Lean Patient Care: The Emergency Department/Centralized Laboratory Collaborative Paradigm

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Traditionally, EDs tend to request laboratory services located in situ due to a perceived delay in turn around of results.

We describe a paradigm where the ED has undergone LEAN culture and design and worked closely with the centralized laboratory to provide exceptional services without an in-ED laboratory.

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Who Are We?

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Our Campus

The First:

- 36th Magnet Hospital in America and the 1st in the Dakotas.
- 11th e-ICU in the country and 1st in the Dakotas.
- Freestanding cancer care facility
- Freestanding heart hospital
- Certified stroke center
- Verified Level II Trauma Center in South Dakota.
- ISO-15189 Accredited Hospital Laboratory in the U.S.
- MLO 2010 Laboratory of the Year

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The Only:

- Burn Unit in our region
- Kidney Transplant Program in South Dakota
- Pancreas Transplant Program in South Dakota
- Bone Marrow Transplant Program in the region
- Hospital Based Platelet Pheresis Program in South Dakota

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What did we do?

We changed the paradigm!

WHY ??

COMPETITION !!

Our Patients Deserve the BEST

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Why Lean in the ED

- Very Traditional Setting
- Front door to the hospital
- Needed more rooms and faster services
- Organization and Layout were not patient centered but instead facility centered.
- Patients spent a lot of time “waiting”.

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Why Lean at AMcK Lab?

- We needed more space in the old area
- The layout was inefficient and ugly
- Staff utilization was spotty and poor
- We had a lot of waste – supplies, time, space, etc.
- While TAT was acceptable, it was certainly not “world class” and did not meet the needs of the physicians or patients.

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Lean as a Culture

- Lean becomes a way of life. It is about eliminating waste, adding value to what you do.
- Lean requires total commitment from ALL levels of the staff, starting with the very top management.
- It is a planned, disciplined approach to problem resolution and process improvement.

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What Lean is NOT

- It is not just about manufacturing. The tools and techniques of the TPS can be applied to healthcare or other industries.
- Lean is not about eliminating FTEs, doing things cheaper. It is about eliminating waste and adding value.

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5 Steps to getting Leaner

- Agree on what the customer really wants
  - The voice of the customer (VOC)
- Understand your processes
  - Value Stream Mapping
- Smooth the flow
  - Single piece flow, FIFO – reduced batches
- Shift from a PUSH to a PULL philosophy
  - Customer Demand dictates your work processes
- Continue to attack WASTE
  - Waste is anything that does not add value to a product

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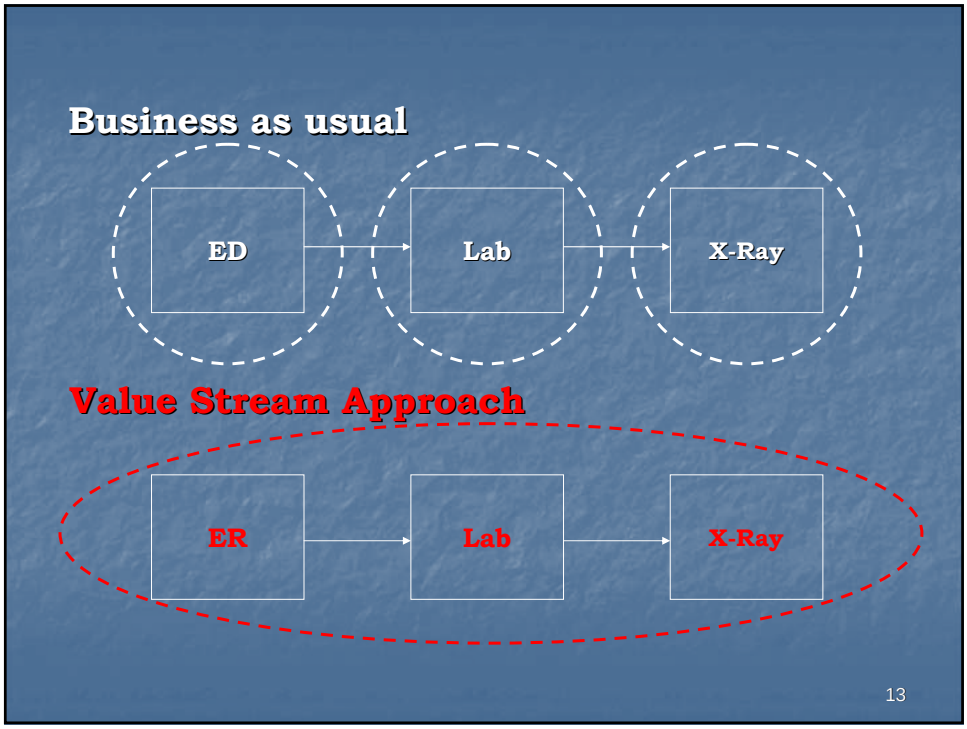

STANDARD WORK

ESSENTIAL ELEMENTS

Process Sequence
Time / Timing
Workstation Layout
Quality
Safety
Operator Walk Patterns
Standard WIP
Machine Cycle Times

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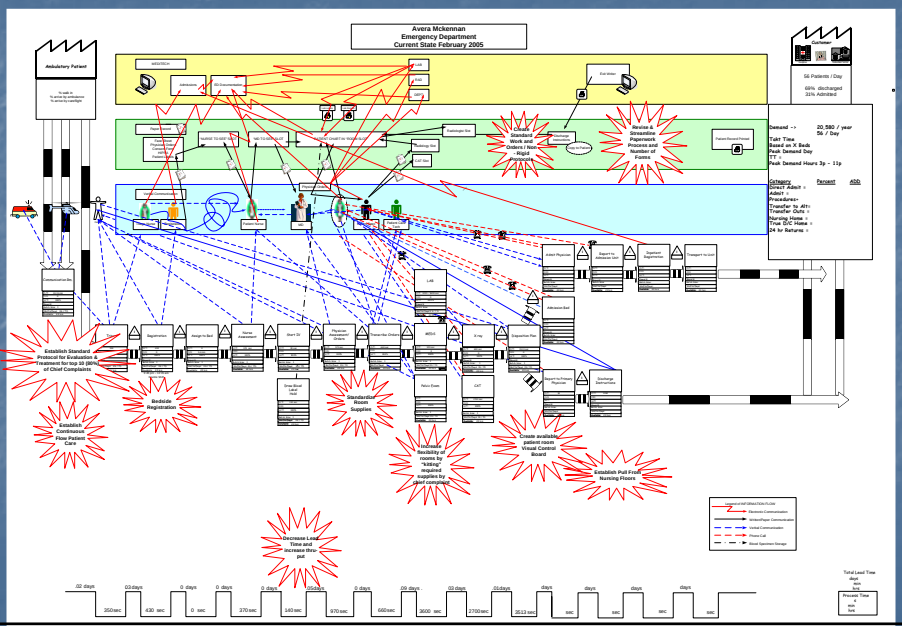
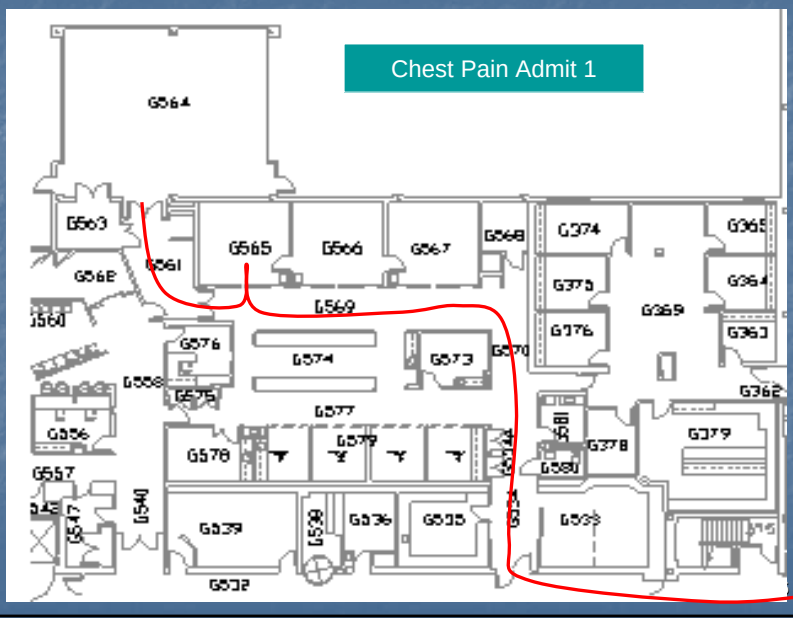
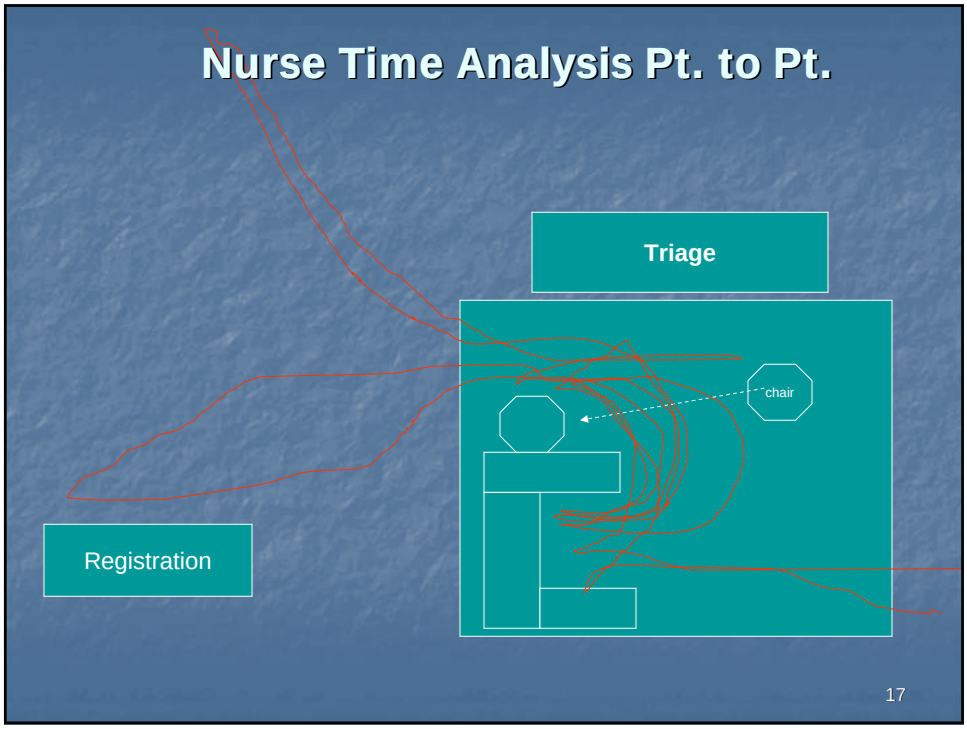
Current State Value Stream Map

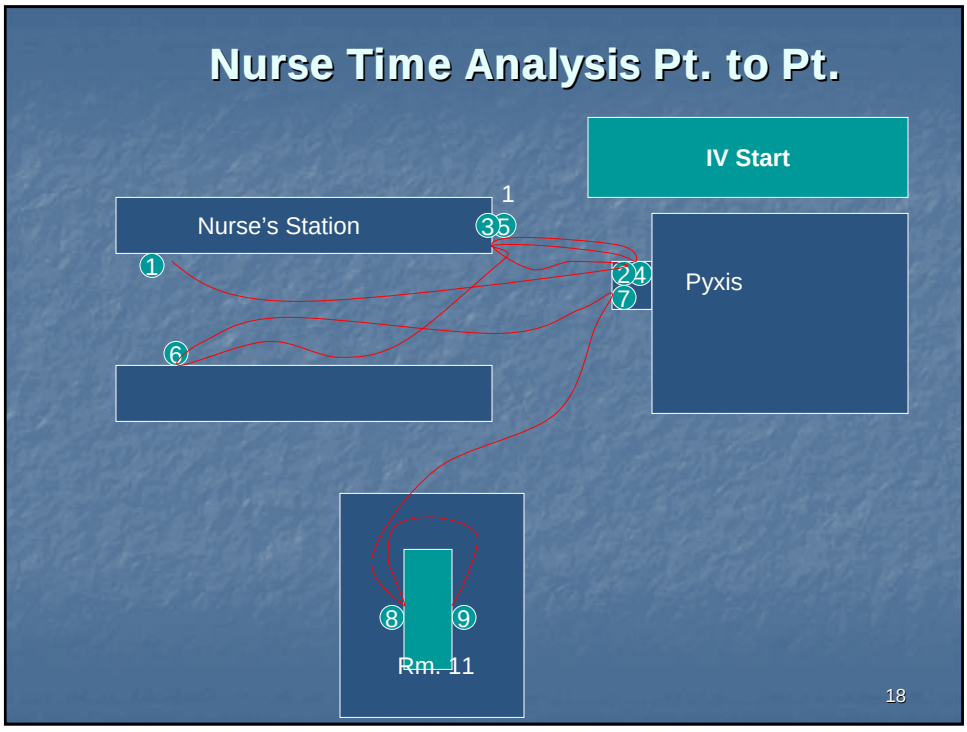
Patient & Information Flow



Patient Flow Pt. to Pt.




Nurse Time Analysis Pt. to Pt.
Triage
chair
Registration
17


Nurse Time Analysis Pt. to Pt.
IV Start
1
Nurse's Station
3
5
1
2
4
7
Pyxis
6
8
9
Rm. 11
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Replenishment System?

Expiration date?

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FIFO Materials?

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Visual Management Control?

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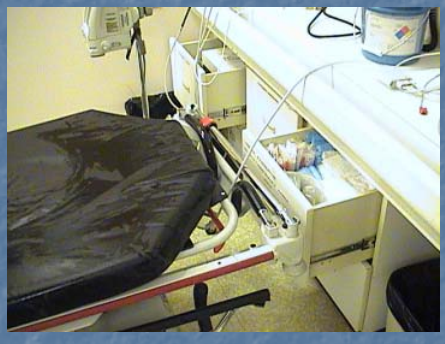
Easy Access to Supplies ?



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Registration Area before construction

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Pre-Lean Triage

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The Changes In ED

- Lean involved a cultural change for all
- While we always said the patient was first, work was planned around what worked for staff within the area.
- The New ED was planned around the patient and the flow.
- Limited POC testing based on clinical need.

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Promises to Patients

- Patients report to Reception and are taken right back to Triage – no waiting around
- Families go to waiting room
- Triage obtains clinical information, symptoms, evaluates based on symptoms and protocols.
- Patient taken right to exam/treatment room by ED Staff, specimens taken now.
- Patient will see the MD within 20 minutes of arrival in the ED.

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ED Reception Desk

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ED Waiting Area for Families

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Visitor/Family Hospitality

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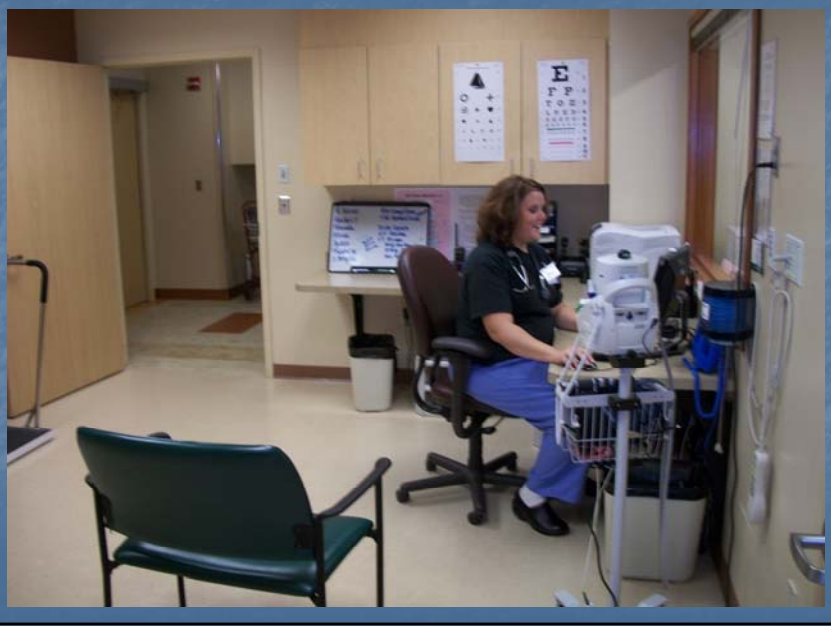
Triage Room



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ED standard room

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Supplies at POU

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In Room

- All needed materials are available in the room. Specialty Carts brought in according to needed specialty.
- Doctor, Nurse and ED Tech all are identified on white board in room.

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In ED Core

- Patient Status Boards located throughout the core to know who is where, what staff is responsible, what physician is assigned, what is outstanding and what has been completed – all color coded.
- Room Status Boards located throughout the core and allow staff to see assets in rooms, staff in rooms, etc.

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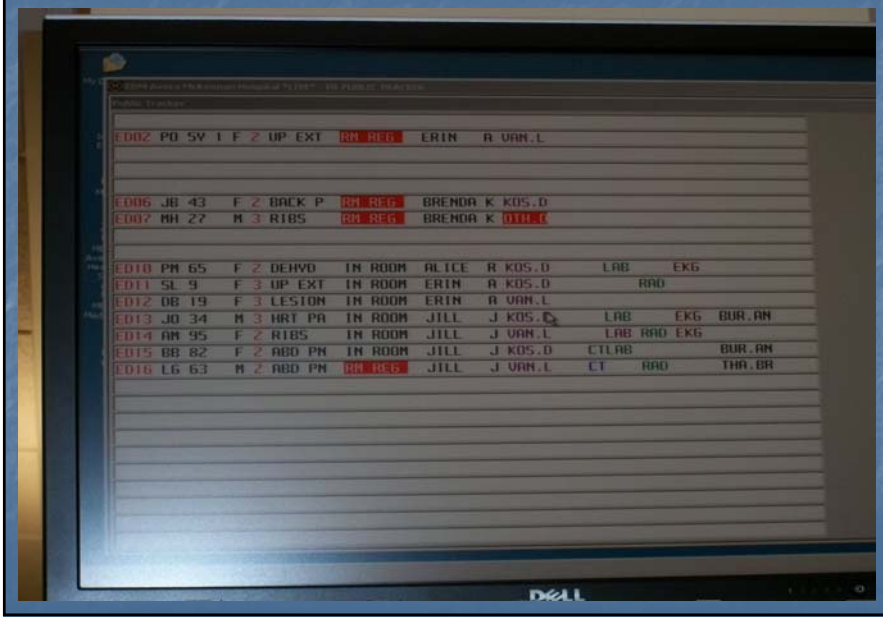
Patient Status Board



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Room Status Board

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Promises (continued)

- Registration completed in room after exam by physician.
- Lab orders placed from Room and the specimens collected, labeled then sent via PTS as soon as MD okays.
- All Specimens received and tested FIFO in Lab – all stat because none are stat.
- LAB ED TAT measured daily by the hour
- Lab has to do its job in order for the ED to meet its promises – thus it is OUR promises. We ALL own it.

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POCT in the ED

- Testing only as clinically needed
  - Urine Dipstick Analysis – Clinitek 50
  - FOBT (Guaiac) –done by MD during exam
  - Urine HCG Test – screen for females prior to radiologic exams- over read by lab
  - I-Stat (for trauma, neonates, BUN/Creat for CT/X-ray screening)
  - Bedside Glucose
  - All instruments are interfaced to LIS including the I-Stat.

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PTS to Lab from ED

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Full Services Available

- Radiographic exams occur in the same fashion.
- X-ray and CT rooms adjacent to or in the Emergency Department
- Staffed by Radiology Staff around the Clock.
- EKG and Ultrasound technology available in the Emergency Department with trained staff performing the exams.

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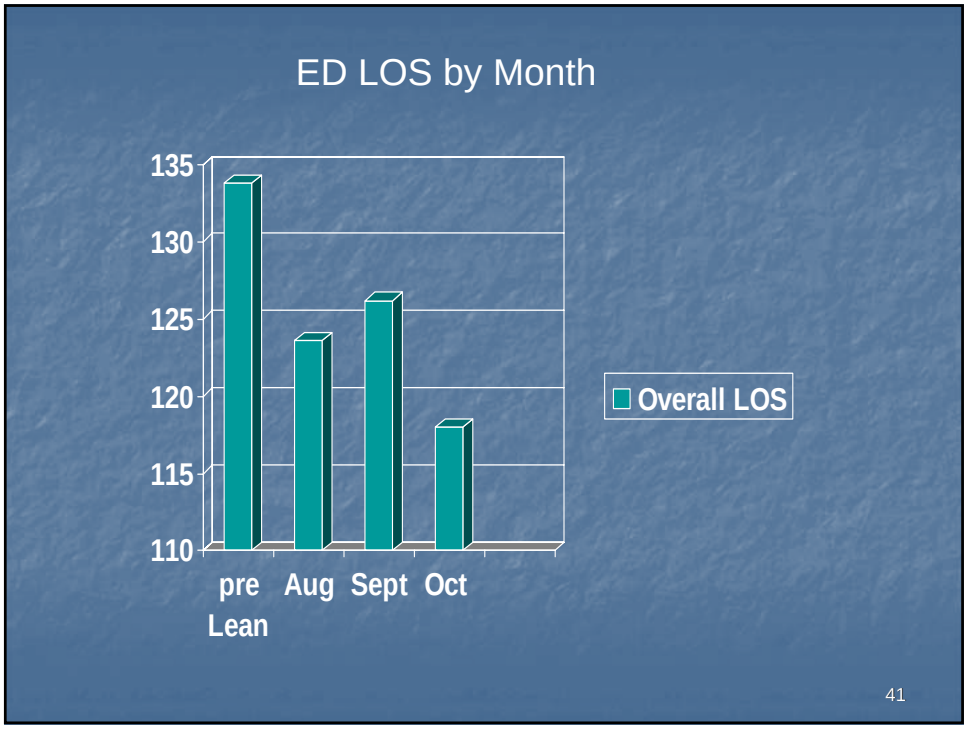

Benefit to Patients

- Original LOS prior to Lean 2H, 20 min
- 6700 pts seen from August to October
- Avg LOS has decreased by 26 min/pt
- As of September 30, 2010 LOS still averages 1 hour and 54 minutes for all cases.
- Press Ganey Scores above 90th Percentile for past year.
- Largest e-Emergency System in the U.S.

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The Lean Core Laboratory

The Second Part of the Story

Visualization

- Lean Design
  - Used to design the work cell or workplace into a more “flow friendly” layout
  - It includes the overall layout
  - The direction of the work/product flow
  - It includes the workstation design
  - Process mapping necessary before design
  - Machines and activities are in the order of workflow.
  - Instrument and equipment layouts are planned and noted on the work cell.
  - 6-Sigma format called DMADV

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The Concept of FLOW

- This is the central concept of Lean.
- Smoothing the flow means ensuring that every piece of work is continuously worked on – there is little or no waiting.
- The key to this is “Single Piece Flow”
  - A sub key is FIFO (First In-First Out)
  - This defines the order of work – eliminate waste of motion, walking, inventory
- Self managing employees- every employee has ownership = is responsible and authorized to ensure that quality is #1.

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5 S (Clearing Clutter)

- A Huge Key to Lean- Clean, Neat, Orderly
  - Sort
    - Clear out un-needed items
  - Segregate
    - Configure the workcell-arrange in order of use
  - Scrub
    - Clean-eliminate dirt, rubbish, trash, scraps
  - Standardize
    - Everything has a place all the time- work the same
  - Sustain
    - Work to the standards-measure and post the data

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Error Management

- Error proof
  - Mistake proof the workcell and processes.
  - Use shut out types and attention types
- Standard Work Document
  - Shows the work sequence, takt & cycle times
  - Defines standard Work In Progress
  - Clearly documented in an SOP
- Root Cause Analysis
  - Look for cause and effect – uses FMEA (failure mode and effects analysis)

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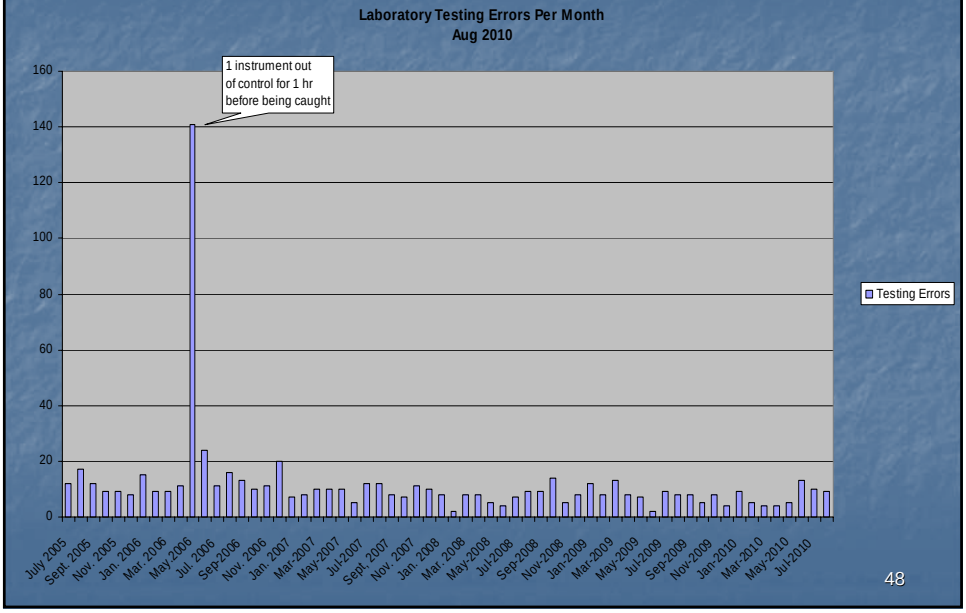
Testing Error= Any time a verified result is changed significantly for any reason.



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Specimen Accession

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Specimen Distribution

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Specimen Processing

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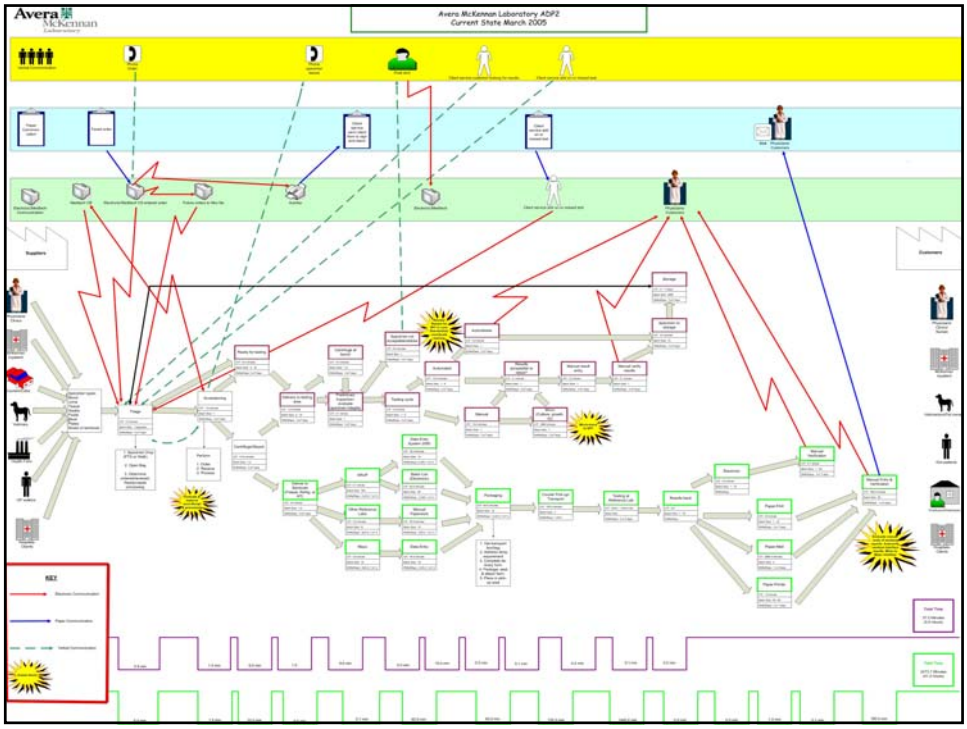
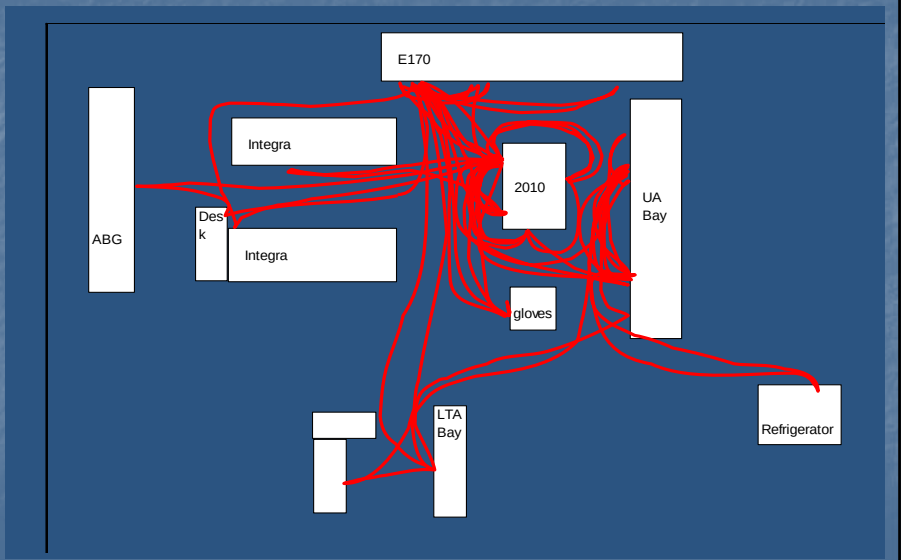


BASE Operator ANALYSIS



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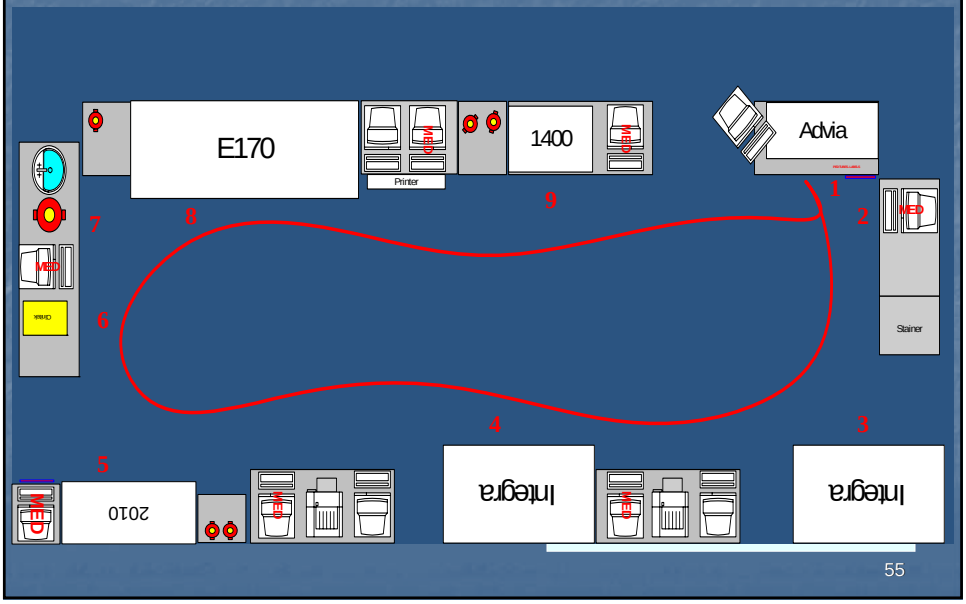
New Layout



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Move from Push to Pull

- Let your customer "Pull" your product
  - Single piece flow- FIFO, try to stop batches
- In lab means "no" Stats because "all" Stats
  - FIFO/SPF means all are treated same way
- Level loading of work
  - Smooth the peaks and valleys of work
- Staffing to demands
  - Create staffing matrix for when work is here.
- Cycle/Takt times
  - Works to beat of demand

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Maintain the Gains

- Hardest part of Lean
  - Metrics- posted goals & posted data
    - no secrets –out for all to see
    - TAT by the hour, error rates, etc.
  - Continue to attack waste
    - Everyone should be looking for waste
  - Kaizens – break thru events
    - Done only after full lean project in area.
  - Stand-up or Start up Meetings
    - Daily Line-up
  - PDCA/FMEA
    - Plan, Do, Check, Analyze

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Maintaining

- Suggestions for Improvements
  - Those who do the work can find the areas that need fixing/improving best.
- Bright Ideas
  - Put your suggestions in to the bright ideas software – we all win that way.
  - Makes you aware that you really own the processes and the work.
- Ensures we are all involved in Quality

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Lab-ED TATs

- ED TATs are measured in 2 ways –
  - Collect – Verify – We want "vein to brain" times.
  - Receipt to Verify – in lab time – we control
- Lab ED TATs are (14 month average)
  - CBC = Coll-Ver = 17.2 minutes (95%)
    Rec-Ver = 7.5 minutes (95%)
  - Chem Panels = Coll-Ver = 35.8 (95%)
    Rec-Ver = 21.2 (95%)
  - Troponin T = Coll-Ver = 39 min (95%)
    Rec-Ver = 22 min (95%)

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Summary

- Key to success is 'putting the patient first'.
- ED Processes revolve around great care and great service from a patient point of view.
- Lab Processes revolve around right result in right time at the right place.
- Collaboration between ED Leadership and Lab Leadership is critical.
  - Lab has designated management staff who are adjacent to the ED and work closely with them to ensure success.

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Take Aways

- Patients are best served when ED and Lab work collaboratively.
- If properly set up, an ED can give world class service using a “core” laboratory.
- Close working relationship with mutual respect and understanding between the ED leadership and Lab leadership are critical.
- There is no 1 size fits all solution.

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QUESTIONS?

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