Institute *for* Healthcare Improvement

The presenters have nothing to disclose

Hospital Wide Patient Flow

General Principles to Improve Hospital Operations

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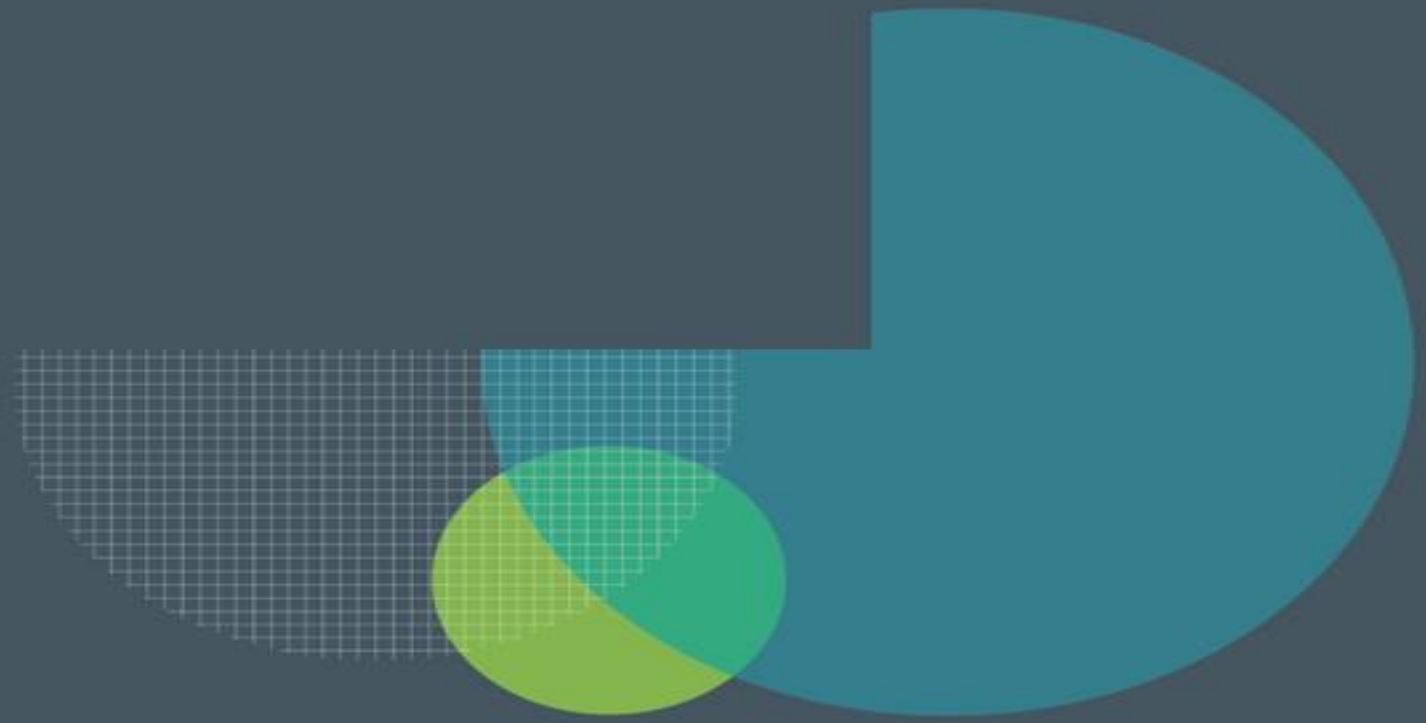


As part of our extensive program and with CPD hours awarded based on actual time spent learning, credit hours are offered based on attendance per session, requiring delegates to attend **a minimum of 80%** of a session to qualify for the allocated CPD hours.

- **Less than 80%** attendance per session = **0 CPD hours**
- **80% or higher** attendance per session = **full allotted CPD hours**

Total CPD hours for the forum are awarded based on the sum of CPD hours earned from all individual sessions.

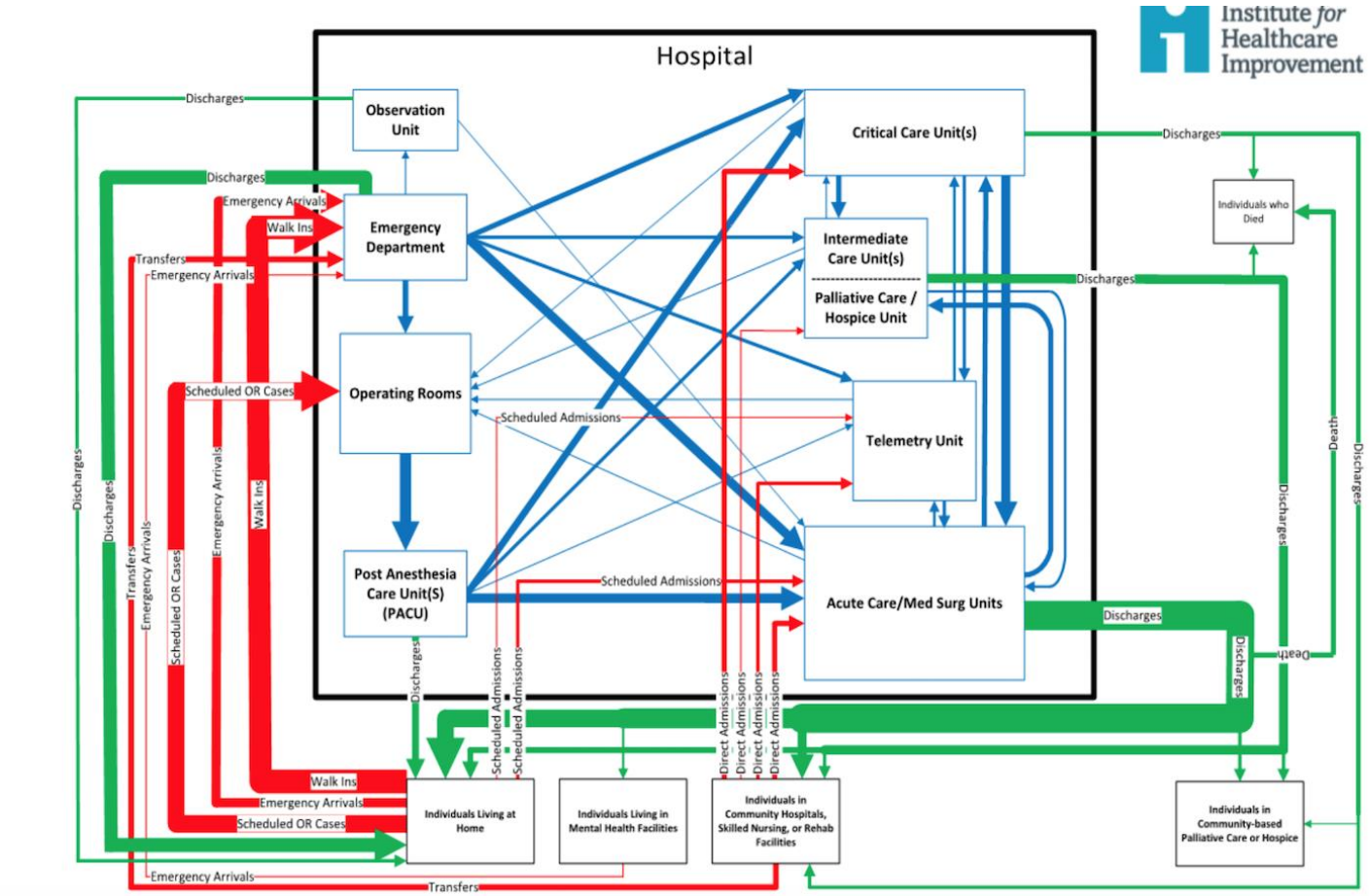
Conflict of Interest

The speaker(s) or presenter(s) in this session has/have no conflict of interest or disclosure in relation to this presentation.

Agenda

1:00-1:10 pm:	Introductions
1:00-1:55 pm:	Improving Critical Care Flow
1:55-3:00 pm:	General Flow Principles & Practical Plans
3:00-3:30 pm:	***Break***
3:30-4:00 pm:	Palliative Care
4:00-4:30 pm:	Surge Plans
4:30-5:00 pm:	Questions & Discussion

Hospital Flow is Complicated



- Rutherford PA, et al. *Achieving Hospital-wide Patient Flow.* IHI White Paper, 2017.

How to even get started?

- Two key elements:
  - ***Process***
  - ***Culture***

Setting Up a Program

- Leadership
- Set a vision
- Look at every process critically
- Goal: Better for patients- easier for staff
- Involve frontline staff
- Continuous improvement
- Open data with clear metrics
- Have fun!

Principle #1: Leadership & Learning

- Embrace the “long view” for patient care…

Think in a different way… avoid silos

Outpatient

ED

Inpatient

Reminder:
Only three ways to create capacity!

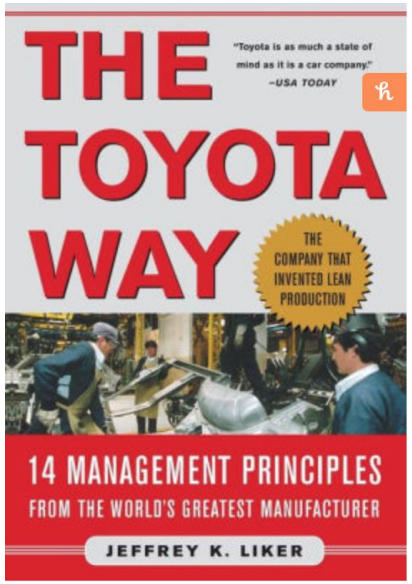
- Decrease length of stay
- Decrease arrivals
- Increase capacity

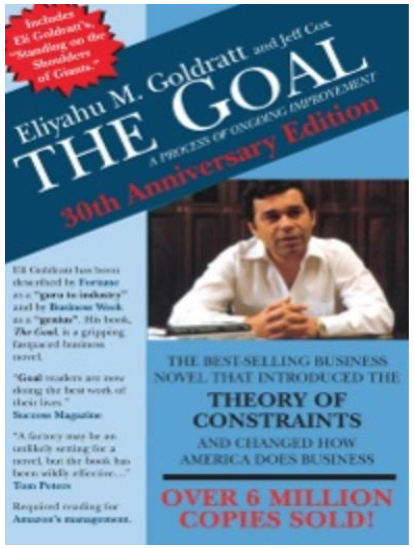
Lean Training

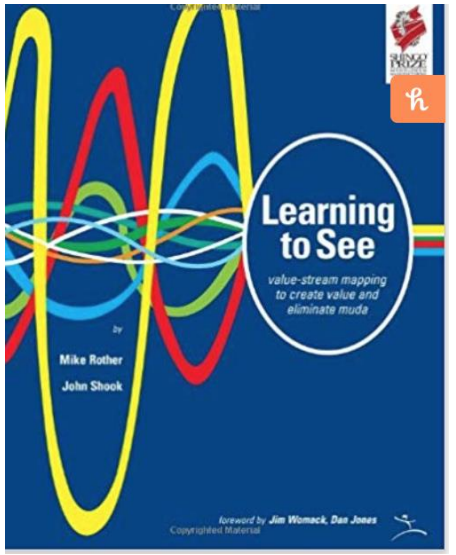
- **Lean Healthcare** *is the application of concepts, tools and management prescriptions aimed at furthering the organizational mission by strengthening operating processes*.
- Characteristics of a Lean **Healthcare** organization
  - More Efficient (operationally & capital-wise)
  - Faster & more reliable
  - Delivers higher quality
  - More Responsive
  - Performs way above the rest

Lean Healthcare

- Easy tools you can learn (Value Stream mapping, Kaizen events)
- Can repeat over and over as you work to improve operations
- Puts discipline into a process and avoids emotional decisions







Key Principles of Lean

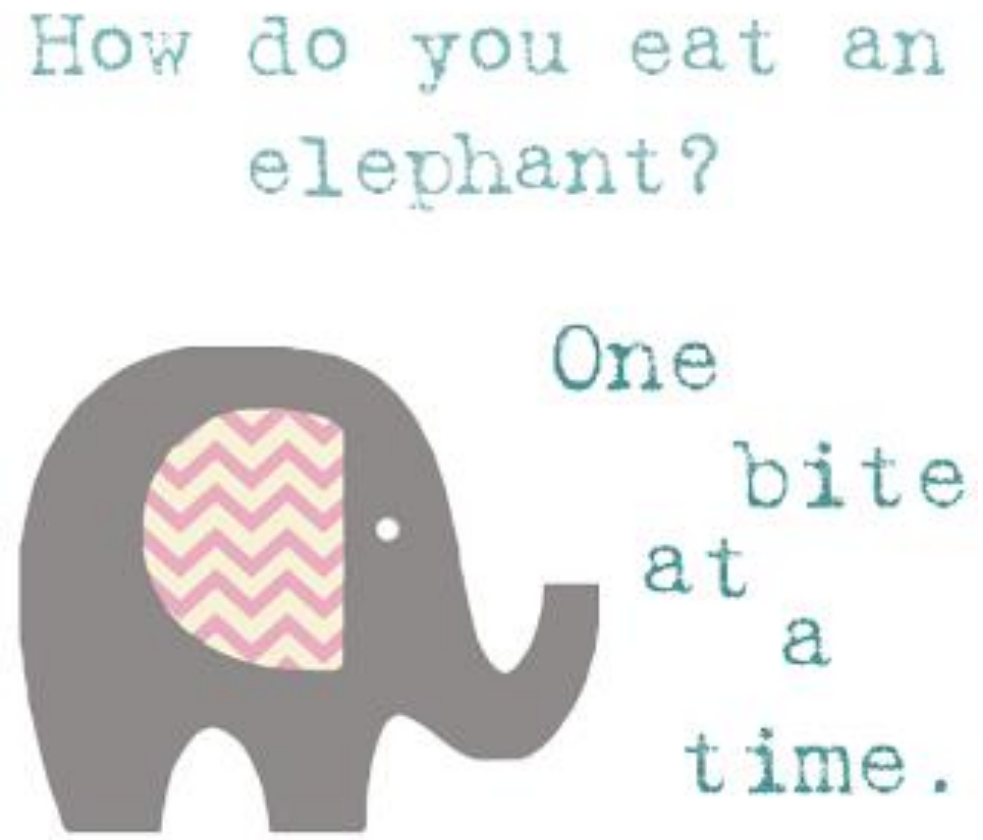
- Focus on Processes that deliver Customer Value
  - *Value-added* activities
    - an activity that moves the patient closer to resolving his/her medical situation
    - an activity which the patient would pay for and which is done right the first time

Lean Healthcare

- Focus on ***Processes*** that Deliver Value
- Value Added activities:
  - Activities that move the patient closer to resolving the medical situation
  - Activities that patients would pay for and is done right the first time
- Non-Value Added activities: ***everything else***

Become an Engineer

One Bite at a Time



Principle #2: **Create a Vision**

- “Our Goal is to Provide the Best Care to our Patients without Delay”
- “No Boarding”

Put a Patient Face on the Vision

- 3 year old girl, brought in by mom…vomiting and diarrhea for 3 days, no fever
- Quickly evaluated by MD who said she “just doesn’t look right”
- LP showed >7000 white cells, culture grows out meningococcus

Dr. Cooke –

Just thought I'd would send you an update. Thanks to you Savannah beat Meningitis 10/2. She won't last many for her 1st year check up and she is perfect!!
Enclosed is her 5 year old picture. She starts kindergarten in the fall. I will always be grateful to you because without you my life could have been very different.

Thank you
Kirsten Garcia

Create cultural change over time…

- Worked to empower all employees to own the change and think about process improvement in their everyday life.
- Told all new hires… “if you don’t like change you probably don’t want to work here”
- Gave all physicians leadership books and challenged them to do projects that would help the department
- Is precedent- Toyota got over 80,000 suggestions from employees and implemented 99% of them.
- Easier said then done!

Principle #3: **Decrease Length of Stay**

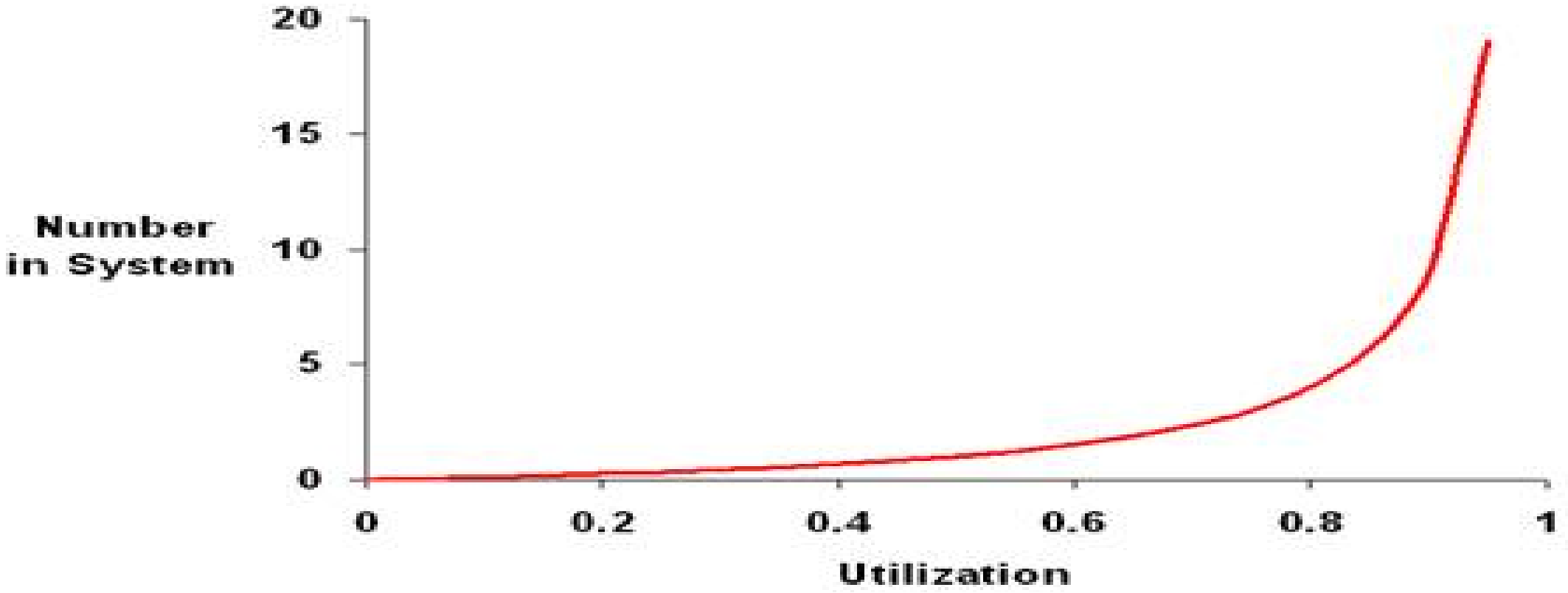
- **Key Principles:**
  - Small reductions in service time can really make an impact in times of high utilization
  - Decreasing length of stay is the most key metric for dramatic improvement quickly

Principle #3: Decrease Length of Stay

- In the ED: ***a war won in minutes***
- Inpatient side: ***a war won in hours***

Never put a new process in place that adds to length of stay unless it dramatically improves patient care…

Remember this graph…



Focus on the most constrained area first

- Look at floor occupancy and get an idea of which floors are most constrained
- A simple calculation:
  - ***(# patient arrivals to floor * avg LOS (days)/ # of floor beds = utilization percentage***
- Pick your biggest bottleneck and work on that first

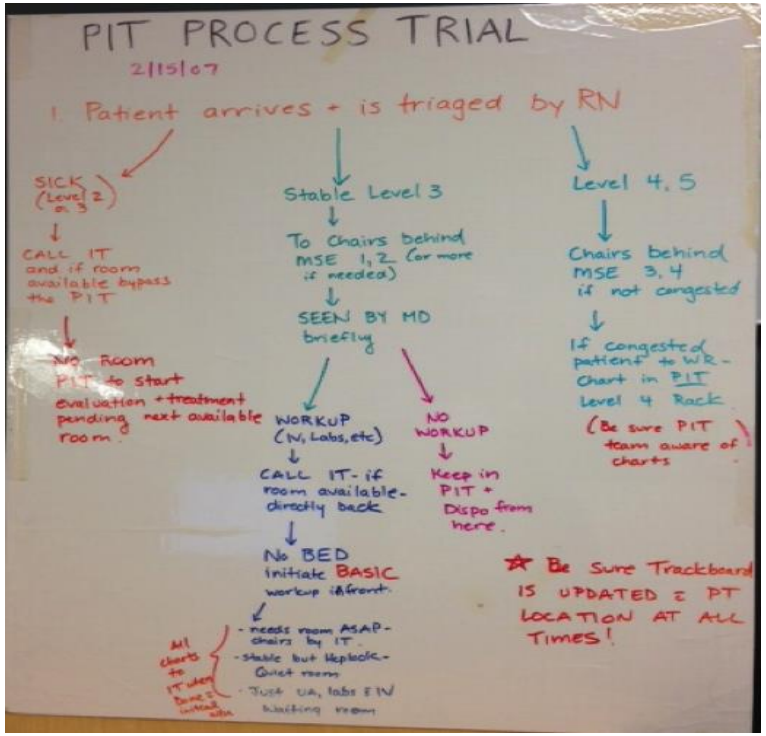
Principle #4: Optimize working conditions

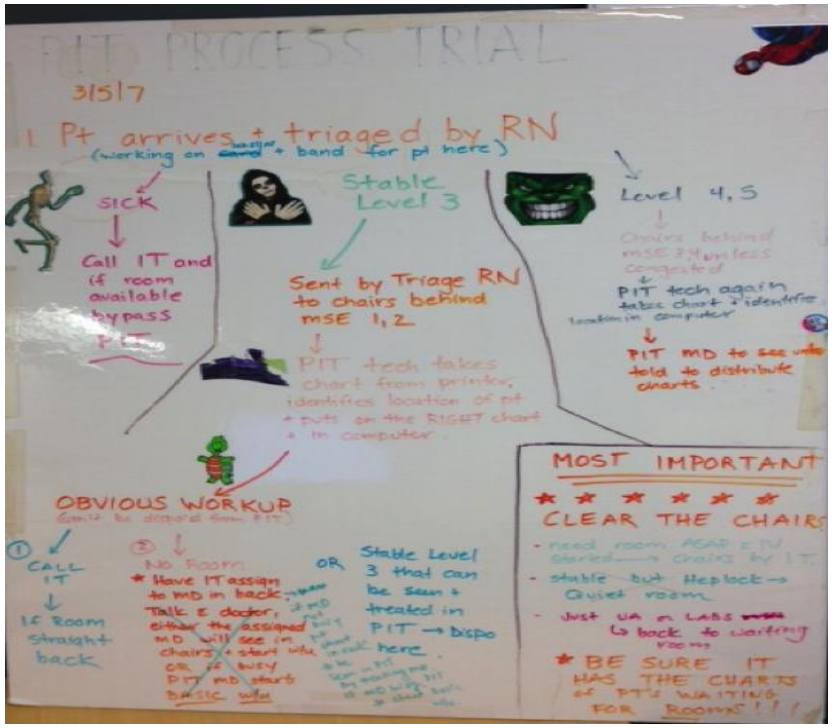
- Look at every system: make it better for patients, but ***easier for people doing the work***
- Ask people to think outside of the box
- Consider training in Lean operations or bring in an expert to help

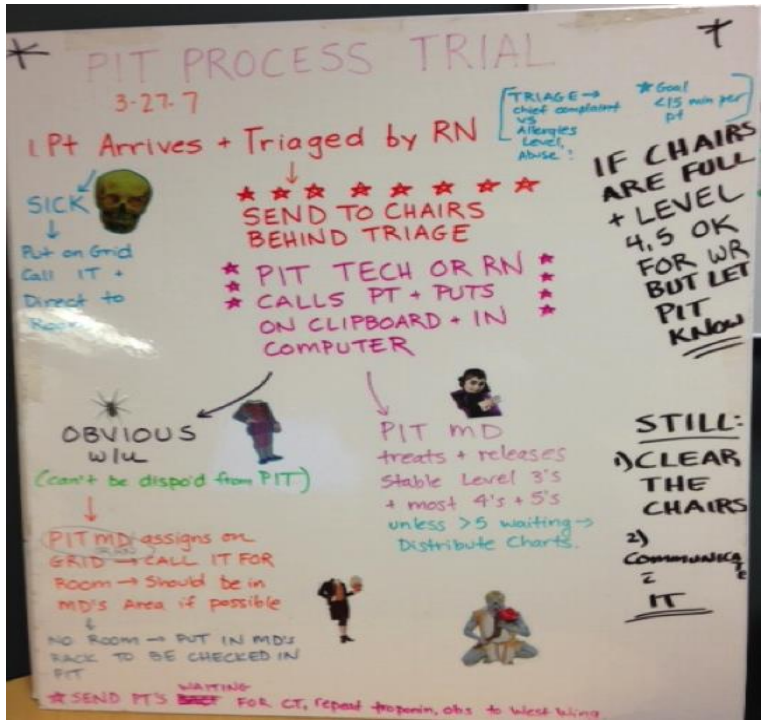
Example: Low Acuity Flow in the ED

- Get the patient in front of the treating provider as soon as possible
- Eliminate triage when possible
- Avoid as much unnecessary movement as possible for patients and providers

Example: ED Low Acuity Flow Project







Example: Low Acuity ED Flow

- Think about things in a new way
- Low acuity patients can be **“triaged to home”** (see a provider quickly, get all care done, and go home)
- Clears the waiting room quickly and creates capacity for high acuity patients

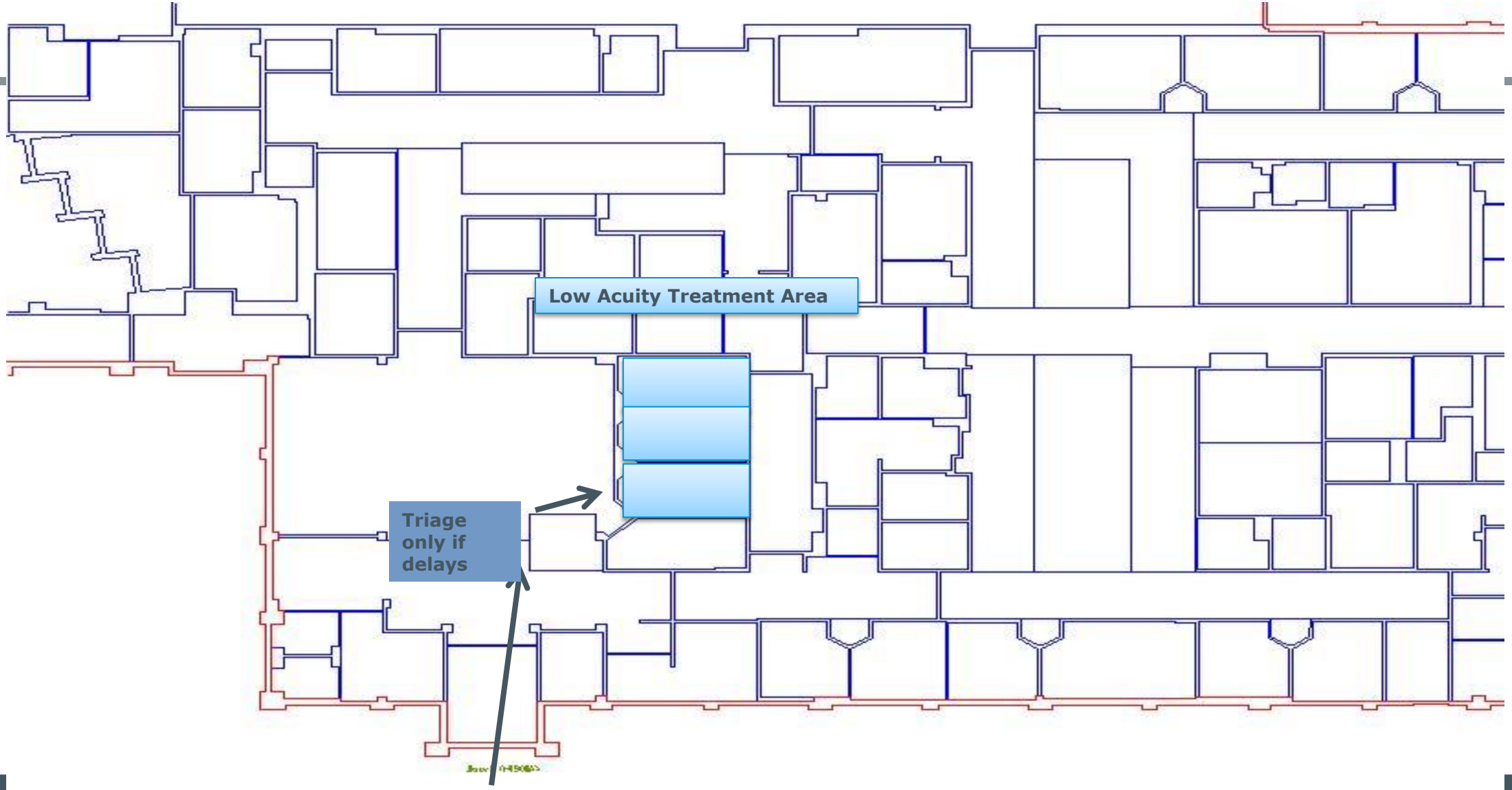
How many patients waited for a bed?

Example: low acuity flow principles

- Small constrained area
- Well defined teams that work well together
- “One Contact” as much as possible
- Minimize movement
- Uniform work stations & stocking

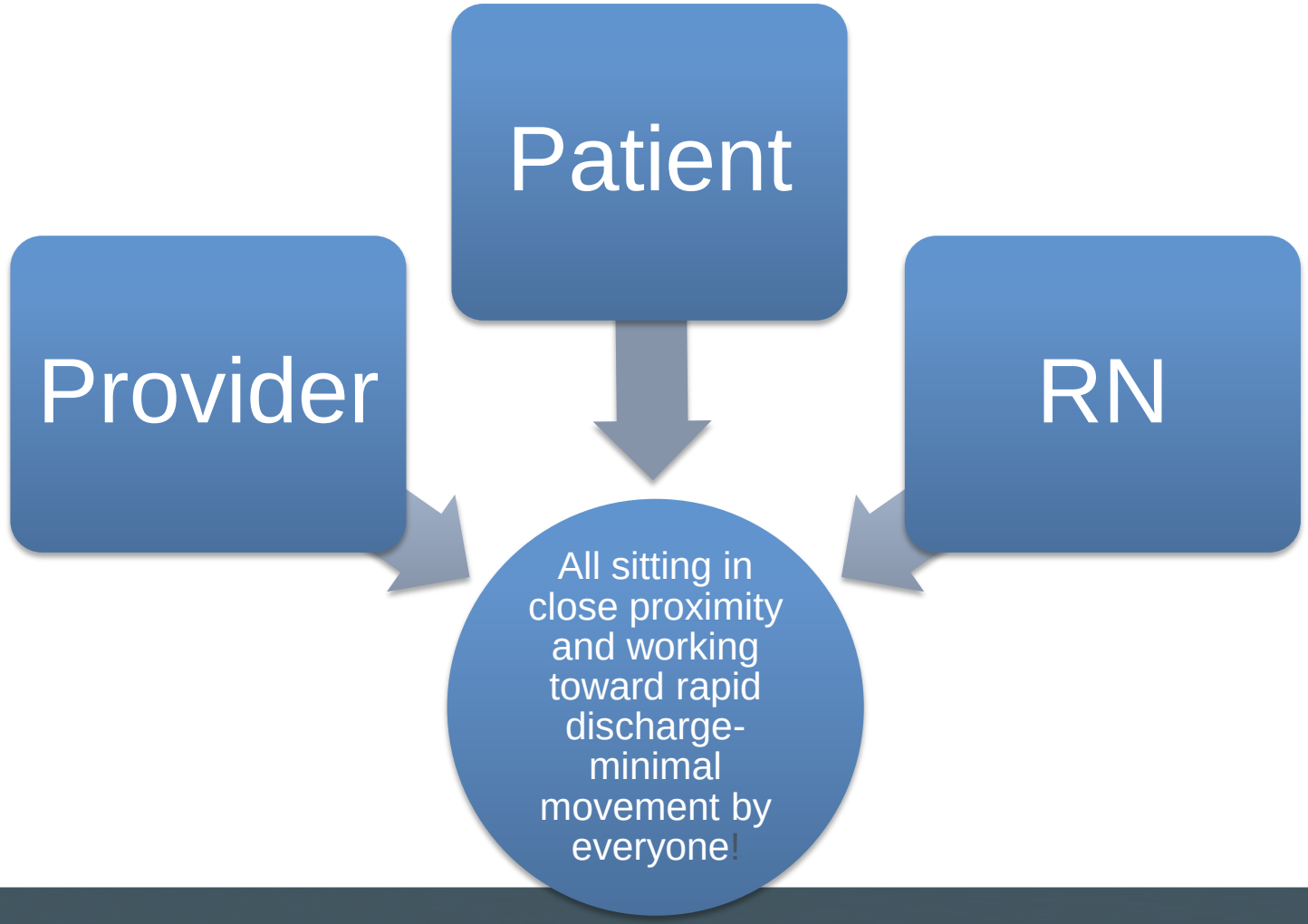
This can be replicated throughout the hospital

Low Acuity Flow



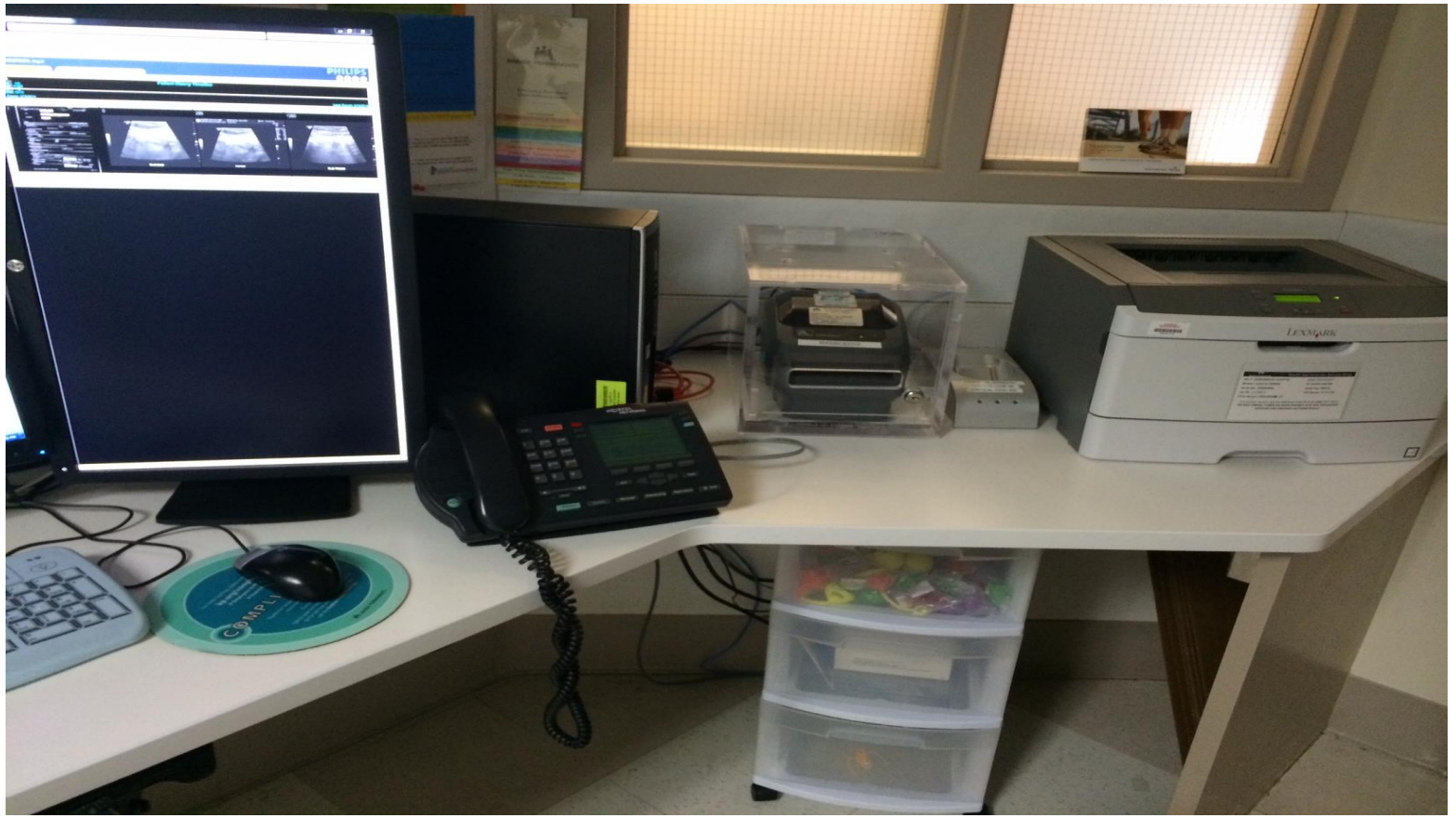
Example Low Acuity (Video)

Example: Low Acuity Flow




MD

Example: Low Acuity Flow



Example: Lean GI Flow

- Set the vision: “no patient will die of colon cancer”
- Combined this with: “make it easy to do the right thing”
- Visionary MD leader changed the culture: had weekly meetings with the team to discuss leadership, patient flow, and environmental improvements
- Fun and teamwork

Waiting Room Redesign

Recovery Area Standardized

Color Coded Treatment Rooms: Each MD gets Two

GI Supply Organization

- Found they were wasting very expensive specialized equipment that expired
- This one improvement saved the organization hundreds of thousands of dollars!


Jason Guardino, DO, MS
Gastroenterology

Principle #5: Shape or Reduce Demand

- Optimize outpatient resources: both before and after hospitalization
- Create clear care plans for patients on arrival to the hospital
- Use data for surgical scheduling of patients- ED arrivals are very predictable: "***we know they are coming, we just don't know their names***"

Principle #5: Shape or Reduce Demand

- Prevent readmissions by optimizing discharge planning, care transitions, and increasing patient and family education

- Example: **CHF:** Outpatient and ED Working together to avoid readmission
  - ***Kaizen event*** to improve the process
  - First time outpatient, inpatient and community resources were in the same room to develop workflows!
  - Multiple silos were identified

CHF Kaizen

- Found home tele-monitoring nurses were recording weights and vital signs, but not treating the patient
- Gaps in communication with physicians
- Developed standard workflows for the nurses: decreased readmissions, easier for both RN and MD

This one day event changed a 10 year old problem!

This process can be replicated over and over!

Palliative Care

- Palliative care program is essential
- Saves ICU beds while providing care ***in accordance with patients wishes***
- Patient centered always

Decrease ED Visits

- Robust primary & community based health centers
- Population based primary care
- Paramedics triage and treat patients at home
- Care management for complex patients with multiple needs

If not possible: *the scheduled ED visit* to shift patients to less busy hours

Surgery

- Avoid artificial variation in hospital census by looking at surgical scheduling
- Consider bed placement before surgery
- Discuss risk of boarding with surgeons and have a surgeon lead this work

OR smoothing resources

- **Eugene Litvak**
- **Fred Ryckman**, MD- Cincinnatti Childrens
  - Transplant Surgeon
  - OR scheduling that is patient and **hospital flow** based
  - Predictive modeling to be sure all scheduled OR and predicted ED patients have beds

OR smoothing

- Don’t have to shift everything: one or two blocks can change things significantly

- Many times the block shift is better for the physician- they just have never been asked

Case Study: Rapid Surgical Unit

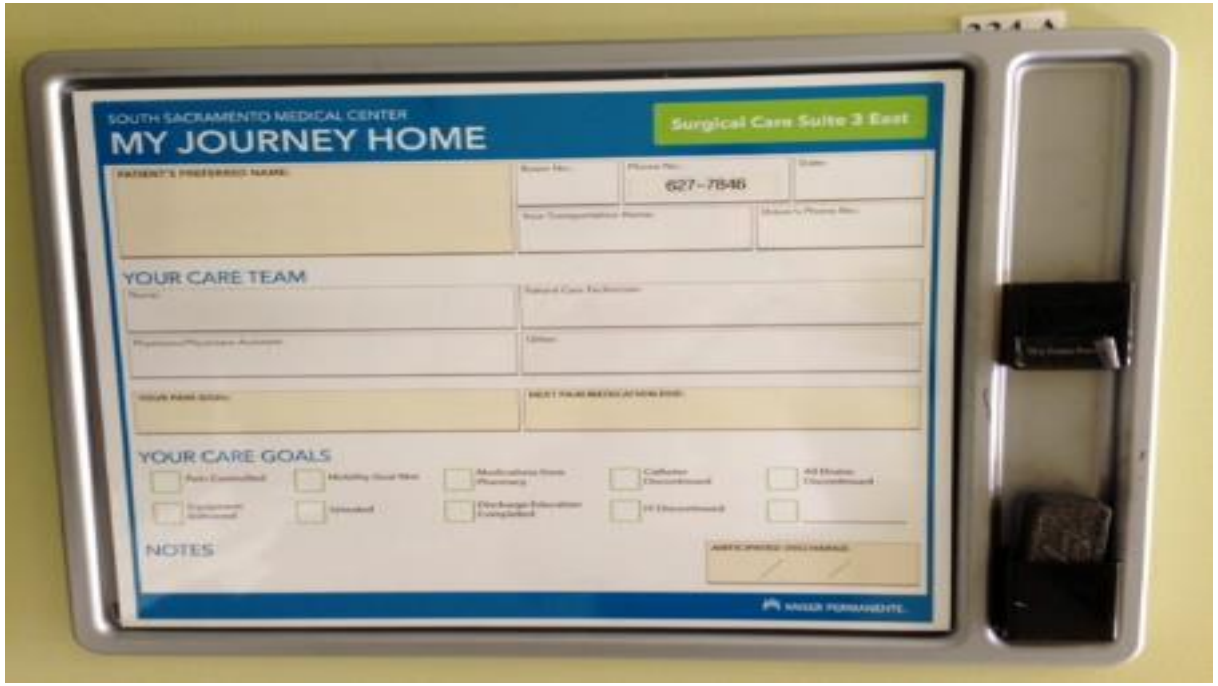
- Kaizen event on Winter Planning
- Identified surgical patient flow as an opportunity
- Made the plans at the Kaizen, opened and implemented completely within 6 weeks

Planning

Met with surgeons for pathways

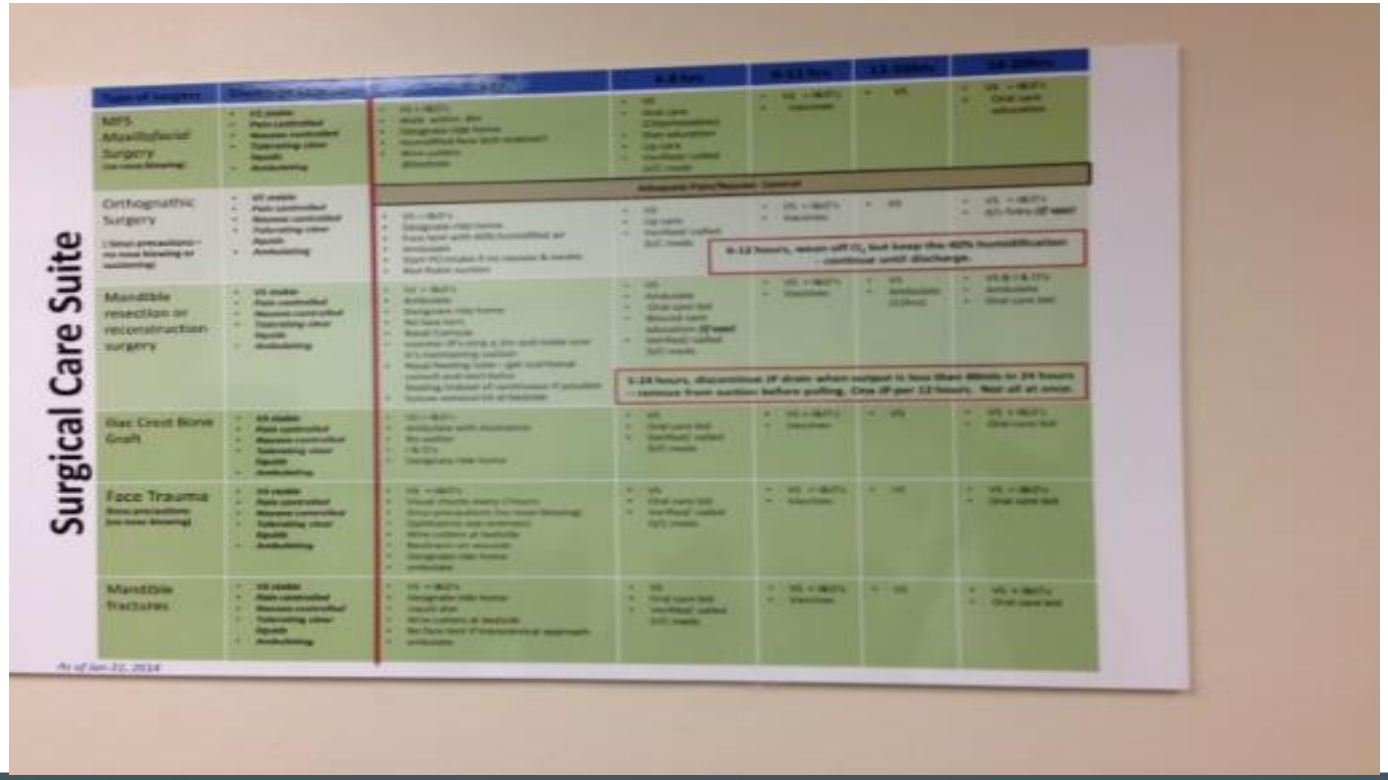
Met with Facilities: Environmental Improvements

Patient Expectations



- Patients allowed to tour the floor before surgery
- Postop expectations given preop
- Nursing volunteers- focus on flow

Six weeks later: new process in place!



Cut almost 24 hours off of our length of stay!

- Great Quality!
- Improved patient satisfaction scores!
- Created hospital capacity

Reduce Preventable Harm

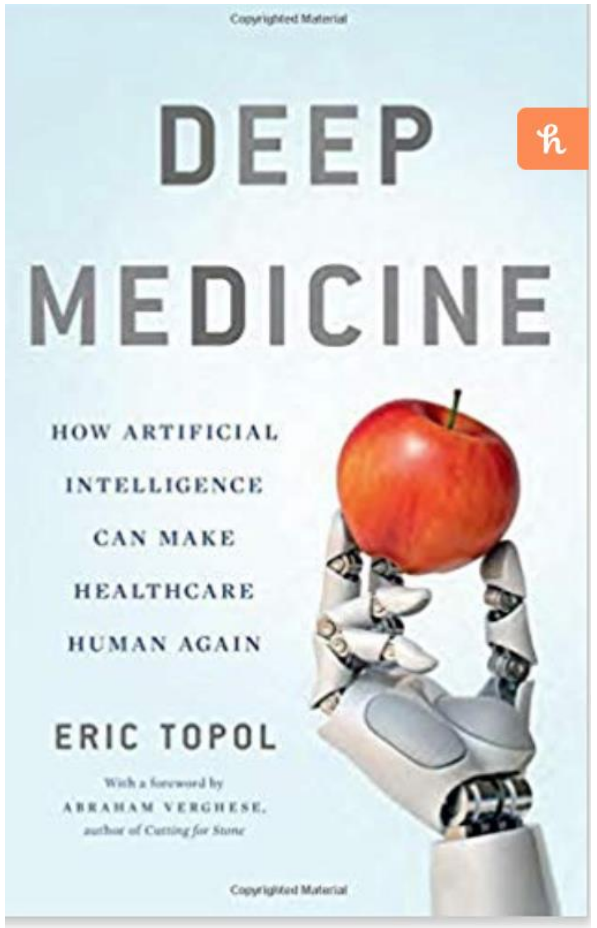
- **The intersection of flow and quality!**
- Create programs to reduce medication errors, diagnostic errors, hospital acquired infections and central line infections
- Studies show that older adults in particular stay twice as long and have a much higher mortality if infection is acquired

Principle #6: Match Capacity & Demand

- Use a data driven operational management system for hospital-wide patient flow
- Consider seasonal and day of week variation in demand patterns to plan for predicted volume
- Use real time demand and capacity management processes

Artificial Intelligence in Health Care

- Look for programs that can optimize patient flow
- The “scheduled” hospital stay
- Better for patients, easier for providers



Principle #7: Embrace New Automation Technology

What it takes for technology to successfully improve flow:

Identify problems before they occur
Predictive analytics & situational awareness

Decrease cognitive burden on frontline
Prescriptive nudges, real-time priorities & automated actions

Intelligent Automation

Drive engagement and collaboration
Modern, user-centric design & behavioral science

+

Operationalize the technology
Project management, data science & change management

Best Practices

Impact Story: Emory + One AI System

Opportunity: Transform total cost of care by reducing hospital-wide LOS and gain better real-time insight into how hospital assets are utilized in real-time

Solution:

- Designed and implemented new cross-functional interdisciplinary rounding process, now with teams achieving **80-90% compliance**
- Deployed Qventus to inform rounding and pull together disparate information that exists in Cerner

ED

- All Results Back
- Real-time situational awareness

IP

- Delayed Patient Placement
- Delay IP Discharge
- Pathfinder

OR

- Wheels In
- PACU exit
- Scheduling
- ToT

Select Results:

0.7 day reduction in LOS
(adjusted for external factors)

15% decrease in ED Dispo Selected to Discharge

37% reduction in bed assign to bed occupied

23% reduction in PACU exit delays

Principle #8: Process Redesign

- Start front to back when considering which processes to start with
  - ED improvement
  - Observation to promote flow
  - Bed assignment
  - ICU
  - OR
  - Med-Surg
- Then consider clinical improvements to improve flow

ED Improvement

- Minimize triage time
- Door to ***treating provider*** as soon as possible
- Maximize low acuity and vertical treatment spaces to preserve high acuity beds
- Create a “no wait” culture
- Maximize the “results waiting” room
- Partner with the inpatient side to “front load” testing for inpatients

Observation to Promote Flow

- Observation is a concept not a regulatory definition
- Consider every patient that you can provide streamlined care to in under 24-48 hours and discharge home
- A procedure room can be very helpful
- Preserve the regular inpatient beds for higher acuity patients
- Key to have a team of physicians and nurses who are focused on flow (consider ED physicians and nurses)

Observation Unit Example

- Eight Rooms
- Staffed with **ED MD's/RN's** with a focus on flow- allows for Trauma, Pediatrics, Gynecology as well as medical patients
- A Flexible Unit
  - Observation with more testing: GI bleed, chest pain, TIA, Stroke without deficit, syncope, pyelonephritis
  - Procedures: Transfusion, dialysis

GI Bleed: a case study for flow

- Elderly patient arrives in ED with lower GI bleed complaint
- Vital signs checked, iStat hemoglobin done, other labs drawn and sent
- Immediate transfer to CDA
- Message left on the “GUT phone” if afterhours
- Standardized bowel prep begun, transfused if needed, serial labs
- Scope in the AM in a procedure room IN THE CDA (minimal movement)
- 75% are discharged home after recovery

Happy Doctor/Happy Patient

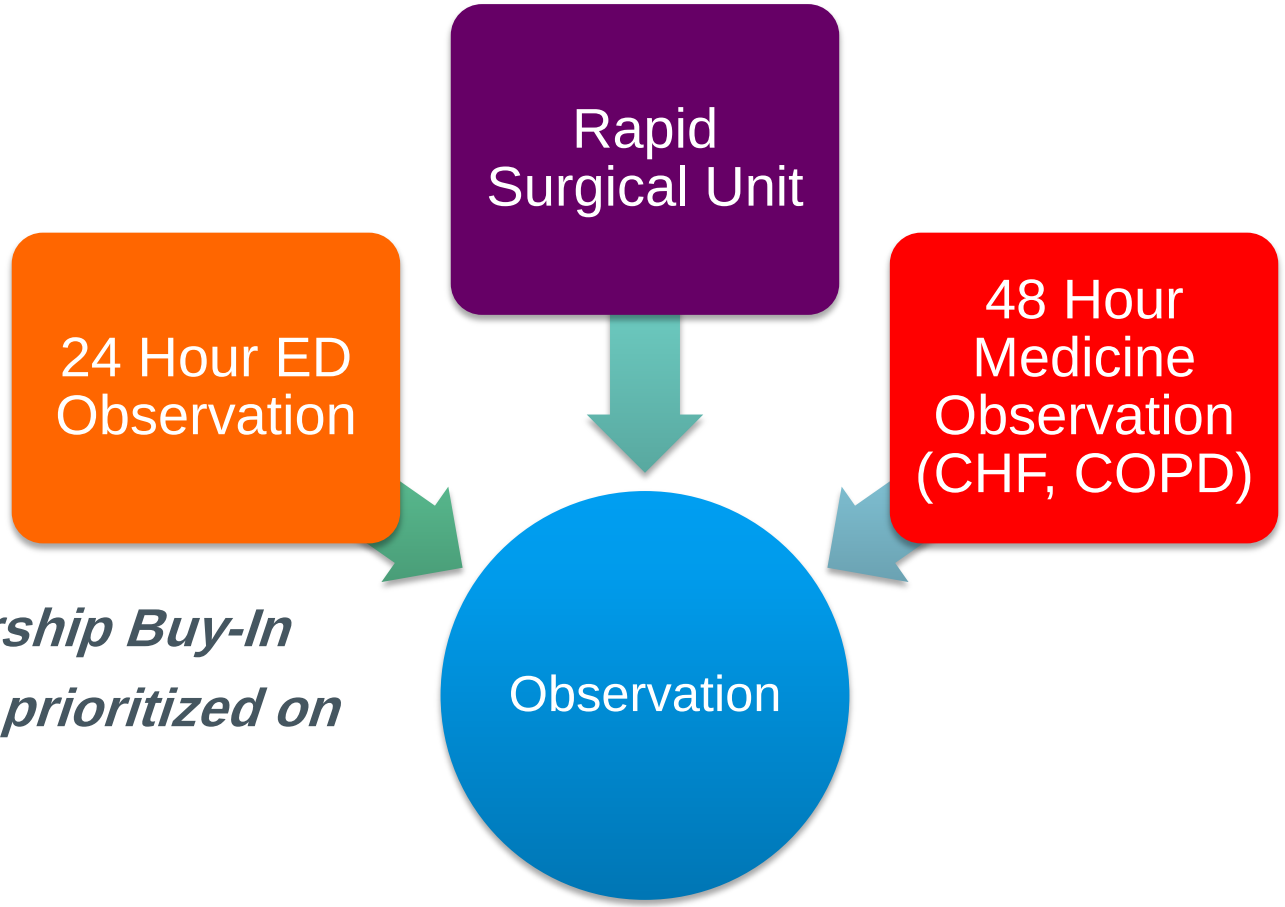
Because movement was minimized, our GI doctors could scope **twice as many** patients in the same period of time!

Examples of Protocols

- Chest pain
- GI bleed
- Mild DKA
- TIA/Stroke without Deficit
- Asthma
- Pyelonephritis
- Head injury

Look what you are admitting as observation and consider if they work for this type of unit

Consider Three Observation Spaces



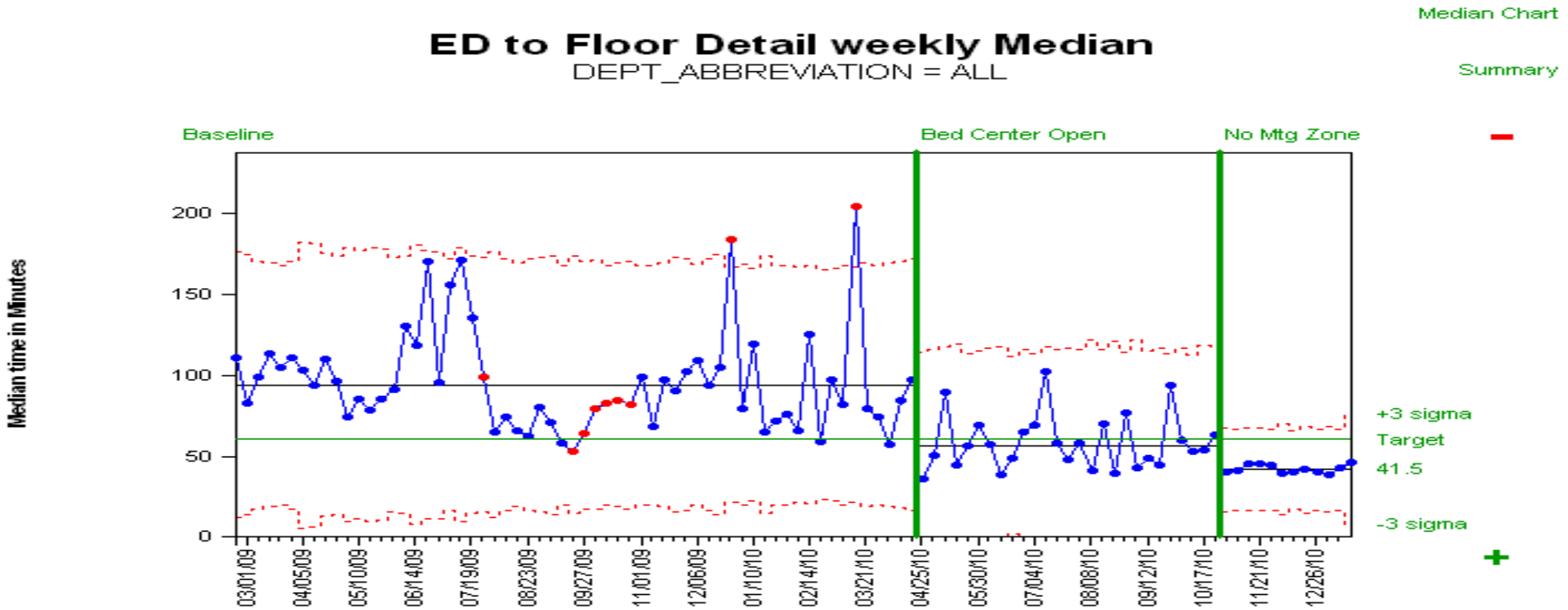
- ***Requires Leadership Buy-In***
- ***Testing must be prioritized on these units!***

- ***Each unit focused on rapid assessment, treatment, and discharge of patients***

Bed Assignment

- This one step can markedly improve Hospital Flow
- Technology can help
- Create a "***bed hub***" for assignment of beds with metrics and accountability
- Consider a leadership ***"no meeting zone"*** in the morning for rounding on the units
- All hospital staff should know their role in the entire system flow

Data Driven Results



ICU, Med-Surg, OR

- Educate all staff on importance of ***safe*** length of stay reductions
- Start discharge planning at admission
- Prioritize transfers out of the ICU
- Improve the discharge process
- Look at room turn around time- involve housekeeping
- Consider conditional discharge when patient meets criteria

Clinical: Enhanced Recovery after Surgery

- Decrease Opioids
- Early feeding & Ambulation
- Clear care plans for patients
- “In my 24 years as a surgeon, this has been the biggest change in our clinical practice. For decades, surgeries were guided by commonly held principles including no food after midnight the night before surgery, strong opioids for pain management, and bed rest for recovery. The elements of an ERAS program- alternative medications for pain control, avoiding prolonged fasting and encourage walking- have been shown to reduce complications.”

Spreading Practice Across an Organization

- Started with one person at one facility
- Colorectal surgery
  - IV Tylenol, NSAID's
  - IV Lidocaine
  - Carbohydrate drink within 2-4 hours of surgery
  - Ambulate within 12 hours post op
  - Diet early post-op

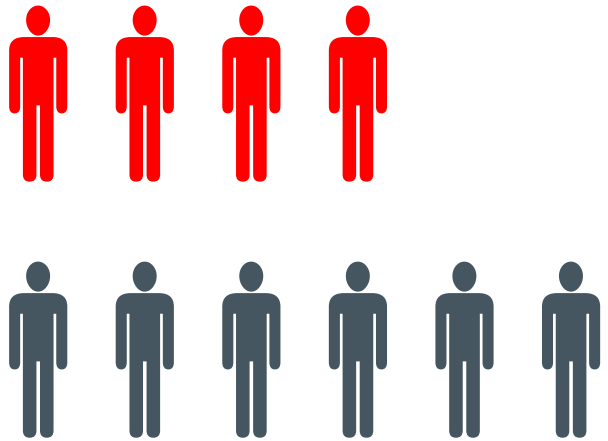
Expand locally

- Hip fractures next
  - Fascia Iliaca Block
  - IV Tylenol
  - Avoid opioids
  - Early ambulation
  - Carbohydrate drink before surgery

ERAS Summit

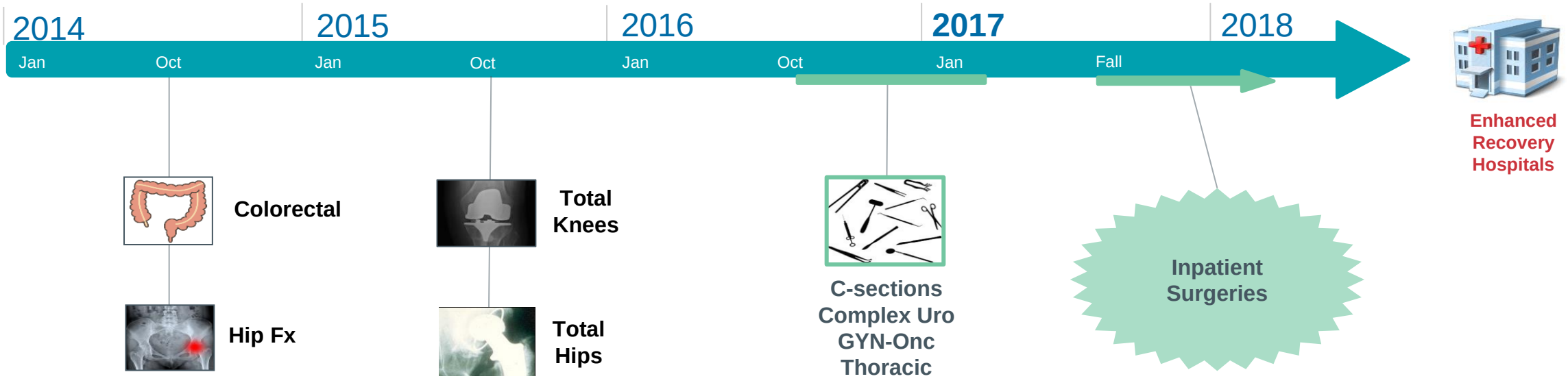
- Key stakeholders from each medical center
- Discussed the vision for the program
- Input and plans for the future

The Why: How Common are Complications?

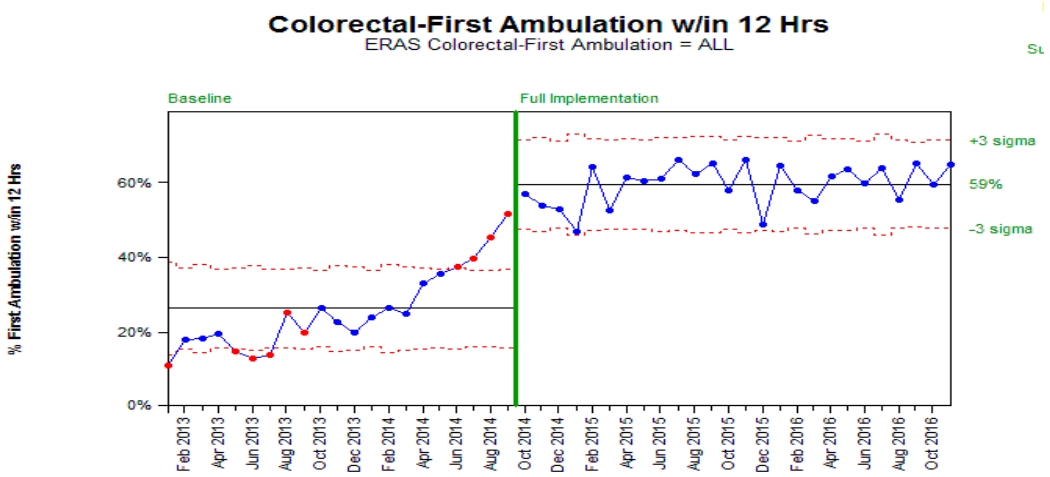


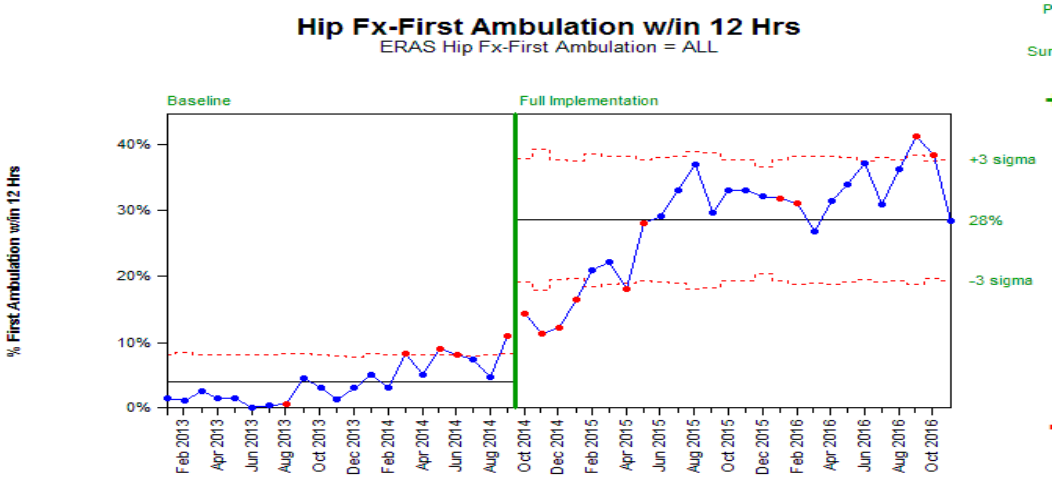
Definition: PNA, UTA, DVT/PE, ARF, MI, CVA, Transfusion, Sepsis, Cardiac Arrest

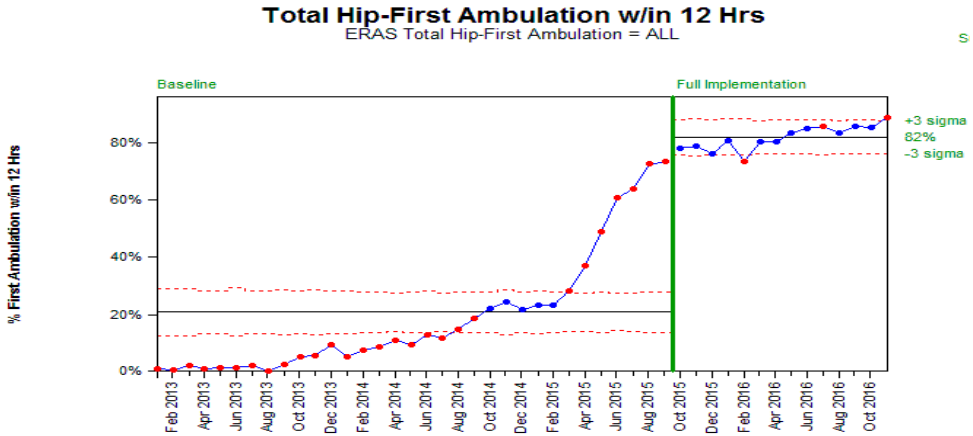
Over 20,000 ERAS Patients to date!

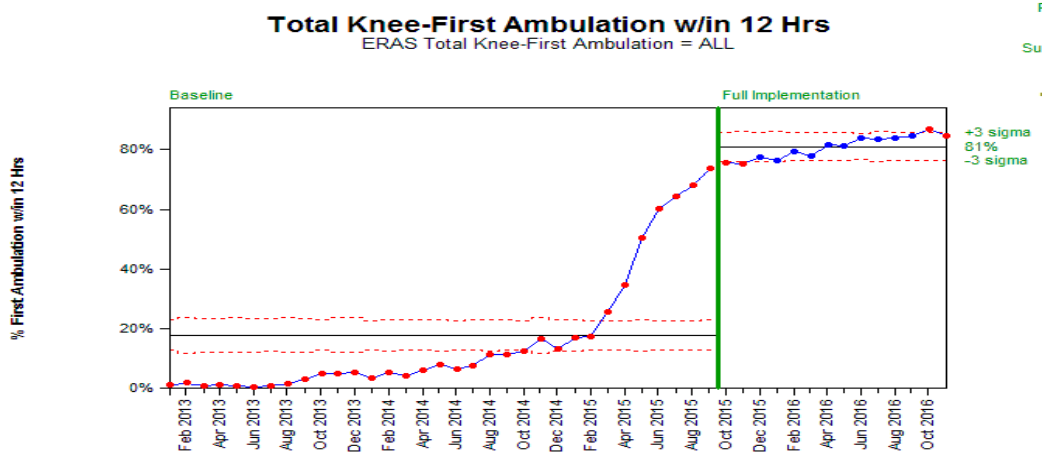


Early Ambulation Increased

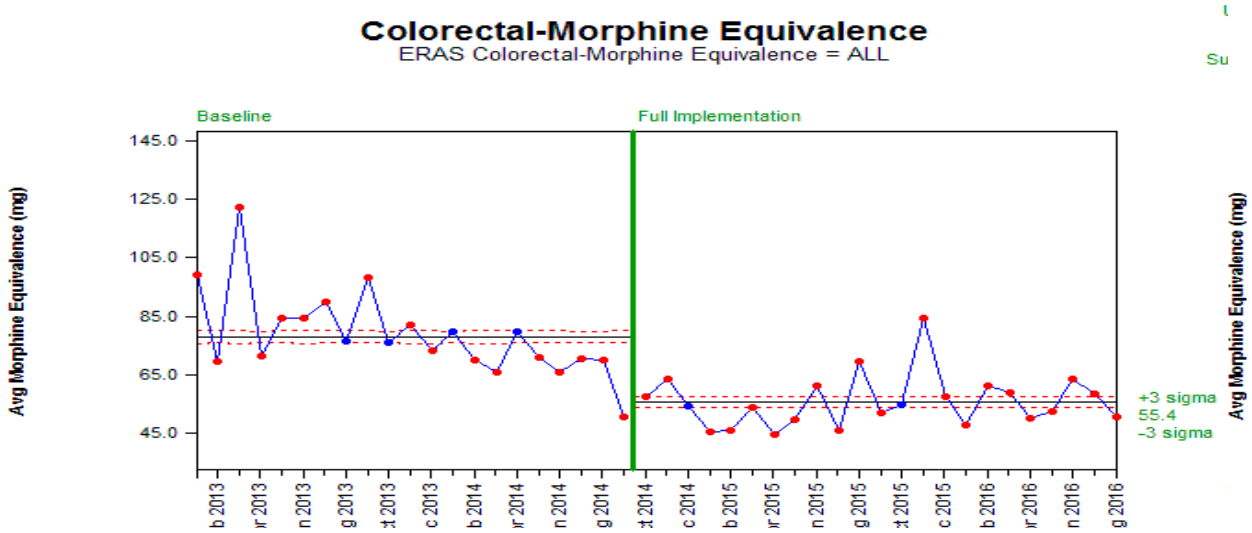


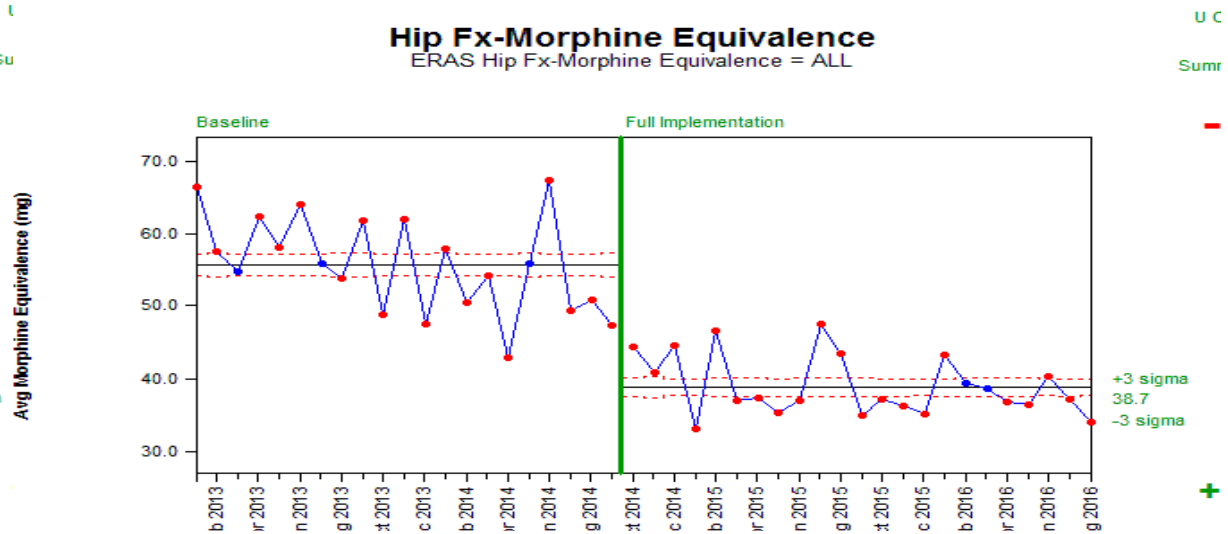


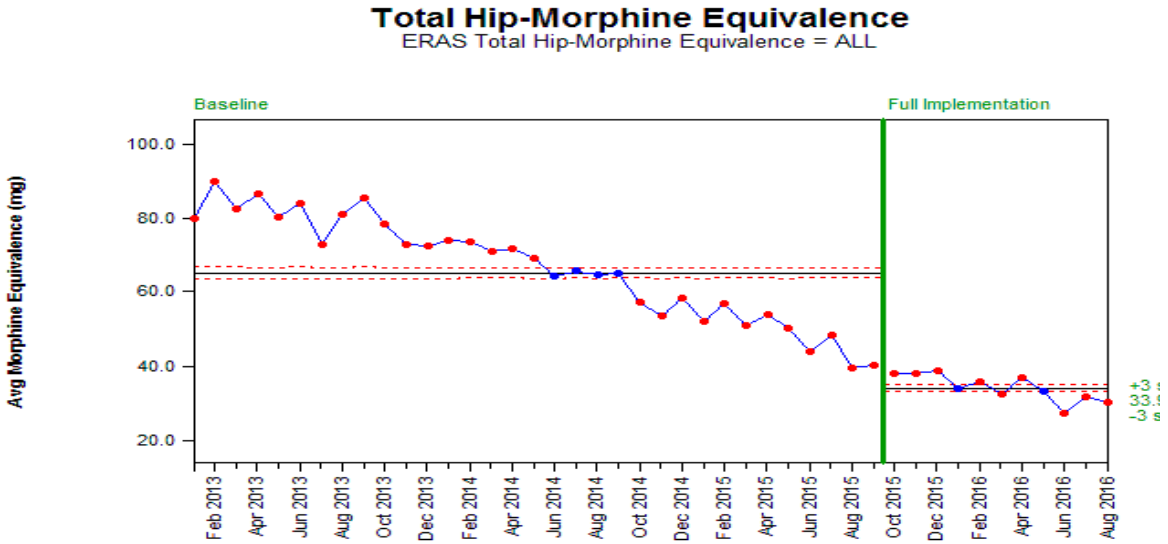


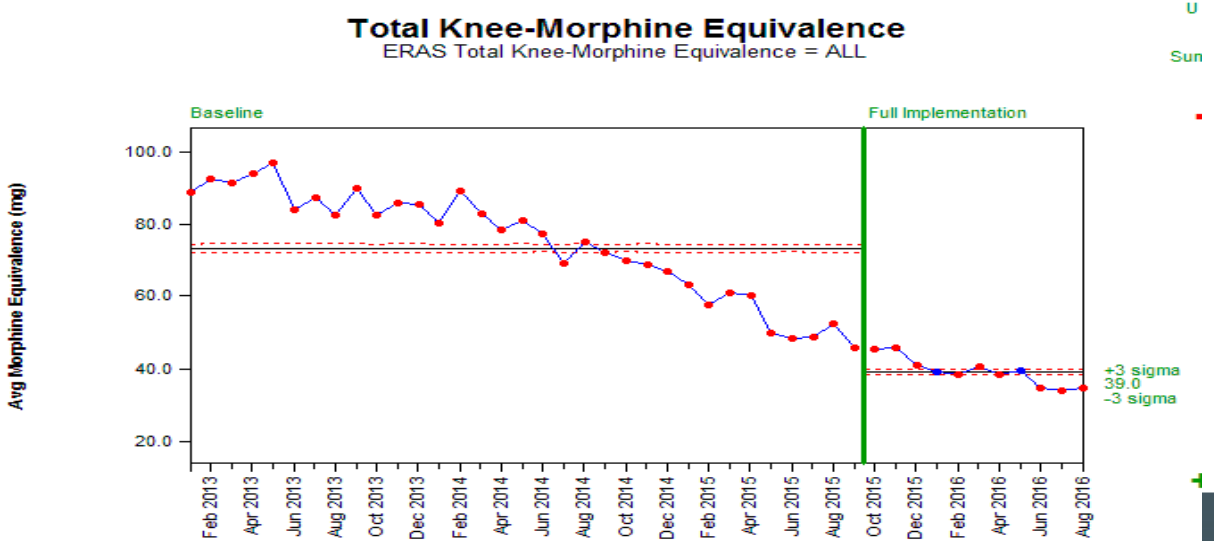


Inpatient Opioid Use Decreased









Team Communication: “Our patients deserve…”

- Better pain control
- Less opioid exposure
- Fewer complications
- Faster recovery

Sepsis Project: Kaiser Northern California

- Vision: There should be no unnecessary deaths from sepsis in any of our hospitals
- Mapped out the process: where were the gaps?
- ***Sepsis summit*** brought together key leaders from every hospital together where data and best practices were shared
- Each hospital dedicated ***champions*** to help teach, guide and give feedback
- ***Provider level data*** with case review

Sepsis: gaps

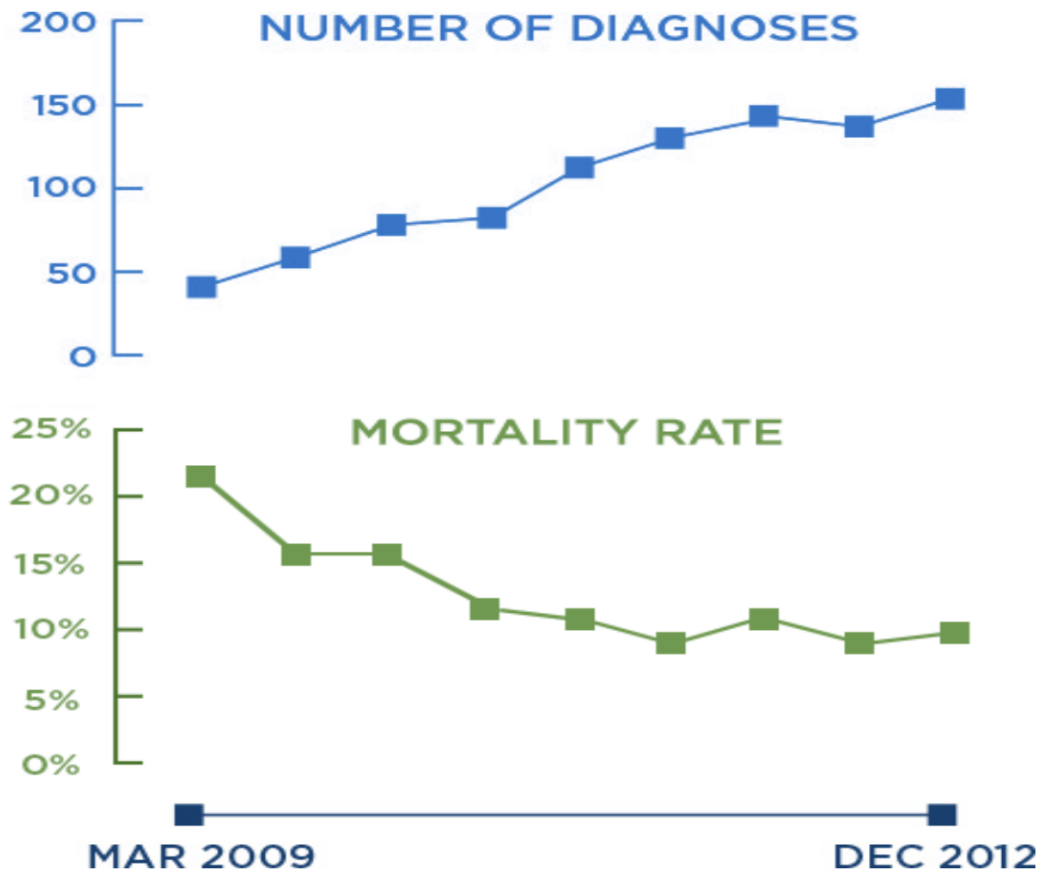
- Created standardized order sets to help physicians and nurses know recommended steps
- Created “sepsis alerts” if patients came in who met criteria. This brought a team to the bedside
- Second lactate was often forgotten: created a standard order for the lab so if elevated was automatically ordered

Better for patients, easier for health care providers!

Results

- Death rate from septic shock dropped from 21.2% to 9.5% (2009-2012)!
- This is the face of national sepsis mortality rate of 28%
- Modeled by New York state and working with the Joint Commission Center for Transforming Healthcare

Data


NUMBER OF DIAGNOSES
200
150
100
50
0
MORTALITY RATE
25%
20%
15%
10%
5%
0%
MAR 2009
DEC 2012

DID YOU KNOW

If all hospitals could match Kaiser Permanente's reduction in sepsis deaths, it would be the equivalent of saving the lives of every man who dies from prostate cancer and every woman who dies from breast cancer each year.

— Heath and Heath, *Decisive: How to Make Better Choices in Life and Work*, 2013.

Clinical Projects

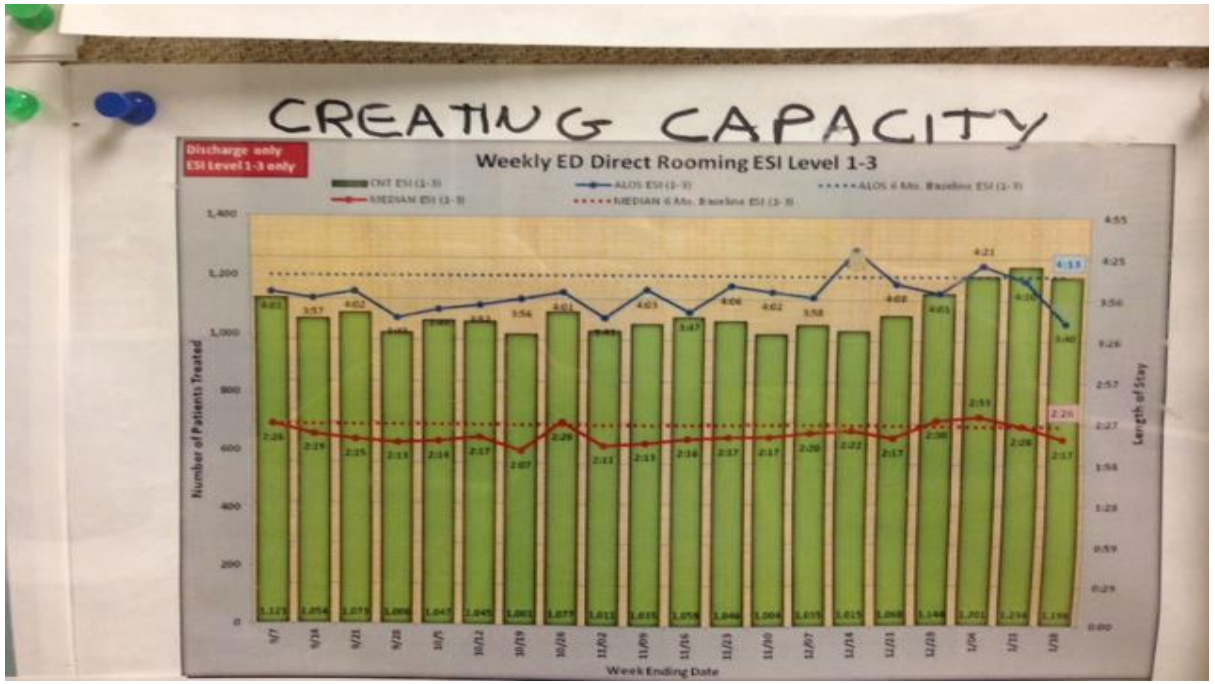
- Each of these projects improved quality of care while decreasing length of stay and improving hospital flow
- Each used general Lean and Change Management Principles
- Each required leadership and vision

Principle #9: Transparent Data in Context

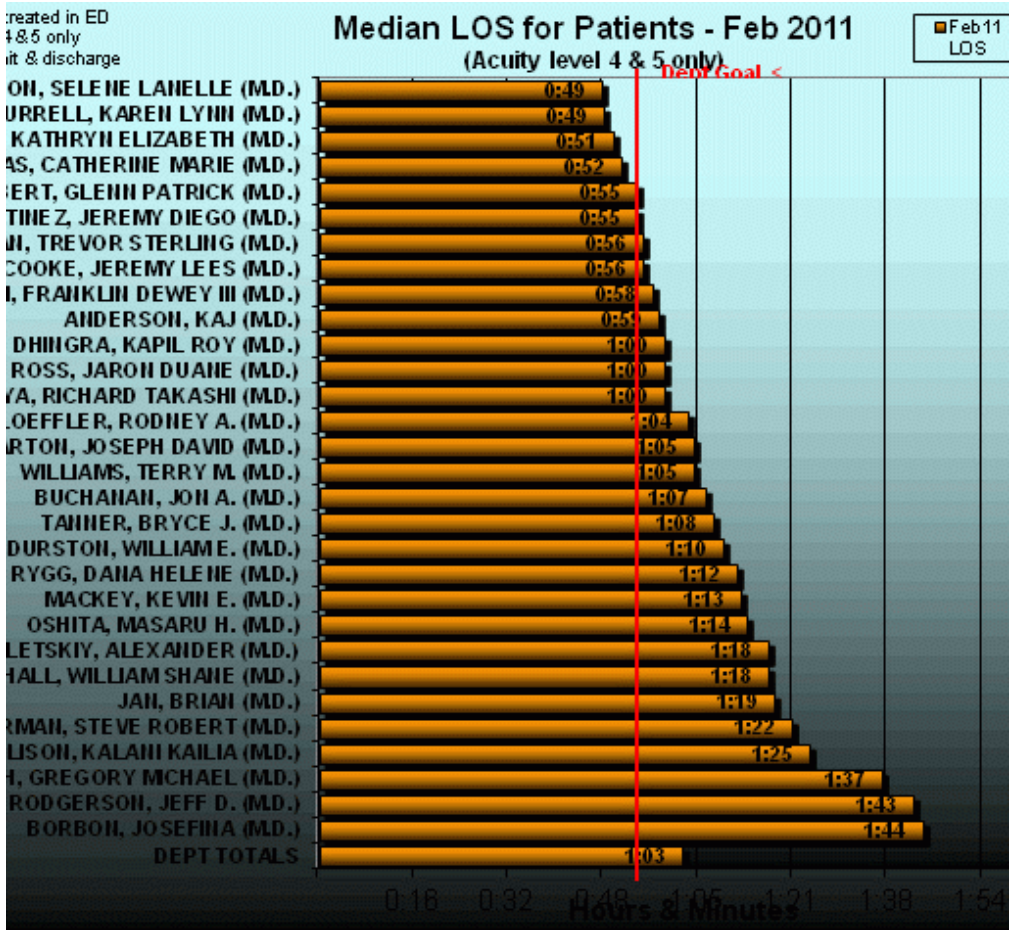
- First meet together as a group and decide goals
- Then, work on systems so team can reach goals without heroics
- Train on Lean Principles, discuss efficiency tips and share best practices
- Balance Efficiency with quality, patient satisfaction

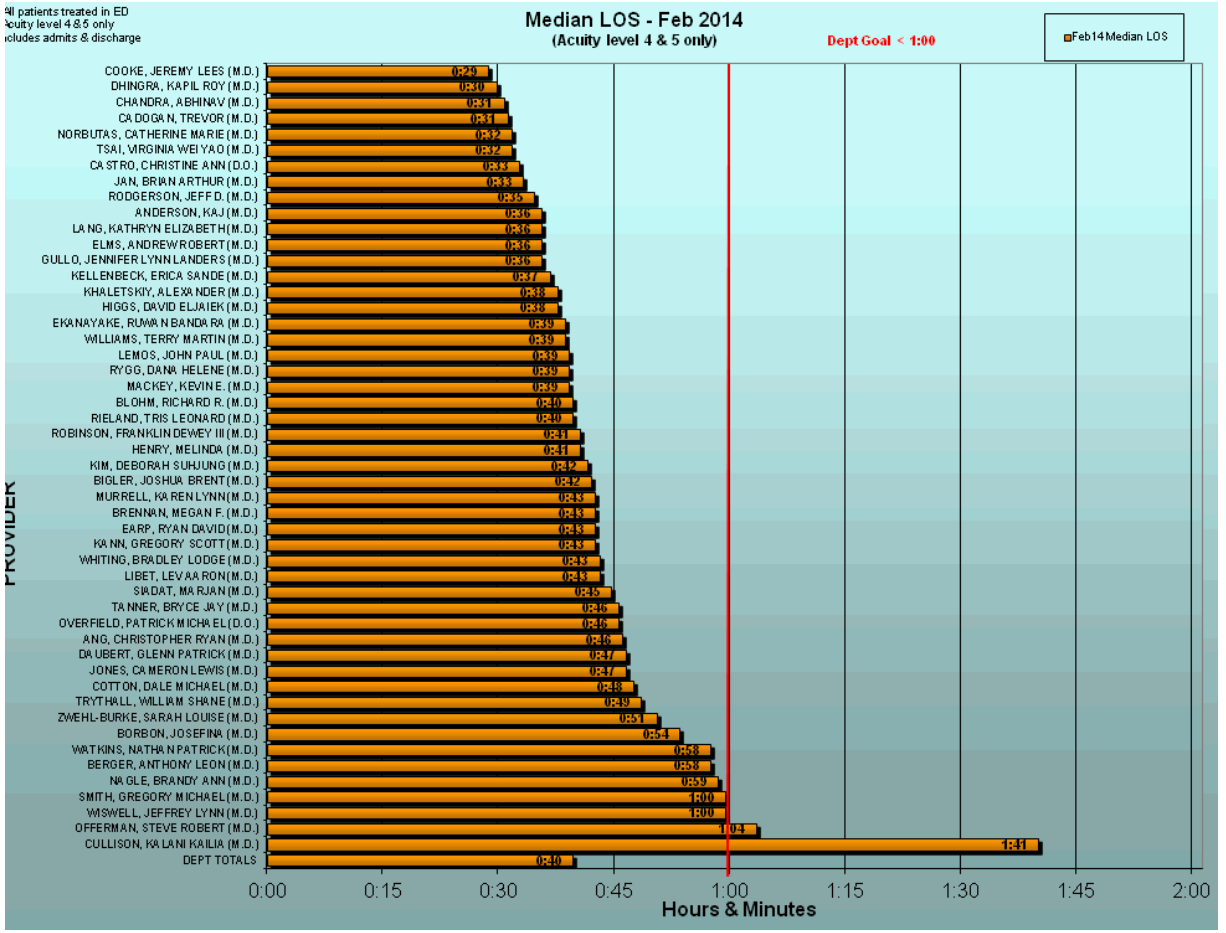
Transparent Data

- Metrics are not random: choose to CREATE THE CAPACITY needed to see patients and eliminate waiting times



One Example: *standard deviation decreased, length of stay down*





Transparent Data Paired with Training

Public Relative Performance Feedback in Complex Service Systems: Improving Productivity through the Adoption of Best Practices

Hummy Song, Harvard University

Anita Tucker, Economics Department, Brandeis University

Karen L. Murrell & David R. Vinson, Kaiser Permanente

Principle #10: Oversight & Leadership

- Declare the importance of hospital-wide patient flow ***from the patient perspective***
- Convene an executive oversight team for improvement ***but set concrete time lines for projects***
- Establish metric goals for patient flow
  - No delay greater than two hours in patient progression
  - Ensure capacity on each unit at the beginning of the day
- Empower teams to make improvements

Hospital Metrics

- Average occupancy rate (monthly & day of the week)
- Readmissions within one week of discharge
- Patient experience
- Clinician and staff satisfaction
- Flow failures
- Length of stay outliers
- Quality complications: falls, central line infection, pneumonia, etc

Principle #11: Build an Army of Improvers

- Build capability at all levels of the organization
- Education, training, time

Principle #12: Have Fun!

Create a culture of patient centered innovation and flow


WAIT FROM
THIS POINT:
0 MINUTES