

Hospital Laboratory Redesigns Space, Standardizes Staff Roles and Collection / Processing Systems, Leading to Enhanced Efficiency and Productivity

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SUMMARY

Marquette General Health System's in-house laboratory reconfigured physical space, redefined job responsibilities and standardized the collection and processing of specimens. The goal was to enhance efficiency and productivity by eliminating steps and processes that do not add value. The program led to significantly faster turnaround times for both "stat" and routine tests, faster morning blood draws, cost savings (through attrition-related staff downsizing) and enhanced productivity that has allowed the laboratory to handle 17 percent more volume. Program leaders estimate that the initiative paid for itself in less than 2 years.

INTRODUCTION

Marquette General Health System is a regional medical center that is part of a 14-hospital health care network serving Michigan's Upper Peninsula and surrounding areas. Marquette General Hospital is a 315-bed, full-service acute care hospital that operates a Level II Trauma Center and serves as a Federally designated Regional Medical Center. The hospital's laboratory performs testing not only for Marquette General but also for 12 other network hospitals and some hospitals in surrounding states.

Over the last 15 years, the laboratory department has grown significantly due primarily to greater outreach to external customers, the development of a Web-based directory and order entry system and service line expansion. Capacity constraints led to the need for new strategies to enhance laboratory efficiency and productivity. As a result, the hospital decided to hire a consultant to help implement Lean manufacturing processes.

GETTING STARTED: Keys to Success

- Garner support of leadership by sharing data on potential quality improvements, cost savings and/or revenue enhancements.
- Consider hiring outside consultants.
- Engage staff in the process.

METHODS

Marquette General Health System's laboratory improved efficiency and productivity of the core lab (hematology, urinalysis, routine coagulation, chemistry, urinalysis and immunochemistry) by reconfiguring the physical layout and standardizing job responsibilities, collections and processing systems.

Key elements of the program included:

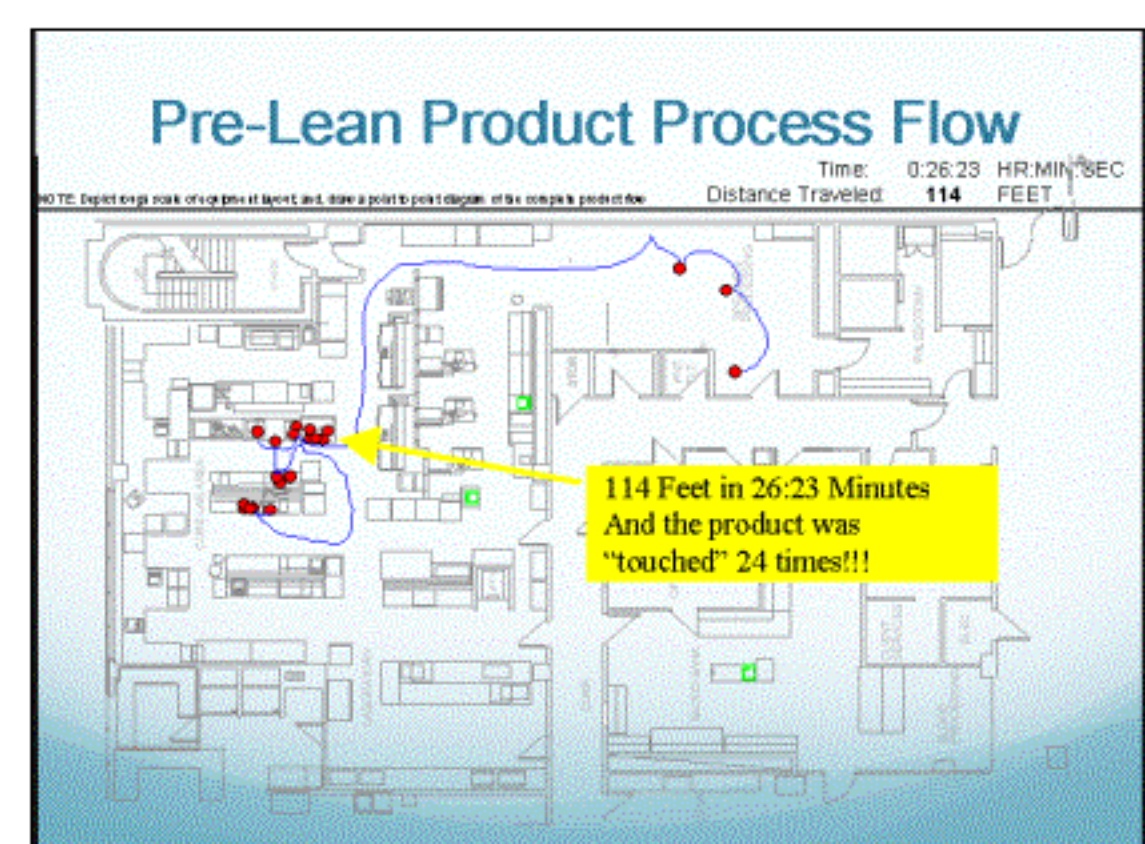
Formation of the Lean Team



Lean Team members (left to right) are as follows: Jennifer Rhodes-Bingham, Stephanie Chaput, Ken LePage (Valumetrix Consultant), Jean Soderberg, Heather Gaines, Peggy Lindeman, and Dale Hamari. Not pictured: John Rhoades and Al Hendra.

Our Lean Team consisted of the Lean Consultant, four medical technologists, one phlebotomist and one nurse from the ED. Our team met weekly, and focused on identifying inefficiencies within the laboratory as well as opportunities for improvement.

Reconfiguration Of Physical Space

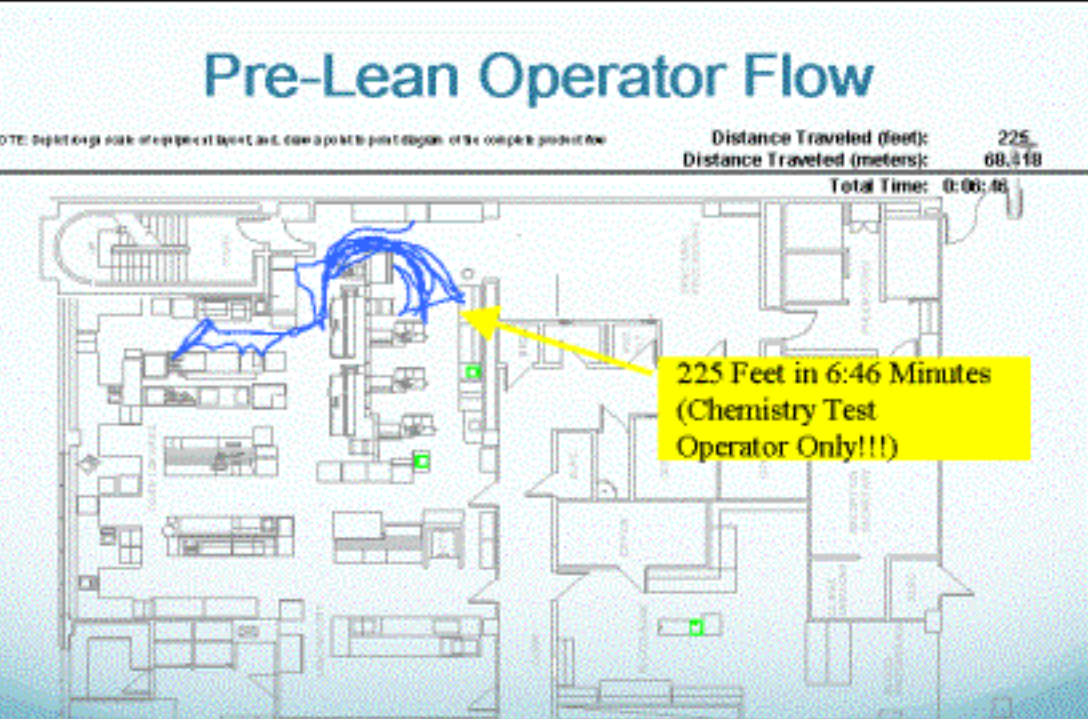


Distance Product Traveled
114 feet
4.35ft per minute
24 touch points

Pre-Lean

- Measure the "Current State" to identify waste in processes and lack of standardization.
- Measure the entire Value Stream to identify gaps.

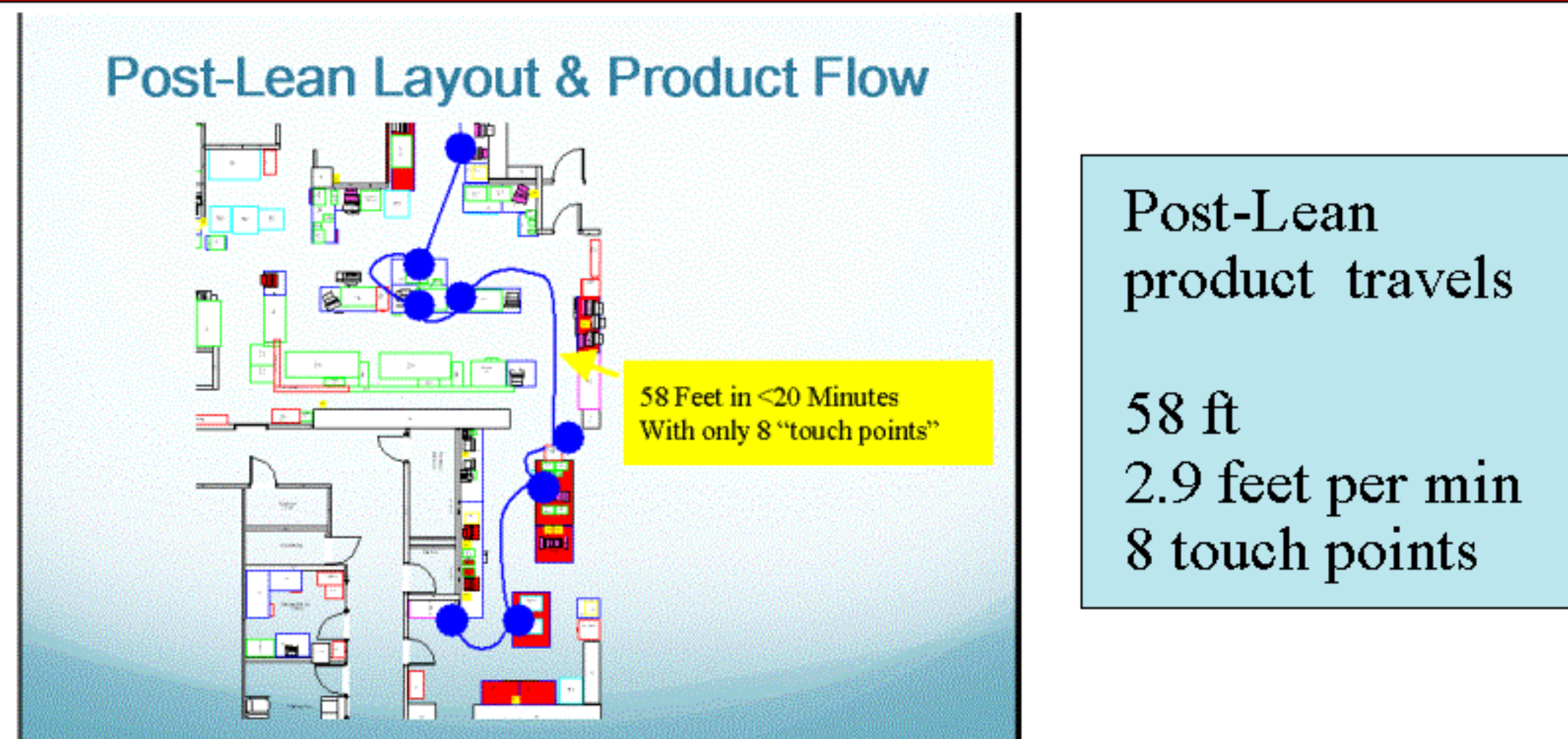
Pre-Lean Operator Process Flow



Distance Operator Traveled
225 feet
34.8 ft per min



Post-Lean Product Process Flow

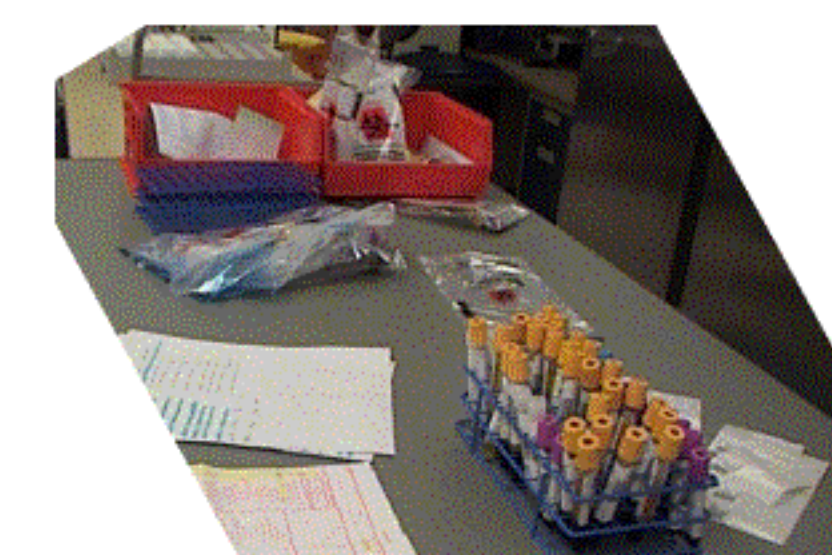


Post-Lean product travels
58 ft
2.9 feet per min
8 touch points

In our post-Lean lab, equipment is configured to enable a single technician to operate six different pieces of testing equipment.



Immediate Transport Of Samples

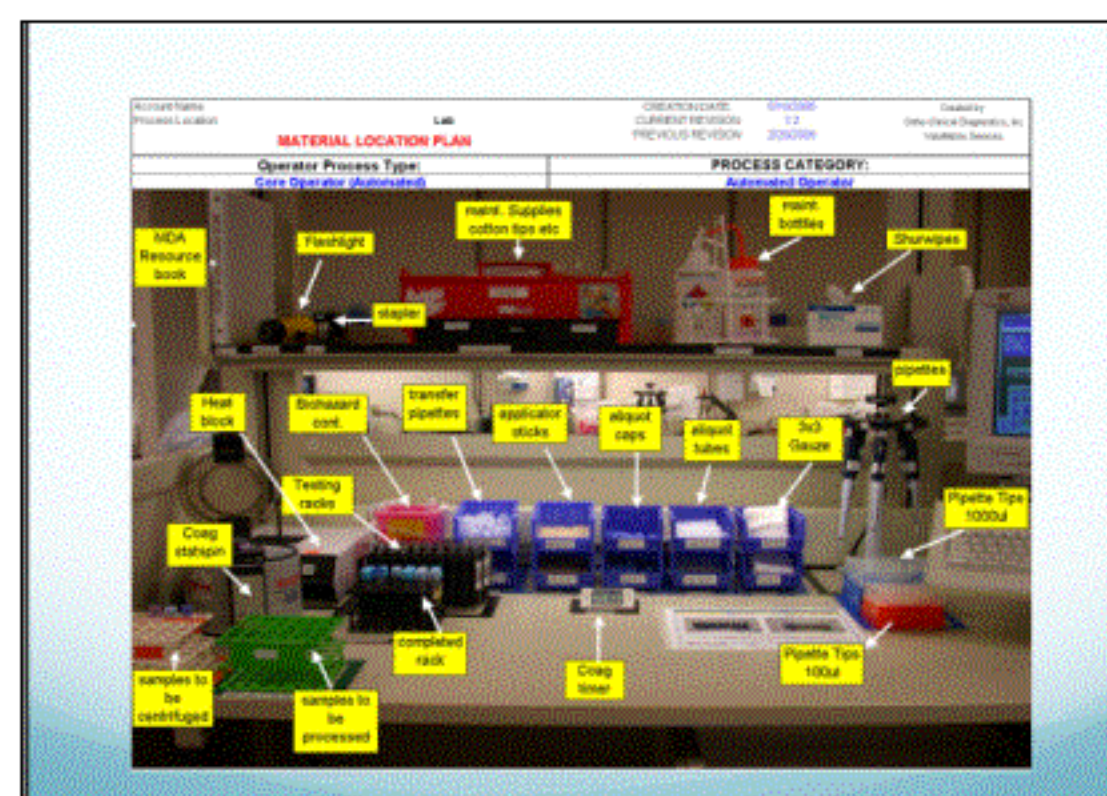


Prior to the implementation of Lean, specimens were batched, delaying distribution to the sections.

Post-Lean: specimens are disseminated to the respective sections every 5 minutes by the "water-spider".



Standardized Processes & Staff Roles



Sort, Shine, Stabilize, Standardize & Sustain: Work stations were cleaned & only necessary items were kept in each defined space.

Job Guidance Sheets were created to standardize the work on each shift, for all "in-cycle" and "out-of-cycle" tasks.

PROCESS #	JOB STEP	DESCRIPTION OF WORK OR ACTION	CODE	ESTIMATE (min)	Tools or Supplies Used During Job Step	Key Quality and Safety Points
1	1	OPERATOR OBTAINS BEEPER AND PLACES NUMBER ON BOARD	OTHER	10	BEEPER	VERIFY BEEPER IS CHARGED
1	2	OPERATOR PICKS UP LABELS	MM	4	TIME CLIP	VERIFY LABELS ARE CORRECT
1	3	OPERATOR WALKS TO PHLEB ROOM	PH	5		
1	4	OPERATOR WALKS TO PHLEB ROOM	PH	6		
1	5	OPERATOR OBTAINS CART AND PUTS LABELS ON LAB BOARD	MM	4	CART	
1	6	OPERATOR WALKS TO ELEVATOR	PH	26		
1	7	OPERATOR WALKS FOR ELEVATOR	PH	32		
1	8	OPERATOR ENTERS ELEVATOR	PH	3		
1	9	OPERATOR ENTERS ELEVATOR	PH	22		
1	10	OPERATOR LEAVES ELEVATOR AND WALKS TO PHLEB ROOM	PH	23		
1	11	OPERATOR ENTERS ROOM	OTHER	5		
1	12	OPERATOR TALKS ON PHONE	OTHER	2		
1	13	OPERATOR IDENTIFIES PATIENT	PH	14		
1	14	OPERATOR WASHES HANDS OR APPLIES PURELL	OTHER	10	HAND SANITIZER	
1	15	OPERATOR OBTAINS SUGARS	PH	3	SUGARS	

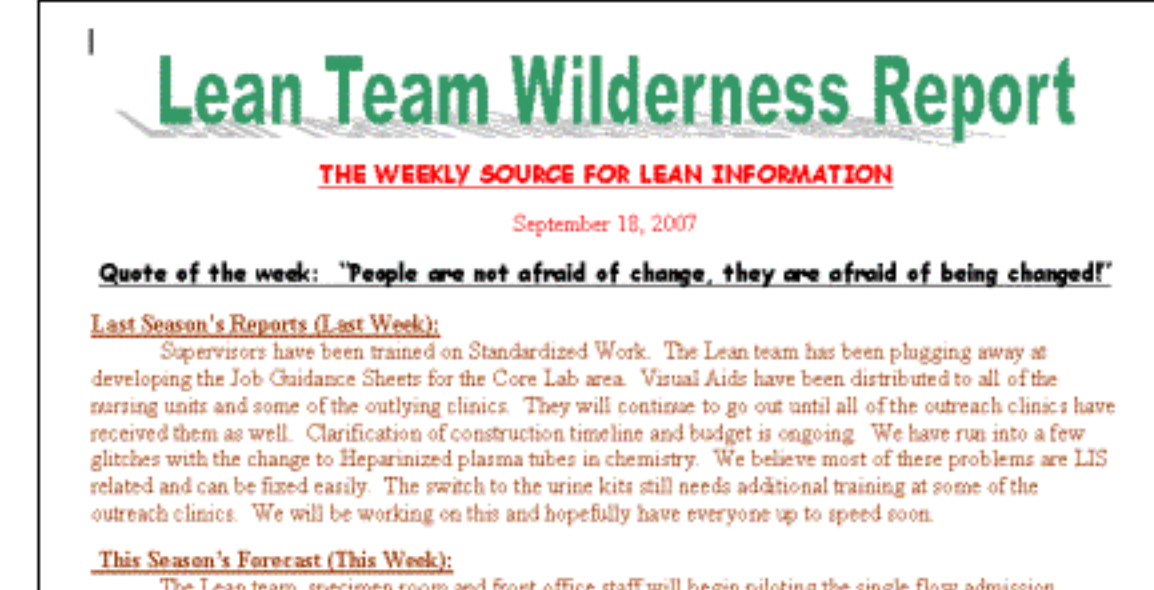
Ongoing Performance Review



Department Performance is posted each week to keep staff aware & focused on performance.

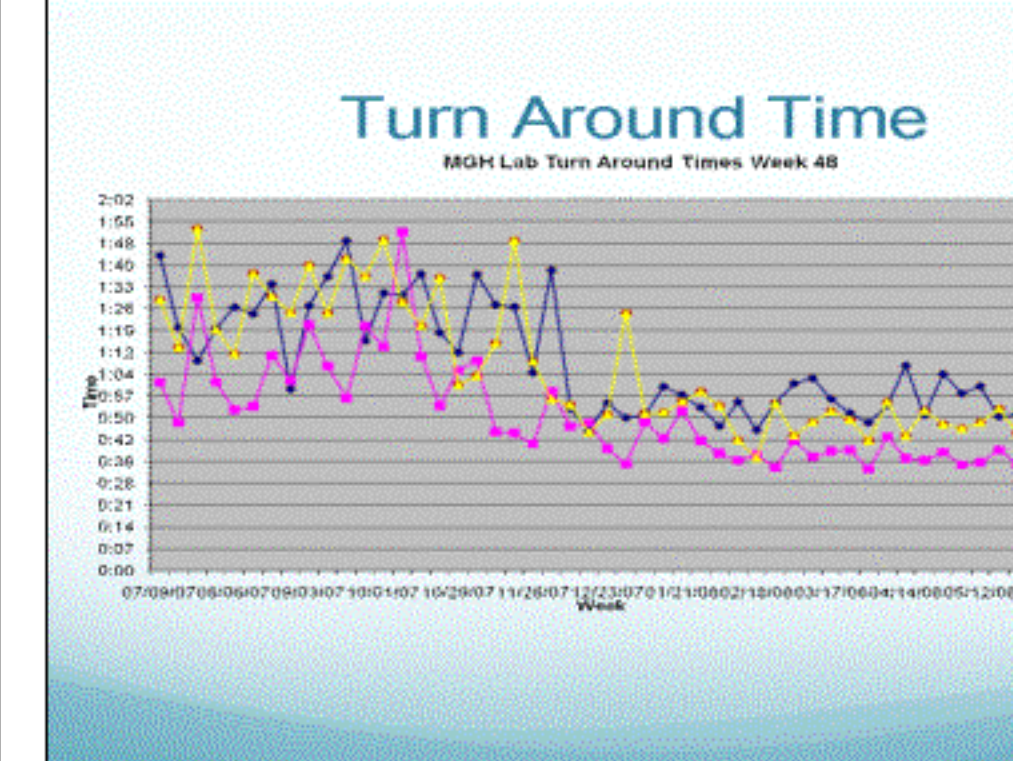
Elicit Staff Input

Weekly newsletters encourage staff participation in the Lean project. Staff engagement is also fostered via the Lean Suggestion Box.



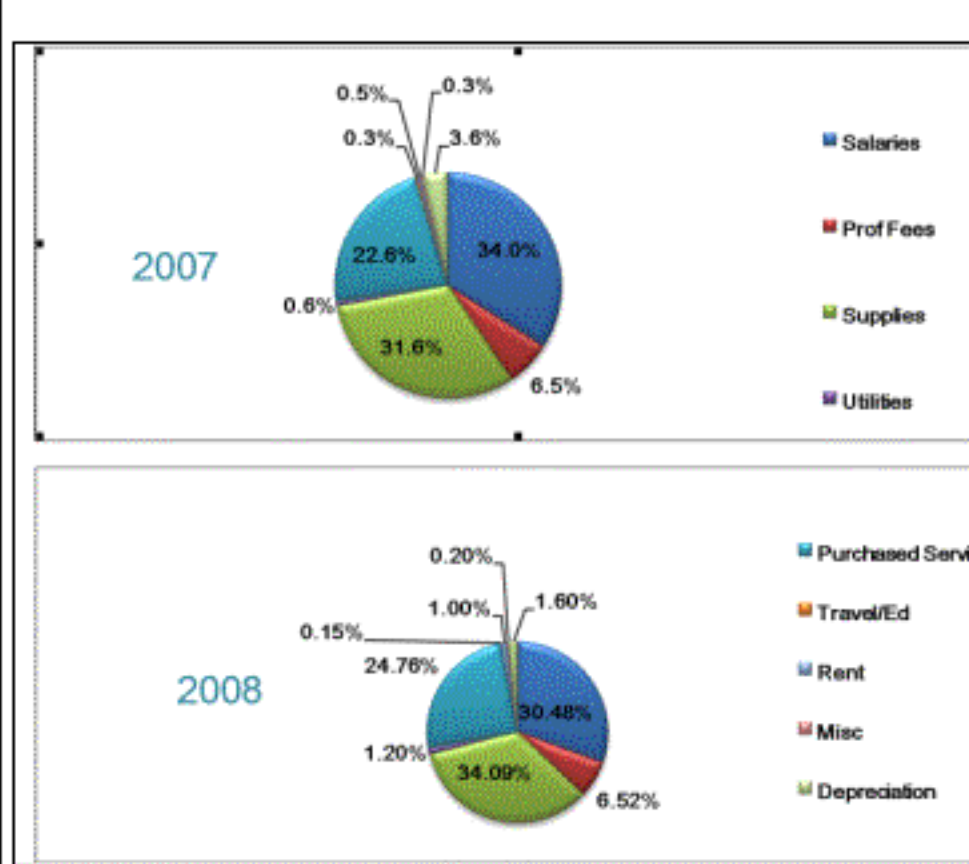
RESULTS

By implementing Lean processes in the laboratory, we redesigned space and standardized work processes, resulting in:



Improved TAT- turnaround time for stat and routine tests decreased from 56 minutes to 36 minutes and from 2-4 hours to 45-50 minutes, respectively.

Enhanced Efficiency & Productivity- Total number of FTEs has fallen from 135 to 130 due to attrition. At the same time, the core laboratory has experienced a 17% increase in volume as a result of outreach efforts and additional new testing services.



Faster Morning Rounds- morning phlebotomy draws on inpatients decreased from 3.5 - 4 hours to 2.5 - 3 hours.

Additional Laboratory Space- the physical redesign and elimination of waste freed up 500 square feet of floor space for other activities.

Rapid ROI- program leaders estimate that the Lean initiative paid for itself in less than 2 years through cost savings and revenue enhancements.

SUSTAINING THIS INNOVATION

- Continually monitor, report and discuss performance.
- Recognize and reward contributions and ideas.
- Cross-train staff.
- Let the data drive the major decisions.