn to apply the Toyota Production System methodology to healthcare. This book lays out the nuts and bolts of the Lean methodology and also describes the more difficult challenges, which have to do with managing change. Graban’s book is full of wins—these are the same type of wins that are happening at ThedaCare every day. I wish I could have read this six years ago, as it might have prevented some of the mistakes we made in our Lean transformation journey.”

**John S. Toussaint, MD**

*President/CEO  
ThedaCare Center for Healthcare Value*

“Mark Graban is the consummate translator of the vernacular of the Toyota Production System into the everyday parlance of healthcare. With each concept and its application, the reader is challenged to consider what is truly possible in the delivery of healthcare if only standardized systems borrowed from reliable industries, were implement. Graban provides those trade secrets in an understandable and transparent fashion.”

**Richard P. Shannon, MD**

*Executive Vice President for Health Affairs  
University of Virginia*

“There is an enormous shortfall between the healthcare we receive and what we actually get. Mark Graban explains how those in the system can make care delivery better for everyone –patients, providers, and payors.”

**Steven J. Spear**

*Sr. Lecturer at MIT Sloan School of Management and Sr. Fellow at  
the Institute for Healthcare Improvement  
Author of The High Velocity Edge*

“Mark Graban has been tirelessly studying the application of Lean to healthcare, with an emphasis on respect for the people served by the system as well as the people who provide excellent care. He has an accurate sense of how things work in health systems, which makes his work more meaningful for people who want to make them better.”

**Ted Eytan, MD**

“The medical community has a tremendous opportunity to learn methods and techniques to improve the quality and efficiency of care and reduce costs, while at the same time engaging the staff in these efforts. Mark Graban has deep experience applying Lean in the healthcare field, and in his book provides an outline of how to transfer concepts originally developed in manufacturing into the unique environment of medical care. Don’t miss the opportunity to learn and apply some great ideas in your organization.”

**David Meier**

*Co-Author of the best selling books The Toyota Way Fieldbook and Toyota Talent*

“The concepts outlined in this book are the most powerful tools that I have ever encountered to foster innovation, ownership, and accountability at the front line staff level. This is a must-read for any leader in today’s increasingly complex healthcare industry.”

**Brett Lee, PhD, FACHE**

*Market Chief Executive Officer  
Tenet Healthcare*

“The Institute of Medicine (IOM) calls for systems in healthcare that support continuous learning and process improvement, and highlights waste as a fundamental obstacle to attaining highly reliable and value-based healthcare systems. Lean is a proven way to eliminate waste, while hard-wiring systems to ensure sustainability. Eliminating waste and engaging employees are the key to value-based medicine, where waste is identified and eliminated, and value emanates seamlessly from continuous process improvement in the rich environment of a continuously learning organization. *Lean Hospitals* is a foundational text for understanding the concepts and application of continuous process improvement in a healthcare environment, and provides practical guidance and concrete examples to eliminate waste and increase value to the customer.”

**Beverly B. Rogers, MD**

*Chief of Pathology, Children’s Healthcare of Atlanta  
Clinical Professor of Pathology, Emory University School of Medicine*

“Mark Graban’s book will leave you with an appreciation for what Lean is and what it can do for your healthcare organization. Since the original edition in 2008, I have conducted *Lean Hospitals* book studies for all my staff. Everyone gets a personal copy of *Lean Hospitals* for the study and to keep as a reference. I look forward to the 3rd edition. It’s my Lean bible.”

**Jim Adams**

*Admin Director of Laboratories  
Children’s Healthcare of Atlanta*



“It’s obvious that Mark Graban has spent time in the trenches of healthcare and understands the complexities of applying the Lean philosophy and tools to that environment. If you want to improve your chances of surviving in today’s healthcare system (both literally and figuratively), read this book.”

**Dean Bliss**

*Former Improvement Advisor  
Iowa Healthcare Collaborative*

“Graban provides a helpful translation of the terms, practices, and tools of Lean thinking into hospitals’ everyday situations and challenges. His book illustrates Lean’s elements with many actual examples of Lean applications in typical hospital practices and procedures. Graban’s book should definitely be on the reading list for those who want to bring the benefits of Lean thinking to healthcare.”

**David Mann**

*Principal, David Mann Lean Consulting*

“Lean healthcare is becoming a global movement. The reasons given are overrun costs, errors that compromise patient safety, time of patients wasted, and general bureaucratic inefficiency. Healthcare is different than car making. This is true but many, many hospitals are learning from Toyota and making remarkable improvements. The two pillars of the Toyota Way certainly fit the healthcare environment—Respect for People and Continuous Improvement.

Unfortunately, the remarkable improvements are in specific areas and seem difficult to sustain because of a mysterious ingredient, which the folks at Toyota seem to understand quite well—humans. Healthcare exists to serve humans and humans provide the services. Humans are far from perfect. Toyota’s system is actually designed to support the development of people, not to provide a quick fix set of technical solutions, and this takes time and patience.

Many healthcare consultants have rebadged themselves as Lean consultants and do not understand the real thinking behind the Toyota Way. Mark Graban is an exception. He has worked hard to study the philosophy and stay true to the thinking of Toyota. His book is a welcome translation of the Toyota Way into language any healthcare professional can understand.”

**Jeffrey K. Liker**

*Professor, University of Michigan  
Author of *The Toyota Way**

# *Chapter 1*

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# The Need for Lean Hospitals

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## **Better Results with Lean**

“Lean” is a process improvement methodology and, more importantly, Lean is a leadership style and a management system. Lean has been embraced by hospitals and health systems since the 1990s, especially so in the past 10 years. The Lean approach is powerful, but it is not a quick fix. Lean promotes a new way of thinking and a different organizational culture, requiring change and participation from everybody at all levels. The practical methods and tools used within this broader framework have led to measurably better performance in areas such as patient safety, quality, waiting times, cost, and employee morale in healthcare organizations around the world.

Lean is not something you simply implement this year or in a few short years. Lean is an approach that you practice diligently, improving and learning more over time. Lean doesn’t mean being perfect or completely free of waste, since no organization ever reaches those heights. But a “Lean hospital” is one where leaders have a humble, inquisitive mindset and a management style that allows for the reinvention of aspects of healthcare delivery and creates a culture of continuous improvement.

## **Why Do Hospitals Need Lean?**

Taiichi Ohno, one of the creators of the Toyota Production System, wrote that organizations must “start from need” and that “needs and opportunities are always there.”<sup>1</sup> In 2014, John Shook, CEO of the Lean Enterprise Institute and the first American to work for Toyota in Japan, said we should start by asking, “What is the purpose of the change and what problem are we trying to solve?”<sup>2</sup> John Toussaint, MD, former CEO at ThedaCare (Wisconsin), emphasizes that Lean activity must be “focused on a . . . problem that is important to the organization.”<sup>3</sup>

Today, the need for Lean in healthcare is very clear in terms of underperforming performance metrics and general dissatisfaction. Hospitals face a growing number of external pressures and challenges as well. Hospitals do many wonderful things, including saving lives. But, a senior leader at a prestigious university hospital summarized their internal challenges by lamenting that “we have world-class doctors, world-class treatment, and completely broken processes.”

So, how can an approach called Lean help healthcare organizations? On first hearing the word, people might complain that they are already understaffed and do not have enough resources. Of course, being Lean means having the *right* staffing levels and resources to do quality work in a way that's not too stressful. The everyday use of the term *lean* and countless newspaper headlines reinforce what are often negative connotations about not having enough resources. Rest assured, the approach presented here is not about mass layoffs. Lean is very different from traditional "cost-cutting" methods that have been tried in multiple industries, including healthcare. The idea of "preventable" errors may also bring skepticism, as employees and physicians believe they are already being as careful as possible. Hospitals using Lean methods do not improve quality by asking people to be more careful any more than they improve productivity by asking people to run around faster.

Lean is a tool set, a management system, and a philosophy that can change the way hospitals are organized and managed. Lean is a methodology that allows hospitals to improve the quality of care for patients by reducing errors and waiting times, which also results in lower costs. Lean is an approach that supports employees and physicians, eliminating roadblocks and allowing them to focus on providing care. Lean is a system for strengthening hospital organizations for the long term—reducing costs and risks while also facilitating growth and expansion. Lean helps break down barriers between disconnected departmental "silos," allowing different hospital departments (and sites within a health system) to better work together for the benefit of patients.

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How a Lean health system respects and supports staff:

- Focuses on their safety and well-being
  - Ensures people have what they need to do the work
  - Doesn't put people in a broken process
  - Doesn't drive cost-cutting through layoffs
  - Doesn't overburden people
  - Has proper staffing levels
  - Gives help and support when needed
  - Doesn't blame people for systemic errors
  - Lets people do meaningful work
  - Lets staff work to their level of licensure
  - Listens and engages people in improvement
- 
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Someone might ask how Lean methods can help solve the everyday, nagging problems that so many committees and teams have already tried fixing. Lean is not a silver bullet, but it is different in that people learn how to look at the details of processes instead of jumping through the same proverbial hoops every day. The people who do the work help fix things where the work is actually done, instead of relying on experts to tell them what to do. Lean helps leaders see and understand that it is not the individuals who are broken, but the system itself. This happens in a way in which the system can actually be fixed, improved, or reinvented in small, manageable bites, with managers and staff working together. The Lean approach also requires the continued learning and professional development of employees, for their own sake and the sake of the organization.

## A Renewed Sense of Purpose

People in healthcare are driven by an important mission and a strong sense of purpose. The everyday problems, waste, and broken processes interfere with what healthcare providers and employees want to do: provide the best possible care to patients and keep people healthy. These problems can also leave people short on time, interfering with their ability to provide a caring environment for their clinical care.

Dr. Jacob Caron, an orthopedic surgeon and former chief of the medical staff at St. Elisabeth Hospital (Tilburg, the Netherlands), is one of their leading advocates for Lean. During a 2009 presentation at a Dutch Lean healthcare symposium, his title slide read, “Lean and Loving ... a mission impossible?” To hospitals like St. Elisabeth, an important motivation for reducing waste is to free up time for clinicians. This newly found time is used not only for better clinical care and improved responsiveness to patient requests but also for what St. Elisabeth describes as “loving care.”<sup>4</sup> When nurses are not scrambling to find supplies and medications, they can take time to talk with patients, answering questions and alleviating anxiety they might have about their hospital stay. In 2015, Dr. Caron said, “Our quest has developed further in a growth process for our coworkers and ourselves. Lean still influences my work as orthopaedic surgeon and medical specialist on quality and safety, as well as my behavior as a person.”<sup>5</sup> The combination of efficiency and caring has led to results including orthopedic waiting times being reduced from “several months to four weeks.”<sup>6</sup>

## Lean Methods Are Not New to Healthcare

While Lean has been used formally in healthcare for a relatively short time, industrial engineering (often known as management engineering in healthcare) has been used for a century to improve hospitals.

Frank and Lillian Gilbreth, sometimes known from the original 1950 version of the film *Cheaper by the Dozen*, were two of the original “efficiency experts” of the late nineteenth and early twentieth centuries, with many of their methods influencing the later development of Lean. Outside of their primary factory work, the Gilbreths published many studies in medicine, being among the first to demonstrate that industrial engineering methods could be applied to hospitals. One innovation from the Gilbreth studies was a practice we take for granted today—having a surgical nurse hand instruments to surgeons as called for, instead of the surgeon taking time away from the patient to search for them and retrieve them.<sup>7</sup>

In 1922, Henry Ford wrote about efforts to apply his production methods to a hospital in Dearborn, Michigan. Ford said, “It is not at all certain whether hospitals as they are now managed exist for patients or for doctors. ... It has been an aim of our hospital to cut away from all of these practices and to put the interest of the patient first. ... In the ordinary hospital the nurses must make useless steps. More of their time is spent in walking than in caring for the patient. This hospital is designed to save steps. Each floor is complete in itself, and just as in the factories we have tried to eliminate the necessity for waste motion, so we have tried to eliminate waste motion in the hospital.”<sup>8</sup>

Almost a century later, nurses around the world still spend more time dealing with waste in the workplace than they spend at the bedside—until Lean is employed to help. This long history suggests that there are long-standing systemic problems in healthcare that have not been solved by old approaches. Virginia Mason Medical Center (Seattle, Washington) has increased the amount of time that nurses are able to spend at the bedside from 40% to almost 90%, which improves job satisfaction and patient care.<sup>9</sup>

## Toyota's Role in Popularizing Lean

Toyota Motor Corporation is sometimes known as “the company that invented Lean production.”<sup>10</sup> Toyota developed the Toyota Production System over many decades, starting in 1945.<sup>11</sup> Inventing and refining a new production system was not an overnight success story, nor will be your hospital's Lean transformation, as changing old mindsets and organizational cultures takes time. Saying that Toyota “invented” Lean is not exactly accurate, as Toyota learned from and was inspired by many others, such as the writings of Henry Ford, the nineteenth-century Scottish self-help author Samuel Smiles, and the restocking practices of American supermarkets.<sup>12</sup> Toyota was also heavily influenced by the visits of Dr. W. Edwards Deming, as the president of Toyota said in 1991, “There is not a day I don't think about what Dr. Deming meant to us. Deming is the core of our management.”<sup>13</sup>

Toyota took some aspects of the Ford approach, but created its own management system, using and inventing methods that fit its needs and situation. In 1945, Toyota set out to improve quality, while improving productivity and reducing costs, as the company was very cash poor and had a small Japanese market in which to sell cars. Crisis and hardship forced Toyota to be creative and innovative; it did not set out to create a production system per se. Toyota was focused on improving its business, and that turned into a management system that became the way they conduct business every day, as opposed to being a short-term program. It is critical for hospitals to follow Toyota's model of adapting what you learn from others and developing methods that solve the problems in your organization, without blindly copying the practices of factories or other hospitals. Lean is a new way of thinking and not just a simple to-do list of tools to implement.

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The CEO of Virginia Mason Medical Center, Gary Kaplan, MD, FACP, FACMPE, FACPE, says, “If your leaders think this is just another improvement method, a program or initiative, you'll never achieve the long term success this management method offers. This is not something you do in addition to other work; it is how we work. The guiding principle of ‘patient first’ known and committed to by everyone in the organization provides long term thinking... perfection is a pursuit not a finish line. Knowing we're getting closer every day is what matters and what the executives need to recognize and reward.”<sup>14</sup>

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## Origins of the Term *Lean*

While the concepts came to us via Toyota, the term *Lean* is credited to John Krafcik, part of the research team at the International Motor Vehicle Program<sup>15</sup> at the Massachusetts Institute of Technology (MIT). That team, led by James P. Womack, Daniel T. Jones, and Daniel Roos, studied the global auto industry in the late 1980s, looking for practices that led to Japanese success. Through their research, they disproved their hypothesis that all Japanese automakers were doing things differently—it was primarily Toyota. The term *Lean* was coined to describe a system that managed to get by with half of just about everything—physical space, labor effort, capital investment, and inventory—and far fewer than half the defects and safety incidents. The term described the results, but the word has also entered the language as a description of the method. In recent years, Toyota has acknowledged that the word Lean is basically a synonym for the term they prefer, the Toyota Production System.<sup>16</sup> If people in your organization react negatively to the word *lean*, that invites a conversation about what the Lean methodology really is, or it creates an opportunity to give it your own label, such as “loving care” or “the ThedaCare Improvement System.”

The early spread of Lean started in the auto industry, where it was easy to see the direct applicability of the Toyota method and, more important, there was a strong recognition of the need to improve. Western automakers typically focused on copying tools and practices that could easily be seen with the naked eye, such as *kanban* cards (a method for moving parts to assembly lines), as discussed in Chapter 6. Even though Toyota started sharing its tools through publications and open tours (even allowing competitors to visit its factories), the unseen management system or “the soul” of Toyota was (and still is) harder to copy or emulate.<sup>17</sup> The other automakers found it more difficult to challenge their existing management systems and thought processes; it was easier to adopt a tool like *kanban* or 5S and to say “we are doing Lean” than it was to fully adopt the Toyota model. Hospitals that say they are doing Lean should reflect on whether they are using an occasional Lean method or project or if they are embracing the holistic management system and culture of Lean.

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I often get asked, “How many hospitals are implementing Lean?” That’s a difficult question to answer for a number of reasons. First, there’s not public reporting about the use of Lean methods. Secondly, there is wide variation in what it means for an organization to be “using Lean”; they could be using a tool like 5S in a few departments, or they could be aiming to transform their culture and leadership system. Or, a health system might be somewhere in between, using a broader set of Lean practices, training many people, and running many Rapid Improvement Events (RIEs). Practicing Lean or choosing to do so should be based on problems you need to solve rather than doing something because it is popular.

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## Lean Is Proven to Work outside Automotive Factories

Lean eventually spread beyond the automotive industry, as other manufacturing sectors adopted the methods in their factories. Manufacturers also began to understand that Lean was not just a factory system; it was also a business system, incorporating all aspects of bringing a product to market, including design, supplier management, production, and sales. For example, the Toyota Product Development System<sup>18</sup> was renowned for bringing new cars to market twice as fast as their U.S. competitors (half the time, indeed “Lean” by the MIT definition). In recent years, “Lean Startup” concepts have helped with the development of new products and services in startups and large companies, alike.<sup>19</sup>

Because every type of organization—including health systems—should be concerned with issues such as safety, cash flow, customer satisfaction, and quality, Lean methods and philosophies are being used, at least to some extent, at some banks, schools, retailers, software companies, airlines, government agencies, and the military, as well as the dominant coffee sellers in the United States (Starbucks)<sup>20</sup> and Canada (Tim Hortons)<sup>21</sup>. In non-profit settings, Toyota staff and leaders helped the New York City Food Bank’s staff and leaders improve their operations and helped them provide meals to more people in the aftermath of Hurricane Sandy.<sup>22</sup>

Toyota University, in California, has coached some surprising students, including the Los Angeles Police Department (LAPD), in problem-solving methods that come from the factory floor. This has helped the LAPD manage its jails more effectively. A Toyota coach said, after the training classes, “What I saw was a commonality in human behavior, a commonality in some of

the issues and challenges that every company faces.”<sup>23</sup> We all have problems to solve, and we are all looking for better ways to lead and manage employees.

## Lean Is Helping Hospitals Improve

It is difficult to pinpoint exactly when hospitals started looking outside the industry for Lean ideas. Some hospitals started experimenting with Lean methods in the 1990s, in some cases with help from Michigan automakers. Seattle Children’s Hospital can trace its Lean journey to early discussions in 1996 with consultant Joan Wellman, who had previously worked with Boeing.<sup>24</sup> In 2001, *USA Today* reported on a study conducted by the Robert Wood Johnson Foundation that looked across hospitals for leaders, those who did things dramatically differently from other hospitals. Foundation executive vice president Lewis Sandy said, “We want to see a Toyota in health care. That’s been one of the barriers in health care. No one can point to a health system and say ‘That’s how it ought to be done.’”<sup>25</sup> The motivation was clear that hospitals had to look beyond their peers to find solutions to widespread systemic problems.

Is there “a Toyota of healthcare” today? Is there a hospital with half the cost and half the defects of other hospitals? Some have made significant progress in this direction, and there are now many examples of the positive impact Lean is having in hospitals throughout the world. As a sample, Lean methods have resulted in the following improvements:

### *Safety and Quality*

- Reduced central-line-associated bloodstream infections by 76%, reducing patient deaths from such infections by 95% and saving \$1 million—*Allegheny Hospital, Pennsylvania*<sup>26</sup>
- Reduced hospital-acquired infections, saving 57 lives, reducing intensive care unit (ICU) length of stay, and reducing costs by over \$5 million over two years —*University of Pennsylvania Medical Center*<sup>27</sup>
- Reduced readmission rates for chronic obstructive pulmonary disease (COPD) patients by 48%—*UPMC St. Margaret Hospital, Pennsylvania*<sup>28</sup>
- Reduced falls by 22%, reducing costs by more than \$500,000—*Hanover Regional Medical Center, North Carolina*<sup>29</sup>
- Reduced pressure ulcers by 56% in three pilot areas over two years, with a 30% decrease system-wide—*BJC Healthcare, Missouri*<sup>30</sup>
- Avoided 87 readmissions for congestive heart failure in 12 months across four hospitals, saving \$830,000—*Four hospitals in California*<sup>31</sup>
- Reduced sepsis mortality from 24% to 9%, reducing the average cost per case from \$15,772 to \$12,771—*Presence Health, Illinois*<sup>32</sup>

### *Waiting Times and Length of Stay*

- Reduced patient waiting time for non-emergent orthopedic surgery from 14 weeks to 31 hours (from first call to surgery); improved inpatient satisfaction scores from 68% “very satisfied” to 90%—*ThedaCare, Wisconsin*<sup>33</sup>
- Reduced emergency patient length of stay by 29% and avoided \$1.25 million in new emergency department (ED) construction—*Avera McKennan, South Dakota*<sup>34</sup>
- Reduced waiting times for screening colonoscopies from six weeks to less than 24 hours while reducing cost per patient by 9.5%—*Palo Alto Medical Foundation, California*<sup>35</sup>



- Increased the percentage of atrial fibrillation patients treated within 40 days from 11% to 94% *HealthEast, Minnesota*<sup>36</sup>

## Flow

- Reduced turnaround time for clinical laboratory results by 60% in 2004 without adding head count or new instrumentation; further reduced times by another 33% from 2008 to 2010—*Alegent Health, Nebraska*<sup>37,38</sup>
- Reduced instrument decontamination and sterilization cycle time by 54% while improving productivity by 16%—*Kingston General Hospital, Ontario*<sup>39</sup>
- Reduced late surgery starts from 50% to 30%, reduced rescheduled procedures from 20% to 4.4%, while increasing cases per month from 329 to 351—*New York City Health and Hospitals Corporation*<sup>40</sup>
- Reduced operating room (OR) turnover time from 60 minutes to 30 minutes, increased utilization rates from 25% to 65%, and achieved 100% on-time starts in a pilot area—*Guangdong Provincial Hospital of Traditional Chinese Medicine, China*<sup>41</sup>

## Satisfaction

- Improved patient/family satisfaction rates in the Neonatal Intensive-Care Unit (NICU) from 45th percentile to 99th percentile—*Franciscan St. Francis, Indianapolis*<sup>42</sup>
- Improved physician satisfaction from 63rd percentile to 87th, being highest rated in overall care among 170 California medical groups for two consecutive years—*Sutter Gould Medical Foundation, California*<sup>43,44</sup>
- Improved ED patient satisfaction from 5th percentile to 98th percentile in just four months (through door-to-doc times falling from 67 to 18 minutes)—*Sumner Regional Medical Center, Tennessee*<sup>45</sup>

## Financial

- Bottom-line benefit of almost \$200 million over seven years, while achieving “the lowest observed-to-expected mortality among the academic health center members of the University Health system Consortium in 2011” and avoiding layoffs—*Denver Health, Colorado*<sup>46</sup>
- Avoidance of \$180 million in capital spending through Lean improvements—*Seattle Children’s Hospital, Washington*<sup>47</sup>
- Improved operating margin by 44%, from 1.70% in fiscal year 2011 to 3.06% in fiscal year 2014—*HealthEast, Minnesota*<sup>48</sup>

## Problems in Healthcare

Before taking a deeper look at this approach, let us begin by practicing a good Lean habit—starting by defining the problems that hospitals and health systems are trying to solve. There are many long-standing problems that hospitals face, a list too long to present here. Lean is not about fixing any one major problem within healthcare; it is about solving the critical few strategic issues, along with the hundreds or thousands of little problems that plague hospitals each day. Some systemic problems in our health systems are important, but probably outside the scope of Lean, such



as dysfunctions in insurance or payer models. Rather than just debating political solutions, we can take action and improve now, regardless of the payer system in our country. We can improve the delivery of healthcare, if we start learning and start taking action today.

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Do you have any of these problems in your hospital?

- Deliveries of supplies delayed because of improper ordering
- Mix-ups in getting supplies
- Articles returned by other departments because they were not made correctly
- Employee difficulty in handling new-type equipment
- Limited storage space (linens and supplies) not properly used
- Safety equipment not being used
- Minor injuries or illnesses not reported
- Correct procedures not followed
- Employees leaving to go to other hospitals
- Employees passing the buck—let the other person do it

Are these modern hospital problems? Yes, but these were also problems in 1944, as documented by the training materials for hospitals provided by the U.S. Training Within Industry (TWI) Program.<sup>49</sup> TWI was halted after World War II ended, so the methods disappeared from hospitals, as well as factories, but became very influential to Toyota and the development of Lean.<sup>50</sup>

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Hospitals everywhere, even across different countries, tend to have the same problems because they were often designed from the same template and are managed the same way. Physical layouts share similar characteristics, possibly given to them by architects with a poor understanding of the details of the hospital's work. Processes were often developed using the same paradigms, or they were just allowed to evolve without structure. Copying other hospitals and their "best practices" might bring incremental (or temporary) improvements, but we can use Lean concepts to drive more dramatic (and more sustainable) improvements by looking at our own processes and management approach in a new way, engaging our own employees to identify waste and develop their own solutions. In the Lean mindset, we have to be open in our recognition of problems as the first stage of improvement.

When asked what is needed for improvement, hospital employees and managers often answer, "We need more money, more space, and more people!" something that budgets often don't allow. Even if adding people were guaranteed to help, we live in a world of finite resources, including shortages of nurses, medical technologists, and other key clinical professionals, in some locales. If we cannot afford more resources, working harder is not usually an option. Lean thinkers do not blame a lack of hard work for problems at their hospital. We have to improve the system, and sometimes that means that people expend less effort because their work is easier, which leads to improved outcomes for all.

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The late Michel Tétrault, MD, was the CEO of St. Boniface General Hospital (Winnipeg, Manitoba) and a great Lean leader. In 2010, he commented about three things that kept him up at night. They were

1. “Being able to find an adequate workforce, to get the people we need to serve all the patients that come to our door” because of an aging population and all of the retirements from the workplace.
2. “The sustainability gap of the cost of health care, and this is a worldwide phenomenon. It’s neither only [an] American nor [a] Canadian [problem]. How do we address that?”
3. “Our patients, our communities, our funders, whether they be private funders or public funders, are [increasingly] scrutinizing how safe and reliable our health care actually is and how good our outcomes are.”

Lean helps address all of these concerns. As Tétrault said, “One way or another, we have to find a way to demonstrate that we’re providing better value, that we’re providing safer, more reliable health care with better outcomes at a reasonable cost.”<sup>51</sup>

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## ***Price Pressures and Cost Challenges***

Healthcare costs are increasing rapidly, as U.S. healthcare insurance costs are increasing at a rate higher than inflation. As of 2012, healthcare spending consumes 17.9% of the United States’ gross domestic product (GDP), reaching levels of over \$2.8 trillion per year.<sup>52</sup> Per-capita spending in the United States is the highest in the world and is much higher than comparable industrialized countries. Even with that high spending, too many patients are harmed by preventable medical errors, and the United States lags in many key quality measures. The high spending does bring a great deal of innovation and technology, which can improve care and save lives, but the cost increases are not sustainable.

In an attempt to rein in higher spending, governments or private payers often propose cutting reimbursement rates. In doing so, they are changing the price paid but not the underlying costs in the system. Price cuts by payers might also, unfortunately, encourage traditional, dysfunctional cost cutting by healthcare organizations, in which layoffs and the closure of units and elimination of services might harm quality or reduce the level of care provided to a community. Lower prices without corresponding cost reductions will hurt hospital margins, which can slow future investment or jeopardize a hospital’s financial future, unless a health system is able to reduce costs by using Lean as an alternative method.

In some countries, lower government budgets mean less care and fewer patients being served, unless the actual efficiency of care delivery is improved. Rather than reducing spending by slashing payments or rationing care, Lean methods enable us to reduce the actual cost of providing care, allowing us to provide more service and care for our communities. A hospital that saves tens of millions of dollars by using Lean methods to avoid costly expansion projects is a hospital that costs society less, while providing the same levels of care, if not more care to more people, with better quality.

Cutting prices also risks driving some physicians out of the market for some patients, as evidenced by the increasing, yet currently small, number of American doctors who opt out of the Medicare and Medicaid systems or stop taking on new patients under those programs.<sup>53</sup> Unilaterally slashing prices to hospitals or providers is, unfortunately, more reminiscent of the supplier management practices of the Big Three automakers, who traditionally demanded annual price reductions from their suppliers, squeezing many of these suppliers to the point of bankruptcy or forcing them to reduce quality.

In comparison, the Lean approach, as demonstrated by Toyota, is more of a partnership between customer and supplier working together to identify true cost savings, often achieved through quality improvement. These cost savings are shared, benefiting both parties, as Toyota and its suppliers operate in an atmosphere of trust and long-term relationships. In healthcare, payers and providers should strive to have relationships more like Toyota and its suppliers, rather than squeezing their suppliers—the hospitals, clinics, or physicians. In some American states and Puerto Rico, health insurance companies or employers are working directly with hospitals on Lean improvement efforts, sharing the benefits.<sup>54</sup>

In the Lean approach, companies are taught that prices are set by the market and that a primary way to improve one's profit margin is to reduce your own controllable costs. Healthcare is often a strange and highly regulated “market,” but this is still a useful concept. This thinking flies in the face of older “cost-plus” thinking, by which we look first at our own costs and set prices based on a desired profit margin. The reality is that most companies, whether manufacturers or hospitals, do not have market power to set prices as they wish. Many health systems have focused on growth and increasing market share, through acquisitions to get better price leverage against payers (who are also merging and trying to gain leverage by getting larger).

Larger health systems still have big opportunities to reduce costs by improving flow and improving quality. Or they can find ways to add more value to their services, so that the market might increase or at least maintain what it is willing to pay. No matter how dysfunctional healthcare markets might be, we should focus less on the unfairness of what is paid to us and more on what we have control over—our costs. One study estimated that 13% of a hospital's costs are due to “inefficient practices within control of the hospital,”<sup>55</sup> while other estimates were closer to 20%.<sup>56</sup>

## ***Employee Shortages***

Hospitals in some locations suffer from widespread employee shortages, particularly for nurses, pharmacists, and medical technologists. In the United States, nursing vacancy rates averaged 8.1% as of 2008, and the shortage was expected to grow to 260,000 registered nurses by 2015.<sup>57</sup> In 2010, 34% of hospitals reported unfilled pharmacist positions.<sup>58</sup> In situations like these, hospitals are often forced to hire costly temporary agency or “traveler” staff, further cutting margins. This is also a problem in the United Kingdom, where the National Health Service (NHS) trusts in England spend over £1 billion a year on agency nurses, a number that continues to grow.<sup>59</sup> If agency nurses cannot be found (or paid for), hospitals are sometimes forced to shut down units, reducing the extent of care they can provide to their community and the amount of revenue received by the hospital.

Nursing shortages can lead to overworked conditions that harm quality, patient and staff safety, and employee morale. Highlighting the connections among employees, patients, and quality, studies show that overworked, tired, or stressed employees are more likely to make mistakes that could harm patients.<sup>60</sup> Understaffed pharmacies, imaging departments, and laboratories might have slower response times, which could delay care or put patients at risk. Physicians who are unhappy with poor service from staff or ancillary departments might react by moving their patients to a competing hospital, thus exacerbating the revenue problem.

## ***Quality and Patient Safety***

While there are differences in the healthcare systems across different countries, there are some universal problems that affect patients: preventable errors that lead to injury and death. It is

imperative that we examine and understand the details of how healthcare is delivered, implementing processes that support safe, efficient, high-quality care. Lean provides a great way to accomplish this.

Other than focusing on some high-profile incidents, the media often overlook the quality problems with the delivery of care in the United States. Many Americans know the numbers of the uninsured—approximately 41 million, even with more receiving coverage under the Patient Protection and Affordable Care Act of 2010, or “ObamaCare.”<sup>61</sup> Far fewer know the estimates of how many patients die as the result of preventable medical errors each year (different studies place the number anywhere between 44,000 and 440,000) and from preventable infections (estimated at about 100,000).<sup>62,63,64</sup>

Quality and patient safety are not concerns just in the United States. The Canadian Institute for Health Information estimated that as many as 24,000 Canadians die each year due to medical errors, such as surgical errors, medication errors, and hospital-acquired infections, which is a similar per-capita rate as the United States. The Canadian Auditor General estimated that one in nine hospitalized patients will acquire an infection during a stay.<sup>65</sup> In the United Kingdom, the Royal College of Physicians estimated that medical errors contribute to the deaths of almost 70,000 patients per year, and Britain’s most senior doctor warned that the risk of dying from a preventable hospital error is one in 300, a similar risk as in the United States.<sup>66</sup> It is estimated that 850,000 British patients are the victims of errors that lead to permanent or moderate injury in 200,000 of those cases. The NHS estimates that half of the errors are preventable, again about the same as U.S. estimates.<sup>67,68</sup> Other countries face the same challenge.

In comparison, with advances and systemic improvements in aviation safety, passengers in the general public take it for granted that they will arrive safely at their destination; we should hope for similar advances in healthcare so patients can take it for granted that they will not be harmed in hospitals. In fact, in recent years, hospitals are learning safety and quality lessons from commercial aviation, such as the use of checklists and “crew resource management.”<sup>69</sup> Some patients blindly trust the healthcare system, assuming they will receive perfect care each time. Lean methods can help us work toward making that goal a reality.

## Good Quality Costs Less

As in other industries, many in healthcare have assumed there is an inherent trade-off between cost and quality; they think better quality must automatically cost more. Patients and payers often make this same assumption. It is true that some methods for improving the quality of patient outcomes might cost more, such as new technologies, treatments, or medicines. Hospitals do have many opportunities, however, to improve the quality of healthcare delivery methods and processes in a way that also reduces costs. Across all U.S. hospitals, there is a large cost-saving opportunity that results from preventing errors and improving quality. For example, preventable adverse events from medication errors are estimated to cost health systems \$4 billion per year.<sup>70</sup> Again, a similar opportunity exists around the world.

David Fillingham, former CEO of Royal Bolton Hospital NHS Foundation Trust in the United Kingdom, has said, quite simply, “Good quality costs less.”<sup>71</sup> This was proven to be true as a result of Bolton’s Lean improvements; the hospital reduced trauma mortality by 36% and reduced a patient’s average length of stay by 33%. ThedaCare documented similar results in cardiac surgery; mortality fell from 4% to nearly zero (11 lives saved per year), with a length-of-stay

reduction from 6.3 to 4.9 days, and 22% lower cost.<sup>72</sup> It might sound too good to be true, but many hospitals are proving that you can simultaneously improve quality, access, and cost.

Lean teaches us to see quality improvement as a means to cost reductions, a better approach than focusing directly and solely on costs. Bill Douglas, chief financial officer at Riverside Medical Center (Kankakee, Illinois), summed it up as the hospital began its first Lean project by saying, “Lean is a quality initiative. It isn’t a cost-cutting initiative. But the end result is, if you improve quality your costs will go down. If you focus on patient quality and safety, you just can’t go wrong. If you do the right thing with regard to quality, the costs will take care of themselves.”<sup>73</sup> Riverside’s laboratory, for example, had previously focused primarily on cost, using layoffs and other traditional cost-cutting methods, but the lab’s quality of service did not improve. Through their initial Lean efforts, reducing errors and improving flow led to getting test results to physicians 37% to 46% faster, while improving labor productivity.<sup>74</sup> The lab’s improved service helped reduce length of stay in the ED, which allowed Riverside to postpone a \$2 million expansion.<sup>75</sup> Riverside has since spread Lean and continuous improvement to many areas including pharmacy, inpatient care, and primary care clinics, as discussed more in Chapter 12.

## Interconnected Benefits

Many of the goals and benefits of Lean are interconnected, as illustrated in Figure 1.1. Lean organizations view cost and financial performance as the end result of doing everything else well.

Improved employee engagement, through the *kaizen* style of continuous improvement, can lead to better safety and outcomes, patient satisfaction, and lower cost in direct and indirect ways. For example, higher employee engagement can reduce voluntary turnover rates, which can improve quality while reducing the cost of hiring and on-boarding new staff. Improved patient satisfaction and quality can lead to more patients choosing the health system (given that data are publicly available), which can improve the bottom line. Reducing costs can allow a health system to offer lower prices, which can lead to higher volumes as, for example, American employers start to steer employees to get care in “center of excellence” sites that have higher quality and lower cost.

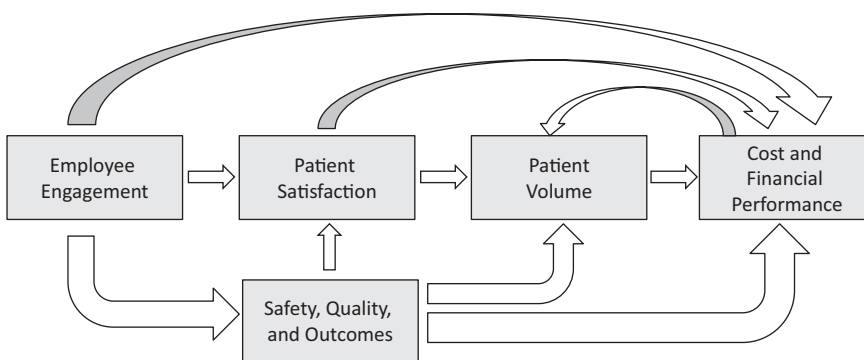


Figure 1.1 Connections between different goals and measures.

Again, Lean is about solving problems that matter and improving performance; problems that matter to patients, to staff, to physicians, to payers, and to healthcare organizations.

## A Snapshot of Department Success: Laboratory, Children’s Health Dallas

Improvements made in the laboratory at Children’s Health, formerly Children’s Medical Center (Dallas, Texas), help illustrate how Lean can provide benefits to all stakeholders—patients, employees, physicians, and the hospital itself. The lab’s leadership team was first exposed to Lean in August 2006 when they saw a presentation by Seattle Children’s Hospital, an early adopter of these methods in healthcare. The lab had previously been studying system dynamics through Peter Senge’s seminal work *The Fifth Discipline* and had high-level goals of becoming a “learning organization.”<sup>76</sup> Lean provided a means for operationalizing this philosophy in a practical way, according to Jim Adams, the senior director for lab operations from 2005 to 2011.

Prior to Lean, benchmarking data seemed to confirm the view that the lab was good, if not above average. For example, the lab reported 90% of stat test results within industry-accepted time limits. However, an initial assessment by outside Lean consultants in November 2006 helped Adams realize that the lab had actually long been experiencing, in his terms, “delusional excellence” because the benchmarked labs had the same waste built into their own physical layouts and processes; therefore, they had similar results. Instead of feeling good about exceeding benchmarks, the lab started looking at their true potential—to be the best lab they could possibly be for their patients.

The consultant’s analysis, later repeated by medical technologists as they learned to observe and better understand their own work, showed that 70% to 94% of typical turnaround time performance was time when the specimen was sitting and waiting. The new challenge became minimizing that waiting time. Instead of thinking that benchmarks showed they did not need to improve, the team learned they had large opportunities to reduce turnaround times by 50% or more, providing better service to patients, ordering physicians and departments that relied on accurate and timely test results.

A formal Lean project was initiated in March 2007, which the author led. In contrast to the common week-long Lean events that are used in many hospitals (more on this in Chapter 12), a team was formed to work on a 12-week “Lean transformation” project that focused initially on the end-to-end flow of clinical lab testing. This team consisted of four medical technologists and two lab assistants from various parts of the department. This group was dedicated full time to the improvement and redesign efforts, learning deeply about Lean principles, analyzing their current state, and working with the larger group of colleagues to transform both the physical space and their processes in an integrated way.

As another early step, the lab’s leadership initiated discussions with internal customers and learned that particular tests were deemed crucial by the ED for the sake of prompt diagnosis and improved patient flow. They were sometimes surprised to learn that tests the lab thought not to be time-critical were, in fact, considered to be so by the ED. It became more important to the lab to improve the relationships with those who ordered tests and used test results—a key part of the customer- and patient-focused Lean approach. With this better customer understanding, success would be defined by their customers’ needs rather than being defined within the lab and their assumptions.

In another example of better understanding customer needs, the lab had been having difficulty meeting turnaround times for complete blood count (CBC) tests with what’s called a



“manual diff.” The lab was “killing ourselves” trying to improve turnaround time performance. The ED told the lab that the only urgent part of the result was the basic CBC, not the more time-consuming manual diff counts. As the ED explained, “We don’t need that right away; we can wait on the manual,” so the lab focused their improvement energy on areas that would more directly benefit their customers.

The full-time project team learned and used the analysis methods outlined in Chapter 4 to trace the flow of testing work from specimen collection through the reporting of test results. As in most hospital situations, the flow moved across multiple roles in many different departments. The team focused on improving the overall flow rather than looking merely to optimize their own departmental definition of success.

While there was a longer-term initiative to fully redesign and reconstruct the physical layout of the laboratory (an effort not fully implemented until late 2010), the lab’s leadership team, including Dr. Beverly Rogers, then the chief pathologist, helped everyone understand that Lean was not a one-time project. Rather, it would become a new management system and a new way of life. Instead of putting all of their hopes on the major redesign, the lab started to take action to make immediate improvements.

Steps were taken to improve specimen flow through small, incremental changes. The blood gas analyzers, used for critically time-sensitive tests, were moved to be much closer to the tube station, where specimens arrived. This reduced average turnaround times for those tests from 20 minutes to about 5 minutes. The “front end” of the process (the nonclinical area where specimens were received, labeled, and prepped) was reconfigured. Instead of two separate work areas about 25 feet apart (a distance that encouraged batching and time delays), the preanalytical area was set up as four identical, separate “flow benches” where one person could do all of the work on a single specimen without the extra movement and delay. This reduced the average turnaround time for chemistry and hematology tests by 43%.

As the team observed and even videotaped their colleagues in the lab, they helped identify waste (as described more fully in Chapter 3) and took initial countermeasures that could reduce wasted walking and motion in the lab. The lab implemented basic methods including 5S and *kanban* (see Chapter 6) to help ensure that supplies and test reagents were always available at the right locations in the right quantities, reducing the amount of time that highly trained technologists spent hunting and gathering. In the first year of the *kanban* system (a system for planning and restocking inventory and supplies), the lab reduced spending by \$80,000. As staff productivity improved, thanks to the waste reduction efforts and new “standardized work,” as discussed in Chapter 5, the lab was able to reduce labor costs by \$147,000 in the first year, through attrition and reduced overtime, without laying anybody off.

Adams and Dr. Rogers also continued the shift toward a Lean culture, educating all staff members about Lean principles, involving them in the improvement work, and continuing group book discussions on titles like *The Toyota Way*. This talk of Lean culture, such as focusing on processes and systems instead of blaming individuals for problems, was invigorated by a number of management practices, which are described more fully in Chapter 11.

Within the lab, daily 10-minute stand-up meetings were held to review performance measures, enabling staff members to talk about their ideas for improving the process. These ideas were tracked on a simple bulletin board; an approach that was far more visual and more interactive than their old suggestion box. As new ideas were implemented, regardless of how small, recognition was given through the documentation and posting of the changes on a “*kaizen* wall of fame,” which created positive reinforcement that led to more *kaizen*, or continuous improvement, as described more in Chapter 11.

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Denver Health (Colorado) has embraced Lean and continuous improvement, first under CEO Patricia Gabow, MD, and continuing under their new CEO, Art Gonzalez. Gonzalez said, “Essentially, we use lean to apply the scientific method to the practice of process improvement. That means we do a little bit here and there and it all adds up to significant improvements.” Elizabeth Fingado, their director of Lean systems improvement, says they look for areas where the hospital’s costs are higher than their reimbursement rates. She explains, “We’re teaching every individual unit how to approach their biggest opportunities for improvement. So, if we have a priority this year to decrease costs by 2%, we will allow each unit to do it in their own way. We give them the tools to do it and teach them ways of thinking about how to do it in a way that makes sense in their area. Then they can deploy lean locally. If we do that throughout the hospital, we can find savings across every unit.”<sup>77</sup>

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Managers from different areas now meet for a daily huddle to review the hospital’s patient census, along with the status of key areas, including staffing levels. Kenny Carr, vice president of clinical and support services, says the huddles “help gel the overall Lean communication together. It’s been phenomenal.” Leaders have visited from other departments, and that huddle, along with the visual status board, is being adopted in areas including the emergency department, operating rooms, and pharmacy, says Carr.<sup>78</sup>

Adams reflected on their experience, saying “There was a growing recognition among lab users in the hospital that the lab was focused on understanding and meeting their particular needs. The nurses and physicians started working with the lab staff in a more respectful, collegial way. We felt more a part of the team caring for the patient.”

As the clinical lab was implementing Lean practices and management methods, leaders and team members introduced these approaches and mindsets to other parts of the lab, such as microbiology, blood bank, and anatomic pathology. The histology department created a new process layout with improved co-location of sequential steps, which improved flow and reduced turnaround times. “There was no flow to start,” says Elma Cortinas, anatomic pathology lab manager, but with the new layout, turnaround times for gastrointestinal (GI) specimens were reduced dramatically.

The positive impact of the cultural transformation was illustrated by the results of a staff engagement survey, comparing “pre-Lean” numbers to 12 months after the Lean education and improvement efforts started. As shown in Table 1.1, scores increased in key questions (on a 1-to-5 scale, with 5 being highest). Every single question on the engagement survey showed an improvement, highlighting the benefits of a Lean environment.

As an additional sign of meaningful culture change, two of the lab’s Lean team members accepted lab supervisor positions after repeatedly turning down the opportunity in previous years. They each took on the role because the lab’s leadership had successfully redefined the role of a supervisor from being a directive “boss” or “cop” to being a coach and teacher, working with team members to make patient-focused improvements that created a better workplace. Adams commented, “Both have thrived and are effective as supervisors in the Lean culture.”<sup>79</sup>

Even as the major reconstruction project has been completed, the lab sees Lean as its culture and a key part of its ongoing improvement efforts. It is not “complete,” as this improvement is never ending. After years of planning and waiting, the new clinical “core lab” layout was finally implemented in late 2010, as a major step function improvement. Evidence of this mindset and



**Table 1.1 Improvement in Employee Engagement Scores at Children’s Health Dallas**

	<i>Before Lean</i>	<i>12 Months after Starting</i>
3. I have the opportunity to do what I do best every day.	3.11	3.92
8. I feel free to make suggestions for improvement.	2.84	3.48
10. I feel secure in my job.	2.32	3.42
13. Stress at work is manageable.	2.43	3.23
17. I am satisfied with the lab as a place to work.	2.51	3.43
18. I would recommend my work area as a good place to work to others.	2.38	3.46
Grand average of all questions	2.96	3.69

culture shift includes the medical technologists quickly coming up with ideas for tweaking that new layout after they started working in it. Traditional cultures might not look for input, leaving well enough alone with the new design. Instead, the Children’s Health lab leaders listened and allowed staff members to experiment and make changes to the standardized work and layout based on data and their firsthand experiences.

As lab leaders reflected on their first years of Lean, lessons learned included ensuring that consistent, continuous education about Lean principles and methods takes place, especially in roles with traditionally high turnover; staff members know how key performance measures, such as turnaround time, are aligned with end patient needs—that this is about improving care, not just hitting numbers; and people do not assume that methods like 5S and standardized work are meant to be controlling and that managers constantly reinforce the importance of staff engagement in continuously improving these standards.

As of 2015, the *kaizen* wall of fame is still active, as staff are being engaged in continuous improvement throughout the lab. “We still have a good culture of continuous improvement, as we help new staff realize they have a voice,” says Amy Sigman, the current lab director. She adds that examples of improvements that are used in new employee orientation illustrate that “anything small” is an idea worthy of mentioning in huddles.

The *kanban* system is still active as the method for ordering supplies, which helps them “not run out of chemicals,” says Sigman. Updated standardized work documents and daily assignments of individuals to certain roles are still posted daily in the core lab. A 5S holding area is still used for staff to place items that are no longer needed, and “5S sweep” events are held quarterly to give special attention to ongoing 5S improvements.

After eight years of practicing Lean, “the spirit is still there,” says Carr. If “leaders all decided tomorrow to stop doing Lean,” he guesses that the lab staff would continue with Lean practices because it has helped them better serve their patients while improving quality.

Carr reflected further on their progress, saying:

Healthcare has changed so much in the past five years, especially pediatric medicine. Because we adopted Lean, we were more prepared to take on challenges associated with change. We’ve been able to address things and improve earlier compared to others.

We’ve asked hard questions up front, focused on performance metrics and asked, ‘What are our staff doing that adds value to the overall patient experience?’ Looking

at it through that lens bought up some hard questions about how to be efficient, rather than just saying ‘you need to do more.’ When we look at the process, we realize that just because we’ve done it that way doesn’t mean we need to keep doing it that way.

Now, physicians never say they have a problem with the lab, and there’s a lot of pride in that. It’s nice to step back and think about how far we’ve come. We’ve done a lot and continue to improve on that journey we started.

While Children’s Health was named “Medical Lab of the Year 2009” by a major trade publication,<sup>80</sup> it is the culture change and the willingness to never be satisfied and to continue learning that makes it more likely to again be a lab of the year in the future.

## From Departmental to Hospital- and System-Wide Success

Lean is not just a methodology that can impact individual departments. Lean can become part of the hospital’s core strategy and day-to-day operating approach, as illustrated by examples including ThedaCare, Virginia Mason Medical Center, Seattle Children’s Hospital, and Denver Health.

The story of Avera McKennan Hospital and University Health Center (Sioux Falls, South Dakota) is highlighted in Chapter 12, as their initial Lean projects, which also started in their laboratory in 2004, eventually became a management system and daily improvement methodology for the entire hospital and have started spreading through the broader Avera system.

At Avera McKennan, Lean methods are now taught to all employees in all departments, and their Excellence in Service and Process program has become a cornerstone of the hospital’s strategy and vision. Their goals are not timid, as they state, “Through service and process excellence, Avera McKennan will lead the nation in high quality, affordable health care.”

The leadership and passion started with Fred Slunecka, formerly the regional president of Avera McKennan Hospital and now the chief operating officer of Avera Health, and his people throughout the facility. To Slunecka, it is “a moral imperative” to streamline processes and eliminate waste, as “30–40% of all health care is waste—pure and simple.” The motivation for improvement came from a realization that government reimbursement was increasing 2%–3% a year, while the hospital’s costs were increasing 5% a year. “We absolutely have got to do a better job,” said Slunecka, and the hospital set out to do just that. Even with the talk of financial needs and motivations, the patient is at the center of their improvements. “The goal is a seamless patient experience, marked by great service, quality care and efficiency,” says Kathy Maass, their director of process excellence. “Lean is about examining the patient care process step by step and redesigning it around the patient to eliminate waste. Employees become involved in the solution at the most grass-roots level,” Slunecka said.

This is the potential of Lean hospitals: strategically redesigning the physical space and processes that provide patient care, while engaging all healthcare professionals and leaders in never-ending continuous improvement.

Reflecting further in 2015, Slunecka says,

After over a decade of trial and error, American healthcare organizations are finally understanding the need to adopt Lean principles. It is only through rigorous attention to work redesign and eliminating variation that we can provide the safe and reliable care that our patients deserve.

I believe that, for the last decade, most healthcare organizations viewed Lean as a tool without a major purpose. Today's focus on value requires that organizations embrace Lean to assure our patients receive what they deserve: safe and highly reliable patient care.

The historically slow adoption of Lean has probably been due to the amount of time and energy needed to change a single process in a single organization. The juice, as we say, was not often worth the squeeze. Today, the largest organizations are developing highly reliable practices and then disseminating them across all their many hospitals. Now the juice is worth the squeeze. The rapid development of 'service lines' is helping to assure that practices are quickly disseminated.

When our revenues were based on volume, quality and value took a back seat. As we confront 'star ratings' and payment penalties we are now focused on safety and quality. I believe that can only enhance the adoption of Lean over the longer term."<sup>81</sup>

## Conclusion

Hospitals and their processes are full of waste and inefficiency through no fault of the talented, caring, and hardworking people who work there. The problems that hospitals face could be discouraging—unless we also had a proven methodology for driving sustainable quality and process improvement. That could be overwhelming if we did not have others to learn from and to model our own improvement after—both Toyota and our hospital colleagues who are blazing the Lean trail.

Lean can be described in a simple way: Lean is working. In one way, Lean is about looking at how we do our work and figuring out ways to improve how that work is done. Lean is about improving quality and productivity. Lean is also about learning to fix problems permanently instead of hiding them or working around them.

In another sense, Lean is proving to be an effective methodology for improving patient safety, quality, and cost, while preventing delays and improving employee satisfaction. It can be done. Lean is working; it is effective. Lean helps save money for hospitals, while creating opportunities for growth and increased revenue. Lean methods can benefit everyone involved in hospitals. Understanding Lean principles is just a starting point. The real challenge is finding the leadership necessary to implement these strategies and to transform the way your hospital provides care.

Virginia Mason's Kaplan says, "If you want this to last, to sustain and not just be seen as another management program or initiative, it has to be the way you work, the way you do everything. Culture change comes from the CEO's commitment to work differently and to model a long-term commitment to 'better never stops.'"<sup>82</sup>

Those of us who have seen leaders successfully use Lean in many hospitals realize this is not an academic exercise or easy. Lean methods allow us to improve how hospitals are managed today. Lean methods let us improve quality now. But, Lean requires vision, leadership, and persistence. We have scattered instances of Lean success and significant results in hospitals throughout the world. As the science fiction author William Gibson wrote, "The future is already here—it's just not very evenly distributed."<sup>83</sup>

## Lean Lessons

- Lean methods started in factories but have proven successful in many functions in many industries, including healthcare.

- Quality improvements are a means to cost reductions.
- Productivity improvements and cost savings can be accomplished in ways other than layoffs or head count reductions.
- Lean is focused on patient safety, quality of care, and improved service, not just efficiency, cost, and productivity.
- Improving the system, rather than working harder, is the key to Lean improvements.
- To make major changes, you often have to start with smaller steps.
- Hospitals cannot just copy others; they need to think through their own improvements after learning Lean concepts.

## Points for Group Discussion

- Are rising healthcare costs having an impact on your hospital's quality of care?
- How can better quality cost less?
- How does personal satisfaction on the job have an impact on productivity and quality?
- What are the biggest problems your department faces? Your hospital? Your health system?
- Why does a hospital typically have departmental silos?
- Are there situations in which your departments or processes are not as patient focused as they could be?
- Why have other improvement methodologies or programs not achieved lasting benefit? How can your organization avoid repeating the same mistakes?
- What percentage of leadership time is spent expediting, firefighting, or working around problems?
- How can our Lean efforts be oriented around the mission and purpose of our organization and our people?

## Notes

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