Lean and Green Laboratory

BCSLS Congress, Kamloops 2012
Presentation Overview

- A little bit about PHC
- First Lean project
- 2nd Lean project
- Green + Leader
- What went well
- What did not
Background

St. Paul’s Hospital

Mount St. Joseph
2003

- Both laboratories were facing increases in test volumes
- Improvement in turn around times
- Staff work areas were cluttered
- Lab costs were high
- Subsections of the lab worked independently
Laboratory Leadership

- Best fit our needs
  - Lab focused
  - Front line driven
  - The change was rapid
  - Proven laboratory success stories
Lean is a system that gets by with half of everything (space, labor, inventory, capital investment) and has far fewer defects and safety incidents.

Lean is a thinking process more than a simple to do list of tools

Lean focuses on customer needs, by improving quality, reducing turn around time and costs all through continuous improvement and employee involvement.
First Laboratory Lean project

St Paul’s Core Lab:

- Accessioning
- Blood Collection
- High volume Chemistry
- High volume Hematology
First Lean Project

- Laboratory processes moved from batching to single piece flow – consolidation of all accessioning
- Renovations was required for the new laboratory work cell
- Layering of high volume automation
- Primary pneumatic tube system was moved
Results of the First Lean Project

- TAT
  - Morning reports by 9 am improved by 50%
- Staff walk patterns were reduced
- KanBan-inventory control system
- Improved working relationships
- National Quality Award
Inventory Control

Laminated cards are located in the same area as the supplies
Supplies are located in the same area the task is being preformed
Eliminates overstocking and supply waste
Frees up lab space
Lessons Learned

• Communication before, during, and after
  – Listen
  – Communicate 4 Ps (purpose, picture, plan, part)
• Involve a change management team prior to role out
• Hire a consultant for a major change
• Enlist staff, supervisors and pathologists throughout the journey
• Limit concurrent major changes
• Have resources (dollars, people) ready for renovations
“Overall batch processing was slowing our entire system by a day or two”

“As work piled up towards the end of the day, the stenos would be tearing their hair out to get everything completed.”
2nd Lean Journey

• Armed with the success and failures
• Consultants return to PHC to make an assessment to determine the current state and potential scope of the project
• Lined up $$ for renovations
• Enlisted in-house Change Initiative Personnel
Formation of the AP Lean Team

- Junior and supervisory staff
- Consultant
- Work areas were transformed
AP’s Lean Journey

• Decision making criteria – surgical report
• Pulled AP processes apart
• Targeted a specific list of problems and de cluttered and rearranged the lab work space
• Layered visual tools, error proofing techniques and automation
AP Lean Journey (2)

• Savings
  – in inventory usage by layering the KanBan ordering system
  – and by rethinking retiring FTE replacement

• Freed up valuable laboratory real-estate which supported the layering of much needed automation to support the increasing work load
Visual Management in the Diamond Area

Supports SOP’s

Improves access to information

Improves working conditions – i.e. search time

Improves staff morale/team work

Reduced the potential for error
Total distance product traveled 806 ft.
Product handled 37 different times
Results continued

New accessioning area

Pathologists workflow change grossing room 1

Processing equipment located in grossing room 2

Grossing room 3

Diamond cutting station

Integrated oven stainer and coverslipper

Relocation of QC bench

Special staining bench

IHC bench

Cytology processing bench
“I would never have believed that we could see so many changes in such a short time.”
Summary – basic approach

- There is no one quality method or procedure that can be applied to all areas of the lab to create the “perfect lab work environment”
  - Understanding the meaning of value and waste
  - Know who the real customer is
  - Cautiously layer the Lean tools/automation into this sensitive work environment.
2007 - 2008

- To support the increasing workload and same day small biopsy processes the work day extended
- New projects on the horizon
  - New laboratory computer system
  - New electronic quality management system
- A staff satisfaction survey
- Cost per test reduced by .04 cents per test
Anatomic Pathology – Lean Instrumentation – 2008/09

- Standardized equipment purchases
- Same day xylene free large capacity microwave processors
- Xylene free cleaning module
- Computer integrated cassette labeler
- Integrated H&E stainer
- Large capacity IHC stainers
2009

- We continue to see a savings in labor but supply costs are on the rise - automation replacing manual processes
- Hospital senior leadership allocates funding for another pathologists
- Med steno area absorbs mail and reception without FTE increase
- We continue to streamline our processes
- Standard Operating procedures (SOPs) required rewriting
2010

- Accreditation
- Pathology case load continues to rise - Funding for staff
- TAT maintained
- New equipment - dictation
- Instrumentation is performing at maximum capacity
- Retirements continue
- Able to maintain costs
“When staff are unable to come into work the system doesn’t fall apart.”

“I cannot believe how efficiently the lab runs”
# Overall Impact of Lean

<table>
<thead>
<tr>
<th>Category</th>
<th>Outcomes</th>
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</thead>
<tbody>
<tr>
<td>Improvement in working conditions</td>
<td>5S - removal of unused equipment&lt;br&gt;Creation of the “Diamond and the work cell&lt;br&gt;Cross training – between the different disciplines&lt;br&gt;Staff satisfaction – survey</td>
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<tr>
<td>Improvement in TAT</td>
<td>Reduction in the # of sample drop off points&lt;br&gt;Reduction in staff walk patterns&lt;br&gt;Innovative automation – freed up technologists time</td>
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<tr>
<td>Reduction in errors</td>
<td>Reduction in sample/specimen flow&lt;br&gt;Cross training&lt;br&gt;Separation of clerical data entry and surgical requisition flow&lt;br&gt;Renovations – more user friendly work areas</td>
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<tr>
<td>Cost savings</td>
<td>Kanban ordering system (just in time ordering)&lt;br&gt;Reduction in staff walk patterns&lt;br&gt;Cross training</td>
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2012 – Maintaining Lean

• Targeted specific previously identified problems, rearranged and de cluttered laboratory work areas and refined the existing ordering system
• Layered RCA (an analytical tool) to perform comprehensive systems/process reviews into the Lean Redesign processes
• AP safety officer
2012 – Lean Projects

- Pathology slide and block in-house and off-site filing and storage system
- Digital dictation system for all three grossing rooms
- Staff workstations i.e. special staining area, technologists grossing room three bench, cytology processing area etc
- Pathologists sample holdover flow
Anatomic Pathology – 2nd Lean project – 2011/12

- RCA
- Improved supply storage grossing room 2
- Improved ergonomics for the clerical staff
- Visual cues for sample flow in accessioning
- Streamlining cell block flow in Cytology
- Increased work space for grossing room 3
- Increased storage capacity for weekly surgical samples in grossing room 1
- De cluttered special stains area
- New face of Lean
Green+ Leaders Training Sessions – Spring 2012

- At the same time the laboratory received a call for volunteers
- Goal of this team
  - Create a sustainable “Green” laboratory culture
  - Inspiring positive change
  - Maintain “Lean” model
Green Team Selection

- Leadership receives interest from many individuals throughout the laboratory
- Membership selection was based on
  - Understanding of Lean processes across the lab
  - Primary roll in the lab (bench technologist)
  - Ability to influence their peers
  - Credibility
Laboratory Leadership’s Role

- Similar to the Lean project
  - To empower
  - To support the initiative
  - To foster a trusting work environment
  - To help guide the team with their decision making as it affects laboratory policies and procedures
Green + Leaders Team

- The membership improved upon the diversion of laboratory paper, plastics and cardboard from entering the landfill
- Raised awareness on how to better utilize equipment through the reduction of electrical consumption
  - Shutting down laboratory equipment
  - Turning off microscopes, computer monitors and lights
First Green Audit

- The first audit performed by the Green team was the assessment of energy consumption
- Stickers - “Monitor Off”
- Total energy savings of 29%
“Shut the Sash” Campaign

- Following the success of the energy audit
- When the sash is open air is circulating through the opening
- If the fume hood is not in use keeping the sash open wastes thousands of dollars of energy
- And has harmful energy impact on the environment

SAVE ENERGY. BE SAFE.
SHUT THE SASH

If left open, your fume hood uses 3.5x the energy of a house!
Save up to 60% energy and reduce greenhouse gas emissions by closing the sash.

Brought to you by HMS, HSPH, FAS & OFS
Recommendation from the Green Team

- The Green team continued to make recommendations such as:
  - Replace old/obsolete laboratory equipment - fridges and freezers
    - Lower equipment temperature on the refrigerators and freezers
    - Defrost regularly
    - Dust coils on the refrigerators
    - Clean doors and seals
    - And replace worn out seals
During the month of April the Green + Leaders collected transit, cycling and/or walking commute times of staff. This info was then published in the lab newsletter to recognize and promote this ACTIVE and SUSTAINABLE initiative.
AP- Cassette Lid Recycle Project
Next Green Team Challenge

• To complete a draft lab checklist similar to UBC’s lab checklist - before the end of summer 2012

• The focus of this checklist
  – Waste minimization
  – Energy conservation
  – Water conservation
  – Green purchasing
To Accomplish this

- Leadership reviewed the UBC laboratory checklist and it became quite obvious that there were many similarities between the green list, the laboratory safety list and lean process improvement strategies.

- *The Green Team Joins the PHC Laboratory Safety Committee*
It was discovered that items from the UBC checklist had already been implemented by the lab safety committee such as:

- Chemical inventory control processes which focused on
  - the reduction and duplication of chemicals and solvents throughout the lab
  - Safe chemical disposal processes across the lab
  - Mapping out of the chemical and solvent storage areas (for disaster control purposes)
UBC Lab Checklist and Lean

- Examples were:
  - First in/first out policy supply usage strategy
  - Regular inventory audits
  - Linking of purchasing requests into an inventory system
What the Green Team is Doing Well

- Communication strategies directed to staff that are at the center of lab processes
- Raising awareness about issues and problems on a regular basis
- Setting goals and tracking improvements using metrics and then comparing these metrics to external indicators
- Support from senior leadership
- Clear commitment from the team membership
- Cost savings from energy reduction campaigns
Example of Communication Alert

- Communicate recycling updates such as:
  - The following items are no longer accepted in our recycling bins – syringes, specimen containers (clean)
  - Because contamination like this could provoke:
    - Cancellation of the laboratory recycling program
    - Recycling going into the garbage
    - Increase lab costs
What the Green Team Needs To Improve Upon

• ID key suppliers
  – Challenge vendors to move supply warehousing to the lower mainland as this would reduce energy consumption, pollution and green house gases
  – Work with suppliers to reduce excess packaging, to use biocompatible packaging or to challenge vendors to provide larger minimally packaged laboratory product
  – Challenge Laboratory Leads to purchase equipment that have energy efficient feature and are environmentally friendly
Similarities Between Lean and Green

• Support form senior leadership
• Dedicated team membership
• Youth
• Structured meetings
• Excellent communication strategies for
  – reduction and waste prevention
  – quality improvement
  – data collection
• Safety checklists and audits
• System for monitoring supplies
• Cost savings
Summary

Even though the Green + Leader culture is still in its infancy there is a feeling across the laboratory that this cultural shift will be sustained, because, the team has a clear vision, the team membership exhibits the “right” behavior and supports the urgency for change.
Conclusion

Lean and Green initiatives build on quality improvement processes and good working relationships.

“When people are committed to a vision, trust and commitment grow.”
Questions

Thank you!