LAB FOCUS

NOVEMBER 2007

Lessons learned from 'Lean' practices

Beginning in 2003, Fairview laboratories were remodeled or newly designed to accommodate Lean practices.

Lean is a process improvement model that strives to improve efficiency and effectiveness by identifying and eliminating waste, with the goal of increased customer satisfaction. Overall, laboratories found using Lean resulted in more efficient layout, less wasted movement, improved staff satisfaction and improved turnaround times of test results to physicians. Individual lab comments are as follows.

Fairview Lakes Medical Center

When we remodeled our laboratory in early 2005, our greatest challenge was the need for ongoing communication with staff during the change process. Whenever we hire new staff, we are forced to re-educate ourselves about our Lean process. It can be difficult to resist customization of one step in a process; Lean requires constant process-checking to stay on track.

Using Lean, our productivity and inventory savings have improved by more than 10 percent. Our overall turnaround time from collection to results went from 84 to 34 minutes, despite an annual 10 percent increase in test volumes.

Cheryl Huuki, lab director

continued on back page

Over the past five years, all Fairview laboratories have implemented "Lean" processes to reduce waste and improve workflow.

Medical center to initiate massive transfusion protocol

University of Minnesota Medical Center, Fairview staff recently collaborated to develop a massive transfusion protocol for trauma cases in the emergency department. The protocol also can be used for non-trauma events at the medical center that might require massive transfusion, such as in the Birthplace, emergency department or operating rooms. "Massive transfusion" is defined as replacing an individual's total blood volume within 24 hours.

The new protocol is designed to ensure timely and appropriate treatment in massive transfusion episodes, maximize the availability of blood and blood components, and use resources efficiently.

The patient's physician (or designee) initiates the protocol via a phone call to the blood bank, where it is reported to the transfusion physician on call. He or she then serves as a consultant in the evaluation and management of the patient's transfusion therapy during the massive transfusion episode.

The massive transfusion protocol includes orders for:

- four units of red blood cells; keep ahead four.
- four units of frozen plasma; keep ahead one.
- one platelet dose; keep ahead one.

The blood bank laboratory issues type-specific red blood cells if ABO/Rh testing is complete or the patient has a history and current type on record. The laboratory issues O Negative red blood cells if ABO/Rh testing is not complete, or if more than six units for adults—or one unit for pediatric patients less than 16 years of age—already have been transfused. In the latter cases, the laboratory will issue O Rh type-specific red blood cells until clinical laboratory scientists have tested a post-transfusion sample for the presence of passive isoagglutinins.

The laboratory issues the blood for transportation in an ice-filled cooler. The clinical laboratory scientist or the physician tracks laboratory values throughout the process. The protocol is discontinued by the patient's physician (or designee) via a phone call to the blood bank.

Donovan Taylor, R.N., director of trauma; **Darlene Gillespie, R.N.**, nurse manager, Birthplace; **Brian Harmon**, performance improvement; and **James Harmon, M.D.** participated in the new transfusion policy development.

Robert Bowman, M.D., Transfusion medical director

Julie Eubanks, C.L.S., Blood Bank supervisor

continued from front page

Fairview Northland Medical Center

The laboratory moved into its new Lean-designed space in November 2004. Rather than remodel the existing laboratory, we took the opportunity to design an entirely new space.

After introducing Lean processes, our result turnaround time for potassium improved from approximately 30 percent in 30 minutes to better than 80 percent. Partial thrombin time improved from 30 percent to 65 percent and troponin from 40 percent to 80 percent in less than 45 minutes.

Consolidating processes allowed us more time to complete non-productive tasks necessary to meet regulatory requirements. We continue to learn which Lean tools best apply to the healthcare setting.

The major challenge is keeping our lean practices current when instruments and tests change. For example, we need to update standard work packages and conduct time studies.

New Lean workflows allow more staff to be off work at the same time and to work fewer weekends and holidays. Lean helps improve communication between laboratory departments and facilitates smoother transitions at shift change.

Matt Zimmer, lab director

Fairview Redwing Medical Center

After implementing Lean in 2005, we quickly learned that the process is ongoing. We chose to "re-Lean" our laboratory when we realized our new chemistry analyzers were not going to fit into our previous space. We maximized staff participation by creating teams to focus on environmental standardization/5S, workflow analysis, voice of the customer, standard job package and lab design.

The greatest benefit from Lean is our increased work space and open structure, allowing evening and night shift staff to cover the entire laboratory more easily. This helps us continue to meet turnaround times and get results to physicians quickly.

Beth Flattum, lab director

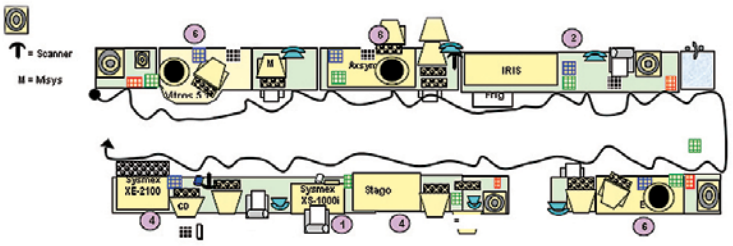
Fairview Ridges Hospital

We completed our Lean project in 2004, but needed to install new chemistry, immunochemistry, urinalysis, and hematology analyzers to meet turnaround time goals. Implementing the new technologies allowed us to expand our test menu and significantly improve our productivity and turnaround time. We now average an 89 percent turnaround time as measured against the established goal of 90 percent, indicating the percent of Core testing completed within 25 minutes (40 minutes for troponin) from specimen receipt in the lab to results in the electronic medical record.

Vicki Seeger, lab director

Fairview Southdale Hospital

When we started our Lean project in 2003, we were Fairview pioneers of Lean. We had never heard of "single piece flow," "workcells" or "value stream maps." During our 16-week project we assembled a Core Lab, moved the Microbiology Lab into a new space with a streamlined flow of the product, redesigned our store room and reorganized our phlebotomists into a team.



This typical Fairview Lean laboratory workcell design is intended to reduce steps and minimize waste, thereby decreasing turnaround time for results.

We soon started receiving fewer phone calls requesting pending results, and we started getting compliments from our customers. Previously, it could take up to two hours to report results, following a possible one- to two-hour delay in receiving specimens after they were drawn. We now routinely report more than 90 percent of our Core Lab results within 25 minutes (40 minutes for troponin).

Brenda Schramm, lab director

University of Minnesota Medical Center, Fairview

The Riverside campus implemented Lean as part of a complete remodeling of a dated laboratory space. An ergonomic assessment provided options to avoid bending and reaching. To prepare staff for Lean, we held change-management sessions and visited Fairview Southdale Hospital's Core laboratory in operation. Our average turnaround time decreased from 50 to 35 minutes.

The University campus acute care laboratory Lean transformation is in progress, including complete remodeling. We began the process by videotaping movement of specimens through the lab (product process flow) and the way the work is done (full work analysis). We used this data to identify waste in the process, from specimen collection through reporting results. With partial implementation of Lean, the average inpatient turnaround time is 40 minutes; we look forward to additional improvements.

Priscilla Bormann, lab manager

Chris Senn, lab manager

Fairview Clinics

Fairview Oxboro clinic is implementing Lean, requiring physical redesign of the phlebotomy and processing areas and the Core laboratory. The redesign has improved workflow and efficiency, allowing us to reduce staffing by one FTE.

The most important lessons learned were to communicate constantly and involve the staff in the Lean process.

The new Fairview Maple Grove Medical Center laboratory was designed with information gleaned from other Fairview laboratory Lean results.

Edrie Murphy, lab manager