

## Supercharging Histology Workflow

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September 2009



## Today's Learning Objectives

- Be able to pinpoint patient safety **RISKS** in your AP lab
- Understand how your AP lab can unlock major **GAINS** with Lean methodologies
- Explore value of automation and workflow changes in the AP lab – a **CASE STUDY**
- Discover new solutions to move from planning to execution to create the AP lab of the **FUTURE**



## Ventana Medical Systems, Inc.



*Born from a relentless search to find a better and faster way to diagnose the patient*

- Over 1,200 employees across North America
- Fully integrated commercial operations, manufacturing, research and development in Tucson, AZ
- 95 patents issued and pending
- 6,000+ systems installed in 2,000+ labs across 33 countries worldwide
- 24% annual growth
- Acquired by F. Hoffmann-La Roche in early 2008
- A division within Roche called Roche Tissue Diagnostics



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## Ventana Leads in Tissue-Based Diagnostics



- Superior workflow solutions in both automation and information systems
- A proven track record of innovation, execution and patient centricity
- Strong research and development investment
- World class capabilities in core technologies
- Unparalleled partnerships for next generation companion diagnostics
- Passion for improving standard of cancer patient care



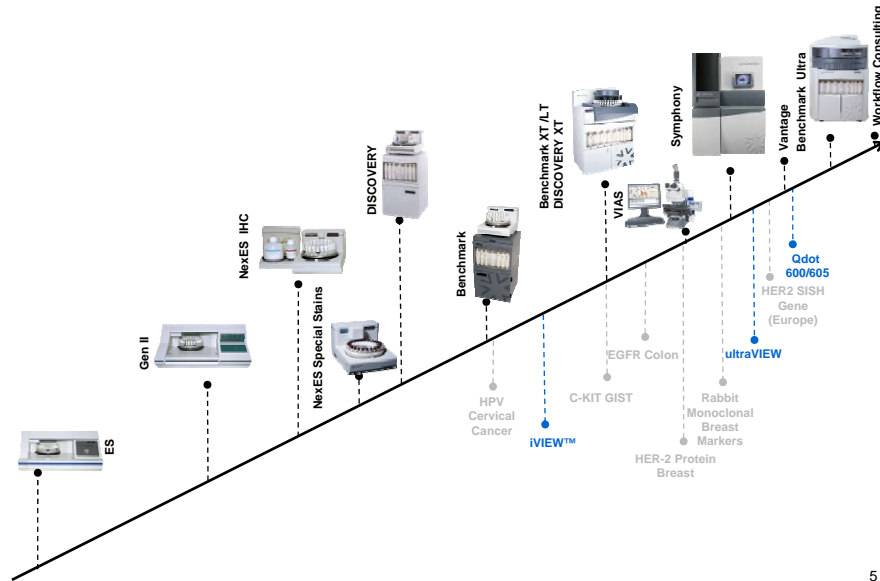
"We will not rest until every cancer patient receives the access to information, therapy options and individualized care we know is possible."

- Dr. Thomas Grogan

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## Continuous Innovation for the AP Lab



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## Patient Centric Solutions



**Workflow Consulting Services**  
*a safe, effective, efficient lab*



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## Vantage & Advanced Workflow - Powering the Total Solution



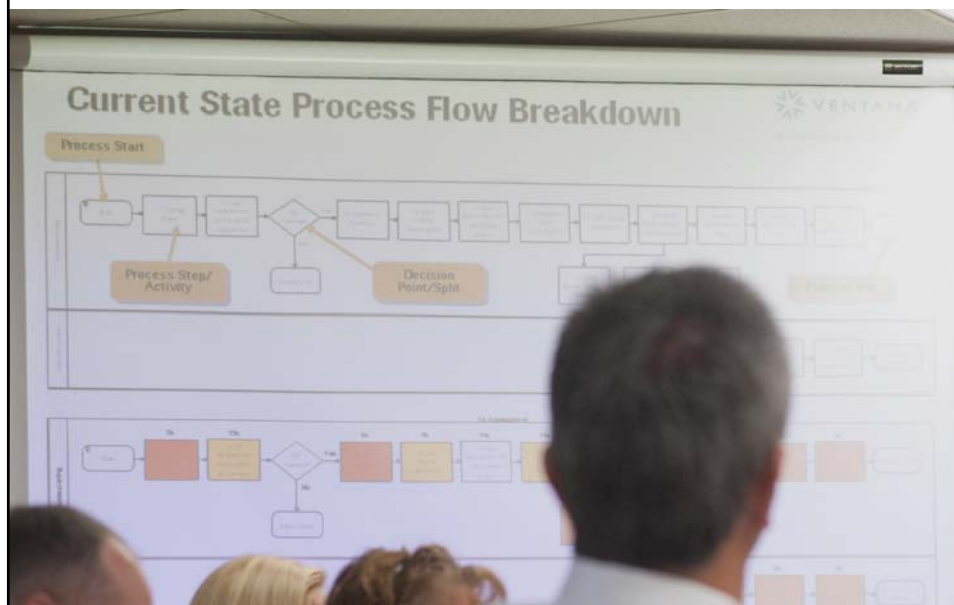
The only complete lean workflow solution that maximizes lab productivity and patient safety

- Turnkey lab improvement solution, including lean six sigma consulting
- Streamlines laboratory workflow
- Provides positive identification, with one label for the entire lab
- Enables advanced, active tracking and reporting
- Integrates Ventana products, multiplying customer value



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## Risks of Status Quo









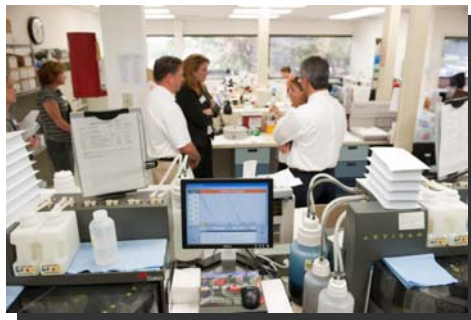
## High Potential for Human Error



- Overcalling
- Missing diagnosis
- **What do you see in your lab?**

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## High Potential for Human Error



- Misidentification of slides/cases
- Tissue floaters
- Redundant data entry
- Handwritten logs/manual information collection
- Labeling/re-labeling
- Batch processing
- Non-standard work practices

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## Media Focus on Lab Safety

**THE WALL STREET JOURNAL**  
ONLINE  
June 14, 2006

**THE INFORMED PATIENT**  
By LAURA LANDRO

**Hospitals Move to Cut Dangerous Lab Errors**

Improved Specimen Collection Affects Accuracy of Medical Testing  
June 14, 2006, Page D1

Diagnosed with a deadly neuroendocrine tumor, told she might have just months to live, a woman told her doctor to remove her face with bone taken from her lost leg. She heard some shocking news. The skin had been contaminated by cells from a cancer in the first place.

The swine-flu outbreak has focused attention on the safety of medical tests.

Vanderbilt University Hospital's lab is testing incoming patients for swine flu and other viruses. The large medical center in Nashville, Tenn., says the swine flu has had minimal impact on the country "would never have an issue, right behind taking out the virus."

Like the growing shortages of primary care physicians, the safety and quality of health care, the American Society for Clinical Pathology says. The group is lobbying for federal action.

**THE WALL STREET JOURNAL**  
ONLINE  
MAY 13, 2009

**THE INFORMED PATIENT**  
By LAURA LANDRO

**Staff Shortages in Labs May Put Patients at Risk**

Page last updated at 13:51 GMT, Friday, 17 July 2009 14:51 UK

E-mail this to a friend    Printable version

**Unit's 2,450 cancer test errors**

An inquiry into the screening of tissue samples for cancer at a hospital has found errors were made in 2,450 cases.

**The Lap Band Chronicles**  
The Obesity "Way Zone"

**Week Twenty Three: "Lab Mistakes Kill People"**  
06/03/09 18:27

I haven't posted for a while and this is the reason: I've been frozen in fear. Yes, I, the smart-mouthed, irreverent lap bander who doesn't care what anyone thinks. Right, the tough gal from Brooklyn. I've had something happen to me that shook me to the core, that I'm still trying to get my arms around.

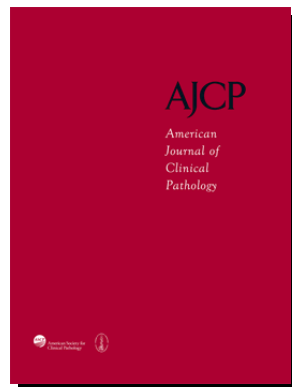
When I had my lap band surgery (obesity, no insurance reimbursement, thank you), my bariatric surgeon found a nodule on the outside of my stomach. Like the excellent surgeon that he is, he immediately cut it out and sent it to a pathology lab for analysis. Just looking at it, he didn't think there was anything to worry about. So, I went merrily along with my new bariatric regime, and lost 40 plus pounds. Oh happy day.

Wait a minute. Not so fast. Happiness never lasts. Three months later I got a personal phone call from my bariatric surgeon. I'm in whole foods picking out fresh vegetables like a good girl, mind you. The doctor called to tell me that he got the lab results back from the nodule biopsy - it's a **WILSON'S DISEASE**. I remained calm while he explained to me that some genius at the laboratory had sent the results to...

**News Front Page**

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## Journals Focus on Lab Safety



Source: Am J Clin Pathol 2007; 128 p423

### 2-week study in histology:

- Nearly 30% of cases had manual rework: 159 hours; 1.3 FTEs
- 89% of defects were made in the analytic phase
- 2% misidentification rate; 67% of those in slide labeling
  - All could have been avoided with an integrated identification system



## Market Forces



Declining reimbursement ➡

Staffing shortages ➡

Increasing regulatory requirements ➡

Mounting competition from consolidation ➡

Consumer demand for rapid turn on results ➡

Higher test volumes; more diverse test mixes ➡



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## Getting It Right...





## Lean Methodologies Unlock Major Gains



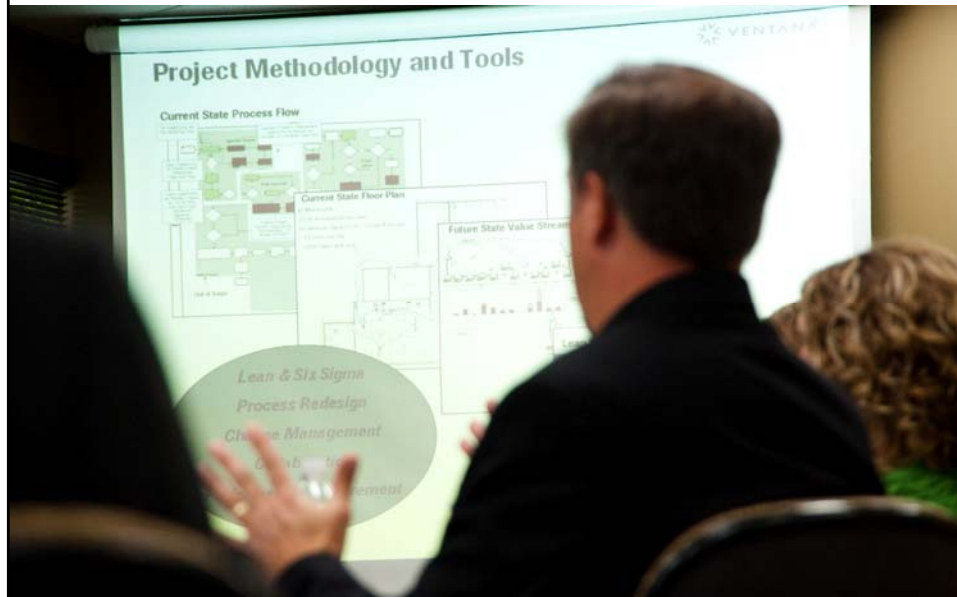
## Lean Moves Labs to the Next Level



- **Improves patient safety**
  - Reduce errors
- **Improves efficiency and reduces costs**
  - More capacity
  - Better staff productivity
  - Reduce wasteful activities
  - Save time and steps
  - Happier staff
- **Improves experience for your cancer patients**
  - Faster turnaround times
  - More reliable results



## Case Study - A Midwest Reference Lab

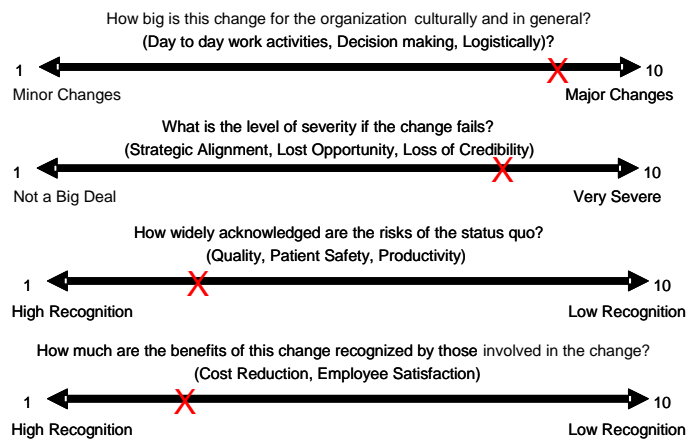


## Case Study - Change Readiness Assessment



Workflow Consulting Solutions is a catalyst for change.

Assessment tool measure dimensions for change management.





## Case Study - A Two Way Partnership



- **80+ hours on-site with team**
  - Involve leadership and establish accountability
  - Observation and determine current state baseline
  - Identify opportunities via Voice of Customer
- **High level of engagement to ensure team embraces change**
- **Leverage expertise across Ventana**



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## Steps to a Safe, Efficient, Effective Lab

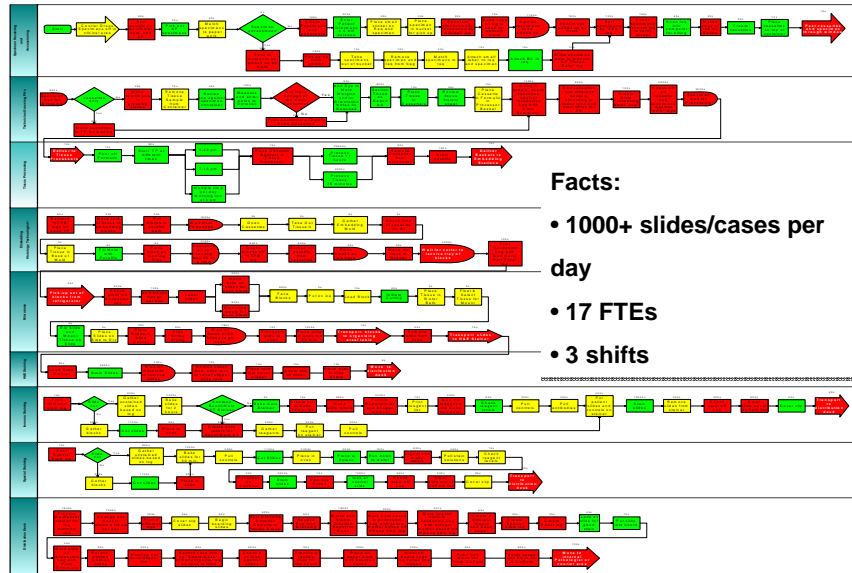


1. **Observe and record**
2. **Reduce or eliminate non-value added activity by mapping the flow of work through the lab**
3. **Map current workflow process and design future state**
4. **Engage team in change management to implement improvements**
5. **Prioritize opportunities for continuous process flow improvements**

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## Case Study - Current State Process Flow

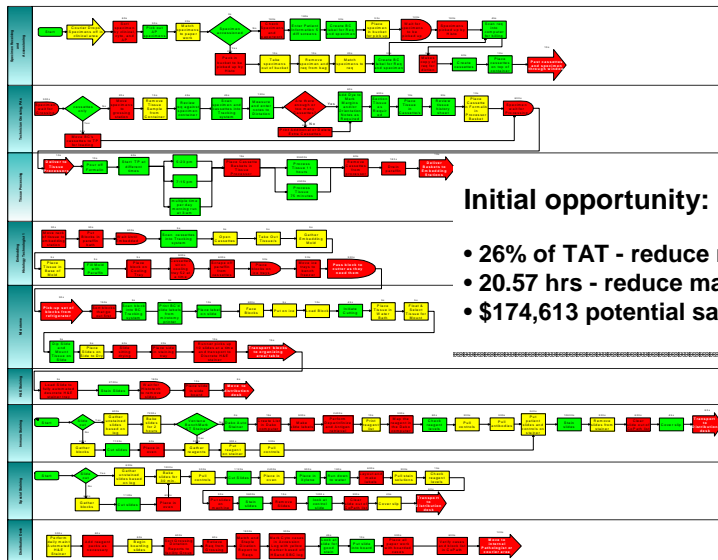


### Facts:

- 1000+ slides/cases per day
- 17 FTEs
- 3 shifts

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## Case Study - Future State Process Flows



### Initial opportunity:

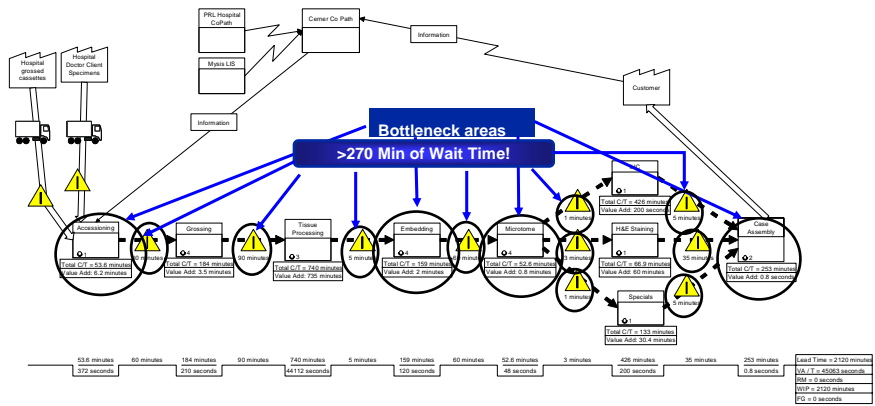
- 26% of TAT - reduce non-value adds
- 20.57 hrs - reduce manual logging
- \$174,613 potential savings

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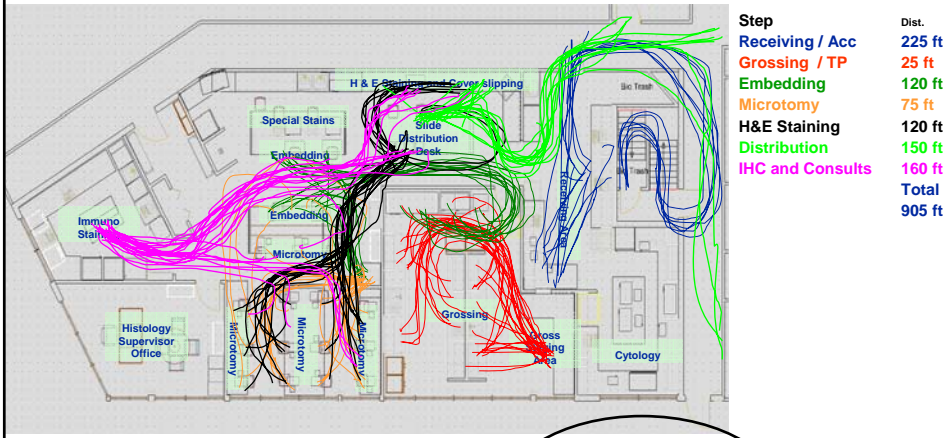
# Case Study - Identify Value System

Use Lean and Six Sigma tools to systematically uncover non-value added activity/ways to maximize lab productivity and safety



# Case Study - Streamline Movements

Current State Floor Plan

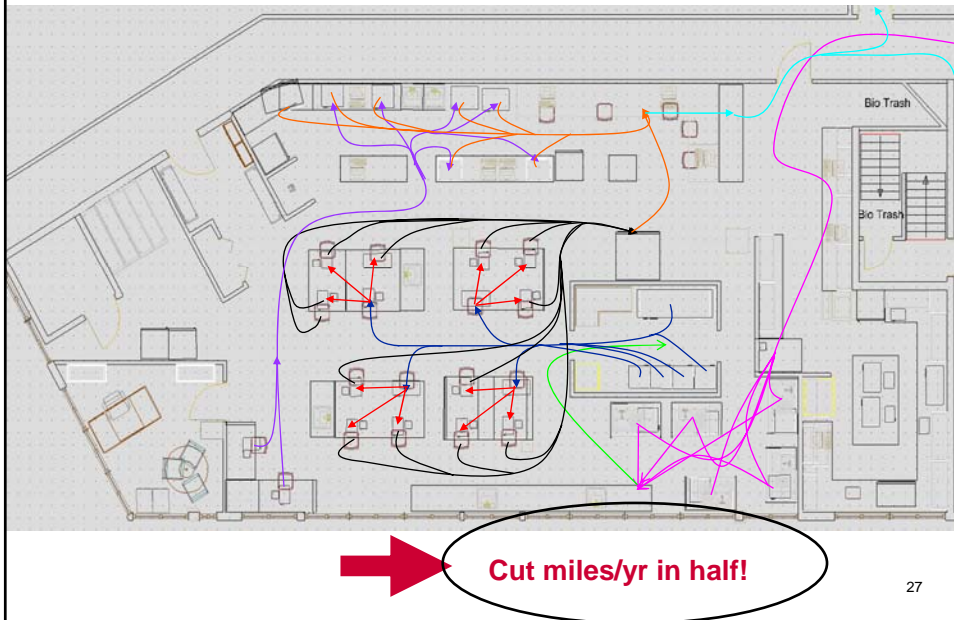


Assumption: 17 people  
25 movements per person per day

**Totals:**  
~ 58,125 ft / day  
~ 11.1 miles / day  
~ 3,176.6 miles / year



## Case Study - Future State Histology Lab



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## Case Study - Reduce Manual Log Creation



Work Station	Hours	Associated Cost
Accessioning	3.97	\$34,062
Grossing	2.77	\$23,737
Embedding	1.30	\$11,154
Microtomy	0.87	\$7,464
H&E Staining	2.98	\$23,981
Immuno Staining	2.30	\$19,447
Special Staining	1.00	\$8,580
Case Assemble	5.38	\$46,188
Total	20.57	\$174,613

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## Case Study - Reduce Cycle Time

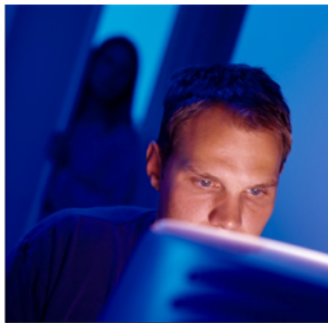


Process Steps	Current State	Future State	minutes
Accessioning	53.6	11.5	
Grossing	183.7	31.8	
Tissue Processing	739.8	739.8	
Embedding	158.6	57.7	
Microtome	52.6	15.4	
H&E Staining	66.9	46.3	
IHC Staining	426.0	410.8	
Special Staining	133.1	117.9	
Case Assemble	252.7	188.9	
<b>Total Time</b>	<b>2067</b>	<b>1020</b>	
<b>Cycle Time saved</b>		<b>447 minutes</b>	
		<b>7.4 hours</b>	

**\$63,492**

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## Case Study - Reduce Overtime



### Improvement Gains

- **Current State Cycle Time in Accessioning: 29 minutes**
- **Future State Cycle Time in Accessioning: 11.5 minutes**
- **May Eliminate Over Time: 65.5 hours /pay period or \$51,090/yr**

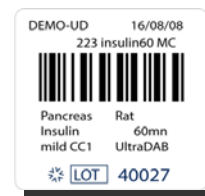
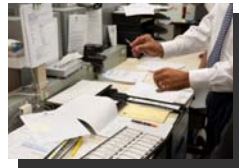
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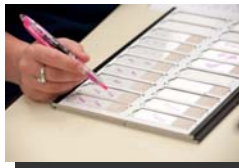
## Case Study - Improve Patient Safety



Akro-Mils Bins with Intersecting Dividers



Bar Coding



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## Case Study - Improve Patient Safety



Optimize workspace to reduce crowding



Automation



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## Case Study - Voice of the Customer (VOC)



- **Total Personnel Interviewed: 11**
- **Key Themes Reported**  
in order of popularity with staff
  - 1) Workflow assessment (across total flow and individual work cells) for alignment of Lean processes
  - 2) Tracking/bar coding need (internal and external)
  - 3) Leadership involvement and communication increase
  - 4) Redundant/excessive paperwork
  - 5) Space increase needed

*"Staff need more efficient workspace, better communication from management, more physical space in which to work, and less turnover in key roles."*

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## Case Study - Impact Summary

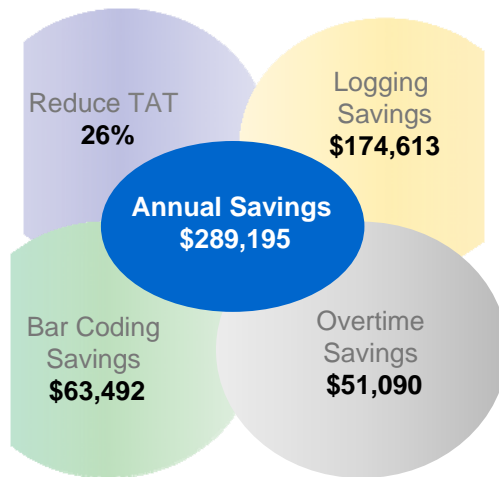


No.	Process Improvement	Process Step	Priority	Lean Improvement Concept
1	Elimination of Handwritten slides	Microtome	High	Waste Reduction
2	Bar Code Tracking, Data / Quality Management	Histology	High	Waste Reduction
3	Eliminate / reduce log creation and management of paper work	Histology	High	Waste Reduction
4	Redesign of laboratory	Histology	High	Visual Workplace, Workcell design
5	Improved Automation of H&E Stainer -	H&E	High	Wait Time Reduction
6	Install Metric Board - Key Performance Indicators	General	High	Visual Workplace
7	Additional Tissue Processors	Tissue Process	Medium	Wait Time Reduction
8	Review/Update Standard Work	Grossing, Microtomy, Distribution	Medium	Standard Work
9	Courier Routing Optimization	Receiving and Distribution	Medium	Wait Time , Batch size Reduction
10	Initiate 5S Concept	Histology	Low	Visual Workplace
11	Runner to transport resources in the lab	Histology	Low	Wait Time Reduction

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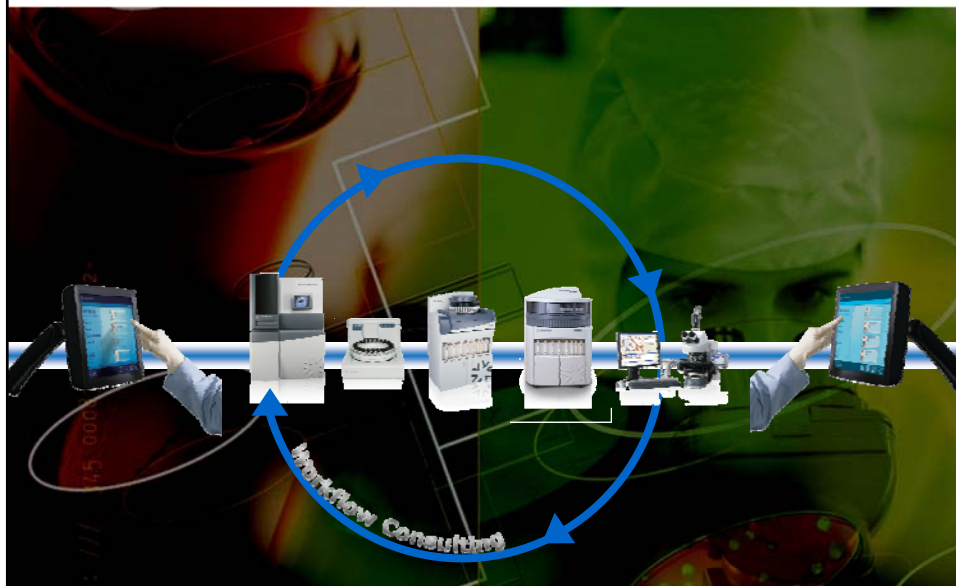
## Case Study - Reference Lab Opportunity



- Improved safety
- Higher employee satisfaction
- Better patient experience
- More competitive lab

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## Using Lean to Create the Lab of the Future





## Lean Transforms AP Lab Performance



Lean & Six Sigma



Better  
quality

Quicker  
response

Greater  
flexibility

Increased  
value

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## Lean Keeps Focus on Execution



- **Lean Six Sigma is established as a continuous, cohesive way of working (not a project)**
- **Leadership is on board and governance is in place; both are aligned to systematically review and improve business process**
- **Lab staff participate in establishing accountability and chain of command at the onset of Lean Six Sigma**
- **Teams are focused on business process, not just tools for improvement**
- **Emphasis is on culture change to sustain improvement**

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**Greatest Challenge is Execution!**



**Process improvement leads to  
cost reduction...**

**Execution** leads to quantum leaps  
in competitive advantage and  
long-term financial benefits

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**Future Lab – Safe, Effective, Efficient**



- Better equipment ➡
- More Sophisticated Testing ➡
- Improved Patient Safety ➡
- More Reliable Information ➡
- Automated Work Processes ➡
- Greater Efficiency, Effectiveness ➡
- Financial Stability ➡
- Competitive Advantage ➡



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## The First Step...Map Out Your Plan



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## Contact Information



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