

Lean in the Laboratory

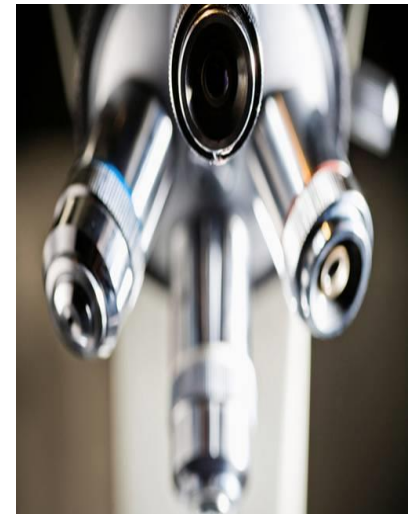


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Objectives

Upon completion of this presentation, participants will be responsible to:

- Describe Lean Terminology
- State the Principles of Lean
- Understand Muda
- Utilize the 5 “S’s”
- Identify Some Lean Tools
- Illustrate applications of LEAN in Royal Oak Anatomic Pathology



Lean – What Is It?

An operating philosophy for improving processes that focuses on the elimination of waste and process variation.



Lean – What Is It?

- Looks at the process;
not individuals
- Helps to examine the process where there is:
 - Waste
 - Quality Issues
 - Work Flow Issues



Why Lean?

- Look at things that:
 - Have been done for 20 years
 - Don't understand purpose for completion



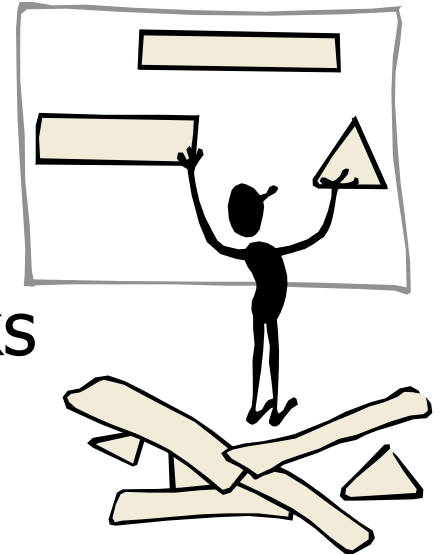
Why Lean?

- If you don't improve you deteriorate
- Complacency \neq HRO in healthcare
 - Can't play role



Why Lean?

- Error Reduction
- Identify Best Practices
- Balanced Distribution of Work
- Eliminate Bad Processes/Bottlenecks
- Reduce Unnecessary Inventory
- Single Piece Flow/FIFO
- National Recognition as a Laboratory of Excellence

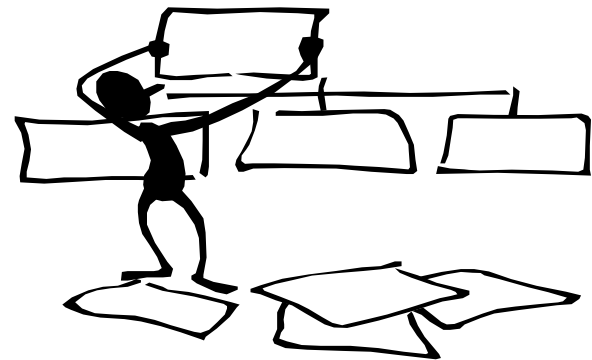


Lean Principles

Developed by James Womack

1. Specify value through the VOC
2. Identify the steps through the process
3. Make processes/value flow
4. Let the customer pull value from the producer
5. Pursue perfection

(ASQ)



Application of Principles



ANYWHERE!!!

- Lab Layout, Design & Set-Up
- Process Flows
- Machines
- Work Stations
- Inventory & Supplies
- Etc.

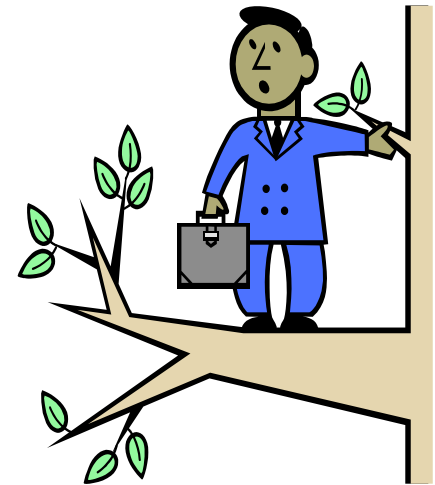
(Mahoney)

Simple Risk Assessment

SRA

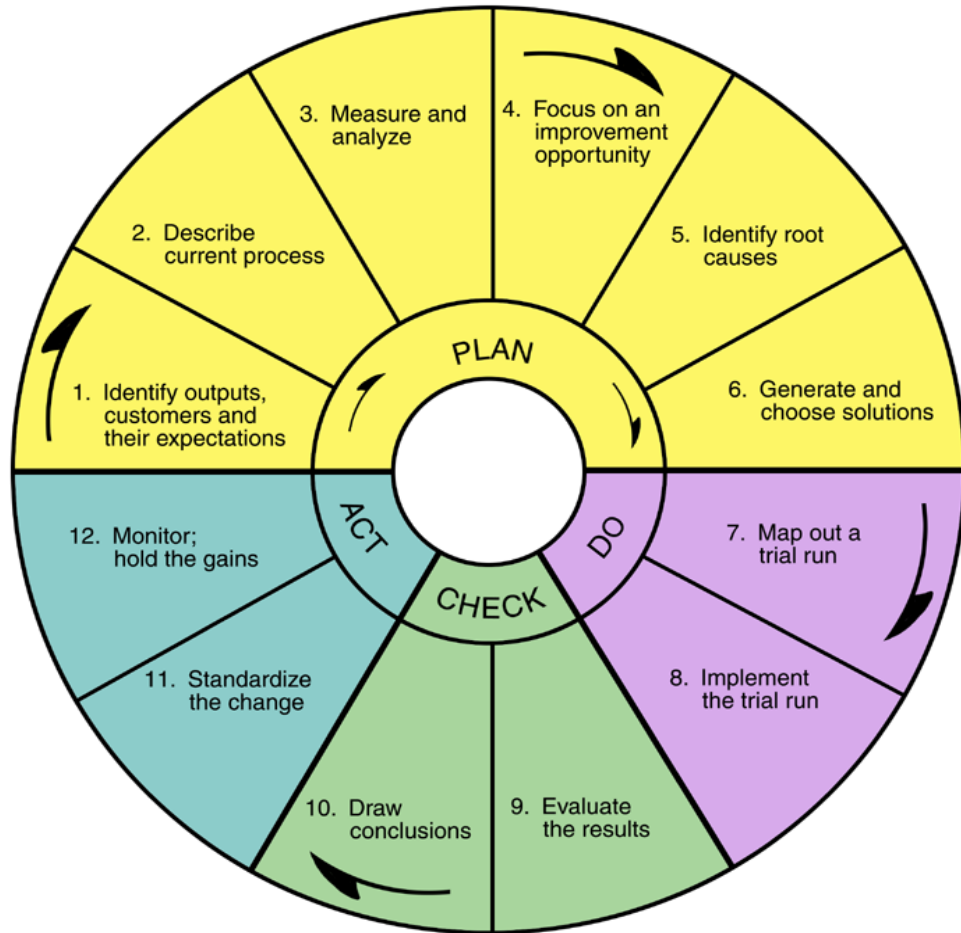
- Why am I doing it at all?
- What could go wrong?
- How could it affect me or others?
- How likely is it to happen?
- What can I do about it?

(Bird)



How

- PDCA Cycle



How

- Communicate in Safe Environment
 - Concerns
 - Near-Misses/Near Hits
- Brainstorm ideas to problem solve
- Empowers teams to:
 - Find Solutions
 - Work Together



How

Key Step:

Involve Everyone



Change

“It is not the strongest of the species that survive, nor the most intelligent, but the ones most responsive to change.”

Charles Darwin



Change

“I have to remember to tell the negative committee that meets in my head to sit down and shut up.”

Kathy Kendall

Process Improvement (PI)

An addition or change
that makes the method of
doing something
better or more valuable.



Voice of the Customer (VOC)

A listening process that comprises a set of continuous, strategically driven activities focused on establishing a relationship between the providers and the customer that drives business results.

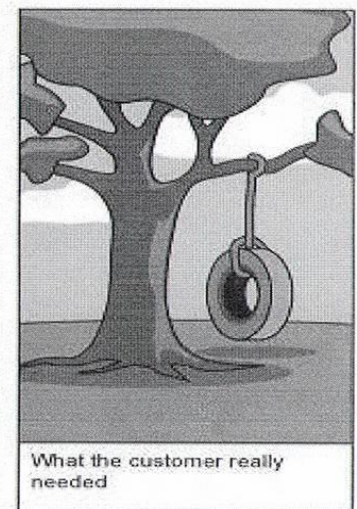
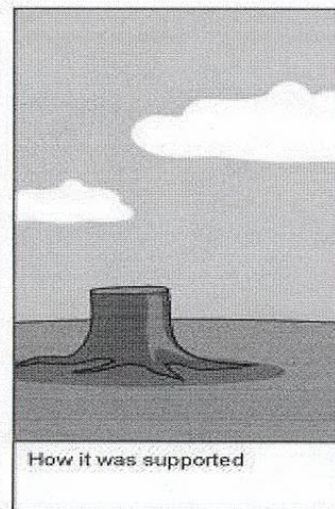
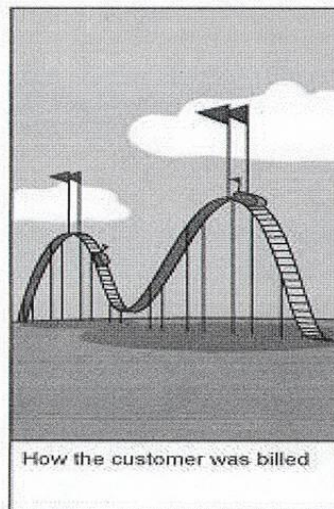
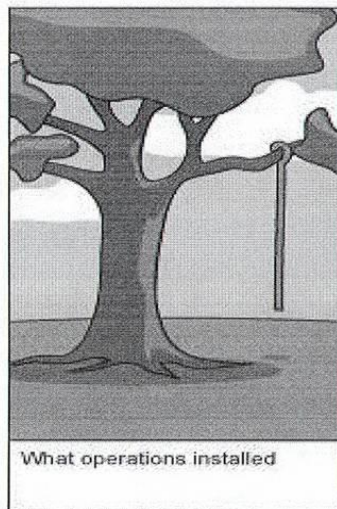
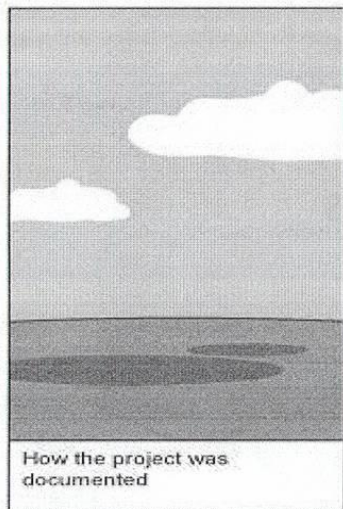
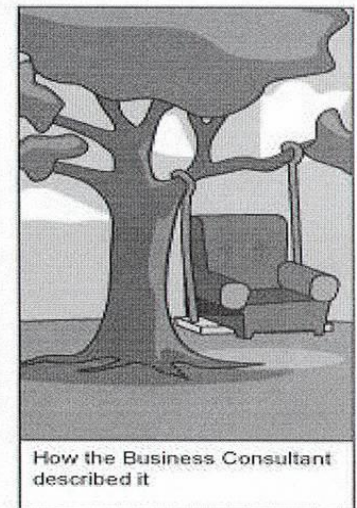
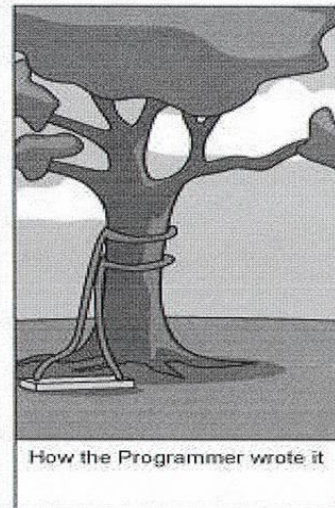
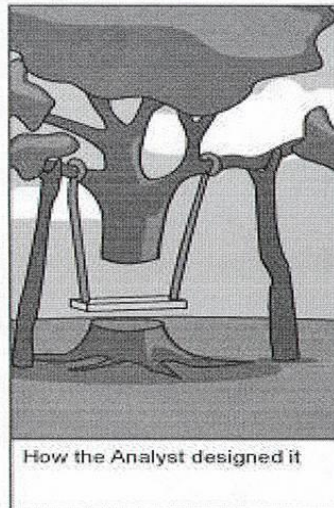
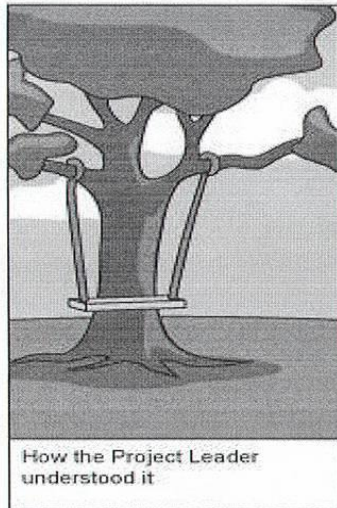
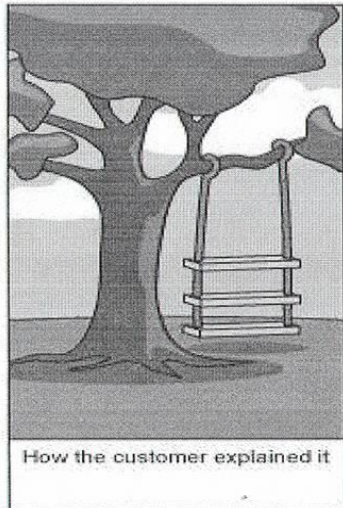


VOC

- Know your customer
- Ask the 5 W's and 1 H:
 - Who
 - What
 - Where
 - When
 - Why
 - How



VOC – Are You Listening????



VOC – Value Added Vs. Non

- Maximize value added opportunities
Ex. Client extra courier pick-up
- Minimize non-value added activities
Ex. Unnecessary log books
- Make changes meaningful

View from the
eyes of the customer



"If I asked people
what they wanted,
they would have said
faster horses."

Henry Ford

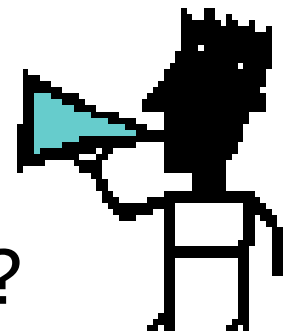


VOC

Goal:

- Fully achieve spoken needs of performance
 - Expected, typical needs
- Go beyond expectations
 - Surprise/Delight customers
 - Unspoken needs performance

What are they really saying???



VOC

- What do you want to achieve?
- What is the desired result?



"Begin with the end in mind."

Stephen Covey

Muda (Waste)

Eliminate Waste = **DOWNTIME**

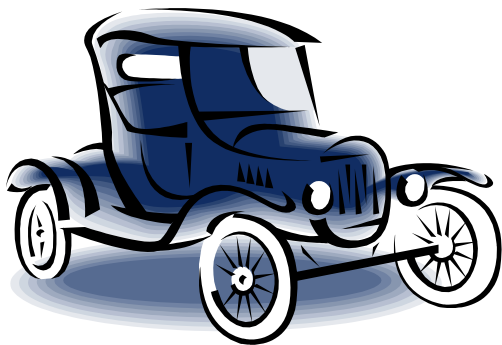
- ✓ **D**efective Products
- ✓ **O**verproduction
- ✓ **W**aiting
- ✓ **N**on-Utilized People
- ✓ **T**ransportation
- ✓ **I**nventory
- ✓ **M**otion
- ✓ **E**xtra Processing



Lean in the Laboratory

"The significant problems we face cannot be solved at the same level of thinking we were at when we created them."

Albert Einstein



Tools

- Next Step:

Determine
Tools to Utilize



Tools

- Possible Causes and Solutions
- SIPOC Chart
- Problem Solving Roadmap
- Kaizen / 5 S's
- Spaghetti Diagram
- Value Stream Map
- Process Improvement Summary



Possible Causes List & Solutions

- Project Name
- List Causes
- Tag each cause with a number
- List identified possible solutions, remarks
- Process Owners
- Target Dates of Completion
- Completion Dates



SIPOC Chart

Suppliers → Inputs → Process →
Outputs → Customers

SUPPLIERS	INPUTS	PROCESS	OUTPUTS	CUSTOMERS
Customer	Verbal Request	Order	Slip of Paper	Employee Assembly
Employee Assembly	Necessary Ingredients	Assembly	Completed Product	Employee Cashier
Employee Cashier	Completed Product and Charge Ticket	Payment (Must be Cash Only)	No Payment by Customer	Customer Angry

Problem Solving Road Map

Beaumont[®] Laboratory

Problem Solving Road Map

P L A N	Theme What are we trying to do? Through the eyes of the customer Critical to Quality (CTQ)	Project Name _____ By _____ Date _____	
	Background Problem context and importance Define the problem Based on direct observation of the problem	P L A N	Future State Diagram of proposed new process Generate and choose solutions Document expected results and impact Cost/benefit
	Current State Diagram of the current process What about the system is not IDEAL		Implementation Plan What Who When Where
	Improvement Opportunity Extent of the problem i.e. measures Proposal of what you want to achieve	D O	Review Predicted performance How/when to check Date check done Results compared to predicted Any unresolved issues
	Cause Analysis Most likely root cause of problems in the current condition Identify waste 5 why's analysis		Follow up Plan Standardize Monitor for Continuous Improvement
		C H E C K	
		A C T	

Kaizen

1. Continuous Improvement

- Focus on the overall value stream
- Multifunctional teams
- Value stream, current and future state maps used as road maps



Kaizen

2. Kaizen Blitz

- Focus is on individual processes
- Improvements made in short fixed timeframes
- Benefits to include immediate results and discovery of other improvement opportunities

- Kaizen Form

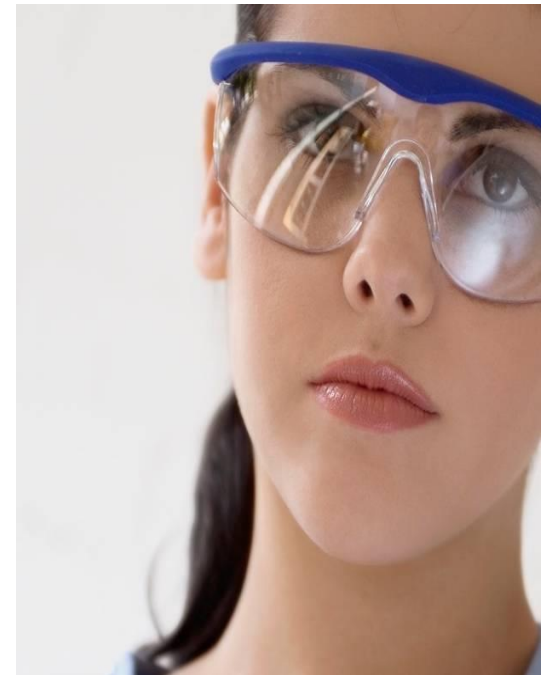


“Just Do It”

- Quick to try
- Low cost/no cost
- Low risk
- Easy to restore

Benefits:

1. ↑ Efficiency
2. ↑ Morale
3. ↑ Satisfaction



5 S's



1. Sort
2. Straighten
3. Scrub
4. Standardize
5. Sustain

RO AP: Autopsy Before



RO-AP: Autopsy After



Surgical Pathology/Histology Storage Closets - Before



SP/H Storage Closets - After



SP/H Storage Closets - After



SP/H Supply Storage

- Organization



SP/H Supply Storage

- Removed cabinet doors



SP/H Work Station Variability

- Clutter
- Disorganization
- Missing equipment, tools, supplies
- No standardization
- Misc. slides, blocks, solutions laying around

SP/H Work Station Variability - Before



*Disclaimer: Photo does not depict an actual work station, it is a “close to reality” dramatization created for this presentation.

SP/H Work Station Variability - After



SP/H Other Work Stations

- Cabinet doors removed
- Organized
- Monitored



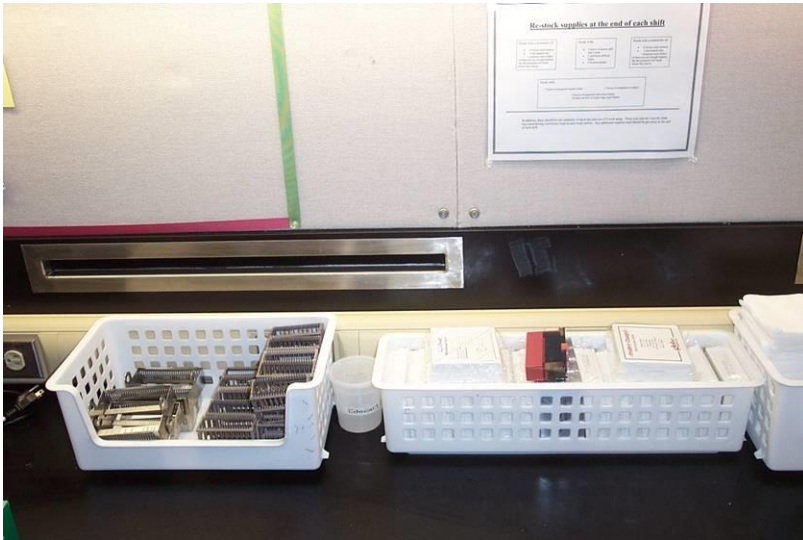
Number	Stain	Solution	Exp Date
1a	Gillette	0.5% Acetic Acid	12/2/10
1b	Trichrome	0.5% Acetic Acid	12/2/10
2	Colloidal Iron	12% Acetic Acid	10/9/10
3	AFB	2% Acid Alcohol	9/30/11
4	Alcian Blue	Alcian Blue 1.0	12/2/10
5	Alcian Blue	Alcian Blue 2.5	12/2/10
6a	VVG	5% Alcoholic Hematoxylin	12/2/10
7	MSB	1% Alcoholic Hematoxylin - Solution A	3/2/11
8	Nuclear Fast Red	5% Aluminum Sulfate	12/1/11
9a	MSB	Aniline Blue	11/11/10
9b	Trichrome	Aniline Blue Solution	7/20/11
10	VVG	1% Aqueous Acid Fuchsin	2/10/11
11	Basic Blue	0.5% Basic Blue 41	1/4/11
12	Trichrome	1% Aqueous Acid Fuchsin	1/22/11
13	Trichrome	1% Stock Biebrich Scarlet Acid Fuchsin	1/22/11
14	GMS	5% Borax	1/22/11
15	Loyez	Borax - Potassium Ferricyanide	12/15/10
16	Trichrome	Borax - Potassium Ferricyanide	3/12/11
17a	GMS	10% Chromic Acid	1/2/11
18	MSB	Chromotrope 2R Solution	11/11/10
19	Colloidal Iron	Stock Colloidal Iron	5/14/11
20	Gerge Red	Saturated Modified Congo Red	12/2/10
21	Cresyl Violet	Cresyl Violet	1/3/11
22	Biebrich Scarlet	Developer	3/2/11
23	Reticulin	2.5% Ferric Ammonium Sulfate	N/A
24	Loyez	4% Ferric Ammonium Sulfate	12/1/10
25	PTAH	5% Ferric Ammonium Sulfate	1/15/11
26	VVG	2% Ferric Chloride	12/1/10
27	VVG	10% Ferric Chloride	12/1/10
28a	Colloidal Iron	20% Ferric Chloride	1/4/11
28b	MSB	20% Ferric Chloride	1/4/11
29	Reticulin	40% Formalin Stock	1/4/11
30	Reticulin	Stock Gomori	1/4/11
31	Gomori	1% Stock Gold Chloride	3/5/11
32	Counterstain	Working 0.1% Gold Chloride	3/5/11
33	Counterstain	4% HCl	12/2/10
34a	MSB	20% HCl	Monthly
34b	MSB	10% HCl	12/2/10
35	MSB	10% HCl	12/2/10
36	MSB	10% HCl	12/2/10
37	MSB	10% HCl	12/2/10
38	AFB	10% HCl	12/2/10
39	Counterstain	10% HCl	12/2/10
40	Counterstain	10% HCl	12/2/10
41	AFB	10% HCl	12/2/10
42	AFB	10% HCl	12/2/10
43	AFB	10% HCl	12/2/10
44	MSB	10% HCl	12/2/10
45	Counterstain	10% HCl	12/2/10
46	Counterstain	10% HCl	12/2/10
47	Counterstain	10% HCl	12/2/10
48	Reticulin	1% Oxalic Acid	5/28/11

SP/H Other Work Stations

- Organization
- Patient Safety
- Flow Chart



SP/H Work Station Variability



SP/H Other Work Stations

- Clean
- Stocked



SP/H Specials and Recuts

- Removed cut-off time for requests
- Services available 24 hours a day
- Improved customer service
- Reduced turn-around time

Bonus:

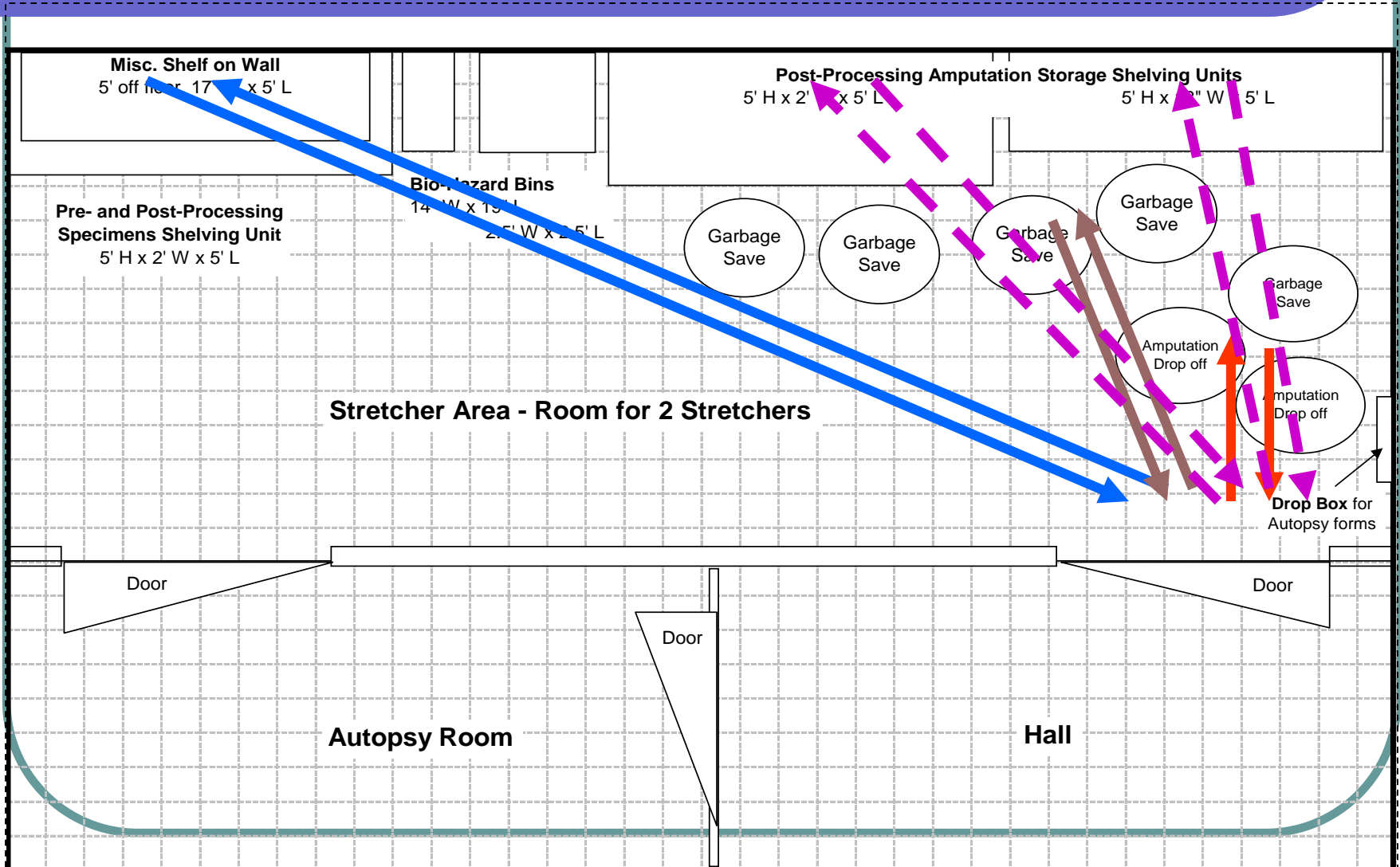
- Allowed all techs, all shifts to remain competent with staining techniques

Spaghetti Map

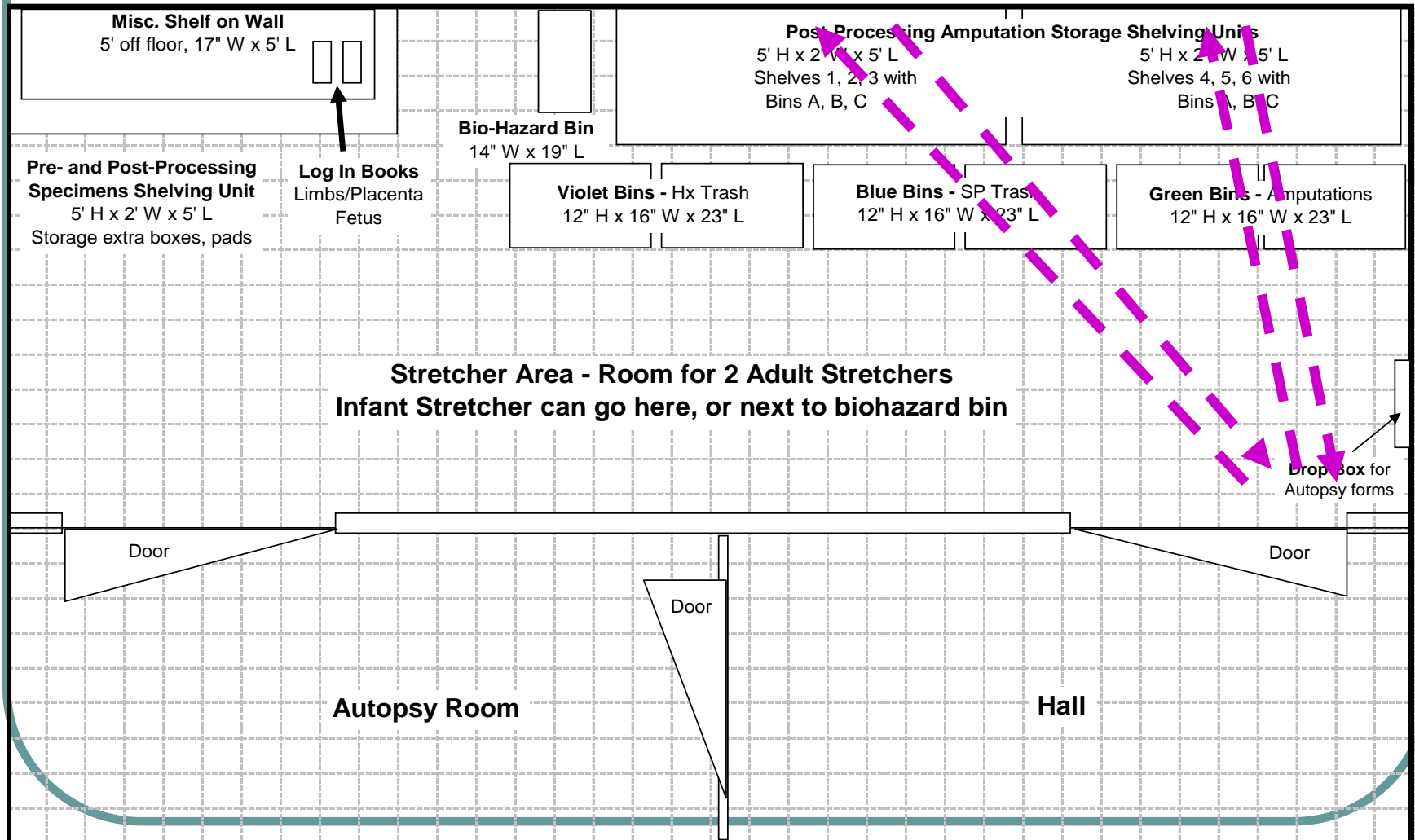
- Map that demonstrates the movement in a process
 - People
 - What's moving (i.e. specimen)



Spaghetti Map – Autopsy Before

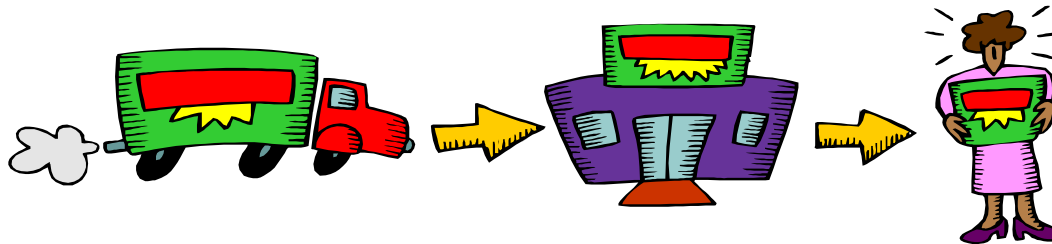


Spaghetti Map – Autopsy After

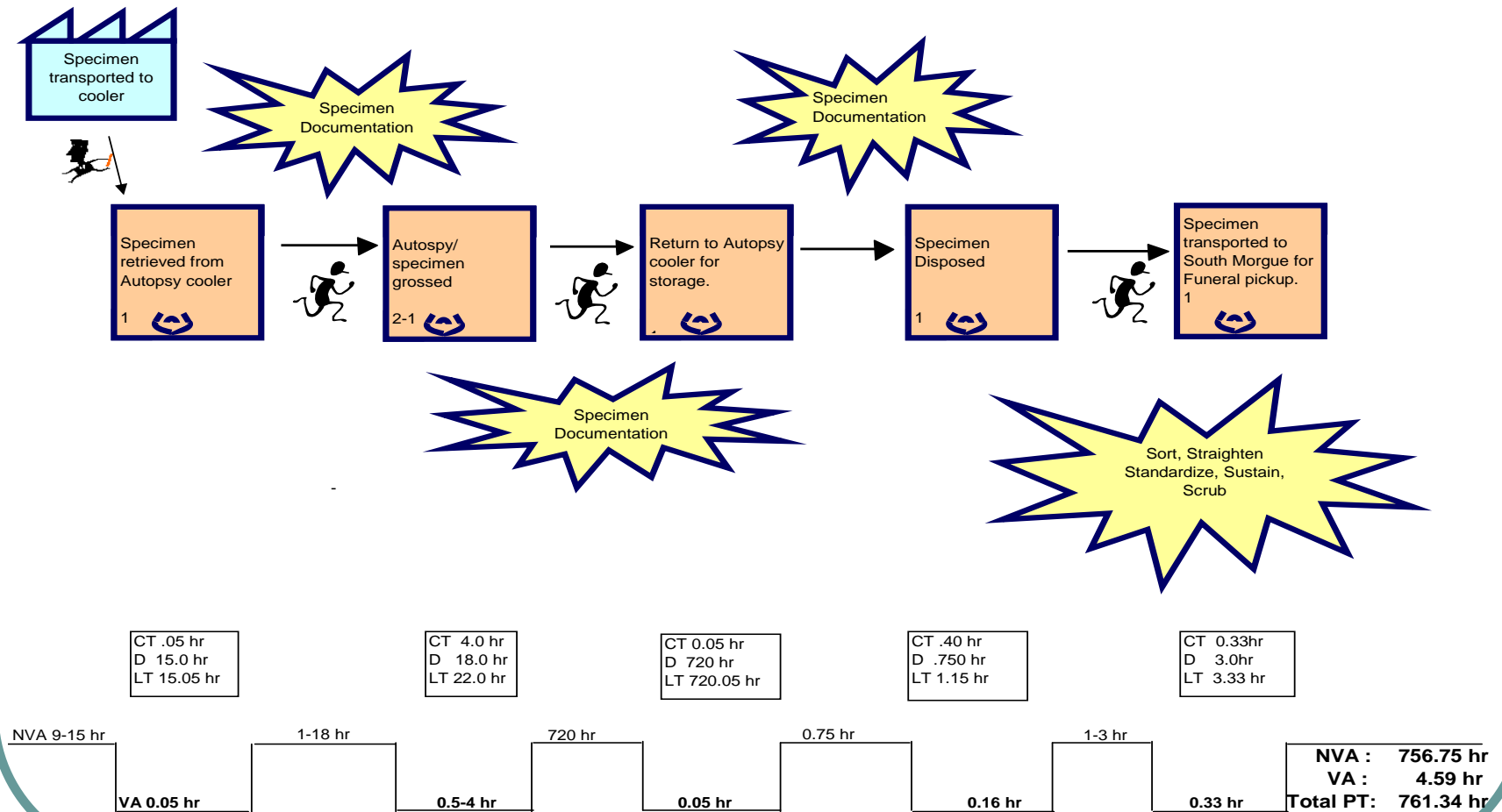


Value Stream Map

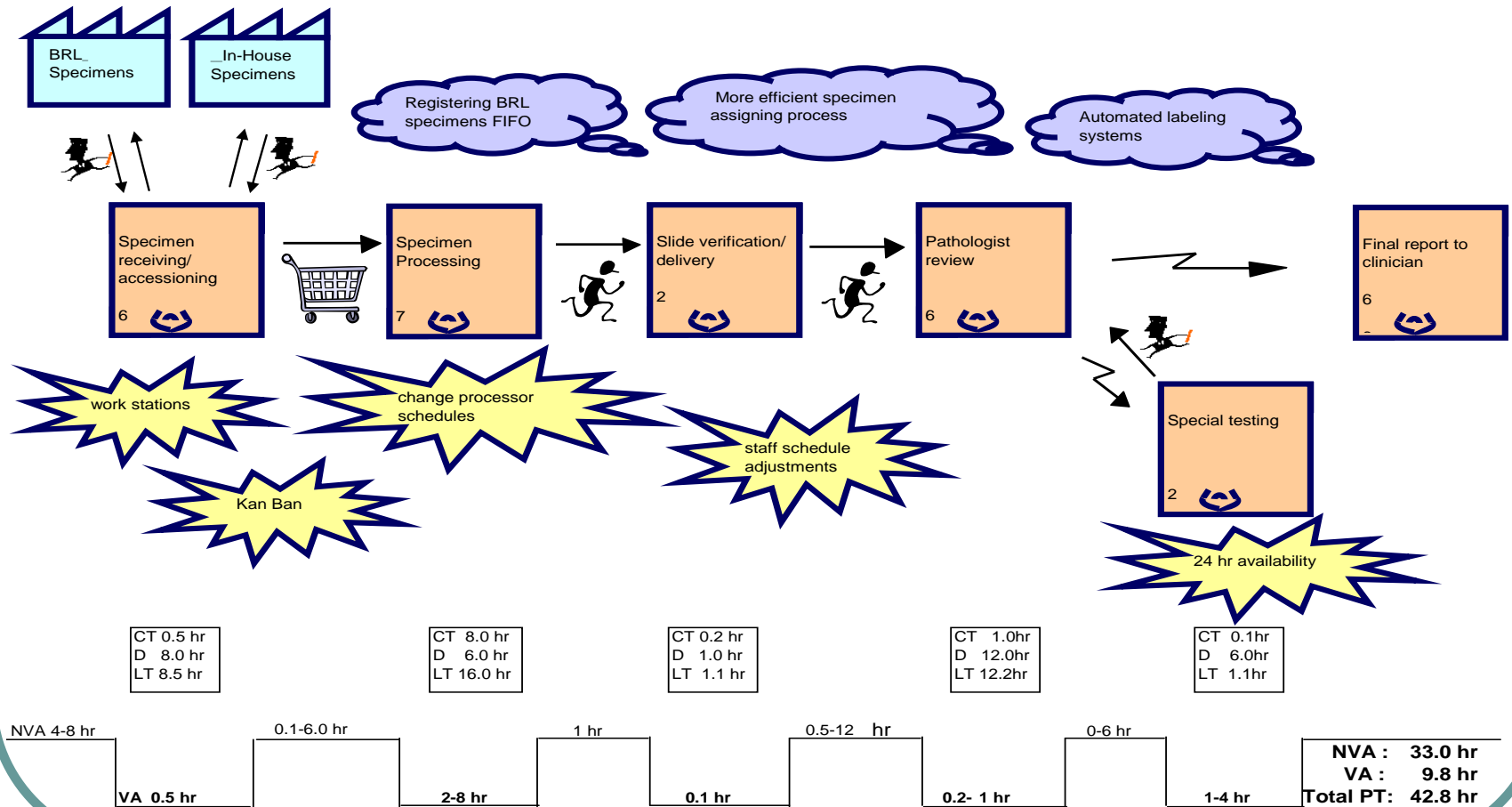
- High detail flow diagram
 - Documents every step of a process
 - Can be used to:
 - Identify waste
 - Reduce process cycle times
 - Implement process improvement



Value Stream Map - Autopsy



Value Stream Map – Surg Path/Hist



Project Improvement Projects/Plans

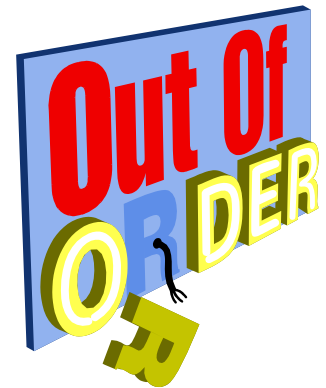
Two Form Examples

- Outreach
- Hospital



SP/H Inventory

- No one took ownership of stock
- Too many instances of running out of stock
- Storage issues
- Ordering issues
- Putting away stock
- Poor organization and unclear responsibilities
- Wasted time, negative affect on workflow



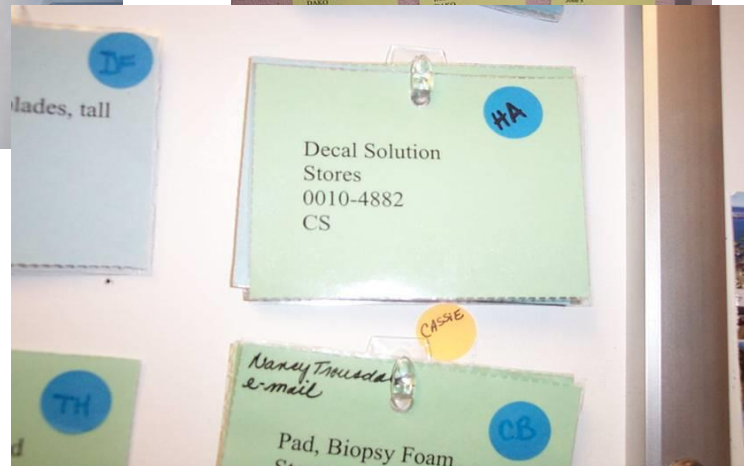
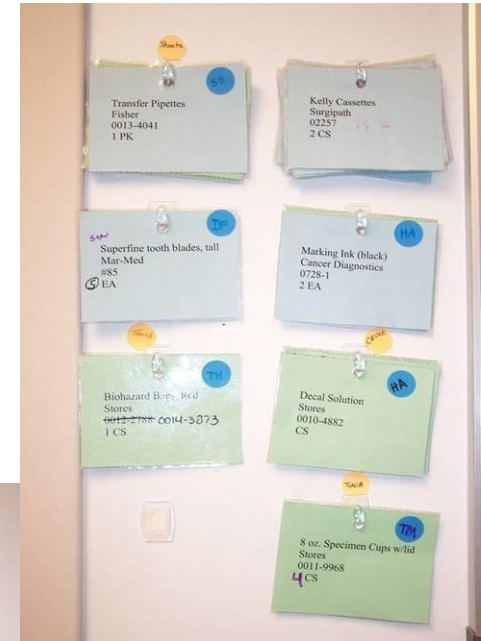
SP/H Inventory

- Kanban – Japanese for reorder card or ticket
- Not inventory system; scheduling system
- Just In Time (JIT) ordering is achieved
- Shared ownership with employees and supervisors



SP/H Inventory

- Kanban Cards



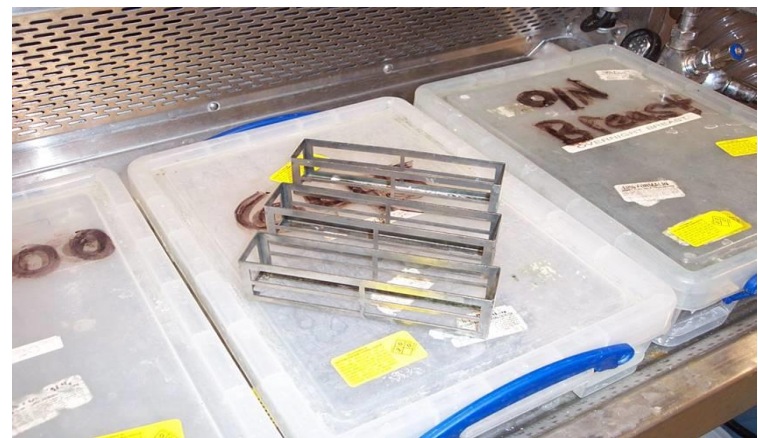
SP/H Processing Schedule

- Processing was in large batches
- Huge amounts of “waste”
- Every process downstream was affected: AKA the CUSTOMER!
- Staffing was affected (PA’s, histotechs, etc.)
- Morale was affected



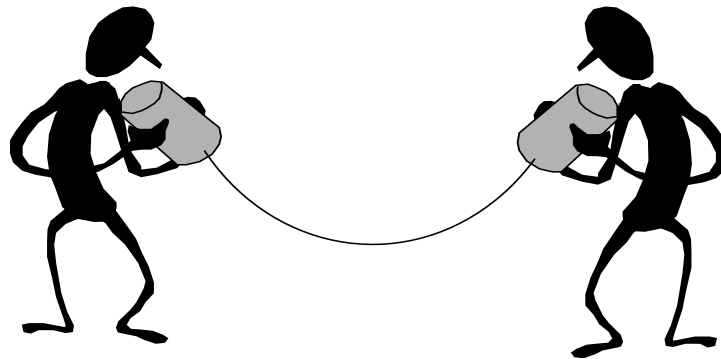
SP/H Processing

- Smaller batches
- Sleeves vs. baskets
- Multiple processing schedules available



SP/H Task Distribution

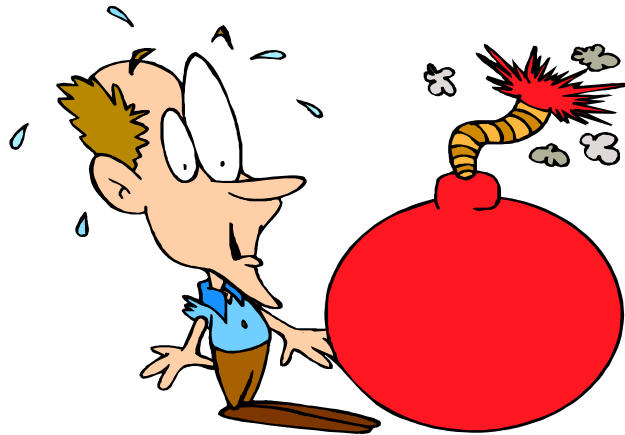
- All shifts took on all responsibilities
- Work was more evenly distributed
- Communication between shifts improved
- Improved customer service
- Reduced turn-around time



Questions?

"One of the true tests of leadership is the ability to recognize a problem before it becomes an emergency."

- Arnold H. Glasgow



References

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