Clinical Safety & Effectiveness
Cohort # 13

Decreasing Door to Balloon Time

CENTER FOR PATIENT SAFETY & HEALTH POLICY
UT Health Science Center
SAN ANTONIO

Educating for Quality Improvement & Patient Safety
The Team

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• Sponsor Department
  – Department of Emergency Medicine/Bruce Adams, MD
What Are We Trying to Accomplish?

OUR AIM STATEMENT

Decrease Total Door to Balloon Time by 10% by January 2014
Project Milestones

- Team Developed
  - 08/2013

- Aim Statement
  - 08/2013

- Biweekly meetings scheduled
  - 08/2013

- Background data, fishbone diagram, process mapping, spaghetti map
  - 08/2013

- Idea prioritization
  - 08/2013

- Implemented
  - 08/2013

- Data Analysis
  - 12/2013-01/2014

- Final presentation
  - 01/2014
Background

- Currently it is a CMS core measure to minimize D2B time \( \leq 90 \) min
- “Time is Muscle”
PLAN: How Will We Know That a Change is an Improvement?

- Decrease in time to EKG and Door to EC departure
- Measure: Minutes
- Avg Door to EKG time: ≤10 min
- Decrease Door to EC departure by 10%
What Changes Can We Make That Will Result in an Improvement?

• Registration/Triage Education of Flagging Patients
• ECG Process Video
• ECG Machines for Scanning Patient MRN
• Quarterly ECG Competency
• 24-7 MUSE Access for Old EKGs
• Tech in Triage 24-7
• Contingency Plan when Med Resus Beds are Full (Code Bed)
• Heart Alert Box
Selected Process Analysis Tools

- Observations: Identifying Waste
- Spaghetti Diagram: Motion Study
- Fishbone: Cause and Effect
- Process Mapping: Value added-Vs. Non-Value
- Brainstorming: Solutions Session
We Started with Process Mapping
Then noted the { Issues & Delays }

“START: Door to EKG Eval”

- Patient check in
  - Parking, Way finding

“START: RPS to Card Eval”

- Cards arrive to Cath lab
  - Patient Monitored?
    - Yes: Patient Departs to Cath lab
      - Yes: Doc calls charge nurse @80683, charge nurse pageMIR3
      - No: Missing resources, materials, no standard work, materials no standardized, no standard work for MD/RN/pharm, after hours cardiology and cath lab, minimum time standard, O2 full, consent clip board

“START: Heart Alert to Card Eval”

- Doc calls charge nurse @80683, charge nurse pageMIR3
  - STEMI?
    - Yes: Patient Departs to Cath lab
    - No: Print old EKG and give to DOC
      - Old EKG printer is not in the same room, DOC moves on Tech
Took it further with a Fishbone..

ECG Machine
- Nurses don’t know how to operate ECG machine
- ECG is not a Nursing competency

Method
- Takes time to enter Patient info into ECG machine
- No Code Bed
- Improper triage at front desk

Man
- Tech pulled into non-ECG activities
- Tech walks too much back and forth to MD
- Nursing ECG training

Materials
- Takes time to assemble STEMI meds
- NO ECG computer for Old ECGs

Mother Nature
- Cardiologist/Cath team Stuck in traffic on off hours
- Some EMS systems Not on Lifenet system

STEMI Delay
- Some EMS systems Not on Lifenet system
- Cardiologist/Cath team Stuck in traffic on off hours
Selected Decision Making Tools

• Nominal Group Technique
• Brainstorming and prioritization (Easy/Hard vs. High/Low Impact)
General Statistics

D2B GAP

BoxPlot

Confidence Intervals

Mean
Median
Background Data

Currently we are not averaging Door to EKG times $\leq 10$ minutes, which is one of the biggest contributors to decreased D2B times.
Spaghetti Diagram (Before)

Technician did plenty of walking!
Eliminated 105 Ft of Tech travel = 36.4 seconds each way
Saved total 2:43 Minutes
Pharmacy STEMI Box
Results

• The net result of our improvement was tighter distribution (less variation) and reduction in Door to ECG time by 2:43 min!
Door to Balloon Time (min)

- Process change occurred during our CSE project Sept 2013.
- Direct Bedding interfered with our process improvement

X Arrival to ECG Gap
Door To Balloon Activation

X D2B Gap (min)

D2B Gap (min)

UCL

CL

LCL

Arrival Date

Door to ECG Time

Door to ECG Time

AFTER
Implementation Challenges

• Implementation issues
  1. Triage system changed while working on this project
  2. Hospital did not approve new ECG machines and STEMI medication box until move to new building in April 2014
Expansion of Our Implementation

We will move forward with new ECG machines and pharmaceutical boxes for STEMI’s in April with our move to the new facility, which should help in continuing to improve these times.
What’s Next

We are implementing monthly ECG competencies to all nurses and techs in the EC

Overhead paging for ECGs that need to be obtained on patients that are directly bedded
Return on Investment

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Visits</th>
<th>Avg D2B Time (min)</th>
<th>Avg D2ECG Time (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>121</td>
<td>78.3</td>
<td>14.41</td>
</tr>
<tr>
<td>2012</td>
<td>146</td>
<td>77.36</td>
<td>10.08</td>
</tr>
<tr>
<td>2013</td>
<td>122</td>
<td>76.6</td>
<td>16.77</td>
</tr>
</tbody>
</table>

- Avg D2B Time for 2013 76.6 min at avg cost ED visit of $1500 = $183,000
- With 10% reduction = $164,700
- This would have saved $18,300 for the ED for 2013
- But.....
ROI for Heart Activations Alerts

According to CDC

Average Length of ED stay is 240 minutes in teaching ED

Average cost per visit is $1500

In a 40 bed ER, average Visits per day is about 240 patients/day

Average charges per day $360,000

10% reduction in D2B time would allow for 24 more patients to be seen/day = $36,000/day in billing