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ORIGINAL PAPER

Leading with Lean: Getting the Outcomes we Need with the Funding we Have

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Abstract   Lean and other quality management methodologies have been used by industry and manufacturing for many years. More recently they have been adopted by health care. The authors describe their experience with the lean way of continuous quality improvement, first developed by Toyota, at one of New York's largest behavioral health departments. The relevance and application of these methodologies to the mental health sector is presented.

Keywords   Administration · Leadership · Psychiatry · Lean · Quality improvement

Introduction

J.S., a recently hired executive at a large city medical center, is confronting many issues that are keeping her up at night. These include a deep-rooted culture of, "that's the way we always do things around here" and a unionized clinical staff with whom it was difficult to implement rapid change. Additionally, her city and state agencies were undertaking major Medicaid reforms that would eventually necessitate a geographically regionalized approach to health care delivery, eliminating duplicated services. This would entail

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partnering with former competitors, downsizing or eliminating some programs, and possibly closing some hospitals. It was clear to her that she had to quickly increase efficiency, maximize margins, and boost productivity all while improving quality and patient satisfaction, without alienating staff.

J.S. sat at her computer thinking, "Why on earth did I take this job?" She heard from a colleague about a hospital system in the city that was using a quality improvement methodology borrowed from industry with impressive results. She accepted his invitation to hear a presentation about it figuring it would at least get her out of the office for a few hours and she felt she needed the break.

What J.S. learned at the lecture and workshop was of great help to her and her leadership team. It provided a fresh way of thinking about the issues and challenges they were confronting while engaging and empowering the direct care staff. It did this by having them identify and solve problems, while decreasing inefficiencies and improving overall quality and productivity. The approach she heard about was called lean and it began with the Toyota automobile company. This paper highlights some of the features of lean in the hope that others in behavioral health will find benefit in using it or a similar quality management approach to help them overcome the ever-increasing onslaught of challenges administrators are facing these days.

Management Approaches Move from Industry to Healthcare

From where did lean come? Lean was conceived in the manufacturing sector and has been most celebrated by the Toyota auto company. Lean has spread widely throughout industry and has been successfully used there for approximately four decades. Many books [1, 2] and papers have been published on lean in manufacturing and more recently on lean as applied to healthcare [3, 4]. The successes achieved by industry in terms of increasing value and quality, while decreasing cost and increasing profit, was not lost on the health care sector where lean has been increasingly utilized over the past decade. During this period, some applications to the mental health field have been published. In 2014, the first book exclusively focusing on the use of lean in behavioral healthcare was published, demonstrating how one large public mental health organization successfully used lean across its entire spectrum of service delivery, including emergency, inpatient, and outpatient divisions [5].

That one approach could be applied both to manufacturing cars and to mental healthcare delivery may seem counterintuitive. However when you realize that, regardless of what is being produced or delivered—cars, information or healthcare—more value, less waste and lower cost are always the preferred outcomes. An approach that helps move things—parts, information, or patients—seamlessly and without unnecessary delays typically leads to improved customer/patient satisfaction and is a win/win both for those receiving services as well as for those providing the services. What industry discovered, and healthcare adopted, is now finding a sustained home in behavioral healthcare as well.

It is a truism that the American healthcare landscape has changed dramatically. Today's behavioral health leader has no shortage of efficiency and quality improvement methodologies to choose from to improve the cost-effectiveness of her[1] operation. A brief

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[1] Throughout this paper, the female gender pronoun will be used to avoid the cumbersome use of "him/her" and "his/her."

description of some of the similarities and differences of the more common approaches adapted from industry follows.

Six Sigma [6] seeks to improve the quality of outputs by identifying and removing the causes of defects or errors by minimizing variability in manufacturing and business processes. It uses a set of quality management methods, including statistical methods, and creates a special infrastructure of people within the organization who are experts in these methods. Each Six Sigma project carried out within an organization follows a defined sequence of steps and has quantified value targets, for example: reduce errors, cycle time, pollution and costs, and increase customer satisfaction and profits [7].

Some of Six Sigma's characteristics are also critical to the principles of total quality management (TQM) as described by Peter Drucker and Tom Peters, particularly in his book "In Search of Excellence;" TQM can be summarized as a management system for a customer-focused organization that involves all employees in continual improvement. It uses strategy, data, and effective communications to integrate the quality discipline into the culture and activities of the organization [8].

Failure mode effects analysis (FMEA), [9] familiar to any administrator about to undergo a Joint Commission survey, is a step-by-step approach for identifying all possible failures in a design, a manufacturing process, a product or service. Effects analysis studies the consequences of such failures so that their impact can be anticipated and effectively dealt with proactively.

Plan-do-study-act (PDSA) [10] cycles can be used to test an idea by temporarily trying out a change and assessing its impact. This approach is familiar to most involved in quality improvement.

A Quality Circle [11] is a volunteer group of employees from the same work area who meet together to discuss workplace improvements. The circle is empowered to promote and bring quality improvements to fruition in order to empower staff and enhance morale.

And last but not least, "lean," the subject of this paper.

Lean

According to the Lean Enterprise Institute [12], "The core idea [behind lean] is to maximize customer value while minimizing waste. Simply, lean means creating more value for customers [while using] fewer resources. A lean organization understands customer value and focuses its key processes to continuously increase [that value]. The ultimate goal, [even if never fully attained], is to provide perfect value to the customer through a perfect value creation process that has zero waste. To accomplish this, lean thinking changes the focus of management from optimizing separate technologies, assets, and vertical departments [often the approach of the previously listed approaches] to optimizing the flow of products and services through entire value streams that flow horizontally across technologies, assets, and departments to [the] customers [or patients in health care]".

Tools that support lean leadership help to align an organization—from the enterprise level, to the department level, to the unit level. There are always many interesting ideas for improvement, but an overall plan and vision for an organization is critical to overall coordination of effort, especially in large systems. Improvements that are geared toward the "big picture" will have a cumulative effect in moving toward that goal. One such tool is known as a Transformational Plan of Care, or TPOC, which serves to set a plan in place across the facilities and value streams of a large organization.

Eliminating waste along entire value streams, instead of at isolated points, creates processes that require less human effort, less space, less capital, and less time to make products and services at far less cost and with [many] fewer defects, compared with traditional business systems. Companies are able to respond to changing customer desires with high variety, high quality, low cost, and with very fast throughput times. Also, information management becomes much simpler and more accurate" [12].

J.S. wants to apply what she has learned about lean and decides to focus her team's first effort on streamlining the hiring and "on boarding" of new physicians that has been a source of universal frustration and complaint at her institution. The reasons for this dissatisfaction were many but essentially came down to administration's micromanaging the entire process in a well-intentioned, but frustrating, effort to save resources while implementing a structured process where there had not been one. Some senior administrators believed the absence of well designed processes led to mismanagement, a lack of uniformity in how physicians were paid, and hiring more doctors than sometimes were needed. At the staff level, the administrators were seen as needlessly getting in the way and focusing on saving dollars rather than providing optimal care. J.S. put a team together to work on this problem that included representation from administration, finance, the clinical services, human resources, and the union. Most significantly the work group included line staff who worked "in the weeds". The staff involved in this exercise were relieved of their customary responsibilities so that they could focus on this singular task without interruption. J.S. also asked the lean facilitator, Robert, she heard speak to lead this exercise.

Robert led the group for 5 days in deciding what the major issue, or burning platform, was. All agreed it was the excessively long time it took to get a doctor hired and through the multi-stepped process of justification to multiple stakeholders along the process together with various and repetitive financial reviews and approvals. Then, if anything in the process was amiss, the entire procedure re-started at the beginning. It was maddening.

Next the group came up with what they wanted to see as the ideal process of bringing on a new physician including the minimal number of steps, reviews and approvals required sot the time could be minimized from MD application to her actually working. Once this was verbalized, and illustrated in a drawing so all steps could be visual, the team focused on the gaps that got in the way which then led to various proposals to fix the problem(s). These were outlined and "tried out" in what are known in lean as "rapid experiments".

Eventually, the team arrived at a process that satisfied the financial administrator who heretofore would not relinquish control for fear of wasting money. The group got him to list what his requirements were so that he could comfortably delegate financial approval at a lower level. Once this approval was obtained, the multiple financial review steps that previously held things up would no longer be required, cutting much time out of the process.

Likewise, other areas of "waste and duplication" were exploded keeping only those steps absolutely necessary in the new process. Concerns which previously resulted in repetitive steps were discussed and "standard work," essentially the "how to steps" to be followed, were drafted and finalized after trying them out in the rapid experiments. This standard work then became the new way of doing business. Variation from any of the steps in the standard work was to be avoided because such variation led to variability in outcome and added time to the process.

The team met regularly over the next several months to monitor the progress for compliance with the standard work while monitoring the time saved in the new process.

The standard work was adjusted if there was consensus, verified by rapid experiments, to justify any changes. The new standard work trimmed weeks off of the timeline to bring on a new physician and eliminated the despair that had set in with the old approach. It appeared to be a "win-win" all around.

Advantages of Such an Approach

The above example illustrates that lean provides a means to create value while eliminating waste that is accessible to all employees of an organization where waste is defined as anything that is not considered value by the patient. Importantly, unlike the traditional improvement efforts applied to healthcare, lean is not solely under the purview of quality departments or physicians and nurses schooled in these processes. *All* employees are enlisted and taught about lean and are encouraged and supported to participate in daily and periodic activities geared toward the resolution of locally defined problems—problems line staff know all too well.

For J.S., lean had the best "fit" for the challenges she faced. Specifically, she sought an approach that could be utilized across all the steps of her entire behavioral health delivery service (referred to in lean as the value stream). While methodologies summarized earlier had previously been used for specific problems or tasks, J.S. did not have one technique or philosophy prior to lean that connected all the stages of the workflow.

Additionally, J.S. sought an approach that would be easy for all staff to understand, that would not require complicated formulas or technology whose data could be readily displayed and quickly and easily understood, that could yield quick results with rapid implementation, and that could be embraced by line staff, organized labor, and management alike. Lean fit the bill for all of these requirements. The fact that lean sought to continuously develop staff to their full potential, while empowering them to identify pertinent issues and develop actual solutions to be utilized, was complimentary to the mental health wellness orientation of her organization and was fully embraced by organized labor.

The full 5-day period used by a work group is known as a "rapid improvement event" or RIE. An RIE event takes 4 days of work with a summation and presentation of the new standard work on the fifth day to the other staff of the organization (hospital, clinic, etc.). As highlighted, the task of the RIE is to find value, eliminate waste, conduct experiments, write standard work and implement the new process with identified metrics to ensure compliance and sustainment. All this is achievable within a matter of days—not months or years. Thus, the term "rapid" improvement event.

She appreciated that she needed an early and significant victory to show staff that change and improvement was both possible and necessary. It was also important that she get union buy-in for her strategic plan of using lean more widely to confront the many challenges her hospital faced. Staff had been justifiably suspicious of "efficiency exercises" because in the past it usually resulted in the elimination of staff and others needing to "do more with less." The very term "lean" implied that to some.

The earlier example, rather than eliminating staff, actually brought more staff on sooner. J.S. announced to her staff that any positions that were no longer needed at the hospital due to increased efficiency would result in those staff being retrained so that they could continue to be productive and valuable performing other rewarding tasks that would be needed. For example, she knew that some of her inpatient staff would need to be re-trained to provide outpatient work since health care was moving more in this direction.

A Brief Look at Tools Used in Lean

Lean tools and tactics range from the simple (post-its and magic markers) to the complex (vertical value stream analysis). While many organizations begin by hiring a lean consultant to get things started, eventually most eventually spread lean knowledge to other staff by utilizing a rolling cadre of individuals with increasing lean experience who gradually become "embedded facilitators," spending more and more of their time teaching and facilitating lean events. Many organizations spread the improvements more broadly throughout the institution; slowly but steadily changing the organizational culture to better focus on patient needs and systematize underlying principles. Lean refers to this as continuous daily improvement. Such culture change is considered a "lean transformation" and requires long-term sustained commitment from visionary leaders.

The first tool typically employed at a facility is called a value stream analysis (VSA). The VSA is where a shared vision is delineated and communicated visually (drawings, post-its on butcher block paper covered walls). Here there is a clear purpose and clearly agreed upon deliverables. A plan is set in motion for a series of events, typically RIEs, which are then employed over the subsequent months. At the core of the VSA, as well as at the core of each of the planned events, is the "problem solving A3" (see Fig. 1). This term simply refers to the size of paper on which nine boxes are arranged. The A3 guides the problem solving from identification of the reason for action, through current state, target state, gap analysis, and eventually solution planning and confirmed state. The gap analysis is critical because it is designed to push past the surface problem to get to the root cause. Lean tools that help get at the root cause include the "5 whys" (simply asking "why" five times arriving at a presumed root cause to the problem) and the reverse fishbone diagram.

Fig. 1 Courtesy of New York City Health and Hospitals Corporation

Rapid experiments help to ensure that you are on the right track before investing too much in the way of resources, including time and training effort.

Using Lean Across the Behavioral Health Care Continuum

Emboldened by her success with lean, J.S. next used the A3 thinking illustrated in Fig. 1 to improve patient care outcomes in her emergency room and on the inpatient service. If these were successful, she planned to work with the outpatient staff using lean to reduce their excess caseloads of chronic but stable patients (thus making room for new patients), while decreasing insurance denials (both thereby increasing overall clinic revenue while serving more of the community).

J.S. brought staff together, identified the problem to solve, followed the steps of the A3 (Fig. 1) having staff illustrate each step along the process by placing post it notes on the wall, and then together decided what steps added value as opposed to wasting time and steps. The later were streamlined, if not eliminated outright, and the new process was written up simply as the steps to be followed by staff (the new or revised standard work). These were then tried out 1 day during the rapid improvement event as rapid experiments to see what worked and what didn't. The steps that did work were then written up as the standard work to be followed. The staff involved in carrying out this function were in-serviced and then the new standard work was rolled out and priminently displayed where that work function was delivered. The outcome measures sought were monitored over the ensuing weeks for sustainment with a constant emphasis on training and supporting staff in following the new steps that resulted from the A3 process followed in the RIEs conducted by their peers and colleagues.

In following this procedure methodically, J.S. and her staff were able to dramatically reduce the amount of time needed to perform safety searches and triage, and virtually eliminated lost property in the psychiatric emergency room.

On the inpatient units using the process of 6S she was able to display standardized white boards on each of the six inpatient units which were all formatted in the same way showing the information the staff determined to be of most usefulness in delivering care on the acute service. Some of these included estimated date of discharge, need for medication reassessment, risk level, precautions, etc. This process also enabled staff to see what was necessary, and done or not done, by the evening before anticipated discharge. Following this methodology greatly increased the on-time discharges the following day and improved patient and family satisfaction as well. Other RIEs focused on decreasing the use of restrictive interventions on the inpatient service (use of seclusion and restraint, stat intramuscular injections, use of 1:1 staff watch). These were remarkably successful and resulted in decreased assaults, and more staff freed from 1:1 watches so they could be available to all patients on the unit. The later also required the use of less agency staff hires and decreased overtime expenses as well.

The details of these events and many others are described in the book Lean Behavioral Health [5].

Importance of Outcome Measures and Metrics

J.S. has come to realize that in the current complex healthcare environment, data management processes such as data collection, tracking, trending, and reporting are becoming more routine and necessary in order to achieve outcome measures that are increasingly tied

to payment. Even though she did not receive any formal training in data management, J.S. has a small "data" team that understand the issues related to data integrity, reliability, data tracking and trending as well as the fundamentals of data reporting. Lean refers to "true north" metrics which include safety, quality, human development, growth, timeliness and fiscal measures. These metrics are used both to guide all transformation efforts as well as to monitor sustainment.

In behavioral health settings, data management and information technology are either frequently overlooked or not given the same level of attention as in other medical settings/specialties. A 2012 National Council survey of 505 agencies found 21 % of surveyed agencies use an EHR exclusively, 35 % use a combination of EHR and Paper and 26 % had no EHR, but were planning to implement one at some point. With a greater national focus on achieving better care, data collection and monitoring, is crucial in demonstrating improved overall quality. Through data management and information technology it is possible to ensure that behavioral healthcare is more person-, family-, and community-centered as well as reliable, accessible, and safe. Additionally, the implementation data management and information technology will be critical in order to achieve healthy people/healthy communities (improve US health by supporting interventions to address behavioral, social, environmental determinants of positive behavioral health and delivering higher quality behavioral healthcare) and create affordable (accessible) care (increase the value and availability of behavioral healthcare for individuals, families, employers, and government).

Recent efforts around payment reform—including shared risk relationships through Accountable Care Organizations, or nonpayment for hospital readmissions—are creating an environment in which behavioral health providers are increasingly driven to manage costs and maintain quality. Quality is being closely tracked, and yet, learning to manage data and measures that communicate quality remains a major challenge. In order for behavioral health providers to remain viable and become both "managed-care ready" and effective partners with other providers, it is imperative that they learn to track the right measures; measure things correctly; present the right data; and make information actionable.

Increases in outpatient billable visits and revenue have been maintained and continue to rise. As new initiatives in managed behavioral healthcare, Medicaid reform, and integration of mental health, substance abuse and primary care become increasingly critical, improvement methodologies, such as lean, become important components of an overall viability strategy. The lean philosophy of quality and performance improvement is one which can be sustained and which yields essential outcomes. It enables leaders to utilize resources wisely and to engage staff in the reorganization necessary to succeed with existing funding and in alignment with the initiatives that are the driving forces in healthcare today.

Behavioral health settings require real-time information and actionable knowledge that allow medical and administrative leadership to improve outcomes and practice. This can be accomplished via visual and results management tools, clinical decision support tools (i.e. clinical guidelines, clinical and drug-related alerts and reminders) as well as patient, clinician and administrative data and reporting.

The importance of data is critical to transformation efforts. The identification of the right data sources, determining the appropriate data measure with clear operational definitions, and the correct tracking, trending and reporting have been the lynchpin for the successes outlined above.

Conclusion

So why adopt lean management? Lean is one of many transformational methodologies for reducing waste and improving operational efficiencies. It is a continuous improvement technique that focuses on adding value by eliminating waste and duplication of services while increasing efficiency in customer-driven systems. Lean deploys the strategic process concomitantly with identified operational objectives.

Critical elements of lean include VSA and RIEs. VSAs are facilitated events where a cross-functional team employs interaction and evaluation to derive steps for increasing throughput in the value stream. RIE's are highly structured, team coordinated events that *quickly* engage staff in honing and implementing improvements in the value stream.

The unique property of lean, however, is that it rapidly engages staff in identifying problems, proposing solutions, and correcting issues. By involving staff at *all* levels, lean helps bring about the culture change necessary for making the transformation successful.

Lean is not a strategic plan but a strategic improvement targeting process. It allows for improvement activities which support a strategic plan and helps implement the plan's defined goals. Lean promotes successful implementation of an organization's operational and strategic priorities. This in turn creates transformation of patient care, operating efficiency and effectiveness, increased staff satisfaction, and culture change [8].

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