No conflicts of interest
Note: All results have been modified from their actual values for the purpose of this presentation
Number needed for addiction: 48
Using Data to Drive ED Performance

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Use of data to drive ED Performance

• 1. Quality Measures
Types of quality measures

- **Structural** (what administrators care about)
  - Measures a health care system’s capacity, systems, and processes to provide high-quality care

- **Process** (what providers care about)
  - Typically reflect generally accepted recommendations for clinical practice

- **Outcome** (what patients care about)
  - Reflect the impact of the health care service or intervention on the health status of patients

https://www.ahrq.gov/talkingquality/measures/types.html
Types of quality measures - STEMI

• **Structural** (what administrators care about)
  • Ratio of interventional cardiologists to patients

• **Process** (what providers care about)
  • Proportion of STEMI patients with door-balloon time <90m

• **Outcome** (what patients care about)
  • Mortality rate for STEMI patients
Types of quality measures - opioid

- **Structural** (what administrators care about)
  - Opioid prescription rate

- **Process** (what providers care about)
  - Proportion of patients prescribed opioids inappropriately

- **Outcome** (what patients care about)
  - Overdose rate
Quality Measure Design – opioid - structural

• Numerator
  • All emergency department encounters during which an opioid was prescribed

• Denominator
  • All ED encounters

• Denominator exclusions
  • Age <18
  • Admitted
  • CT/MRI performed
Opioid Dashboard for Jordan Swartz

Opioid Rates

- Opioid Rate (first)
- Opioid Rate (in escalation)
- Opioid Rate (overall)
- Opioid Rx Rate

Rate (per 100 pts)

Opioid Rate (Rx) over time

- Opioid Rate (ED)
- Opioid Rate (Rx)

My patients given an opioid while in the ED

<table>
<thead>
<tr>
<th>Arrival</th>
<th>Pt Name</th>
<th>ED Diagnosis</th>
<th>Medication</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/15/19</td>
<td>SOTO</td>
<td>Abdominal pain, unspecified abdomen..</td>
<td>OXYCODONE-ACETAMINOPHEN 5-325 MG ORAL TAB..</td>
</tr>
</tbody>
</table>

My patients who were prescribed an opioid

<table>
<thead>
<tr>
<th>Arrival</th>
<th>Pt Name</th>
<th>ED Diagnosis</th>
<th>Prescription</th>
<th>Tabs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/21/19</td>
<td>BOSTON</td>
<td>Acute pain of left knee</td>
<td>OXYCODONE-ACETAMINOPHEN 5-325 MG ORAL TAB..</td>
<td>10</td>
</tr>
</tbody>
</table>
Quality Measure Design – opioid - process

• Numerator
  • All emergency department encounters during which an opioid was prescribed

• Denominator
  • All ED encounters with an opioid-sparing diagnosis

• Denominator exclusions
  • Age <18
  • Admitted
  • CT/MRI performed
American Academy of Neurology

Don’t use opioid or butalbital treatment for migraine except as a last resort.

Opioid and butalbital treatment for migraine should be avoided because more effective, migraine-specific treatments are available. Frequent use of opioid and butalbital treatment can worsen headaches. Opioids should be reserved for those with medical conditions precluding the use of migraine-specific treatments or for those who fail these treatments.
Noninvasive Treatments for Acute, Subacute, and Chronic Low Back Pain: A Clinical Practice Guideline From the American College of Physicians

Amir Qaseem, MD, PhD, MHA; Timothy J. Wilt, MD, MPH; Robert M. McLean, MD; Mary Ann Forciea, MD; for the Clinical Guidelines Committee of the American College of Physicians
Benefits and harms associated with analgesic medications used in the management of acute dental pain

An overview of systematic reviews
Effect of a Single Dose of Oral Opioid and Nonopioid Analgesics on Acute Extremity Pain in the Emergency Department
A Randomized Clinical Trial
First, Do No Harm
N = 921
Bouncebacks ~ 2-15
All providers with at least 50 admits
“Researchers have noted that measurement and comparison of physician quality can be hampered by sample size. A minimum threshold of 30 patients is a common guideline for supporting comparisons for an individual measure, and evidence suggests that at least 35 to 45 observations are needed to make valid comparisons.”

Attribution

“It’s kind of a big deal.”
Attribution

• First provider
• Last provider
• Longest provider
• Group attribution
Risk Adjustment

“It's kind of a big deal.”
Rotational assignment versus self-assignment
How much risk adjustment do you need?

Emergency Department Rotational Patient Assignment

Stephen J. Traub, MD*; Christopher F. Stewart, MD; Roshanak Didehban, MS; Adam C. Bartley, MS; Soroush Saghaian, PhD; Vernon D. Smith, MD; Scott M. Silvers, MD; Ryan LeCheminant, BS; Christopher A. Lipinski, MD

*Corresponding Author. E-mail: Traub.Steven@Mayo.edu.

Study objective: We compare emergency department (ED) operational metrics obtained in the first year of a rotational patient assignment system (in which patients are assigned to physicians automatically according to an algorithm) with those obtained in the last year of a traditional physician self-assignment system (in which physicians assigned themselves to patients at physician discretion).

Methods: This was a pre-post retrospective study of patients at a single ED with no financial incentives for physician productivity. Metrics of interest were length of stay; arrival-to-provider time; rates of left before being seen, left subsequent to being seen, early returns (within 72 hours), and early returns with admission; and complaint ratio.

Results: We analyzed 23,514 visits in the last year of physician self-assignment and 24,112 visits in the first year of rotational patient assignment. Rotational patient assignment was associated with the following improvements (percentage change): median length of stay 232 to 207 minutes (11%), median arrival to provider time 39 to 22 minutes (44%), left before being seen 0.73% to 0.36% (51%), and complaint ratio 9.0/1,000 to 5.4/1,000 (40%). There were no changes in left subsequent to being seen, early returns, or early returns with admission.

Conclusion: In a single facility, the transition from physician self-assignment to rotational patient assignment was associated with improvement in a broad array of ED operational metrics. Rotational patient assignment may be a useful strategy in ED front-end process redesign. [Ann Emerg Med. 2015;1:1-10.]
Risk adjustment for rotational assignment

• E.g. overnight shifts, fast-track shifts
Risk adjustment for self-assignment
What if you can’t risk adjust?
Sepsis Dashboard for Jordan Swartz

1 Hour Bundle Completion Percentage

% of my patients who received all components of the 1 hour bundle

3 Hour Bundle Completion Percentage

% of my patients who received all components of the 3 hour bundle

6 Hour Bundle Completion Percentage

% of my patients who received all components of the 6 hour bundle

My Sepsis Patients

<table>
<thead>
<tr>
<th>Arrival</th>
<th>Pt Name</th>
<th>MRN</th>
<th>1hr - Lactate</th>
<th>1hr - cxs before abx</th>
<th>1hr - Abx admin</th>
<th>1hr - IVF started</th>
<th>3hr - Lactate</th>
<th>3hr - cx before abx</th>
<th>3hr - Abx admin</th>
<th>3hr - IVF started</th>
<th>6hr - Lactate</th>
<th>6hr - IVF expected</th>
</tr>
</thead>
</table>

Last updated: 2/27/2019 8:26:03 AM

Arrival (date)
1/1/2017

ED
Perelman

Instructions
Bundle Definitions
Types of Provider Quality Measures

• Effectiveness measures
  • % of patients who received appropriate first line analgesics
  • % of patients who received appropriate care for severe sepsis/septic shock

• Patient-centeredness measures
  • Patient satisfaction

• Timeliness measures
  • Door to doctor
  • Door to disposition
  • Door to balloon
  • Door to pain medication (for fractures)
  • Door to CT (for stroke)

AHRQ https://www.ahrq.gov/talkingquality/measures/setting/physician/examples.html
Ideas for Quality Measures

www.qualityform.org/qps
<table>
<thead>
<tr>
<th>NQF#</th>
<th>Title</th>
<th>Steward</th>
<th>Updated</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>2774</td>
<td>Functional Change: Change in Mobility Score for Skilled Nursing Facilities</td>
<td>Uniform Data System for Medical Rehabilitation, a</td>
<td>Oct 25, 2016</td>
<td>ENDORSED</td>
</tr>
<tr>
<td>0536</td>
<td>30-day all-cause risk-standardized mortality rate following Percutaneous Coronary Intervention (PCI) for patients with ST segment elevation myocardial infarction (STEMI) or cardiogenic shock</td>
<td>American College of Cardiology</td>
<td>Jun 05, 2018</td>
<td>ENDORSED</td>
</tr>
<tr>
<td>0535</td>
<td>30-day all-cause risk-standardized mortality rate following percutaneous coronary intervention (PCI) for patients without ST segment elevation myocardial infarction (STEMI) and without cardiogenic shock</td>
<td>American College of Cardiology</td>
<td>Oct 25, 2018</td>
<td>ENDORSED</td>
</tr>
<tr>
<td>0698</td>
<td>30-Day Post-Hospital AMI Discharge Care Transition Composite Measure (Composite Measure)</td>
<td>Centers for Medicare &amp; Medicaid Services</td>
<td>Feb 04, 2014</td>
<td></td>
</tr>
<tr>
<td>0699</td>
<td>30-Day Post-Hospital HF Discharge Care Transition Composite Measure (Composite Measure)</td>
<td>Centers for Medicare &amp; Medicaid Services</td>
<td>Feb 04, 2014</td>
<td></td>
</tr>
<tr>
<td>0707</td>
<td>30-day Post-Hospital PNA (Pneumonia) Discharge Care Transition Composite Measure (Composite Measure)</td>
<td>Centers for Medicare &amp; Medicaid Services</td>
<td>Feb 04, 2014</td>
<td></td>
</tr>
</tbody>
</table>
Potassium Sample Hemolysis in the Emergency Department

**STEWARD**: Cleveland Clinic

**Measure Description:**

Percentage of laboratory potassium samples drawn in the emergency department (ED) with hemolysis.

**Numerator Statement:**

ED Potassium Samples with Hemolysis

**Denominator Statement:**

all ED patients getting a lab potassium sample

**Exclusions:**

None

**Risk Adjustment:**

No
Use of data to drive ED Performance

• 1. Quality Measures

• 2. Outward facing measures
Consult timeliness by consultant (only consultants with at least 35 consults are shown)

Consult Timeliness by consult (only consultants with at least 35 consults are shown)
## ED Radiology Dashboard

### Turnaround Times

<table>
<thead>
<tr>
<th>Study Type</th>
<th>Total Studies</th>
<th>Order to check-in (min)</th>
<th>Check-in to begin</th>
<th>Begin to end</th>
<th>End to sign</th>
<th>Order to sign</th>
<th>Order to sign &lt;30min %</th>
<th>&lt;60min %</th>
<th>&lt;90min %</th>
<th>&lt;120min %</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT A/P w/ IV contrast</td>
<td>1,135</td>
<td>128</td>
<td>9</td>
<td>14</td>
<td>39</td>
<td>212</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>CT A/P non-contrast</td>
<td>312</td>
<td>61</td>
<td>4</td>
<td>10</td>
<td>39</td>
<td>135</td>
<td>0</td>
<td>5</td>
<td>22</td>
<td>42</td>
</tr>
<tr>
<td>CT Head</td>
<td>1,701</td>
<td>43</td>
<td>3</td>
<td>9</td>
<td>19</td>
<td>94</td>
<td>10</td>
<td>26</td>
<td>47</td>
<td>64</td>
</tr>
<tr>
<td>CT (all others)</td>
<td>1,804</td>
<td>67</td>
<td>7</td>
<td>18</td>
<td>34</td>
<td>150</td>
<td>0</td>
<td>4</td>
<td>16</td>
<td>34</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>1,768</td>
<td>67</td>
<td>0</td>
<td>26</td>
<td>25</td>
<td>143</td>
<td>0</td>
<td>5</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>X-ray</td>
<td>9,466</td>
<td>44</td>
<td>8</td>
<td>9</td>
<td>11</td>
<td>87</td>
<td>4</td>
<td>26</td>
<td>52</td>
<td>71</td>
</tr>
</tbody>
</table>

### Total studies and % signed by target time

- **<120min %**
- **<90min %**
- **<60min %**
- **Order to sign <30min %**

![Graph showing turnaround times and percentage signed by target time](image)
Use of data to drive ED Performance

• 1. Quality Measures

• 2. Outward facing measures

• 3. Workflow measures
What can’t be easily measured?
Structured Versus Unstructured Data
Feasible versus less feasible

**Feasible**
- Medication orders
- Prescriptions
- Procedure orders
- Timestamps

**Less feasible**
- Anything scanned from paper
- Items found only in notes (e.g. whether patient fell)*
What do you want to improve?