Applying Lean to Improve the Patient Visit Process at Three Federally Qualified Health Centers
This report was produced under the auspices of Altarum Institute's Community Health Center Innovation Mission Project, a 2-year, $2.3 million internally funded initiative to strengthen the federally qualified health center (FQHC) care delivery system and improve health for vulnerable populations. The project was designed as a working partnership between Altarum and FQHCs to test systems change methods, strengthen FQHC capacity, and ultimately enhance patient care. This project was one of three in Altarum Institute's Mission Projects Initiative, which sought to solve pressing health care issues using systems methods at the institutional, organizational, and community levels in partnership with the public and private sector.

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Applying Lean to Improve the Patient Visit Process at Three Federally Qualified Health Centers

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Overview

Federally qualified health centers (FQHC) represent the largest primary care system in the United States. A network of 1,200 FQHCs operate from 8,000 rural and urban service delivery sites across the country, providing comprehensive medical, dental, and mental health care services to a predominantly low-income, minority patient population. FQHCs face growing pressure to meet increased patient demands with limited staffing and financial resources. In order to ensure long-term stability, FQHCs must leverage existing capacity and maximize efficiency and effectiveness.

Applying the Lean Process Improvement Approach in FQHCs

In May 2009, Altarum Institute launched partnerships with three FQHCs—Alexandria Neighborhood Health Services, Inc. (Virginia), Baldwin Family Health Care (Michigan), and Penobscot Community Health Care (Maine)—through the Community Health Center Innovation Mission Project. The goal of this project was to apply innovative systems change methods to strengthen FQHC operations and, in turn, improve health for the patients whom they serve. Over an approximately 18-month period, Altarum and its FQHC partners worked together to improve operations using the Lean process improvement approach. The Lean methodology originated in the manufacturing industry and focuses on minimizing waste—be it time, energy, or resources—and maximizing value. This approach has recently been adopted in the health care sector, particularly by larger hospitals and health systems, and has resulted in financial savings, increased productivity, decreased delays in care, reduced errors, and improved quality of care. The application of Lean in FQHCs, however, is relatively limited.

Altarum supported FQHCs in adopting the Lean approach in two key ways: (1) providing training in Lean principles, tools, and techniques and (2) facilitating Value Stream Mapping (VSM) events. VSM is a Lean tool used to analyze a process from a systems perspective, creating a visual depiction of the sequential steps in a process from beginning to end. Additional support was provided to FQHCs based on each site’s individual needs and requests.

To obtain a solid understanding of each FQHC’s experience using Lean tools and techniques, Altarum conducted interviews with staff members, including those in leadership, direct care, and front-line positions. These interviews provide critical insights and practical lessons learned for other primary care organizations considering adoption of the Lean process improvement approach.

Lean tools and techniques were used to improve patient flow across the three FQHCs. The health centers addressed a range of problems related to:

- Scheduling
- Registration
- No shows
- Wait time
- Provider productivity
- Care coordination
- Miscommunication
- Unclear roles and processes
Findings

Staff members across the three organizations reported that the use of Lean enabled them to identify and make positive changes to several processes and workflows. Many of the improvements perceived by the staff are interrelated. The standardization of a complex, time-consuming process, for example, may have a ripple effect leading to improved patient flow, the provision of safer and better quality care, and enhanced patient access to care. In turn, the improvements may result in greater provider, staff, and patient satisfaction.

The Value of Lean

Staff members perceived the application of Lean to result in improvements in the following key areas:

Standardization of processes. Standard work is associated with role clarity, error reduction, and the promotion of safety. The three FQHCs implemented a number of changes to promote standardization, including the use of checklists and templates and the establishment of formal policies and procedures. As a staff member pointed out, “creating efficiencies and standardization is huge, because your resources are so limited. We cannot afford to do things many different ways.”

Patient flow. Changes that improved patient flow ranged from streamlining processes to organizing supply areas. These changes were associated with fewer delays and interruptions, reduced waste, time savings, and enhanced staff and patient satisfaction. The importance of improvements in patient flow was captured by a health center staff member: “It makes the process flow faster. [Patients] are in and out, yet they still felt that all their needs were met.”

Communication. The VSM event was cited by staff members as a critical framework for openly discussing issues and challenges and provided a strong foundation for ongoing communication across all staff levels. One participant noted succinctly, “The more I see Lean working, the better I see communication working.”

Collaboration. Lean encouraged the increased use of interdisciplinary teams and was viewed as a key vehicle to facilitate movement toward a shared, common goal of improved patient care. As one staff member described, “I feel strongly that staff are more cohesive and working better together and are more team oriented.”

Staff satisfaction and empowerment. Staff members felt they were active contributors to the improvement process, had a voice, and could offer ideas and solutions for improvement. A staff member observed, “I’ve seen members of this team feel like they are bigger contributors than they had felt before because they’ve seen how they can play a role that really affects the patient process.”

Patient access to care. Improvements in provider and staff efficiency and patient flow were associated with enhanced patient access to care. Changes implemented helped to free up exam rooms, reduce wait times, and improve provider productivity. Decreased cycle times resulting from the use of computers in exam rooms, for example, “translates directly into more patients seen with the same staff.”

Patient satisfaction. Staff members observed changes in patient satisfaction, sharing anecdotes from patients pleased with experiencing a more organized, timely, and efficient visit. Changes implemented through Lean process improvement work were seen as “better for patient care,” with some staff members sharing that they now receive “more compliments than complaints.”

Quality of care. Many of the changes made in the areas of patient flow and standardization were identified by staff as having an impact on both quality and safety of care. Increased efficiency and better use of time, for example, allowed staff to focus on providing the best patient care. As noted by a staff member, “I can be more efficient. I can be more effective … I can streamline certain things and spend that time with the patient. Because that’s what it’s all about—the patient.”
Facilitators and Barriers

Staff members revealed a number of factors perceived as supporting the application of Lean within their organizations, most importantly, staff buy-in and leadership support. The presence of these facilitators may serve as a powerful countervailing force to overcome barriers to change, such as competing priorities and limited organizational capacity.

Factors Supporting the Successful Adoption of Lean

Lean empowers staff members to become active participants in the change process. The Lean approach introduces a new way of thinking and provides concrete tools enabling staff members to proactively resolve problems. This internally generated change separated Lean from other initiatives “forced” upon the staff by top management or external organizations. Improvements are a direct result of their own ideas and work, leading to a greater sense of achievement.

Leadership must demonstrate active support and investment of resources in order to implement Lean. Lean requires top-down commitment and prioritization from senior leadership in order for an empowered staff to then drive the improvement efforts. Leadership must directly engage in Lean activities and commit the resources required to both train staff members and offer them opportunities to continuously apply Lean methods.

The Lean approach takes time to gain traction. Once staff members see the impact of Lean on their own work—whether it is in the form of reduced stress, being able to complete their work faster, or the perception that patients are happier—skepticism and distrust give way to enthusiasm and receptivity to change through the Lean approach.

Quick wins are critical to maintaining momentum. One way to address initial resistance to Lean is to target relatively simple, straightforward changes. Easy, seemingly obvious changes may have significant impact. Moreover, small successes build momentum, propelling staff to move forward with continuous improvement efforts. As referenced by several staff members, these quick wins are “contagious” as “success breeds success.”

Lessons Learned

Common themes emerged from the health centers’ shared Lean journeys, which may serve as useful insights and lessons for other health care organizations:

Value Stream Mapping events provide a structure for critical thinking, teamwork, and problem solving in FQHCs. By design, VSM requires 3 full days of uninterrupted time for the FQHC staff to examine the root cause of problems and brainstorm solutions as a team. The end product is a roadmap for change, critical to maintaining focus and accountability amidst countless priorities competing for staff attention.

“...[Lean] was a real learning process initially...and then everyone [started] to embrace it slowly and talk about it more and more and it turned to belief and then into action.”

Quick wins are critical to maintaining momentum. One way to address initial resistance to Lean is to target relatively simple, straightforward changes. Easy, seemingly obvious changes may have significant impact. Moreover, small successes build momentum, propelling staff to move forward with continuous improvement efforts. As referenced by several staff members, these quick wins are “contagious” as “success breeds success.”

“I see changed attitudes. It really empowers people. It makes them realize that just because you’ve done something for a long time doesn’t make it right or doesn’t make it the best, and that you can always look and figure out how to do things better, faster, cheaper.”

“We’ve given up a huge amount of staff and provider time for the trainings and that costs us real money when we pull providers out of seeing patients ... but we believe it’s been worth it.”

“People have made changes [and say] “We put a chart together this way now instead of that way’ They are applying the concept but don’t view it as a big win. It doesn’t have to be a big win. What we are doing is improving our processes using these tools.”
Lean is an effective tool for FQHCs in transitioning to the patient-centered medical home (PCMH) model. The Lean approach provides the structure, nuts-and-bolts tools, and accountability to assist FQHCs in making a smoother, faster transition to the PCMH model. Specifically, Lean helps translate PCMH features from conceptual ideas to a set of actual tasks and projects that must be completed.

Lean can be an effective change management and continuous process improvement strategy in the FQHC setting. Lean may serve as a welcome reprieve for overworked and underresourced FQHC staff, which is constantly having to do more with less. Once staff members recognize the benefits of Lean, they continuously explore opportunities to improve and perform to the best of their ability. In this way, Lean may help FQHCs to maximize the resources they have—a benefit of tremendous importance in the current health care environment.

Conclusion

The experience of partner health centers in this project revealed that Lean can be adapted within FQHCs and lead to improvements in a number of areas. These include standardization, patient flow, communication and collaboration, patient access to care, patient and staff satisfaction, and quality of care. In addition, staff members expected continued improvements to generate financial savings.

In order to reap these benefits, however, Lean requires work and an upfront investment of staff time—the most valuable of health center resources. Such investment comes in the form of pulling staff away from providing direct patient care, resulting in short-staffed clinics as well as lost patient revenues. The costs and benefits of Lean are summarized in the following observation made by an FQHC staff member: “[The benefits are seen in] employee experience, in improving processes, having happier patients and employees…in the long run it is worth it.”

It is important to recognize that Lean is a long-term approach to continuous process improvement and may take 5 years to become fully embedded within an organization. This project tested the implementation of Lean within a small sample of FQHCs over an 18-month time period. Despite these limitations, the findings in this report suggest that Lean has the potential to enhance operations within the primary care setting.

Altarum Institute’s quality improvement experts have a history of successfully applying Lean principles to improve efficiency in more than 30 commercial health systems (including large, multisite teaching and research hospitals). A small sample of Altarum’s health system clients include:

- Memorial Sloan Kettering Cancer Center
- UMass Memorial Health System
- Kaiser Permanente
- Dartmouth-Hitchcock Medical Center
- Scott & White Health System
- University of Michigan Health System
Introduction

Overview and Purpose

Federally qualified health centers (FQHC) represent the largest primary care system in the United States. These nonprofit, locally directed organizations provide comprehensive primary and preventive health care to the nation’s most vulnerable populations. While FQHCs have demonstrated resilience in responding to the challenges of an evolving health care system, they face growing pressure to meet increased patient demands with limited resources. In order to ensure long-term stability, FQHCs must leverage existing capacity and maximize efficiency and effectiveness. The purpose of this report is to describe the experiences of three FQHCs in applying Lean, a continuous process improvement approach, to improve the patient visit process and ultimately enhance patient care. The report provides insight into the use and effectiveness of Lean in the FQHC setting.

This report was produced under the auspices of Altarum Institute’s Community Health Center (CHC) Innovation Mission Project, a 2-year, internally funded initiative to strengthen the FQHC care delivery system and improve health for vulnerable populations. Using Lean principles and tools, the patient visit process at three FQHCs was examined from a systems perspective in an effort to analyze complex procedures and interactions, identify root causes of problems, and implement sustainable solutions. The participating FQHCs have unique features, ranging from size of organization to patient demographics, and their experiences with Lean differed as well. However, common themes emerged across the three FQHCs and provide important lessons for the broader FQHC community.

Organization of Report

This report, Applying Lean to Improve the Patient Visit Process at Three Federally Qualified Health Centers, is organized in the following manner:

This first chapter (Introduction) provides background information about FQHCs and their role in the health care system, the partnerships forged between Altarum and FQHCs in the CHC Innovation Mission Project, and the use and impact of Lean in the health care sector. Subsequent chapters explore in greater detail the approach used to apply Lean within three FQHCs (Chapter 2); key findings from interviews with FQHC staff, including the perceived value of Lean as well as key barriers and facilitators to implementation (Chapter 3); the use of Lean to facilitate transition to the patient-centered medical home model of care delivery (Chapter 4); a discussion of lessons learned from applying Lean in three FQHCs (Chapter 5); and the report conclusion (Chapter 6).
Health Centers: Effective Care Delivery Models

Health centers first emerged in the 1960s at the height of movements for civil rights and social justice. They began as demonstration projects, funded by the federal Office of Economic Opportunity in 1965 during the Johnson administration's War on Poverty. At that time, indoor plumbing and drinkable water were nonexistent in many poor U.S. communities, as was accessible, quality health care. The health center model, founded by physician-activists Jack Geiger and Count Gibson, responded to this desperate need (Lefkowitz, 2007). Health centers were designed “of the people, by the people, for the people,” (Adashi, Geiger, & Fine, 2010, p. 2047) and sought to empower communities by addressing the underlying social, environmental, and economic factors contributing to overall health. In addition to bringing medical care to disenfranchised populations, for example, they offered supportive services—such as interventions for young mothers, transportation, job training, and child care—based on unique patient and family needs. Services were rendered by teams of health care professionals, emphasizing treatment of the “whole person,” regardless of a patient’s ability to pay (Lefkowitz, 2007). This fundamental concept of integrating personalized, affordable health care with community-based services remains at the core of health centers today.2

The FQHC network has since thrived and secured a critical role in the U.S. health care safety net. Throughout the country, 1,200 FQHCs operate from 8,000 rural and urban service delivery sites, serving 20 million patients throughout their lifespans. Many of these individuals do not have access to any other source of care (National Association of Community Health Centers [NACHC], 2009a). FQHCs are administered by the U.S. Health Resources and Services Administration (HRSA) and are federally funded under Section 330 of the Public Health Service Act (often referred to as Section 330 grants or grantees). Revenue is derived primarily from Medicaid (37%), federal grants (22%), and state and local grants (12%). Additional sources include private insurance, Medicare, patient self-pay, foundations and private grants, and other revenue (Kaiser State Health Facts, 2009).

Despite a significant nationwide representation, FQHCs are not well known to the public at large. These “best kept secrets” have important features that distinguish them from other safety net providers. As part of their mission, FQHCs are located in or serve medically underserved areas or populations and offer a comprehensive array of medical, dental, mental health, and social services to all residents.3 They also use a sliding fee scale based on patients’ ability to pay, helping to remove financial barriers to care. Finally, ensuring that FQHCs remain sensitive to the specific needs of their communities, they are governed by a community board. The majority of the board’s members must be active patients of the FQHC and represent the characteristics of the FQHC’s patient population (Rosenbaum, Finnegan, & Shin, 2009).

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1 Note. From Lefkowitz (2007, p. 146).
2 Legislation authorizing health centers as “community health centers” was passed by Congress in 1975. Subsequent legislation in 1989 created the FQHC program, which established preferential Medicaid and Medicare reimbursement rates for health centers (Taylor, 2004).
3 Health care services include primary care, laboratory and radiology services, preventive services and screenings, well child services, immunizations, eye, ear, and dental screening for children, family planning services, preventive dental services, emergency medical and dental services, and pharmaceutical services. Enabling services include case management, financial support, referrals, substance abuse and mental health services, outreach, transportation, interpretive services, and health education.
The health care providers and staff members who work at FQHCs often sacrifice higher salaries and earning opportunities, such as those offered at hospitals and private practices. They do so out of support for the FQHC mission and the opportunity to serve those in need (UMASS Medical School, 2010). As shown in figure 1, compared to the overall U.S. population, FQHC patients are disproportionately poor, uninsured, and publicly insured by Medicaid. The majority are also members of racial and ethnic minority groups (Health Resources and Services Administration, 2009). In general, FQHC patients more likely to have serious and chronic health conditions than those receiving care at private physician practices (Rosenbaum, Finnegan, & Shin, 2009).

Despite the high-risk nature of their patient population, the quality of care provided by FQHCs has been shown to meet or exceed national benchmarks, as well as the quality of care furnished by other primary care providers (Dor, Pylypchuck, Shin, & Rosenbaum, 2008; Hicks et al., 2006; Regan, Schempf, Yoon, & Politzer, 2003; Shi & Stevens, 2007; Shin, Markus, Rosenbaum, & Sharac, 2008). Numerous studies also recognize FQHCs for reducing health disparities (O’Malley, Forrest, Politzer, Wulu, & Shi, 2005; Schempf, Politzer, & Wulu, 2003; Shi, Tsai, Higgins, & Lebrun, 2009; Shi, Stevens, Wulu, Politzer, & Xu, 2004), improving access to care (Hing, Hooker, & Ashman, 2011; O’Malley et al., 2005; Probst, Laditka, & Laditka, 2009; Shi & Stevens, 2007; Shi et al., 2009), and contributing to cost savings in the health care system (Falik et al., 2006; Hadley & Cunningham, 2004; NACHC, The Robert Graham Center, & Capital Link, 2007; Rust et al., 2009). In fact, by reducing unnecessary and costly hospitalizations and emergency department use, FQHCs save the health system an estimated $24 billion per year (Ku et al., 2010).

**FQHC Expansion**

Since their inception and throughout the ensuing 5 decades, FQHCs have enjoyed bipartisan political support. This has translated into a consistent stream of federal funding to strengthen and expand the program. Federal grants to FQHCs increased at a steady pace throughout the 1990s, from $550 million in 1990 to nearly $1 billion in 1999 (Lo Sasso & Byck, 2010). The following decade resulted in significant investments in FQHCs, as highlighted below:

- **Health Center Initiative.** Acknowledging a lack of access to affordable primary care as a key challenge for significant numbers of Americans, President Bush launched the Health Center Initiative in 2002, with the goal of significantly increasing access to primary health care services. This initiative doubled the investment in health centers from $1 billion in fiscal year 2000 to $2 billion in fiscal year 2007. The number of health center patients increased from 10 to 16 million and the number of centers increased from 750 to 1,200 over this period (Iglehart, 2010).

- **American Recovery and Reinvestment Act (ARRA).** The economic downturn that began in 2007 resulted in nationwide unemployment rates hovering around 10%. During the period of 2007 to 2009, 5 million Americans lost employment-based health insurance (Holahan, 2011). Given the mandate of FQHCs to provide care regardless of ability to pay, they served as a “critical finger in the dike” (Iglehart, 2010, p. 343) against the flood of
newly uninsured individuals and faced a surge of new patients. In an effort to mitigate the deleterious effects of the economic downturn, the Obama administration provided stimulus funding under ARRA, which included a one-time appropriation of $2 billion to FQHCs for construction, renovation, equipment, and health information technology, new sites and services, and workforce investments. Consequently, FQHCs were able to reach 2.1 million new patients and 1.2 million new uninsured patients by the end of 2009 (NACHC, 2010).

- **Affordable Care Act (ACA).** The ACA, passed in 2010, committed $11 billion to FQHCs over a period of 5 years. Through provisions to expand access to affordable health insurance coverage, the number of patients seen at FQHCs may more than double from 20 to 44 million by 2015 and 50 million in 2019. However, FQHCs will continue to play a key role in caring for the uninsured as an estimated 23 million will still lack access to coverage. As final confirmation of the vital role of FQHCs in the health care system, the ACA permanently reauthorized the FQHC program. Other ACA elements that will have an impact on FQHCs include reimbursement for preventive services, increased primary care payment rates, the creation of health insurance exchanges offering subsidies to lower-income individuals, the authorization of a teaching health center grant program, and various initiatives to improve health care costs, access, and quality. Additionally, the law increases funding for the National Health Service Corps, which provides health professionals for many FQHCs (Rosenbaum, Jones, Shin, Tolbert, 2010).

**Challenges**

While federal funding has increased over the years, it has not matched increases in FQHC operating expenses and the cost of providing care to a growing uninsured patient population. Many FQHCs are in the tenuous position of striving to meet increased patient demands in the face of significant resource constraints (Hurley, Felland, & Lauer, 2007). Moreover, although health reform intended to expand the reach of FQHCs, proposed funding restrictions for fiscal year 2011 threaten to undermine these efforts (Shin & Rosenbaum, 2011).

Other challenging factors affecting the ability of FQHCs to carry out their mission include:

- **Ongoing Funding and Payment Issues.** FQHCs struggle with low payments from private insurers, inadequate reimbursement for services (Iglehart, 2010), Medicaid cutbacks, and a nationwide shift toward high-deductible and catastrophic health insurance plans (NACHC, 2009b). As a result, many FQHCs lack the capital needed to support technical improvements and construction projects (NACHC et al., 2007).

- **Insufficient Supply of Health Care Professionals.** The surge of patients occurs against the backdrop of a primary care workforce shortage. Nearly two-thirds of all physicians in the United States practice as specialists (Mullan, 2009), and the primary care physician shortage is expected to reach 46,000 by 2025 (American Association of Medical Colleges, 2008). Notably, the number of U.S. medical school graduates entering family practice decreased by 51% between 1998 and 2006 (Woo, 2006). This is especially concerning as family physicians are the single largest category of specialists in FQHCs and account for nearly half of total physician staff (Rosenblatt, Androlla, Curtin, & Hart, 2006, p. 1004).

- **Recruitment and Retention Challenges.** FQHCs must employ a diverse mix of health professionals with wide-ranging skills. They face staffing challenges due to the inability to offer competitive compensation packages (Hurley et al., 2007; Rosenblatt et al., 2006), limited family physician training opportunities (Morris, Lesko, Androlla, & Chen, 2009b). As a result, many FQHCs lack the capital needed to support technical improvements and construction projects (NACHC et al., 2007).

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4 At the time of preparing this report, the U.S. House of Representatives proposed a $1.3 billion reduction in FQHC funding for fiscal year 2011. While the proposal was rejected by the Senate, final FQHC funding levels were yet to be determined (Rosenbaum & Shin, 2011).
Applying Lean to Improve the Patient Visit Process at Three Federally Qualified Health Centers

2010), and difficulty attracting bilingual and culturally competent staff (Hurley et al., 2007).

■ **Other Challenges.** FQHCs face a number of other challenges, including difficulty obtaining off-site specialty care for uninsured and Medicaid patients (Cook et al., 2007; Doty, Abrams, Hernandez, Stremikis, & Beal, 2010; Gusmano, Fairbrother, & Park, 2002), declining amounts of “charity care” provided by private physicians, greater reporting requirements from public and private payers, and increasing public health and emergency preparedness responsibilities (Hurley, Felland, & Lauer, 2007).

**Testing Change in FQHCs**

Over the years, FQHCs have demonstrated flexibility and have adapted to address challenges and meet the changing needs of their communities. A large part of this success lies with their ability to forge strong community partnerships. Through collaboration with hospitals and members of the local health care delivery system, as well as schools, faith-based organizations, foundations and other institutions, FQHCs tackle resource and capacity constraints, implement new initiatives, and ensure access to needed services for patients (Hurley et al., 2007). In addition, they often engage in various performance and quality improvement (QI) initiatives in an effort to enhance care. The largest and perhaps most important of these QI efforts was the Health Disparities Collaboratives (HDC), a national initiative sponsored by HRSA to improve chronic disease management for patients served by FQHCs. The HDC, which began in 1998, brought together FQHCs in learning sessions to receive training on QI strategies developed by the Institute for Healthcare Improvement (Landon et al., 2007). Most interventions initially targeted improvements in diabetes care and subsequently were extended to include asthma, depression, cardiovascular disease, cancer screening, planned care, finance, and clinical systems redesign (Graber et al., 2008).

Initiatives focusing on improving care processes in FQHCs, including the HDC, have demonstrated short-term effectiveness. However, long-term effectiveness and sustainability of QI initiatives in the FQHC environment, as well as insight into the “best” QI tools and methods, are less certain (Chien, Walters, & Chin, 2007). Additionally, while it is important for FQHCs to continue engaging in opportunities for improvement, participation in change initiatives often creates additional responsibilities for FQHC staff already struggling with excessive workloads. The HDC, for example, added approximately 8 to 11 hours of extra work per week for the staff and, in some cases, led to staff burnout and decreased morale. Organizational and leadership factors, such as the use of strong champions and the distribution of labor across the staff, were shown to mitigate these effects (Graber et al., 2008).

**CHC Innovation Mission Project**

Altarum, a nonprofit health systems research and consulting organization, recognizes the central role FQHCs play in the provision of primary care as well as the considerable challenges threatening their ability to achieve their mission. In 2008, Altarum launched the Mission Projects Initiative, which sought to solve pressing health care issues using systems methods at the institutional, organizational, and community levels in partnership with the public and private sector. Specifically, Altarum invested $7 million over a 2-year period into three distinct projects focusing on:

■ Fostering innovation in FQHCs to strengthen capacity;
■ Confronting the childhood obesity epidemic; and
■ Integrating community health and social services for veterans.5

5 For more information on the Mission Projects Initiative, please visit www.altarum.org.
Consistent with Altarum’s overarching mission to solve systems problems to improve human health, the goal of the CHC Innovation Mission Project was to improve the health of vulnerable individuals and communities by applying our systems research expertise and innovative approaches to challenges and opportunities in the FQHC delivery system. This project was designed as a working partnership between Altarum and a small group of FQHCs to test systems change methods, strengthen FQHC capacity, and by extension, enhance patient care. Given that the broad network of FQHCs extends across all U.S. states and territories, it was necessary to limit the scope of those eligible to participate in the project (see appendix A for a description of the site selection process). In May 2009, Altarum ultimately launched partnerships with the four FQHCs offering the strongest opportunity for successful collaboration.

Unlike technical assistance projects that are more prescriptive in nature, this project offered FQHCs the opportunity to select an improvement focus based on their own strategic goals and unique challenges. Altarum then drew from its range of service offerings to identify strategies that would address the targeted area of need (see appendix B for the project’s theory of change model). In the summer of 2009, the Altarum project team conducted site visits to each partner FQHC to explore areas for potential assistance. Three FQHCs—Alexandria Neighborhood Health Services (ANHSI) in Alexandria, Virginia, Baldwin Family Health Care (FHC) in Baldwin, Michigan, and Penobscot Community Health Care (PCHC) in Bangor, Maine—referenced various challenges related to clinical and administrative efficiency, such as:

- Explosive organizational growth;
- Increasing numbers of patients;
- Inefficient patient flow;
- Lack of standardized processes;
- Overwhelmed physicians and staffing shortages;
- Long patient wait times; and
- Provider productivity concerns.

In subsequent discussions with leadership and staff members at ANHSI, FHC, and PCHC, the Lean process improvement approach was examined and ultimately selected as a strategy to test changes for system-level improvements within these organizations. Altarum had successfully applied Lean to enhance efficiency and productivity at a number of other health care organizations, including Kaiser Permanente, Memorial Sloan Kettering Cancer Center, and Scott & White Health System. This project represented an opportunity for both Altarum and the participating FQHCs to learn about Lean’s applicability in the primary care setting. Moreover, each FQHC partner varied in size, structure, and patient mix, offering further insight into how these different organizational factors may influence the adoption of Lean. Table 1 provides a snapshot of ANHSI, FHC, and PCHC.

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6 Cherry Street Health Services, another partner in the CHC Innovation Mission Project, selected integrated care as a focus area. A separate report titled Integrated Primary Care and Behavioral Health: A Case Study Report and available on www.altarum.org captures key outcomes from their experience in the project.
Table 1. At a Glance: Partner FQHCs Applying Lean

<table>
<thead>
<tr>
<th></th>
<th>ANHSI</th>
<th>FHC</th>
<th>PCHC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year Established</td>
<td>1997</td>
<td>1967</td>
<td>1997</td>
</tr>
<tr>
<td>State</td>
<td>Virginia</td>
<td>Michigan</td>
<td>Maine</td>
</tr>
<tr>
<td>Rural or Urban</td>
<td>Urban</td>
<td>Rural</td>
<td>Urban</td>
</tr>
<tr>
<td>Year EMR Implemented</td>
<td>2009</td>
<td>N/A</td>
<td>2003</td>
</tr>
<tr>
<td>Number of Sites</td>
<td>8</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Total Budget</td>
<td>$5.7M</td>
<td>$33M</td>
<td>$40M</td>
</tr>
<tr>
<td>Total Number of Staff Members</td>
<td>62</td>
<td>300</td>
<td>532</td>
</tr>
<tr>
<td>Total Number of Patients</td>
<td>11,905</td>
<td>37,149</td>
<td>46,748</td>
</tr>
<tr>
<td>% Increase from 2006 to 2010</td>
<td>96%</td>
<td>66%</td>
<td>31%</td>
</tr>
<tr>
<td>Total Number of Patient Visits</td>
<td>33,810</td>
<td>159,948</td>
<td>260,773</td>
</tr>
<tr>
<td>Patient Income as % of Poverty Level*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At or below 100% of Poverty</td>
<td>55%</td>
<td>40%</td>
<td>34%</td>
</tr>
<tr>
<td>At or below 200% of Poverty</td>
<td>94%</td>
<td>72%</td>
<td>63%</td>
</tr>
<tr>
<td>Patients by Insurance Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Uninsured</td>
<td>79%</td>
<td>20%</td>
<td>11%</td>
</tr>
<tr>
<td>% Medicaid</td>
<td>15%</td>
<td>31%</td>
<td>34%</td>
</tr>
<tr>
<td>% Medicare</td>
<td>3%</td>
<td>21%</td>
<td>16%</td>
</tr>
<tr>
<td>% Privately Insured</td>
<td>3%</td>
<td>28%</td>
<td>38%</td>
</tr>
<tr>
<td>Patients by Race/Ethnicity*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Asian/Paci/fic Islander</td>
<td>8%</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>% Black/African American</td>
<td>20%</td>
<td>3%</td>
<td>1%</td>
</tr>
<tr>
<td>% Native American/Alaskan Indian</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>% Hispanic/Latino</td>
<td>64%</td>
<td>8%</td>
<td>1%</td>
</tr>
<tr>
<td>% White</td>
<td>7%</td>
<td>88%</td>
<td>94%</td>
</tr>
<tr>
<td>% More than One Race</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Note. Data were provided by each FQHC based on 2010 Uniform Data System figures. ANHSI = Alexandria Neighborhood Health Services, Inc.; FHC = Baldwin Family Health Care; PCHC = Penobscot Community Health Care.

What Is Lean?

Lean is a set of principles and tools used to continuously improve processes in a system. This approach, derived from the manufacturing industry and the Toyota Production System, serves as a framework for organizational change. Often characterized as a way of thinking, the Lean philosophy focuses on minimizing waste—be it time, energy, or resources—and maximizing value (Womack, Byrne, Flume, Kaplan, & Toussaint, 2005). This is achieved through small, incremental changes, which often have a broader impact on processes and the system as a whole (Tsasis & Bruce-Barrett, 2008). By analyzing all of the steps in a process, defined as the value stream, Lean reveals opportunities to identify and remove anything that has no value to the customer or waste. This is intended to create a more efficient flow where the customer is able to easily pull value (i.e., whatever the customer needs, whenever the customer needs it). The process is then re-examined until a perfect or ideal state is attained. These five guiding principles of value, value stream, flow, pull, and perfection may apply to any industry as all organizations are made up of different processes (Womack & Jones, 2003). For this reason, Lean has been successfully adopted in other fields such as aerospace, consumer products (Spear & Bowen, 1999), and more recently, health care (Womack et al., 2005). Table 2 demonstrates how Lean principles may apply to the health care field.
As the Institute of Medicine’s *Crossing the Quality Chasm* (2001) reports, the U.S. health care system is fraught with complex processes, medical errors, wasted resources, and harmful delays in access to care. Moreover, experts in health quality research note that as much as 50% of all health care work activity may be classified as waste (ThedaCare Center for Healthcare Value, 2011). Many organizations are turning to Lean as an approach to enable change and address these problems. Hospitals and large health systems, such as Virginia Mason Medical Center, ThedaCare Inc. (Womack et al., 2005), and Intermountain Healthcare (Jimmerson, Weber, & Sobek, 2005), have adopted Lean principles and tools to eliminate waste, redesign processes, and deliver more efficient, patient-focused care. These organizations have experienced significant financial savings, increased productivity, decreased delays in care, reduced errors, and improved quality of care provided to patients. Changes implemented through Lean in health care settings have also led to improved flow (Hintzen, Knoer, Van Dyke, & Milavitz, 2009), increased teamwork and staff empowerment to create change (Jimmerson et al., 2005) and improved patient and employee satisfaction (Jimmerson et al., 2005; Wojtys, Schley, Overgaard, & Agbabian, 2009). Supporting these results with quantitative data has proven to be a challenge. Indeed, there is a dearth of rigorous research on Lean outcomes in health care, with most organizations self-reporting the results (Poksinska, 2010).

As a system-level change strategy, Lean requires investment and involvement of employees across all levels of the organization. Womack et al. (2005, p. 4) note Lean is “not for the faint of heart” and it may take 5 years to fully embed Lean within an organization (Liker, 2004). Research indicates that senior leadership plays a critical role in the successful adoption of Lean by fostering an environment in which employees openly discuss and identify problems and work in teams to test changes and solutions. This constitutes a culture shift for many organizations, where the traditional approach is to function in silos, accept the “status quo,” and blame individuals for problems rather than viewing them as opportunities for improvement (Womack et al., 2005). It takes time for employees, especially health care professionals skeptical of using manufacturing methods in patient care environments, to embrace and understand the benefits of Lean (Poksinska, 2010).

### Table 2. Lean Principles Applied to Health Care

<table>
<thead>
<tr>
<th>Lean Principle</th>
<th>Applied to Health Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determine value from the customer’s perspective</td>
<td>The customer, or the patient, values an efficient and effective health care experience in which all of their needs are met</td>
</tr>
<tr>
<td>Identify the value stream for each product or service</td>
<td>Every step of the patient’s health care experience produces value</td>
</tr>
<tr>
<td>Make value flow smoothly from beginning to end</td>
<td>The patient moves continuously through the health care system with no delays, interruptions, or gaps in care</td>
</tr>
<tr>
<td>Let the customer pull value from the process</td>
<td>The patient “pulls” products and services (e.g., appointments, prescriptions, tests, information) easily when needed</td>
</tr>
<tr>
<td>Pursue perfection and continuous improvement</td>
<td>Care processes are continuously re-evaluated and redesigned to optimize the patient experience</td>
</tr>
</tbody>
</table>

*Note.* Adapted from Womack & Jones (2003).

### Examples of Wastes in Health Care
- Medication errors
- Missing or inaccurate information
- Redundant information gathering
- Unnecessary screenings or tests
- Waiting for appointments, test results, patient records, information, approval
- Excessive movement of people and materials
- Unused or expired inventory
- Searching for people, charts, supplies, paperwork, information

*Note.* From Snyder & McDermott (2009).
Lean in FQHCs

Over the last few years, Lean has gained traction in the FQHC setting. Denver Health, for example, implemented Lean in eight of the health system’s FQHCs to streamline appointment scheduling, simplify the registration process, standardize roles, and redesign work processes to promote team-based care. As a result, the FQHCs experienced reduced no-show rates, reduced patient wait times, and enhanced efficiency and productivity (Agency for Healthcare Research and Quality, 2006). Other early adopters such as the CHC of Lubbock, a mid-sized center in west Texas, has applied Lean tools to improve several clinical and administrative processes, resulting in increased efficiency, enhanced access to care, improved patient flow, and improved quality of care (M. Sullivan, personal communication, June 22, 2011). Primary care associations are also recognizing the benefits of Lean in helping FQHCs address a myriad of operational challenges. Associations in Montana and North Carolina, for example, have offered Lean training courses to member FQHCs in an effort to promote continuous process improvement. Despite this recent uptake, exposure to and application of Lean in FQHCs remains limited across the network.

Early Adopter Snapshot: The Community Health Center of Lubbock

In 2008, the Community Health Center of Lubbock (CHCL) began implementing the Lean continuous process improvement approach. Lean was identified by leadership as a way to structurally sustain the center after a significant reorganization. According to the executive director, “Lean is invaluable right now. In the environment we’re in, health care businesses that are driven by a true culture of continually improving and taking waste out of their business will survive—it’s imperative for survival.”

The application of Lean at CHCL has led to performance improvements in areas such as scheduling, screening, patient care, billing, collections, inventory, and administration. From this experience adopting the Lean approach, the center has gleaned key lessons for other FQHCs:

- Lean is a culture shift that is built over time
- Lean is an investment of time and resources that pays off over the long term
- Lean must be applied across the organization (not by “a handful of people”)
- Support from senior leadership and middle managers is critical to successful adoption of Lean
- Small, incremental improvements make a big difference

Note. From personal communication with M. Sullivan (2011).
Conclusion

Since the mid 1960s, health centers have been providing comprehensive medical, dental, mental health and social services to predominantly low-income, medically underserved populations. The FQHC network has expanded and secured a critical role in the U.S. health care safety net. Although FQHCs have successfully adapted over the years to meet the needs of their communities, they face a number of challenges threatening to erode operational capacity, including rising numbers of uninsured patients, a diminishing primary care workforce, and ongoing staffing and fiscal constraints. In 2009, Altarum launched partnerships with three FQHCs through the CHC Innovation Mission Project to test systems change methods, strengthen FQHC operations, and enhance patient care. The Lean continuous process improvement approach, which maximizes value and minimizes waste, was selected as a strategy to test changes for system-level improvements within these organizations. The application of Lean is relatively new in the health care field and limited in the FQHC network. The approach used by Altarum and its partner FQHCs to implement Lean is discussed in the next chapter.
Lean Approach

Introduction

An Altarum Lean coach, supported by CHC Innovation Mission Project team members, facilitated and oversaw the implementation of Lean at ANHSI, FHC, and PCHC. Each health center launched project activities between late 2009 and early 2010 and concluded between late 2010 and early 2011. This staggered launch was based on each center’s readiness to undertake a new initiative. Following a detailed description of the approach used to implement Lean in each FQHC, this chapter discusses data collection and analysis methods used to generate project findings.

Lean Approach

Altarum used the following five-step approach to support partner FQHCs in adopting Lean:

1. Plan and prepare for the Lean improvement effort in scoping sessions;
2. Train FQHC staff in Lean tools and techniques;
3. Facilitate value stream mapping events, the primary Lean process improvement tool used to bring about change in each health center;
4. Track progress through action item review sessions; and
5. Provide additional Lean support based on the specific needs and requests of each site.

Scoping Sessions

The first step in implementing Lean at partner FQHCs was to determine the scope of the improvement effort. This involved developing a clear understanding of (1) the specific process to be improved using Lean and (2) the reasons for changing this process. During onsite meetings with FQHC leadership and staff members, referred to as “scoping sessions,” Altarum’s Lean coach facilitated discussions to create a case for change and build consensus around the need for improvement. Given that each health center experienced difficulty attaining a smooth and efficient flow of patients through their clinics, the patient visit was selected as the process to be examined and improved at ANHSI, FHC, and PCHC.
The Value Stream Mapping Tool

In most health care organizations, patient care is delivered across different departments and work silos. The patient navigates through various stages of his or her visit interacting with staff members along the way, all of whom complete their own set of actions to move the patient to the next stage. The many steps that constitute the patient visit are interrelated, yet they are often performed discretely and without consideration of their impact on care delivery as a whole. In order to think analytically about the patient visit from a systems perspective rather than a series of unrelated tasks, Altarum and partner FQHCs used a Lean tool known as value stream mapping (VSM). The most common Lean tool used in health care settings (Poksinska, 2010), VSM is a visual representation of the sequential steps involved in a process from beginning to end. A VSM event typically occurs over a 3-day period. On the first day, a team of individuals representing every role or function (i.e., those closest to the work) recreate the process, step by step, to develop a current state map. This helps to visualize the process flow and identify where problems, bottlenecks, and wastes occur. On the second day, the team maps out an ideal process without any of the problems found in the current state, referred to as the future state map. Finally, on the third day of the VSM event, the team creates a list of specific action items, or an action plan, needed to achieve the future state and create an improved process.

Preparation for Value Stream Mapping Events

During scoping sessions, FQHCs also completed a process improvement charter in preparation for the VSM events. This one-page document summarized key information related to the Lean improvement effort, including the following:

- **Process Scope.** This patient visit process begins with the patient’s request for an appointment and ends when the patient’s appointment has been completed and he or she leaves the center with all the necessary follow-up information in hand. Health centers identified areas that were “in scope,” such as medical visits, and “out of scope,” such as pharmacy- or lab-only visits.

- **Problems and Case for Change.** The health centers shared similar problems contributing to inefficiencies in the patient visit process, such as: long patient wait times, excessive patient visit cycle time (i.e., the amount of time a patient spends at an office visit), lack of care coordination, poor communication across staff and departments, and unbalanced use of resources.

- **Goals and Key Measures.** The overall goal was to improve the patient visit process at each FQHC by addressing the above-cited problems and, in turn, improve patient flow. Each health center determined for itself the specific objectives it sought to achieve. These included, for example, reduced patient visit cycle time, reduced no-show rate, increased revenue, and improved provider and staff satisfaction, among others. Related metrics were identified to measure improvements in these areas. For example, FQHCs measured the number of patients seen per provider per day, monthly patient revenue, patient visit time, and patient no-show rates. In addition, PCHC used the VSM event to implement elements of the patient-centered medical home (PCMH) model, discussed in more detail in Chapter 4.

- **Team Members.** Careful examination of the patient visit requires input from everyone who plays a role in the process. These individuals cut across several departments and work areas, from schedulers and direct care providers to electronic medical records (EMR) trainers and members of the center’s executive leadership. Therefore, FQHCs assembled teams with a range of clinical and administrative staff members, including physicians, nurses, physician assistants, medical assistants, receptionists,
clinical coordinators, practice managers, pharmacists, lab technicians, billing specialists, medical records and referrals personnel, information technology staff, and executive leaders. In some instances, these individuals had never met one another. Additionally, each health center identified individuals to serve as sponsors, process owners, embedded Lean coaches, and members of an executive committee. These roles are described in Table 3.

- **Time Frame.** The VSM event required 3 full days of provider and staff time. Recognizing the difficulty of pulling health care providers away from their clinics and patients for an extended amount of time, FQHCs conducted VSM events on three nonconsecutive days over a period of weeks. These VSM dates, as well as other important planning, implementation, and follow-up meeting dates, were listed on the process improvement charter.

### Table 3. VSM Event Roles and Responsibilities

<table>
<thead>
<tr>
<th>Role</th>
<th>Key Responsibilities</th>
</tr>
</thead>
</table>
| Team Member                 | - Actively share input and participate in the improvement effort  
                            | - Implement, test, and monitor changes                     |
| Sponsor                     | - Encourage and empower team members to meet goals        |
| Process Owner               | - Assist in planning, implementation, and follow-up activities  
                            | - Maintain action plan and monitor completion of action items |
| Embedded Lean Coach         | - Assist in facilitating improvement event                |
| Executive Committee         | - Develop competencies in Lean and serve as mentor for peers |

### Introductory Lean Training

Prior to conducting VSM events, it was necessary to expose participating FQHC staff members to basic Lean principles, concepts, and tools. Altarum’s Lean coach conducted onsite training sessions, introducing these individuals to the history, application, and benefits of Lean. One of the main learning objectives was for participants to develop “eyes for waste,” that is, recognize opportunities to reduce or eliminate waste in their environments. Waste might include errors, duplicate or redundant work, time spent waiting (e.g., for information, people, materials), outdated or unused supplies, excessive walking or travel, and other activities that do not add value. A core tenet of Lean, the elimination of waste requires individuals to feel safe exposing problems and testing solutions. When a problem occurs, the Lean approach avoids placing blame and focuses on identifying the root cause—often times, a process failure. Through lessons and hands-on team-building exercises, participants learned about different Lean strategies used to minimize waste and maximize value. These included, for example, reducing variation through the use of standard work, simplifying and organizing operations with visual management tools, redesigning processes through the VSM tool, and performing root cause analysis using the A3 approach (named after the A3-sized, or 11X17, paper). Table 4 includes examples and benefits of key Lean concepts and tools. This list includes those most commonly used by FQHCs in this project and does not represent the full range of available Lean methods.
### Table 4. Examples of Lean Concepts and Tools

<table>
<thead>
<tr>
<th>Lean Concept or Tool</th>
<th>Description</th>
<th>Key Benefits</th>
</tr>
</thead>
</table>
| **Standard Work**    | Written description of well-defined, precise procedures for each step of a process  
* Examples: Checklists, protocols, templates, standard operating procedures | ✓ Simplifies processes  
✓ Increases efficiency  
✓ Reduces variation, error, and rework  
✓ Clarifies roles and responsibilities and enables cross training |
| **Visual Management**| Use of visual signals to manage and make a process “visually obvious”  
* Examples: Color coding, labels, numbering systems, display boards | ✓ Tracks process performance  
✓ Identifies errors and problems  
✓ Promotes standard work |
| **5S**               | Five-step process to create and maintain an orderly work area:  
1. Sort and prioritize items  
2. Straighten the area using visual controls to promote efficient flow  
3. Scrub and clean the area  
4. Standardize across other areas  
5. Sustain improvements using audits | ✓ Increases productivity  
✓ Eliminates waste  
✓ Reduces cost, space, and inventory  
✓ Improves quality and safety |
| **Lean Layout**      | Configuration of process to promote continuous flow of people, information, and materials with minimal movement and delays | ✓ Reduces process time  
✓ Enhances work flow  
✓ Saves space and inventory  
✓ Improves communication |
| **5 Whys**           | Problem-solving approach: Ask “why (is this happening)” five times, or until further breakdown of the problem is not possible | ✓ Uncovers the root cause of a problem, not just the symptoms  
✓ Ultimately reveals the cause of a process failure |
| **Error Proofing**   | Redesign processes to reduce the probability of making an error  
* Examples: Use visual or audible warning signals, automated technology, quality checks | ✓ Improves quality and safety  
✓ Reduces waste and defects |
| **Value Stream Mapping** | Used to analyze the flow of materials and information required to complete a process from beginning to end  
* Visually represents the current process and related problems (current state map) and the ideal process (future state map) | ✓ Identifies and reduces waste  
✓ Improves flow and efficiency  
✓ Improves role clarity  
✓ Promotes team building |
| **A3**               | Problem-solving method similar to plan-do-check-act, which provides a concise summary of the problem and potential improvements  
* Describes background and current condition, analyzes the root cause, identifies countermeasures to achieve a target condition, creates and tests an implementation plan, and identifies follow-up actions | ✓ Facilitates simple, prompt, and structured communication and problem-solving  
✓ Promotes standard work |
Value Stream Mapping of the Patient Visit Process

Altarum’s Lean coach conducted separate VSM events at each health center, guiding team members through a collective examination of the patient visit process. As noted above, the VSM occurs over a period of 3 days; it is described below in detail.

**Current State Map**

On the first day of the VSM event, team members discussed the current state of the patient visit process. The Lean coach asked team members to describe how the process actually works in practice, not how it should work in theory. Discussions focused on the following questions:

- What actions take place at each step?
- Who is involved at each step?
- What is the average amount of time required to complete each step?
- What is the average amount of waiting time in between each step?
- What problems and wastes occur at each step?

Each step of the process was mapped out on a large sheet of paper. Together, these steps formed the current state map and the basis for improvement. An electronic version of the map was subsequently created, along with documentation of the problems and sources of waste identified in the current patient visit process. Figure 2 is a sample map of the first few steps in a patient visit process, beginning with the patient’s initial telephone request for an appointment with the scheduler (step 1) and proceeding through to the patient’s arrival and check-in at the front desk (step 2), interaction with the medical assistant (step 3), and examination by the provider (step 4). At each of these four steps, staff members perform a variety of tasks and encounter problems and inefficiencies. In this example, the patient waits a total of 72 hours and 40 minutes from the appointment request to actual face-time with the provider. The goal of the VSM is to reduce this wait time (i.e., non-value added time) and address the root causes of problems, creating an improved process.

**Figure 2. Sample Value Stream Mapping Steps and Problems in a Patient Visit Process**

<table>
<thead>
<tr>
<th>STEP 1</th>
<th>STEP 2</th>
<th>STEP 3</th>
<th>STEP 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient calls or walks-in for appointment; Scheduler collects patient information and makes appointment</td>
<td>Patient arrives and checks in at the front desk; Staff members collect patient information</td>
<td>Medical assistant (MA) escorts patient to exam room, performs tests as needed and collects patient information</td>
<td>Provider performs exam, orders prescriptions and tests as needed, completes notes</td>
</tr>
<tr>
<td>Patient waits</td>
<td>Patient waits</td>
<td>Patient waits</td>
<td>Provider performs exam, orders prescriptions and tests as needed, completes notes</td>
</tr>
<tr>
<td>72 hours</td>
<td>30 minutes</td>
<td>10 minutes</td>
<td>15 minutes</td>
</tr>
<tr>
<td>5 minutes</td>
<td>10 minutes</td>
<td>10 minutes</td>
<td>15 minutes</td>
</tr>
<tr>
<td>Busy phone line</td>
<td>Patient is a “no show”</td>
<td>Supplies missing</td>
<td>Unfinished provider notes</td>
</tr>
<tr>
<td>High walk-in volume</td>
<td>Duplicate patient records</td>
<td>MA tasks vary by provider preference</td>
<td>Missing test results or hospital reports</td>
</tr>
</tbody>
</table>
The specific actions and steps encompassing the patient visit were different at ANHSI, FHC, and PCHC. Current state maps and related problems varied based on factors unique to each site, such as staffing patterns, patient demands, physical layout of operations, and use of EMR. However, teams at each FQHC described similar inefficiencies affecting the flow of the patient through his or her visit. These included inconsistent work procedures, duplicate efforts, work-arounds, communication breakdowns, and a significant amount of wasted time for providers, staff members, and patients.

**Future State Map**

The second VSM day focused on exploring opportunities to improve the patient visit process. The FQHC teams reviewed the current state map and collectively brainstormed ways to enhance the process over the next 6 to 12 months. Teams then created a future state map without wastes or problems, whereby the patient flows smoothly through every step of his or her visit. In some instances, teams decided to eliminate redundant or unnecessary tasks, condense steps, and reallocate resources and responsibilities—all with the end goal of reducing waste and adding value for the patient.

**Action Plan**

On the third and final day of the VSM event, FQHC teams developed a list of action items needed to achieve the desired improvements in the future state map. These ranged from simple “just do it” changes, such as purchasing new scales for patients or new printers for the front desk staff, to more complex projects requiring in-depth analysis, such as standardizing the role of the medical assistant or developing a formal policy regarding walk-in patients. Each action item was assigned a target date and the name of an individual responsible for managing its completion.

**Action Item Reviews**

The Lean coach visited the FQHC teams in roughly 30-day intervals following their VSM events. During these 1-2 hour action item review sessions, team members convened to discuss the status of each action item and evaluate progress made toward completing the action plan. Team members experiencing difficulty completing certain action items were able to brainstorm solutions with their peers and benefit from group problem solving activities. Additionally, management intervened in some cases to remove specific barriers preventing action items from being completed. These follow-up meetings were designed to track progress, address obstacles to change, maintain momentum and energize teams to continue process improvement efforts.

**Other Lean Support**

Throughout the project, Altarum’s Lean coach and project team members provided additional support to assist FQHCs in the application of Lean. The level of support provided to each health center varied depending on individual needs and requests. Assistance was provided in the following areas:

- **Conference Calls.** PCHC requested weekly conference calls with Altarum to keep the project on track and moving forward. An Altarum staff member produced a structured agenda and facilitated these 1-hour meetings, summarizing discussions in meeting notes. A select group of PCHC team members used this time to discuss project
issues and activities, address challenges, generate solutions and identify next steps. Conference calls were also instituted with FHC team members with less regularity. Team members at ANHSI found it difficult to dedicate time for these meetings on a consistent basis.

- **Intensive Lean Training.** Altarum organized a 4-day intensive Lean training course for partner FQHCs. The course offered in-depth lectures, group activities, and simulation exercises to demonstrate the principles and impact of Lean.

- **Additional Lean Training.** At the request of PCHC leadership, Altarum offered additional 4-hour, 8-hour, and 4-day Lean training sessions throughout the course of the project. While most sessions were sponsored by Altarum, PCHC also invested internal funds to train staff. Notably, two PCHC staff members developed strong competencies in Lean over the course of the project and led a 4-hour Lean training session for their peers with guidance from Altarum’s Lean coach.

- **Additional VSM Events.** Both FHC and PCHC requested second VSM events, focusing on improving the prescription fill process and the MA process at each site, respectively. Staff at PCHC co-facilitated this second VSM event. In addition, PCHC hosted a third VSM event to improve the scheduling and reception process. This was led by PCHC’s internal Lean champions, again with support from Altarum’s Lean coach.

- **Coaching Support.** Altarum’s Lean coach offered one-on-one support to FQHC team members at various stages of the project. The coach also conducted direct observation activities to examine workflows and provide suggestions for improvement.

- **Research Support.** Altarum project team members periodically reviewed articles and research literature to share relevant information with partner FQHCs. This included information specific to Lean, such as examples of other health care organizations using Lean tools and techniques, and site-specific information on topics such as open access scheduling, the effective use of care teams, and providing performance feedback to physicians.

The Lean activities implemented at ANHSI, FHC, and PCHC are summarized in table 5.
### Table 5. Summary of Lean Activities at Three FQHCs

<table>
<thead>
<tr>
<th></th>
<th>ANHSI</th>
<th>FHC</th>
<th>PCHC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial Site Visit</strong></td>
<td>August</td>
<td>July</td>
<td>June</td>
</tr>
<tr>
<td><strong>Initial VSM Event</strong></td>
<td>May–June</td>
<td>Oct–Nov</td>
<td>Jan–Feb</td>
</tr>
<tr>
<td><strong>Number of Staff Trained in Lean</strong></td>
<td>21</td>
<td>27</td>
<td>150</td>
</tr>
<tr>
<td><strong>Number of VSMs and Focus Areas</strong></td>
<td>1. Patient visit process</td>
<td>1. Prescription refill process at pharmacy</td>
<td>1. Patient visit process 2. MA process 3. Scheduling and reception process</td>
</tr>
</tbody>
</table>
| **Key Issues Examined**        | Patient flow  
No shows  
Registration process  
High volume of walk-in patients | Patient flow  
Cycle time  
No shows  
Provider productivity  
Medicaid enrollment  
Revenues and costs  
Using Lean layout principles to design new clinic building | Patient flow  
Cycle time  
No shows  
Staff satisfaction  
PCMH elements  
MA role and responsibilities  
Vaccine process  
Patient scheduling and check-in process |
| **Examples of Changes Made (Action Items)** | Install electronic numbering system in waiting room  
Identify (number) registration windows  
Develop walk-in policy  
Standardize check-in and check-out process  
Create EMR templates | Standardize check-in and check-out process  
Make scheduling changes related to new patients  
Organize supply storage areas  
Decentralize charts  
Standardize process for enrolling eligible patients in Medicaid | Install computers in exam rooms  
Implement flag system outside exam rooms  
Standardize release of information process  
Develop no-show policy  
Develop standard work for care managers  
Conduct panel management  
Organize supply storage areas  
Standardize MA role and process  
Standardize vaccine process |
| **Other Lean Support**         | Intermittent conference calls  
Intensive Lean training  
Coaching support  
Research support | Biweekly conference calls  
Intensive Lean training  
Additional Lean training and VSM event  
Coaching support  
Research support | Weekly conference calls  
Intensive Lean training  
Additional Lean training and VSM events  
Coaching support  
Research support |
Data Collection

In an effort to understand the process of implementing Lean as well as the perceived outcomes associated with Lean, Altarum conducted a series of interviews with FQHC staff members who were involved in the project.

Qualitative Data and Analysis

Altarum staff conducted semistructured, in-depth interviews with a purposive sample of 77 FQHC staff members. All of these individuals were involved with the application of Lean tools and techniques at one of the three health centers. Sixteen of these staff members, four at ANHSI and 12 at PCHC, were interviewed twice to determine whether any changes occurred in the perspectives of these FQHC staff members regarding the project as the use of Lean tools and techniques were spread in their centers. These staff members were selected to be interviewed twice over the lifespan of the project due to their high-level of involvement. The interviews were conducted in-person, onsite at staff members’ clinics and administrative offices, 6 to 12 months following each FQHC’s completion of the first VSM event. For staff members who were interviewed twice, these interviews occurred first at 6 months and then again at 12 months following the first VSM event. Informed consent was obtained from all of the FQHC staff members who were interviewed. Interviews lasted approximately 45 to 90 minutes, depending on the level of staff involvement with the initiative, and were audio recorded for subsequent transcription by an independent consultant.

A coding team of four Altarum researchers managed and analyzed the data, using QSR NVivo 8 software. An inductive content analysis approach was employed to generate coding categories from the data. Coding confusion and the creation of new nodes was collectively resolved on a routine basis, and a reliability test was conducted on a sample of the interview transcripts that were coded by all team members to verify good to very good coding agreement occurred among team members. Finally, matrix queries were run to identify the most frequently sourced themes (i.e., the number of interviewees who referenced the given theme) capturing FQHC staff member experiences related to the following:

- The approach used to implement Lean (i.e., scoping sessions, training, VSM events, and action item reviews);
- Changes associated with Lean implementation;
- Factors that helped and hindered the use of Lean to enact changes;
- Strategies to spread and sustain Lean implementation; and
- The similarities and differences between Lean and other FQHC initiatives.

The qualitative findings of these staff interviews are discussed in the following chapter.
**Conclusion**

Altarum supported ANHSI, FHC, and PCHC in adopting the Lean approach in two key ways: (1) providing training in Lean principles, tools, and techniques and (2) facilitating VSM events. Each of the three health centers assembled multidisciplinary teams to improve the patient visit process from a systems perspective, using the Lean VSM method. Over a 3-day period, these cross-functional teams jointly mapped out the steps required to complete the patient visit, from the patient’s initial request for an appointment to checkout. Teams explored opportunities to eliminate waste and add value to the current process, generating a list of specific actions needed to achieve an improved “future state.” These changes were intended to enhance the patient visit process and, in turn, improve patient flow. Two centers, FHC and PCHC, conducted additional Lean training sessions and VSM events to improve other workflows and processes. Two PCHC staff members facilitated Lean training and VSM events for their colleagues.

In order to understand staff experiences implementing Lean and the associated outcomes, Altarum conducted interviews with a sample of 77 FQHC staff members. The findings from these interviews are discussed in the next chapter.
Key Findings

Introduction

As previously discussed in this report, the Lean approach is relatively new to the health care sector and is not commonly used within the FQHC system. It is important, therefore, to obtain a solid understanding of the experience of our three partner centers as early adopters in the use of Lean tools and techniques. To that end, Altarum conducted interviews with staff members directly involved in the Lean initiative, including those in leadership, direct care and front line positions. These interviews provide a valuable window into FQHC staff experience with Lean and offer critical insights for other organizations considering adoption of this process improvement approach.

All three FQHCs in Altarum’s mission project used Lean to enhance the efficiency of the overall patient visit process, targeting such specific areas as patient flow, visit cycle times, and provider productivity. Increased efficiencies in these areas are often associated with longer-term outcomes related to increased access, improved quality, and reduced costs. Though the goal of increased efficiency was similar, the three partner centers differed in size, patient population, and organizational culture and implemented Lean with varying degrees of success, spread, and integration. Despite these differences, common themes emerged from the staff members interviewed about their experience implementing Lean within their organizations. Key findings from interviews with FQHC staff are synthesized according to these broad themes, which are supported with direct quotations drawn from staff interviews.

The findings from staff interviews are organized and presented in response to the following questions:

- What were staff member perceptions regarding the approach used to implement Lean within their organizations?
- How did Lean add value to the FQHCs?
- What were the facilitators to using Lean at the FQHCs?
- What were the barriers to using Lean at the FQHCs?
- What other themes emerged related to the implementation of Lean in FQHCs?
- How did Lean compare to other FQHC initiatives, specifically, the Health Disparities Collaboratives?
- How may Lean be spread and sustained effectively in FQHCs?
Staff Perceptions of the Lean Approach

In interviews, FQHC staff members were asked to provide feedback on the effectiveness of scoping sessions, Lean training, VSM events, and action item reviews. Specifically, they offered input regarding the usefulness of these activities as well as ways in which they might be improved. These comments are summarized below.

**Scoping Sessions.** When asked about the usefulness of Lean scoping sessions, staff across the three FQHCs responded that these meetings helped to "set the tone" and frame the Lean improvement effort. Specifically, the scoping sessions initiated the discussions necessary to develop an understanding of the purpose and goals of the project. Some staff expressed disappointment in not being able to participate in these meetings, which were conducted primarily at the leadership level. For example, one noted, "I think there are specific individuals who are trying to make things better and then they go ahead and make these decisions without discussing with the people in the practices … I trust administration, but I would have liked to have been a little bit more involved." Others echoed this sentiment and reported that they would have liked to provide more input regarding the initial selection of goals, metrics, and team members for the project.

**Introductory Lean Training.** The majority of FQHC staff members found the introductory Lean training sessions useful in setting expectations for the upcoming VSM events. Staff members reported that the training helped them to become familiar with Lean terms and tools and understand how these apply in the health care environment. In particular, many appreciated the opportunity to participate in hands-on exercises to better understand how Lean principles and tools apply to their work, with one commenting, “Sometimes just talking about it isn’t the same as acting it out in a group.”

Staff observations include:

- “[The training] laid out what the goal of our time and effort was from the very beginning in a manner that made it easy to accept.”
- “I think in the beginning … I was completely lost. I had no idea what this was supposed to be about, but things started to click for me when he did the exercise. … I thought, ‘Aha! This is about analysis of workflows and your daily activities, not how does Toyota make a car.’”
- “It introduced the strategies and sort of set our expectations for short-term and long-term outcomes.”
- “It really helped when we started to have at least that [Lean] background, and [understand] what some of the tools were going to be and what the terms were … definitely having that training ahead of time was useful.”

Most FQHC staff members were satisfied with the introductory Lean training sessions. When asked to share suggestions for improvement, some indicated that shorter lectures, more case studies, and concrete examples of the use of Lean in health care would be useful. Additionally, some staff indicated that they would have liked more of their peers to be exposed to this training.

**Value Stream Mapping Events.** FQHC staff members were extremely satisfied with their participation in VSM events, using terms such as “enlightening,” “illuminating,” and “insightful” to describe the experience. The exercise of mapping out the patient’s journey through every
step of the care delivery system—and creating a visual depiction of the process—enabled them to clearly see the problems contributing to waste and inefficiency in the patient visit. Some staff members expressed surprise at how truly inefficient the patient visit process was once they were able to see the “big picture.” Many commented on the team-building nature of the VSM and reported an enhanced awareness and appreciation of the many roles and responsibilities affecting the patient visit. For most staff, the VSM event was the first time they had engaged in critical thinking, problem solving, and brainstorming discussions with so many of their peers.

Comments reflecting staff perceptions of the VSM event include:

- “It’s been a great ‘guided tour’ of our processes with a team approach to problem solving.”
- “I think when you actually see it written down like that it kind of makes you stop and think. You maybe didn’t see the whole picture before, and it helped to show where the trouble areas were and what could be done to fix them.”
- “[We] mapped out over two workshops how the timeframe took almost 3 to 4 hours for a patient to be processed. Then we looked at … how much of that time was really wait time and not contact time, which I thought was really fascinating … to see it on paper was a little scary.”
- “I found that we were doing a lot of things that were not necessary.”
- “I liked the different areas coming together because I may be an expert in triage, but medical records [staff] doesn’t know the value of my job, and the steps in my job. With a VSM you could kind of see where everybody’s job interconnected a little more.”
- “It helped me to look at the roles in the process differently. I think I was so stuck in ‘it’s always been done this way’ that I was lulled into thinking it had to be done that way. So it opened my eyes to a different way of thinking.”
- “I thought the rigorous exercise of discretely breaking down the different steps is a good exercise to go through. I think otherwise we can operate almost unconsciously about what we do. It becomes so second nature … without having to go through the exercise of breaking down the individual, discrete steps we might not have them at the top of our mind as steps that we might improve to impact the overall efficiency of the organization.”
- “What’s helped is giving people an opportunity to shine … there are some people … who aren’t at the top of this organization who have brilliant things to say, and their understanding of process flow certainly taught me a thing or two in that process. So I think there are some individuals here that, when given an environment that was conducive to them thinking and participating at their best, they rose to the challenge.”

Although staff members were largely satisfied with the VSM events, some offered areas of improvement. These included “cutting off” participants who dominated the conversation, shifting focus when group discussions were not leading to consensus (particularly during the development of the future state map and identification of action items) and eliminating the extra chatter that tends to occur in group settings. Additionally, staff members expressed concerns in taking so many clinical leaders and key decision makers away from clinics at the same time.

**Action Item Reviews.** Staff members indicated that the action item review sessions following the VSM event were important in monitoring progress on the changes being
implemented through Lean. Specifically, staff reported that these follow-up meetings helped to maintain communication across team members, hold people accountable for completing their tasks, and recognize accomplishments. Moreover, the meetings served as structured time to focus on change for staff members who were otherwise consumed by daily work demands.

Select staff comments include:

- “I think it was important to all get back together at those increments because otherwise I think people tend to go back to their clinic and get back into their normal routine and just lose sight of the headway we made during the 3-day event.”
- “It’s been good accountability to make sure things are being done. It’s been helpful to see that some things have been improved. … It’s good seeing where the process is at or where it’s getting hung up on, where we need to follow through.”
- “They just helped me and a few of the other people there use our time more valuably.”
- “It made me look at it in a way to realize we’ve made a lot of progress. We still have a long way to go but I could see more clearly the progress that we made in that particular structure.”
- “Because it keeps us on track and it’s like, ‘Oh shoot, we didn’t get to that since last time. We really need to get on that’… We are going through all these [action items] and some we can say have been completed, we are marking off the list. … That feels awesome.”

Overall, FQHC staff members felt that the action item reviews were effective and necessary to maintain momentum for change. They also reported, however, that it was difficult to find time to implement changes and report on progress during these meetings, as they constantly struggled with competing work priorities. Some staff members noted that not all of the VSM participants participated in the action item reviews, which may have limited the effectiveness of some of these meetings.

**Intensive Lean Training.** The FQHC staff members who received the 4-day, intensive Lean training shared overwhelmingly positive feedback regarding this experience. The in-depth training, and the group exercises in particular, provided staff members with a deeper level of understanding and the ability to apply Lean principles in their everyday work. In the words of one participant: “It really ‘cemented’ [Lean] for me.”

Other staff comments include:

- “To break into the groups and problem solve … is useful because you’re not just learning the process, you’re applying it before you even leave the training. And then presenting, we all took turns presenting so it kind of helped build your skills on presenting to a group as well.”
- “[The training] made it click for me because, of course, usually when problems arise the first thing you always want to do is add. ‘Well I guess we need more people, we need more this, we need that.’ It turns out it was better with less and less, and it was more efficient and you got the job done.”
- “It was invariably positive … They went around the room and asked everyone to speak. People were all extremely positive … A lot of people talked about, ‘Don’t blame the person, look at the system.’”
"I found the interdepartmental communication the most useful. … Little lights went on about how important [each person’s] role is. They might be facilities, they might be IT, they might be accounting, but … each one of those things affects a practice."

“One of the things [I learned] was when there is an issue, it’s usually the process and not the person. I applied that several times that next week.”

After the training, at a staff meeting, “we spent the whole time talking about, ‘Name one thing that drives you crazy, and if you could fix it, what would you do about it?’ Just the first three examples were so simple and so easy to fix that they want to incorporate in their all staff meetings a section on Lean. … So it works.”

There were limited suggestions for improving this training session. However, some indicated it would have been helpful to receive a clear agenda ahead of time to frame expectations. Other staff members expressed that they wanted more of their colleagues to have the opportunity to participate in the training.

How Does Lean Add Value to a FQHC?

In order to understand how Lean adds value to an FQHC, it is helpful to first view Lean not as a theoretical construct but as a practical process improvement approach. The changes implemented during the course of the Lean effort must be anchored within the context of a health center’s daily operations. To that end, table 6 provides a summary of real-time FQHC problems, Lean concepts and tools applied to address these problems, and results as observed and reported by staff. As evident in the table, the changes implemented range from the relatively simple actions, such as the development of a checklist, to more complicated interventions, such as the standardization of the role of the medical assistant.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Lean Concept or Tool</th>
<th>Result</th>
</tr>
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</table>
| Inefficient patient visit process            | **Value stream mapping** was used to visually depict the current process and a set of action items was developed to achieve an improved “ideal” process | ✓ Enhanced teamwork, problem solving capacity, and employee empowerment  
✓ Improved workflows and processes            |
| Inaccurate and incomplete patient information | **Standard work** was used to develop a checklist detailing all necessary steps for patient check-in and checkout | ✓ Staff members follow a standard process for check-in and checkout, ensuring that all required information is collected  
✓ Associated impact on improved patient flow, no-show rate, and revenue  
✓ Checklist serves as a training document for new staff |
| Eligible patients are not enrolled (“fall through the cracks”) in the Medicaid program | **Standard work** was used to developed a step-by-step approach to guide staff members in determining patient eligibility for Medicaid and subsequent enrollment | ✓ Increased Medicaid coverage for patients and reimbursement for the FQHC |
Table 6. Examples of Lean in Practice in the FQHC Setting (cont.)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Lean Concept or Tool</th>
<th>Result</th>
</tr>
</thead>
</table>
| Inconvenient location of patient charts                                | Lean layout was used to locate patient charts onto movable carts closer to health care providers | ✔ Patient information is more accessible to health care providers  
✔ Saved time, reduced delays, and improved patient flow                     |
| Staff waste time searching for necessary supplies in disorganized storage areas | 5S (sort, straighten, scrub, standardize and sustain) was used to organize supply closets  
Visual management was used to sort and label items in color-coded bins | ✔ Visually obvious supply areas enable staff members to clearly identify waste (e.g., excess or expired materials) and needs (e.g., missing supplies)  
✔ Time savings and associated impact on patient flow  
✔ Reduced staff frustration  
✔ Cost savings (inventory reduction)                                      |
| Patients not arriving at scheduled appointments (“no-show”)            | Standard work was used to (1) develop checklists for the staff to ensure accuracy of patient information, including contact numbers and (2) develop a standard, organization-wide no-show policy  
Lean thinking led the staff to test a new scheduling approach and create an overbook column to offset no-shows | ✔ Reduced number of patients missing scheduled appointments  
✔ Revealed and eliminated barriers (e.g., transportation) to health care access  
✔ Encouraged patients to take more responsibility for their own care  
✔ Improved access to care                                                  |
| Unclear policies and procedures regarding the sharing of patient information | Standard work was used to create a uniform release of information process for all staff members to follow | ✔ Enhanced communication across departments  
✔ Timely access to necessary patient information                             |
| Large walk-in patient population proves difficult to manage            | Standard work was used to develop and implement a formal policy regarding walk-in patients, including set hours that walk-in patients will be seen and reserved slots in provider schedules for walk-in patients  
Visual management was used to install an electronic numbering system in the waiting room | ✔ Improved patient flow  
✔ Increased staff and patient satisfaction  
✔ Increased access to care  
✔ Reduced frustration and aggravation among patients  
✔ Reduced stress on staff                                                   |
| Inefficient use of time and rework in collecting patient information  | Value stream mapping revealed use of computers-on-wheels and printers in exam rooms would improve efficiency  
Standard work was used to develop and operationalize templates in EMR | ✔ Reduced cycle time  
✔ Enhanced provider productivity  
✔ Increased access to care  
✔ Increased MA and provider value-added time with patients  
✔ Standard forms ensure appropriate and consistent patient care             |
Staff members across the three organizations reported that the use of Lean enabled them to identify and make positive changes to processes and workflows. These changes resulted in improvements in the following key areas:

- Standardization of processes;
- Patient flow;
- Communication;
- Collaboration;
- Staff satisfaction and empowerment;
- Patient access to care;
- Patient satisfaction; and
- Quality of care.

It is important to note that these categories are interrelated—the impact of improvement in one area is felt in a number of others. The standardization of a complex, time-consuming process, for example, may have a ripple effect leading to improved patient flow, the provision of safer and better quality care, and enhanced patient access to care. In turn, the improvements may result in greater provider, staff, and patient satisfaction. Staff interviews confirm that changes implemented through Lean do have a far-reaching impact across multiple areas. Comments are organized and presented within these eight major thematic headings for ease of discussion; however, considerable flow and overlap exist between the interconnected themes as depicted graphically in figure 3.

### Table 6. Examples of Lean in Practice in the FQHC Setting (cont.)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Lean Concept or Tool</th>
<th>Result</th>
</tr>
</thead>
</table>
| Poor communication across care team during various stages of the patient visit | **Visual management** was used to install colored flags outside of exam rooms                                  | ✓ Enhanced care team communication  
✓ Reduced interruptions saved staff time  
✓ Improved cycle time                                                                     |
| MAs overburdened by unnecessary steps in the patient visit process     | **Standard work** was used to create a checklist of the various tasks performed by MAs, identify and remove non-value added steps, standardize forms, and document a new systematic process for the role of the MA | ✓ Streamlined process and improved clarification of MA role  
✓ Reduced variation  
✓ Increased efficiency with an associated impact on improved patient flow                |
| Inefficient vaccine process                                             | **Standard work** was used to create consistent forms and develop a step-by-step protocol to administer vaccinations  
**Visual management** was used to color-code storage bins for vaccines                     | ✓ Condensed and eliminated steps to streamline the vaccine process  
✓ Saved time with an associated impact on patient flow  
✓ Reduced waste (e.g., printing forms, open and unused vaccine vials)  
✓ Improved staff satisfaction                                                        |
| Unnecessary printing and faxing                                        | **Lean principle of waste elimination** led staff members to institute a virtual faxing system                  | ✓ Reduced inventory associated with cost savings  
✓ Increased efficiency and time savings                                                   |
Standardization of Processes. Staff members most commonly cited standardization of processes as one of the most significant contributions Lean made to their organizations. Standard work is a key concept of Lean and ensures that all staff members follow the required steps in any given process. This helps to clarify roles and responsibilities, reduce errors, and promote safety. The three FQHCs implemented a number of changes to promote standardization, including the use of checklists, templates, and the establishment of formal policies and procedures (see table 6).

The following staff comments indicate the importance of Lean as a vehicle for standardization of processes. Additionally, staff members describe how standardization has had an impact on their own work, their peers, the organization as a whole, and the patients they serve:

- “…[S]tandardization is important so I think the organization has benefited that way, and there will be cost savings for the organization. The staff benefits because it makes their job easier, less stressful. In turn, if the organization does well financially then the employees can do well. Then the patients, because I think standardization is better for patient care … overall everybody wins.”

- “I noticed … yesterday I saw 24 patients, which I have probably done before but I was there until 6:00 p.m. and I was totally stressed, and I did it [yesterday] with no stress and I was done at 4:30. It was like, wow, that was really good … things were flowing well with the EMR because we have focused on a lot of these things, the templates and the favorites and getting the rooms stocked appropriately. … So I’ve seen an impact now.”

- “…providers can spend more time with the patients because of the standardization we have done…”

- “Standardization has a positive effect. Any one of us can jump on and look at the protocol and know that we are doing it the same way for each patient.”
“...[B]efore, each of the rooms was different, and now that I standardized it, [any staff member] can go into every single room and still know where all the supplies are; before we had to search and we couldn’t find anything.”

“Creating efficiencies and standardization is huge because your resources are so limited. We cannot afford to do things many different ways.”

“Those things [checklists] make it easier … as far as, like, rooming a patient, and having the MA tasks written down what they are supposed to do. If an MA works in a different clinic they could pull out the policy and say, ‘Here is what I’m supposed to do,’ …and know every patient is getting the same care and getting the best of care.”

Patient Flow. The smooth and continuous flow of patients from one step of their care journey to the next without delay and interruptions was a major goal of this Lean effort. Indeed, the timely and efficient flow of patients is critical to the performance of any health care organization, particularly FQHCs confronted with increasing patient demands. Staff members described changes that led to improved patient flow, such as streamlined processes, installing computers and printers in exam rooms, using flag systems to facilitate communication, and organizing supply areas. As reported by staff members, these changes led to the elimination of waste, time savings, and a smoother work day. One staff member noted: “Peace of mind. I go home at night and I’m happy. We’ve accomplished our mission today. … I have a good flow, a good thing going now.” Other staff perceptions regarding the impact of Lean on patient flow include:

“I think the biggest positive change has been the computers in the [exam] room and the realization from providers that it really could make their life easier, it could make their visits more efficient and not only for them but for their MAs as well. We used to have a system where the MAs would go in and transcribe everything on paper, return to the common area, and then put it in the computer, which was a huge waste of time. Now it’s all done in that one step, in the room, with the patient.”

“It takes a lot of work away from certain people such as the providers, puts the responsibilities onto the MAs so the providers can get in and out of the rooms quicker for better patient flow. Then they had the chart prep changes, which also helped patient flow because everything that was needed for that appointment was already in the chart before the patient comes in. So it was just a total overall easier flow throughout the whole office.”

“I know that the decrease in cycle time … translates directly into more patients seen with the same staff.”

“...[W]e used to have to … walk … all the way to the front desk to get our charts and the patients, but now they print [a notification] to our station so we do not have to do all that extra walking.”

“It makes the process flow faster. [Patients] are in and out but yet they still feel like they were welcomed and don’t feel like a number. All their needs are met.”

“It cuts the time down because you are not wasting so much time looking for stuff [in supply areas].”

“...[A provider] went from averaging 20 patients a day to 24 or 25 and those patients were easier to see than the initial 20 because they had done their huddle, everything

“Creating efficiencies and standardization is huge because your resources are so limited. We cannot afford to do things many different ways.”

“I know that the decrease in cycle time … translates directly into more patients seen with the same staff.”

“It makes the process flow faster. [Patients] are in and out but yet they still feel like they were welcomed and don’t feel like a number. All their needs are met.”

“It cuts the time down because you are not wasting so much time looking for stuff [in supply areas].”

“...[A provider] went from averaging 20 patients a day to 24 or 25 and those patients were easier to see than the initial 20 because they had done their huddle, everything
they needed for the visit was in the chart, they had improved their communication so she wasn't running back and forth. … So yes I've seen a difference in patient flow.”

- “I think the flow for the providers has changed … that's been a big change for them. Having printers in the rooms. I think the flags have helped them know where they are going.”

**Communication.** Staff reported that the application of the Lean approach led to enhanced communication. As previously discussed, the VSM was cited by staff members as a critical framework for openly discussing issues and challenges and provided a strong foundation for ongoing communication about opportunities for improvement. As one staff member explained: “I think it’s brought about better communication probably preceded by a willingness to look in an in-depth manner at the processes that take place … some of which led to efficiencies, some of which lead to inefficiencies. That willingness is a good first step to build a foundation of communication.” Another staff member succinctly stated: “The more I see Lean working, the better I see communication working.”

Other staff references to improved communication include:

- “I think when we got into it we wanted efficiency. What we got out of it was peer to peer communication.”
- “…[I]t has opened up a dialogue between different people in the organization. It’s given them some common language to be able to have a discussion … whether it’s between a provider and their clinical support staff or our triage function and the front desk staff, they have something to relate back to and do.”
- “I think people are communicating better. I think we are talking, able to bring up things and be more accepting of other ideas and more accepting of other possible ways of doing things and of testing new ideas.”
- “The communication is a lot better. I think we communicate better as a whole because with us working on these different projects and systems, they are expressing what's working well, what's not working well, so we're always trying to improve the system, which is nice. We are more of a team now.”
- “…[T]he communication process was opened up. Instead of your department, my department, this whole building is our department. We learned to talk to each other. If we can solve a problem we will talk it out instead of saying, 'well I don't know what goes on past here.' Instead, you ask questions.”
- “The group involved in Lean communicated out to their peers and explained what was going on. … [I]t was people at the line level saying: ‘This is a good idea. Let's try it. If it doesn't work we can go back, but we all know it is broken so let's try something.’”
- “[Staff thought], “Wow, my ideas are as important as a physician's ideas. Or my ideas are as important as the COO’. … [I]t really opens communication. I'm not sure we started out with that purpose but certainly as a result, communication definitely has improved.”

**Collaboration.** Staff members perceived that Lean had a positive impact on collaboration in two ways. First, they observed that Lean encouraged the increased use of interdisciplinary teams. Second, Lean was viewed as a key vehicle to facilitate movement toward a shared, common goal of improved patient care. One staff member shared: “… [W]e’ve seen some wonderful team development in the practices. People have learned to come together and rely on each other and trust each other and value each other’s opinions. Again, attitudes have improved because of shared purpose, shared mission. Those things always bring people together.”
Staff comments reflect the benefits of Lean in the form of increased teamwork and collaboration:

- “I think that [Lean] is really bringing us closer to being one organization with one goal rather than a lot of clinics that all have the same name.”

- “I feel strongly that staff are more cohesive and working better together and are more team oriented. I think the Lean process has improved the leadership skills of some of our key staff, our supervisors and directors.”

- “…there seems to be more cooperation and readiness to help assist one another and make it more routine…”

- “Every morning staff do their huddle and they talk about challenges for the coming day … we’ve got directors involved in that [who] transcend multiple locations … they talk about this is what helped improve our process…”

- “…they’ve all learned to help each other out and they sort of tell each other how they did this or that in their meetings. It’s interesting. They are not really competitive with each other, which previously would have been the ‘one-upmanship’ kind of thing … they do share things that have worked in different situations. I think that’s been a big change.”

- “…staff were coming together as a team and there was a lot of energy. Staff would talk back and forth … and even made comments about, ‘I don’t know why we work in the same building yet we haven’t talked about this before.’ I found that very impressive. I didn’t realize that was going to be one of the outcomes, a teambuilding outcome.”

**Staff Satisfaction and Empowerment.** Not all staff necessarily embraced or welcomed the Lean approach when it was first introduced. Some viewed Lean with a mixture of fear, distrust, and frustration, feeling that Lean’s origins in manufacturing rendered the approach irrelevant to the health care sector. Others viewed Lean as ‘one more thing leadership is making us do.’ As one staff member described: “People felt overwhelmed… and were saying, ‘I already have a full-time job and now you’re going to make me do this?’” Interviews with staff revealed, however, a notable shift in attitudes over the course of the implementation of Lean. Many staff came to see the value of Lean and ways in which it made their jobs easier and reduced their stress levels.

Similarly, staff members expressed satisfaction in actively contributing to the change process—they had a voice and could offer ideas and potential solutions for improvement. The following comments illustrate the ways in which Lean added value in the form of staff satisfaction and empowerment:

- “I’ve learned what I can do ahead of time to save myself time later. So then I’m not here until 6:00 or 7:00 at night. I hope to continue that. I hope everybody can do that.”

- “It made me feel like management cared and somebody listened.”

- “Changes we have made have been positive and have made a difference, probably for the patients, but I do know for the providers … those changes really helped them with their quality of life and quality of their workday. I almost feel before in some ways we were at a breaking point and I think this brought us back to a better place.”

- “I’ve seen members of the team really feel like they are bigger contributors than they had felt before because they’ve seen how they can play a role that really affects the patient process … that what they do is really important and can make a huge difference in the success of how well it all flows.”
“Lean has empowered people to think out of the box, to not be afraid to bring up some really creative ideas.”

“The process was very constructive for all staff … it showed that everybody has weight and a stake in the process, where they can have others hear their ideas and react. Sometimes employees are intimidated to speak out. … [W]hen you give an MA the opportunity to share ideas in the same venue as higher level staff members, the MA becomes more invested in the process.”

“I think the biggest thing is it has allowed staff to say, ‘What we are doing isn’t perfect and what can we do to change it?’ And empowering them. … Once you empower people to make change and just keep pushing and pushing, ‘you can do this’… Otherwise people just go to work and kind of do the same thing day in and day out and never question it.”

“I have never known you could ask questions, or bring up problems so we could solve them. … Now it’s easier for me to come up to the doctor or nurse and say something about this, let’s change this, let’s do something else.”

“I think probably the greatest accomplishment is a different way of thinking … it’s a different way of problem solving and actually empowering your staff to make changes is huge. … Everybody has a voice, everybody has a say. One idea may be the fix to something. It might come from a receptionist or custodian or who knows where that’s coming from. Really we talk about people working to the top of their licensure or ability—that goes for everybody in this entire organization.”

**Patient Access to Care.** Staff associated improvements made in a number of areas with enhanced patient access to care. For example, reduction in cycle time through use of computers and printers in exam rooms was seen as having a direct impact on enhancing provider productivity, thereby expanding access to care. Moreover, the development of standard policies—such as a no-show policy and a walk-in policy—expanded access to care. One staff member captured the impact of Lean quite concisely: “[The changes] will help us see more patients.” Another reported that their center is “seeing more patients now because they had taken the time in the beginning to problem solve and get things done.”

Other staff comments include:

- “We made a simple process change [regarding] labs. … It freed up exam rooms so we could get the patients in. I think that also made a very big difference.”

- “I know that the decrease in cycle time … translates directly into more patients seen with the same staff.”

- “One of the things that we touched upon was productivity and if our providers are more productive it certainly lends more access to the community.”

- “A lot of [things] have improved about access to care and the next visit and [patients] being able to get in which is critical in the same day if anyone is sick. No shows, all those kind of things. So I think there has been a lot of stuff that actually has improved over the last number of months in a very concrete manner for [the] patient process.”

- “I think that patient access has already been improved, and patients do comment on that.”

- “I’ve noticed I’ve been seeing more patients in a day so there has got to be more access for [patients]. So that right there is a plus.”
One FQHC team used Lean to test scheduling changes. By double-booking patient appointments in an overbook column, they aimed to offset those patients who did not show up for appointments. One staff member noted, “[The team created] an overflow appointment column and just started trialing it … and found that it worked … definitely it has affected access…Currently it is four additional appointments a day. My hope is eventually everybody will have their own overbook column. Maybe one patient in the morning and one in the afternoon, but when you have eight providers on, that’s still a significant [increase in] access.”

“Some of the hard discussions about creating a walk-in policy and having two rooms per provider, those are the conundrums that paralyze this clinic. I’m glad they were talked about; movement there could really change access.”

Patient Satisfaction. One of the key principles of the Lean approach is to understand value from the perspective of the customer. In this project, FQHCs focused on redesigning and improving the patient visit process to add value to the ultimate customer—the patient. Staff members observed changes in patient satisfaction, sharing anecdotes from patients pleased with experiencing more organized, timely, and efficient visits. Patients benefitted from Lean process improvements in areas ranging from shorter wait times to see providers, to improved conditions in the waiting room.

Staff expressed the connection between Lean and patient satisfaction in the following manner:

- “With the numbering system it is better. There are no lines anymore. Patients take the number and have a seat. Before there were a lot of patients standing and the line was really long. There were always arguments between patients as to who was first, who was waiting. Now there is more control and it is more fair. I have a lot of compliments from patients saying that it is more organized. I know that they look a little more relaxed.”
- “Now we have bulletin boards that are very organized and professional looking and places for our educational literature. That has got to help our patients.”
- “I think it’s made a big difference because I think people are a little bit more content, not as stressed and I think things are moving better, patients seem to think things are moving better.”
- “It can be very cold trying to be a patient going through this whole place but it can be a very warm experience depending upon the patient’s interaction with the people they meet here, from the front desk to check out. I think if we are making the front desk’s job easier and the MAs job easier, then the patients are going to sense ease and warmth and that’s going to bring more patients here. … The [process improvement work] that we’ve done is better for patient care, and I hear that. It’s always nice when you hear good stuff.”
- “[Patients] have noticed … we’ve actually [been] complimented on the less wait time that they have in the waiting room and exam room.”
- “I think patients are very satisfied with their care, and I’ve had several different comments from patients that they are very pleased with what we are trying to do.

Quality of Care. Many of the changes made in the areas of patient flow and standardization were identified by staff members as having an impact on both quality and safety of care. One staff member noted: “standardization is better for patient care,” and with standard processes staff “know that every patient is getting the same care and getting the best of care.”
Staff also associated Lean with improvements in patient-centered care, as Lean enabled staff to use their time more efficiently and “focus on patient care more than the other [administrative] things that have to be done.”

Staff comments reflect a perceived impact of Lean on the quality of care:

- “I can be more efficient, I can be more effective … I can streamline certain things and spend that time with the patient. Because that’s what it’s all about … the patient.”
- “Clearly we have seen improvements in tracking test results. … Our referrals department has made huge strides. There was a period of time when referrals [were] backed up like a month. Now they are like 36 hours … it’s not just that they are making referrals, they are also tracking them, signing them off when they are done. … That’s one of the things I’ve seen clinically that’s been a huge plus … for safety.”
- “The piece that I see that is absolutely the most critical is getting a diverse organization working and thinking down one path how to make it better, how to make the patient the middle and our services wrap around the patient so that the patient also feels valued. I do believe that if people value each other it shows and then that relays itself to patients.”
- “I think the whole process has made people maybe more aware of the whole concept of quality care.”
- “Showing patients that we care, we’re taking care of their health and getting them more involved in their health as well by getting their yearly exams and we are flow sheeting them to find out when they are due and we let them know … before we did not have a system to track that so this is good.”
- “When I went through the Lean training we learned a lot more about using our time wisely and it has helped. … It really has cut back time for me because I need more time with patients than I do with working with the computer or papers. So that has helped a lot.”
- “All the improvements that need to be made had to come through all of us. Like creating a favorites list, which is very key to getting the right diagnosis for the patient, all of us had to come up with a list of what were the most commonly used diagnoses.”
- “I think it makes for a more efficient environment, it makes for more satisfied staff. In turn it’s safer for the patient. I think it’s a win-win for everyone.”

**Future Value of Lean.** In addition to sharing observations about the present value of Lean, staff members also provided insight into ways in which Lean might add value to their organizations in the future. Staff members generally believed that continued use of the Lean approach would lead to positive changes in the areas discussed above, namely standardization of processes, patient flow, staff and patient satisfaction, and quality of care. Additionally, they felt that ongoing improvements in efficiency would translate into financial benefits for the organizations in the future. Some felt that the changes they had implemented were already contributing to cost and inventory savings, as highlighted by the following remarks:

- “We have gained some financial efficiencies. We have physicians who say I trimmed off 3–7 minutes per visit. I don’t have to chase after my MA, I know right where she is the minute I walk out the door. All those efficiencies have financial value.”
- “I’m sure we’re saving money in the immunization process because we are not printing off as many papers as we were. It has to be saving something.”
“I sent a lot of items back already. … I think we are going to save a lot of money in that aspect.”

“It’s not black and white … but when you have MAs saying, ‘Okay this new process saved me one minute every time I do an immunization,’ or ‘Now I go to the supply closet and it takes me much less time to find something’—that always comes down to dollars and cents, but not necessarily that you can see clearly on paper.”

Facilitators to Lean Implementation

When asked to identify the key factors that supported, enabled, or promoted the use of Lean within their organizations, staff members most commonly identified the following:

- Staff buy-in;
- Leadership support;
- Use of teams and collaboration;
- Communication;
- Dedication of time;
- Positive staff characteristics;
- Accountability and follow-up; and
- External technical assistance and expertise.

These factors are described briefly below and summarized in table 7.

Staff Buy-In. Buy-in among staff members was identified as one of the key factors supporting Lean implementation. The Lean approach is a “bottom-up” approach to change, relying heavily on the active involvement of the front line staff. Therefore, the acceptance of Lean by staff members and their willingness and commitment to actively engage in the change initiative is critical to its successful implementation. Key elements associated with staff buy-in include recognition of the value added through Lean, familiarity with Lean tools and techniques, and positive attitudes and enthusiasm toward change.

Leadership Support. Also ranked highly among factors enabling successful Lean implementation was the role of FQHC leadership and their continuous support for the initiative. Staff members reported that leaders contribute to the success of Lean in a number of ways, including making process improvement a priority within the organization, attending meetings, providing direction and exercising decision-making authority as needed, encouraging staff members to enact change through personal example, openly celebrating and communicating successes, giving staff members time to devote to Lean activities, holding staff members accountable for making changes, and supporting decisions made by those involved in the change initiative.

Use of Teams and Collaboration. Teamwork in a traditionally hierarchical system such as health care may present challenges. Yet staff members identified the importance of teamwork and collaboration as a factor that contributed to the successful implementation of Lean. The sense that “we are all in this together” and are “working toward a shared common goal” was identified by many staff members as central to the success of Lean. Key elements associated with the use of teams include the ability of staff members to regularly communicate and collaborate in the trialing of changes and trust and mutual respect among team members.
Communication. Staff members noted that consistent and clear messaging about the Lean effort was a key factor in success. They emphasized that frequent communication and interaction was essential throughout every stage of the Lean process improvement effort, including planning, implementation, and follow-up. This may include visual reminders (e.g., posters, quality boards, emails, newsletters), weekly meetings, huddles, or the creation of subcommittees to focus on change and process improvement. As one staff member noted, “The staff that have been involved have been really positive in trying to spread the word to other employees.”

Dedication of Time. The dedication of “protected” time to focus on problem solving and process improvement activities was cited by staff as critical to the successful adoption of Lean. Lean required a significant amount of staff time and investment, particularly at the outset for planning, training, and participation in VSM events. Moreover, staff members needed time to then implement and monitor the changes identified in the VSM. Staff members credited leadership in most instances with “allowing” them the time to dedicate to the improvement effort.

Positive Staff Characteristics. Staff members identified a number of personal characteristics they perceived as contributing to the success of Lean. The attributes most commonly cited included creativity, willingness and openness to change, ability to adjust to new ideas, commitment to making Lean changes, and positive attitude.

Accountability and Follow-Up. Staff members recognized the importance of assigning specific tasks to individual staff members in making progress with Lean process improvement activities. Likewise, they indicated that constant follow-up was essential to maintain momentum. This involved, for example, the establishment of teams or subcommittees to implement specific changes and regular meetings to assess the level of progress made.

External Assistance and Expertise. The involvement of external consultants and assistance was identified by FQHC staff as facilitating the implementation of Lean. Staff members identified the key role played by the Lean coach and Altarum project team in training the staff, facilitating Lean activities, establishing a structure for regular communication and follow-up (e.g., regular conference calls, action item reviews), and providing ongoing assistance throughout the project.

Table 7. Key Factors Supporting Lean Implementation

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<tr>
<th>Facilitator</th>
<th>Staff Comments</th>
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<tr>
<td><strong>Staff Buy-In</strong></td>
<td>“I think we were all encouraged by the idea that everyone was really owning this as something that would improve care … the team that’s here wanted to see it work.” “The process of Lean in and of itself requires really in-depth buy-in by everyone engaged in it … It’s the people on the real level of doing things … Lean is a tool, a system of thinking that allows them to figure out ‘how can we do this better?’ … So they have by necessity bought in because it doesn’t happen, nothing happens in Lean unless the team takes the process apart and puts it back together again.”</td>
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<td>Facilitator</td>
<td>Staff Comments</td>
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<tr>
<td>Leadership Support</td>
<td>“[Our leader] believes, she encourages, and she inspires. Her acknowledging, accepting, and celebrating what we are doing is huge.”</td>
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<td>“There is a lot of support from the top. They try to encourage all the managers and staff about moving forward and buying into the Lean concept.”</td>
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<td>“[Our leaders] are huge supporters of Lean ... they are always reminding us, encouraging us to use Lean so that we don’t forget, so we don’t go back to the old ways of doing things … it’s nice to see upper management reminding us and using it themselves so we can see they use it, too.”</td>
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<td>“So the fact that leaders right from the very start, the opening of those events, leadership was there promoting it and letting people know they supported it and they did all the way through. I think that brings everybody together more when they realize you know this is important to everybody all the way up and down the ladder.”</td>
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<tr>
<td>Use of Teams and Collaboration</td>
<td>“I really love the team-based approach. It’s been a huge help. I think it’s helped the patients as well, which again, this is what this is about.”</td>
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<td></td>
<td>“Working as a team has improved the whole process.”</td>
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<td>“… the fact that we are all going through it together … the teamwork piece and the fact that this is not a contest, we are here to help each other.”</td>
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<td></td>
<td>“It’s that validation with your peers that makes people feel that they are important.”</td>
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<tr>
<td>Communication</td>
<td>“… [T]he person in that department would come back and update them on what was going on during the meetings and explain to them what the action plans were and how we were going to go about carrying them out.”</td>
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<td>“… when staff keep hearing this is important … it’s really a culture of transformation … but how do we communicate in the face of all this incredible change? What is Lean’s place in that? It’s a tool to help transformation, that’s what it is.”</td>
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<tr>
<td>Dedication of Time</td>
<td>“… being allowed the time to make improvements instead of just nose to the grindstone, see patients, see patients, see patients. Being able to take the time to look at things to improve processes, that is very important.”</td>
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<td>“… allowing practices to experiment. To make changes. Just to let them try things out.”</td>
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<td>“… not many organizations devote the time of the clinical teams and the staff to do this work. I really applaud this organization for doing that … they gave people protected time.”</td>
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<td>“Definitely need support from administration to be able to allow providers and staff the time to get out and actually sit down and map your process and talk about it and come up with what are we doing now and where do we want to be and how are we going to get there … or you won’t even get started.”</td>
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Barriers to Lean Implementation

The previous section highlighted the key factors that staff members identified as promoting or supporting the implementation of Lean. Staff members were also asked to discuss the factors that in their view represented obstacles or challenges to carrying out Lean activities. Staff members identified specific barriers to the implementation of Lean, including:

- Competing priorities;
- Lack of capacity;
- Negative staff characteristics;
- Lack of support or direction from top management; and
- Organizational culture.

These barriers to Lean implementation are described briefly below and summarized in table 8.

Competing Priorities. A significant majority of the staff interviewed cited competing priorities as a major impediment to Lean implementation. Staff members pointed to the challenge of balancing daily patient demands and the focus on patient care with the need for dedicated time to apply Lean. Staff members frequently expressed a sense of being overwhelmed by the daily demands of working in a resource-constrained FQHC environment. As one staff member

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Table 7. Key Factors Supporting Lean Implementation (cont.)

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<tr>
<th>Facilitator</th>
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<tr>
<td>Positive Staff Characteristics</td>
<td>“… willingness to change, to work, to adjust to new ideas.”</td>
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<td>“… need to be people [who] are committed to putting the time into going to the meetings and people [who] don’t lack the ability to follow through … and you need to have an open mind.”</td>
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<td>“… need to tag the most intuitive and committed individuals … if you don’t go after those traits it’s easy to sit back and watch it happen and not engage.”</td>
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<td>“… thinking outside the box, just being able to problem solve, and be willing to make some changes and take some risks and try new things. Not being afraid to question ‘why am I still doing it this way’ if it doesn’t make sense.”</td>
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<td>Accountability and</td>
<td>“… [setting] deadline dates, and doling out the tasks. We all collectively decided to do this, that and that but then we sat around and said, ‘Okay, well you’re going to be in charge to get this done by this date.’ So we were kind of like forced into it … if it wasn’t for these names and these dates I don’t think any of this would have got done.”</td>
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<tr>
<td>Follow-Up</td>
<td>“I think it’s important to have the action items and have them assigned. Otherwise, it may not ever get done.”</td>
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<td>External Assistance</td>
<td>“… having the agendas, weekly focus … just having the structured agenda has been really helpful … I don’t think this would have been as successful if we did not have the weekly calls.”</td>
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<td>“… Altarum has great expertise and have contributed a huge amount.”</td>
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<td>“… Altarum staff was incredibly nonjudgmental so people don’t feel they need to hide stuff from you or cover things up.”</td>
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<td>“… you need your experts for people to lean on and keep setting up that framework.”</td>
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explained: “The demand is such and the pressure of patient need is such that [staff] could do that all day long and not have time to think about anything else and not have the time to say, ‘Hey, could we do this better?’” Examples of specific competing priorities cited by staff included:

- Establishing new programs, initiatives, opening new sites, constructing new clinic building;
- Implementation of new systems (EMR, project management);
- Accreditation;
- Improving coordination and integration of care delivery; and
- Fiscal pressures and need to focus on grants and fundraising.

Staff members seemed to recognize the importance of Lean even as they were struggling to find time to dedicate to this new approach. As one explained: “We are pressured in so many different directions all the time and we have so many responsibilities that sometimes even something as important as this gets pushed to the bottom.” Many staff referenced the need to carve out time for Lean and sacrificed lunch hours and weekends to focus on Lean projects.

**Lack of Capacity.** Staff members also identified the lack of capacity within their organizations as a factor inhibiting Lean implementation. This lack of capacity was perceived on two levels. On the human resources level, lack of capacity was defined as either limited staff or reductions in staff and staff turnover. On the organizational level, staff members cited a lack of resources such as the “cost” of pulling away providers and staff members from patient care, and the physical space needed for team members to meet and perform Lean activities.

**Negative Staff Characteristics.** Given that staff input, involvement, and engagement are at the core of the Lean approach, it is understandable that the characteristics of an FQHC staff could pose a significant barrier to its successful implementation. Participants in this project encountered this challenge most often when attempting to spread Lean to other staff members who were not initially involved in the Lean effort. These negative characteristics took several forms, such as resistance to change and lack of initiative or motivation to change. Also, change fatigue was identified as a barrier as some staff members had grown weary of constant changes within their organizations. One staff member described the various ongoing initiatives at the health center as, “We have enough pilots going on to start our own airline.”

**Lack of Support or Direction from Top Management.** As noted throughout this report, strong leadership and direction from top management is a key factor supporting the successful implementation of Lean. It was not surprising to learn from staff members that the lack of such support represents a key barrier to the success of a change initiative such as Lean. Specifically, staff members cited leadership inaction and lack of enthusiasm and buy-in as hindering the progression of Lean.

**Organizational Culture.** Staff members spoke about the impact of shared values, beliefs, and behaviors—or culture—of their organizations on the implementation of Lean. Barriers related to organizational culture identified by staff members included a top-down organizational management approach, the lack of encouragement or freedom for staff members to take the initiative to work on problems and challenges, and an environment in which change is not embraced or supported.
### Table 8. Key Factors Hindering Lean Implementation

<table>
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<tr>
<th>Barrier</th>
<th>Staff Comments</th>
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| **Competing Priorities** | “Time is an issue. I am overwhelmed, understaffed; it’s tough to make a contribution.”  
“We are short staffed, have a new building going up and a new practice management system so there has been a lot of barriers.”  
“We have too many projects going on, and every project is important and has to get done now.”  
“Leadership is telling staff: we need to see more patients, see more patients. So it gets to be a bit of a grind, and when you are in a grind you just sort of do what is in front of you; you don’t get too creative.”  
“We realized we were going to need more time to sit down and actually work out these tasks, divide the tasks among the team and actually get to them, and we recognized that we couldn’t do it in the work day.” |
| **Lack of Capacity**     | “Another challenge is incorporating these [Lean] principles into a clinic which is overwhelmed by patient care. We are a small center and don’t have a lot of administrative capacity.”  
“I think it was very hard for us to follow through on this because we’ve lost many employees throughout the organization.”  
“Another big challenge has to do with the crush of patients and space … You can react all day long and be very busy without even thinking about a process or Lean or what could be better because there is so much to do always.” |
| **Negative Staff Characteristics** | “There are a lot of people [who] just don’t like change. Whether they are young or old, people get in a routine and do not want to change. If they are not willing to change … it kind of slows the whole progress down.”  
“The person selected to lead [this initiative] is a project guy, and that gave the impression of being another project, flavor of the month sort of thing.”  
“Like every other health center, your leaders are 50, 60, 70 hour a week employees and do the best they can. My biggest fear is that by changing so much at one time people become even more resistant to change because it is too much.”  
“Change is difficult and resistance to change is natural and there is a huge amount of inertia in the health care system. ‘We’ve always done it this way’ is the thing that you are up against.”  
“There tends to be no initiative on the part of the staff to go ahead and do things because they are waiting for someone to tell them what to do.”  
“Resistance to change is always going to be there. It’s human nature. It’s actually worse the higher amount of education you have … the more you think you know the harder you are to convince that you should do things in a different way.” |
Table 8. Key Factors Hindering Lean Implementation (cont.)

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Staff Comments</th>
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<tbody>
<tr>
<td>Lack of Support or Direction from Management</td>
<td>“I think we didn’t have a very good start in terms of having our organizational leadership own the process. Even at the first session, the executive director’s level of participation was minimal. … [The staff] didn’t have the impression that the executive director thought it was very important.”</td>
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<td></td>
<td>“I just don’t think [staff members have] been allowed to be independent and say, ‘I need some time to do this.’ It’s like they wait to be told. It’s a cultural thing.”</td>
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<tr>
<td></td>
<td>“The executive director was involved … went to the meetings … but didn’t own the process and see the benefit.”</td>
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<tr>
<td></td>
<td>“[As a staff member] I can set up a meeting and make a decision with a group of people and take it up the ladder but when that decision is then put into suspension or into an abyss awaiting a decision, it doesn’t exactly encourage you to want to move forward. It creates a barrier to change.”</td>
</tr>
<tr>
<td>Organizational Culture</td>
<td>“As an organization, we have a tendency to be involved in a lot of stuff because it is good for the organization to look like it’s involved in a lot of stuff but not necessarily to buy in and complete everything.”</td>
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<td></td>
<td>“It’s an agency culture that doesn’t lend itself to really be assertive on this, and the day-to-day operations become more front and center and therefore people don’t pay attention to something that could actually improve our service.”</td>
</tr>
<tr>
<td></td>
<td>“It wasn’t what I would call an environment that encouraged people to look at ideas, want to meet, want to make recommendations and so forth.”</td>
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“I’m being scheduled every 15 minutes for physicals. … I cannot keep up with the pace. I am very frustrated. I don’t think they realize the stress they put on us to see patients, productivity … I feel rushed. [Patients] are getting the proper care. Nothing is happening to the patients. But what’s happening to me is uncomfortable.”

[A doctor] “… sees patients in like 2 or 3 minutes each and it’s like, okay, well he sees a lot of patients. I’m sure there is some good done there. Is that really making a difference in their health when they are just getting a prescription in like 3 minutes and not getting education or not listening to what their barriers are to actually deal with this disease in a more proactive way? It looks good on paper, but it’s like that outcome has really got to be an improvement of the health and how do we measure that?”

“When we look at physician productivity data we can’t assign the same measure of good productivity to each provider. We may have an internist who is seeing patients [who] are typically 60 and older with significant medical problems. They are not going to see as many people in a day as a family practitioner or a pediatrician who [is] seeing younger, healthier people.”

Unrealistic Expectations about Lean. Some staff members also felt that their initial expectations of the Lean process improvement initiative were not realistic, particularly as they related to the amount of time and resources required to successfully implement Lean. They spoke of “biting off more than we could chew” and discussed the importance of narrowing the scope of Lean interventions. One staff member pointed out that there cannot be a one-size-fits-all approach to Lean and that Lean needs to be customized according to numerous organization-specific attributes such as size and capacity. Staff comments reflect their concerns:

“I’m not sure that [we] had realistic expectations of the timeframes. I know we didn’t know enough to create realistic expectations. I think that the amount of data that is to be collected, the frequency with which data is to be collected, the scope … the project was a big project.”

“The challenge is that we don’t have the people to really oversee something like this, and a lot of the advice we got was well make the time and then you’ll have more time, squeeze it out of the early morning. But when you have this burned out overworked clinical staff trying to implement. They’ll do their part but they can’t be the leaders and the organizers and the people putting the charts on the wall. Because it just isn’t practical given how much else they have to do for patient care.”

“We took a process that was way too big. We want to fix the flow of patients … it’s a little too big.”

“I think the changes needed to happen on a much smaller scale first … the senior managers need to have a clear understanding of the paradigm shift involved in implementing Lean principles and be willing to allow [things] to change.”

Difficulty of Data Collection and Quantifying Outcomes. Some staff members commented on the difficulty of collecting data and quantifying outcomes related to changes implemented through Lean. Staff members also referenced difficulty attributing small, incremental changes to quantifiable outcomes. For example, after attending Lean training sessions, staff members were driven to organize their own workstations and change daily work routines to improve efficiency. While staff members felt that these changes led to “more timely results,” they found it difficult to measure improvements. These concerns are reflected in the staff comments below:

Metrics selected to measure progress were “very manually intensive to develop the information for, so [data collection] failed.”
“The things we are trying to improve aren’t things we really track data on. I think a lot of the things we did were based upon our gut feeling that this [outcome] would happen if we did this [action item].”

“We were supposed to do graphs and stuff to show the staff our progress, what’s been done, how it’s changed. Like the no-show rate, the new patient rates. I think that’s where it failed because we did it in the beginning, we did it one time … and [a staff member] never updated it since … he just quit doing it.”

“I think some of them are tougher to measure and certainly more long term … Because everything that the teams work on, they are little pieces and if one little piece doesn’t work then it gets put aside and they move on to another little piece. So it is just a huge process. It’s not like an easy, like a lab value that you can measure it this week and look back at it next month and quantify it. It’s much tougher than that.”

**Gradual Acceptance of Lean.** Several staff members shared that Lean was abstract and confusing to them at first. However, with continued exposure to and use of Lean tools, staff members eventually began to realize the benefits of Lean, particularly after application in their own practice or work area. Staff noted that after persistence and dedication, Lean gradually became part of their everyday routine, and even those most resistant began to recognize a return on their investment. Related comments from staff members follow:

- “In the beginning … I’m thinking, ‘Who is going to have time to do this? … How realistic is this for people to make these changes?’… But if you plug away at it and make it part of your routine and part of your standardization, it definitely pays off in the end.”
- “I didn’t know what to expect. It was a little confusing. I didn’t see how we were going to put everything together … in the end [I saw] slowly but surely things being changed.”
- “It was confusing at first but the more you used it the better it was.”
- “Any change brings on a little stress but once you start doing it and make those changes to benefit yourself as well as your patients it’s well worth taking the time to do it.”
- “You have to make the time, but once you do, it just flows better and then you have time at the end for what you need it for.”
- “Let’s face it, we have a full schedule and my patients run from 7:45 in the morning until 5:00 and you’ve still got your desktop to do and it’s like, oh by the way, here is this task and you have a deadline. So it can get in the way but we’ve just been sucking it up and finding a way because it makes it better later. So it’s stupid not to.”
- “Even the ones who I would have considered nay-sayers at the beginning have really opened up because I think they see the value and improving their workflows and improving their day.”
Staff members also shared valuable insight regarding their experience with Lean compared to another change initiative, the Health Disparities Collaboratives (HDC). In an effort to understand where the Lean process improvement approach falls along the spectrum of quality improvement initiatives undertaken within the FQHC environment, staff members were asked to compare and contrast their experience with Lean and their experience with the HDC. As discussed in chapter 1, the HDC was sponsored by HRSA’s Bureau of Primary Health Care. Each of the centers that implemented Lean process improvements under this mission project also had been involved in one or more HDC. Staff members had varying perceptions of the two initiatives.

One health center staff member saw the HDC as an important precursor that paved the way for the center’s work with Lean and enabled the staff to use Lean tools and techniques to enhance operations. The staff member expressed this in the following manner: “The way I see this, which might be bizarre, is that the Health Disparities [Collaboratives] was a nice ice breaker and nice introduction to Lean. It made the Lean process easier for us, easier to understand, easier to implement. Because we had gotten like the tip of the iceberg. With Lean we were able to go down deeper.” Other staff perceived the situation to be the reverse in that they saw the value of Lean as a foundation for improving quality. As one staff member noted, Lean “was like the work that you need to understand and get done before you can start to drive clinical outcomes.” Another explained, “You should be using [Lean] to identify the next layers of where you should be going … to me the collaboratives are more of a focus on a topic where you would apply Lean concepts.”

In considering similarities and differences between the two initiatives, staff members perceived the HDC as much more prescriptive and less interactive than the Lean initiative. As one staff member noted, with Lean “I had a lot more communication and input on what should and should not be part of the process. With the … collaborative it’s just been kind of, ‘This is what you need to do, and do it.’ I’ve not been able to maybe brainstorm some of the things that could improve it.” Another staff member found Lean “to be more structured and [had] better, more tools,” while others pointed to the benefits of interactive exercises: “… as learners I see us benefitting much more from the hands-on events you engage us in.” Another staff member shared that “I think [the Lean] approach … is leaps and bounds ahead of what the Health Disparities [Collaboratives] does.”

Staff recognized that there are similarities between the two approaches, citing “both were time consuming.” Others saw similarities in that both initiatives “seek to improve processes and outcomes.” Another staff member echoed that sentiment, commenting: “I think they are similar in that it’s kind of a process where the measures are defined and you are given some focus and some tools into how to improve those measures.” One staff member viewed Lean and the HDC from the perspective of the ways in which both approaches focus on continuous improvement: “Lean is encouraging a circular flow that we are looking at making changes, looking at measuring how we are doing, did we accomplish the change and then did we accomplish everything or do we need to make more change to continue to go on? And that’s what the collaborative is encouraging.”
Spreading and Sustaining Lean

Lean implementation does not come easy for many organizations and involves a significant amount of staff time and dedication to improving processes. Once the hard-won changes are in place, organizations are then faced with the challenge of sustaining improvements and ensuring the momentum to change is not lost by those who return to “the old ways” of working. As one staff member explained, it’s important to “keep the communication going. Otherwise I could see it falling to right back to where it was. Because there are a lot of people [who] will be coming and going and you have to keep the training and everything up so everyone knows the same things.”

Still another challenge is successfully spreading Lean throughout the organization. As one staff member noted, “I think the farther you are from being engaged in it the harder it is for people to understand it. You have to be pulled into it, which is why spread is so important.” In essence, organizations need to identify the most effective way to take Lean to the next level, to transition from viewing Lean as a set of tools and techniques to an ingrained problem-solving approach and overarching organizational philosophy. Examples of ways to extend Lean’s roots more deeply within an organization include integrating Lean into the orientation process so new employees are exposed to Lean from their first day on the job, providing ongoing Lean training to all staff members, as well as including use of Lean as part of an employee’s evaluation process. As one staff member noted, the successful spread of Lean to other areas and departments of the organization increases the likelihood of embedding and sustaining Lean: “I think we’ve adopted a culture of change and improvement that will continue on. At this point, with enough people within the organization that have embraced it… it will be here long after we have turnover and change in our leadership structure. At least as long as health care continues to change.”

Staff members identified commitment of leadership, communication, plans to spread Lean, and the regular use of Lean as the most important factors necessary to successfully spreading and sustaining Lean.

Commitment of Leadership. One staff member proffered a gardening analogy to explain the need for leaders to constantly be thinking about and supporting Lean efforts: “I think it’s going to require ongoing attention. When you plant a garden you have to have appropriate sunlight, water, you have to weed … you have to have the right fertilizer. You got to pay attention to it. I think leadership and management need to tend to that garden to cultivate growth, or cultivate that change that we are all kind of working towards as a team.” Others spoke of the role of leadership in sustaining Lean, noting there must be “expectations from leadership that we will continue to use the tools.” Staff members pointed out that leadership needed to establish frequent meetings to discuss process improvement projects and opportunities and commit to ongoing training of the staff in the Lean approach. This includes both “refresher” courses for staff members already trained in Lean, as well as an introduction to staff without previous exposure.

The important role of leadership in spreading and sustaining Lean is evident in staff comments:

“I think it’s a leadership challenge to just reinforce that this is not a theoretical change, it’s a practical change. And to build it in and not minimize what it is. We talk about performance improvement and we talk about wanting to have the best outcomes measuring things. We have to continue along those lines building in the Lean tools. It’s an evolution to the next layer of tools and skill sets being integrated into people…We’ve got challenges on two layers. One, within the people who have already gone through some of the process, and [two] making sure they keep using it and then expanding it to other parts of the organization.”
“Commitment by leadership to keep training more people … that will be really important for spread. Keeping and making sure that teams are all staying engaged and meeting on a regular basis … there has to be a formal structure in place to kind of keep it rolling.”

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“I still feel like the structured formal meetings are really going to be important to the continuing of the improvement process for the whole organization.”

**Communication.** Another factor key to sustaining and spreading Lean is consistent communication about Lean, whether it is a focus on using the language of Lean or on communicating about ongoing changes throughout the organization. One staff member noted that it is important to share success so that it is “contagious.” The importance of communication in spreading and sustaining Lean was described by staff in the following way:

“... bring it up in meetings … it’s nice to hear how another practice tried the same thing and what happened when they tried it … sharing that information.”

“If you don’t keep the energy going people go back to what was comfortable. So you have to keep bringing them back and refreshing the energy. You need to incite them which is why the [newsletter] keeps it out there and people’s names are out there and people take pride in their practices being named and the successes they are having.”

**Plans to Spread Lean to Other Areas within the Organization.** Another factor related to leadership and communication is having Lean champions in place as well as firm and deliberate plans to spread Lean throughout the organization. One staff member used a health-related term to express the belief that Lean will spread as a result of success as “good processes can become infectious.” Others had the following to say about effective ways to spread Lean throughout their organizations:

“We spread it through our management meetings with the staff, our staff meetings. Just implementing different things. We educate all the staff on it and let them know it’s process improvement. Through email, through word of mouth, through meetings we get the word out.”
“We are trying to reinforce to people just to continue doing it on a day to day basis. It doesn’t have to be a big project but it is what you do day to day where you see changes that you think made sense, communicate them. Let’s formalize that idea, not just assume it’s going to happen.”

“I think it takes a champion, it takes somebody who is there on a regular basis [who] can figure out how [to] incorporate this into the regular activities that we have? How do we incorporate [Lean], how do we continue to share it, make it a consistent part of our messages whenever we are together? … bring it to people’s attention when we do things that are based on Lean concepts.”

Daily Use of Lean. A final factor critical to spreading and sustaining Lean follows a simple rule—practice makes perfect. Using Lean on a daily basis, repeated training, and reinforcing the concepts and principles of Lean are all critical to spreading and sustaining Lean. Staff members spoke of the importance of a continued focus on process improvement efforts, with the hope that it will ultimately make the providers’ and other staff members’ lives easier, and affect their satisfaction levels.

““The repetition is good and it’s needed anytime you want to bring about effective change. I think you need to hear it again and again.”

“People need to constantly reinforce this now that they’ve started to learn it. Because you drift off with your other 4,000 priorities and I think the group needs to keep reconvening…”

“We are trying to reinforce to people just to continue doing it on a day to day basis. It doesn’t have to be a big project but it is what you do day to day where you see changes that you think made sense, communicate them. Let’s formalize that idea, not just assume it’s going to happen.”

“I think it takes a champion, it takes somebody who is there on a regular basis [who] can figure out how [to] incorporate this into the regular activities that we have? How do we incorporate [Lean], how do we continue to share it, make it a consistent part of our messages whenever we are together? … bring it to people’s attention when we do things that are based on Lean concepts.”

“Step one is to bring the people [who] you know are going to be the doers and then spread it.”

“… need to spread beyond the clinical practices and get into [the] infrastructure.”
Conclusion

This chapter has presented the experiences of three FQHCs applying the Lean approach to improve the patient visit process, viewed directly through the lens of the staff members who were “boots on the ground” doing the work. These qualitative findings reveal that the staff members who were implementing process improvements perceived that Lean added value to their organizations in a number of important, interrelated areas. These include increased standardization of processes, improved patient flow, enhanced staff communication and collaboration, increased staff and patient satisfaction, enhanced access to care, and improved quality of care. Staff also shared their perspectives on the key factors that facilitate Lean implementation, such as staff buy-in, leadership support, use of teams and a deliberate focus on communicating about Lean throughout the organization. Staff members overwhelmingly identified competing priorities as a key obstacle to Lean, as well as lack of capacity and insufficient support from top management. Importantly, they also shared honest observations of unintended consequences and unrealistic expectations associated with Lean, including additional demands on top of already heavy workloads. No stranger to change initiatives, staff members also spoke of similarities and differences between Lean and the HDC. Finally, staff members recognized that it would take continuing hard work and focus to sustain and spread Lean to other parts of their organization. They identified the commitment of leadership, frequent and effective communication, the development of spread plans, and the regular use of Lean as keys to sustaining and spreading Lean.
Lean and the Patient-Centered Medical Home Model

Introduction

The patient-centered medical home (PCMH) model promotes the delivery of comprehensive, patient-focused, coordinated care across the lifespan. Transformation to a PCMH represents the implementation of many elements related to patient services and practice organization, and each element requires significant changes to existing work processes and staff roles. In May 2009, PCHC was one of 26 practices selected to participate in the three-year Maine PCMH pilot, a “first step” in achieving statewide implementation of the PCMH model. The center subsequently recognized the opportunity to use Lean to both improve the patient visit process and achieve core expectations of the PCMH model.

Using Lean to Implement PCMH Elements

PCHC included the achievement of PCMH elements as a goal during its first VSM event. At this event, 35 staff members across four practices, including three participating in the PCMH pilot and one “shadow” practice, convened to map out the patient visit process. When creating the future state map (i.e., the improved patient visit process), the teams worked together to envision a visit that offered patients various features of the PCMH model. They then worked to translate these features from conceptual ideas to a set of actual tasks and projects that needed to be executed. For example, the PCMH pilot required participating practices to implement practice-integrated care management. At the VSM, team members discussed what the provision of care management services entails and generated a list of distinct action items needed to integrate care management into their practices, such as:

- Hire care managers;
- Create standard work for care managers;
- Test pre-visit planning within care teams;

Maine PCMH Pilot Core Expectations

1. Demonstrated leadership
2. Team-based approach to care
3. Population risk stratification and management
4. Practice integrated care management
5. Enhanced access to care
6. Behavioral-physical health integration
7. Inclusion of patients and families in implementation of the PCMH model
8. Connection to community
9. Commitment to reducing unnecessary health care spending, reducing waste, and improving cost-effective use of health care services
10. Integration of health information
Test patient self-management tools;
Develop care plan guidelines;
Review practice quality reports monthly; and
Set up a process to receive regular reports from area hospitals (i.e., to track patients who received care).

As another example, care management involves systematically tracking and managing patient information in order to identify and resolve any gaps in care. Team members realized they needed a system in place to manage provider panels and proactively identify patients needing preventive services. They created a list of related action items, such as:

- Develop criteria to sort provider panels by risk;
- Develop routine protocol for maintaining patient registrations (e.g., active, inactive, medical, dental); and
- Review practice quality reports and identify patients missing mammograms and pap tests, and send reminder letters to patients.

These are only a small sample of the many changes implemented through Lean in an effort to achieve components of the PCMH model. Often the changes were tested on a small scale in one PCHC practice and then spread to others throughout the organization. As of May 2011, PCHC employs care managers and health coaches in each of its major practices and care management services are provided to 1,486 patients. PCHC has associated the integration of care management with enhanced care coordination, smoother transitions of care, more efficient use of resources, and improved quality of care as more patients are receiving necessary services (see figure 4). Moreover, providers and staff members have shared anecdotes of patients expressing appreciation for care management services rendered.

**Figure 4. Patients Receiving Needed Preventive Care Services, 2010**

![Graph showing patients receiving needed preventive care services, 2010](image)

*Notes:
Data for Helen Hunt Health Center
Mammogram (female patients between 50–70 years old)
Pap Test (female patients between 21–64 years old)*
Staff Perceptions of Lean and the PCMH Model

Staff involved in both the PCMH pilot and Lean process improvement efforts were participating in two major organizational change initiatives at the same time. Interviews with these individuals included questions to determine the differences and similarities between the two initiatives, ways in which Lean may have facilitated progress toward achieving PCMH goals, and staff perceptions of the specific core expectations advanced using the Lean approach.

Comparison of Lean and PCMH as Change Initiatives

Staff members were asked to share their feedback on how the Lean and PCMH initiatives were similar to and different from one another. The majority considered Lean to be the “nuts and bolts” tools used to operationalize the theoretical goals identified by the PCMH pilot. Some staff members felt the pilot dictated to the staff the change that needed to take place, whereas the Lean approach caused change to be generated by staff members themselves. Also, while the pilot offered educational learning sessions, it did not provide change methods or frequent problem solving opportunities. As a result, some staff members noted that the pilot was less engaging for the staff.

Select comments include:

- “I see the Lean as the process and I see the PCMH as the end point of the process.”
- “The difference I think is learning how to make change … with the Lean training we learned how to problem solve and had time to do it. That’s what you need to make it happen.”
- “Lean is the tools to get to where we need to be, where PCMH wants us to be.”
- “The pilot sets forth goals. If you are going to be a PCMH, you [must] have these things. Okay, how are we going to get these things? Well, let’s use Lean processes in order to achieve these things that we have to have.”
- “The Lean process, we can identify what we want to work on and go from there, where the PCMH, there [are] the core pilot expectations, this is what we have to be working on as far as they’re concerned and to be part of the pilot.”
- “In the PCMH pilot, “the involvement is less frequent and it’s more education opportunities, like when we go and spend a day and we listen to speakers … I mean it’s a nice learning piece and an education piece but it’s less engaging.”
- “I think when you get right in and you work with staff and they are all very much involved in the changes and the process then they feel engaged in it. I think there is probably a lot more engagement because of the way that we’ve done Lean in the organization than what they feel has happened with PCMH. I think that probably feels much more distant to them.”

Usefulness of Lean in Facilitating PCMH Progress

Staff members decisively felt that Lean facilitated progress toward achieving the PCMH core expectations. In particular, Lean and the VSM tool provided the structure and accountability needed to identify and implement specific changes that needed to take place in order to achieve PCMH elements. Staff members commented on how Lean helped to accelerate progress and simplify the transformation to a PCMH—other practices participating in the pilot were perceived to have a more difficult time breaking down the core expectations into tangible changes. Some staff members expressed disappointment, however, in manage-
ment’s decision to incorporate PCMH into the VSM event. In addition to feeling as though they were trying to accomplish too much, the pilot, and care management in particular, “took over” the VSM and shifted focus from the initial goal of improving patient flow.

Staff comments reflect these views:

- “Patient centered medical home, it’s a journey, it’s not a destination. It is a huge undertaking and it’s overwhelming. But what better thing to do than to have a tool that everyone can use to figure out how to do it better?”
- “It’s given us the structure to be able to implement these core expectations.”
- “I think some of the things that we have started to do with the PCMH may not have been started if we hadn’t done Lean.”
- “Each one of these [core expectations] is a big honking deal ... So I think Lean helps you transform and creates that buy-in from within and it creates a structure to do a lot of work all at once.”
- “Certainly we could do Lean without PCMH, just simply improving our office systems and making work flows and decreasing cycle times in all of that. Certainly we could work towards PCMH certification without Lean. It would just be more complicated.”
- “We incorporated this into our Lean event so it kind of forced us to move forward and most of the action items we had, or a good portion at least, were associated with the PCMH so as we are continuously following up on action items it keeps pushing us forward instead of, ‘Okay, we’re going to do this’ and nothing gets done. So in that aspect it helps move us forward with it.”
- “I think it’s made it good on one end because we’re killing two birds with one stone, but at the same time it shifted it away from what can we do to make the provider’s day flow better, the staff more satisfied, the patients more satisfied to more of ‘Okay, let’s work on this initiative through Lean.”

Achievement of Core Expectations

In the interviews, staff members were asked to discuss the specific core expectations they believed Lean helped to achieve. The vast majority associated Lean with care management, noting it would have taken the organization longer to integrate care managers and health coaches into the practices without Lean. The use of care managers and health coaches was also associated with improvements in team-based care and population (panel) management. Some staff members referenced the realignment of certain responsibilities (e.g., MAs performing tasks previously allocated to providers) that occurred during VSM events as enhancing the use of teams. The use of Lean tools and techniques, particularly the emphasis on eliminating waste and optimizing efficiency, was linked to improvements in access to care as well as an organizational commitment to reducing unnecessary health care spending. Finally, staff members associated Lean with a demonstrated commitment from leadership to implement the PCMH model, as senior leaders were seen as taking a more active and visible role in examining, auditing, and improving processes. Select staff comments regarding achievement of these PCMH core expectations appear in table 9.
Table 9. In Their Own Words…Staff Perceptions of PCMH Elements Advanced by Using Lean

<table>
<thead>
<tr>
<th>PCMH Core Expectation</th>
<th>Staff Comments</th>
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| **Practice-Integrated Care Management** | “Lean has been instrumental in care management.”  
“To get care management in place that we need to have for PCMH and to get the acceptance of health coaches, it could have taken months, years…”  
“Initially there was a lot of resistance and now we’ve gotten to the point where the practices are saying, ‘Where is my health coach? I need a health coach. We need this person in place.’” |
| **Team-Based Approach to Care** | “Team-based approach to care, having care management in place and the health coaches in place, I think that has been a big improvement.”  
“Definitely the team-based approach to care … [in the VSM event] we looked at … certain items that the MA could do for the provider, so that’s been a big part of training for some of our newer practices.”  
“I think the team-based approach has been the biggest change …” |
| **Population Risk Stratification and Management** | “Lean helped us really well with panel management.”  
 “[The health coaches] do mostly panel management and help keep track of people who haven’t been in and or haven’t had certain things done in a certain period of time and get them bought into the practice. I think that’s been a huge plus in patient care that we’ve seen.” |
| **Enhanced Access to Care** | “Access to care. We are open evenings and weekends now, and it’s been [in] large part to the PCMH [pilot] and Lean.”  
“Lean …, I think, made huge impact on understanding cycle time, supply and demand … What stops you from having a 45-minute cycle time? What do we need to do to get you to have a third next available [appointment] for a new patient be within two or three days?… You use techniques that you learn in Lean to ask the questions to then motivate people to move in a different direction.” |
| **Commitment to Reducing Unnecessary Health Care Spending, Reducing Waste, and Improving Cost-Effective Use of Health Care Services** | “The commitment to reducing unnecessary spending and reducing waste, that is one thing that Lean always keeps at, ‘How can we do this … how can we Lean it up?’ So definitely that one.”  
“I would say the commitment to reducing unnecessary spending and waste and improving cost effective use of health care services … We looked at everything I think differently because of our Lean exposure.” |
| **Demonstrated Leadership** | “Demonstrated leadership … when [the Lean coach] does his debriefing or talks with leadership, senior management, [he says], ‘It’s got to start at the top before it trickles down.’ I think that’s a big thing he has really helped us with and also it’s nice to have senior administration around seeing what’s going on in the clinics. The … Lean ‘go see’ [approach] is a big thing with demonstrated leadership.” |
Conclusion

The use of Lean supported PCHC in achieving the required core expectations of the Maine PCMH pilot. Specifically, Lean was strongly associated with helping the organization to build a functional care management infrastructure. Lean was also perceived to facilitate progress toward achieving other core expectations, including team-based approach to care, population risk stratification and management, enhanced access to care, commitment to reducing unnecessary health care spending and waste, and demonstrated leadership. Overall, staff considered Lean useful in providing the structure, tools, and accountability necessary to make a smoother, faster transition to the PCMH model. While the use of Lean was helpful in advancing the center’s PCMH goals, it was also viewed as a set of tools that would be applied to create improvements in other areas as well. As one staff member shared, “I think the elements and basics of Lean training will go a long way with us in the future. I don’t see it as something we use to accomplish PCMH and then we put it on a shelf somewhere and bring it out and dust it off for the next thing that comes along.”
Discussion and Lessons Learned

Introduction
The three FQHCs in this project had the shared experience of being counted among the vanguard of innovators adopting Lean methodology in the primary care setting. Each FQHC followed the same approach to implement Lean, including training the staff in Lean principles and tools, conducting VSM events, and making a wide range of operational changes. Yet the extent to which Lean tools and techniques were embraced by the staff, supported by leadership, and ultimately used and spread throughout the organizations, varied considerably. This chapter briefly summarizes each FQHC’s distinct experience implementing Lean. These experiences along with the findings discussed in chapters 3 and 4, offer practical lessons learned for other primary care organizations.

Discussion of FQHC Experiences Implementing Lean
Any change initiative will face challenges that threaten to derail its progress. Interviews with FQHC staff revealed that each health center faced similar obstacles to implementing Lean, most notably competing priorities and demands on limited resources. However, staff also cited many factors that served to promote and advance the adoption of Lean (see figure 5). The presence of these facilitators may provide a powerful countervailing force to overcome barriers and maintain momentum. Similarly, the absence of any one factor, such as strong leadership support, may slow or halt the progress of Lean implementation. These factors are discussed in the summaries of Lean implementation at FHC, PCHC, and ANHSI below.

Figure 5. Factors Supporting the Successful Adoption of Lean
Baldwin Family Health Care

FHC was the first of the three health centers to launch Lean activities. The center conducted two VSM events to address the patient visit process and the prescription refill process. Staff members made a number of improvements related to patient flow including standardizing the check-in and check-out process, making scheduling changes enabling new patients to be seen more quickly, organizing supply areas and standardizing a process for enrolling eligible patients in Medicaid. Additionally, pharmacy staff streamlined the refill process and instituted changes to reduce the prescription fill error rate.

FHC faced a number of major competing priorities throughout the project, including the construction of a new clinic building, the introduction of a new practice management system (in anticipation of EMR implementation), ongoing staff turnover and financial pressures, and the retirement of the executive director midway through the project. All of these factors led staff members to determine they could not devote the time necessary to fully integrate Lean into their organization. Despite this decision, staff members perceived value in Lean and continue to use Lean principles and tools, albeit on a reduced scale. The overall experience of FHC is captured in the following quote from a FHC staff member:

"I think we didn’t have a very good start in terms of having our organizational leadership own the process … [The staff] didn’t have the impression she thought it was very important. Additionally, [the staff member selected to be the internal champion] is a project guy, and that gave this the impression of being another project, flavor of the month sort of thing. We’ve faced challenges throughout this in terms of our finances and bottom line cash flow and we’ve made some changes where we’ve taken positions out of the organization. That has taken its toll I think on some of the momentum here. We did some good things from a process standpoint where we made real change, we added in some tools that people needed … We are trying to reinforce to people just to continue doing it on a day to day basis … I think it’s a leadership challenge to just reinforce that this is not a theoretical change, it’s a practical change. We have to continue along those lines building in the Lean tools. It’s an evolution to the next layer of tools and skill sets being integrated into people … we’ve got challenges on two layers. One, within the people who have already gone through some of this process and making sure they keep using it, and then expand it to other parts of the organization."

Penobscot Community Health Care

The largest FQHC in the project, PCHC was the second health center to launch Lean activities. In 18 months, PCHC conducted three VSM events, engaged 150 staff members in Lean trainings and activities and spread Lean through more than 20 departments and practices. Additionally, two staff members were designated as Lean champions and led Lean training and VSM events for their colleagues. Lean tools and techniques were used to simplify and streamline processes ranging from scheduling and reception to referrals and immunizations. The changes implemented through Lean were associated with improvements in areas such as provider and staff efficiency, patient flow, cycle time, staff satisfaction, care coordination and management, and patient access to care.

During the project period, the center faced financial pressures, staff turnover, and change fatigue as staff members were involved in various other programs and initiatives. These barriers were counterbalanced, however, by unwavering commitment from senior and mid-level leaders, demonstrated by an investment of more than 3,500 staff hours devoted to Lean projects. Leadership also communicated about the importance of Lean in monthly
newsletters, highlighting staff members who experienced Lean successes. Additionally, PCHC benefited from strong buy-in from staff members who saw the value of Lean and engaged their peers in the Lean approach. As a result, PCHC was able to begin an organizational transformation toward embedding Lean within its culture. The overall experience of PCHC in adopting and applying Lean is summarized in the quote below:

“We as an organization have gone through constant change for years about everything, EMRs, quality of care, joint commission, PCMH, access and redesign—Lean is perhaps the latest big kind of organizational change … [Our leaders] are willing to keep looking at themselves in their departments and go, ‘How do we do this better?’ People are overwhelmed by change but they don’t run from it … It is very, very difficult to explain what Lean is about and get people interested … unless they experience the in-depth [Lean] training and get the results … when people I think do get it firsthand, or … if one doctor says to another, ‘Wow, I feel better, I can get home at night.’ That’s powerful. So I think it’s something that does take time. It’s not something that happens in six months or a year … It needs to be imbued in an organization and it needs real, serious time to have widespread acceptance … It’s [staff members] using their immediate knowledge and creativity and expertise and intelligence to change what they are doing … that can make their jobs better and their outcomes [better] for the people they care about, their colleagues and their patients … We have ‘verbed’ it. We often are saying, ‘[We need] to Lean something’ now…It’s really become quite embedded in our thinking…It’s part of the culture of how we think.”

Alexandria Neighborhood Health Services, Inc.

As a small, underresourced FQHC serving a nearly 80% uninsured patient population, ANHSI had its own set of challenges in this project. The center launched Lean activities much later than the other two FQHCs and struggled to gain traction throughout the project. ANHSI conducted one VSM event, which served an important purpose in providing a forum for staff to communicate and openly discuss improvement opportunities. The VSM led to a number of improvements in the organization. These include the installation of an electronic number-ing system to bring order to a previously chaotic waiting room, the development of a policy to manage the center’s large walk-in population, and standard processes ranging from patient registration to use of the EMR.

Despite these achievements, overall, staff members felt that more progress could have been accomplished, which they attributed to a lack of commitment and support from leadership. Progress was also stymied by staff turnover and ongoing financial limitations. The following quote from an ANHSI staff member summarizes the center’s experience applying Lean:

“A lot was accomplished but a great deal more could have been accomplished…we started almost a year late … The structure was not put in place and maintained and encouraged to make these things go forward and be resolved in a timely and efficient manner … So I think a lot was done but a great deal more could have been done. [Leadership] creates a barrier to change and to growth and to people feeling independent and empowered to want to look at ideas and so on … It wasn’t like an overt ‘don’t do this’ but it was a kind of paralysis that is embedded in the agency because every decision, every movement, everything that is done has to be done by [leadership] … It doesn’t create a growing environment and an environment where people learn.”
Lessons Learned

The experiences of the three FQHC partners in this project suggest a number of important lessons for other primary care organizations considering the adoption of Lean as a process improvement strategy.

Value stream mapping events provide a structure for critical thinking, teamwork, and problem solving in FQHCs.

Time is a luxury that comes in short supply in the FQHC environment. While staff members may want to address problems they encounter throughout the work day, they often lack the time needed to do so and, instead, create “workarounds” to bypass the issue. The VSM event awards these employees the opportunity to address the root cause of problems and brainstorm potential solutions. By design, VSM requires 3 full days of uninterrupted time for staff members to focus on process improvement. This structure allows staff members at all levels to drill down and examine the many discrete yet interrelated steps of a process. In doing so, they are able to visualize the “big picture,” understanding not only their own critical role in the overall system, but also the important contributions of their peers. Everyone from secretaries to clinicians to senior leaders is given an equal voice and, importantly, a safe environment in which to express concerns and discuss sensitive issues. Hierarchical layers and silos are broken down as staff members—many of whom have little or no direct interaction on a regular basis—offer creative solutions to shared problems. The end product is a concrete list of action items needed to make improvements and a set schedule of follow-up meetings to track progress. As noted by numerous staff members in this project, this roadmap for change was critical to maintaining focus and accountability amidst the countless other priorities competing for their attention.

Lean empowers staff members to become active participants in the change process.

Lean empowers employees to become active stewards of change rather than passive observers. With its strong emphasis on identifying and removing waste, employees are encouraged to question the status quo (“because it’s always been done this way”) and consider opportunities to optimize efficiency. In this way, Lean enables staff to work at their highest professional level, or as many FQHC staff members noted in this project, to the top of their license or ability. The Lean approach introduces a new way of thinking and provides concrete tools enabling staff members to proactively resolve problems. Staff in this project, for example, noted an enhanced awareness of the waste around them, such as extra paperwork, careless use of resources, and wasted time spent waiting or searching for people, supplies, and information. Instead of unconsciously accepting these inefficiencies as part of everyday work, Lean prompted them to take action and test changes. The improvements that ensued were a direct result of their own ideas and hard work, leading to a sense of satisfaction and achievement. Staff members frequently commented on how this internally-generated change separated Lean from other initiatives “forced” upon them by top management or external organizations. Change that is imposed upon a staff is less likely to be sustained and can lead to resentment and low staff morale. In contrast, change that originates from within (i.e., those who are actually doing the work) has greater likelihood of being sustained.
Leadership must demonstrate active support and investment of resources in order to implement Lean.

Employee empowerment is not only a byproduct of the Lean approach, it is also a necessary condition for Lean to truly take hold within an organization. Leadership plays an integral role in fostering this empowerment and enabling staff members to enact change. First, senior leaders are largely responsible for setting the tone in support of the Lean approach. Verbal “cheerleading” alone will not suffice—they must lead by example and use their influence to pave the way for change. This is done by actively participating in Lean events, expressing an interest in staff ideas and changes underway, stepping in to remove barriers, following through with necessary executive-level decisions, and openly rewarding employees for their efforts in improving the organization. This consistent, visible presence sends a clear message to the staff that the use of Lean is not only encouraged but expected. Support also filters through to middle managers, who take ownership of the change process and subsequently empower their staff members to engage in problem solving and process improvement activities. Essentially, Lean requires top-down commitment and prioritization from senior leadership in order for empowered staff members to then drive the improvement efforts.

As a systems-level strategy, the implementation of Lean hinges on widespread acceptance and adoption of its principles and tools. Leadership must commit the resources required to train staff members at all levels and offer them opportunities to continuously apply Lean methods. The FQHCs involved in this project pulled staff members from their daily responsibilities, for days at a time in some instances, to participate in Lean trainings, VSM events, and team meetings. This not only created administrative and logistical burdens (e.g., blocked schedules for health care providers, understaffed clinics), it also translated into a direct financial loss for the organizations. Simply put, health care providers who are attending Lean activities are not seeing patients and, therefore, not bringing in revenue. As one senior leader noted, “It’s a bit of a leap of faith to dedicate those kinds of resources.” However, the same leader felt that the investment paid off as employees gained the motivation and skills needed to make numerous improvements throughout the organization. Staff members across all three FQHCs in this project shared similar remarks, noting that the “protected” time given to them in the form of Lean training, VSM events, and follow-up meetings was essential in allowing them to build competencies in Lean.

The Lean approach takes time to gain traction.

As demonstrated by the three FQHCs participating in this project, the implementation of Lean is challenging for most organizations, and is initially an uphill struggle. Health care staff may respond with skepticism or resistance, balking at Lean terminology and tools and their seeming irrelevance to the provision of patient care (e.g., “What do cars and Toyota have to do with patients?”). There is a steep learning curve involved in understanding this new language and learning to apply Lean tools and techniques to daily work. While many Lean tools are straightforward and user-friendly, the terminology and principles can be intimidating to new users. As a result, staff originally perceived Lean to be more work, with one referencing it as “another full-time job.” As such, significant external support and consultation may be required in the initial stages of Lean implementation in the FQHC setting, ranging from facilitation of events to administrative support.

Despite these preliminary implementation challenges, experience shows that there is a point at which Lean moves from a theoretical concept to the way in which people do their jobs and approach problems and challenges. This in turn results in a shift in the perception of Lean as an added burden to simply the way one goes about daily responsibilities. Indeed, once people start to see the impact of Lean on their own work—whether it is in the form of reduced stress,
being able to get their work done faster, or the perception that their patients are happier—skepticism and distrust give way to enthusiasm and receptivity to change through the Lean approach, as depicted in figure 6. Widespread adoption of Lean occurs when staff at all levels see and feel the benefits of Lean directly related to them.

Figure 6. Tipping Point of Lean

Quick wins are critical to maintaining momentum.

One way to address the initial resistance to Lean is to focus on quick fixes (i.e., “low hanging fruit”). By targeting relatively simple, straightforward changes—such as moving patient charts to more convenient locations, organizing supply areas for quick and easy access, and creating checklists for more organized completion of tasks—staff members may realize immediate gains. These easy, seemingly obvious changes can carry with them significant impact. For example, training staff members to consistently verify a patient’s phone number instead of assuming the number on record is correct, would appear to be almost too simple to warrant attention. Yet this small change was associated with reducing the number of no-shows negatively affect provider productivity, revenues, and patient scheduling.

Small successes also propel staff members to move forward and continue making improvements. They serve as powerful motivators and help to build an evidence base in support of Lean. As referenced by several FQHC staff members in this project, these quick wins are “contagious” as “success breeds success.” They should be celebrated and reported out to the entire staff to both recognize those responsible for making the change, and encourage others to take similar steps in improving the organization.

Lean is an effective tool for FQHCs in transitioning to the patient-centered medical home model.

The experience of PCHC in this project demonstrated that Lean, and the VSM tool in particular, may be used to successfully facilitate transition to the PCMH model. PCHC deliberately included specific components of the PCMH model, such as care management, population and panel management, and team-based approach to care, as goals and objectives in their initial VSM event. This framework assisted the center in actualizing PCMH elements that were otherwise viewed by staff members as broad and overwhelming. By identifying distinct action items, individuals responsible for carrying them out, and target dates for comple-
tion, staff members felt accountable for implementing and following through with changes needed to transition to the PCMH model. This led to a faster, less complicated transition to the model. Moreover, this helped to build buy-in as staff members began to more clearly understand how PCMH elements translated into their daily work and the actual provision of patient care. Overall, the Lean approach provides “nuts and bolts” tools to aid FQHCs in simplifying and implementing components of the PCMH model.

**Lean can be an effective change management and continuous process improvement strategy in the FQHC setting.**

Lean offers FQHCs a powerful approach to manage change and instill a culture of continuous process improvement within their organizations. Based on the experiences of FQHCs in this project, Lean principles and tools may be successfully applied to streamline processes and address challenges related to patient scheduling, flow, wait times, no shows, and provider productivity. The resulting efficiencies may serve as a welcome reprieve for overworked and under-resourced FQHC staff members, who are in a position of constantly having to do more with less. Once staff members see and feel the benefits of Lean, they shift their thinking toward continuously exploring ways to improve and perform to the best of their ability. In this way, Lean may help health centers to maximize the resources they have—a benefit of tremendous importance in the current health care environment.

Facing workforce shortages, rising numbers of patients, and ongoing fiscal and economic pressures, it is imperative for FQHCs to be vigilant and resourceful in addressing these challenges. Moreover, they must navigate the unchartered territory of a newly reformed health care system. While it is unclear what shape reform will ultimately take, the role of FQHCs at the forefront of primary care delivery will remain unchanged. Given their role as critical safety net providers, health centers must be prepared and equipped to meet even greater patient demands and diverse community needs. Those FQHCs employing proven methods to embrace, implement, and manage change will be better able to respond to the challenges of an evolving health care system. Lean, with its emphasis on reducing waste and maximizing value, can arm FQHCs with tools and strategies to simplify their processes, provide more efficient and effective care, and in turn, create a better environment for the staff and the patients they serve.

“I think we are using our staff that we have more efficiently.”
Conclusion

This chapter presented a brief summary of the ways in which each FQHC used Lean to improve the patient care experience. These summaries serve to reinforce the findings described in chapter 3, most notably, the key role that staff buy-in and leadership play in the success of a major change initiative such as Lean implementation. The health centers found that Lean requires significant time and investment and a long-term horizon. A focus on quick wins, however, may help maintain the momentum necessary to push staff members toward continuous improvement. The centers’ experiences also underscore the value of Lean as a tool to enhance efficiency, staff capacity, empowerment, and teamwork. Additionally, Lean may provide a solid framework to assist organizations in transitioning to the PCMH model of care delivery.
Conclusion

This report documents the experiences of three FQHCs in learning about and applying the Lean continuous process improvement approach. In providing a comprehensive view of Lean as it was implemented by early adopters, this report serves to demystify Lean and anchor its application firmly within the daily operations of resource-limited health care organizations such as FQHCs. This project tested the implementation of Lean within a small sample of FQHCs over an 18-month time period. While staff members at each FQHC reported positive changes resulting from Lean implementation, the findings outlined in this report cannot be generalized and further testing of the Lean approach within the FQHC setting is needed. Despite these limitations, the experiences of ANHSI, FHC, and PCHC in adopting Lean suggest that Lean has the potential to enhance operations within the primary care setting. Moreover, Lean is an effective tool to accelerate and simplify transition to the PCMH model.

The findings in this report are consistent with the literature on the use of Lean in health care. Specifically, Lean can be adapted in health care settings, such as FQHCs, and lead to improvements in a range of areas. These include standardization, patient flow, staff communication and collaboration, access to care, patient and staff satisfaction, and quality of care. Moreover, staff members expected continued improvements to generate financial savings. Lean has an impact on three key levels—staff, patients, and the organization as a whole (see figure 7). This is reflected in a comment made by an FQHC staff member: “[The benefits are seen in] employee experience, in improving processes, having happier patients and employees … in the long run it is worth it.” It is noteworthy that Lean’s ability to affect positive change on multiple levels occurred against the backdrop of organizational change and financial pressures, two chronic challenges for FQHCs.
The three FQHCS in this project that reaped the benefits of Lean did not do so without making a significant investment. Lean requires hard work and an upfront outlay of staff time—the most valuable of health center resources. In order to focus on process improvement activities, Lean activities such as the VSM event require taking staff away from providing direct patient care, resulting in short-staffed clinics as well as lost patient revenues. As one staff member explained, FQHCs are naturally lean with “not a lot of fat to draw from,” adding, “It’s a function of reality. Health centers run lean. There is not usually a lot of extra staff anywhere and for every staff member you put in the room, you are looking at” a substantial amount of lost revenue. Based on the experience of health centers in this project, however, the return on this investment is considerable. One staff member pointed out the benefits and costs of Lean, noting, “I think it’s proven to work. I can’t imagine a health center not benefiting from it … they all need to get involved in it. I think the big issue for most of them would be affording it.”

Lean’s impact may be evident in measurable improvements such as reduced wait time, increased productivity, and reduced cycle time. Equally important, however, are the intangible effects of Lean, notably in enhanced communication, teamwork, and cohesion of the staff. Additionally, Lean engenders empowerment and confidence, enabling staff members to become active change agents, critical thinkers, and pragmatic problem solvers (see table 10). In this way, Lean serves as a powerful facilitator of professional growth and development, both at the staff and executive levels. This strengthening of human resource capacity is critical at a time when FQHCs are expanding and merging into larger delivery systems. In addition to offering tools to effectively manage expanding operational scale, Lean may offer a valuable strategy for executive development, succession planning, and employee retention. Engaged, empowered staff members may in turn become the new generation of health center leaders. An added benefit may be seen in staff retention as employees see that a clear advancement track is open to them.

“It’s really a mind-altering way of looking at your job and empowering you, then congratulating your value to the organization. It’s a wonderful feeling.”
Table 10. The Tangible and Intangible Impact of Lean

<table>
<thead>
<tr>
<th>Tangible</th>
<th>Intangible</th>
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</thead>
<tbody>
<tr>
<td>Reduced wait times and delays</td>
<td>Staff empowerment</td>
</tr>
<tr>
<td>Fewer no-shows</td>
<td>Strengthened problem-solving and critical thinking abilities</td>
</tr>
<tr>
<td>Cost savings</td>
<td>Reduced staff frustration</td>
</tr>
<tr>
<td>Reduced cycle times</td>
<td>Improved staff satisfaction and morale</td>
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<tr>
<td>Easily accessible supplies</td>
<td>Enhanced communication</td>
</tr>
<tr>
<td>Increased number of patients seen</td>
<td>Strengthened teamwork and collaboration</td>
</tr>
<tr>
<td>Reduced inventory</td>
<td>Improved patient satisfaction</td>
</tr>
<tr>
<td>Orderly, organized, less stressful work environment</td>
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Lean is a long-term approach to continuous process improvement and may take 5 years to become fully embedded within an organization. As one FQHC staff member noted, “I just don’t think we’ve been able to see the fruits off the tree yet because we are still putting the roots down.” Given the long-term horizon and significant upfront investment required, health care organizations such as FQHCs should “look before they leap” and conduct an honest assessment of their organizational capacity for and readiness to change. Further research is needed to develop strong tools to guide such assessments. However, the experiences of the three FQHCs in this project offer useful recommendations for other organizations considering Lean adoption. In addition to these recommendations, a network of support must be in place to ensure that health centers are able to realize the full potential benefits of Lean. This support system should include Lean experts, HRSA technical assistance providers, and supplemental funding. Finally, FQHC stakeholders across the federal, state, and local levels should support health centers in broadly disseminating Lean experiences and outcomes. This will ultimately build an evidence base on the applicability of Lean in the FQHC setting.

“[As an FQHC], you constantly have to grow. Health care is changing. If you don’t change with it you’re just going to be in the back of the pack … We need to have more services available, and the only way we are going to get there and be financially stable is by eliminating waste.”
Recommendations for FQHCs Adopting the Lean Approach

- **Conduct an Organizational Assessment.** Ensure FQHC leadership is secure, respected by the staff, understands the need for continuous improvement, and demonstrates systems-level thinking and analysis. Assess the willingness and ability to commit necessary organizational resources to Lean. Consider the use of external Lean experts, especially during initial ramp-up phase.

- **Build Widespread Support for Lean.** Identify an initial Lean team to launch Lean projects. The team should include:
  - Internal champions who are respected by peers, influential, and demonstrate commitment and dedication to continuous improvement;
  - Staff members who demonstrate creativity, openness to change, ability to adjust to new ideas, positive attitudes, courage to question the status quo, follow-through, and willingness to “go the extra mile”;
  - Individuals who are influential yet may be less receptive to change—converting “nay-sayers” to “believers” is important in building support for Lean.

- **Expose Staff to Lean Early and Often.** Train the staff organization-wide in Lean concepts and tools. Include real-world examples and interactive exercises demonstrating the use of Lean in the primary care setting. Use various communication channels throughout the entire Lean effort to convey goals, expected outcomes, progress, and lessons learned for all staff members.

- **Carefully Consider the Scope of Improvement Efforts.** Ensure goals are relevant, realistic, measurable, and may be achieved within the existing organizational capacity. Understand and appreciate the broad impact of small, incremental change.

- **Formalize a Plan for Spread and Sustainability.** Develop a deliberate strategy to integrate Lean into departments, sites, practices, and processes, by:
  - Using Lean to achieve strategic organizational goals;
  - Creating a step-by-step plan for introducing, spreading, and sustaining Lean throughout the organization; and
  - Incorporating Lean into programs and policies, such as job descriptions, orientation for new hires, and employee evaluations.

- **Recognize and Appreciate the Continuous Nature of Lean.** Lean is not a linear approach; rather, it is a constant and self-reinforcing focus on improvement that involves educating staff members of the value of Lean, recognizing all staff ideas and contributions, rewarding successes, re-evaluating changes and progress, and energizing the staff to continue the application of Lean.
References


Public Health Service Act, 42 USCS § 254b.


Appendix A.
Selecting the Project’s Partners

The project team’s selection approach reflected a focus on streamlining the process in an effort to maximize time and financial resources. The team decided that in order to be considered for participation in this project, FQHCs must have an existing, identifiable culture of innovation. The team began development of a screening tool that reflected a direct connection with the research literature on the determinants of innovation (see below). The screening tool took the form of a request for information (RFI) with a set of questions designed to elicit a solid description of the organization’s culture of innovation, openness to new ideas, as well as their strategic vision. The team determined that FQHCs in the areas in which Altarum Institute has offices (Michigan, Maine, Virginia, Texas, Georgia, and the District of Columbia) would be eligible to participate in the project. This reduced the number of eligible FQHCs from 1,200 to approximately 170.

Selecting our Partners: Request for Information

FQHCs located in the District of Columbia, Georgia, Maine, Michigan, Texas, and Virginia were eligible for participation in the CHC Innovation Mission Project. Eligible FQHCs were encouraged to complete a request for information, which contained 10 open-ended questions. Applicants were encouraged to provide as much detail as possible in answering the following questions:

1. How does management encourage and incentivize employees to generate new ideas at your organization? How are those ideas tracked?
2. What are some ways in which your organization creates opportunities for employees from different departments/disciplines to interact with one another?
3. Provide an example of an innovation implemented at your CHC. How did the idea for the innovation come about? What steps were taken to turn the idea into a reality?
4. What doesn’t exist now in your CHC that if it did would greatly accelerate your mission? What have you done to develop this idea?
5. CHCs have many partnerships with outside organizations, giving them insight into how other organizations change and improve their services. Describe a time when you have learned from or collaborated with a partner to implement change in your CHC.
6. What other CHCs, health care providers, or partners do you look to for inspiration? Why?
7. Describe a time when your CHC tried but wasn’t able to implement a change, or you had to change direction from what you originally planned to do. What lessons were learned from this experience?
8. Where do you see future business or service opportunities?
9. What are the long-term goals of your organization? How are these reflected in your strategic plan?
10. What are some strengths of your management team? Where is there room for improvement?
The CHC Innovation Mission Project was officially launched with the release on March 9, 2009, of the project announcement, RFI, and supporting materials through two parallel paths, the primary care associations and the HRSA project officers in the five eligible states (GA, ME, MI, TX, VA) and the District of Columbia. FQHCs were initially given the deadline of March 31 to submit their completed request for information. Given that the FQHCs had been involved in completing their Increased Demand for Services Federal Grant submissions and attending the NACHC Policy and Issues Conference, the deadline was extended by one week to April 7, 2009.

RFI Evaluation

There were 18 completed submissions received: eight from Michigan, three from Texas, four from Virginia, and three from Maine. No submissions were received from Georgia or the District of Columbia. The project team systematically evaluated each submitted request for information. Team members independently ranked each applicant according to the quality of their response. The overall scoring results revealed significant consistency across team members (see report from project evaluator below). The ranking process enabled team members to develop a short list of nine candidates. The team conducted conference calls with the nine centers (four in Michigan, two in Maine, and three in Virginia) which enabled the team to delve deeper than the overview provided in the RFI submission. All team members were present on the conference calls. Although the team initially envisioned conducting site visits as a follow-on to the conference calls, it was determined that the telephone discussions provided sufficient information to make our final site selection decision. It was further decided that we would reserve the site visits for our selected partner FQHCs to lay the framework for the specific assistance to be provided to each center.

After completion of the telephone conversations, the team convened for extensive meetings to select project partners based on the center’s ability to meet our criteria as well as whether they would be a good fit with Altarum Institute’s areas of expertise. In addition, the team took into consideration such factors as whether the center identified a systems-level challenge or opportunity, and whether the center presented logistical or structural obstacles that might hinder the successful implementation of the project. After intensive deliberations the team selected four FQHCs as project partners.
<table>
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<tr>
<th>Determinant</th>
<th>Source</th>
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<tr>
<td>Innovation infrastructure: formal, deliberate, organized system to search for innovations; evidence of ideas in the pipeline; well arranged logistical procedures to enable innovation</td>
<td>Berwick¹; Fleuren²</td>
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<td>Managerial acceptance of change; top management support, advocacy, and expectation of innovation</td>
<td>Greenhalgh³; Fleuren</td>
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<td>Proactive leadership toward identifying and sharing or spreading new knowledge and ideas</td>
<td>Greenhalgh; Rogers⁴; Berwick</td>
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<tr>
<td>Employees are given time to develop and implement innovations</td>
<td>Berwick; Fleuren</td>
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<tr>
<td>Employees are given resources to develop and implement innovations</td>
<td>Greenhalgh; Berwick; Fleuren</td>
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<tr>
<td>Employees are given security to develop and implement innovations; employee self-efficacy and confidence to innovate</td>
<td>Berwick; Fleuren</td>
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<td>Employees are given praise for developing and implementing innovations</td>
<td>Berwick; Fleuren</td>
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<tr>
<td>Trialability methods (to test change on a small scale)</td>
<td>Fleuren; Berwick</td>
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<tr>
<td>Observability methods (to allow potential adopters of a change to watch others try the change first)</td>
<td>Fleuren; Berwick</td>
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<td>Methods to monitor and evaluate the impact of the innovation</td>
<td>Greenhalgh</td>
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<td>Climate is conducive to experimentation and risk-taking</td>
<td>Greenhalgh</td>
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<td>Willingness to experience failure (absence of failure = no innovation)</td>
<td>Paulus⁵</td>
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<td>Internal communication and collaboration between departments and disciplines, opportunities for interprofessional teamwork; the organization fosters social exchanges and increases the ease and frequency of personal interactions, especially between innovators, early adopters, and early majority</td>
<td>Greenhalgh; Fleuren; Rogers; Berwick</td>
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<td>Shared meanings and values regarding innovation; support of colleagues; shared belief system among employees</td>
<td>Greenhalgh; Fleuren; Berwick</td>
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<tr>
<td>Active collaboration with diverse stakeholders</td>
<td>Paulus; Berwick</td>
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<tr>
<td>Ability to rapidly apply new knowledge with own existing knowledge base to deliver change (local adaptation and reinvention of innovations)</td>
<td>Greenhalgh; Paulus; Berwick</td>
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<tr>
<td>Involvement in research; application of research evidence; the organization is aware of new research developments and modifies its practice accordingly</td>
<td>Greenhalgh</td>
</tr>
<tr>
<td>Strong technical capacity/resources and effective data capture systems; data mining and performance management</td>
<td>Greenhalgh; Paulus</td>
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<tr>
<td>Willingness to actively engage patients (learn together with consumers)</td>
<td>Paulus</td>
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<tr>
<td>Organization encourages continuing education; employee involvement and participation in extra-organizational professional activities; strong level of professionalism; “learning organization” culture</td>
<td>Greenhalgh; McConnell⁶</td>
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<tr>
<td>Availability of high quality training for employees; employees have sufficient knowledge and skills to implement innovation</td>
<td>Greenhalgh; Fleuren</td>
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Inter-rater Reliability Analysis

Summary of inter-rater reliability analysis

Instrument: Community Health Center (CHC) Innovation Mission Project Request for Information (RFI) evaluation form

Instrument purpose: To assist in evaluating applicant responses to the CHC Innovation Mission Project’s RFI, and thereby determine applicants that demonstrate characteristics of an organization with a culture of innovation.

Instrument content: Ten items, which required unstructured (open-ended) responses from applicants

Applicant pool: Eighteen federally qualified health centers (FQHCs)

Scoring mechanism: Project team members scored applicants’ responses to each question on a scale of 1 to 5, such that a score of 1 indicated a “poor” overall quality of the response regarding the culture of innovation criteria associated with the question, and a score of 5 indicated an “outstanding” overall quality of the response regarding the culture of innovation criteria associated with the question. For each applicant, all question scores were summed for a total score reflective of the strength of the applicant’s culture of innovation. Total scores ranging from 1 to 10 were considered indicative of a “poor” culture of innovation, and total scores ranging from 41 to 50 were considered indicative of an “outstanding” culture of innovation.

Raters: Four CHC Innovation Mission Project team members

Background information: To understand the purpose of reliability analyses, it is first helpful to summarize two key concepts.

Reliability refers to the consistency, stability, or dependability of the data. Whenever an investigator measures a variable, he or she wants to be sure that the measurement provides dependable and consistent results. A reliable measurement is one that, if repeated a second time, will give the same results as it did the first time. If the results are different, then the measurement is unreliable (Fisher & Foreit, 2002, p. 45).

Validity refers to data that are not only reliable but also true and accurate. Put another way, validity is the extent to which a measurement does what it is supposed to do. If a measurement is valid, it is also reliable, but if it is reliable, it may not be valid (Fisher & Foreit, 2002, p. 46).

To accurately test the validity of a measurement tool and ultimately ensure the statistical legitimacy of the results, it is necessary to administer the given measurement tool as well as a similar measurement tool(s) to a sufficiently large sample of relevant individuals (i.e., the target population among which the tool will be utilized). In light of these parameters, it is not feasible to conduct any type of validity analysis on the data currently available from the
RFI evaluation forms (i.e., the ratings of each FQHC applicant’s responses to the RFI evaluation form items by four project team members).

However, it is possible to estimate the reliability of the RFI evaluation form as it was utilized among the given CHC Innovation Mission Project team members. The most accurate and straightforward way to estimate the reliability of this measurement tool, given the parameters of the data presently available, is to conduct an inter-rater reliability analysis.

- Inter-rater reliability is an “estimation based on the correlation of scores between two or more raters who rate the same item, scale, or instrument” (Garson, 2009). In other words, inter-rater reliability estimates the degree of homogeneity or agreement between individuals that have evaluated the same thing(s) with the same measurement tool.

- Intraclass correlation (ICC) is used to test inter-rater reliability when there are more than two raters. ICC can be thought of as the ratio of between groups variance (i.e., how spread out raters’ scores are around the sample mean/average) to the total variance (i.e., between groups variance plus error). See the seminal paper by Shrout and Fleiss (1979) for a more comprehensive explanation of ICC.

- The ICC coefficient ($r$) can be interpreted similarly to Cohen’s kappa ($κ$). Both the ICC coefficient and kappa range from 0 to 1. Shrout (1998) proposed the following value ranges and corresponding labels, which have been widely applied by health researchers to better interpret the degree of inter-rater reliability indicated by ICC coefficients.

  - (0.0 – 0.10) Virtually none
  - (0.11 – 0.40) Slight
  - (0.41 – 0.60) Fair
  - (0.61 – 0.80) Moderate
  - (0.81 – 1.0) Substantial

**Inter-rater reliability analysis:** SPSS 16.0 was utilized to test the inter-rater reliability of the four project team members based on their total score ratings of the culture of innovation for the 18 FQHC applicants’ responses to the RFI evaluation form items. Specifically, an ICC test using a two-way mixed model with absolute agreement type indicated was conducted.

Based on this analysis, the reliability of each, individual rater (single measure reliability) resulted in an ICC coefficient of .605, with a 95% confidence interval from .374 to .803. This result implies a fair to moderate level of agreement or reliability between the individual ratings of each project team member with respect to their total scores for FQHC applicants.

The reliability between all raters (average measure reliability) resulted in an ICC coefficient of .860, with a 95% confidence interval from .705 to .942. This result indicates that there was a moderate to substantial level of agreement between all project team members with respect to their mean total scores across the 18 FQHC applicants.
References:


Appendix B. Community Health Center Innovation Mission Project Theory of Change

Shared conditions to affect systems change

- Commitment to improve health care
- Community health systems focus
- Dedication to bridge the gap from research to practice
- Engagement in unique partnerships
- Readiness to innovate

How

Systems change strategies

- Lean Six Sigma
- Primary and behavioral health care integration
- Applied research
- Utilization-driven evaluation
- Knowledge transfer

Community Health Center Innovation Mission Project
Theory of Change

What

Strengthened FQHC delivery of health care services

- Improved access to care
- Enhanced quality of care
- Increased revenue

Why

Improved health of vulnerable individuals and communities

Altarum Institute

Federally Qualified Health Centers (FQHCs)