Consolidating Microbiology from Five or More Hospitals: Performance Improvement Secrets That Guarantee Top Clinical Quality and Fast Turnaround Time

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Put science on your side.

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Abbott
A Promise for Life

Agenda

1. Design a lean work cell

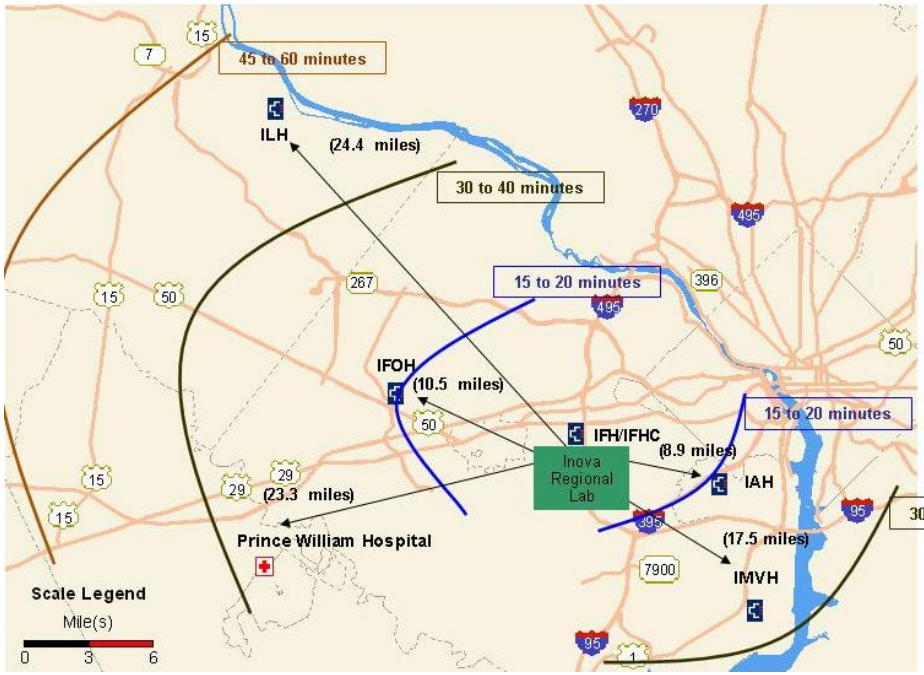
2. Apply Lean tools and techniques to a process in order to maximize flow and minimize lead time which will result in reduced cycle time and reduced number of defects.

3. Understand impact of change and apply techniques to manage that change.

4. Review key learnings from actual case study.

Our Health System

- Largest not-for-profit health care system in the Washington, D.C. metropolitan area
- 6 Hospital System
- 1725 Licensed Beds
- 985,000 Patients served per year
  - 103,000 inpatient
  - 450,000 outpatient
  - 350,000 ER visits
  - 82,000 home visits
- 180,000 Outreach encounters
- GE CE and Cerner Classic
- 430 Hospital and Central Laboratory FTEs, 5 million billable CPTs per year



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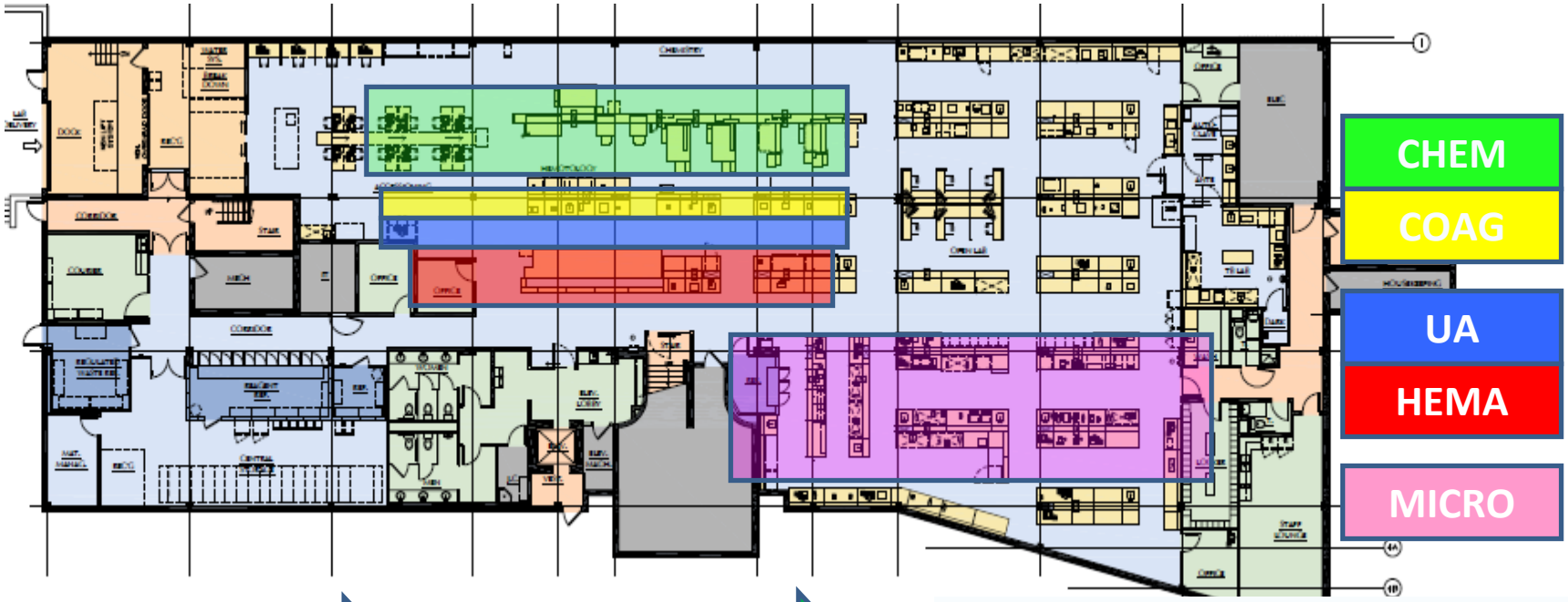
Laboratory Strategic Priorities

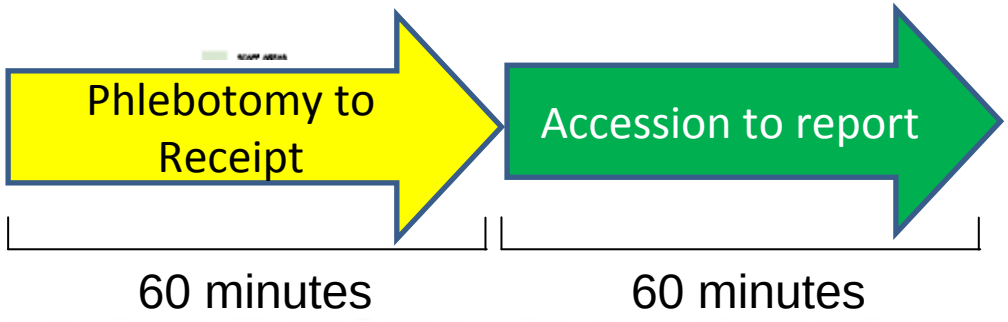
- Enterprise Standardization
  - Policies and Procedures
  - Analytical Systems
    - Chemistry
    - Immunochemistry
    - Hematology
    - Urinalysis
    - Coagulation
    - Pathology
  - Work processes
- Consolidation
  - Integrated systems
  - Point of Care
- Lean Processes
  - Centralization
  - Automation
  - IT systems
- Growth
  - Internalize send out testing
  - Outreach
  - Emerging technologies

- Pre lean design and automation
  - 5 full service laboratories with duplication of menus
  - Disparate analytical systems
  - Variable turnaround times
  - Non-standard processes
  - STAT prioritization

- Post lean design and automation
  - 5 rapid response laboratories and 1 central laboratory for menu expansion
  - Standardized analytical and IT platforms
  - Lean utilization of space and human resources
  - 2 hour routine and 30 minute STAT maximum turnaround
  - Flexibility of physical plant

Process Goals





- Promote Lean processing - FIFO, single piece, standardized work
- Eliminate waste
- Provide linear flow from receipt to analysis to storage
- Minimize traffic flow disruptions
- COTS plug and play automation with system integration capability

Sub-Project Title:
ICL Microbiology

Opportunity/ Problem Statement:
Wastes identified in current process: Motion, Transport, Inventory, Rework, Overproduction, Waiting

Goal: Lean Microbiology Processes to achieve consistent reading of cultures every hour

Scope: Specimens received in Micro to results available in LIS

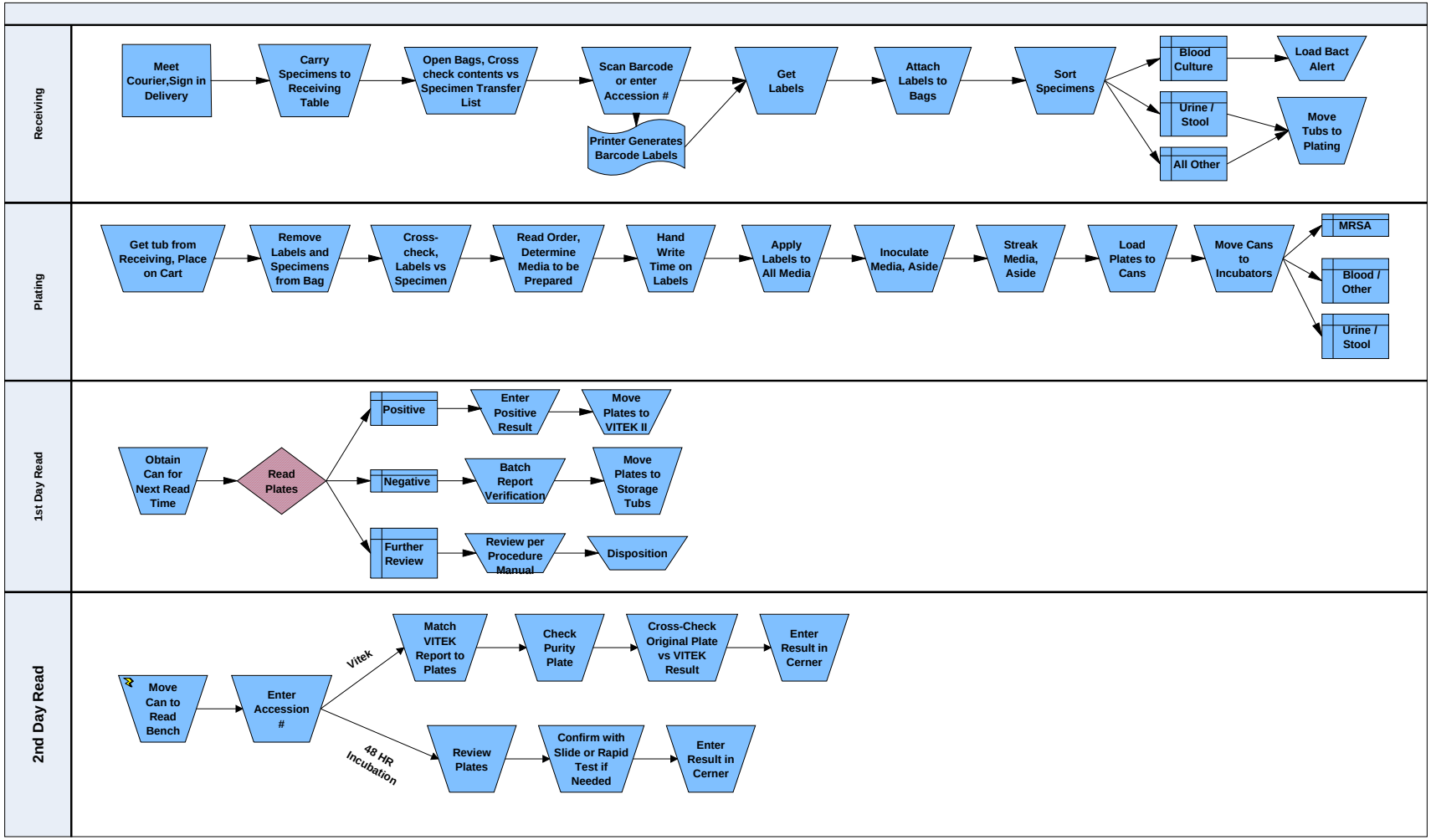
Stakeholders: Ordering Physicians, Laboratory Staff, Patients

Constraints: Scheduling, cross training, training to ICL Microbiology processes

Assumptions: A Lean work cell design will reduce waste, improve efficiency.

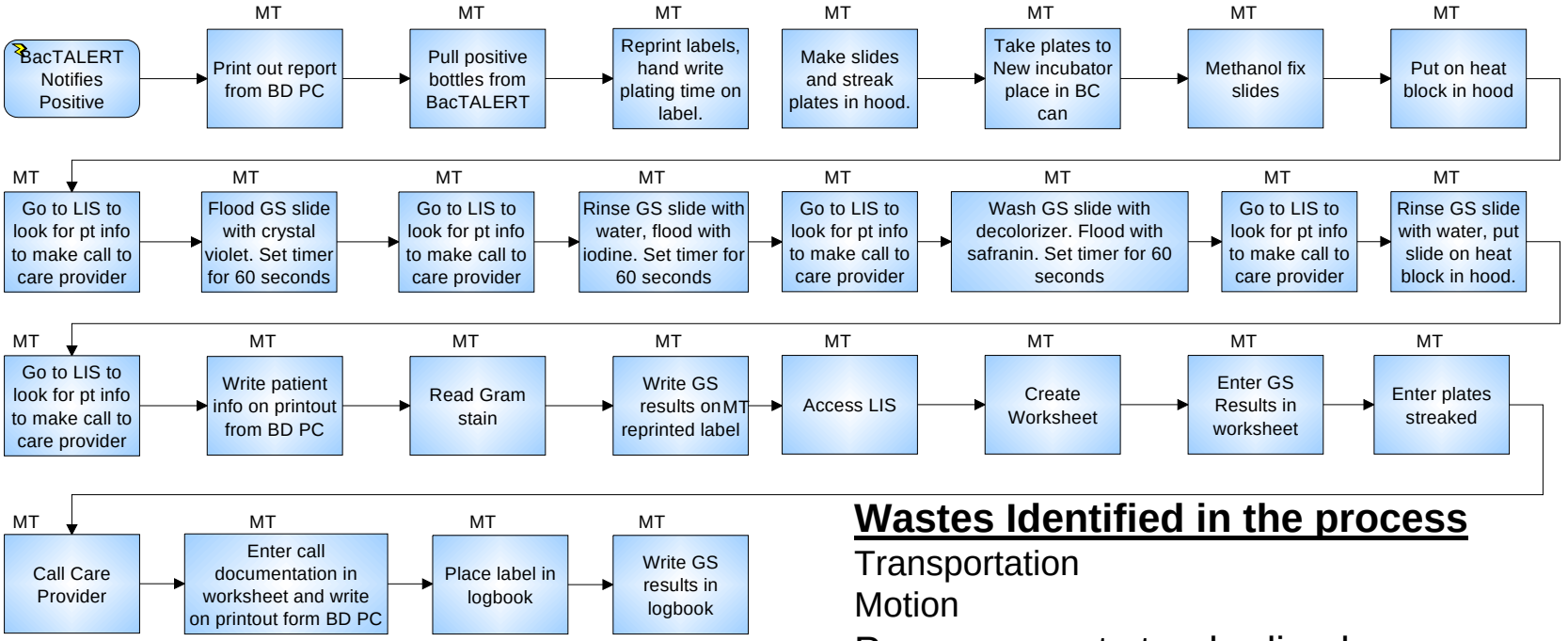
Opportunity to Eliminate Waste and Reduce Non-Value Activity

Microbiology Current Process June 2009



Direct Observation at Customer site June 2009

Blood Culture Current Process



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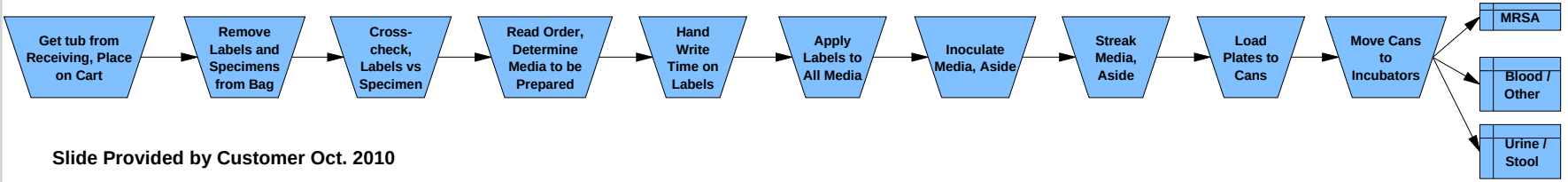
Wastes Identified in the process

Transportation
Motion
Processes not standardized
Rework
Extra Processing

Opportunity: Eliminate waste
Reduce rework
Reduce extra Processing

Plating Current Process



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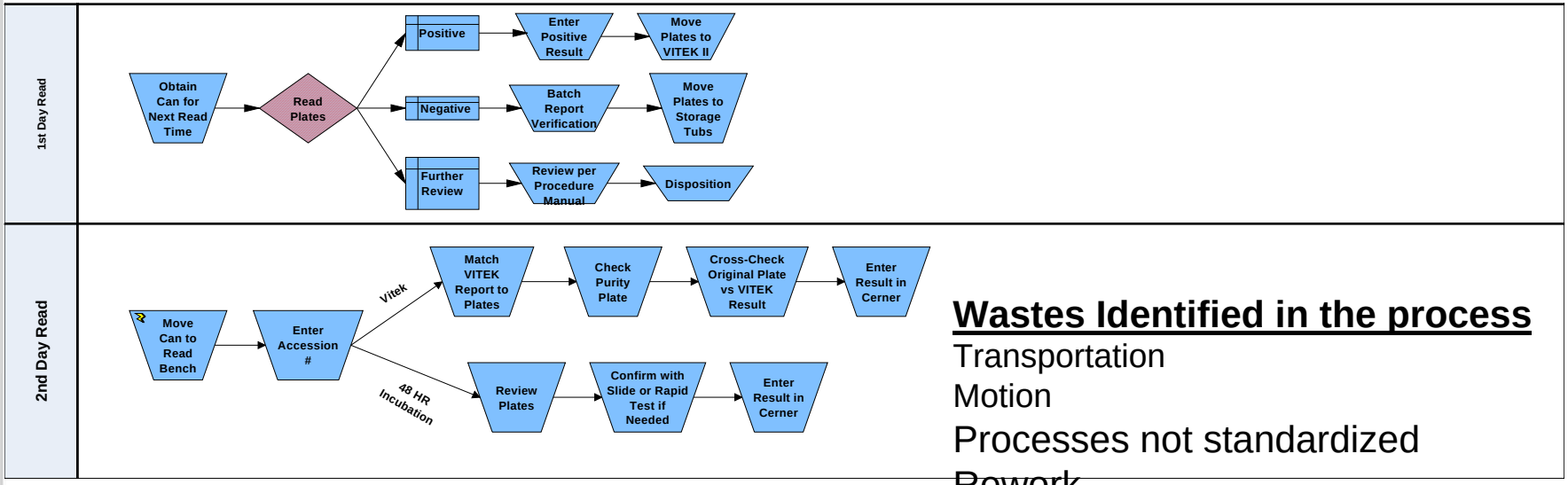
Wastes Identified in the process

Transportation
Motion
Processes not standardized
Rework
Extra Processing
Inventory

Opportunity: Standardize Work
Eliminate batching
Reduce TAT

Plate Reading Current Process

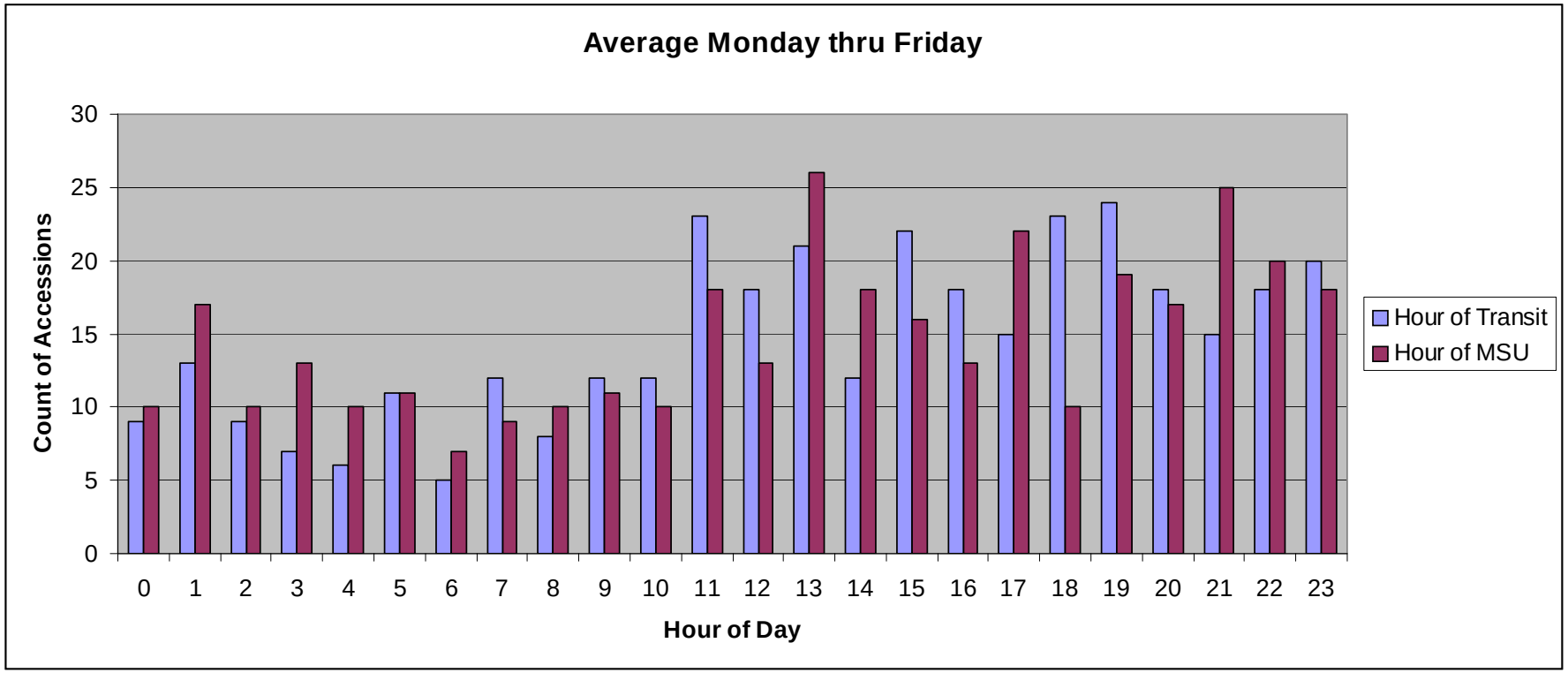


Wastes Identified in the process

Transportation
Motion
Processes not standardized
Rework
Extra Processing
Waiting

Opportunity: Standardize Work
Eliminate Waste from Process
Reduce batch size

Micro Sample Arrival Transit and MSU by Hour



LIS Data provided by customer 2009

ICL Microbiology Kaizen

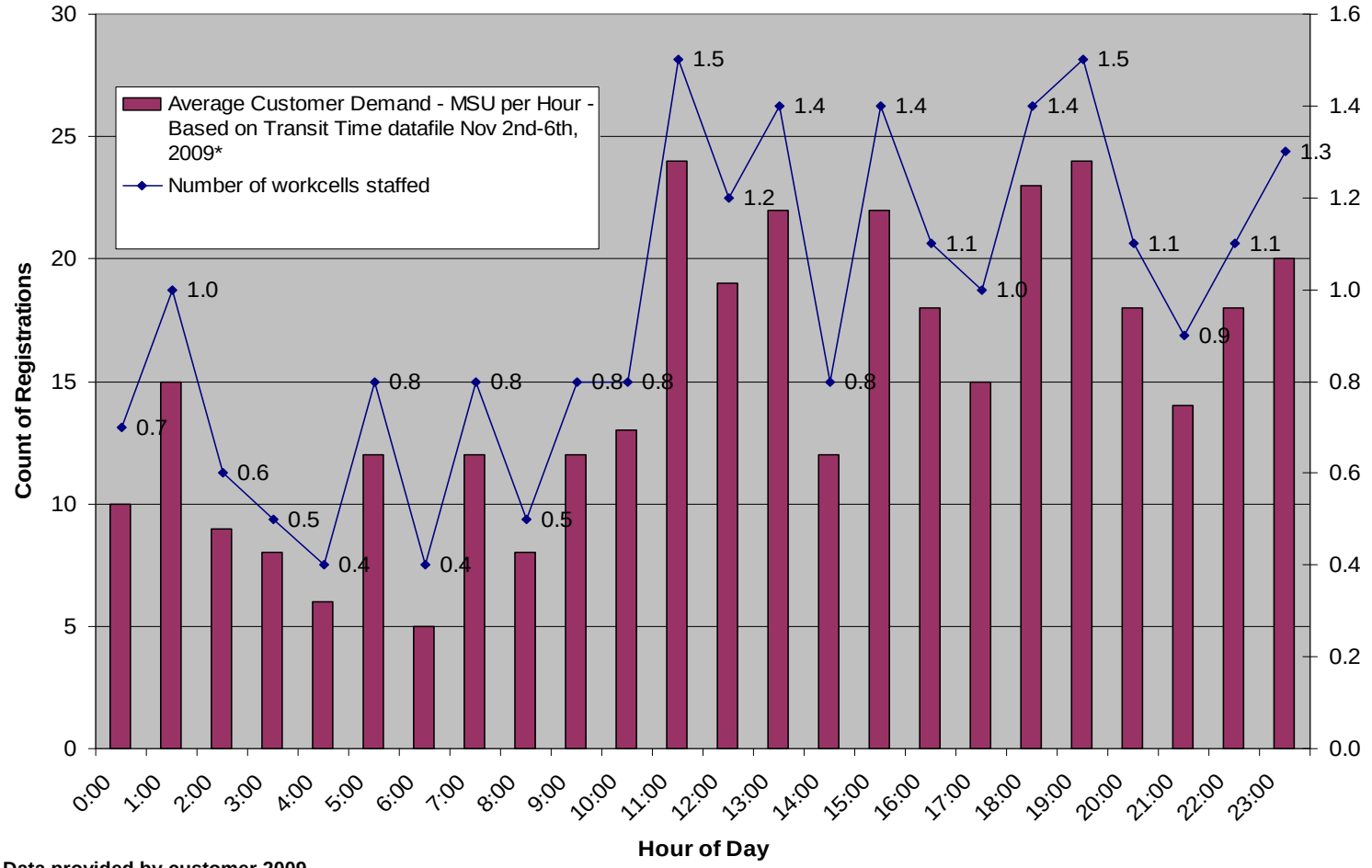
Operating Unit

All bags will be ready to be delivered to micro plating station upon arrival at Central Lab

1. No more than 10 microbiology specimens per bag – includes:
   - Routine Cultures
   - Urine Cultures
   - Stool Cultures
   - AFB/Fungal Cultures
   - Kit Tests
2. Sort Blood Cultures into separate bag

Reduced batch size facilitates one-piece flow, reduces TAT, increases quality.

Micro Sample Arrival Transit and MSU by Hour



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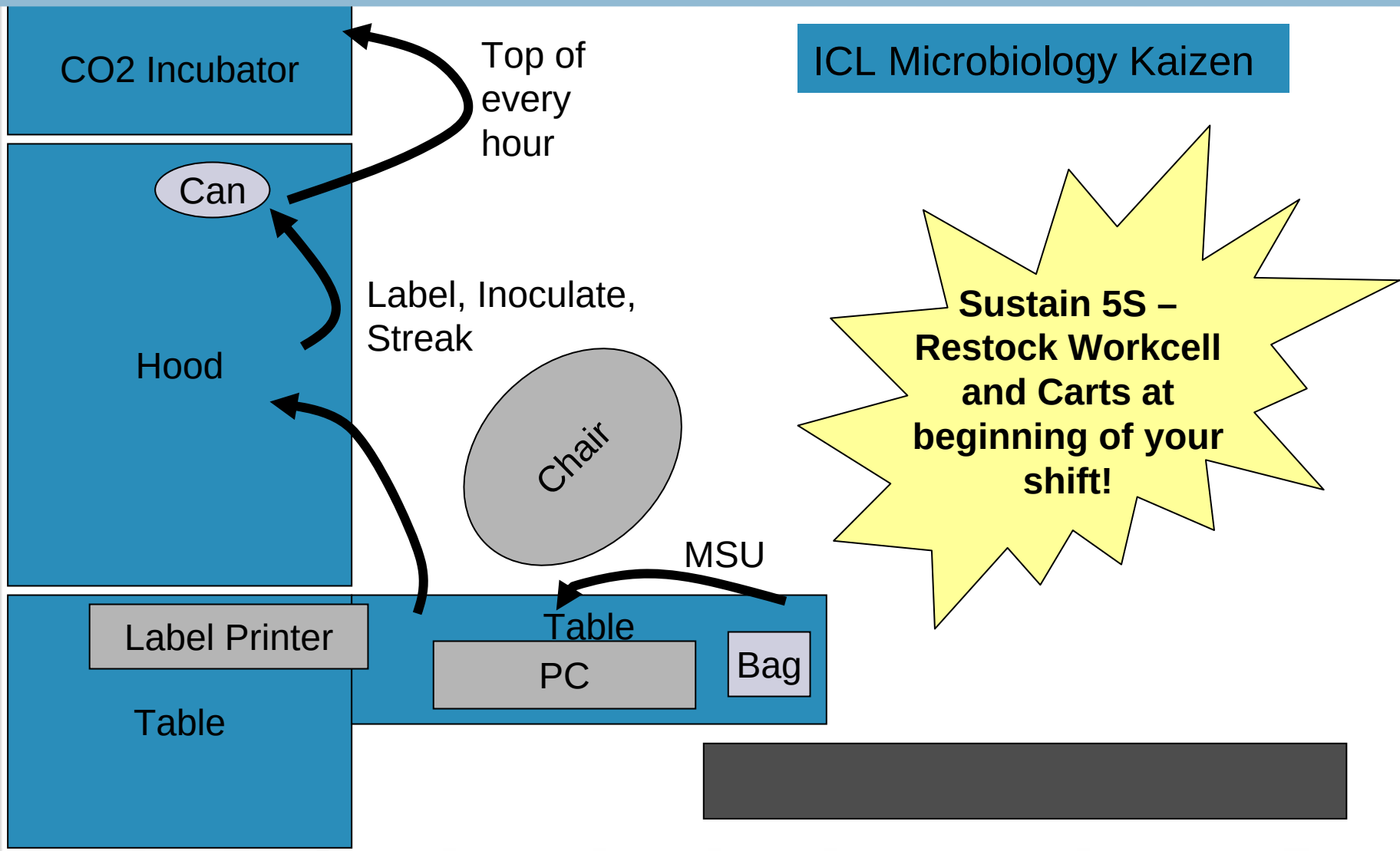


ICL Microbiology Kaizen

Process Flow for Plating Workcell

Handle one culture at a time

1. MSU Accession
2. Retrieve labels
3. Turn to hood
4. Label plates and media
5. Inoculate plate
6. Streak plate
7. Place in can (labeled CO2 or Ambient Incubator)
8. Place specimen in bag to go to storage
9. Open second culture
10. Repeat from step b.

Workcell Design reduces batch size thus facilitates one-piece flow, reduces TAT, increases quality.

ICL Microbiology Rapid Improvement Event

Plating Workcell Design

Supermarket setup at Plating Workcell

Plating Workcell at hood

Incubator Setup

2 Bin replacement at Plating Workcell

5S Plating Cart

ICL Microbiology Kaizen

Process Flow for Read Station

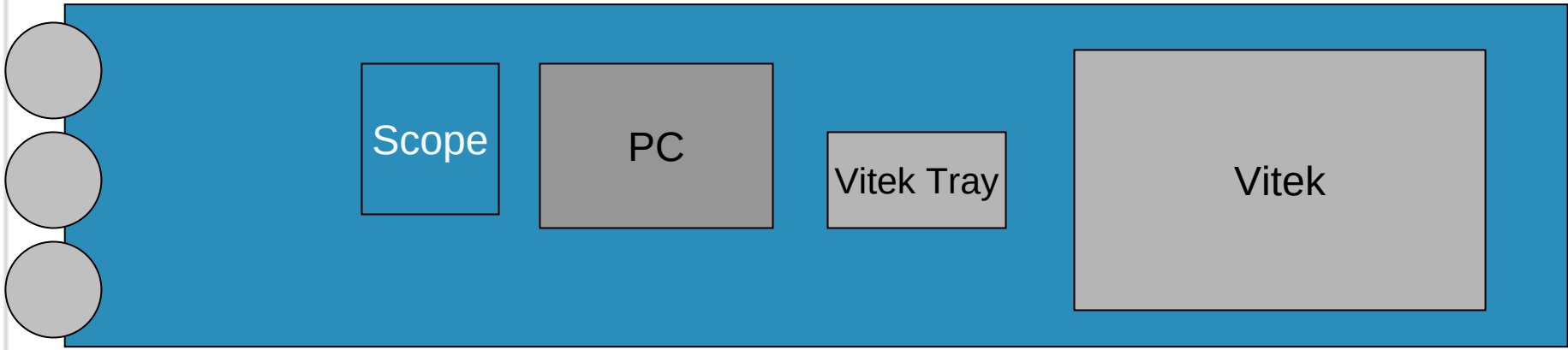
Handle one culture at a time

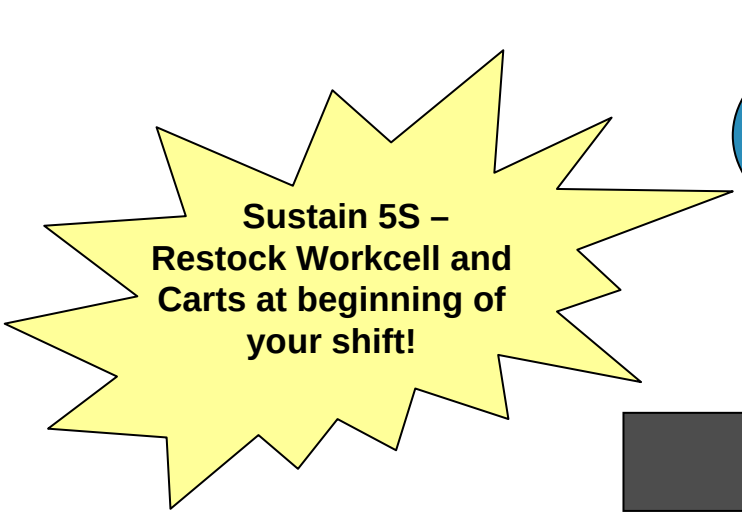
Every hour:

1. Read 18-hour culture FIFO.
2. Finalize if no growth.
3. Setup for Vitek/ Microscan/ or re-incubate if indicated
4. Read 36-hour culture FIFO
5. Setup for Vitek/ Microscan/ or result NG/No pathogen isolated.
6. Read gram stains
7. Bag completed plates at top of every hour.

Workcell Design reduces batch size thus facilitates one-piece flow, reduces TAT, increases quality.

ICL Microbiology Kaizen





Chair

Supply Cart

Reading Workcell Design

ICL Microbiology Rapid Improvement Event

Reading Workcell Design

Incubator Setup

Plating Workcell

Plating Workcell

ICL Microbiology Kaizen

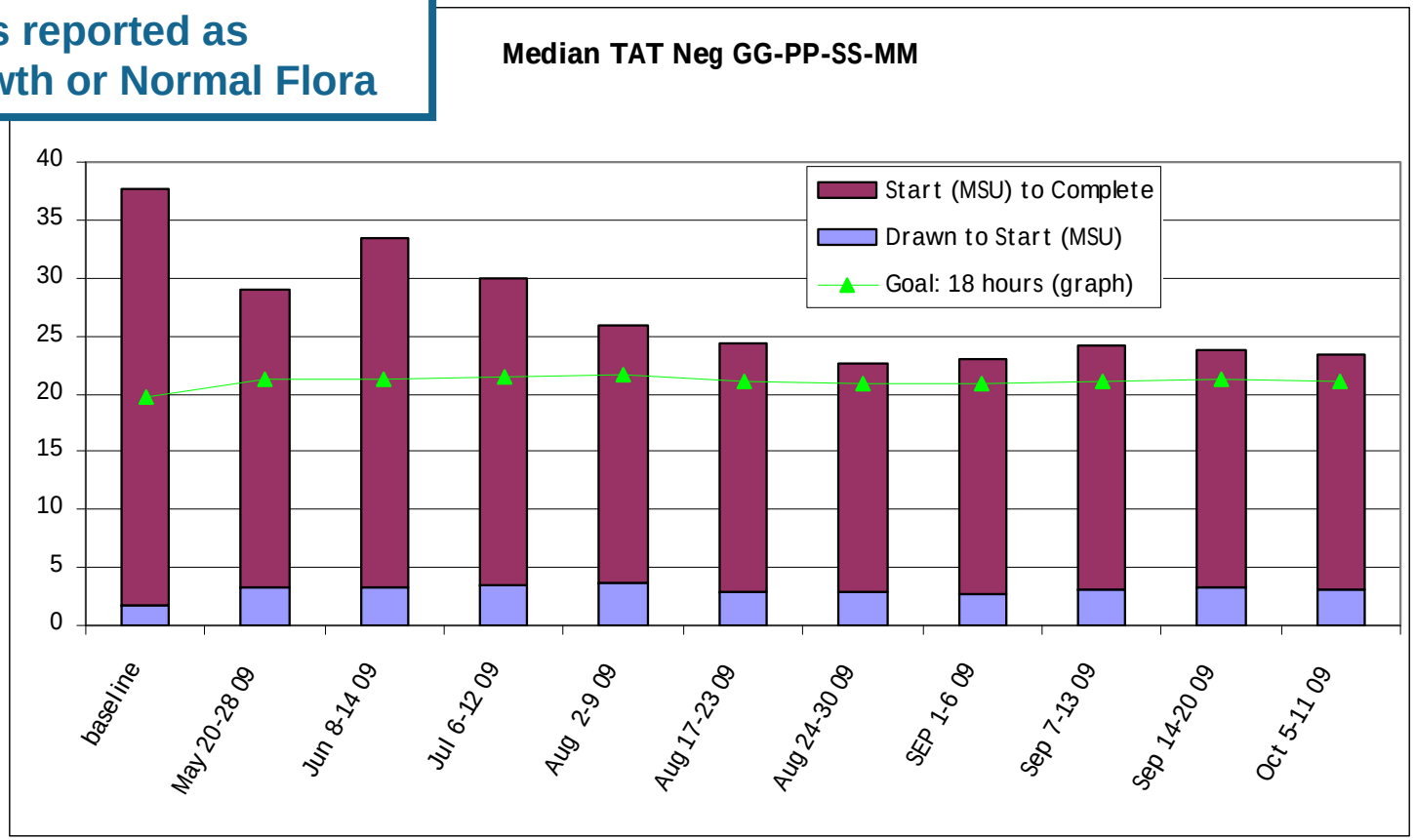
Sweep (Red Jacket)

This is not implemented to date. Micro staff and consultants have determined that implementation of the sweep would help improve efficiency of the leaned processes at the Plating and Read work cells

Every hour on the hour:

- MSU/Load BC
- Maintains Plating Supermarket (FIFO)
- Load/unload stainer
- Deliver GS/ New / Old to Read Workcell
- Load Vitek
- Take temps
- Perform stainer maintenance
- Pull Queues for pending (PLR)
- Research issues and problems

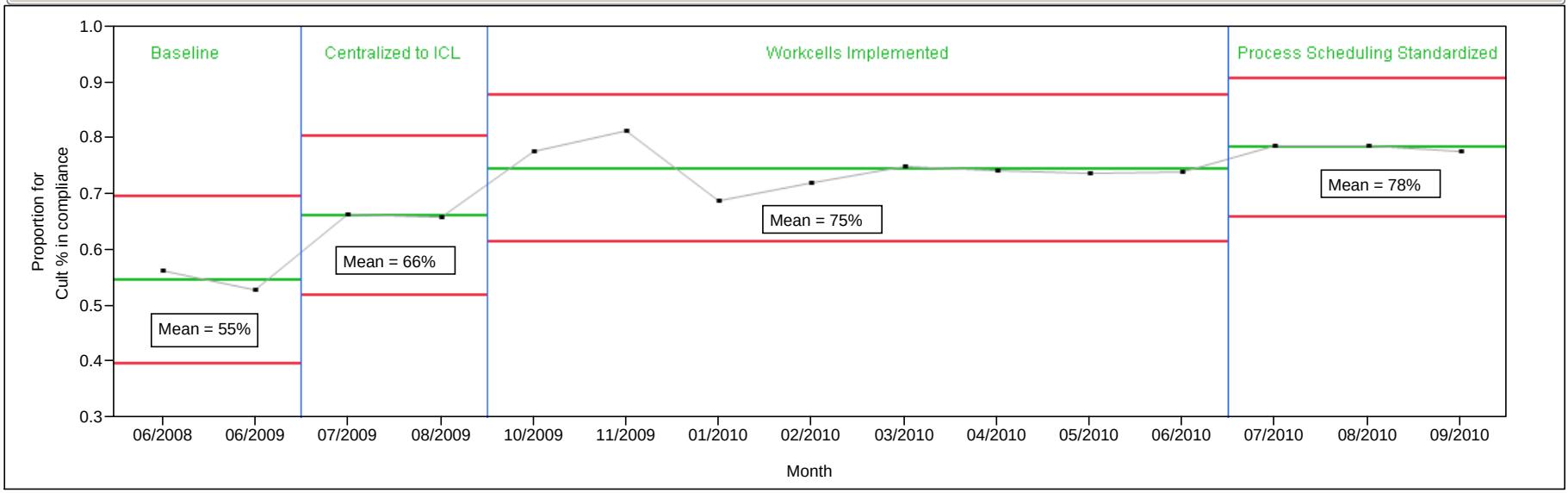
Cultures reported as No Growth or Normal Flora



44% Decrease in TAT from Baseline

Goal = 90% of all cultures reported with 36 hours

Cult % in compliance

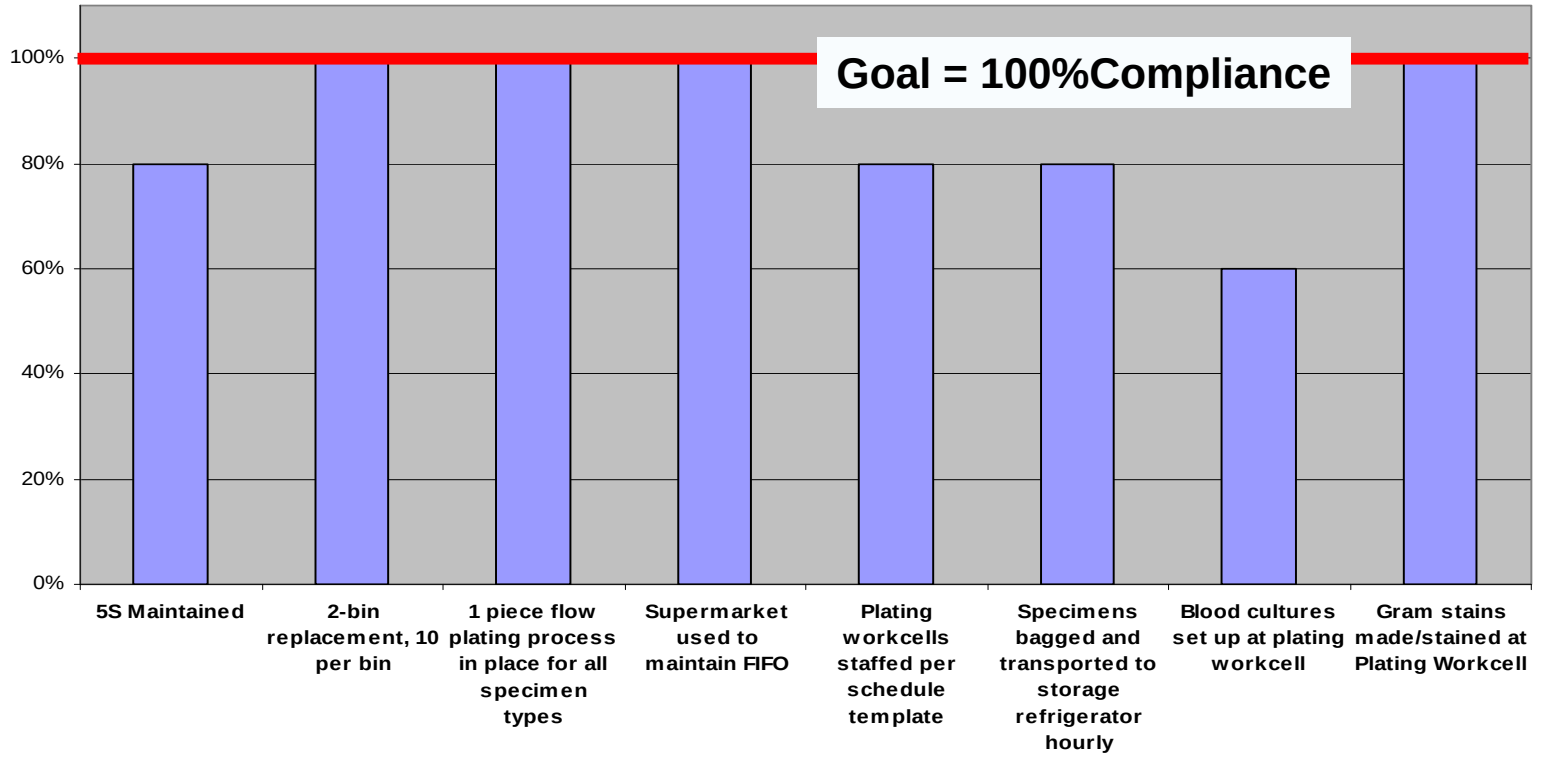


Culture % in Compliance increased from 55% to 78%

Phase	Questions to Answer	Answers
Plan / Do	What is the plan for auditing Micro processes	Audit Plan
	What will the team do to improve the process?	Training and Education
Check	How will the team monitor the improved process?	Graphs
	What metrics will be monitored?	TAT
	Who will monitor the metrics?	Cyndi Samuels
	How often will the metrics be monitored?	Weekly
	Where will the data come from?	LIS/Excel/JMP
Act	When will action be required based on the metrics?	Immediately after identification <100% compliance
	What action will occur?	Determine reason for not following Lean Process

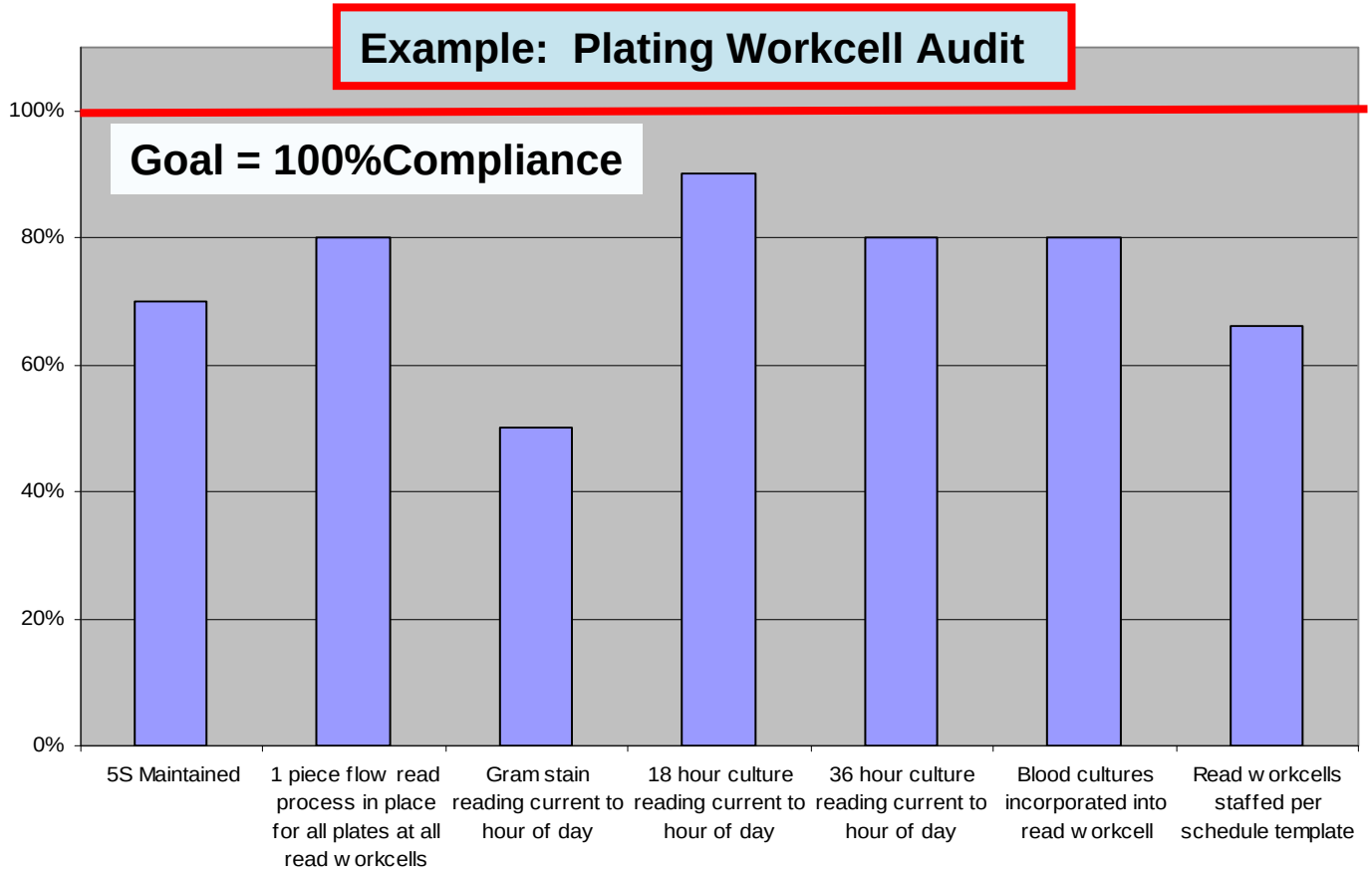
Sustain the Micro Lean Process

Example: Plating Workcell Audit



Goal = 100% compliance in all categories

Example: Plating Workcell Audit



Goal = 100% compliance in all categories

Roadmap to Success

Lean Education to Staff

- Basic Lean Overview
- Workcell Design
- Continuous Flow
- One Piece Flow
- 5 S

Change Management

- Staff Overview of Management Goals
- Change Management Training
- Engage staff in the process

Understand impact of change and apply techniques to manage that change

Thank You!!

Questions??