

# Lean and Six Sigma in Healthcare

## Solving the New Dilemma: Improving Patient Outcomes and Reducing Costs

By: Ron Wince, President/CEO of Guidon Performance Solutions

With healthcare costs on a continuous upward trend, it's not surprising that there is an underlying assumption that quality healthcare is expensive. Or that to improve the quality of care, you have to spend more.

However, recent experiences demonstrate that healthcare organizations can prove both of these assumptions false—if they adopt business improvement methods. From the Cleveland Clinic to Kaiser Permanente, healthcare organizations of all types have shown that they can improve patient outcomes and simultaneously control or reduce costs.

This paper provides a brief overview of Lean and Six Sigma, the two most effective improvement disciplines used in business today, and shows they can successfully be applied in healthcare.

### Speed and Quality: The Magic Effect of Lean Six Sigma

Today there is a set of business improvement tools and methods that is gaining new prominence among service organizations. Lean Six Sigma offers the advantage of combining methods for gaining speed in processes (rooted in Lean Manufacturing techniques developed by Toyota) with the ability to improve quality (using the Six Sigma model developed by Motorola in the 1980s).

Once thought to be a “management fad,” Lean Six Sigma is now on the brink of becoming the most successful improvement methodology of all time. Over 50% of the Fortune 500 are using its tools and principles to drive operation improvements that contribute to strategic priorities. Similarly, according to the ASQ Hospital Benchmarking Study, 53% of hospitals report some level of Lean deployment, and 42% of hospitals report some level of Six Sigma deployment.

Growing acceptance of these “tools from industry” within healthcare organizations shows no signs of subsiding. Given the dynamics of the current economy—and the uncertain future of healthcare in particular—now is not the time for business leaders to expend precious capital on risky silver bullets. On the contrary, the latest economic cycle has shown that healthcare providers and insurers alike need faster adoption of Lean Six Sigma and a corresponding shift in culture to be capable of getting maximum value from business processes without spending excessive capital.

The longevity and renewed popularity of Lean Six Sigma can be attributed to the flexibility it provides from a core set of principles and tools useful in nearly any business environment. Moreover, Lean Six Sigma is readily integrated with existing business management methods such as Balanced Scorecards, Policy Deployment, and Empowered Work Teams, to name a few. But most importantly, Lean Six Sigma has proven to have high acceptance rates in corporate cultures regardless of industry, business size, or competitive environment.

### Lean = Speed

The term Lean Manufacturing was popularized in the book *The Machine That Changed the World*, written by James Womack, et al, and published in 1990. The book detailed the Toyota Production System (TPS), comparing and contrasting it to other approaches in automotive manufacturing. As

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a result, the term “Lean” became synonymous with the principles and methods developed over five decades to create the most efficient manufacturing processes in the world.

At their core, Lean methods are focused on reducing waste. And “waste” in the Lean discipline has a very specific meaning: it is anything that does not add value in the customer’s eyes.

By definition, if an activity consumes resource time or capital but does not add value it must be wasteful and should be eliminated—or at least minimized as much as possible. Value and waste are extremely important concepts, and it’s not always obvious which is which, especially in healthcare.

Here is one example:

*Six cardiac surgeons in one hospital each ordered two types of “surgical packs” (one for their coronary artery graft surgeries and another for valve surgeries). Initially, each surgeon argued that their specific kits were needed for some particular purpose. Having surgeons be able to use the specific equipment and supplies they want to use sounds like something that would be of value to patients, right? But allowing this practice to continue meant the hospital had to work with multiple vendors (having little leverage with any single one of them because of low purchasing volumes), track and stock 12 different kits, and so on.*

*When the hospital got all the surgeons in one room and had them talk through all the components of their individual kits, it turned out there was more agreement than anyone could have predicted. In the end, the surgeons all agreed on just two standard surgical packs, one for each type of surgery. So instead of having to purchase, track, and account for 12 packs, the hospital now only needed to handle two. In other words, having some differences in surgical packs was value-added to the patient, but having too much variability was waste: it added to the administrative cost without improving patient outcomes.*

## Rapid Improvement with Minimal Training

The results from this cardiac surgery unit were generated by having a Lean expert guide a team of frontline employees (which included surgeons, nurses, care plan managers, and administrators) who received only a brief introduction to Lean concepts. This is a typical model of Lean-based improvement: you can make a lot of progress very quickly by leveraging the knowledge that people have gained simply by doing their work everyday. A Lean expert can help them translate and structure their knowledge in ways that leads to many ideas for immediate improvements. (Successful implementation must also be guided by an expert because it requires careful planning, pilot testing, and data-based follow up to make sure that the ideas help rather than hurt the process or generate no value at all.)

The issue of value vs. waste is complicated in sectors such as healthcare that are highly regulated because there are business practices you must perform so you can stay in business, even though they are “non-value-added” as far as your patients are concerned. Such compliance practices cannot be labeled “value-add” since they don’t directly affect your customers (healthcare consumers), but are typically labeled as “business non-value-add” to differentiate them from pure waste.

But just because compliance activities are required, that doesn’t mean the way you are doing them is sacred. There is usually a lot of pure waste in compliance processes—activities that only slow down the process or add cost without adding “value” to your ability to be compliant. Healthcare organizations have found that by applying Lean principles they can perform such “business required” tasks faster and cheaper.

## Waste Is the Enemy of Lean

In nearly every organization 95% or more of the activities and time in business processes do not add value; they are waste. The goal of Lean is to root out these activities and quickly eliminate them.

There are seven widely recognized categories of process waste:

- 1. Defects** – work performed incorrectly that must ultimately be accurate in order to create value.
- 2. Work In Process** – build-ups of queues and transactions which have not been completed.

- 3. Overproduction** – doing activities earlier than necessary. Typically leads to accumulated Work-in-Process.
- 4. Waiting** – people and transactions idled due to work imbalances, defects or other root causes.
- 5. Motion** – unnecessary human movement required to complete a transaction or customer request.
- 6. Transportation** – movement, either physically or electronically, of a customer transaction which consumes resources and costs, but is not required to satisfy the customer.
- 7. Overprocessing** – excess activity or steps that do not add value to the service or product for the end customer.

In practice, Lean engages employees throughout an organization, in particular those who know the actual processes best, to examine processes through the lens of the seven forms of waste. Typically this is done through some method of rapid problem solving with the most common approach being known as **Kaizen** (kye-zen) breakthrough events (Kai = change; Zen = for the good).

Kaizen events involve deploying small, agile and short term (typically 4 – 5 days within a single week) project teams which are charged and empowered with taking a process, assessing the current state, brainstorming waste reduction and improvement ideas, implementing the ideas quickly and putting in place new process standards and sustainment tools before reporting results out to business leaders. The goal of Kaizen is to draw employees into the ongoing pursuit of waste and create a culture capable of rooting out and eliminating waste continuously.

## Examples of Kaizen Event Results in Healthcare

- Improved Press Ganey scores by 20%
- Reduced the footprint for a new lab from 60,000 sq ft to 40,000 sq ft (cost avoidance of \$800,000)
- Improved utilization of equipment, ER, OR, and Procedure rooms by over 20%
- Shortened the lead time from discharge to payment by over 10 days
- Eliminated unnecessary work for support staff, nurses, providers and improved productivity by 15-20%

## List of Lean Tools

- **5S & Visual Controls** – These tools are used to eliminate waste that is cluttering up workspaces and to make it easier for people to do the right thing the first time around.
- **Kaizen** – A model of “focused improvement effort” in which groups of people with the right types of knowledge and experience come together for anywhere from a few days to a week and work on identifying ways to improve a process or solve a specific problem.
- **Pull** – Adding signals at key points in a process so that work can be “pulled out” of one step when it is required for the next step, rather than pushed out of the first step.
- **Flow** – Paying attention to how work flows through a process, and removing barriers at every step that slow down the flow or make the work inefficient.
- **Just In Time** – Providing materials and information to the point in the process where it is needed at exactly the time it is needed for someone to complete a step in the process.
- **Jidoka** – Responding to any deviation in quality or performance as soon as it happens. This prevents errors/waste from being passed to the next step or process in a chain, and keeps it from reaching the customer.
- **Value Stream** – Examining the series of linked processes/steps that produce the value your organization exists to produce. The concept of a “value stream” forces us to look at how work is passed from one process to another, and how value is created (and destroyed) in our processes.

The bottom line is that Lean focuses on creating processes producing the right product or service, in the right quantity at the right time with minimum amount of effort, resources, capital and time.

## Six Sigma = Precision

While Lean focuses on increasing efficiency and flow of processes, Six Sigma focuses on improving the capability of a process to consistently deliver quality outcomes that meet customers' expectations. A core tenet of Six Sigma is that by removing variation from a process, you decrease the chances of introducing errors in a statistically measurable and controllable way.

Born within Motorola in 1979 out of frustration with quality problems, the term Six Sigma (or  $6\sigma$ ) refers to six standard deviations from a target value. The principle is that businesses need to remove enough variation from their processes so they will still meet customer requirements (or specifications) even if the output of a process is six standard deviations from the average value. In other words, the variation in the process output is much less than the distance between customer specifications. (The model for outstanding quality was arbitrarily set at six sigma because that level of performance seemed unattainable at the time and thereby a worthy goal for a world-class organization.)

In contrast to Lean, Six Sigma relies more heavily on practitioners with specialized skills and training in statistical tools and structured problem-solving methods. Six Sigma experts are certified in a rigorous process using a martial arts-like naming system. Completing a basic course earns people a White or Yellow "belt"; more advanced training and leading projects successfully to completion earns them a "Black Belt."

Like Lean, Six Sigma has a well developed set of tools and methods that practitioners employ. Three core tenets drive the Six Sigma methods:

- Six Sigma focuses on quality, and it defines quality at an extremely high standard. To perform at a "six sigma" level means getting something right 99.99966% of the time. Less quality than this, and there's room for improvement.
- Six Sigma achieves quality largely through reducing process variation. (Reducing variation means a process is more predictable and reliable.)
- Six Sigma establishes an organization's capability to create high quality processes and to be a high quality organization as a whole.

## Lean + Six Sigma = Lean Six Sigma

In some organizations, Lean and Six Sigma have been viewed as competing priorities. While they have taken separate paths getting to where they are today, the core concepts of Lean (increase efficiency through speed and process flow) and Six Sigma (increase quality through defect elimination and capability) both begin with the same focus on the customer and value creation. When explicitly employed together, they exemplify synergy – achieving more together than either could alone.

## Best Practices for Applying Lean Six Sigma in Healthcare

There is no single perfect approach to launching and gaining benefit from Lean Six Sigma. Ample case studies demonstrate that success can be gained without following a boilerplate solution. In the end, Lean Six Sigma must be a part of an organization's management system that can incorporate the philosophies, tools, methods and principles from Lean and Six Sigma into the overall business strategy and culture.

With that said, best practices have emerged in the past 20 years or so that make success in gaining benefit from Lean Six Sigma more realistic. Business leaders in the healthcare industry who are considering taking their organizations down a Lean Six Sigma path should consider these principles and decide how they apply to their own situations:

**Leadership Leading** • As with many other types of change initiatives or strategic imperatives, success with Lean Six Sigma is ultimately predicated on the attention span of leadership. If senior executives actively provide leadership, accountability, direction and vision while delegating tactics and actions, the chances are Lean Six Sigma will be a success. When this isn't the case the efforts begin to flounder. Enthusiasm wanes, impact declines, and projects become misaligned from true business objectives. The result will be that an organization has no choice but to rely on spending money to hire consultants and acquire technology solutions.

Leadership must recognize that Lean Six Sigma is just one component of a high-performance business ecosystem, along with business process management technology, performance

scorecards, strategy planning and deployment, training and talent development. And as such it must become as much an element of driving growth and profitability as the management of capital budgets and customer relationships.

**Speedboat Versus Ocean Liner** • Years ago, the ideal deployment of Lean Six Sigma was thought to involve massive launches of employee training programs and improvement projects. But experience has shown that it can take a long time to turn an ocean liner—and it can be a year or more before an organization taking this approach will see significant, meaningful impact on bottom line results.

While widespread adoption of Lean Six Sigma practices is still a useful goal if you want to transform your organization so it can achieve and sustain exceptionally high levels of performance, there are many paths to get there. In some cases, it is best to launch a number of speed boats: finding one or two significant but self-contained opportunities to pilot Lean Six Sigma. This approach can help gain buy-in, demonstrate the potential of the approach, and let the organization learn more about the tools and methods and how they will fit into the overall ecosystem of the organization. Even more importantly, pilots provide a hint of how the culture of an organization will view Lean Six Sigma and what “antibodies” will emerge to try to fend off the foreign invader.

**This Is Not Home Depot** • Far too often companies decide to take a “Do-It-Yourself” approach with major transformation and improvement efforts. They look for textbook roadmaps and send a few employees to classroom training with the hope they can save money on the effort. But while bootstrapping may have its place in business, when you’re trying to implement a system that will affect your organization’s ability to perform all of your work, it’s better to try to get it right the first time.

That’s why most organizations have found it helpful to bring in outside expertise when launching Lean Six Sigma initially, building in plans to transfer the knowledge and skills to in-house staff on a reasonable timeline. Especially in the early days of deployment, the ability to leverage the expertise of someone with ten or more years of experience in Lean Six Sigma application not only helps to deal with any “antibodies” that arise, but also to accelerate the journey from launch to maturity – something that is critical in the uncertain economy of the future.

**WIIFM** • Just as critical to your ability to put your best foot forward in launching Lean Six Sigma is the need to align projects to business objectives. In the past, a common mistake was for organizations to launch projects that had very little impact on the real needs of the company. The paradox that these companies discovered was that not only did Lean Six Sigma projects picked without regard to business priorities not deliver needed and desired results, but they consumed precious resources – resources needed to drive the results that matter.

That’s why today’s approach is to select projects because of their potential impact on something that matters to your company - such as increasing customer satisfaction, improving efficiency and effectiveness, or driving profitable growth.

This principle is true not only at the organization, but at the department and individual levels. Lean Six Sigma projects must be selected with a mindset of “What’s In It For Me” (WIIFM) in order to capture the minds and hearts of the business unit and functional managers as well as frontline associates.

**Accountability and Measurement Drives Success** • Lean Six Sigma tools and methods have been proven time and again to deliver rapid, double digit improvements in financial and operational measurements. But early in the adoption cycle, leaders may be willing to applaud incremental improvement and thereby set the standard that “good is enough.” To be successful, you need to set the bar higher, measure impact and expect great results. High standards will create urgency and focus and prevent sandbagging down the road as Lean Six Sigma becomes more pervasive.

**From Functional Pilots to End-to-End** • Many companies enjoy great success applying Lean Six Sigma within the functional silos of their organization. And while this is of great importance in delivering solid, bottom-line benefits, functional improvement leads to local optimization and often fails to provide impact to the customer. Some of the greatest

opportunities for driving performance excellence exist in the gaps between the functional groups along the end-to-end continuum where companies deliver value for their customers. In Lean Six Sigma terms this is known as the customer Value Stream and presents the greatest opportunities for companies to generate competitive advantage and drive top-line growth while simultaneously improving profitability.

## Unique Challenges of Lean Six Sigma in Healthcare Organizations

While healthcare organizations are the perfect subject for process improvement initiatives such as Lean Six Sigma, they present challenges that manufacturing companies often don't face.

Common challenges to successful improvement initiatives in services such as healthcare include:

**Waste in Process Is Hidden** • On assembly lines in manufacturing, it's relatively easy to see when people (or materials) have to move around, or if there are piles of scrap or stacks of unused components lying around. But within a healthcare organization, the piles can't be seen quite as easily. In the cardiac unit described earlier, it was obvious that there were many different surgical packs in the supply room. But what would the waste of inefficient protocols look like? Or the waste of using brand name drugs when a generic would do? Or of having too many decision makers involved a process. Just observing processes won't help identify much of the waste and defects that are buried within the administrative and service processes, such as those in healthcare. This makes it critical to leverage the combined analytical tools of Lean Six Sigma to make hidden processes visible to facilitate diagnosis, action and improvement.

**Proliferation of Customization Has Complicated Improvement** • Over the last decade the focus on mass customization and serving the unique needs of each customer have led to a proliferation of services within hospitals, banks, insurance companies, benefits management, government agencies and other non-industrial companies. While most manufacturing companies offer only a few options in their products, service companies must deal with the unique tastes and needs of the individual. This complexity creates unique challenges for tools and methods that were designed to create stability and predictability. To successfully deploy Lean Six Sigma tools, companies must learn to stay true to the principles and philosophies of Lean Six Sigma but in ways that are consistent with the needs of a service environment.

**A Daunting Prospect** • Manufacturing companies have been involved in some form of quality control and quality assurance for nearly a century. When these older methods proved no longer effective and manufacturers moved into Lean Six Sigma practices, they at least had a foundation of quality language and concepts to build on.

Few services have that kind of foundation. So the enormity of the challenge—most processes are “unimproved,” priorities vary across divisions/location/service areas, few skills to build on, business operations with dissimilar dynamics under one roof, lack of documentation and procedure—can seem daunting. That's why healthcare organizations have to pay close attention upfront to where, why, and how they are going to launch a Lean Six Sigma effort.

**Lives Are at Stake** • Healthcare providers work in an environment where decisions they make affect the health and quality of life of real people, every day. They are, understandably, reluctant to “try out” changes. What's important to realize is that Lean Six Sigma and other improvement disciplines are not in competition with medical practice standards. They are there to make sure that everything surrounding the medical treatment of patients happens most efficiently and effectively, so that all patients receive the highest quality care a facility is able to provide without creating unnecessary costs.

Despite the challenges facing healthcare today, it's critical that healthcare providers and insurers continue to find solutions to improve efficiency, drive growth and position themselves for the future. And while Lean Six Sigma is not a silver bullet for driving business performance improvement, it is a key element of a high-performing business ecosystem which provides the ongoing catalyst to drive innovation while also improving outcomes. Additionally, the long success Lean and Six Sigma have had takes a significant amount of risk out of adopting these techniques (compared to risks of bringing in brand new methods and systems). For the future, Lean Six Sigma looks to continue to play a pivotal role in helping healthcare organizations thrive in any economy.

## **About Guidon Performance Solutions**

Guidon is a global management consulting organization that helps clients achieve rapid, sustainable improvements in operational performance and growth. Guidon pioneered the combined application of Lean and Six Sigma in the service sector and has a proven track record working with clients in financial services, insurance, healthcare, government, retail, technology and other service organizations. With a full-spectrum of capabilities focused on people, process, and technology, Guidon provides strategic direction and hands-on implementation to guide cultural and organizational transformation. Guidon's approach, aligned with client leadership, generates measurable results including revenue growth, cost reduction, productivity improvement, increased customer satisfaction and innovation.



866.986.4414 or 480.986.4414  
contact@guidonps.com  
[www.GuidonPS.com](http://www.GuidonPS.com)