LEAN MANAGEMENT SYSTEM IN HEALTHCARE

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By
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CERTIFICATION OF APPROVAL

LEAN MANAGEMENT SYSTEM IN HEALTHCARE

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DEDICATION

To my daughters, Tiffany and Tamara, and my grandchildren, Taj, and Aria, who provide me daily with strength, motivation, and unconditional love. I could not have accomplished this without you. You give me the inspiration and desire to be a better person. Each of you have been my greatest blessing, and it has been an honor to be your mother and grandmother. I'm not perfect, but my hope is that I have made you proud.

ACKNOWLEDGEMENTS

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ABSTRACT

Improvements in quality and efficiency while controlling costs in healthcare are major strategic initiatives for many organizations. Many healthcare organizations are implementing a Lean Management System as the method to tackle these demands. When a Lean Management System is implemented properly, it will transform an organization's culture. If the culture is focused on continuous improvement, sustainment is more likely to occur. In this project, I will define Lean, describe how a Lean Management System is used in healthcare, and consider its advantages for patients, staff, and physicians.

CHAPTER I

WHAT IS LEAN?

Lean is a quality improvement philosophy that focuses on the customer. A Lean Management System (LMS) considers how to continuously improve value (what is your customer willing to pay for) to the customer while removing waste, improving quality and efficiency, and reducing costs. In other words, LMS focuses on giving the customer more for less (money and resources). Lean is a process that focuses on optimizing flow across all departments and customers. To optimize flow, management must focus on the entire process by looking at the flow horizontally across customers, technologies, departments, and assets. Lean is not just a set of tools or methods, it is a culture and way of thinking. When an organization has a Lean culture, and continuous improvement is encouraged, the improvements are more likely to be sustained.

A value stream in LMS terminology is a chain of events that are taken to deliver a certain product or service. It is critical to analyze the entire value stream instead of separate points when trying to eliminate waste. Eliminating waste can include fewer defects, less human effort, reduction in space, a decrease in capital, less time to make products or deliver services, and lower costs without sacrificing quality.

Gemba, another important term used in LMS, is defined as "the real place" in Japanese. In business, the Gemba is where the value is created. For example, in manufacturing, the factory floor is the Gemba.

There must be a commitment on the part of senior leadership for a Lean Management System to be successful. This is often difficult because many want proof that something works before they are willing to commit. A company must also undergo a culture change, including how it hires, trains, analyzes, assesses, and grows. Adopting a new way of thinking is not easy, so the concept must be supported from the top. "Building a long-term learning culture is the most difficult part of any Lean journey, but it is also the most powerful and most personally rewarding part" (Koenigsaecker, 2013, p. 306).

Lean is a way of thinking for the entire organization and the best value creator, not just a way to reduce costs. An organization needs to undergo a transformation since a new way of thinking must be implemented. This takes long-term commitment and perseverance. Lean is an improvement system driven by people that can improve any process. According to Hafey (2014), "It's not a program; it's a philosophy. It's a way of thinking and seeing the world" (p. 1).

Sutter Gould Medical Foundation (SGMF) is a not-for-profit healthcare organization that serves communities in the Central Valley of Northern California in 25 locations across 3 counties. SGMF is affiliated with Sutter Health, a healthcare network with more than 35,000 employees. The Gould Medical Group (GMG) has more than 300 physicians in primary care and specialty practices and is associated with SGMF.

At SGMF, the culture change began with thinking differently about their purpose as a leader. SGMF adopted a servant leadership model. Leaders went to the Gemba,

observed the frontline employees, and supported their improvement work. Leaders did not take on the work of improvement; instead, they supported and enabled their employees to engage in improvement activities.

Lean management includes five basic principles suggested by Womack and Jones (1996):

- Specify the value desired by the customer

- Identify the value stream for each product providing that value and challenge all of the wasted steps (generally nine out of ten) currently necessary to provide it

- Make the product flow continuously through the remaining value-added steps

- Introduce pull between all steps where continuous flow is possible

- Manage toward perfection so that the number of steps and the amount of time and information needed to serve the customer continually falls (pp. 16-18).

When considering whether or not something is waste, it is important to ask if a customer would be willing to pay for the organization to do something and if they would be willing to pay the organization if they had to do it again.

History of Lean

In 1913, Henry Ford was the first person who truly integrated an entire production process. Ford created a flow production that used standard work and consistently used interchangeable parts. He created assembly lines to assemble the components for each vehicle. Ford created flow; however, he was not able to provide variety. The world wanted variety and, unfortunately, Ford was limited in what he could provide to his customers.

In the 1930s, Kiichiro Toyoda, Taiichi Ohno, and others at Toyota looked at their process and believed that they could create a system that would provide both continuities in the process flow and a wide variety of product offerings. They reviewed Ford's original thinking and created the Toyota Production System. Toyota would later integrate takt time (rate at which a product can be finished), flexibility, and Ford's concept of continuous flow. This integration allowed Toyota to create small batches of high-quality products with short lead times.

Taiichi Ohno would later be considered by many to be the father of modern Lean management. The term "Lean" was used to describe Toyota's business during the late 1980s. Jim Womack, at MIT's International Motor Vehicle Program led the research team. The success of Toyota created a demand to understand Lean thinking and principles.

Goals of Lean

An organization that wants to implement Lean thinking must first understand what their customer thinks is valuable. The organization then must focus on what it will take to continuously improve their processes to increase value to their customer. The organization attempts to eliminate waste/defects by creating a process that delivers the most value to the customer. Lean also addresses other goals such as safety, quality, delivery (reducing delays & waiting through a process), cost, and morale.

Another fundamental goal of Lean is to identify and minimize/reduce waste. This can only be accomplished by spending time in the Gemba (workplace) to

observe the *gembutsu* (specific process) and go through the steps of the process. It is important to understand the process before organizations can find waste and opportunities to improve the process.

How to Implement Lean

To implement Lean in the organization, the leadership must think of this endeavour as an enterprise-wide transformation – not a discrete implementation in selective areas. Typically, an organization evaluates the flow of its services in a value stream context and not by siloed departments or disconnected processes. By seeing and creating flow of its services from a value stream perspective, an organization begins to become nimble and able to respond quickly to their customer's needs while still providing high variety, high quality, and low cost with fast output times.

There are five major components to implement Lean in any organization: lead from the top; defined strategy: lean becomes the vehicle to achieve the enterprise strategy; transform the people; value stream focus; and daily improvement and sustainment

Lead from the Top

Senior leadership must be the drivers of the culture change that needs to take place. Each leader should commit to being a lean expert, lead by example, and learn by doing. Leadership needs to be developed so they can teach other leaders in the organization. Leadership must also be willing and humble enough to invest in a Lean coach.

Defined Strategy: Lean Becomes the Vehicle to Achieve the Enterprise Strategy

The organization needs to define their True North (guiding principles) and their focus needs to be on the processes, not just the results. There needs to be a focus on the fundamentals of Lean: standard work, pull system, one-piece flow and work to takt time and Lean principles.

Transform the People

The people in the organization need to change their way of thinking and focus. This means all people in the organization. People are resistant to change so having the leadership and employees understand the changes and why they are necessary is key. Leadership must also provide structure, support and a safe environment focused on learning. A respect for people is critical. Respect for people would include listening, coaching people at their level of learning, allowing them to make mistakes and encouraging them to see waste and opportunities for improvement.

Value Stream Focus

Focus needs to be on the entire value stream instead of individual points in a process. Focusing on the value stream requires looking at the current state and designing a future state (value and non-value activities) by analyzing the product of service from the beginning through to the customer.

Daily Improvement and Sustainment

There should be a focus on daily improvement. Lean Daily Improvement (LDI) makes systematic small-step changes. A daily management system is key to sustain the gains of daily improvement. Daily management huddles are critical to for

improving employee engagement, transparency, solving problems, identifying

opportunities and sustainment.

Figure 1, with disconnected processes and disorganized flow is an example of

how a traditional company not leveraging Lean operates.
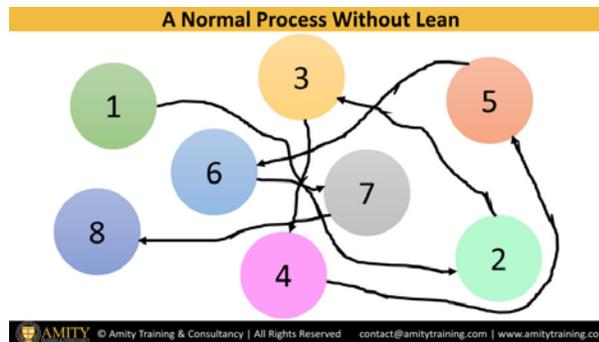
Figure 1. A normal process without lean. What is lean? (n.d.). Retrieved from

http://www.amitytraining.com/what-is-lean/

Once Lean is implemented, and the value streams work together than proper flow

happens as shown in the picture below. Pull rather than push systems are created as

shown in Figure 2.
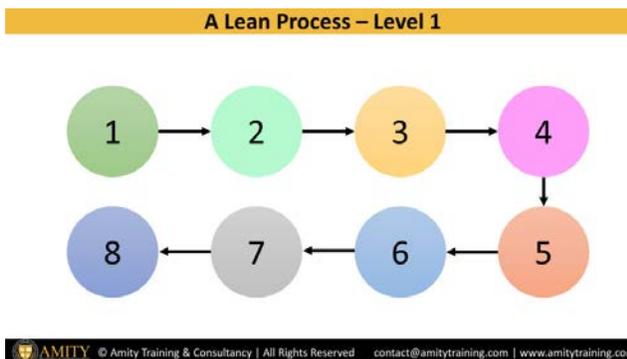
Figure 2. A process where lean is implemented. What is lean? (n.d.). Retrieved from

http://www.amitytraining.com/what-is-lean/

As the process of continuous improvement is implemented several processes may either be simplified, eliminated or combined. This can provide more value to the organization and costs can be reduced or possibly eliminate. Figure 3 shows the advancement of continuous improvement.
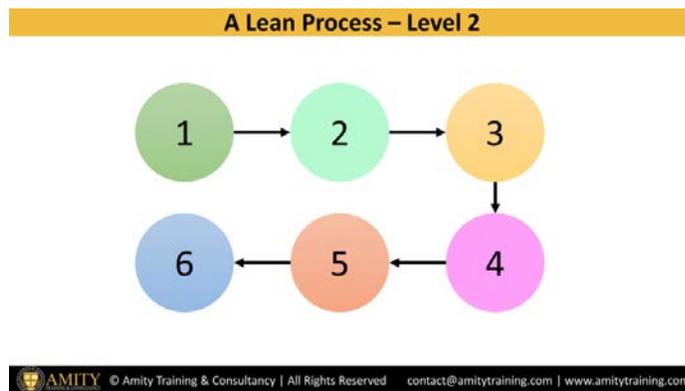
Figure 3. A lean process with continuous improvement. What is lean? (n.d.). Retrieved from http://www.amitytraining.com/what-is-lean/

SGMF identified the value-add activities for leaders so they could track and support the shift in leadership. The value-add activities include work that builds others, builds the team, builds the organization, and builds the person. SGMF defined standard work for leaders, such as attending huddles, tracking whether teams were identifying and monitoring metrics for improvement, and championing Rapid Improvement Events (RIEs). Leaders tracked their time using leader standard work. Leaders were expected to work towards increasing the percentage of time spent on value-added work. Leaders' compensation was tied to the improvement activities of the teams they lead.

CHAPTER II

HOW IS A LEAN MANAGEMENT SYSTEM USED IN HEALTHCARE?

Healthcare leaders, like many organizational leaders, have enormous pressures to perform. As the United States healthcare system shifts toward improving outcomes, the pull for their time and the demand for new strategies increases. By being visible, supportive, and engaging with the front-line, healthcare leaders can create a work environment that encourages continuous improvement, creates new ideas, and promotes safety. The healthcare industry is also facing unprecedented nursing and physician shortages, patient frustration, increased expectations, quality errors and issues, and interference from insurers. In light of these challenges, many healthcare providers are turning to Lean healthcare since its approach has been proven to assist with dealing with many of these issues.

Lean is often implemented in non-production/manufacturing settings including healthcare since it has proven to be a successful way to improve quality and reduce wastes and costs. Lean has the potential to help lower the costs associated with healthcare, increase job satisfaction, improve service provided to the patients, and increase job performance and satisfaction of physicians and their staff.

The core principles for Lean healthcare are

- focus on patients (not the hospital or staff) and design around them,

- identify value for the patient and get rid of everything else (waste), and

- minimize time to treatment and through its course.

Since the implementing Lean is a culture change, healthcare organizations must first engage their leaders including senior leaders in strategy deployment or *hoshin kanri* (a standardized process to select and focus on key initiatives). Lean can be successfully implemented in any organization, regardless of structure, size, or physician model.

Leadership must also set the expectation that every person in the organization, including executives, are required to actively apply scientific thinking Plan Do Check Act (PDCA) to remove waste and variation. The PDCA cycle as represented in Figure 4, a four-stage repetitive model used for continuous improvement of a process. Organizational silos will only create barriers and frustration. The organization must be open to the fact that there are defects that are occurring and improvement is necessary.

Excerpted from Perfecting Patient Journeys   Published by Lean Enterprise Institute
                                                             lean.org

PDCA and Improvement Steps

- Problem statement
- Lean value proposition
- Socialization
- Elevator speech
- Current-state map

Grasp the Situation

- Identify systemic problems
- Identify cultural barriers
- Establish next gap
- Select next improvement project

Act

Plan

- Future-state map
- Goal and action plans
- Socialization

Continuous Improvement

- Performance to plan
- Capture learning
- Reinforce PDCA discipline

Check

Do

- Measure results
- Visual management
- Problem solving
- Conduct reviews and checks
- Transition to continuous improvement
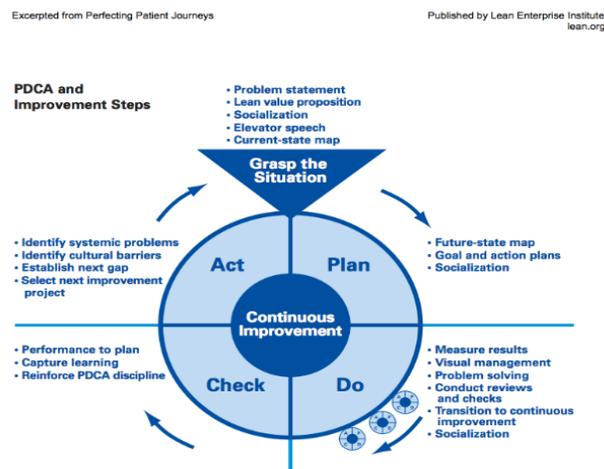- Socialization

Figure 4. PDCA and improvement steps. PDCA and improvement steps. (n.d.). *Lean Enterprise Institute*. Retrieved from http://www.leanblog.org/wp-content/uploads/2013/01/Screen-Shot-2013-01-30-at-11.26.26-AM.png

To implement a Lean Management System in healthcare, organizations must focus on five major components: leading from the top in healthcare; defining strategy in healthcare: lean becomes the vehicle to achieve the strategy; transforming the people in healthcare; daily improvement and sustainment in healthcare.

Leading from the Top in Healthcare

In healthcare, senior leadership, such as the CEO, COO, CMO, physician partners, and operation leaders, must be the drivers of the culture changes that need to take place. The leaders need to articulate their vision, determine their core values, create a code of conduct, set expectations, and develop a deep understanding of their Lean knowledge. Executives and leaders need to interact with employees and be prepared for setbacks. Setbacks are likely to occur since there is likely to be resistance to new Lean structuring from employees.

Leaders also need to have humility. Many problems will come to the surface that may be a caused by the senior leadership or other leaders in the organization.

Defining Strategy in Healthcare: Lean Becomes the Vehicle to Achieve the Strategy

Leadership needs to make the case for Lean, attempt to get everyone involved, and get them on board. The focus needs to be on looking forward, non-traditional measurements, end of the month reviews, and standard cost accounting. The organization must define their True North metrics. ThedaCare, long considered a leader in the implementation of Lean healthcare uses True North metrics developed around the following key business drivers: safety, quality, people, delivery, and cost.

Figure 5 illustrates ThedaCare's True North metrics for their organization while maintaining their focus on their customer. Sutter Gould's True North metrics are safety, quality, people, service, and finance.

Figure 5. ThedaCare's true north metrics. ThedaCare's true north (n.d.). Retrieved from http://www.mayoclinicproceedings.org/cms/attachment/2005916356/2026344429/gr2.jpg

Transforming the People in Healthcare

To successfully transform people in healthcare, careful consideration must be given to a diversity of perspectives; a wide range of personalities, priorities, experiences; and the backgrounds of patients, doctors, executives, managers, other leaders, nurses, and staff. There are challenges in understanding how to support, provide value to, and engage people in each area, and healthcare systems must use a collaborative effort. If done properly, the results in healthcare can prove to be more rewarding than any other industry.

Leadership must respect and support all employees and strive to create future leaders. Transforming people will include allowing front-line employees to identify

and solve issues, thereby empowering them. The intent of Lean management is to

create a culture of problem solvers and increase employee engagement. Employees

need to feel valued and should understand how they can personally contribute to the

overall goals and success of the organization. A comparison of the differences of

traditional work viewed as part of operations vs. the difference when Lean principles

and methods are applied is shown in Figure 6.

Traditional vs Lean Work Environment

Traditional	Lean
• Complex	• Simple and visual
• Management by status reporting	• Management by sight
• Push system	• Pull system
• Just-in-case inventory	• Inventory as needed
• Batch production	• Single item or small lot size
• Long lead time	• Minimal lead time
• Quality inspected in	• Quality built in
• Functionally managed	• Value stream managed

Figure 6. Traditional vs. lean work environment. Seeley, R. (n.d.). *Lean Daily*

Management (LDM). [Powerpoint]. Retrieved from

http://www.results.wa.gov/sites/default/files/Lean%20Daily%20Management.pdf

Value Stream Focus in Healthcare

The organization needs to create a value stream structure. Sutter Gould

Medical Foundation originally decided to spread/implement Lean in phases. SGMF

started in Internal Medicine in May of 2010 and Lab in November of 2010. Figure 7,

outlines the timeline and specific value streams that SGMF used to spread Lean. By

spreading Lean in stages it allowed them to focus on one value stream at a time and

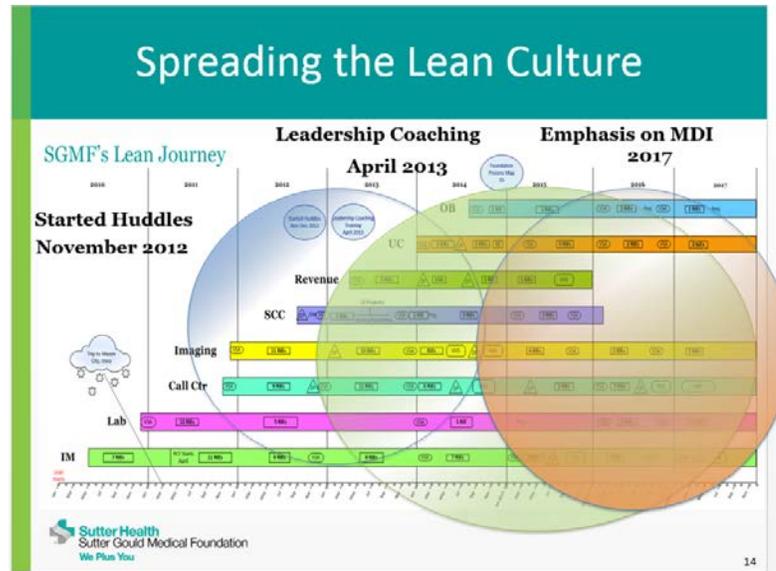reflect on their learnings before moving to the next value stream.

Figure 7. SGMF's lean journey. Manuel, M., & Mitnick, S. (2017) *Sutter Gould*

Medical Foundation (SGMF) Lean Practitioner's Conference (LPC) [Powerpoint].

Retrieved from http://simpler.com/Portals/3/assets/SutterGould.pdf

A value stream map can visually show each step in the process from

beginning to end. Opportunities for improvement can be easily seen. A current state

and future state map showing the opportunities can be helpful and provide a

framework and rallying point to begin Lean work.

Daily Improvement and Sustainment in Healthcare

Lean Daily Improvement (LDI) makes systematic small-step changes and is

critical for sustainment. It is focused on the development of the team and audits the

daily performance. Performance if audited daily can catch small deviations/defects in

the process so adjustments can be made in real time. Lean daily management includes

leadership coaching of the team members, daily huddles, daily check-ins, and Gemba

walks. Figure 8 illustrates the Lean daily management goals to support lean principles

while maintaining minimal inventory. To sustain proper behaviors Lean Daily

Management Elements should be followed as shown in Figure 9.
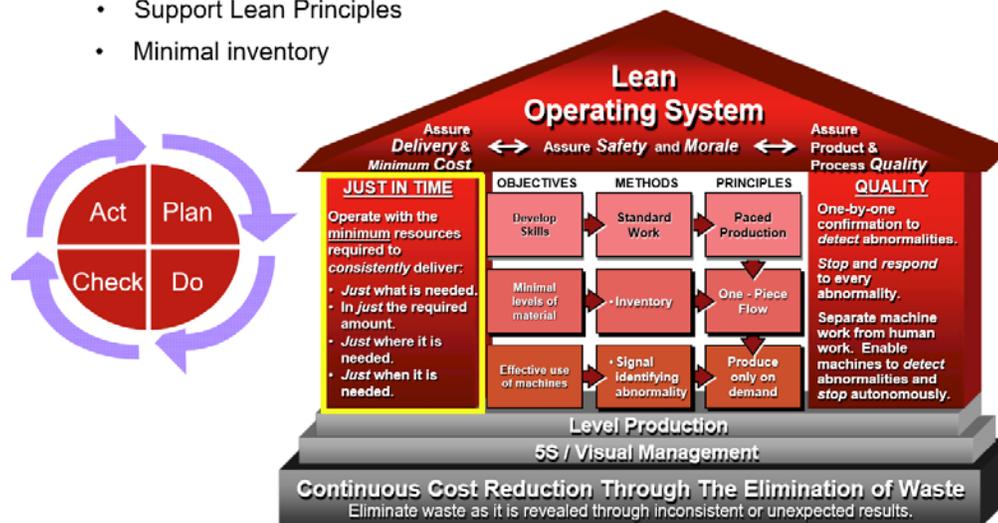
Figure 8. Lean daily management goals. Seeley, R. (n.d.). *Lean Daily Management*

(LDM). [Powerpoint]. Retrieved from

http://www.results.wa.gov/sites/default/files/Lean%20Daily%20Management.pdf

Lean Daily Management Elements
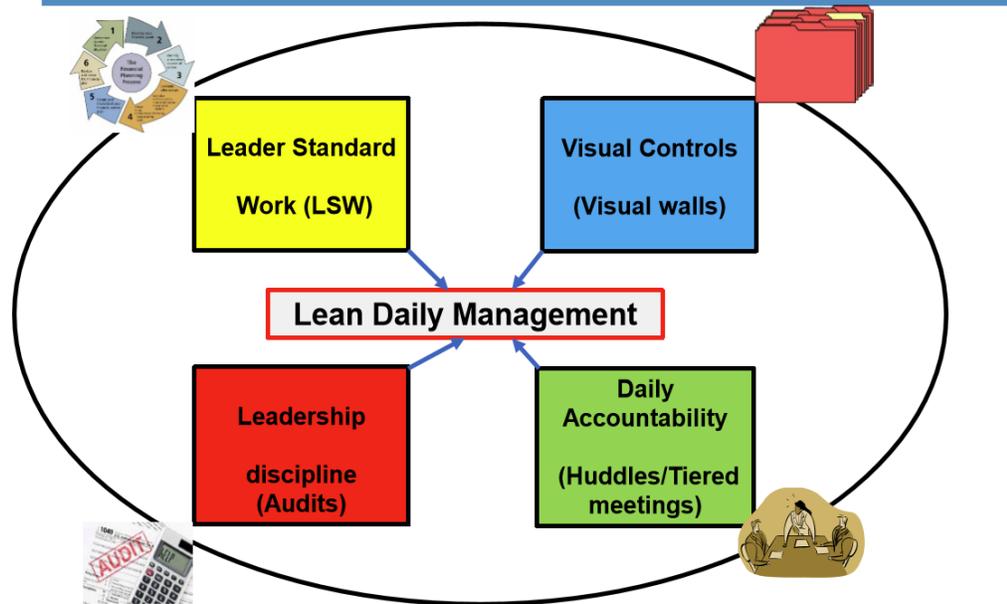
Figure 9. Lean daily management elements. Seeley, R. (n.d.). *Lean Daily Management (LDM).* [Powerpoint]. Retrieved from

http://www.results.wa.gov/sites/default/files/Lean%20Daily%20Management.pdf

The focus of Lean in healthcare is the patient. How to provide excellent care with as little waste or defects as possible. The focus is delivering only what is of value quickly to the patient from diagnosis to treatment. It is important to provide the correct care at the right time and place. This care includes reducing wait times/defects while reducing costs. This also includes respect for people/customers. Organizations must put their customers/patients' needs and desires first and define value from customers' perspectives.

Before an organization can be successful it must work at solving issues with their staff and physicians. By dealing with these issues first they can then focus on the

patient. If these issues are not solved, there will be challenges/barriers that may jeopardize successful implementation of any new processes or tools since each party may not be willing to fully engage.

There are many examples of health systems that implemented Lean and reduced costs, improved flow, quality, and care for their patients including ThedaCare, Virginia Mason, and Sutter Gould Medical Foundation. These organizations' stories demonstrate that improvement occurred. ThedaCare reported that they "improved productivity by 30 percent, increased gross revenue by 24 percent, and reduced the time from patient referral to treatment by 44 percent. Additionally, Lean management has helped relieve overburned staff, allowing them to focus on patient care". ("ThedaCare Improved Outcomes with Lean Management," n.d., para. 9).

How Does a Lean Management System Assist Physicians?

Physicians are naturally scientific problem solvers. If they apply those characteristics to improving patient care, they could also make their jobs easier. If standard work is implemented, followed, and audited, physicians can consistently deliver effective and safe care. Standard work is also a way to measure if a change that has been implemented is improving a process.

At Sutter Gould Medical Foundation, the senior leaders realized it was critical to engage the physicians, but they had to be systematic in their approach. A decision was made to initially focus on the management team and the medical assistants. This approach was used to attract the physicians to the improvement processes rather than

force them to be involved. Initially engaging and training the medical assistants allowed medical assistants to learn how to use A3 thinking and its associated improvement tools. Physicians were interested, asked questions, and wanted to participate in the huddles.

The A3 thinking approach provides organizations with a systematic method to identify opportunities for improvement. The core of A3 thinking is the development of an organization focused on improvement and changing its company culture. The A3 approach provides a logical thinking process, focuses on sharing critical information/data, provides a consistent approach throughout the organization, creates a powerful problem-solving process, objectively presents clearly known information, and aligns with the organization's strategy.

Sutter Gould Medical Foundation supported physician engagement by implementing an aligned compensation model. The physicians' compensation plan included a provision that each physician participates in at least ten (10) huddles per year as a requirement for their annual, individual bonus. The expectation was increased to participation in two huddles per month plus working through at least one A3 during the year and identifying at least five problems to address the next year.

Physician burnout can be a danger to any management model. One of the key causes of burnout identified by physicians was a disconnect between the leaders making decisions and physicians. Leaders make decisions that impact patient care without involving the physicians, so physicians felt they were being ignored. Physicians that are dealing with burnout may choose to reduce their workload. This

could impact organizations since there is already a shortage of physicians. Lean management can assist physicians by reducing the waste and effort by the physician while not sacrificing care for patients.

Paul DeChant, former CEO of Sutter Gould Medical Foundation and author of *Preventing Physician Burnout, Curing the Chaos and Returning the Joy to the Practice of Medicine* writes

> If we do strategy deployment properly with catchball, and having people understand what the "True North" metrics are, we can address a lot of the issues around mismatch of values. Fairness issues can get addressed by empowering people to make changes in their own workplace, so they start to regain control over addressing the barriers and frustrations they run into. As people work together in huddles to do problem-solving, just the fact that we're working together helps rebuild the community. As we do all of those, and the intrinsic rewards that come from that kind of work start to address the inadequate reward issue, and we then regain control (DeChant qtd. in Graban, 2017, p. 2).

How Lean Management Impacts Safety, Quality, Productivity, Costs and People Development

Creating a culture of safety is an ongoing concern and is paramount in healthcare. Healthcare is one of the industries where the quality of the service provided directly impact the patient's health and safety. Healthcare professionals are becoming more aware that they need to be dedicated to continuous improvement. Research has shown that the front-line staff is often not committed, but that

leadership has a significant influence on them. A positive level of trust is created when employees feel that leadership is concerned with employee wellbeing and work life.

Lean management impacts the quality of an organization because Lean focuses on daily improvement. By using Lean, an organization can focus on a coordinated system-wide approach to quality management, align the organization's approach to quality management with its mission and strategy, and implement a quality strategy with input from the employees that provide the service.

In *Leading the Lean Healthcare Journey: Driving Culture Change to Increase Value*, Wellman, Hagan, Jeffries, and Bailey (2017) show that at Seattle's Children's Hospital, improved quality, safety, and access and an improved bottom-line can go hand and hand.

CHAPTER III

HOW DOES LEAN AFFECT THE PATIENTS THAT ARE SERVED?

The U.S. spends more money on healthcare than any other nation in the world compared to the percentage of its gross domestic product (GDP); therefore, it is critical that healthcare organizations continue to find ways to improve the service provided and reduce costs. Although the cost of healthcare continues to increase, the outcomes and patient care have not improved. It is imperative that healthcare finds innovative ways to improve patient care, improve safety, reduce preventable medical errors, and still reduce the costs for healthcare.

Lean principles and methods have been applied successfully in healthcare facilities with positive results. In one urban hospital, they estimated that nearly one-third the staff's time was spent resolving issues because of the medication orders not being complete or illegible. This put patients at risk and cost approximately $155,000 per year (cost to clarify issues with the problem medication orders). Lean principles were used to create process changes to the medicine unit orders and post-operative medication orders. The changes reduced the average time to process a medication order to less than five minutes. More impressive was the reduction of medication orders placed on hold waiting for clarification from 2% of all orders to just 0.02%. Issues with post-operative medication orders dropped from 34% to 10%. The percentage of unclear post-operative medication orders was reduced by 42%. These changes resulted in improved patient care and less waste/wait for the patient.

Another example is a children's hospital that allowed their staff to apply Lean principles to review their process and eliminate the non-value activities that were currently part of the patient's experience. This reduced the costs for the organization by over $8 million in just two years. Additionally, they reduced the access waiting times by nearly 75,000 days.

At Virginia Mason, nurses spent 90% of their time with the patients instead of 35%, the costs of their supplies went down by $1 million per year, time to report lab results went down by 85%, and hospital liability costs went down by 49%.

Closer to home, SGMF in Modesto, California implemented Lean principles and improved the following processes:

1. In the clinical laboratory, the average turnaround time for urgent blood tests is now 20 minutes, down from 40 minutes.

2. The imaging department has doubled its productivity without adding staff.

3. The call center decreased the amount of overtime for their staff from 241 hours per month to 26 hours per month.

SGMF has successfully implemented Lean principles and many improvements have taken place. SGMF has been the highest rated of 170 medical groups in California by Consumer's Report for two years in a row. By applying Lean principles and methods to healthcare, many existing healthcare organizations are achieving significant improvements in patient quality, safety, and reduction of costs.

CHAPTER IV

HOW DOES A LEAN MANAGEMENT SYSTEM AFFECT

THE PROCESS DESIGN?

In traditional leadership, leaders are taught to delegate work and that they do not need to be aware of the details or how things work. Toyota has disputed this and believes it is critical for senior leadership to know the work intimately so they understand the challenges their employees encounter.

Integrated Facility Design

Financial challenges and healthcare reform are making healthcare organizations reconsider how they invest their capital for facility infrastructure. An Integrated Facility Design (IFD) or what some organizations refer to as Lean design, is at the forefront of leveraging Lean principles to deliver breakthrough results in the design process. IFD incorporates Lean principles such as continuous flow, line-of-sight, point-of-use, and work cells and includes all the stakeholders (patients and families, hospital administrators, staff, physicians and surgeons, nurses, architect, general contractor, and Lean experts). Compared to traditional design, the integrated design seeks to achieve breakthrough improvements. Involving the stakeholders early can result in fewer changes in work orders and more efficient construction.

By removing waste through Lean transformation, an IFD can provide measurable improvements in safety, quality, service, cost, growth, and engagement. "Lean innovation is defined as the creation of services for the future, with a rapid and

disruptive continuum shift in performance and cost that separates itself drastically
from the industry performance standard". (Dulin, 2015, p. 1).

During the IFD process, the expert applies Lean principles by considering
workflow analysis, linking design metrics to True North metrics, evaluating
organizational values, and keeping patient value at the forefront.

"True North" is a key concept in Lean process improvement. It refers to what
an organization should do to get to where they want to be. It is an idiom that
originated from Toyota 20 years ago, connotes the compass needle for Lean
transformation. True North works as a guide to take an organization from its current
condition to where it wants to be. True North is a universal, concise, and precise set
of ideals when that can provide a compass and can transcend and organization,
strategy, culture, or geography (McMahon, 2014, p. 1).

Workflow Analysis

The team reviews the layout to identify where it adds value and where there
are bottlenecks or waste. Waste needs to be looked at a macro level. Areas to be
reviewed should include care coordination and delivery, 5S (workplace organization),
and standardized work planning. The team should also use a 7-way scenario
scorecard to track improvements. This will assist the team to see opportunities for
future layout changes.

Linking Design Metrics to True North Metrics

Each organization has its own True North metrics, and IFD should be linked
to them. The team should understand the True North of the organization so it can stay

focus on the organization's strategic plan. There are guiding principles to be considered throughout the process:

- ▪ Start with the customer

- ▪ Too much space is an enemy

- ▪ Base the design on flow optimization, not department optimization.

- ▪ Use load leveling to reduce space requirements.

- ▪ Reduce lead times to decrease space requirements.

Evaluating Organization Values

The IFD process moves organization's beliefs, principles, and values, to fixtures through five phases:

Phase 1.   Project management and governance

Phase 2.   Conceptual design at the systems level

Phase 3.   Functional design at the value-stream level

Phase 4.   Detailed design at the operational level

Phase 5.   Standard work development for operating in the new design

Keeping Patient Value at the Forefront

During the planning and implementation, representatives from the core services, facilities, architects, and patients are part of the process since all can determine value. IFD, like Lean transformations, is a new concept to many providers, so it important to make sure they understand the process. Buy-in from the leadership, physicians, and staff of the process and data is critical for teams to successfully move forward.

Settle's Children's Hospital (SCH) designed an integrated facility. "The traditional approach of industry benchmarking, parametric sizing, protracted user group input, and the separation of siloing of the owner, project manager, architect, general contractor, and subcontractors was purged and replaced with concurrent set of design activities through sponsor and project management (PM) group, a facilities team, and a core team." (Wellman et al., 2017, p. 252).

The core team implemented Lean principles. The project team listened to the voices of patients, physicians, and staff. They also did Gemba walks in the current outpatient facility to ensure they understood the needs of the new facility. During the conceptual design phase, a work flow analysis was completed, and to minimize space, Lean concepts were used. During the functional design phase, the overall utility of the facility was defined.

SCH has met the goals of reducing space from 110,000 square feet to 75,000. They also reduced costs and delivered on-time. One of the reasons they could reduce space was they used data to analyze capacity based on Lean processes instead of their current practices.

IFD had measurable results for SCH: construction costs were reduced by $25 million, the total square footage was reduced by 28 percent, and the patient and clinical staff experience were improved by double-digit numbers. SCH is visited by healthcare organizations from around the world to study the hospital's use of IFD principles. Many also come to learn how SCH used the Lean Management System to support its design assumptions.

Many large healthcare organizations around the world are using IFD. Children's Hospital and British Columbia Women's Hospital & Health Centre are constructing a new Acute Care Centre, and Sutter Gould Medical Foundation (Turlock and Tracy) and Landmark Cancer Facility in Oklahoma City, Oklahoma are implementing IFD.

Patient Flow (Traditional vs. Lean)

Traditionally, a patient would arrive for their appointment, wait, and conform to a hospital or healthcare organization's business practices. Many patients have waited 1 hour to 2 hours before seeing their doctor. This led to frustration and dissatisfaction for patients. One of the major wastes/defects is when a patient is waiting. Whether it is waiting for lab results, their doctor coming into the room, or waiting to be called for their appointment. This is all considered waste, and patients do not find any value waiting. Traditionally, healthcare has not fully considered the importance of bringing great value as well as great service to their customers. Since patients are the most important part of healthcare, organizations must find ways to increase value for their patients while reducing waste/wait and still try to reduce costs.

A workflow that is not efficient can cause longer waits for patients, frustration for staff, patients and physicians, and physician burnout. To adopt Lean, a healthcare organization needs to analyze the entire work flow/value stream (end-to-end sequence of steps required). This will allow the organization to see the opportunities for improvement in the current process. A process map or value stream map is a useful

tool to visually see each step of the process. Figure 10 illustrates a process map

outlining the necessary steps taken by a patient from arrival to departure for a medical
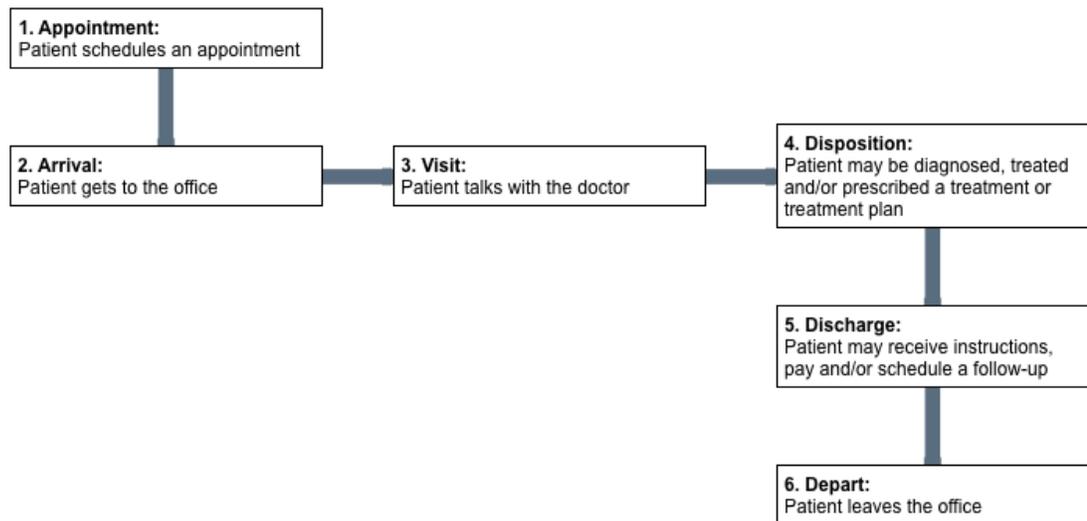
appointment.

Figure 10. Process map of medical appointment. Medical Appointment Process Map.

(n.d.) Retrieved from https://www.techsolve.org/news/lean-doctor%E2%80%99s-

office-using-value-stream-mapping-improve-your-workflow

Bahri (2011) refers to a lean patient service vision as "single patient flow."

Implemented in a dental practice in Jacksonville, Florida, Bahri (2011) believes that a

patient should not wait anywhere in the process. He implemented many small

changes including a pull system to manage a flow of information, treatment, and

information to the patient. His staff also came up with quick change instrument trays

with the goal of completing most dental procedures in one single seating. His office

also implemented visual controls to alert others when help is needed. They also have

morning meals so that daily improvement, immediate adjustments and problem-solving can occur.

Employee Engagement (Traditional vs. Lean)

The traditional approach of managing employees was hierarchical, top-down directive fashion that relied on layers of managers telling their staff what to do. Organizations that have implemented Lean management principles have realized that a people-centric approach to leadership is more successful. Lean requires the leader to build their team focused on A3 thinking, continuous improvement, and sustainability. Employees feel empowered because they participated in the improvements made. They are the subject matter experts and the changes impact their work. When employees feel they can make a difference they will become more engaged.

Leaders at SGMF adopted servant leadership. They exchanged tradition questions about why certain tasks have not been completed to questions about how management could help employees in the Gemba improve their job, assist with better service, or remove barriers.

At SGMF, the staff and physicians at SGMF reported that the transformation impacted their professional lives positively. Staff experience scores reached the 98th percentile nationally. Physician satisfaction scores have continued to increase as well. Figure 11 shows the AMGA Physician Satisfaction Employee Engagement Survey, data provided by SGMF.
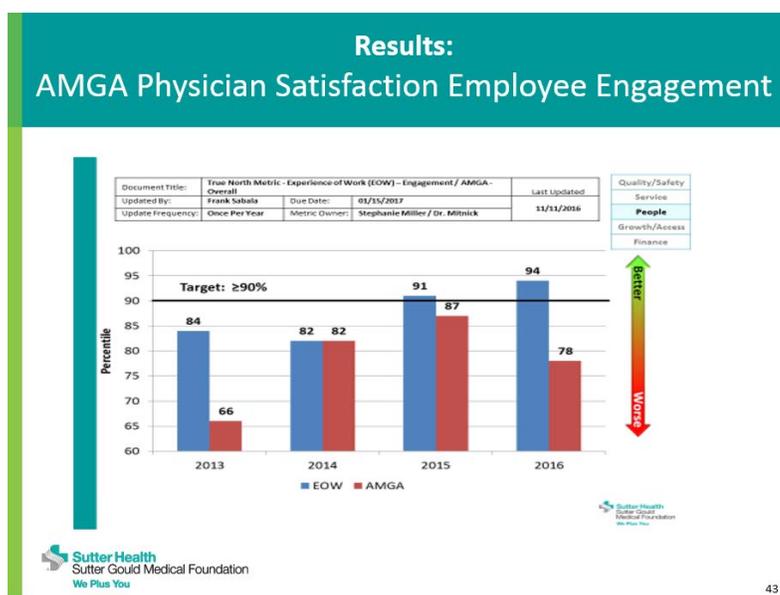
Figure 11. AMGA physician satisfaction employee engagement survey results.

Manuel, M., & Mitnick, S. (2017) *Sutter Gould Medical Foundation (SGMF) Lean*

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CHAPTER V

HOW DO PEOPLE GROW WITH LEAN -

DEVELOP AROUND PROBLEM-SOLVING?

A Lean transformation/culture change is a big task for any organization. Toyota believes that their key objective is build people not cars. Toyota believes that in order to build cars they must focus first on building their people. The key to developing a team around problem-solving is getting their buy-in. Change is difficult, so many employees and managers may be resistance to change; therefore, their buy-in is critical for success. Changing the culture is not a program with a completion date or a quick fix. An organization needs to understand their current state, establish a clear vision, align behaviors, and hold their teams accountable.

Leadership Development

An ongoing commitment to training and development is required for Lean leaders. All leaders need to be able to identify waste, root cause issues, and opportunities for improvement.

Leadership's primary role is to develop the employees into problem solvers. Each director/manager/supervisor is responsible for developing their teams. Leaders need to learn to ask questions and allow their teams to identify and solve problems. Leaders cannot "just fix" the problem or jump to provide a solution. A Lean leader needs to be willing to give up control, allow people to solve their own problems, and make people accountable. The "5 Whys" is an important tool for a leader to use in an

attempt to identify the root cause of an issue. By repeatedly asking the question

"Why" (five is a good rule of thumb), you can peel away the layers of symptoms

which can lead to the root cause of a problem. Very often the ostensible reason for a

problem will lead you to another question. Although this technique is called "5

Whys," you may find that you will need to ask the question fewer or more times than

five before you find the issue related to a problem. ("Determine the Root Cause: 5

Whys", n.d., p.1)

A leader can use visual management to set and track targets. At SGMF, each

leader is required to have Leader Standard Work (LSW). LSW allows the leader to

track their work and determine how much time they are spending on their value and

non-value work. LSW, if used properly, will allow the leader to spend more value add

time developing and coaching their staff and spending time in the Gemba.

Kata coaching (as seen in Figure 12) can also help the leader ask the right

questions to initiate useful conversations to help them understand the issue.
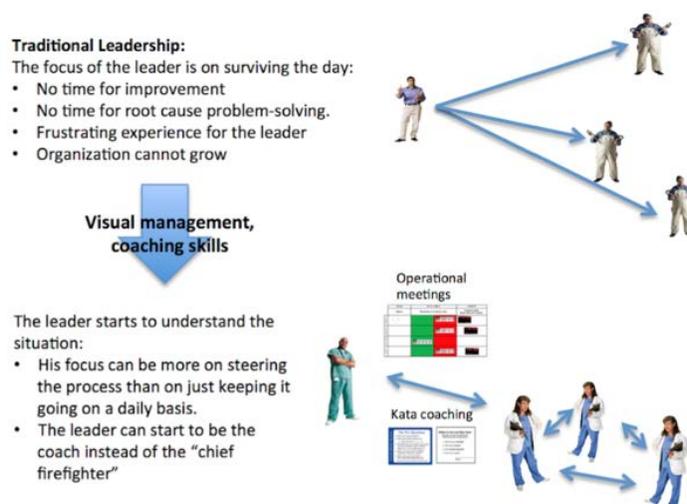
Figure 12. Kata coaching in lean management. Visual management coaching skills

diagram. (n.d.). Retrieved from http://planet-lean.com/the-step-by-step-lean-

development-of-teams-and-leaders

Team Development

In Lean, coaches ask questions instead of providing the answers or solutions.

This will allow others to develop A3 thinking and participate in the changes and

improvements. Lean principles and practices are being successfully applied in daily

processes used by healthcare leadership and staff at many healthcare institutions.

SGMF has been on its Lean journey since May of 2010. The call center value

stream started at the end of 2011. The call center operates 24 hours a day, 365 days of

the year. Patients can call to make or cancel appointments any time of the day. They

can also send messages to their providers. This was accomplished without impacting

the call center's metrics or adding additional costs. There were 6,298 improvement

items have been identified and 5,073 have been resolved by staff. The call center has

had 39 Rapid Improvement Events (RIE) and has been able to sustain improvements

in their metrics each year. 100% of the call center staff is trained in Lean, and 40% in

active participation on A3/PDCA improvements. Some of the improvements in the

hiring flow of the SGMF call center can be seen in Figure 13.

Hiring Flow Cell:

	Metrics	Initial	Target	Sustained
Quality	Time from resignation to 1st day on the phones	111	21	18
Service	Vacancy Rate	31%	22%	18%
Service	Open Position vacancies	5.2%	2%	0%

Figure 13. SGMF call center hiring flow. Call center 2017 highlights [Pamphlet].

(2017) Modesto, CA: Sutter Gould Medical Foundation

The imaging value stream also started at the end of 2011. Imaging has had 43

RIEs and has been able to sustain improvements in their metrics each year. They also

have 100% of their imaging staff trained in Lean and 77% in active participation on

A3/PDCA improvements. They have 100% of their radiologists trained in Lean and

36% in active participation on A3/PDCA improvements. Some of the improvements

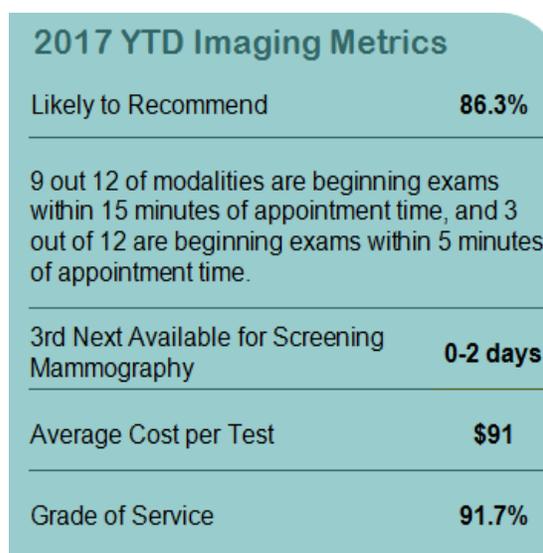made at in the imaging department at SGMF in 2017 are shown in Figure 14.

Figure 14. SGMF Imaging Metrics for 2017. Imaging 2017 highlights [Pamphlet].

(2017) Modesto, CA: Sutter Gould Medical Foundation

Conclusion

Healthcare is confronted with many challenges to deliver the most value and cost-effective services for patients. Health care organizations must be willing to be innovative and disruptive with their ideas for improvement. Lean requires a culture change that enables doctors, nurses, staff, managers, and leaders to feel empowered and adequately equipped to address the problems which can be resolved only by making continuous changes and improvements to this work environment. Lean offers the opportunities of improving efficiency and quality while controlling costs and optimizing patient care.

The five key components that need to exist to successfully implement Lean in healthcare are

1. Lead from the Top

2.   Defined Strategy: Lean becomes the Vehicle to Achieve the Strategy

3.   Transform the People

4.   Value Stream Focus

5.   Daily Improvement and Sustainment

These five steps are critical since they need to occur collaboratively. You cannot transform people if the proper guidance and support does not exist from leadership. Leadership must be committed to the process of daily improvement, hold their teams accountable, and create a condition/environment in which improvements are supported, encouraged, and rewarded.

Lean is not the answer for all healthcare organizations. Chakravorty (2013) (qtd, in Brathwaite, 2013) believes that part of the problem with some healthcare organizations is that senior leadership loses their focus on Lean, causing its failure. In healthcare, the percentage of failed improvement efforts is high. Executives in organizations want to make sure there is a return on investment. Will Lean provide a financial benefit to their organization? If the patient flow is improved, will the physician see more patients? As organizations improve, executives need to be able to see how the improvement can eliminate costs.

There is much evidence that shows that if Lean is properly implemented in a healthcare organization it can successfully impact and improve service for patients; improve the work environment; empower doctors, nurses and staff; and ultimately impact the bottom-line for the organization.

Many health care organizations have been extremely successful using a Lean Management System such as SGMF, Seattle's Children's Hospital, Virginia Mason Medical Center (VMMC) in Seattle, Washington, and Inova, an integrated health system in Virginia. Lean requires the transformation of an organization, making it challenging for organizations to implement and sustain. There must also be a shift in roles. Managers and leaders need to become teachers, mentors, and coaches, while allowing and engaging their front-line employees to see the opportunities and make the improvements. People need to understand that Lean is a journey, not a destination with a finish line.

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