Creating a “No Wait” ED

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Kaiser South Sacramento

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Case Study: Kaiser South Sacramento
Our Past: Impending Disaster!

![Image of a train on a bridge with a warning sign.]
Kaiser South Sacramento ED

The County Hospital for Sacramento

- Busiest ED In Sacramento
- Kaiser Facility
- Serves mixed payer/socioeconomic population (almost 40% Medi-Cal/Uninsured)
- Level 2 Trauma Center
- UC Davis ED residency teaching
- On pace for 130,000 visits this year
- Up 20% in volume in 2015, continued increases in 2016

(c) Murrell 2015
Space Constrained

- 49 ED bays
- Lose 3 for Trauma
- 4 dedicated to psych
- Over 2500 patients per ED bay!
Our Past State
Prior Baseline Data

- 450 hours of diversion annually
- LWOT rates 6.6% on average, but over 12% some months
- Average door to doctor: 55 minutes
- Total time in ED on average
  - 4 ½ hours for discharged patients
  - 8 hours for admitted patients
- But…wide variability day to day with much longer times some days
MD perspective

- May work a 12 hour shift and only see 8 patients with 30 or more patients in the waiting room
- Poor flow made it impossible to see patients
- Doctors were frustrated, complaining to administration about ED function
- Patients angry, staff angry, chaos!
- Unnecessary tests ordered
For our patients

- Waits of 5-6 hours to see a doctor
- 30-40 patients in the waiting room every night at 11pm
- Calls to “see if I could get them in quicker”
We saw the crisis coming…

- Volume going up from 67,000 in 2008 to 130,000 in 2016
- Trauma started Aug 2009
- County psychiatric failures
- Hospital space constraints: 180 IP beds
Sacramento girl needed amputations after 5-hour wait at emergency room

By Cynthia Hubert
chubert@sacbee.com

Published: Friday, Dec. 31, 2010 - 12:00 am | Page 1B
Last Modified: Sunday, Feb. 13, 2011 - 2:16 pm

As his tiny daughter's skin turned blotchy and her body went limp during a lengthy wait at Methodist Hospital's emergency room, Ryan Jeffers panicked.

Malyia Jeffers, 2, has Streptococcus A, which has led to the amputation of both feet and a hand. She is now being treated at Stanford's children's hospital.
Our Current State
Our Current State

- Time to Physician 19 minutes
- LWOT: 0.4% all of last year
- Diversion hours: **Zero!**
- Length of Stay Down
  - ESI Level 4,5: 43 minutes
  - Discharged patients: 2 hours 9 minutes
  - Rare inpatient holds in the ED!
2015 Year End Totals: 80% of patients are out of the ED in under 4 hours, and 55% are done in under 2 hours

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Totals</th>
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<tbody>
<tr>
<td>0-2 Hours</td>
<td>55.0 Percent</td>
</tr>
<tr>
<td>2-4 Hours</td>
<td>25.2 Percent</td>
</tr>
<tr>
<td>4-6 Hours</td>
<td>9.1 Percent</td>
</tr>
<tr>
<td>6-10 Hours</td>
<td>5.0 Percent</td>
</tr>
<tr>
<td>&gt; 10 Hours</td>
<td>5.7 Percent</td>
</tr>
</tbody>
</table>
Current State: Patient Side

- March, 2011: our ED

- 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 we would send you an update. Thanks to you Savannah beat meningitis 100%. She went last May for her yearly 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 Barlow
## Recap

<table>
<thead>
<tr>
<th>Measure</th>
<th>Before</th>
<th>After</th>
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<tbody>
<tr>
<td>Hours on Divert per year</td>
<td>450</td>
<td>0</td>
</tr>
<tr>
<td>Percent LWOBS</td>
<td>6.6%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Door-to-Doc (minutes)</td>
<td>55</td>
<td>19</td>
</tr>
<tr>
<td>LOS – Treat &amp; Release (hours)</td>
<td>4.5</td>
<td>2.4</td>
</tr>
<tr>
<td>LOS – Treat &amp; Admit (hours)</td>
<td>8.0</td>
<td>6.0</td>
</tr>
</tbody>
</table>

So, how is it possible to go from Before to After?

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A little about Kaiser…

- Prepaid integrated health system
- No financial incentive to admit patients
- Similar acuity to other ED’s, but good follow-up and available testing allows discharge of many patients
- Examples: stable chest pain, atrial fibrillation, TIA, deep vein thrombosis, diverticulitis
- So, not only do we diagnose our patients, we treat as many as possible to send them home
- But remember almost half of our patients are non-Kaiser…
Acuity

- In a comparison study, had the same acuity as most Level 2 Trauma Centers

- Because of systems that are in place we only admit 11% of patients vs 18% typically

- As an example, only 10% of chest pain patients are admitted, 75% of GI bleeds are scoped and sent home- a different mindset

- Best clinical outcomes- nationally recognized
How to even get started?

Two key elements:

- **Process**

- **Culture**
Amazing 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!
Flow Prior To Changes

Flow was controlled by the IT RN. Same MD could own patients on opposite sides of the ED!

Often 30 or more patients in the waiting room at 11pm.
What we discovered:

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
We live on the high end of the curve...
Building Blocks to Improve Flow:

- Rapid Care
- Hospital Partnership
- Team Assignment System
- Vertical 3 Area
- Clinical Decision Area
- Open Data
- Staffing for Volumes

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Let's start at the beginning...
Leadership & Perseverance

- Set a Vision
- Look at every process critically
- Goal: better for patients, easier for staff
- Involve the frontline staff
- Continuous improvement
- Open data with clear metrics
- Have fun!
Pearls

- Set a vision with the staff “our patients do not wait”, “we want to be the best emergency department in America”

- Take risks: ask forgiveness later… a few hours of time for the staff in a Kaizen event will pay off in spades later

- Small tests of change…everyone is willing to try something for a day, week, month especially if their voice is heard when making changes
Improving Flow in the ED

- High volume ED: different patient streams based on acuity
  - Low
  - Medium
  - High

All with very clear & **different** workflows with the goal of decreasing length of stay to create capacity.
Triage

- Remember, a “non-value added” necessity in many cases
- Eliminate when possible
- Directly pull into an area: if you guessed wrong just shift the patient!
- 90% of the time, first impression is the right one
Process Improvement

Doesn’t need to be fancy to work...
Rapid Care

- Our first project

- Low acuity patients were “triaged to home”

- 30% of our patients fit in this category after healthcare reform
Rapid Care: Low Acuity Flow
Started us thinking in a new way…

- Think *triage to home*…
- Small constrained area
- Well defined teams that work well together
- “One Contact” as much as possible
- Minimize movement
- Uniform work stations & stocking
That was our first project-
Many failures along the way
Immediate Results

% LWBS

Months
Pre-PIT:
August - December
Post-PIT:
March - August
Low Acuity Flow

Patient Arrives

Triage only if delays

Low Acuity Treatment Area
Streamlined Low Acuity (Video)
No repeat work…
Goal arrival to discharge in under one hour

All sitting in close proximity and working toward rapid discharge—minimal movement by everyone!
Consider every step
Minimize movement for everyone
The System Makes It Easy

Before Process Change

After Process Change
Mid-Acuity Flow

- Area to treat healthy patients who need more testing
- Goal to save high acuity beds in the main ED
- Patients like it better, improves the system
Key Points:

- KEEP VERTICAL PATIENTS VERTICAL!
- PO meds instead of IV meds: patients like it better!
- Never change your diagnostics
  - Partner with radiology to eliminate contrast
  - Have a phlebotomist if possible
- Results waiting room for patients who need testing
- Partner with the Main ED if more treatment or admission is needed
Mid Acuity Flow

- MD/RN team in the front eliminates waste
- Immediate communication between the team members
Mid Acuity Patients: no one in extremis!

- Abdominal pain
- Back pain - <40 years
- Chest pain - < 30 years
- DVT rule out
- Flank pain - <40 years
- Headache with migraine history
- Pelvic pain (stable r/o ectopic)
- Pediatric fever over 6 months
- Gastroenteritis
What you need to start

- Streamlined area for intake similar to low acuity area
- Pelvic Room
- Phlebotomist
- Partner nurse & treatment nurse
- Results waiting room
Our Intake Results

- Patients with the same chief complaint had an hour cut off of their length of stay
- Abdominal pain diagnosed in under 2 hours
Main ED
Need to make the main ED more manageable…
Main ED Teams

- Team composed of a doctor and two RN’s
- Each team gets six rooms in the main ED with 2 flex beds when needed
- Manage your own area
- Code rooms flexible for any team
Team Assignment System

- Patients are assigned to a color coded team in the main ED **on arrival**!
- This created ownership for patients and decreased our time to MD dramatically
- Started at 55 minutes: now average 19 minutes arrival to MD start (over 350 patients a day)
- MD’s like it because they are front loaded with patients, then tapered at the end of their shift
Team Assignment System

Patient Arrives

Brief Triage

Green Team Beds
Starts with the vision!
The job is easier if everyone lifts a little
Other ED best practices

- Portal System: Front end rooms where MD’s meet their patients and order testing with a dedicated phlebotomist (decrease order turnaround time)
- “Rocket start”: Frontload a number of patients when MD is fresh
- “Merry-go-round”: when capacity a problem- patients enter an area and meet MD, have EKG’s, labs, radiology done- when room available in main ED, testing complete
Hospital Capacity - The same principles apply

- Decrease arrivals
- Decrease length of stay
- Standardize care when possible
Start at the Front: Observation Unit

- Decreases arrivals to the hospital
- Standardizes care
- Procedure Room: better for patients, easier for doctors (MD’s can scope twice as many patients- no down time)
Observation Unit Example

- Eight Rooms

- Staffed with **ED MD’s/RN’s** with a focus on flow- allows for Trauma, Pediatrics, Gyne

- A Flexible Unit
  - Observation with more testing: GI bleed, chest pain, TIA, syncope, pyelonephritis
  - Procedures: Transfusion, dialysis

  - Certain dispositions: Mild DKA, early sepsis, asthma
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
Is it working for us?

- Trial was done with CDA, closed for three months then reopened
- When CDA was closed admission percentage rapidly climbed to 13%
- Hospital became impacted
- Now, consistently admission percentage down to around 10%
Better Patient Satisfaction than ED or Hospital
Protocols

- Chest pain
- GI bleed
- DKA
- Abdominal pain
- Asthma
- Pyelonephritis
- Head injury

Plus many others…
For everything to work: Staffing for our volumes…

- Refining our staffing… we did not match our staffing to the demand!

http://anyq.cn/GUEST/
Nursing Staffing: Before

2008 Nursing Staffing
Kaiser South Sacramento

ED Arrivals by Hour of the Day
Kaiser South Sacramento 2008
Nursing Staffing Post Change

2011 Nursing Staffing - Kaiser South Sacramento

ED Arrivals by Hour of the Day - Kaiser South Sacramento
Physician Staffing: Before
After Health Care Reform
Looking at Staffing at Least Monthly
Not just the assignments: Team Work!

- Team composed of a doctor and two RN’s
- Each team gets six rooms in the main ED with 2 flex beds when needed
- Manage your own area
- Code rooms flexible for any team
- Liked because loaded with 3 patients initially, but tapered at the end so home on time…
- See many more patients than a traditional system
Team Assignment System

Patient Arrives

Brief Triage

Green Team Beds

(c) Murrell 2015
Open Data

- First we met together as a group and decided goals

- Then, worked on systems so MD’s could reach goals without heroics

- Staff meeting discussed efficiency tips and shared our best practices

- Efficiency balanced with quality, patient satisfaction
Open data

- Metrics are not random: chosen to CREATE THE CAPACITY we need to see our patients and eliminate waiting times.
Results:
standard deviation narrowed, length of stay decreased
Results

- No push-back
- MD’s requesting more data
- Want to add nursing and tech data in as well
Open Data Results

ALOS (min) x ESI

1. After vs. Before
2. After vs. Before
3. After vs. Before
4. After vs. Before
5. After vs. Before
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
Many Hospitals: War between ED & Inpatient
What we want...

Teamwork

Smooth Flow
Solution:
ED presence to improve hospital flow

- Found a partner on the floor who wanted to make things better

- Wanted to go beyond the traditional meetings without many results

- The two of us decided to sponsor a series of Kaizen events with ED/Floor participation
Bed Hub

- An assigned person who focused on placement of patients
Same Vision: Patients Do Not Wait

- Daily bed huddle with ED and Floor Nursing leadership
- MD participation when beds are tight
- Use a predictive model to **anticipate** admissions: “we know they are coming, we just don’t know their names”
- RN/PCC’s predict the discharges
- Main result: ownership for the patients waiting in the ED
Look at Every Step
*Improving the report to the floor…*

- Kaizen event to standardize the reporting process and prevent repeat calls…
- Frontline staff helping to drive the process
Example of Improvement

ED to Floor Detail weekly Median
DEPT_ABBREVIATION = ALL

Median Chart
Summary

Baseline
Bed Center Open
No Mtg Zone

Median time in Minutes
-3 sigma
Target
41.5
+3 sigma

03/01/09 04/05/09 05/10/09 06/14/09 07/19/09 08/23/09 09/09/09 10/03/09 10/17/10 11/21/10 12/25/10
Other Possibilities

- Intermediate Medicine Observation Unit
- Standardized Protocols for the 48 hour patient
  - Congestive heart failure
  - COPD exacerbation
  - Non-critical Sepsis
Rapid Surgical Unit

- Created in six weeks after a winter summit
- Same principles: standardize care, decrease length of stay
- But… better for patients, easier for staff
<table>
<thead>
<tr>
<th>Procedure</th>
<th>Days Postoperative</th>
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What to do when there is just not enough room
We don’t have to be surprised...
The Unexpected Will Always Happen
Standardized Overcrowding Score

Severe 151

- **57** ED Patients
- **46** ED Beds
- **6** ED Admits
- **132** IP Beds

- **10h** Longest Admit
- **0.3h** Last Wait
- **2** 1:1 Patients
Visible to all employees...
Linked to a “surge plan”

<table>
<thead>
<tr>
<th>HOSPITAL OVERCROWDING SCORE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
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<tr>
<td>0-50 Normal</td>
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<tr>
<td>51-100 Busy</td>
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<tr>
<td>101-140 Overcrowded</td>
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<td>141-180 Severely Overcrowded</td>
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<tr>
<td>&gt; 180 Critically Overcrowded</td>
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<table>
<thead>
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<th>GENERAL</th>
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<tbody>
<tr>
<td>ED</td>
<td>ANM or designated personnel to calculate NEDOCS at 0300, 1100, and 1900 daily</td>
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<td>ANM or designated personnel to calculate NEDOCS at 0300, 1100, and 1900 daily</td>
</tr>
<tr>
<td>ED</td>
<td>NEDOCS on Kaiser homepage, discussed at Bed Huddle</td>
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</tr>
<tr>
<td>ED</td>
<td>bed huddle to look at anticipated admissions in the AM to prevent overcrowding later in day.</td>
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</tr>
<tr>
<td>MEDICAL STAFF</td>
<td>Standard operations</td>
<td>HBS representative to attend bed huddle</td>
<td>HBS representative to attend bed huddle</td>
<td>HBS representative to attend bed huddle</td>
<td>HBS representative to attend bed huddle</td>
</tr>
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Technology

- Now linked to a phone app
- Automatically sends updates
- Monitors if actions are completed
- Creates transparency & accountability
Other Ideas

- The Scheduled Hospital Stay
- Improved Discharge Process
  - Prepped the day before
  - Pharmacy delivers to room
  - Discharge lounge
- Medical Directors for Each Unit
Our Final Truths!

- The longer they stay... the more work they are

- The deeper they get... the longer they stay
Most of all…
a culture of patient centered innovation and flow
WAIT FROM THIS POINT: 0 MINUTES