

Know What is Ideal Work

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Strive for the IDEAL Condition

Delivery of products & services should pursue the Ideal

Production that is

- Defect Free (goal is zero, meets customer expectation)
 - On demand (supplied when you want it, in right version)
 - Immediate (now, no waiting)
 - One at a time (single piece flow, batch size of 1)
 - Continuous flow (no batches, queues)
 - Minimal waste (materials, labor, energy, other resources)
 - Safely for every employee
- Physical, emotional, professional

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Focus teams on Eliminating the Wastes

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LEAN Tools to Improve Workflow

- Standard work
- Mistake proofing
- Batch size reduction
- Level load
- Work simplification, posted job aides
- Visual displays, controls & and color coding
- White boards, Deviation Management Process, Daily Management Boards
- Kanban inventory and production signals
- "Stop the line" (Specimen labeling and acceptability rehabilitation process)

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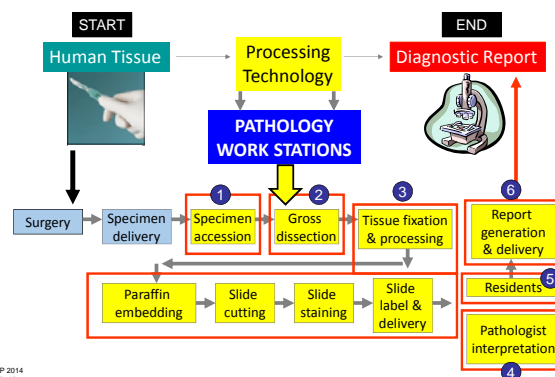
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Structure the Teams

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Surgical Pathology Path of Workflow

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Identify the Defects

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Survey Defects Work In-Process

Poor quality of service or product that makes you:

- **Stop your work**
- **Reject it**
- **Return it to sender**
- **Delay your work to fix it yourself**
- **Not pleased, could be better**

= variation = bad
= poor quality

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Defect Board- Make Defects & Resolution Visible

Rework Pathway for Corrective Actions

- Histology Core lab weekly Quality Huddle
- Lab meets to review past week's defects
- Defects are posted on white board with resolution for all to see, obtain clarification, suggestions and for all to learn from

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Simplify Rid Un-needed Process Steps

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LEAN LESSON

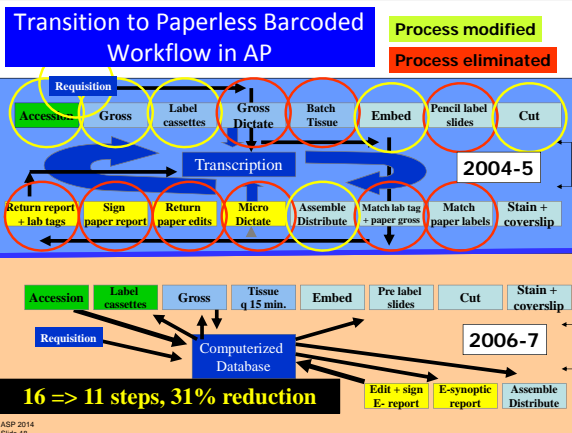
Lean Principle- Start with Work Simplification

“Every well thought-out process is simple.”

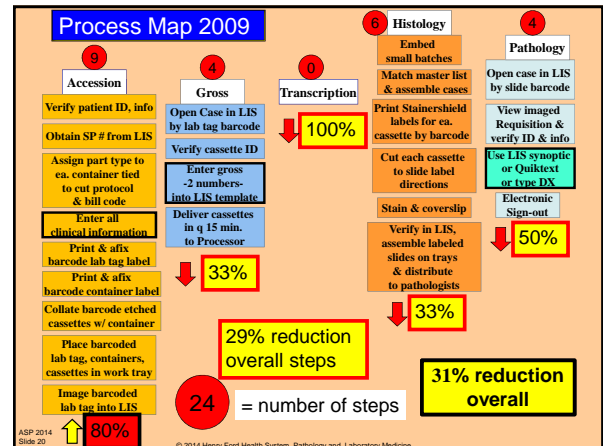
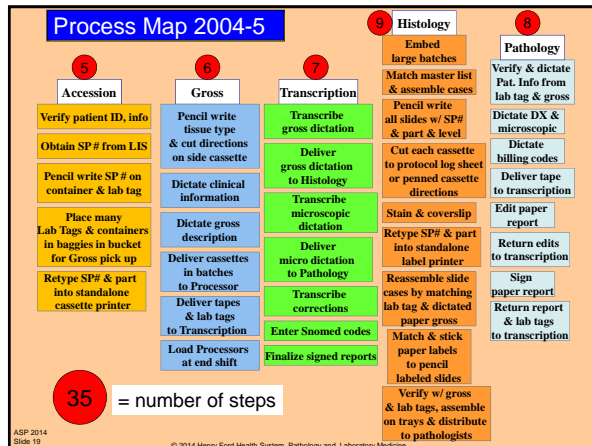
— Henry Ford

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Simplify = Safer

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Safer Work Simplification Redesign

3 FTE Transcription → **Eliminated**

1.4 FTE Manual labeling → **Eliminated**

1.3 FTE Mis-ID corrections

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Standardize Activities, Connections & Pathways

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Key Lean Process Changes 2004-2008

- Organized workflow, visual standard work, priority specimen streams

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Key Lean Process Changes 2004-2008

- Laboratory structural redesign, work cell design & standardization



- Linear flow
- U-shaped individual workcells

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Standard Work

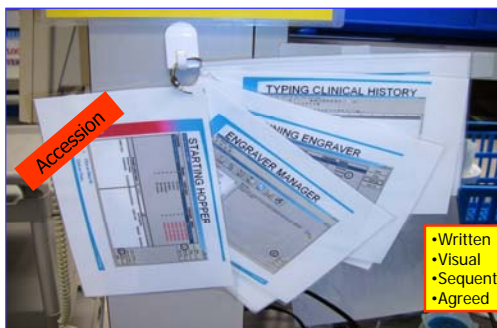
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Standard Work

Posted at work stations



- Written
- Visual
- Sequential
- Agreed

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Barcode Standardized Work Processes

Barcodes as production kanbans

Requisition

Specimen container

Tissue cassette

Glass slide

This case is submitted in 3 specimen containers consisting of:
part A - sigmoid colon biopsy,
part B - transverse colon biopsy and
part C - stomach biopsy with standing preorder for Helicobacter pylori immunostain.

Protocol driven information is reflected in the slide labels dictating 2 levels cut for each part.

The stomach biopsy protocol, part C, calls for an additional 2 blank slides to be cut, one for the immunostain & a 4th left unstained.

All barcodes generated at Accession & Microtome

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Workplace Design Follows Standardization

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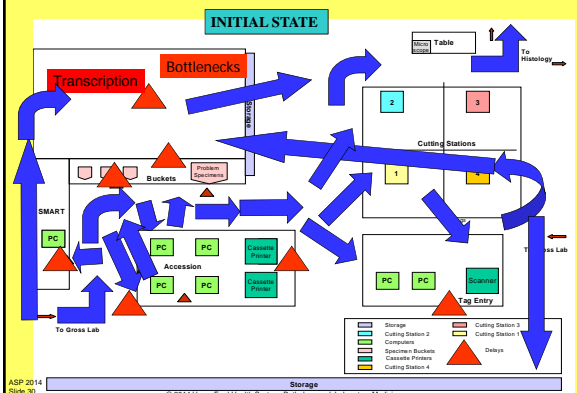
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Gross Lab Process Map- January 2006

Baseline

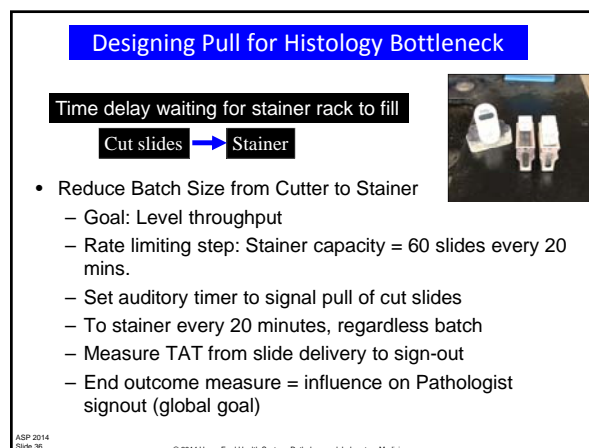
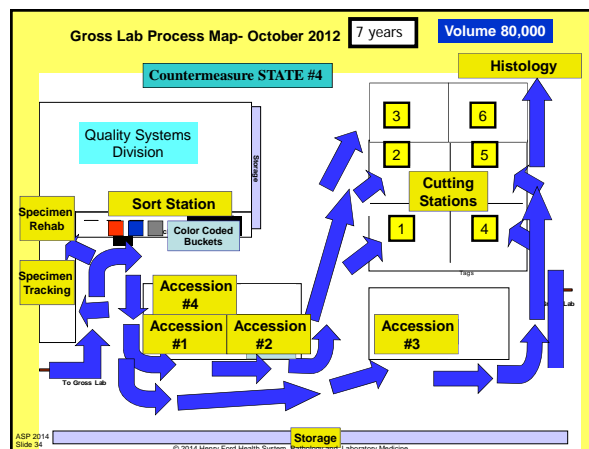
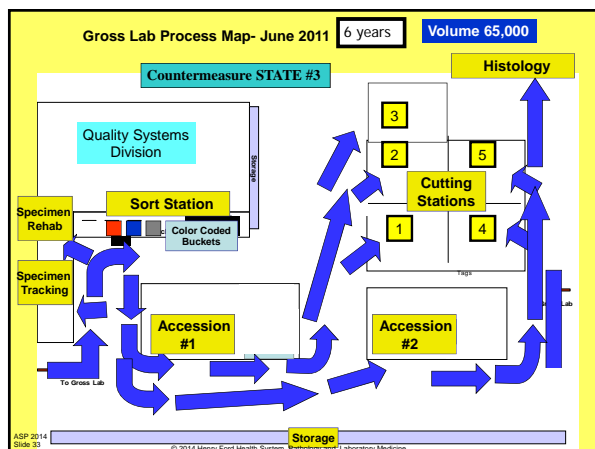
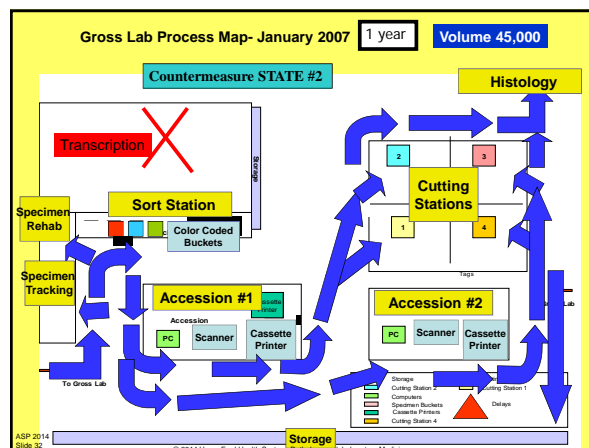
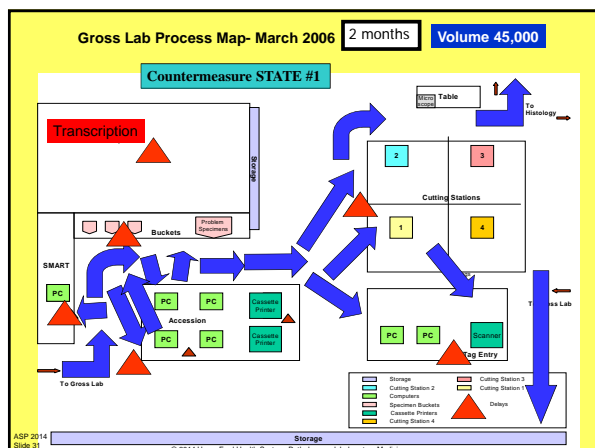
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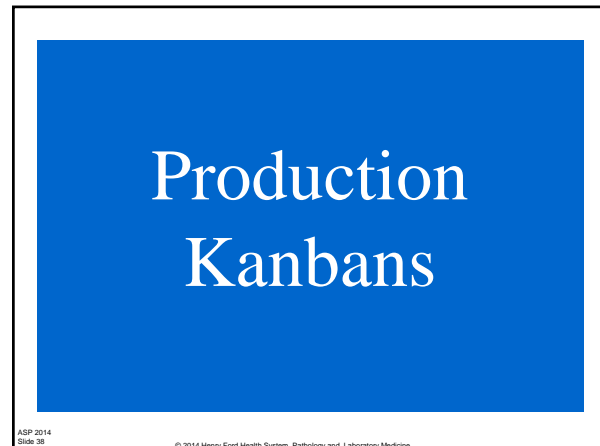
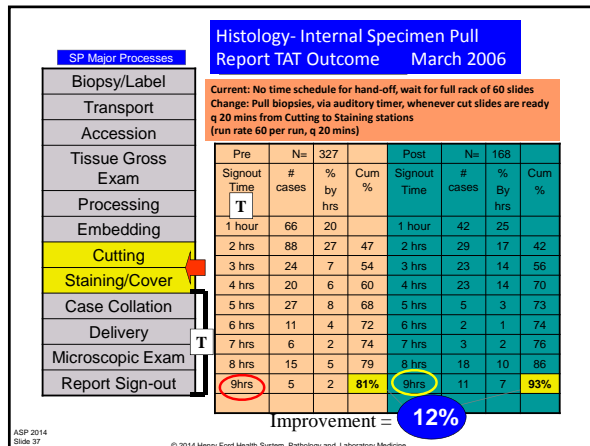


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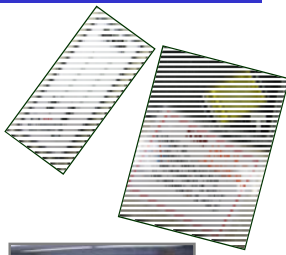

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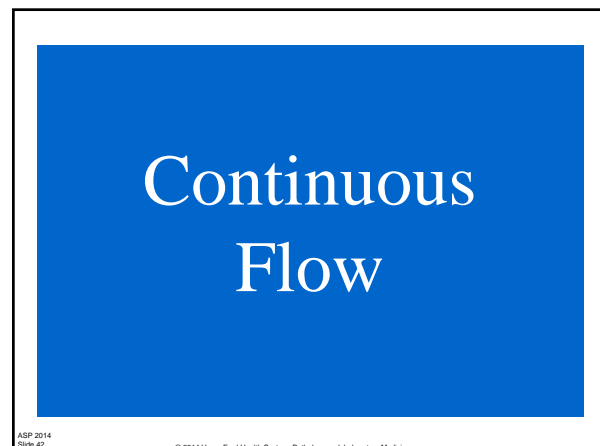


Production Kanban Cards- Visual Aids

- Decal placeholder card**
 - To alert tech that block from case will be missing at cutting
- Re-embed card**
 - Alerts embedder why block is melting on embedding center;
 - Has tech's name so it can be returned for cutting
- Instrument status card**
 - Alerts tech that solutions are not changed yet

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Lean Operational Efficiency

- **Continuous flow goal**
 - **Centralized production** for Accession, Gross, Histology, all Stains and Slide disbursement
- **Operational challenges**
 - **Work simplification and mistake-proofing**
 - **Original condition**- Barcoded operation with transcription-less & paper-less gross, histology and signout
 - **Challenge**- same-day metrics of successful production and defect resolution between hospitals
 - **Load leveling**
 - **Original condition**- 1 histology shift
 - **Challenge**- Match courier with specimen availability and workers with volumes of work around the clock
 - **Batch size reduction**
 - **Original condition**- overnight large specimen batch processors, same-day rapid cycle processing of small biopsies only since 2004
 - **Challenge**- rapid cycle processing of large specimens & biopsies

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Lean = Minimal Batch Sizes & No Waiting

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Common Challenges

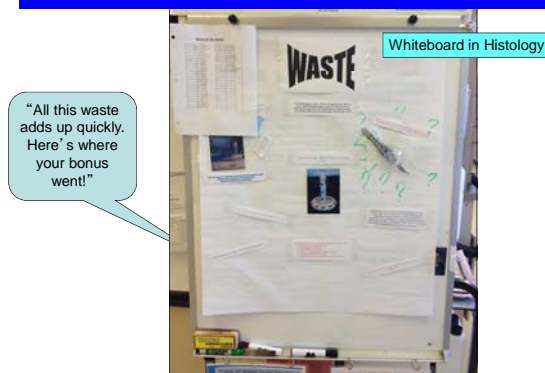
Key Problems

- Core AP Lab operations
 - Specimen accession, gross exam, histology, IHC, molecular studies
 - Serving 4 hospitals up to 30 miles away
 - Specimen delivery efficiency
 - Production efficiency
 - Timeliness of slide production & return delivery
- Large specimen resections timely triage to Tumor Board presentations at 4 hospitals

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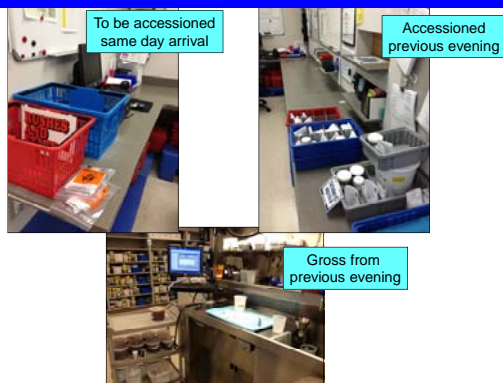
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In Search of a Batch

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7 AM SP Core Lab- Accession & Gross

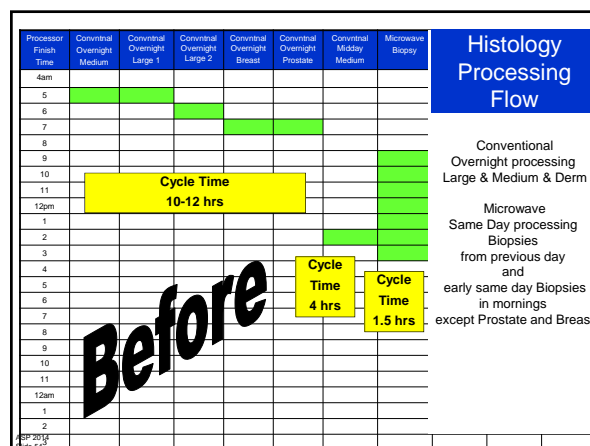
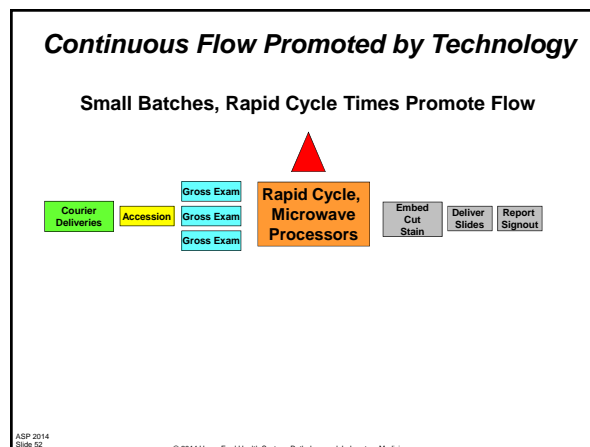
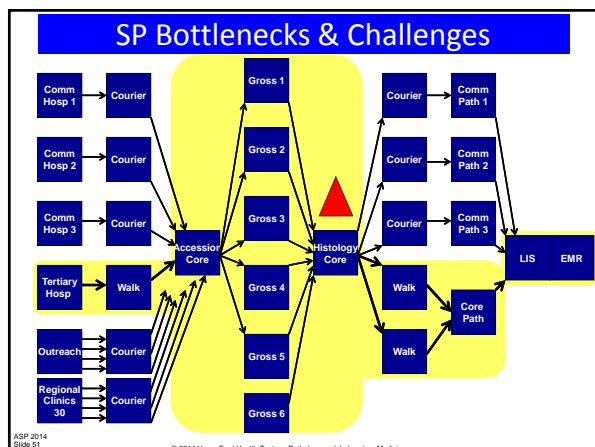
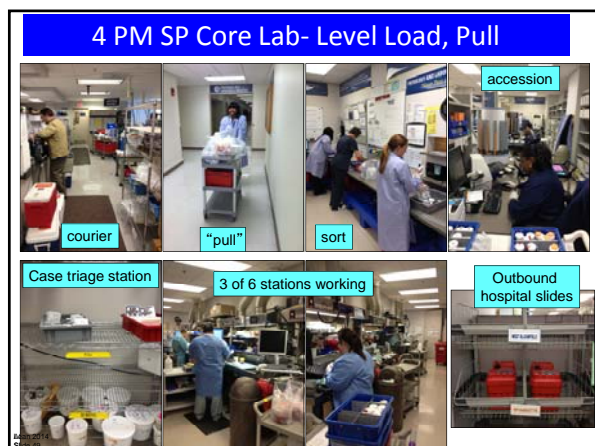
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7 AM SP Core Lab- Histology

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New Technology

“Your methods are formed by what you are trying to do; they do not determine your purpose. To my mind it is starting wrong to put methods ahead of purpose.”
— Henry Ford

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Daily Management

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Surgical Pathology Daily Management Board 2013

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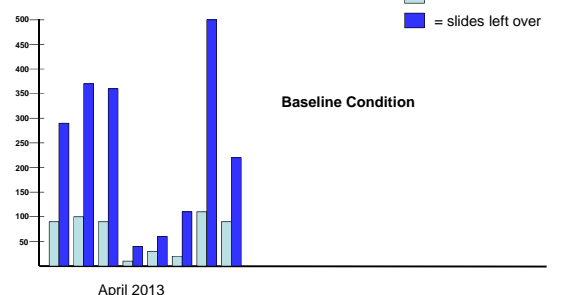
Surgical Pathology
Work Leftover after 2nd Shift

Specimen Prioritization and Load Leveling Between 3 Workstations

Accession – Gross - Histology

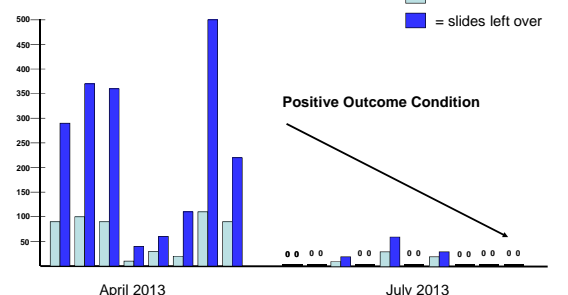
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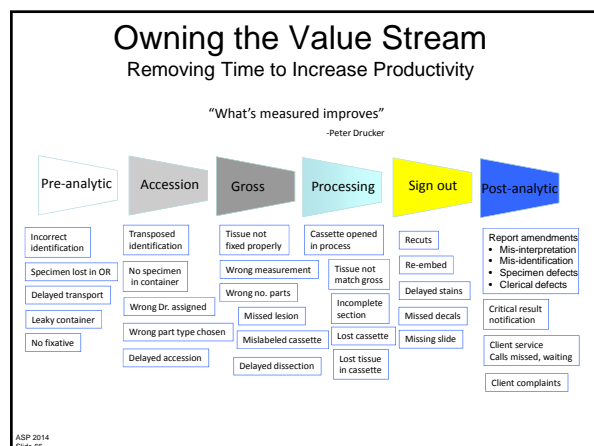
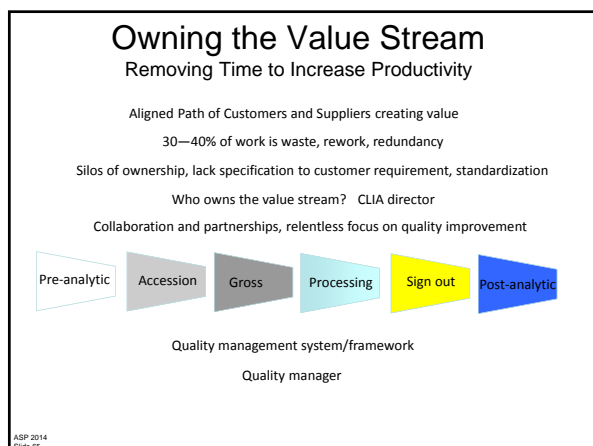
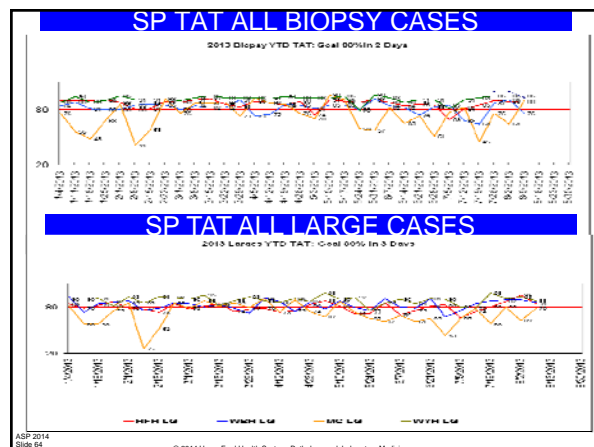
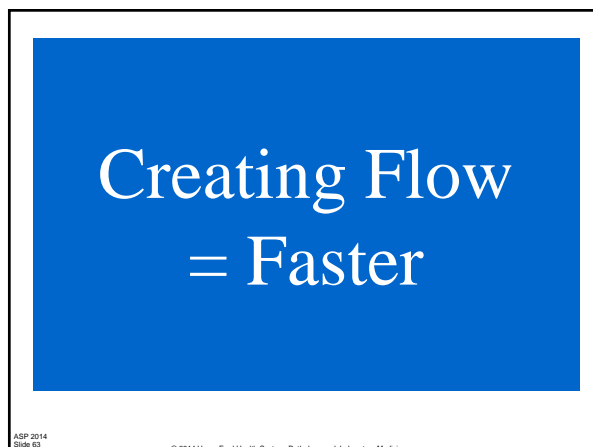
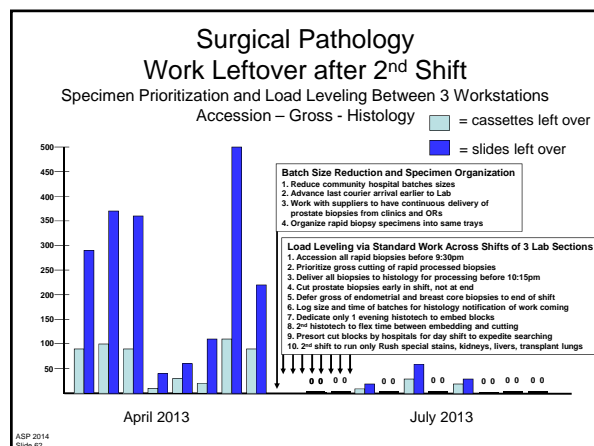
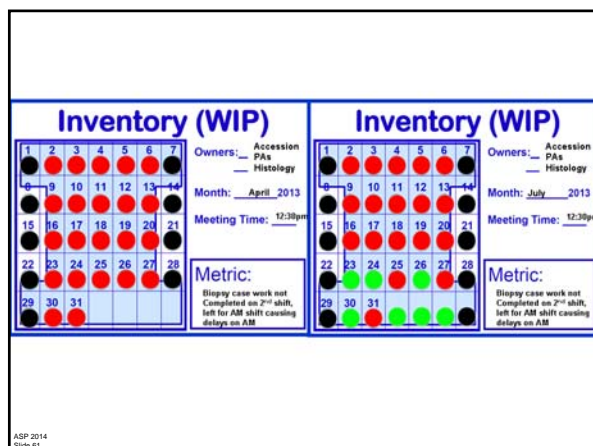
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Surgical Pathology
Work Leftover after 2nd Shift

Specimen Prioritization and Load Leveling Between 3 Workstations

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LEAN LESSON***Lean Principle- Time Waste***

“Time waste differs from material waste in that there can be no salvage. The easiest of all wastes, and the hardest to correct, is the waste of time, because wasted time does not litter the floor like wasted material.”

— Henry Ford

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LEAN LESSON***People solving problems continuously******Don't Be Overwhelmed***

“Nothing is particularly hard if you divide it into small jobs.”

— Henry Ford



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