

### Emergency Department Prescribes

# Lean for Process Improvement

by Janet Jacobsen

#### At a Glance . . .

- With emergency department patient satisfaction scores slipping into the unhealthy 30<sup>th</sup> percentile, leaders at Mercy Medical Center wrote a prescription for process improvement that would ultimately reduce the length of stay for patients receiving emergency care.
- The therapy was lean, and satisfaction scores quickly rose to the 95<sup>th</sup> percentile after a cross-functional team completed value stream mapping to identify and eliminate non-value-added steps in the department.
- From the initial mapping came a series of lean cycle change initiatives, one of which led to the creation of Mercy's Fast Track service to treat less acute patients in one hour or less.
- By improving process flow, the capacity to serve patients increased, and the department soon experienced a 6% growth in patient census.

On a blustery winter night a young family brings their 6-year-old daughter to the emergency department (ED) at Mercy Medical Center. The parents suspect the girl suffered a broken finger while roughhousing with her younger brother, and now they are hoping for prompt medical attention so they can return home quickly. If this scenario had occurred just a few years ago, the family may have experienced a long, frustrating wait, with treatment for their daughter's injured finger delayed while ED staff attended to more serious cases. But now, thanks to process improvements through lean, the young child will likely receive timely treatment and the family will be heading home in approximately one hour.

#### About Mercy Medical Center

For more than 100 years, Mercy Medical Center in Cedar Rapids, Iowa, has delivered *The Mercy Touch*<sup>®</sup> by partnering the latest technology with compassionate and high-quality patient care. Mercy is a fully accredited, 445 licensed-bed regional hospital that was founded in 1900 by the Sisters of Mercy. Today it offers a wide range of patient care services, with strengths in cancer care, surgical services, emergency services, cardiac care, critical care services, women's services, and obstetrics. Mercy is the only hospital in the eastern Iowa corridor to offer all-private acute patient rooms.

The hospital's ED is fully staffed 24 hours a day and is completely equipped with state-of-the-art technology to handle the most serious healthcare emergencies. Mercy's ED is designated as a Level III trauma facility. Patients are cared for by full-time staff physicians who are board certified in emergency medicine and by specially trained nurses.

#### Heeding the Call for Lean

At the time when Mercy's ED was struggling with patient satisfaction scores that were sliding into the 30<sup>th</sup> percentile, as measured by Press Ganey Associates, the hospital's executive leaders were beginning to hear more about the benefits of lean. Prominent organizations in this east central Iowa community eagerly shared their successes with lean and encouraged the hospital to embrace it as well. In the fall of 2004, Mercy participated in the training and report out of a trial sponsored by the University of Iowa and the Iowa Business Council. This test included training on lean concepts and guidance in conducting a lean event at the hospital. Convinced that lean could indeed work in healthcare, Mercy began looking for an area on which to focus its first efforts. Given the opportunities for improvement, hospital leaders selected the ED for the first value stream mapping event.

Initially, some employees thought that lean tools were applicable only in manufacturing environments, not healthcare. Thus, selecting team members for the first lean event was a careful, considerate process, explains Kimberlee Haskins, director of organizational development at Mercy. "We worked hard to select the right formal and informal leaders. We felt if they could have a good experience with lean

then they would go back and share those positive experiences with their departments.”

Selecting a cross-functional team and providing ongoing and consistent communication were keys to a successful start to Mercy’s lean journey. “One of the crucial things about lean is having all the key players at the table because you need the buy-in of other departments,” remarks Dr. Mark Pospisil, medical director of the ED. He explains that earlier improvement efforts typically fell short of expectations because they were conducted in isolation without participants from the lab, radiology, or other departments that routinely interact with the ED.

Haskins, who served as the facilitator for the value stream event, along with other hospital leaders educated Mercy employees about:

- How lean would work
- How lean would help improve processes
- What type of results to expect from lean
- How lean would help staff do their jobs more efficiently

And, most important for gaining employee buy-in, leaders reiterated that no one would lose his or her job as a result of lean.

### Teaming Up to Streamline Processes

During the two-day lean value stream event in the ED, a cross-functional team mapped the current state, identified non-value-added processes and issues, and then developed an ideal state and a future state for the department. This initial work took place in February 2005. The team also brainstormed ideas for improvements and created a list of events, projects, and “do its,” which are items that are quickly and easily corrected.

Figure 1 shows the first section of the initial map of patient flow through the ED. Red boxes indicate non-value-added activities while value-added activities are designated by green boxes. A

quick look at the map reveals a number of red boxes, which were ultimately target areas for process improvement.

For Pospisil, executive support during the first value stream mapping event was crucial. “Tim Charles (CEO) spent more time there than I did. It was remarkable to have that commitment coming from the top of the organization. With the CEO present, you have the ability to make change happen,” Pospisil emphasizes.

Focusing on the goal of reducing patient length of stay in the ED, several additional lean cycle change initiatives were conducted in 2005 and early 2006 on the following topics:

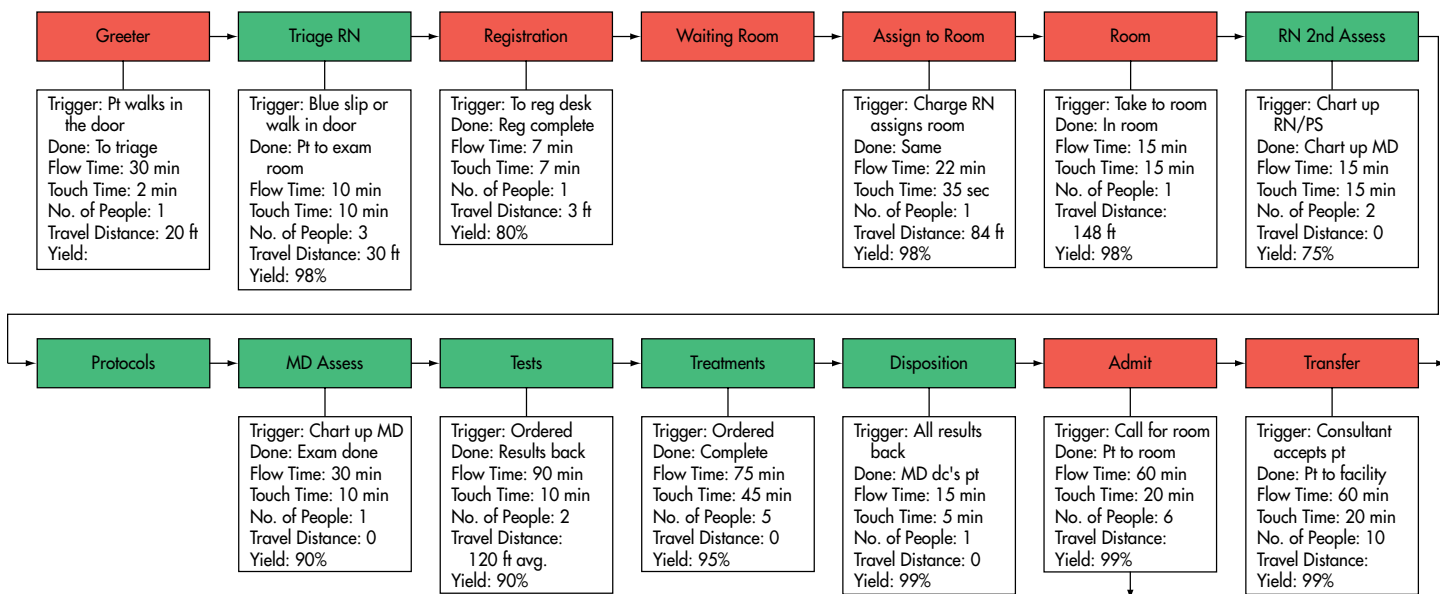
- X-ray turnaround times
- Fast Track service (see sidebar, “On the Fast Track to Success”)
- Insurance denials
- CT scans

In some cases, issues detected during the initial value stream mapping were quickly and easily addressed. Examples of these “do its” include:

- Ensuring that physicians complete charting within three days
- Cross-training of ED technicians
- Making changes to the software used during the discharge process
- Updating procedures so that some tests are conducted in the ED rather than transferring the patient to another department
- Registering patients at the bedside
- Initiating teamwork activities to promote a culture change in the department

When early modifications were made to ED processes, some employees resisted the changes, recalls Chad Ware, RN, program coordinator in the ED. “At first, each time we changed something,

Figure 1 ED Patient Flow & Revenue Cycle Current State (abbreviated version)



staff were resistant; they didn't want to work on the days when the process changes were to go into effect." Ware says that once the staff could see the positive effects of the updated processes, they got on board quickly and were very supportive.

As more and more ED staff participated in lean events they began developing a sense of pride and ownership about the process improvements in their department. "They are very passionate and become the number one champions, which helps with follow through," notes Tami Meier, RN, director in the ED.

## On the Fast Track to Success

One of the major lean cycle change initiatives to stem from the initial process mapping at Mercy Medical Center tested the concept of offering a quick turnaround service to treat less acute patients in the ED. In a typical emergency room, patients with minor illnesses or injuries such as the flu, broken fingers or toes, minor cuts, or earaches, are often faced with delays in treatment as more serious cases take precedence.

The figure below highlights measures from the Fast Track lean event conducted in March 2005 and shows significant gains in total cycle time, time to provider, and distance traveled by ED staff in performing their duties. It also shows impressive decreases in the number of staff involved with each patient and subsequently the number of times a patient is handed off to another staff member. Major reductions in the number of non-value-added steps for providing services to less acute patients also were recorded.

### Fast Track Project Measures

	Before	Trial Fast Track	Proposed Fast Track	Improvement (trial and proposed)
Total cycle time	104 minutes	69 minutes	Less than 60 minutes	34/43%
Time to provider	61 minutes	31.25 minutes	Less than 30 minutes	49/52%
Distance traveled (by staff)	1243 feet	1243 feet	903 feet	0/27%
Number of people involved	12	10	8	17/33%
Number of handoffs	19	14	9	26/53%
Number of non-value-added steps	38	9	6	76/84%

Given the results from this process-mapping event, the hospital quickly introduced its Fast Track service in June 2005. This service guarantees that care for patients who have less serious injuries or illnesses will be started in at least 30 minutes. Hours of operation for Mercy's Fast Track service are 1 p.m. to 11 p.m. daily.

## Reducing Length of Stay and Enhancing the Culture

Once Mercy's lean journey unfolded, positive results were easy to find. Emergency department patient satisfaction scores soared to the 95<sup>th</sup> percentile and remain there today, shown in Figure 2, as patients experience shorter stays. As a result of improvements in process steps, most ED patients at Mercy are now seen by a provider (physician or nurse practitioner) within 30 minutes of arrival, and the average total length of stay is now two

hours, which for many U.S. hospitals is the amount of time that patients wait just to be seen by a provider. And, along with the impressive gains in customer satisfaction results, the department experienced a 6% growth in number of patients served.

Process mapping activities also led to the following changes, all of which helped reduce patients' length of stay in the ED:

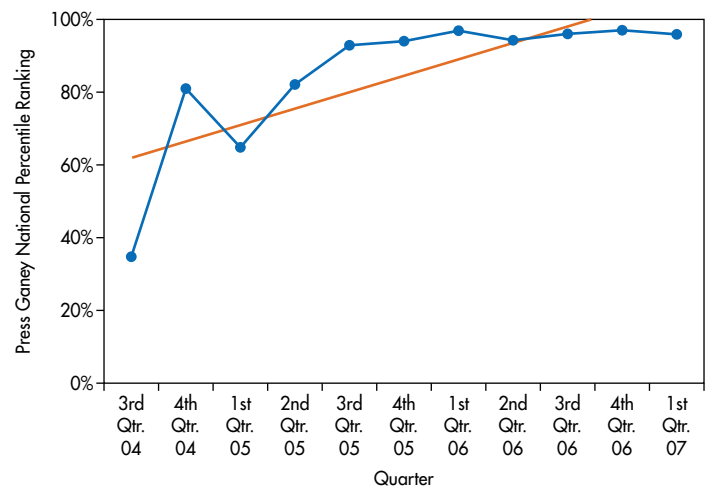
- Renovating the department's front entrance and triage areas for smoother patient flow
- Implementing bedside registration and rapid triage
- Allowing patients to bypass the waiting room and go directly to exam rooms when available
- Creating protocols that allow nurses to begin some treatments before a physician sees the patient
- Installing an electronic documentation system to improve the discharge process
- Restructuring the department's leadership team to promote consistency and teamwork
- Appointing a medical director for the ED and building administrative time into his schedule

## Maintaining The Mercy Touch®

While making a patient's length of stay as short as possible, Mercy will not sacrifice its goal of providing compassionate and high-quality care by reducing the time that staff spend with patients. "We never want the patient to feel like he or she is being rushed. It's all those things like documentation, travel from place to place in the department—the non-value-added steps—that are the focus of process change," Haskins explains.

By removing non-value-added steps, the ED has decreased the staff time spent per patient from 2.82 hours to 2.388 hours. These figures include tasks that are completed once the patient

**Figure 2—Emergency Department Patient Satisfaction Scores**



Mercy Medical Center's emergency department customer satisfaction scores as measured by Press Ganey Associates increased dramatically after the initial value stream mapping event.

is discharged, so the times are higher than statistics for patient length of stay.

### *Promoting Culture Change*

Culture change was also integral to the success of lean activities in the ED, explains Haskins. Having come to Mercy in 2003 from Toyota, Haskins had firsthand experience with lean, which traces its roots back to the Toyota Production System. She and other hospital leaders continually reinforce that lean is not just about the tools; it's about the team culture and the importance of employee buy-in of that culture. "One of the important things that came out of the value stream was that we couldn't just apply the tools; we also had to improve the culture of the team to have success," recalls Haskins.

Two vital components of the department's culture change involved restructuring the ED's leadership team and implementing a rounding system where department supervisors check in not only with patients but also with staff. The focus is to offer an opportunity for patients and staff to voice questions and concerns. "The rounding process helped create a culture where management is available and concerned for patients and staff. You try to foster the type of environment that you'd like to work in by modeling the customer-focused behavior that you want to see happen," explains Ware.

### **Moving Forward With Lean**

#### *Lessons Learned*

Leaders at Mercy have learned many lessons about lean and its impact in a healthcare setting. While some may view lean as a method to reduce cost or trim the work force, Haskins says that lean is really about freeing up capacity and listening to the voice of the customer. "Through lean you can free up the capacity to meet the new demand," she explains.

She notes that Mercy's staff has also learned about the importance of flow. More space or more staff isn't always the answer, but the key is improving flow, which increases capacity in the existing space.

#### *Encouragement for Other Healthcare Organizations*

Given Mercy's impressive gains in customer satisfaction scores and growth in ED patient volume, Haskins believes that other healthcare centers could benefit from lean. She offers the following advice:

- Lean must be supported by the executive team. This team has to understand it, buy in to it, and support it.
- Lean is a journey, not an initiative or a program. With lean you will change how you do business.
- The organization's culture and soft skills are just as important as the lean tools. Simply using lean tools isn't enough; you must understand the importance of soft skills and shifting the culture to create a team environment.

#### *Lean Becomes the Norm*

Haskins feels that the first value stream mapping event was the spark that put the ED staff on the continuous improvement journey. "Now they are always looking at what's the next thing they can fix or improve," she says.

The department is also now putting lean tools to use during a remodeling project. Leaders in the ED are working with architects and discussing the flow and the future layout of the department—something that probably would not have occurred before lean. "We know we can't operate in a bubble. We need to think through the redesign and we know we'll need to re-examine our processes after the remodel is complete," explains Meier.

Both Meier and Pospisil believe that lean principles are becoming so engrained in the culture that eventually the department will need fewer formal lean events. Pospisil envisions his staff conducting mini-lean events in the hallway to make small improvements. He says, "That's how an organization becomes successful, by incorporating lean into everyday processes."

#### *For More Information:*

- To learn more about Mercy Medical Center visit the organization's Web site at [www.mercycare.org](http://www.mercycare.org).
- Contact Kathy Krusie, [kkrusie@mercycare.org](mailto:kkrusie@mercycare.org), for further information on Mercy Medical Center's lean journey.
- Visit the Iowa Healthcare Collaborative's Web site at [www.ihconline.org/toolkits/leaninhealthcare.cfm](http://www.ihconline.org/toolkits/leaninhealthcare.cfm) for more information on lean in healthcare. For a variety of resources on quality in healthcare visit ASQ's Web site: [www.asq.org/healthcare-use/why-quality/overview.html](http://www.asq.org/healthcare-use/why-quality/overview.html).
- To view the full version of Figure 1, visit [www.asq.org/economic-case/mercy-fig-1.pdf](http://www.asq.org/economic-case/mercy-fig-1.pdf).

#### *About the Author*

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