Process Excellence (PEx)
&
The Basics of Lean Thinking

Steve Friedland
Managing Principal
OCD ValuMetrix Services

Ortho-Clinical Diagnostics
a Johnson & Johnson company

Objectives

- Learning Objectives
  - Review the basic concepts of Process Excellence and Lean Thinking
  - Using Lean thinking to deliver breakthrough results within a hospital or clinical laboratory setting

A View from the Top Corporate Culture

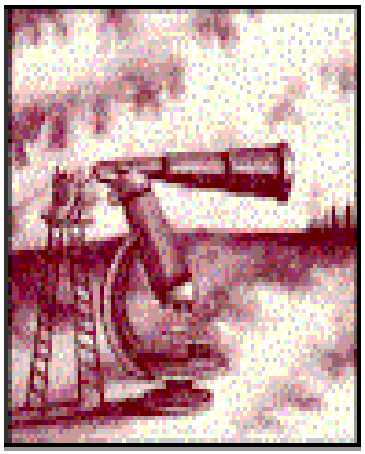
"We will be the **Best** and **Most Competitive** Health Care Company in the World and **Sustain** that position through Process Excellence with the use of its **Assessment** and **Improvement** Methodologies. This Company will **Never Rest** in its Pursuit of Excellence."

Bill Weldon, Chairman
Johnson & Johnson

Components of PEx

Process Excellence

Assessment



Improvement

- Lean Thinking
- Metrics
- Six Sigma
- Design Excellence

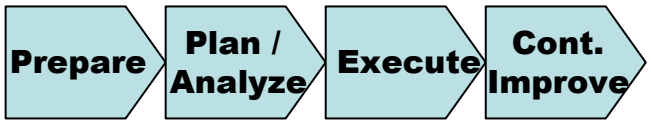
Recognition

Leadership:
Creating the environment for success.

Methodologies 2 of 2

Lean Thinking

Road Map to Lean

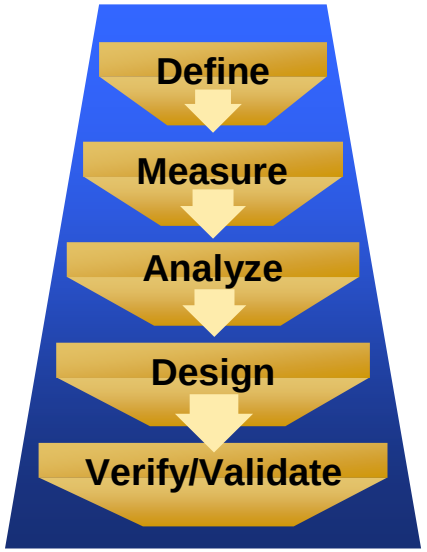


The relentless effort to systematically reduce waste while improving the flow of value to the customer.

Six Sigma

The relentless effort to systematically reduce variation and eliminate defects.

Design Excellence



Proactively applying all of the concepts in the design & development processes.

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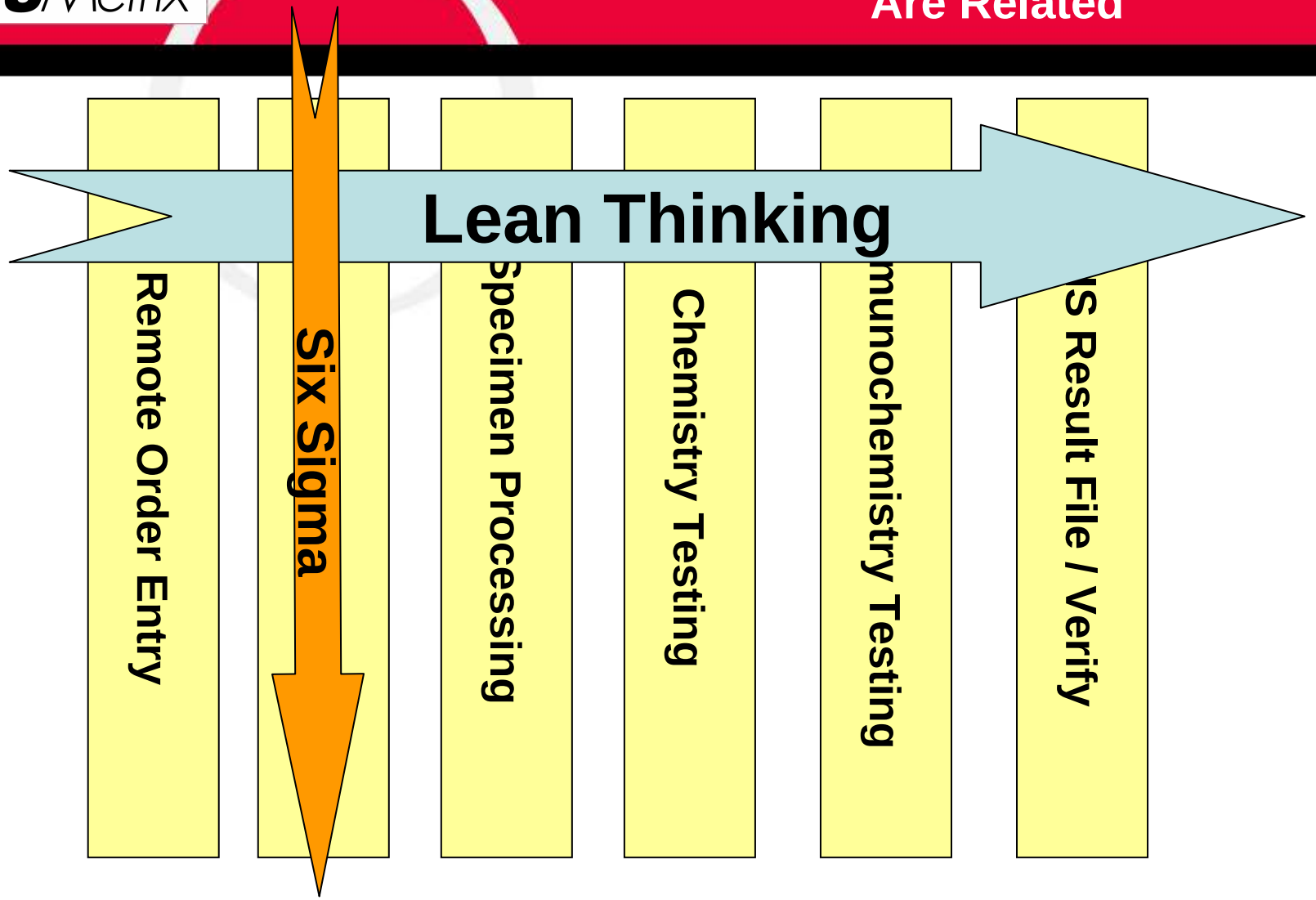
Continuous Improvement

- The goal is not to implement tools
- The goal is to create a culture of excellence for both customer service and process design
- The tools are merely methods for analyzing and improving situations in a systematic way

ValuMetrix Healthcare PEx Approach

- **Assess**
  - For base condition and % ROI
- **Start with Lean**
  - Eliminate waste before attacking variation with six sigma
  - Project Based (Full Value Stream in 8 –14 weeks)
  - Scope first projects for big organizational wins
- **Select the right team**
  - 4-6 member team dedicated 100% of the time
  - 2-3 from the department, 1-2 as next project team leaders
  - Identify and groom future PEx leaders
- **Senior management involved**
  - Steering Committee
  - Change management / Communication plan
  - Training – Leadership, Managers, Department
- **Cycles of Learning and knowledge transfer**

How Lean and Six Sigma Are Related



PEx Project - Typical Benefits

- 30-60% reduction Turn Around Time (TAT)
- 20-40% reduction in floor space requirements
- 20-30% improvement in equipment capacity
- 20-50% improvement in productivity
- 10-30% reduction in inventory
- Increased quality through reduction in defects
- Financial savings
- Organized workplace / manageable workload

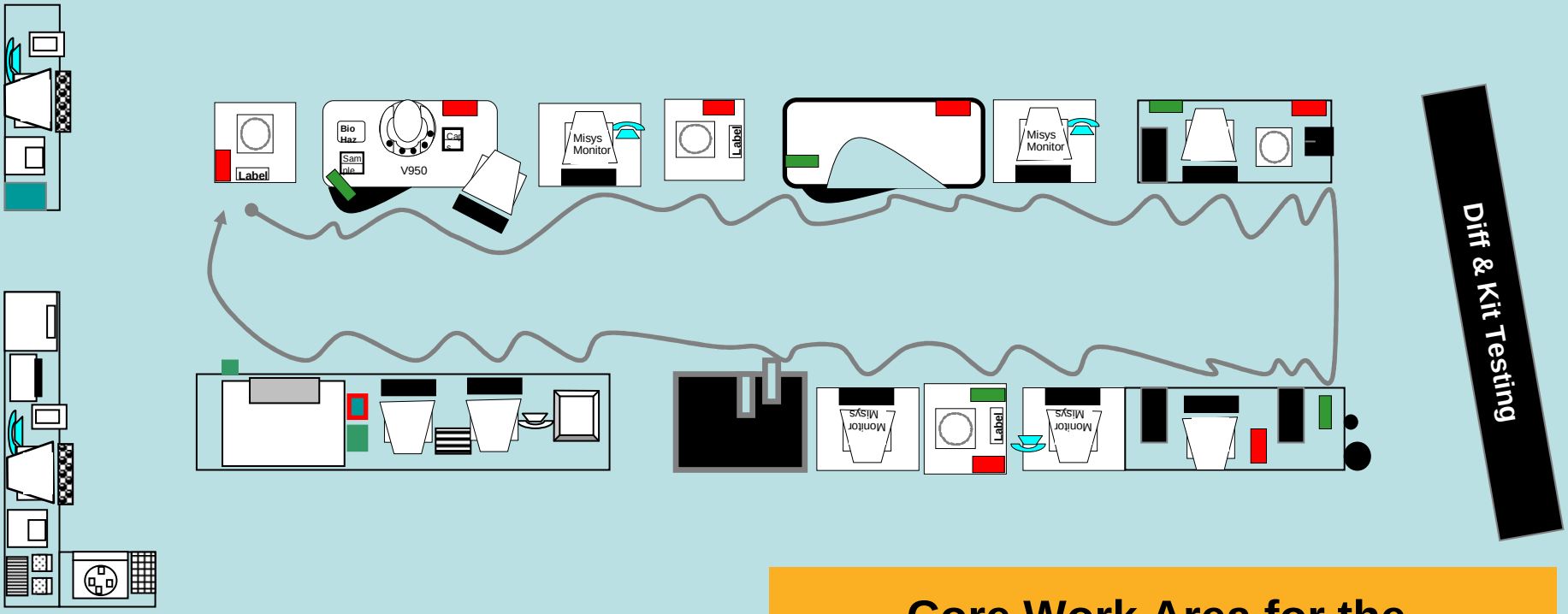
Lean – Basic Concepts

- Voice of Customer drives operational decisions and design
- Flow of customers and product in a single direction
- Level Loading - Can adjust production rate with more people – staff to demand for TAT metrics
- Standard Work -Tools and inventory all standardized and in order of use
- Visual Management systems and real time Performance Measures in place
- Operator walk patterns dramatically reduced
- Wait times eliminated or dramatically reduced

Case Study
Fairview Southdale

After LEAN

One person walking 6 cycles in 30 min and operating 6 work stations



Core Work Area for the Clinical Lab Scientists who perform 90% of all Lab tests

Post-project Productivity

Area	Before	After	% Improve
Phlebotomy (M-F, day shift)	10 FTE	5 FTE	50%
Core Lab (M-F, day shift)	8 FTE	4 FTE	50%
Total Lab	62 FTE	51.2 FTE	20%
		(target – 58)	(actual daily staffing deduction of 35%)

Collection to Result

Compliance within 30 min.

- Hemoglobin
  - Pre Lean: 40%
  - June 2005: 91%
- Potassium
  - Pre Lean: 12%
  - June 2005: 96%
- PTT
  - Pre Lean: 5%
  - June 2005: 94%

Summary of Benefits

- Testing thru-put (TAT) reduced by 50%
- Productivity improvement >40%
- Cost reduction at 28%
- Space savings of >450 ft2
- Standardized work practices
- Reduction in Errors and Error Potential
- Performance measurement
- Elimination of excess unused inventory ($16,100)
- Elimination of visual noise
- 100% cross-training of staff

Additional Benefits

- Development of a **core team of people** that has implemented “Lean Manufacturing” and are therefore available to **spread the benefits** organizationally
- **Standard Work** and Standard performance measurement tools developed
- 2004 employee engagement score in clinical lab rose by 0.48 on a 5 point scale
- **Laboratory recognition** from customers
- Laboratory recognized as a pioneer within Fairview

Ohio Health OR Projects

OR Projects

- Decreased wait time for case cart supplies from 11 hrs to 1.5 minutes
- Patient discharge cycle time
  - From 6 hours to 2.2 hours (63% reduction)
- $2.5MM cost and revenue benefits

Salad / Sandwich Line Results – 1/26/05

Baseline Metrics Salad

Operators	2
Units Per Day	300
Units Per Operator	150
Space	300 sq. ft.

Baseline Metrics Sandwich

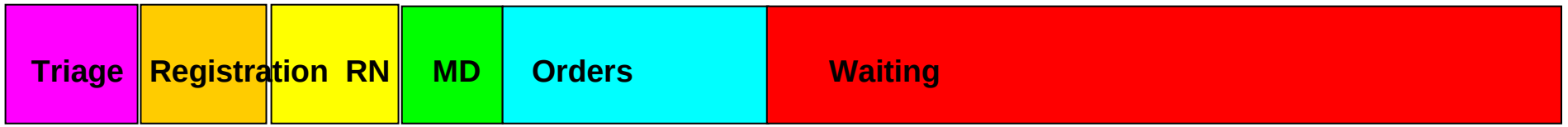
Operators	6
Units Per Day	1,050
Units Per Operator	175
Space	448 sq. ft.

Lean Metrics Salad and Sandwich Combined

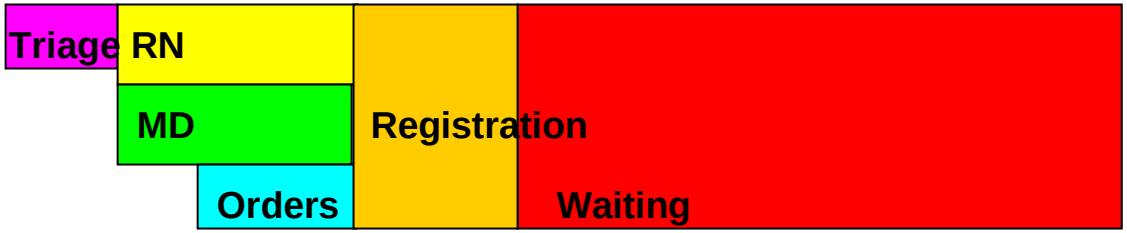
Operators	3	-62.5%
Units Per Day	1,639	+17%
Units Per Operator	546	+69%
Space	375 sq. ft	-50%

ED Patient Flow

- Before Lean
  - Average length of stay 2 hours, 20 minutes



- After Lean - 29% faster
  - Average length of stay 1 hour, 54 minutes



Lean Mission

- Recognize and Identify Waste
- Have the Courage to Call it Waste
- Have the Desire to Eliminate it
- Eliminate the Waste
- Understand that Waste simply:
  - Raises cost
  - Produces no corresponding benefit
  - Threatens all of our jobs

You get what you expect and you deserve what you tolerate!

Lean Definitions

Value is always defined by the customer

Value Added Activity

An activity that transforms the material or information to meet customer requirements.

Non-Value Added Activity

Those activities that take time or resources, but do not add to the customer requirements.

Types of Waste

Over Production	(Doing more than you need to - output of a process)
Waiting	(Things just don't happen when they should)
Transportation	(Shipping stuff to different locations)
Inventory	(Keeping stuff on-hand when it isn't required)
Processing	(Doing more than you need to - within a process)
Motion	(Excess movement - person/material - within a process
Defects	(It just doesn't meet expectations)
Intellect	Wasted human potential

Goal is Flow

Flow – In Lean terms

- Actions that create value without:
  - Interruptions
  - Waiting
  - Barriers/Detours
- Keys to making product / process flow:
  - Eliminate batches
  - Co-locate operations throughout the supply chain
  - Improve quality of product (6 sigma)

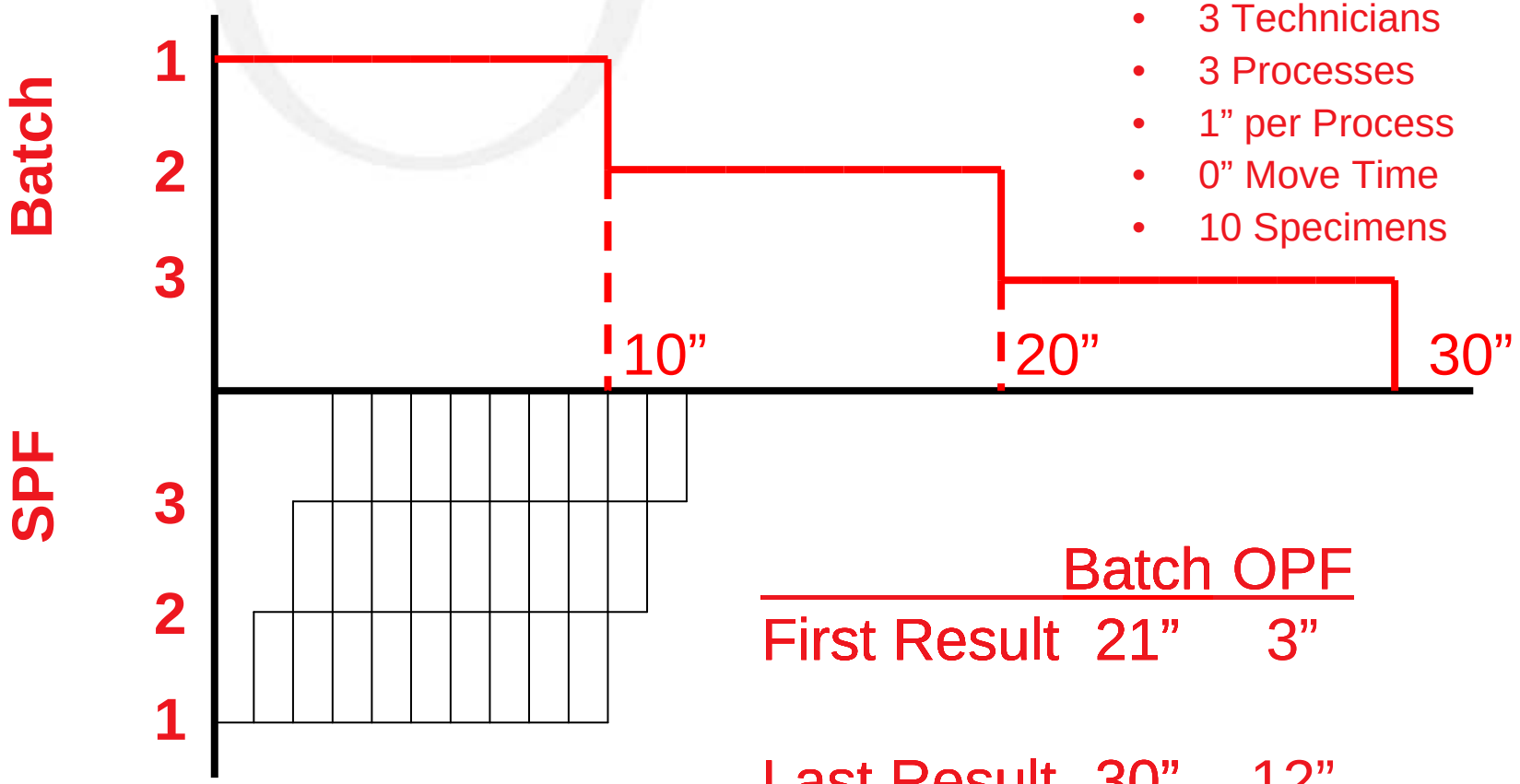
The Ultimate Goal is Single Piece Flow and the Level Loading of Work

Batching Prohibits Flow

Batch is the Enemy of Flow

Single Piece Flow

- Assumptions:
- 3 Technicians
- 3 Processes
- 1” per Process
- 0” Move Time
- 10 Specimens



	Batch OPF	
First Result	21”	3”
Last Result	30”	12”

Source – SMC Consulting – M. Jamrog

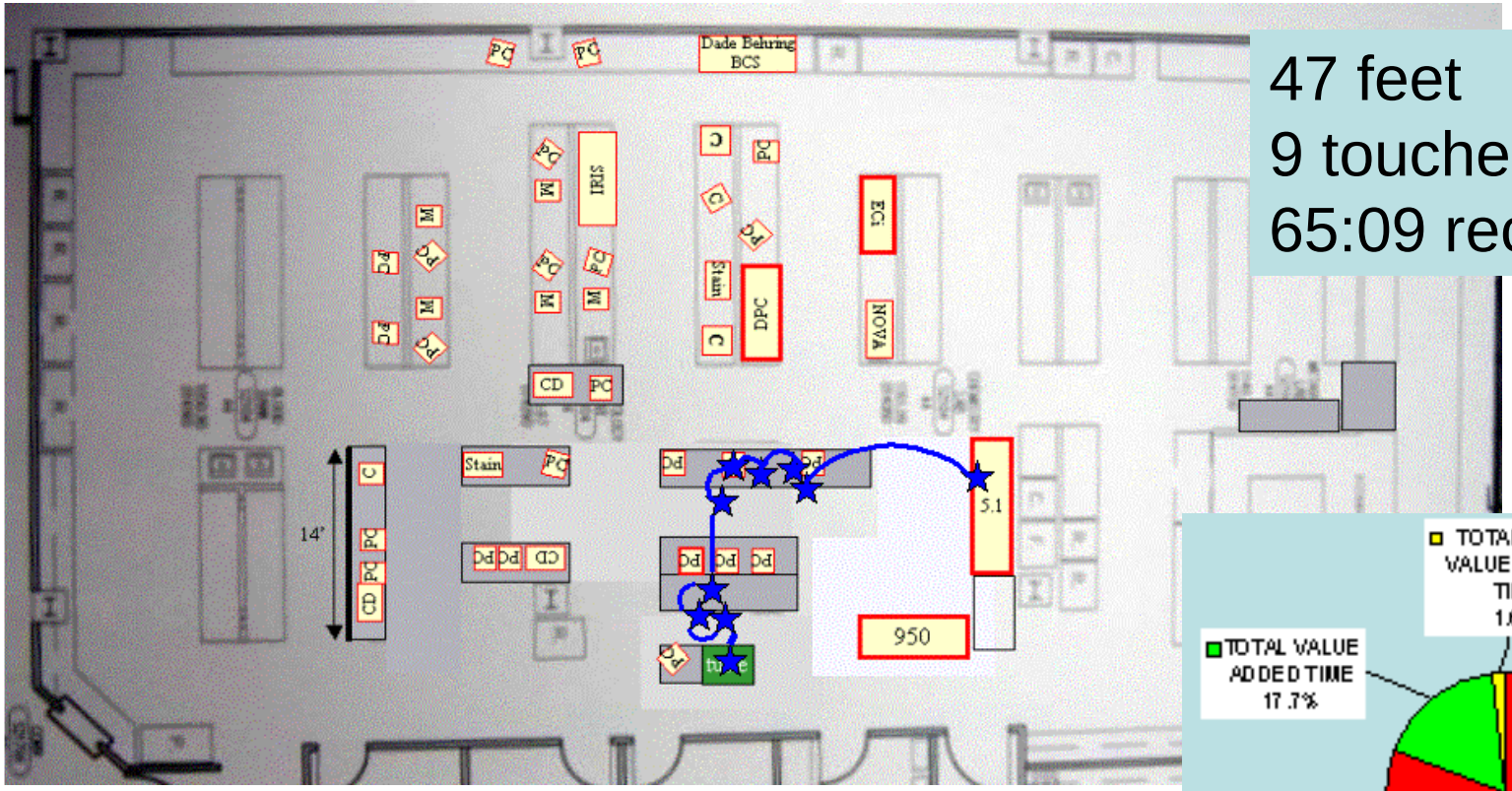
Understanding the Current State

- Activity of the Product / Patient
- Activity of the Operators / Care Givers
- Facility/Department
  - Structural Layout and Department Design
- Inventory
    - Non productive inventory
    - Point of use and stocking levels
- Tool Presentation & Visual Management
- Standard Work
- Performance Measurements

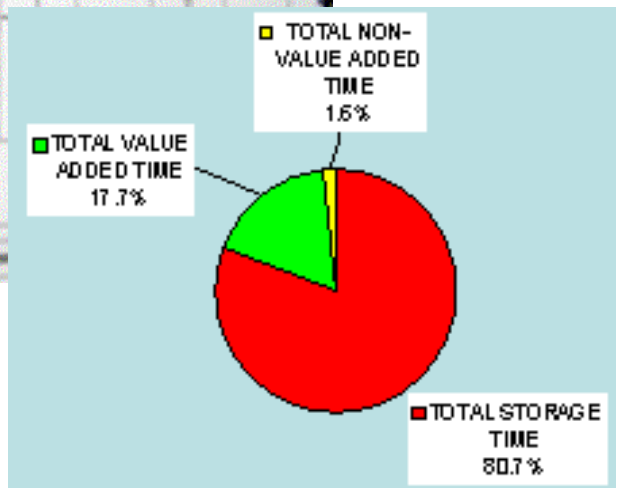
Activity of the Product

Identifying Waste

Product Flow
Tube to Chem (#1)



47 feet
9 touches
65:09 receipt to result



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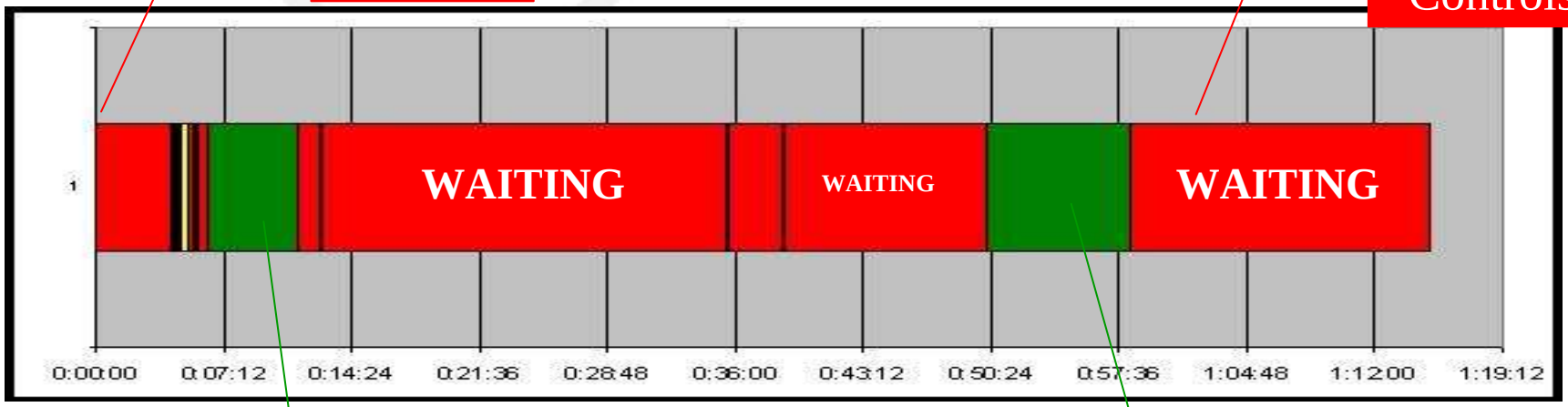
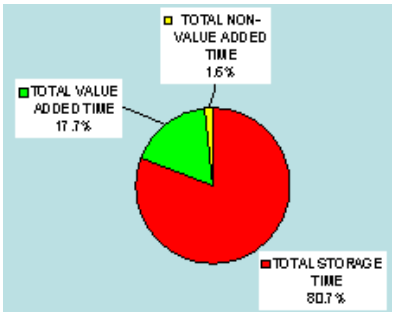
Timeline
Tube to Chem (#1)

Tube Arrival

Wait for Controls



Centrifuge



On Instrument

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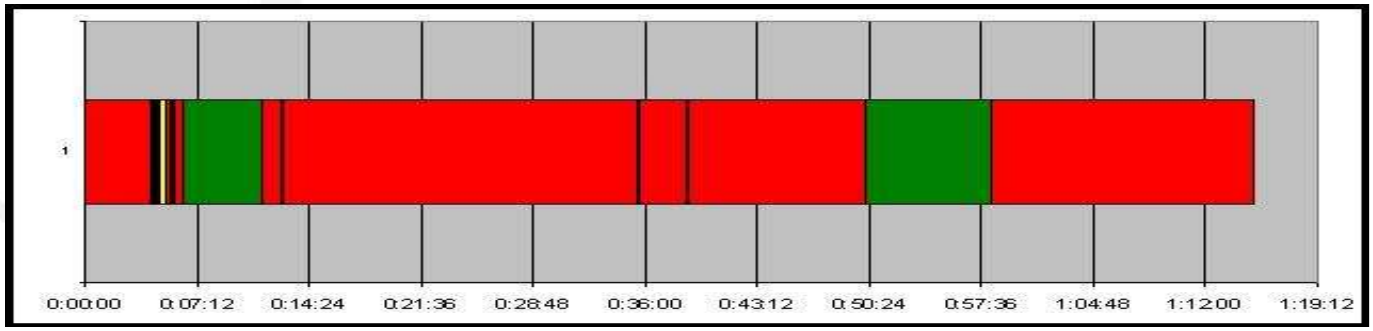
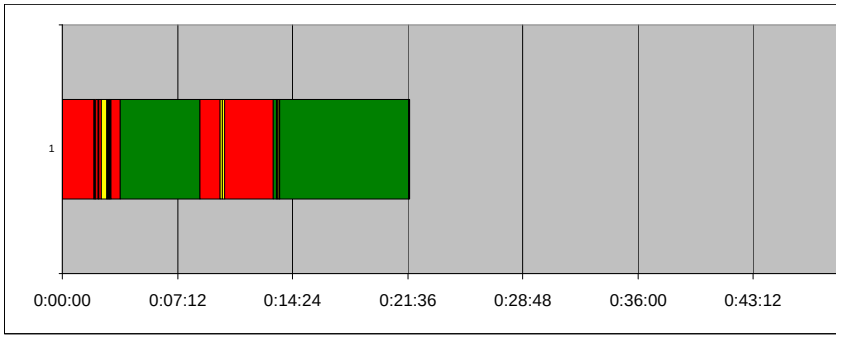
Timeline
Tube to Chem (#1)

Current State



Future State

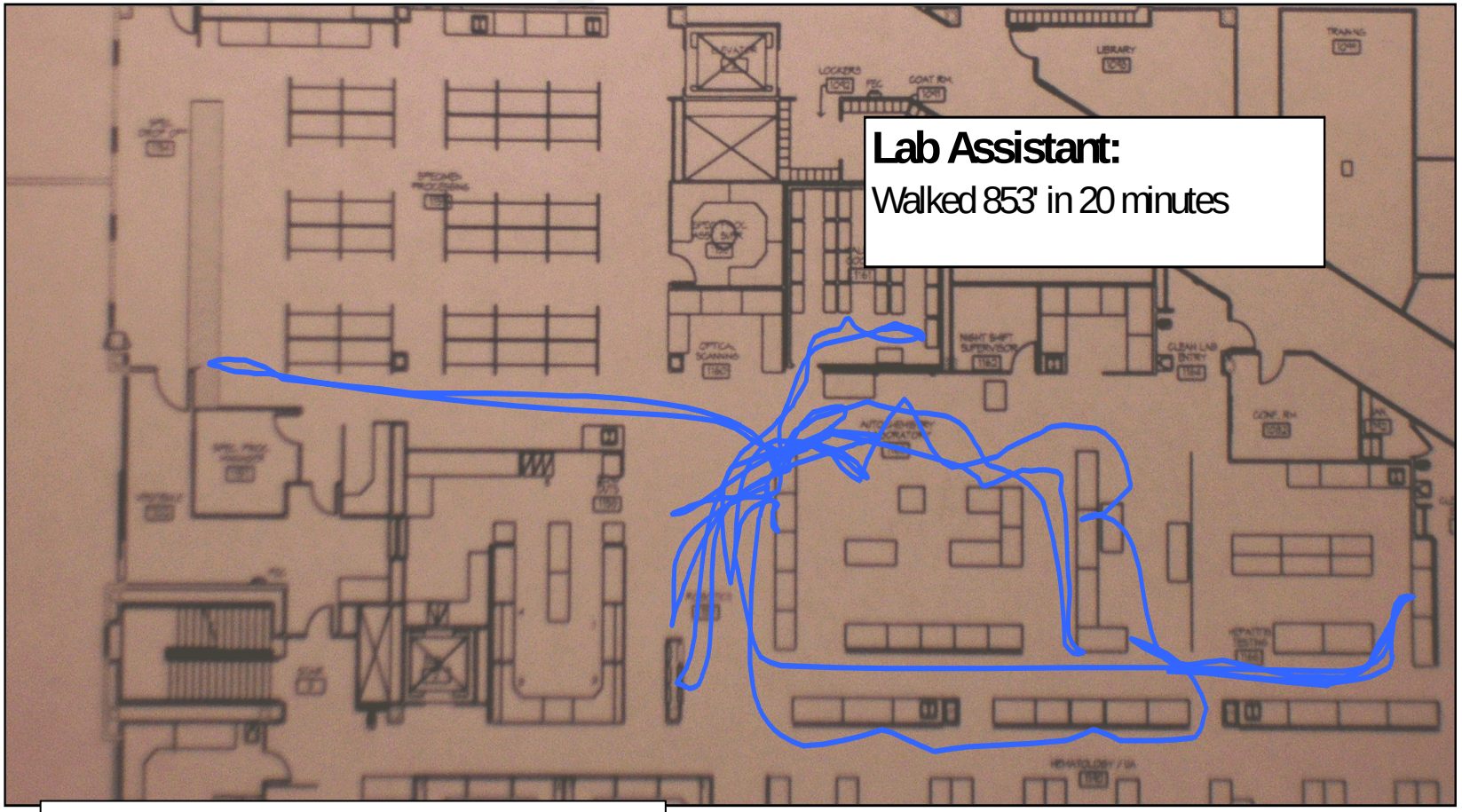


ACH Lab has opportunity to reduce chemistry TAT by 71%

Activity of the Operator

Identifying Waste

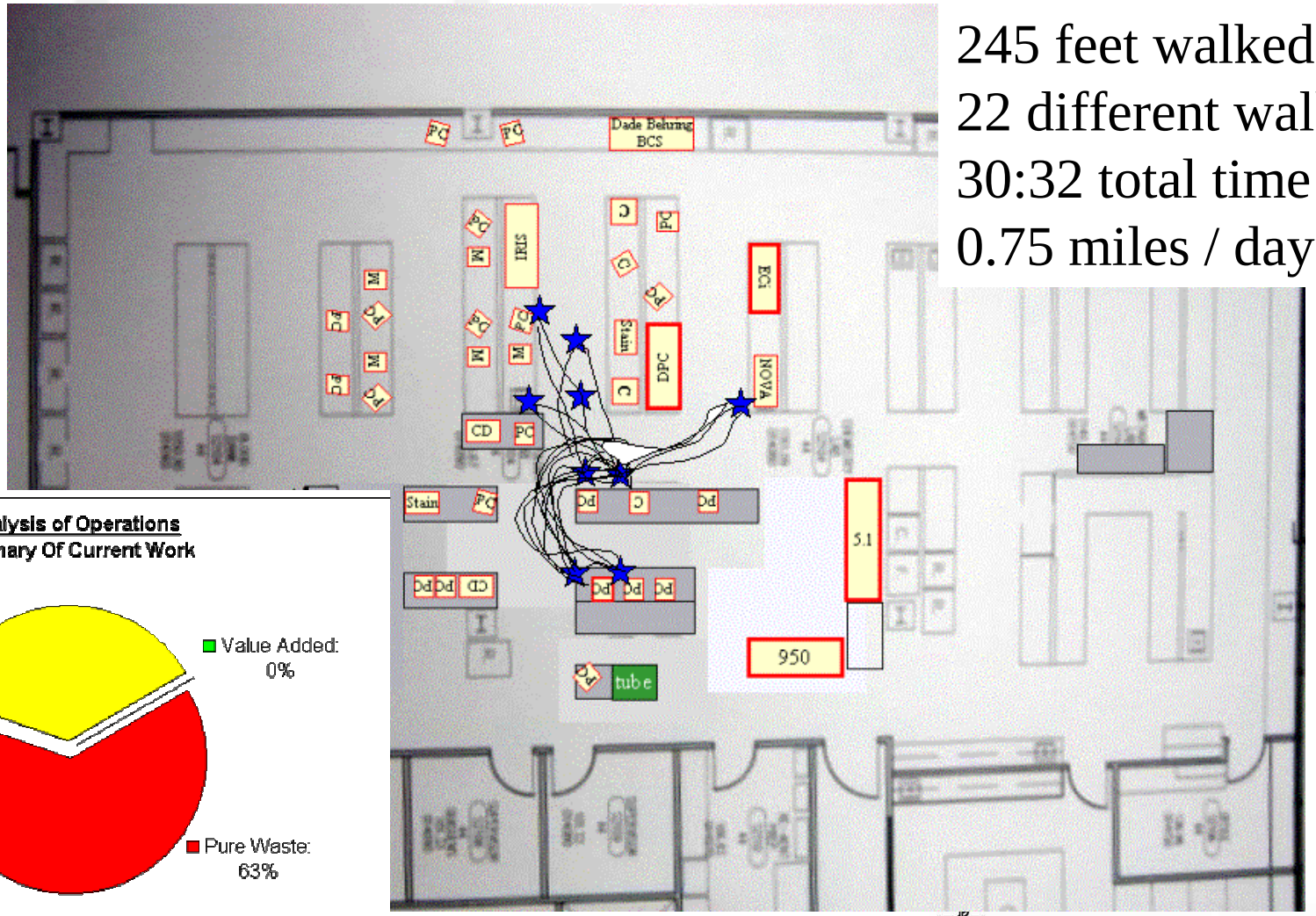
Processing Area



Walk Pattern – Lab Assistant

Specimen Processing (#3)

245 feet walked
22 different walks
30:32 total time
0.75 miles / day



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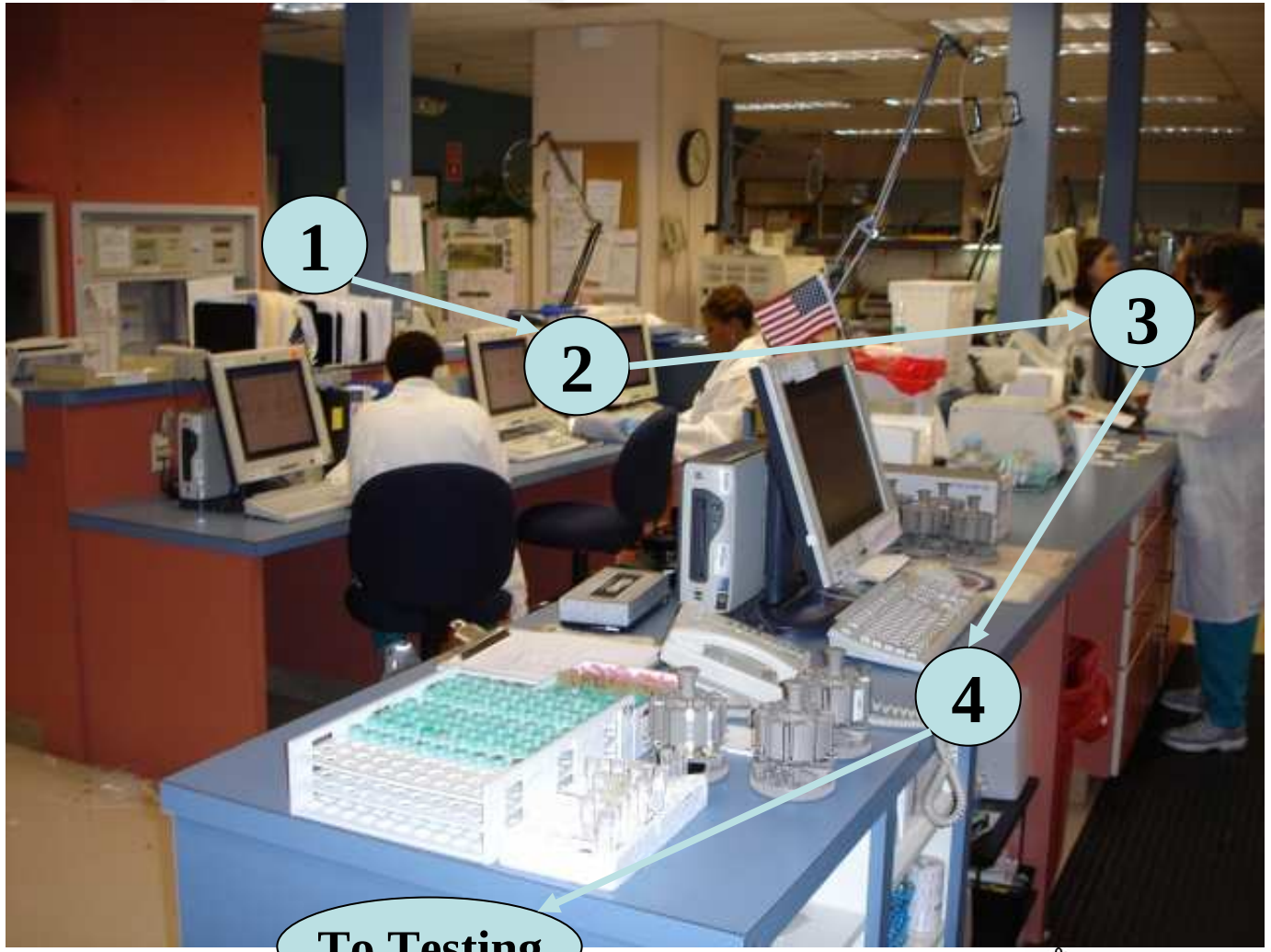
Four Steps Between Tube and Testing



Specimen Processing (#3)

	Current State	
	Time	% Total
Value Added:	0	0.0%
Pure Waste:	1,163	63.5%
Required Waste:	669	36.5%
Total:	**1,832**	100.0%

VA: None

Pure Waste:
Waiting for work
Shuffling items
Looking for missing paperwork

Required Waste:
Walking,
Loading & Unloading Centrifuge
Paperwork & Labeling
LIS Data Entry
Moving tubes

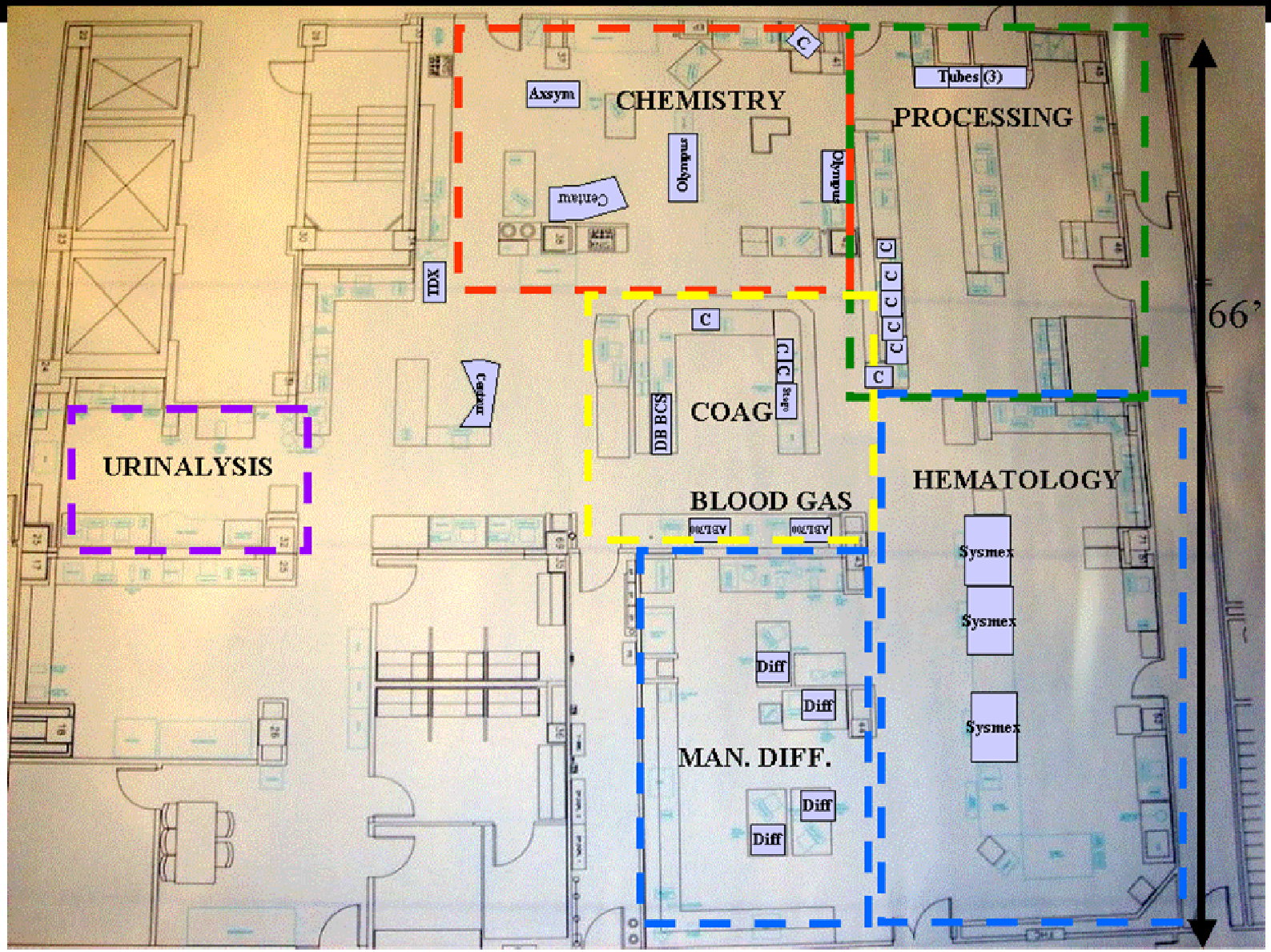
FACILITY

Structural Design

and

Equipment Layout

Structural Layouts
Drive Waste



Poor Facility Layout

Does the current layout impede flow?

nostics
company

Poor Facility Layout

- Layout / Workstation Design
  - Does the structure support a standard?

Lean Assessment Findings

Space Utilization

Inventory

Non-Productive Inventory

Poor Inventory Management

When do I reorder?

How many do I need?

Any visual controls?

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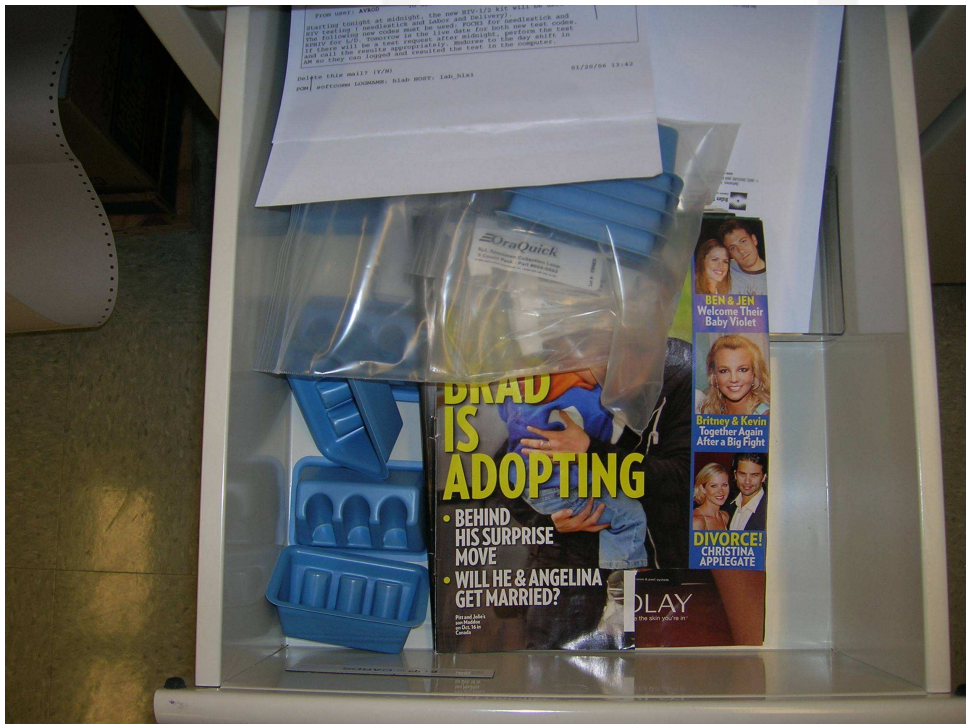
Bench Level Inventory



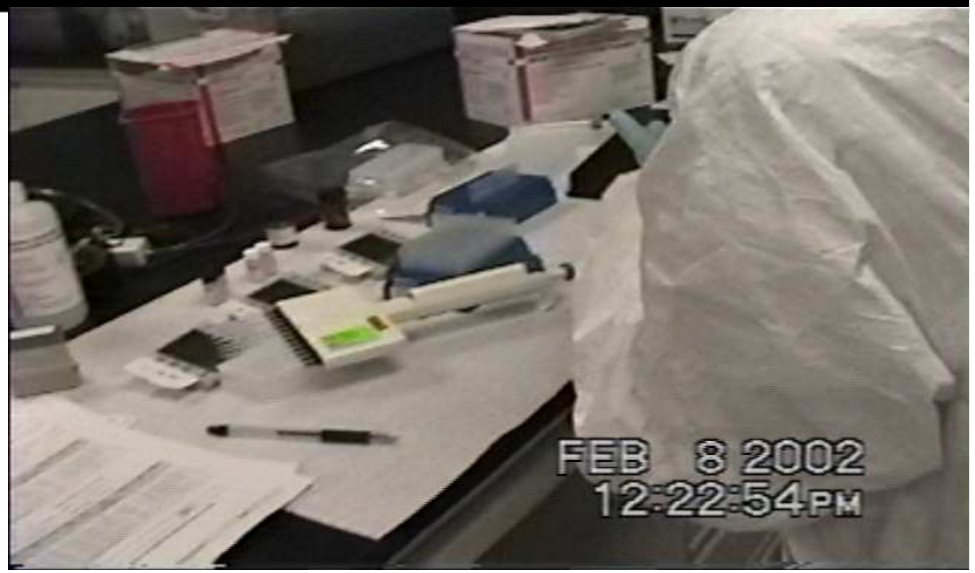
OR Disorganization
Doors, Drawers, Closets

Tool Presentation
and
Standard Work

Poor Facility Layout

- Workstation Design
  - Lack of Standard Work

Tool Presentation and Standard Work

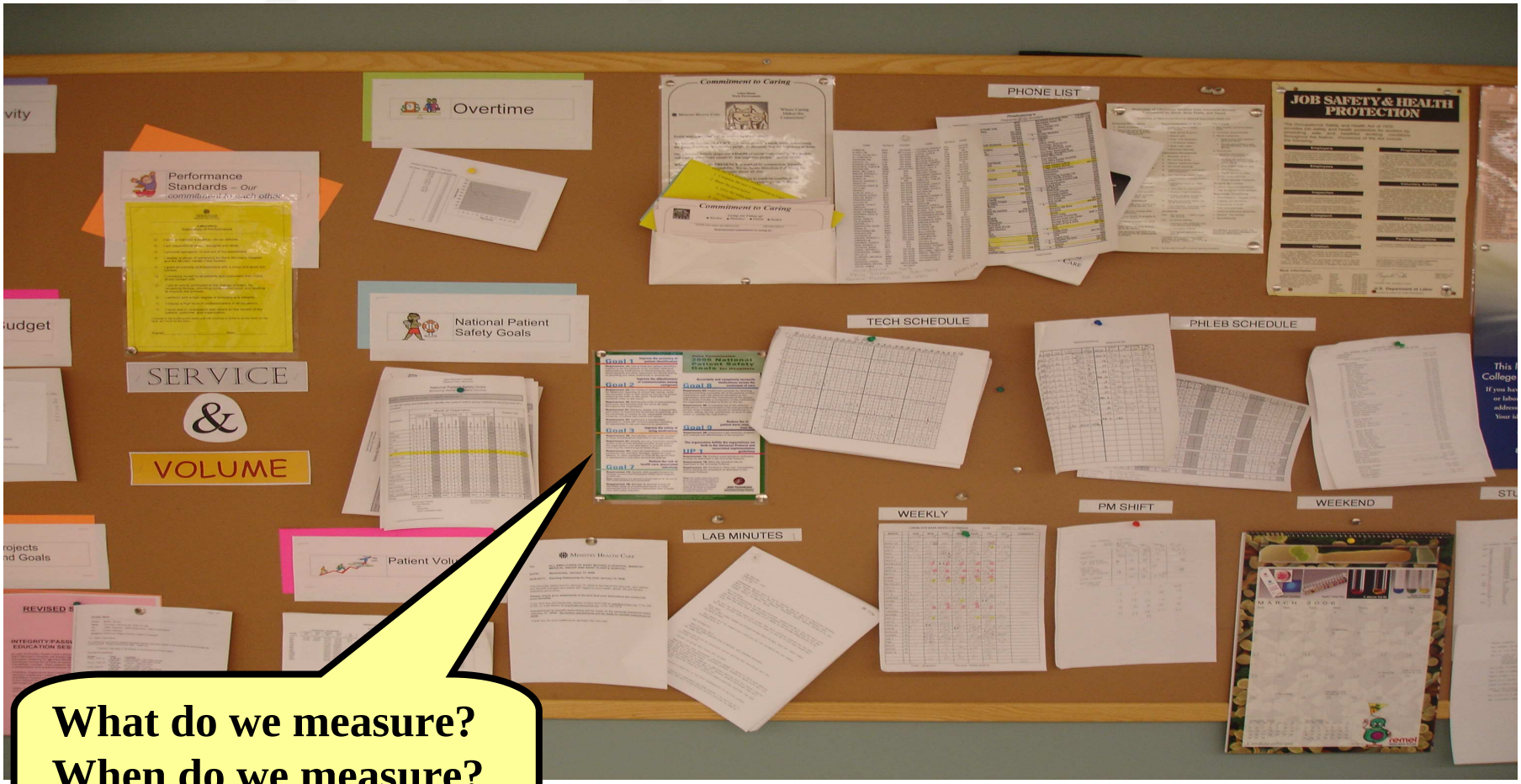


Tool Presentation and Standard Work

- Layout / Workstation Design
  - Equipment/Supply presentation

Performance Measures

Performance Measures



What do we measure?
When do we measure?
Who's accountable?

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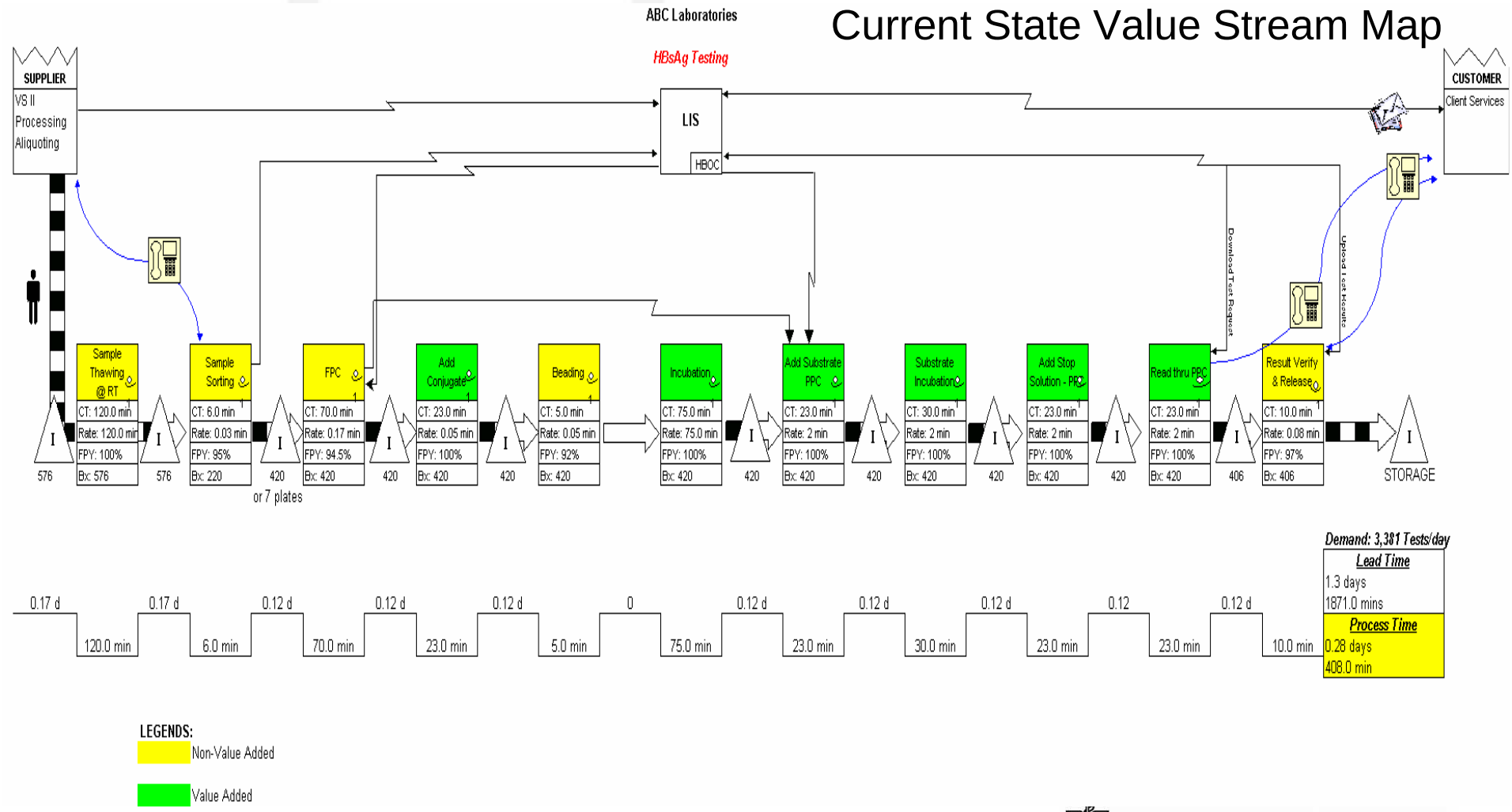
Our Approach to PEx

Project Flow

- Identify the Value Stream
- Activity of the Product / Patient
- Activity of the Operator / Care Giver
- Facility / Department
- Inventory
- Tool Presentation & Visual Management
- Standard Work
- Performance Measurements

Identify The Value Stream

Current State Value Stream Map



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Remove Barriers

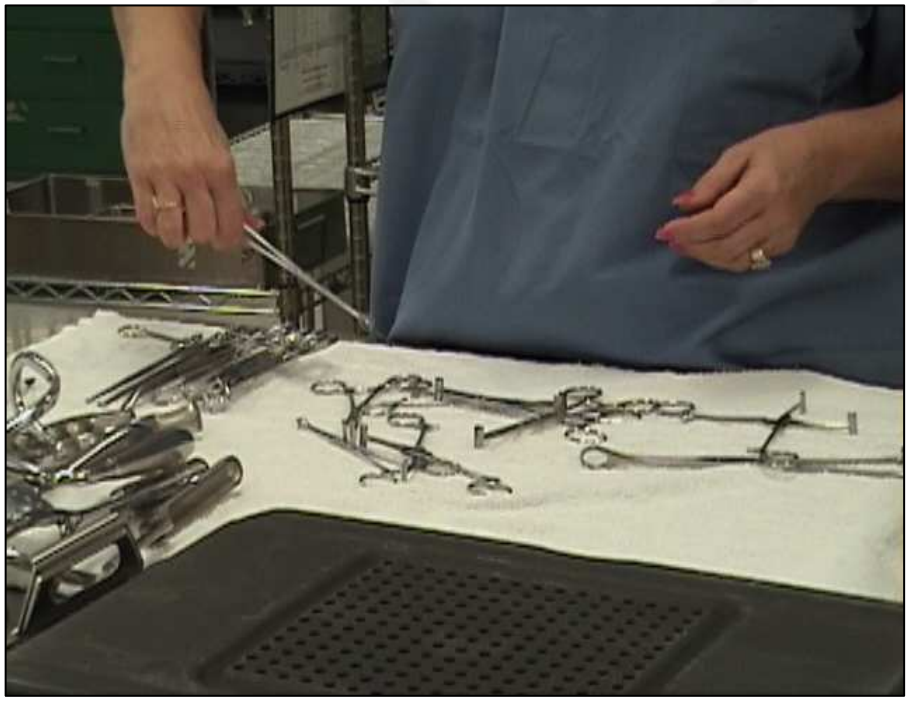
80-90% Testing Cell

Before

After

Design Standard Work

Before



After

Workstation Layout

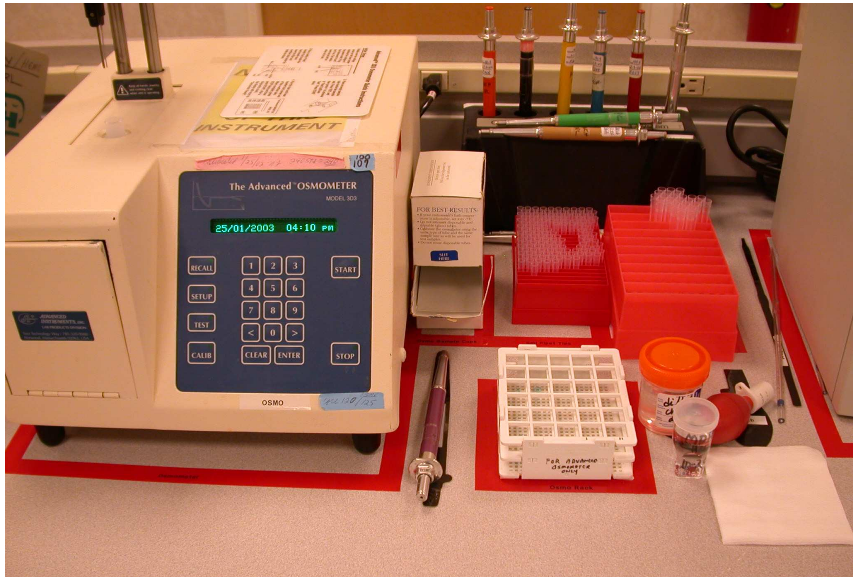
Mistake Proof

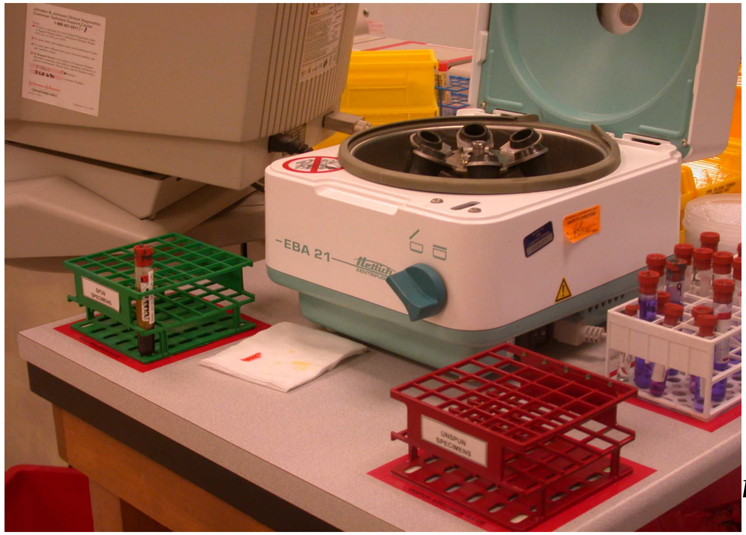
Standard Tool Presentation

BEFORE

AFTER

Standard Tool Presentation





Establish Visual Controls

Visual Control Management System

Facilitator Assistance

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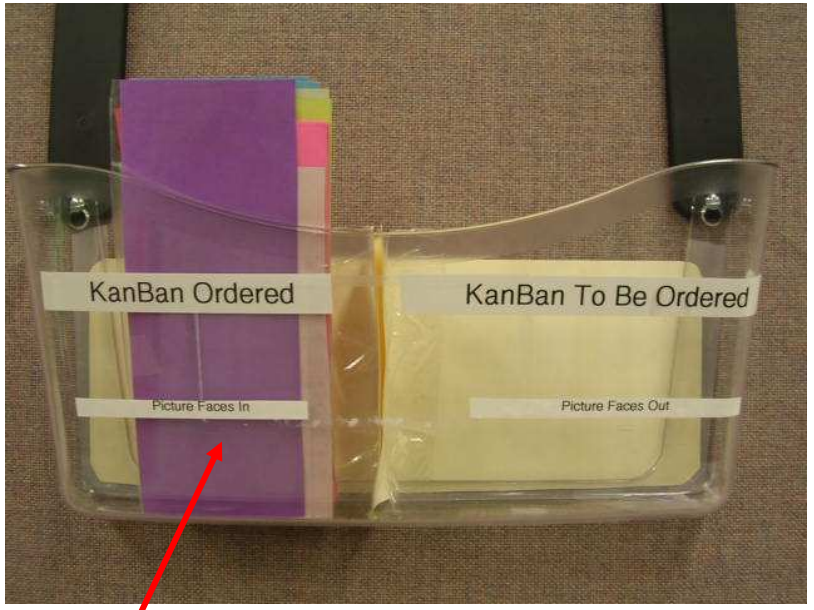
Visual Controls

Inventory Control

KanBan Systems Visual Control Management

Reorder Point



Items for Order

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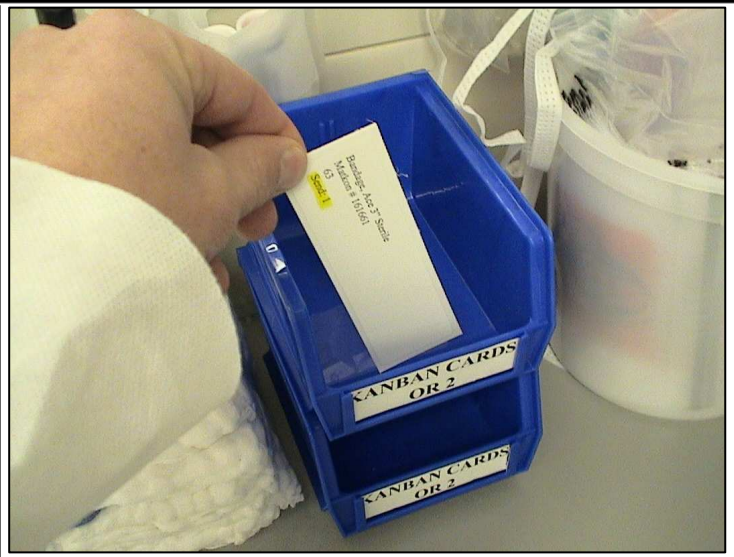
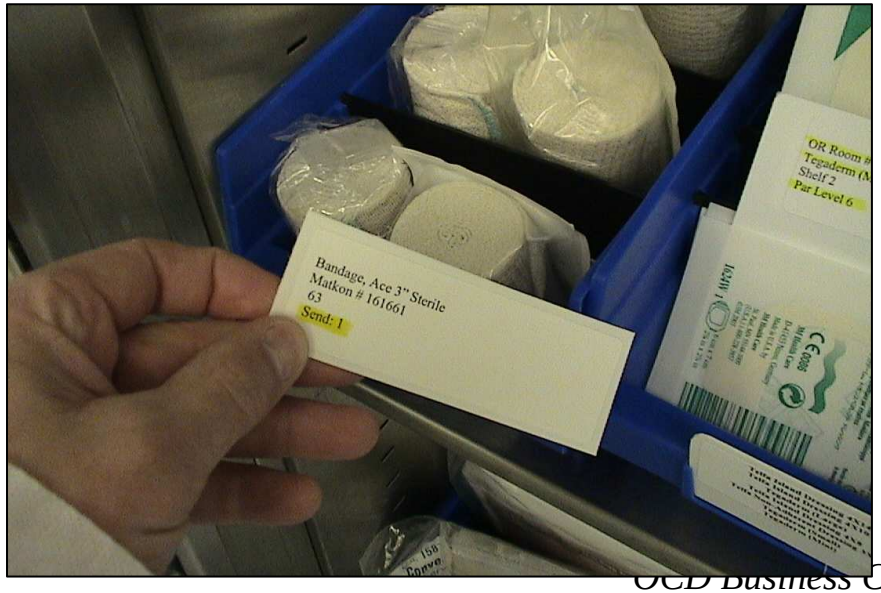
Inventory Pull Systems





- FIFO
- Two bin replenishment
- Visual controls
- Material handlers

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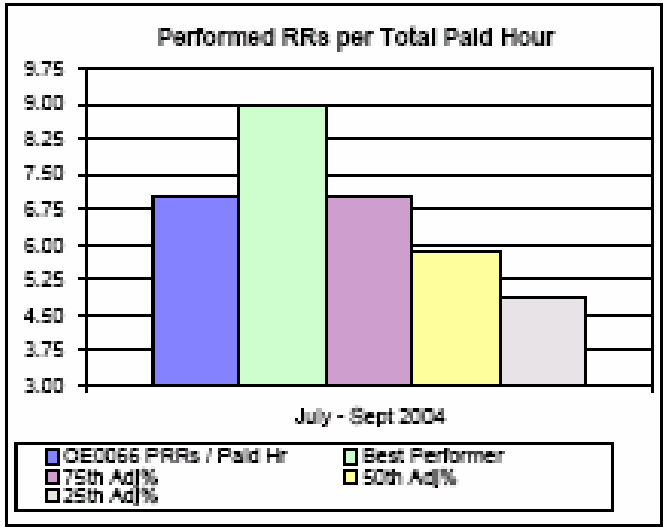
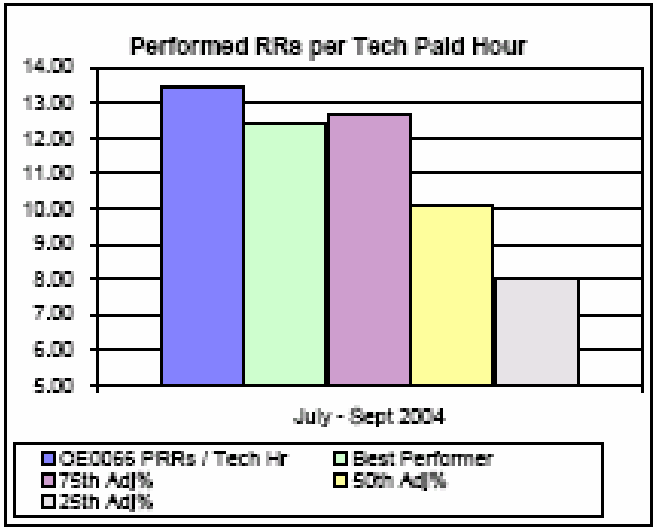
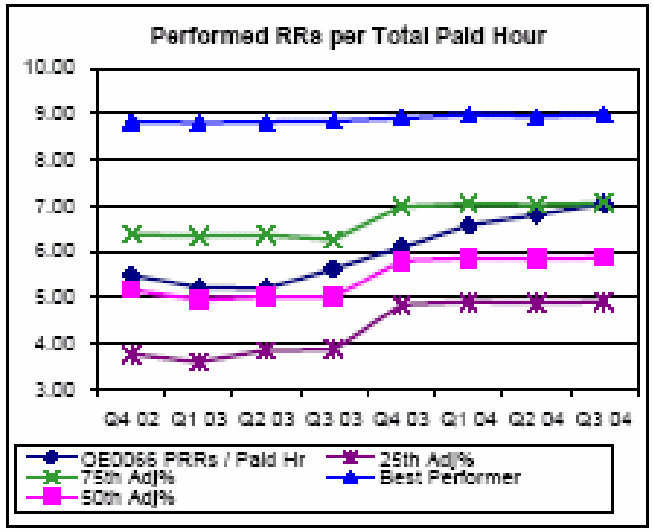
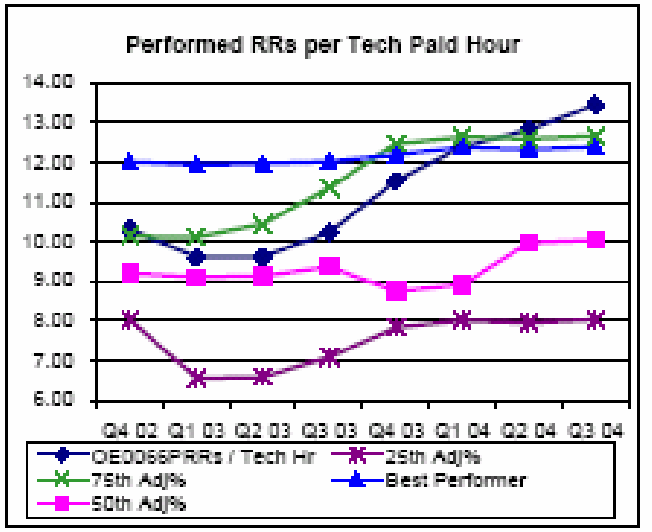
Performance Measures in Place









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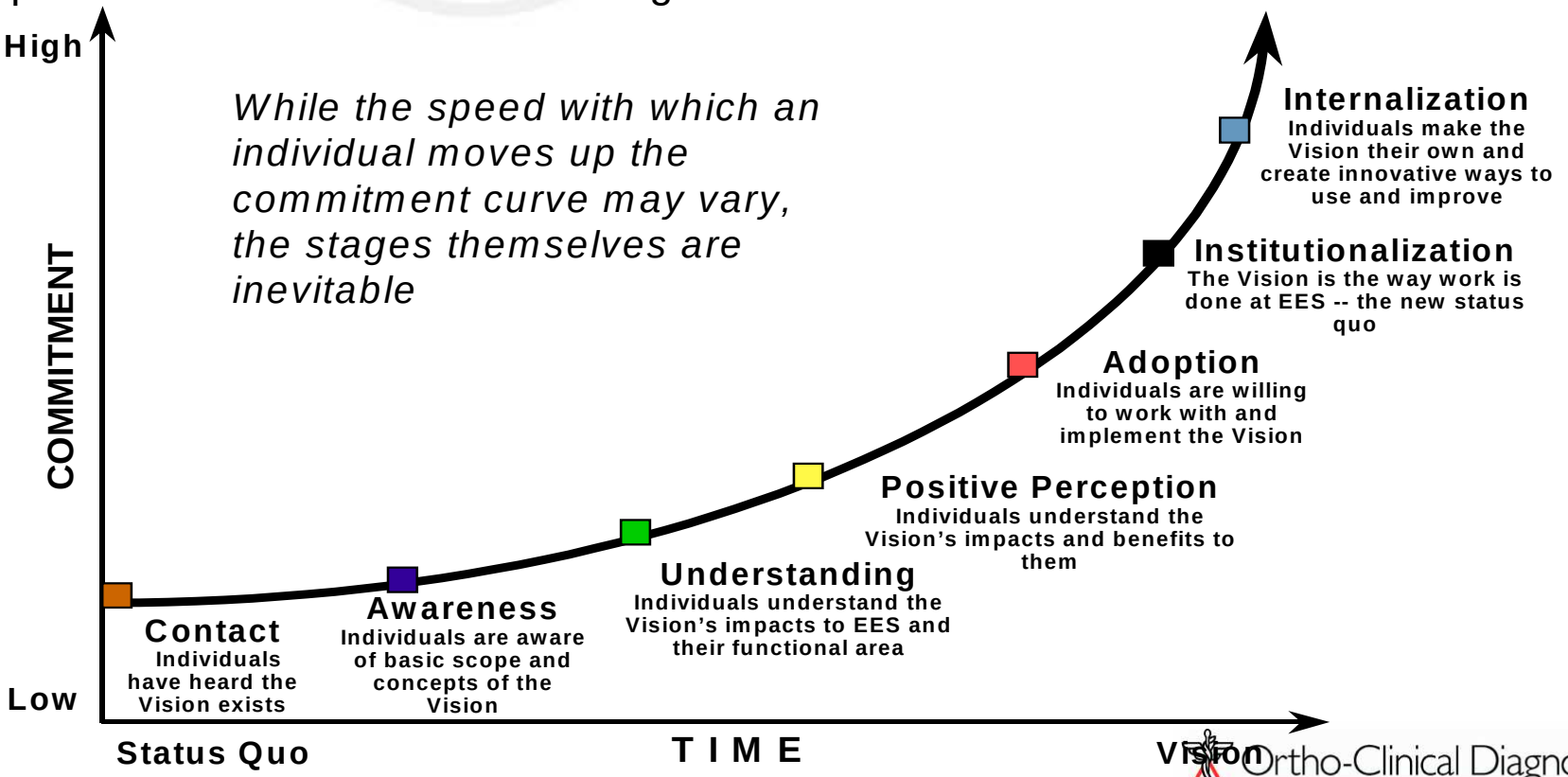
Change is Natural and Inevitable

The Commitment Curve

People travel up a “commitment curve” that defines the stages for building personal commitment to change



Self Assessment Questions

- What are the three improvement methodologies used in Process Excellence?
- What is the Lean mission statement?
- In Lean thinking all design is based on what?
- A Value Stream map follows the product from where to where?
- What is the definition of standard work?
- How is performance measured in a Lean thinking culture?

Thank You