

Quality Improvement and Leadership Capacity Development Through Lean Methodology

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ABSTRACT

OBJECTIVES: Implementing “Lean” methodology as a way to build requisite skills, enhance collaboration, and eliminate complicated work patterns for positive outcomes (eg, lowered costs, improved patient wait times).

STUDY DESIGN: Case-control study.

METHODS: A Lean learning project, facilitated by a locally sourced Lean learning organization, is documented at an autonomous internal medicine practice with the goal of improving patient wait times throughout the practice. Lean learning principles are modified to accommodate ambulatory care settings. Barriers to physician and practice involvement are minimized to encourage physician and practice engagement.

RESULTS: Initial quantitative results showed improvement in patient flow through the practice and time/cost savings that will continue to accumulate over time. Qualitative results show greater change management skill and capacity, as well as awareness and appreciation of team members and collaborative work in this ambulatory care setting.

CONCLUSIONS: The increase in change management skill and capacity is critical to the success of transformation efforts in ambulatory care and finding ways to reduce barriers to direct physician involvement and physician practice involvement must remain high priority.

Transforming healthcare is a favorite topic in newspapers and professional journals, with the promise of reformed care delivery methods, improved quality, and patient satisfaction, while reducing overall costs.¹ Achieving this Triple Aim in healthcare is essential to ensuring the long-term health of our population and the stability of the economy.² There is consensus that the patient-centered medical home (PCMH) model of care holds the greatest potential as a road map for the transformation of clinical care; however, implementation of the PCMH model requires significant change to care delivery structure, culture, payment models, and traditional leadership. Ambulatory care settings currently incentivized to advance the PCMH model lack significant leadership and quality improvement (QI) capacity.³ Incentivizing practices to move forward with transformative efforts without prerequisite skills to manage change effectively is counterproductive and may be the reason more significant success has yet to be achieved. Extending the PCMH model into a robust and cooperative patient-centered medical community (PCMC) is the vision that must be achieved in order for sustainable and meaningful transformation to occur.

Impeding adoption of the PCMH model are complicated work patterns developed over years in response to extrinsic demands by the system, patients, and payers, as well as a lack of methodology to effectively manage change. Elimination of these complicated work patterns is a critical first step, and cannot be done without investing in change management, leadership, and QI skill development in autonomous ambulatory practices. These skills, robustly developed, render organizations capable of enduring transformation, rather

than simply making brief problem-oriented adjustments. “Lean” methodology is a way to build requisite skills and eliminate complicated work patterns in a single initiative.

Northern Physicians Organization (NPO), in Traverse City, Michigan, believes that investment in the development of Lean thinking in autonomous practice settings is of prime importance to realizing the goals of transformation and quality care for patients. NPO is a physician-led provider organization representing over 500 physicians in northern Michigan, assisting practices of all sizes in the move from fee-for-service to fee-for-value. NPO believes the practices it represents are well suited to Lean methodology for QI, as Lean builds leadership and improvement skills in the individuals who perform the work through the entire vertical structure of the organization. NPO, in partnership with the Northwestern Michigan College (NMC) Training Services Department, is bringing Lean thinking to ambulatory office practices, and one project case study is described in this paper.

Case Study

Thirlby Clinic is a 9-physician adult internal medicine practice in Traverse City, Michigan, which opted to pursue a Lean learning initiative at the encouragement of NPO. Although Lean is gaining momentum in healthcare, according to Heather Fraizer, PhD, of the NMC Training Services Department, the majority of Lean projects are initiated within large organizations and acute care facilities. These larger initiatives become less about transferring long-term skills and more about solving specific problems by reproducing institutional solutions. Thirlby Clinic’s business manager, Louise Kilmer, has been party to large institutional and system changes in her 40-year healthcare career. She believes that employee empowerment resulting from Lean is most beneficial to businesses like hers. Deb Schepperly, the clinical quality manager, was “sold on Lean principles,” as she believed, for the first time in many years, that changing the landscape of healthcare was possible.

With a Lean project on the agenda, the practice identified a physician champion in Peter Alvarado, MD. Physician champions are critical for healthcare change demonstrations,^{4,5} yet they are often the most difficult element to secure. This lack of engagement is driven by many factors, including a deep sense of personal autonomy that frequently conflicts with principles of quality improvement, a culture of blame that can result if mistakes happen and priorities for quality seem at odds between the system and individual care perspectives.⁶ Physician support signals value and significance for the process to all team members in a powerful way. “The physician’s role is central, and the commitment and drive must come from the physician level.”⁷ Dr Alvarado secured consensus that practice physicians would not impede the efforts of the team, despite varying levels of physician enthusiasm and readiness to participate. Leading by example and assisting the practice to implement change systematically and incrementally was Dr Alvarado’s strategy to allow Lean to spread through the practice culture.

METHODS

A 10-person multidisciplinary team—formed with representation from physician, administrative, clerical, clinical, billing, and laboratory staff—was tasked with the broad goal of improving patient flow through the practice. This goal allowed the team to determine problems using Lean methodology, which, in turn, helped them to avoid anchoring to preexisting conceptualizations of problems and their origins.

With project roles, scope, and purpose clarified through a project charter, the team proceeded to an introductory simulation of how Lean could impact a different healthcare setting. The simulation brings team members together onto a “level playing field,” where individual team members’ positions or status in the practice is not important to the work they do in the simulation. Gayle Gwizdala, MD, the second participating physician, felt that this leveling effect was important for their team, as it created a true collaborative environment.

Dr Fraizer met with the team for 2-hour sessions, roughly every 2 weeks, following the simulation, accommodating shorter work periods that minimize disruption to patients and nonparticipating office staff, while remaining true to Lean principles of coaching teams where the work is performed. To analyze their current work process, the team created a value stream map (VSM) of each patient’s journey through the practice, with the task of improving patient wait times. VSM is a paper-and-pencil tool that helps teams to visualize and ultimately understand the flow of material and information as the patient moves through care (the “value stream”). The VSM takes into account not only the activity of the patient, but the management and information systems that support the process. The information gathered in this tedious but critical step represents more than just the assigning of time or collection of metrics. According to Dr Gwizdala, the mapping process results in a deep appreciation for the work of others on the team and for the rollover effect that process changes in one aspect of care have on other team members. This forging of interdisciplinary respect and team mentality was believed by both Dr Gwizdala and Ms Schepperly to be the biggest benefit to the VSM process.

Using the VSM and a multidisciplinary team, problems were identified in the process that create bottlenecks to patient flow. The team then quantitatively ranked these problems based on the impact that change would have on the value stream and how easily the problem might be solved. The ranking approach allowed priority problems to surface that decrease the value to the customer, while de-emphasizing totally disruptive, across-the-board change; Dr Fraizer refers to this as the sweet spot of change. The quantitative approach reduced individual perceptual and emotional biases and brought the team to consensus with greater efficiency, resulting in the identification of 4 clear problems that the team could focus on improving.

Work groups formed for each identified problem to develop solutions using rapid development plans, known as Plan/Do/Study/Act

(PDSA) cycles with guidance from Dr Fraizer. Constant refinement of solutions kept the impact of change minimized. During this time in healthcare, where change fatigue is a real danger, Lean returns a sense of control to physicians and staff members.

RESULTS

Lean thinking continues to grow at Thirlby Clinic, and results are already evident. Tangible effects, both quantitative and qualitative, are further discussed in the context of the 4 identified problems:

1. Improve Scheduling Patient Appointment Availability

The clinic was not able to achieve the 30% availability of open access appointments as part of their PCMH functions in the past. This had been an elusive goal, with physicians expressing concern that open appointments would remain open and subsequently become lost income potential. Dr Alvarado was instrumental in securing a 15-minute open same-day care (SDC) appointment for every half-day worked from each of the clinic's 9 providers. Previous attempts by administrators to make this change failed due to a lack of true buy-in by physicians. Late morning and afternoon appointments were typically kept open, although the physicians do control where open appointments are placed based on individual needs. Electronic scheduling software that tracks appointment openings, permits easy changes, and provides quantitative feedback to team members as the process is refined.

One problem identified almost immediately was the absence of a clear definition or shared understanding of what constituted an SDC appointment. Some believed SDC appointments were to be used for acute care visits only, and were therefore usually booked a day or 2 in advance. The team developed a clear definition of the term and disseminated this definition to the entire practice. The clinic also stopped screening calls to see if appointments were deemed as "necessary," instead employing the now-universal operational definition that an SDC appointment accommodates the patients' needs. "It is needed by our patients and this is what matters. We don't judge why our patients want a same-day appointment because we don't live in their world," summarized Deb Schepperly. Patients were educated about the changes through signs in the waiting and exam rooms, messages on the website, closed-circuit TV messages, and recorded telephone reception messages, as well as through direct discussion with office staff. Patients were happy to see their usual provider rather than being sent to urgent care.

The clinic now offers 20% SDC appointments and estimates that 6 minutes are saved per open appointment, largely due to the elimination of administrative coordination overhead between front staff and physician or clinician. With 12 open appointments per day, this equates to 72 minutes of time saved every day that can be repurposed. With the 20% SDC process standardized, Thirlby Clinic is moving forward to eventually meet the 30% SDC requirement. Physicians have found that open appointments are rarely unused, and so

it paves the way for the practice to more easily increase the fraction of open-access appointments up to 30%. The team prioritized the value of the patient's time, thereby generating substantial time savings for the practice and increasing patient satisfaction.

2. 5S Methodology Application

The work group assigned to apply the 5S (Sort, Straighten, Shine, Standardize, and Sustain) method to the common work areas took their task very seriously, and they were amazed at how many unneeded items cluttered their work and mental space. Minimizing disorder in an office environment by keeping the work area clean and organized minimizes interruptions; fewer unnecessary interruptions—which healthcare workers are prone to experiencing due to the inherently coordination-intensive type of work⁷—keeps providers' mental reserves ready to tolerate and cope with the necessary disruptions that will occur.

The work group liberally applied 5S to their own work environments, which quickly spread to staff members not directly involved in the project. Employee satisfaction increased, as did their productivity; the 5S improvements smoothed awkward work processes and increased employee pride and ownership in the office. These benefits, although challenging to quantify, were agreed to have increased productivity through minimized rework and employee retention over the long term. The clinic very conservatively estimated 30 seconds of savings per staff member per day, which seems trivial, but over the course of a month, and distributed across such a large practice, it equates to 4 hours of time available for any number of things that compete for attention in healthcare practice.

3. Decrease the Number of Phone Calls

Medication refill requests; estimated at 40% of all incoming phone calls/faxes, represent a substantial time demand for the practice. The work group opted to take a 2-pronged approach, addressing patient education and physician ordering practices. The considerable scope of this change suggested the need for smaller group trials of possible solutions to minimize practice disruptions. Solutions were trialed with the 2 participating physicians before rolling out to the full practice. Signs and outgoing messages were used to remind patients about changes to the medication refill process. Physicians changed their renewal habits to ensure that stable medications were renewed for 1 year at a time and were reminded to do this using messages on their computers.

Over the course of 2 months, the clinical staff has noted a 25% to 35% reduction in phone calls and incoming faxes for the 2 providers who implemented the changes. Dr Alvarado took an additional step to reduce phone calls by ensuring that his patients had labs drawn in advance of their appointments. Although some additional work by the physician is necessary, the benefit is tremendous: patients appreciate having results at the time of their appointments and physicians appreciate having all the information required to develop treatment

plans and coordinate care. The opportunity to discuss the results and the suggested treatment plan within a single visit allows the patient to ask questions and optimizes their participation in shared decision making. Patients value this time and note that it is a better quality of appointment.

With the reduction in phone calls, each of the 2 physicians estimated a 15-minute weekly time savings, and clinical/front office staff noted an hour of weekly time savings. Time savings for each of these represent increased capacity for additional work. Lisa Reed, a licensed practical nurse involved in the Lean project, stated, “I find myself at the end of a day and I know my work is done. I feel as though I am on top of what is happening instead of playing catch-up. It feels great!”

Formal metrics that document tangible time savings, continue to provide increasing momentum for providers who were initially skeptical. With the original Lean project complete, Dr Alvarado and Ms Schepperly continue to champion these changes to the remaining practice members. The standardization of processes across the practice is the next stage, although Dr Alvarado observed that the word standardization “can be a scary thing” for a physician. He went on to explain:

“In regards to standardization, physicians may find the concept of standardization a little scary or unsavory because they may feel that they lose autonomy or are relegated to practicing cookie cutter medicine. However, standardization often lessens the workload, decreases complexity, and is less onerous on staff. Once you get through the scariness of the unknown, very often standardization is better medicine and more efficient.”

4. Improve the Check-in Process, Increase Lab Function, and Decrease Documented Wait Times

In order to streamline the check-in process, the assigned work group implemented a patient kiosk in the waiting room that allows patients to check themselves in and update records, as needed. The team knew that a percentage of patients would never use the kiosk, and therefore, the manual check-in process could never be completely eliminated. On average, 110 patients are seen in the clinic daily; of these, 27% choose to use the kiosk. Each normal check-in occupies a front staff member for an average of 2 minutes, so kiosk check-in saves the practice about 60 minutes a day.

The team is still evaluating processes to improve efficient use of the lab. However, the team has recognized through analysis of the smaller PDSA trial for phone call reductions, that lab capacity would be a significant problem if performing lab draws in advance of appointments became standardized across all physicians in the practice. The implication of the process changes suggested by the PDSA trial kept the practice from making changes that could not be effectively implemented. Management of change and anticipation of the consequences of change is a key benefit of Lean methodology, particularly when implementing multidisciplinary team solutions.

Comparison of the pre-Lean VSM to the clinic’s current state is enlightening. Pre-Lean, patients were in the office for 1 hour, and 10 minutes of this was face-to-face time with the physician. Through the use of the collective changes noted previously, the average patient now spends 47 minutes in the office, but still receives 10 minutes of face-to-face time with the physician. Lean thinking then, reduced wasted time by 22%, while preserving physician–patient time—time tightly coupled to both patient and provider satisfaction.⁸ As the practice engages more physicians and staff members, further reductions in time waste and increased capacity to engage in activities that bring value and revenue into the practice are expected.

The benefits of Lean thinking are seen beyond the outcomes from specific work projects. Individual departments are now meeting specifically to focus on improvements, and employees are now engaged in the problem-solving process. There is greater overall awareness and discussion about change management; provider and provider/management meetings have time reserved to discuss changes happening within the organization. The common thread is that rather than having change thrust upon the practice, the full team has gained the necessary skills to continue the work of proactive management.

DISCUSSION

Lean is seeping into all aspects of Thirlby’s practice as team members are energized by their success, combined with newly acquired skills. As noted above, significant time savings resulted from the introduction of Lean methodology and will continue to accumulate with spread to the rest of the office. However, even a limited implementation of Lean methodology in the case study practice has resulted in notable effects on patient satisfaction, outcomes, and cost of care.

The biggest challenge to the Thirlby’s Lean effort was gaining active physician participation, which is a universal challenge recognized in the literature.⁵ The next step to increase Lean momentum in NPO’s practice base is to continue generating physician-to-physician opportunities to discuss and affirm the benefit of Lean initiatives. Direct physician endorsements are meaningful to other physicians; the knowledge that another physician has been able to manage and find benefit in change, is far more impactful than the same message delivered in any other way. In addition to engaging physicians and their practices in Lean transformation, NPO will continue to seek funding sources to assist practices in making this journey. According to Dr Alvarado, adoption of Lean methodology by practices will be facilitated by reducing financial barriers to participation.

Lean championship training—the extension of initial projects—more robustly develops Lean methodology in practice leaders, ultimately building a base of effective change agents that will become communities’ future healthcare leaders. NPO considers the adoption of Lean methodology strategically critical in its plans to support its member practices through transformation. NPO believes that by providing skill development opportunities and a plan for how

change can happen, Lean methodology will provide foundational building blocks essential to success in this new era of healthcare. Without the fundamentals required to lead and manage change, forced transformation is wasteful and counterproductive.

Limitations

A major obstacle to Lean adoption for physicians and practices is the time required for the learning process. An estimated 192 hours of time was spent by the 10 interdisciplinary team members between November 2014 and June 2015; however, this is gross time expenditure and the net time spent is considerably less. For example, the changed prescription renewal process alone resulted in an hour of time saved across the practice daily. With this single process change, the use of Lean thinking returned more than the time cost of the entire demonstration period, and furthermore, the benefit of change continues accumulating into the future. Thin financial margins—far from constituting an argument against change—are the primary reason to invest in skill development. Efficient change management is critical to survival during this time of transformation.

Practices in ambulatory care settings must remain operational during the learning process. This ultimately limits the participation in any Lean learning experience to a fraction of the staff and providers any one time, thus challenging the spread of change throughout the rest of the organization. Lean learning however, develops not just a changed process for those that participate, but also the capacity, flexibility, and creativity required for meaningful and sustainable change to continue. This skill enhances the ability of practices to spread adoption, and, ultimately, changes the organizational culture, thereby moving once immovable attitudes.

Another limitation in the use of Lean learning in ambulatory care settings that are geographically remote is access to qualified Lean leaders and facilitated learning experiences. Lean experiences that are subsidized by outside sources can be rigidly imposed and contracted which can be prohibitive to ambulatory care settings and independently owned physician practices who require flexibility in order to participate.

NPO's investment in initial Lean learning, and its continued commitment to extended learning, demonstrates that practices can develop the skills and capacity required to effectively manage change and build on successes, extending the reach of transformative efforts while minimizing the risk of change.

CONCLUSIONS

Practice engagement in Lean results in far greater results than the use of tools and understanding of Lean terminology. Leadership skill and collaborative work habits create efficiency and even greater capacity to further transformation efforts. Future implications include the elimination of barriers to physician and practice involvement in Lean learning in the ambulatory care setting such as subsidizing costs and adaptation to time and physical restrictions. Physician en-

agement may be the biggest future implication and need for development as the health system advances in the transformation from fee-for-service to fee-for-value. The involvement of physicians, the traditional leaders of healthcare and whose relationship with the patient are the basis of healthcare as a whole, is essential to the process. Physician engagement of other physicians is likely the best hope in moving this mark

Lack of time is a common argument against transformation, but tools that reduce time inefficiencies and develop change management skill are most likely to successfully overcome this argument. Efficiency translates into more time spent with patients working on their health, a greater capacity to succeed in change, and greater satisfaction for patients, physicians, and staff members. NPO believes that achieving the Triple Aim in healthcare is well within our reach, and is committed to empowering its members with Lean methodology, 1 physician and practice at a time.

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REFERENCES

1. The IHI Triple Aim. Institute for Healthcare Improvement website. <http://www.ihl.org/engage/initiatives/tripleaim/pages/de>

fault.aspx. Accessed August 26, 2015.

2. Boushey H, Hersh A. The American middle class, income inequality, and the strength of our economy new evidence in economics. Center for American Progress website. <https://www.americanprogress.org/issues/economy/report/2012/05/17/11628/the-american-middle-class-income-inequality-and-the-strength-of-our-economy/>. Published May 17, 2012. Accessed August 15, 2015.
3. Taylor EF, Genevro J, Peikes D, Geonnotti K, Wang W, Meyers D. Building quality improvement capacity in primary care: supports and resources. Agency for Healthcare Research and Quality website. <http://www.ahrq.gov/sites/default/files/publications/files/pcmh-q2.pdf>. Published April 2013. Accessed July 17, 2015.
4. Suneja A, Suneja C. *Lean Doctors: A Bold and Practical Guide to Using Lean Principles to Transform Healthcare Systems One Doctor at a Time*. Milwaukee, WI: American Society for Quality, Quality Press; 2010.
5. O'Rourke T, Ha B. How Lean thinking and switch change management benefits small healthcare practices. GoLeanSixSigma.com website. <https://goleansixsigma.com/lean-thinking-switch-change-management-healthcare-practice/>. Published January 4, 2013. Accessed August 20, 2015.
6. Reinertsen JL, Gosfield AG, Rupp W, Whittington JW. Engaging physicians in a shared quality agenda. Institute for Healthcare Improvement website. <http://www.ihl.org/resources/Pages/IHI-WhitePapers/EngagingPhysiciansWhitePaper.aspx>. Published 2007. Accessed July 28, 2016.
7. Li SY, Magrabi F, Coiera E. A systematic review of the psychological literature on interruption and its patient safety implications. *J Am Med Inform Assoc*. 2012;19(1):6-12. doi: 10.1136/amia-jnl-2010-000024
8. Lin CT, Albertson GA, Schilling LM, et al. Is patients' perception of time spent with the physician a determinant of ambulatory patient satisfaction? *Arch Intern Med*. 2001;161(11):1437-1442.