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Implementation of Lean in a Community Health Center: A Case Study

Submitted To:
California HealthCare Foundation

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1.0 Introduction

Lean is an organizational redesign approach that is increasingly being used in healthcare. At its core, lean focuses on the elimination of *muda* or waste, which is defined as any activity that consumes resources (staff, time, money, space) without adding value to those being served by the process. In essence, lean provides a pathway for organizations to do more for the customer or patient with fewer resources, such as time, space, and money. The world's leading example of lean production is the Toyota Production System. In healthcare organizations, lean is directed toward improving efficiency, clinical outcomes or health status, and financial performance.[1] These improvements are achieved by standardizing and error-proofing administrative or patient care-related processes. Some argue that lean's focus on processes makes it especially appropriate for solving complex healthcare issues. However, others believe that lean is most relevant for manufacturing, arguing that its focus on standardization renders it inappropriate for healthcare because the "customers" are patients with unique needs.

Employees in lean organizations are responsible for improving value and eliminating waste on a daily basis. They are empowered to "stop the line" when they see something wrong, such as seeing a suspected foreign object in a patient prior to closing a surgical site. With time, lean is expected to transform the organization to a culture where employees at all levels are continuously looking for opportunities to remove waste and add value.

The California HealthCare Foundation (CHCF) sought to better understand how lean works in healthcare, specifically:

- whether and how lean can work in a community clinic;
- key outcomes of lean implementation (e.g., efficiency, patient experience, employee engagement); and
- information about facilitators, challenges, and solutions regarding lean implementation.

To investigate these issues, the American Institutes for Research (AIR), a nonprofit research organization headquartered in Washington, DC, conducted a case study of the implementation of lean at a large urban, multisite Federally Qualified Health Center. The Health Center (HC) is a private nonprofit community clinic with headquarters in urban California and several sites within

Common Lean Terms

Efficiency: Optimization of a process that results in minimum resource use.

Kaizen: Incremental continuous improvement that increases the effectiveness of an activity to produce more value and less waste.

Lean: an organizational redesign approach to identify and eliminate activities that do not add value while performing value-adding activities more efficiently and effectively.

Muda: An activity that consumes resources without contributing value to the process. There are seven forms of waste: transport, waiting, overproduction, defect, inventory, motion, and extra processing.

Non-value adding: A task that the customer does not care about and would be unwilling to pay for if they knew the incremental cost of the task.

[1] "Assessing the Evidence of Six Sigma and Lean in the Health Care Industry," J. L. Dellafraine, J. R. Langabeer, and I. M. Nemhard, 2011. *Quality Management in Health Care 19*(3): 211–225.

a single county. Lean implementation efforts began in 2008; the HC anticipates a long-term process with a 10-year horizon. This case study is a snapshot of overall lean implementation at the HC during the early implementation period, based on staff interviews, employee surveys, and data on key metrics. See Appendix A for a full description of study methods.

Note that in this report, the term the HC uses to describe lean, *kaizen,* is used interchangeably with the term *lean. Kaizen* refers to the philosophy or practices that focus upon continuous improvement of processes through system redesign.

More information about lean

Lean Enterprise Institute
http://lean.org

Lean certifications from the University of Michigan
http://interpro.engin.umich.edu/Lean.htm

ASQ Lean Enterprise Division
http://asq.org/le/

2.0 *Kaizen* Initiation and Implementation at the Health Center

About the Health Center. The HC includes more than 20 care delivery sites, including primary care, dental and HIV clinics, mobile medical units, and ancillary facilities that serve pregnant women, the homeless, and at-risk youth. The HC is a large provider of school-based health services in the area. In 2010, more than half of the HC's 160,000 patients were uninsured; most had incomes at or below 200 percent of the federal poverty level.

2.1 Initiation of *Kaizen*

Factors contributing to *kaizen* adoption. A number of factors contributed to the HC's initiation of *kaizen* in 2008. Historically, the HC's quality improvement work had tended to focus on condition-specific projects and programs such as medication management and increasing rates of childhood immunization, or on Joint Commission standards. The HC leadership was interested in transforming into a continuously improving, high-performing customer service organization—and in earning the Malcolm Baldrige National Quality Award, given by the President of the United States in recognition of performance excellence. *Kaizen* appealed to the HC because it offered an array of tools that could be applied across the organization to support this transformation, in contrast to more narrowly targeted improvement methods such as Six Sigma.

Another factor in *kaizen* adoption was the tremendous growth and dynamic environment of the HC. Over the past 10 years, the organization expanded or opened approximately 10 sites. Several staff reported that continued increases in patient growth, a competitive provider market, and a challenging reimbursement environment—including cuts to some Medicaid services—created pressure to improve the efficiency of the delivery of services and contributed to interest in *kaizen*.

Several staff members reported that interest in Kaizen was attributed to environmental pressure to improve the efficiency of the delivery of services.

"Kaizen doesn't cost a lot because you're using your existing human resources and you're developing them. And so you don't need expensive Six Sigma Black Belts. And it doesn't take a sophisticated training. It's about developing the people who are here. It takes advantage of what exists already and builds on that. And it's extremely respectful."

—Senior leader

***Kaizen* approach.** The HC has taken a cultural transformative approach to *kaizen* implementation similar to other organizations regarded as highly successful at *kaizen* implementation, such as Virginia Mason Medical Center. The HC's 10-year approach for implementing *kaizen* involves training all staff on the concepts, tools, and techniques used in *kaizen*. Following the staffwide training, selected clinics and staff implement chosen projects at different points in time. An alternative approach is to train staff members on a project-by-project basis: staff form project teams and learn about *kaizen* by applying the tools to specific improvement projects related to their work. Lean events traditionally occur over four to five days, creating pressure on the team of sequestered employees to work together to produce breakthroughs leading to immediate and tangible results. Neither approach has been shown to be inherently superior. Project-based implementation is oriented toward solving specific problems and features learning-by-doing, which is generally an effective mode of adult learning. However, projects alone may not empower work teams to practice *kaizen* philosophies independently as an approach to work; the HC intends that, over time, such an approach will become embedded in the organizational culture.

2.2 Implementation of *Kaizen*

Once the HC's leadership team made the decision to implement *kaizen* across the organization, work began with a *kaizen* consultant on a diagnostic assessment of the HC to support planning for the *kaizen* initiative. The diagnostic assessment sought to identify the organization's current principles and practices of improvement and resources for filling identified gaps. The consultant moderated 38 focus groups with staff across the organization. The assessment highlighted several organizational strengths: the HC is mission-centric, its workforce is dedicated, and its staff has strong technical expertise. Other findings identified opportunities for improvement through implementation of *kaizen,* including process standardization, employee recognition, and problem solving through root cause examination to build a just culture. Following the initial assessment, senior leadership developed an organizational plan to implement the *kaizen* initiative based on the organization's greatest need and available resources.

Training. *Kaizen* implementation at the HC began with multiple levels of training for staff. The 2-day foundation training, introducing *kaizen* principles, targeted all of the HC's several hundred employees and represents a significant investment of resources for the HC. Other trainings—train-the-trainer, supervisor, leadership, and organization and standardization—are targeted to different audiences, such as those in specific clinics or those with management responsibilities. See Appendix B for a complete list of trainings.

Common Lean Terms

Foundation training: Training on basic principles of lean.

Sensei: A lean expert or consultant who guides the lean implementation and teaches lean principles.

***Kaizen* activities.** The HC's implementation of *kaizen* includes a wide range of new activities. Clinic-specific activities include 5S launches and *gemba kaizens,* which took place at three clinics.

- **5S** (sort, setting in order, scrub, standardize and sustain) is a series of activities used to standardize and organize the workspace. The 5S launch in the targeted clinic begins with a 3-day in-person event, which includes a review of *kaizen* principles and an introduction of 5S principles. Through the implementation, participants make changes in their work space and across the clinic. As part of the launch, clinic staff determines metrics to assess progress, often related to time or cost (e.g., wait time or reduced inventory). After the activity, staff continue to monitor these metrics as necessary, and follow-up is specific to each clinic.

- ***Gemba kaizen*** is a focused process improvement effort targeting a specific identified need. In a *gemba kaizen* activity, participants create a flow map of each step in the process, discuss the road blocks to each step, discuss staff's perspectives on the process, and hold a brainstorming session about how to overcome roadblocks and redesign the process. Over the 3-day session, the team implements changes and redesigned processes and identifies a metric to monitor progress over time. If progress is not sustained over time, the entire process flow may be revisited in another *gemba kaizen* activity.

The HC leadership selects clinic sites for *gemba kaizen* and 5S events based on the areas of greatest need and resource availability. In addition, *gemba kaizen* projects should have easily understood metrics—such as cycle time—focus employee efforts, and facilitate buy-in. The pharmacy at the HC's largest clinic site was selected for a *gemba kaizen* in part because it provided a concrete opportunity to reduce patient wait time for prescriptions and in part because the process of dispensing prescriptions was viewed as closer to manufacturing and more suitable for application of *kaizen* tools than clinical processes. An overview of this clinic pharmacy's implementation of *gemba kaizen,* along with an example from a 5S launch, is provided in Appendix C.

Other quality-related activities implemented at the Health Center. *Kaizen* was not implemented in isolation. Organization-wide activities that were implemented alongside *kaizen* include AIDET and weekly huddles.

- **AIDET** (**A**cknowledge, **I**ntroduce, **D**uration, **E**xplanation, **T**hank You), a framework aimed at improving staff communication with patients and their families, was rolled out to staff across the organization.

Common Lean Terms

5S: Waste elimination through workplace organization by sorting, straightening, scrubbing, systematizing, and standardizing.

Gemba: The place where the work occurs.

Gemba kaizen: Focused process-improvement effort.

***Kaizen* event:** An improvement event where process changes can be made in a short time frame by a cross-functional team who applies Lean thinking and tools to a problem. Activities usually include: (1) team training, (2) current state analysis, (3) future state design, (4) prioritization of improvements, (5) new process testing, (6) training on the new process, and (7) implementing the selected improvements. The length of the event is traditionally one to five consecutive days.

Waste: Anything that consumes resources without providing value to the customer.

- **Weekly huddles** are short team meetings of the staff at each clinic, at which clinic directors relay new information from across the organization and provide staff with an opportunity to ask questions and exchange information. The CEO instituted these weekly huddles as a result of earlier research. Although not an outgrowth of the *kaizen* effort, the weekly huddles supported the dissemination of *kaizen* activities.

3.0 Outcomes of Lean

To date, 5S launches and *gemba kaizens* have been rolled out in three clinics at the HC. Key outcomes of interest identified by the HC, CHCF and the researchers include organizational culture change, employee engagement, increased *kaizen* knowledge and skills, access, and efficiency. Two main sources of outcome data were available: qualitative data from interviews with staff members and quantitative data from an employee opinion survey and clinic reporting on key metrics.

A summary of outcomes identified from interviews is provided below in Exhibit 1.

Exhibit 1. Summary of outcomes

Outcome	Results from Staff Interviews, Survey, and Clinic Data	
	Improvements	**No changes/ no information available**

Efficiency	• Interviewees reported project-specific improvements in efficiency:
	  ○ decrease in pharmacy wait time for prescription processing from 2–3 hours to 45 minutes
	  ○ quicker patient referrals
	  ○ improved productivity
	  ○ quicker receipt of records for walk-in patients
	• Appointment completion rate increased from 64% to 72% (p = .04).
	• Patient time to exam room was reduced by 10 minutes in one clinic (p = .01) but not in another (increased by 6 minutes, p = .15).
		• No statistically significant changes were found in time to third available appointment (pre-1.4 days vs. post-1.7 days, p < .25) and provider productivity (pre-2.6 patients/hour vs. post-2.4 patients/hour, p < .15).

Outcome	Results from Staff Interviews, Survey, and Clinic Data	
	Improvements	**No changes/ no information available**
Organizational culture change	• Interviewees mentioned changes in the organizational culture: ○ improved teamwork and communication within and across clinics ○ shifting the culture to a no-blame, systems view of problems • *Kaizen* efforts to enhance patient communication and reduce wait times were perceived as improving patient experiences at the HC. • Statistically significant improvements were found in the employee survey* in: ○ punitive response (attitudes: pre-51% vs. post-62%, $p < .01$) ○ safety practices (46% vs. post-51%, $p < .01$) ○ communication within the organization (attitudes:pre-61% vs. post-66% , $p < .01$; perceived behavior: pre-62% vs. post-72%, $p < .01$) ○ interaction with leaders (attitudes: pre-63% vs. post-67% , $p = .01$; perceived behavior: pre-63% vs. post-73%, $p < .01$)	• The employee survey did not find improvements in perception regarding punitive behaviors (pre-81% vs. post-82%, $p = .08$).
Employee engagement	• Interviewees described employee engagement outcomes: ○ improved employee satisfaction ○ staff may feel overwhelmed with new *kaizen* activities and current responsibilities	• The employee survey* showed nearly all employees were engaged in their jobs (pre-97% vs. post-97%, $p < .01$) and were satisfied (attitudes: pre-91% vs. post-92%, $p < .01$). • Affective commitment to the organization did not improve (pre-66% vs. post-69%, $p = .08$).
***Kaizen* knowledge and skills**	• Interviewees noted that *kaizen* principles and skills are increasingly evident in clinics where the most *kaizen* activity has taken place; effects are less clear elsewhere.	• No quantitative data available.

***** Percent scores indicate the percent of employees who responded in the top two most favorable categories (agree, strongly agree) of the response scale

3.1 Efficiency

The HC staff reported improvements in efficiency related to specific *kaizen* projects or activities, such as 5S events and in the pharmacy *gemba* described in Appendix C. Twenty-three interviewees described examples of efficiency improvements including reduction in pharmacy wait time for prescription

processing from 2–3 hours to 45 minutes; quicker patient referrals, now initiated within 3 days; improved productivity at one clinic that implemented 5S; and quicker receipt of records for walk-in patients.

In addition to findings from interviews, clinics gathered data on productivity and access to care measures; however, only provider productivity showed a statistically significant change over time. An overview of the productivity and access measures is presented below.

Patient cycle time was systematically collected in two clinics that had conducted several 5S events and, in one of these clinics, a *kaizen* to reduce pharmacy wait time. Lean projects did not specifically target reduction of patient cycle time. Data were collected on 57 scheduled encounters in the second and third quarters of 2010 and on 73 encounters in the last quarter of 2011 across both clinics. No statistically significant changes were found from the point a patient was scheduled to the time patients were placed in the exam room and the provider entered the room in one clinic but a second clinic showed a reduction in time by 10 minutes (Exhibit 1).

Third available appointment is a measure of access to care—the average number of days between the day a patient requests an appointment of any type (new patient, routine, follow-up) with a physician and the third available appointment.[2] The goal is same-day access (1.0 days), which is achieved by matching supply and demand; increased time between the scheduling of an appointment and the available appointment time is one factor known to contribute to higher no-show rates. Data were collected one day in October 2010 and another day in December 2011. The overall average number of days to third available appointment across all 12 clinics reporting data was close to target at 1.37 in 2010 and 1.71 in 2011; the increase in time was not statistically significant. Because third available appointment was collected for 2 days only, the data may not be representative of overall appointment access at the HC.

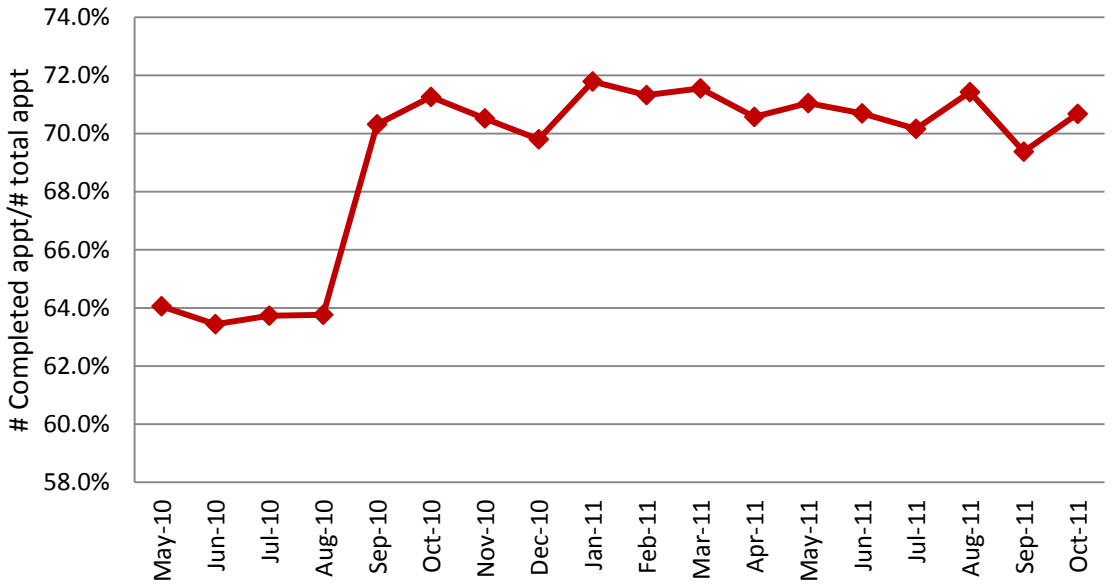
The change in average numbers of days to third available appointment comparing an October date to a December date was calculated for clinics with and without *kaizen* events. Clinics that held *kaizen* events had an increase of 0.75 days on average to a third available appointment whereas those clinics that

[2] The "third next available" appointment is used rather than the "next available" appointment since it is a more sensitive reflection of true appointment availability. For example, an appointment may be open at the time of a request because of a cancellation or other unexpected event. Using the "third next available" appointment eliminates these chance occurrences from the measure of availability. http://www.ihi.org/knowledge/Pages/Measures/ThirdNextAvailableAppointment.aspx

did not have *kaizen* events had a reduction of 0.10 days. The difference was not statistically significant.

Appointment completion rate is a ratio of the completed appointments compared to the available appointments in a given month. A higher completion rate indicates greater efficiency; if all available appointments are fully scheduled with patients, the completion rate reflects the patient show rate. A total of 19 clinics consistently reported data on a monthly basis between May 2010 and October 2011. Between May and August 2010, the average completed appointment rate hovered around 64%; the rate increased to 70% in September 2010, then stabilized to between 70% and 72% through October 2011 (see Exhibit 2 below). Statistically significant improvements (data not shown) were found in completion of mental health visits from May 2010 (64.1%) to May 2011 (69.1%), as well as for physical exam visits in Pediatrics (49.1% to 60.8%) and Adult Care (46.7% to 62.2%). The sharp increase in appointments completed from August 2010 to September 2010 was attributed by the HC to a variety of factors such as the reorganization of care coordination and outreach calls to patients.

Exhibit 2. Percent of appointments completed by month, May 2010—September 2011



The change in mean percent of completed appointments between May 2010 and May 2011 was calculated for clinics that had and did not have *kaizen* events. Although the clinics with *kaizen* events had a greater increase in the percent of completed appointments compared to those clinics that did not hold events, the difference was not statistically significant.

Provider productivity is a measure of the average number of patients seen per hour by each clinic provider. Productivity trended downward from the second quarter of 2010 (2.63 encounters per hour) to the fourth quarter of 2011 (2.41 encounters per hour). When productively was evaluated by clinic, four clinics had small increases in productivity that were not significant, whereas five other clinics saw a drop in productivity ranging from 0.23 to 0.51 encounters per hour that were statistically significant.

The change in provider productivity between the third quarter of 2010 and the third quarter of 2011 was calculated for clinics that had and did not have *kaizen* events. Both types of clinics had a drop in productively but the *kaizen* event clinics drop in productivity was not as large as those clinics that did not have *kaizen* events (-0.07 encounters per hour vs. -0.27 encounters per hour). This comparison of clinics was statistically significant.

Data on efficiency metrics provide some preliminary information about the impact of lean but are not conclusive for a number of reasons. First, no baseline data were available; these measures were collected during the first year of lean implementation and then one year later when lean was just beginning to take hold. Although the majority of employees had attended basic lean training, only a few clinics had undertaken a formal lean project—and only one of those projects targeted efficiency (the pharmacy cycle time *gemba kaizen* described in Appendix C). Second, the data have some limitations. Changes (positive or negative) could potentially be explained by seasonal differences or factors inherent to the day of the week. The data analysis partially compensates for this possible bias by comparing data from the same quarters from one year to the next. In addition, some clinics did not consistently report data every month; only those clinics reporting data at least 75% of the time for monthly measures and 2 months for quarterly measures are included in this report. These caveats must be taken into account in interpreting the results.

3.2 Changes in Organizational Culture

Among the outcomes of interest, staff noted the most significant changes in the domain of organizational change, as reported by 25 interviewees. Interviewees who had participated in 5S activities were almost unanimous in their perceptions of positive organizational culture change as a result of *kaizen;* interviewees who had not participated in 5S noticed fewer changes to culture. Many staff at all levels said they thought that more cohesive work teams had been created after the implementation of *kaizen*. Most staff noted improved communication throughout the organization. Many interviewees cited the new mechanisms created to facilitate communication across clinics. For example, a "weekly huddle" allowed staff to learn about what is going on at other parts of the organization.

"It feels like now there's more cohesiveness. Instead of just, 'Well, you're working with me today and if you need help, sorry.' It's like everyone's working together a little bit more and making more of an effort to create more of a positive work environment besides the fact that everything is labeled very nicely and organized and clean."

—Provider

There were mixed reports regarding the organization's culture prior to *kaizen*. Several staff members across different levels of the organization reported a shift from a blaming culture to a systems way of thinking in which staff seeks to understand the root cause of a problem and to suggest process changes to address issues. They noted that the HC is making headway in the goal of becoming a no-blame, no-judge culture. Other individuals, however, did not perceive any change. They felt that the culture of their clinic was already one of no blame, and that that feature should not be attributed to *kaizen*. These interviewees generally worked in smaller clinics or were newer to the organization.

"When I first started here a couple of years ago, I thought, 'what if I tell them this? Are they going to like my ideas?' I didn't feel that communication or being able to speak what I felt, my mind. And now, it's just gotten way better from when I first started here."

—Medical assistant

Staff members were also asked for their perceptions of whether their efforts were improving patient experiences. While this data cannot be supported by quantitative data, staff perspectives on their impact are worth noting. At all levels of the organization, interviewees overwhelmingly felt that their efforts to decrease patient wait time, to enhance communication with patients and families through AIDET, as well as 5S and *gemba kaizen* activities, was improving patient experience. Several interviewees reported that patients appear happier and calmer and are more complimentary; one clinic director reported receiving telephone calls from patients expressing their satisfaction.

"I think in regards to customer service and patient care, those are where the biggest benefits have come in because one of the first steps of Kaizen was taking a look at the process in creating our standards of conduct… getting that in place and really defining it. Because it's like, 'We'll be nice to our patients.' Well, what does that does mean? 'Be respectful.' What does that mean? I think that that created very clear lines in customer service and it's given a framework to all of our employees."

—Nurse manager

In addition to information available from interviews, employees were asked to complete an online Employee Opinion Survey in April-May 2010 then again in November-December 2011. The survey was divided into 10 scales with questions ranging from overall job satisfaction to communication at the HC. In some questions, employees were asked to indicate their level of agreement (strongly disagree, disagree, neither agree or disagree, agree, or strongly agree) with perception statements (e.g. "I would be very happy to spend the rest of my career with this organization."). In other questions, employees were asked to identify the frequency (never, sometimes, routinely, or all of the time) a specific behavior (e.g. "Staff reporting potential mistakes") occurred. Each of the scales was scored by counting the number of responses in the top two most favorable categories then creating a percentile for the scale.

A total of 88% (n = 664) of permanent employees completed the Employee Opinion Survey in 2010 and a slightly lower percent (80%, n = 683) in 2011. Statistically significant improvements were found in perceptions related to punitive response, communication within the organization, and interaction with leaders (Exhibit 3). Safety perception had a statistically significant increase as well.

Exhibit 3. Employee Opinion Survey results, 2010 and 2011

Employee Opinion Survey scales	2010	2011	Significance
Job engagement: percent of employees who agree or strongly agree that they feel personally responsible for and committed to their job performance	97.1%	96.7%	NS
Affective commitment: percent of employees who agree or strongly agree that they have an emotional attachment to the organization	66.4%	69.3%	NS
Employee satisfaction: percent of employees who agree or strongly agree that the work performed is meaningful and satisfying	91.0%	91.5%	NS
Safety perception: percent of employees who agree or strongly agree that the organization responds to errors reported by employees in a favorable manner	46.1%	50.8%	*
Punitive response perception: percent of employees who agree or strongly agree that the types of punitive responses employees experience after reporting errors are favorable	51.3%	62.4%	*
Punitive response behavior: percent of employees who are willing to report errors routinely or all of the time	80.7%	82.4%	NS
Communication within the organization—perception: percent of employees who agree or strongly agree that they feel free to speak up about their concerns and communicate in an effective manner with their peers and patients	60.9%	66.0%	*
Communication within the organization—behavior: percent of employees who observe behaviors indicative of good leadership and communication with employees routinely or all of the time	62.2%	72.2%	*
Interaction with leaders—perception: percent of employees who agree or strongly agree that supervisors provide feedback that helps employees meet performance expectations	62.6%	67.3%	*
Interaction with leaders—behavior: percent of employees who report that the organization allows employees to speak freely to supervisors about issues negatively impacting patient/client care routinely or all of the time	62.6%	72.8%	*
* Statistically significant difference; NS = not statistically significant			

When the change in Employee Opinion scores (2010 to 2011) in the three HC clinics that had *kaizen* events were compared to all other clinics within the organization, the results were mixed. The *kaizen* event clinics showed greater improvements than non-*kaizen* event clinics in the perceived frequency of behaviors in three areas: punitive response, communication within the organization, and interaction with leaders. In other areas, the *kaizen* event clinics scores did not improve as much as in nonevent clinics: affective commitment, employee satisfaction, and perceptions related to safety and communication within the organization. All noted comparisons were statistically significant.

Improvements that were identified in the Employee Opinion Survey did not vary by type of frontline employee (clinical vs. nonclinical), job level (supervisor vs. nonsupervisory) or race/ethnicity.

3.3 Employee Engagement

Sixteen interviewees across multiple levels, from senior management to frontline staff, reported an improvement in employee satisfaction and engagement because of *kaizen*—and this improvement was more pronounced in clinics farther along the process of lean implementation. In clinics that had launched 5S, nearly all staff indicated improved job satisfaction; staff members were excited to see the improvements they had made to their work spaces and felt a sense of accomplishment. Interviewees at all levels of the organization reported that support staff—including patient service representatives, registration staff, and medical assistants—experienced the greatest improvements in satisfaction as a result of *kaizen*. These staff members were more involved with lean than were physicians and midlevel providers. Nurses who had participated in 5S believed that it resulted in better defined nurses' stations and provider rooms at each clinic, allowing both groups of staff sufficient space to complete their work processes adequately.

Access to training and staff development also contributed to improved employee satisfaction, with several interviewees reporting that the staff was excited to participate in lean training and perceived it as a development opportunity. However, a few interviewees expressed a concern that personnel feel overwhelmed by additional responsibilities and workload resulting from *kaizen*.

The Employee Opinion Survey showed job engagement remained high at over 97% over 18 months as did employee satisfaction at 91% and above (Exhibit 3). Employee's affective commitment increased, but the change was not significant.

3.4 *Kaizen* Knowledge and Skills

Knowledge of *kaizen* principles and skills seems to be permeating parts of the organization. Nearly all of the HC staff interviewed had adopted the *kaizen* language and used it in interviews.

Beyond the use of the *kaizen* language, the *kaizen* consultant noted that staff is more aware of *muda*, or waste, in their work space and in their clinic. Further, senior executives and clinic directors at this organization identify it as a "*kaizen* organization." Implementation of *kaizen* knowledge and skills is also evident through the many "bubble up" *kaizen* activities, informal activities

> *"The language is totally integrated now. People walk around, it's* kaizen gemba. *They [staff] have—they have* muda *language. They—and that's important to have new language for them because it helps them again to identify the waste in the organization, what's standing in the way of their work."*
>
> *—Kaizen consultant*

initiated by clinic staff and attributed at least in part to *kaizen*. Examples include:

- A clinic director and nursing staff worked together to create a better process to sort charts that need follow-up.
- Based on feedback from nurses, one clinic installed a new phone for emergency phone calls because other phones were constantly in use.
- A front-desk staff person organized the packages of registration forms so that the clinic is prepared for the following day's patients.

The HC is still relatively new in its *kaizen* journey, and there were mixed reports of the degree to which *kaizen* has become a part of the fabric of the organization. Five clinic directors noted that the "*kaizen* way" is becoming the standard approach across the HC, whereas other interviewees noted that this is only the case in the three clinics that have implemented 5S or *gemba kaizen*. A few interviewees noted increased standardization associated with *kaizen*, such as integration of AIDET behavior standards for staff communication with patients and families into performance evaluations across clinics. Others noted that the unique features of each of the HC clinics, from the culture of the clinic and the population served to the physical layout, make standardized processes difficult to implement.

4.0 Facilitators, Barriers, and Lessons Learned

During site visits and interviews, staff members at all levels were asked to name the two or three greatest contributors to success, the problems or challenges they encountered in implementing *kaizen* at the HC, and lessons learned. Senior managers and clinic directors provided the largest number of responses, and themes emerged related to managing change, leadership commitment, *kaizen* training, and implementing lean in a community clinic setting. In addition, interviewees had several recommendations for provider organizations—including community clinics—interested in undertaking lean initiatives.

"I think anytime you change things, big or small within a company, there's a lot of resistance. … People are stuck in their ways and are resistant to adding new things or taking away things, even if it improves the scheduling … or whatnot. They may know what to do, but getting them to do it is a different thing."

—Mid-level provider

4.1 Managing Change

Several major organization-wide initiatives occurred at the HC, raising concerns about overwhelming providers and frontline staff. In addition to *kaizen* implementation (trainings, AIDET, 5S, *gemba kaizen*, and other activities), the HC undertook an organizational restructuring, electronic health record implementation, preparing for Joint Commission certification, changes to the staff evaluation process, and applying for the Baldrige award.

Change is always difficult, and the HC has encountered a wide range of emotions in reaction to the implementation of the *kaizen* initiative, including questioning, fear, and excitement. While many staff members are enthusiastic about working to improve patient care and experience and see *kaizen* as an opportunity for professional development, others are concerned about and resistant to the changes. A few interviewees noted that some long-tenured staff in leadership positions have had trouble adjusting to a no-blame culture and are less supportive of *kaizen* implementation.

Frontline staff may require particular attention in the implementation efforts. At the HC, frontline staff tended to be concerned about an increased workload as a result of *kaizen* implementation, and clinic directors and trainers worked closely with staff to assuage their concerns by explaining how staff would be involved in the process. In addition, frontline staff was sometimes more comfortable speaking up and offering improvement suggestions in discussions with peers than with a multilevel group that included clinic leadership. Sensitivity to structuring *kaizen* activities may facilitate participation across all levels, particularly in the early implementation efforts when staff is less familiar with *kaizen* and the important role staff members play in identifying and implementing improvements.

One specific tactic for helping to manage change that emerged from the interviews is clear communication regarding the timeline for implementation. Some staff members were unsure about what was planned for *kaizen* and what the time horizon was, not only for the initiative as a whole but also for specific applications like 5S.

4.2 Leadership Commitment

Multiple interviewees highlighted the importance of organizational commitment to *kaizen* as demonstrated by allocating resources, clearly and consistently identifying *kaizen* as an organizational priority, following through on implementation activities, and sustaining improvements once they have been achieved. Several staff members at various levels of the organization noted that leadership commitment to *kaizen* has encouraged them to engage in *kaizen* implementation even in the face of resistance from others. Specific mentions included the importance of leaders being open, being present, engaging in activities with the team, and supporting and showing commitment to a *kaizen* activity or intervention on an ongoing basis—including the HC executives' visits to clinics and interaction with staff members.

> *"It's a very open door policy. I'm going to go to my clinic director and I know she'll be like, "Come in, sit down. What's going on?" Every voice is heard, which is a big part. It's taking personal ownership and I really enjoy that because if I see a problem, I know I can go to them."*
>
> *—Nurse manager*

4.3 *Kaizen* Training

Several interviewees at all levels of the organization noted the challenges of separating the training from the project-based application. Depending on the length of time between the training and the implementation of 5S or *gemba kaizen*, staff members may forget many of the concepts and terms because they have had little opportunity to apply them.

> *The one negative has been that they go to Kaizen training, they come back—and this happened more at the beginning, they will come back and then what? So the first few days, they were, yes excited. And then, as days went by, nothing."*
>
> *—Clinic director*

Several interviewees suggested providing staff with an opportunity to work on a project at their home clinic shortly after the training to allow them to apply what they learned—in part to reinforce the *kaizen* training, and in part because the process improvements implemented through *kaizen* provide an opportunity to improve service to patients, increase staff engagement, and improve morale.

4.4 Implementing Lean

One specific issue that emerged at the HC is a strong organizational culture that requires careful accounting and frugal management of resources. As a Federally Qualified Health Center, the HC has directed almost all financial resources to service provision. While perhaps essential for a provider with constrained resources and high demand, tight budgetary control and related bureaucratic requirements reduce flexibility and, according to interviewees, occasionally hampered the HC's ability to invest in the proposed solutions that resulted from *kaizen* activities.

Multiple interviewees in both clinical and management positions mentioned that it is difficult for providers in a community clinic setting to participate in *kaizen* given the high demand for their services and the mission of the organization to provide services to those with limited resources. In practice, physician and midlevel providers rarely participate and are not as directly involved in *kaizen* activities as other staff members. Likewise, training and participation of frontline staff was viewed by some as detracting from the organization's core mission because it reduced—albeit temporarily—the number of patients who could be seen at the clinics. Several interviewees mentioned that the pace of patient care can present a challenge to implementing *kaizen* solutions—at times, so many patients were at the clinic that staff was unable to slow down and correct processes, particularly with patients who require more time.

5.0 Recommendations for Similar Organizations Considering Lean

A number of recommendations from the HC interviewees in addition to recommendations that came to light from the case study of the HC's experience should be considered by similar organizations considering *kaizen*. When

considering implementing lean, it is important to remember that lean is an effective mechanism for reducing waste and increasing efficiency. However, lean will not provide a solution to a problem, merely a process for solving it. Recommendations for applying lean are listed in are listed in Exhibit 4.

EXHIBIT 4. Recommendations for similar organizations considering lean

Factor	Recommendations and lessons learned
Managing change	• Early wins foster buy-in. The HC's first *gemba kaizens* were viewed as successful, facilitating confidence in the lean process among staff. • Choose an implementation plan that works best for your goals, timeline, and budget. The HC chose to implement an organization-wide training as a first step to cultural change. Other organizations may choose to implement a series of individual projects to bring about cultural change. • Communication about the process of *kaizen* rollout across departments and clinics is critical.
Leadership commitment	• Embed *kaizen* in the organizational strategic plan. Aligning *kaizen* with the strategic plan will ensure that staff members understand that there is a firm commitment to *kaizen*. • When initiating *kaizen* implementation, engage the managers and executive team first. The HC's leadership was deeply involved in learning about *kaizen* and trained in how to engage their staff using *kaizen*. This approach fostered support from the very top levels of the organization. • *Kaizen* ensures that solutions to a problem are derived from frontline staff; however, decision making on what to do and where to focus must come from the leadership.
Kaizen training	• *Kaizen* implementation at the organizational level requires expertise. External consultants are a critical resource for staff. • Provide opportunities for staff to get involved with *kaizen*. Involving staff in trainings or projects will improve the dissemination of *kaizen* knowledge and skills and may promote further culture change. • Projects keep staff engaged and provide them with opportunities to apply their *kaizen* knowledge.
Implementation of lean	• Be prepared for significant investment of staff resources. Time during the regular workday, and sometimes on the weekends, must be carved out for staff training and participation and follow-up on *gemba kaizens*.

6.0 Conclusion

To date, little research has been conducted on implementation of lean in the primary care setting; most of the literature on lean is specific to hospitals and hospital systems, making it challenging to apply the lessons learned to other settings. Yet, lean is increasingly deployed in primary care: In 2011, CHCF

released findings from a study of methods used by providers in redesigning care that showed that lean was one of those primary methods.[3]

This case study is one of the first assessments of lean as implemented in a primary care setting—more specifically, a multisite Federally Qualified Health Center. The HC chose a transformative approach to lean implementation, engaging the entire organization in general lean training. Intensive implementation has taken place in three clinics to date, with a focus on administrative and support processes—rather than clinical processes—perceived most likely to yield early successes through the application of *kaizen* tools.

Initial results from the HC's lean implementation show largely positive findings from staff interviews regarding the effect on organization culture. Anecdotal accounts were consistent with improvements to communication, leadership, and culture shown in an Employee Opinion Survey. Widespread improvements to efficiency and access were generally not found. Given that lean implementation at the HC is ongoing, it would be premature to state that the findings of the case study presented here are definitive. It will likely take years to fully assess the effect of lean on the HC.

[3] *Better and Faster: How Safety-Net Providers Are Redesigning Care,* by A. Eslan, and C. L. Preheim, 2011, Oakland, CA: John Snow, Inc. Prepared for California HealthCare Foundation. Available at: http://www.chcf.org/publications/2011/01/better-faster-safety-net-redesigning-care.

Appendix A: Methods

Based on a literature scan and development of a conceptual framework for a related project—AIR conducted case studies of lean implementation in five additional provider organizations across the country—AIR designed a mixed-methods case study of the HC's implementation of lean. This approach provides robust information about the design and implementation of lean, referred to as *kaizen,* at the HC. However, the timing of the study does not allow a full understanding of the impacts of the implementation or potential outcomes of lean. Although the HC is made up of multiple clinics, the unit of analysis for this study is the overall organization, or the HC.

This issue brief describes findings to date from both qualitative and quantitative data.

Qualitative data were collected in the following ways between October 2009 and April 2011: two site visits, telephone interviews, observation of events, digital diaries, and collection of documentation related to lean implementation. A total of 31 interviews were conducted. Interviewees included several senior executives, clinic directors from nearly half the clinics (7 out of 15), and staff across various levels of the organization and eight individual clinics. The sample included staff that played a variety of roles in the organization and on *kaizen*, ranging from overall leadership to responsibility for the day-to-day management of clinics to frontline patient service. The study was focused on clinics where most *kaizen* activity was occurring. All interviewees had participated in the HC's *kaizen* initiative through Foundation Training activities, a 2-day in-person training on the principles and practices of *kaizen*. About three quarters of interviewees had participated in other *kaizen* activities, including *gemba kaizens* (projects to improve processes and efficiencies), and/or 5S launches (a series of activities used to standardize and organize the workspace).

Quantitative data were collected through employee survey and clinic reporting of metrics. AIR worked with the HC to design and implement an employee engagement and satisfaction survey, developed using existing scales that have been shown to be valid and reliable and fielded in both English and Spanish. This survey was conducted in April and May 2010, and repeated in November and December 2011. In addition, AIR worked with the HC to create a definition and documentation method for patient waiting times, provider productivity, patient complaints, and access to care at the clinics. The clinics submitted these data between May 2010 and October 2011.

Appendix B: *Kaizen* Trainings Offered by the HC

	Duration	Mode	Participants	Trainers	Content
Foundation (general *Kaizen*) training	Two days	In-person	All employees. Groups of 15–24 staff members trained at once: mixed levels and roles, including clinical and nonclinical staff	External *kaizen* consultant, the chief operating officer, clinic directors, and one nurse manager	Principles of *kaizen*; seven practices of *kaizen; muda* walks (or walks through other clinics to examine waste)
Foundation and 5S train-the-trainer training	Varies by activity, overall process takes several months	In-person	Staff selected by the HC senior leaders with input from clinic directors to serve as trainers for Foundation and 5S Trainings	External *kaizen* consultant	Four-phase process: (1) participate in session; (2) observe session; (3) cofacilitate session with external consultant coaching; (4) facilitate session with observation by external consultant
Supervisor training	Half-day sessions, quarterly	In-person	All staff supervisors from the HC clinics	External *kaizen* consultant, other speakers	How to lead for *kaizen,* manage individuals, and encourage improvement suggestions
Leadership training (offered Year 1 only, then ended)	One-day sessions, quarterly	In-person	The clinic directors and chief operating officer meets as one group and the executives meet as a separate group	External *kaizen* consultant	How to lead in a *kaizen* environment, visioning for the company, and how to coach staff
5S training	One day	In-person	Frontline managers and clinic directors receive training in 5S	External *kaizen* consultant	Concepts of visual management and the steps for implementing visual management

Appendix C: Implementation of 5S and *Gemba Kaizen* in the HC Clinics

	5S launch – Clinic "A"	***Gemba kaizen* – Clinic "B" pharmacy**
Background	The third largest clinic in the HC launched 5S in October 2010. The clinic sees a high volume of walk-in patients and shares space with the dental clinic.	The largest clinic in the HC launched a *gemba kaizen* in 2009 for its pharmacy. The goal of this project was to reduce patient waiting time in the pharmacy to 30 minutes or less.
Participants	• Three staff members each from nursing, registration, and medical records participated in the program. • All staff participated on the last day, including the clinic director and the chief operating officer. • Each team worked with a trainer. • The team had limited input from providers.	• Pharmacy team. • Two *kaizen* consultants. • Clinic director. • Chief operating officer.
Activities and results	• Removed or repurposed many items in the clinic • Reorganized the patient waiting room and registration process. • Created new signage to guide patients. • Reorganized the nursing station. • Standardized exam rooms. • Reorganized medical records area • Staff realized that additional staff and/or space might not be necessary.	• Mapped out current process and work flow and created several options for changing and improving work flow. • Redesigned the entire pharmacy area. • Decreased prescription filling time from 2 to 3 hours to 45 minutes. • Pharmacy team members reported that they function better as a team but also acknowledged that the *gemba* was hard work.
Post-launch	• Staff continued to meet in their natural work teams weekly or biweekly. • Staff continued to revisit the patient flow, especially through the registration area. • After the launch, registration staff and the clinic director implemented a new system where registration staff would be assigned to a provider in an attempt to avoid patient backlogs.	• Initial improvements in efficiency were sustained, but they varied over time with some lack of adherence to standards and changes in staffing (e.g. staff out sick). • Staff revisited the process twice through additional 2-day events. • Staff meets weekly for 30 minutes to discuss progress and changes.

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