Two Hospitals-One Heart: World Class Heart Care through Multi-Disciplinary Collaboration

American Nurses Association
7th Annual Nursing Quality Conference
February 18, 2013
Session 206 8:30 am-9:30 am

Susie Schnitker RN, BSN, CEN
Director of Critical Care Services
Schneck Medical Center
Seymour, Indiana
Seymour, Indiana
Schneck Medical Center

- 97 beds
- Not-for-profit
- Facilities
  - Main Campus
  - State-of-the-Art Cancer Center
  - Outpatient Rehabilitation Center
  - Home Services
  - Convenient Care Centers
Objectives

• Describe the benefits of a collaborative approach to heart care
• Define measures to focus priorities for cycles of improvement
Best in Class Door to Balloon (D2B) for ST-Elevation Myocardial Infarction (STEMI) Patients
What is a STEMI

STEMI is an acronym meaning "ST segment elevation myocardial infarction," which is a type of heart attack. This is determined by an electrocardiogram (ECG) test.

In a STEMI, the coronary artery is completely blocked off by the blood clot, and as a result virtually all the heart muscle being supplied by the affected artery starts to die. During an acute STEMI seconds count! There is a direct relationship between the amount of time a heart artery is blocked and the severity of the heart attack and odds of survival.

• 1.5 million Heart attacks occur in the US each year with 500,000 deaths
• A heart attach occurs about every 20 seconds with a heart attack death about every minute.
• Heart attack is a leading killer of both men and women in the United States.
Estimated In-hospital Mortality D2B Time STEMI

In Hospital Adjusted Risk of Mortality (%)

<table>
<thead>
<tr>
<th>Time (minutes)</th>
<th>15</th>
<th>30</th>
<th>69</th>
<th>90</th>
<th>120</th>
<th>150</th>
<th>180</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold standard</td>
<td>&lt;120 minutes for hospitals without a Cath Lab</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. Project Selection

2. Current Situation Analysis

3. Solution Development

4. Project Implementation & Results
Development of “Code STEMI “

Purpose:

Four Main Drivers Behind D2B
Time Improvement

Patient Outcomes • CMS Guidelines • JC Guidelines • Risk Management

Goal: Achieve best in class door to balloon times for patients suffering from ST-segment elevation myocardial Infarctions (STEMI) by working with our competitor hospital and local EMS to implement an ideal system of care to provide seamless transitions from each stage of care to the next. The American Heart Association and the American College of Cardiology recommend that the door-to-balloon time interval be no more than 90 minutes and under 120 minutes when the patient has to be transferred to another hospital.
### DMAIC

<table>
<thead>
<tr>
<th>Stage</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DEFINE</strong></td>
<td>Identify scope of project &amp; key stakeholders</td>
</tr>
<tr>
<td></td>
<td>Identify stakeholder requirements</td>
</tr>
<tr>
<td><strong>MEASURE</strong></td>
<td>Create data collection tool</td>
</tr>
<tr>
<td></td>
<td>Identify key measurements</td>
</tr>
<tr>
<td><strong>ANALYZE</strong></td>
<td>Gather and analyze data</td>
</tr>
<tr>
<td></td>
<td>Median D2B time = 167 Min</td>
</tr>
<tr>
<td><strong>IMPROVE</strong></td>
<td>Collaborate with CRH &amp; Jackson County EMS</td>
</tr>
<tr>
<td></td>
<td>Identify &amp; eliminate barriers to implementation</td>
</tr>
<tr>
<td><strong>CONTROL</strong></td>
<td>Implement monitoring method</td>
</tr>
<tr>
<td></td>
<td>Deploy results to all key stakeholders</td>
</tr>
</tbody>
</table>
## Project Charter

### STEMI IMPROVEMENT PROJECT

<table>
<thead>
<tr>
<th>Project Charter</th>
<th>Champions: Tammy Dye &amp; Vicki Johnson</th>
<th>Process Owners: Matt Chandler, Susie Schnitker Staci Glick, Julie Bailey &amp; Dennis Brasher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizations: Schneck Medical Center, Jackson County EMS, Columbus Regional Health,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project: ED STEMI: Rapid Identification and Intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem Statement:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In quarter one 2010 our median door to balloon time was 167 minutes. The American Heart Association and the American College of Cardiology recommend that the door-to-balloon time interval be no more than 90 minutes and under 120 minutes when the patient has to be transferred to another hospital.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Objective:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The objective of this project was to create a process that allowed 100% of STEMI patients to be reperfused with a door to balloon time under 90 minutes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suppliers</td>
<td>Inputs</td>
<td>Process</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>EMS Registration</td>
<td>Transportation</td>
<td>1. Onset of symptoms</td>
</tr>
<tr>
<td>Triage Nurse</td>
<td>12 Lead EKG</td>
<td>2. EMS Dispatch</td>
</tr>
<tr>
<td>Emergency</td>
<td>Doctor assessment</td>
<td>3. 12-lead ECGs</td>
</tr>
<tr>
<td>Physician</td>
<td>History &amp; Physical Diagnosis</td>
<td>4. Early Diagnosis</td>
</tr>
<tr>
<td>Dispatch</td>
<td>Handoff Communication</td>
<td>5. Transport to SMC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. ED MD confirms diagnosis, pt stays in ambulance</td>
</tr>
</tbody>
</table>
Excellence Every Person, Every Time

- **Project Impact on Key Stakeholders**

| Patient                      | • Improved outcomes  
|                             | • Increase patient satisfaction  
| SMC, CRH, & JCEMS           | • Increase in clinical quality  
|                             | • Increase possibility for further collaborations  
| Physicians & Staff          | • Streamlined processes  
|                             | • Increased staff engagement  

- **Door to balloon times under 90 minutes (best in class)**
- **Address to balloon times under 120 minutes (best in class)**
- **Improved patient outcomes**
1. Project Selection

2. Current Situation Analysis

3. Solution Development

4. Project Implementation & Results
# STEMI Kaizen Event Agenda

## Day 1 (September 27th, 2010)

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0830-0900</td>
<td>Training and review of current data (SZ)</td>
</tr>
<tr>
<td>0900-0930</td>
<td>SIPOC</td>
</tr>
<tr>
<td>0930-0945</td>
<td>Break</td>
</tr>
<tr>
<td>0945-1030</td>
<td>Review/validate current state map</td>
</tr>
<tr>
<td>1030-1100</td>
<td>Affinity diagram and creation of Customer Requirement Tree</td>
</tr>
<tr>
<td>1100-1200</td>
<td>Brainstorming of potential failure modes using Man/Machines/Materials soft tool</td>
</tr>
<tr>
<td>1200-1245</td>
<td>LUNCH</td>
</tr>
<tr>
<td>1245-1400</td>
<td>FMEA</td>
</tr>
<tr>
<td>1400-1415</td>
<td>Break</td>
</tr>
<tr>
<td>1415-1500</td>
<td>FMEA</td>
</tr>
<tr>
<td>1500-1630</td>
<td>Brainstorm of improvements</td>
</tr>
</tbody>
</table>

## Day 2 (September 28th, 2010)

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0830-1015</td>
<td>Future state process map</td>
</tr>
<tr>
<td>1015-1030</td>
<td>Break</td>
</tr>
<tr>
<td>1030-1200</td>
<td>Action Plan</td>
</tr>
<tr>
<td>1200-1230</td>
<td>LUNCH</td>
</tr>
<tr>
<td>1230-1500</td>
<td>Implement Improvements through 5S and system redesign</td>
</tr>
<tr>
<td>1500-1630</td>
<td>Control Plan</td>
</tr>
</tbody>
</table>
SWOT

**Strengths**
- Chest Pain Center Accreditation
- Engaged Stakeholders

**Weaknesses**
- No Cath Lab (Schneck Medical Center)
- Variances in standard of care

**Opportunities**
- Develop partnerships with EMS & CRH
- Standardize care every patient, every time

**Threats**
- Quality of care due to locums ED physicians
- Loss of market share
Goal: Door to Balloon Time <90 Minutes

Schneck Stats
Employees 800
Beds 113

CRH Stats
Employees 1,625
Beds 225

26.1 miles
Current State Process Map

1. Patient calls 911
2. EMS Responds
3. EKG obtained
4. Transports to SMC
5. Patient is triaged and placed in treatment room
6. ED Physician assess & diagnose. EKG is repeated
7. ED Physician contacts Indianapolis facility to transfer patient
8. EMS or helicopter is contacted to transport patient
9. Facility activates catheterization lab
10. Facility receives patient
11. Patient is transported to receiving facility
12. Patient is transferred to Cath lab
13. Patient intervention
Desired State Process Map

1. Patient calls 911
2. EMS Responds
   - Paramedic obtains EKG & activates Code STEMI. Medical control activates Cath Lab
3. Transports to SMC
   - Patient is triaged in ambulance bay
   - ED Physician contacts CRH cardiologist with additional information
4. Patient is transported patient to CRH
5. Facility receives patient and transports to Cath Lab
6. Patient intervention

30% decrease in process steps
### Failure Mode Effect Analysis

#### Narrowing the List of Opportunities

<table>
<thead>
<tr>
<th>Potential Failure Mode</th>
<th>SEV</th>
<th>OCC</th>
<th>DET</th>
<th>RPN</th>
<th>Actions Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of clinical personnel as first contact</td>
<td>9</td>
<td>10</td>
<td>5</td>
<td>450</td>
<td>Change process to Triage Nurse First</td>
</tr>
<tr>
<td>Clocks not synced on EKG</td>
<td>5</td>
<td>10</td>
<td>9</td>
<td>450</td>
<td>Sync clocks on a routine basis</td>
</tr>
<tr>
<td>Clocks not synced on EKG</td>
<td>5</td>
<td>10</td>
<td>9</td>
<td>450</td>
<td>Sync clocks on a routine basis</td>
</tr>
<tr>
<td>Busy</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>392</td>
<td>Proper triage and rapid identification of critical patients</td>
</tr>
<tr>
<td>High census</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>392</td>
<td>Proper triage and rapid identification of critical patients</td>
</tr>
<tr>
<td>Inaccurate history</td>
<td>9</td>
<td>6</td>
<td>6</td>
<td>324</td>
<td>Clinical person as first contact</td>
</tr>
<tr>
<td>Poor historian</td>
<td>9</td>
<td>6</td>
<td>6</td>
<td>324</td>
<td>Clinical person as first contact</td>
</tr>
<tr>
<td>Inaccurate history</td>
<td>9</td>
<td>6</td>
<td>6</td>
<td>324</td>
<td>Clinical person as first contact</td>
</tr>
<tr>
<td>Late diagnosis</td>
<td>10</td>
<td>4</td>
<td>8</td>
<td>320</td>
<td>Rapid identification and interventions of ACS patient through expedited ED process</td>
</tr>
<tr>
<td>Misdiagnosis</td>
<td>10</td>
<td>4</td>
<td>8</td>
<td>320</td>
<td>Change process to Triage Nurse First</td>
</tr>
<tr>
<td>Atypical symptoms</td>
<td>10</td>
<td>4</td>
<td>8</td>
<td>320</td>
<td>Change process to Triage Nurse First</td>
</tr>
<tr>
<td>Delayed EKG</td>
<td>10</td>
<td>6</td>
<td>5</td>
<td>300</td>
<td>Rapid identification and interventions of ACS patient through expedited ED process</td>
</tr>
</tbody>
</table>
1. Project Selection

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3. Solution Development

4. Project Implementation & Results
Solution Development

- Society for Chest Pain Accreditation
- American Heart Association
- American Society of Cardiology
- AMI Simulation
- Guidelines/Standards
- Evidence Based Best Practice
- Evidenced Based System Design
Solution Development

Grant Application and Recipient:
Simulation for Improved Teamwork in Myocardial Infarction
SIM-FIT MI
An in situ Educational Initiative Tailored to Individual Hospital Needs
April 13, 2011
Taped and analyzed by
The American College of Cardiology
Solution Development

- EMS performs 12 lead EKG and field activates one call process to cath lab for positive STEMI EKG’s
- SMC ED physician and nursing team assesses and stabilizes patient in ambulance for transport to CRH
- Developed similar process for walk in STEMI patients
- Standardized equipment between all providers
- Data collection and rapid feedback to everyone involved in the process
- Collaboration & coordination of resources
- Mock code event to identify waste in process
- Training & education to Dispatch, EMS, SMC ED Staff, CRH ED Staff, Cath Lab Staff
Intended Benefits

• Intended Benefits
  – Tangible
    • Improve door to balloon times
    • Improve patient outcomes
  – Intangible
    • Increase stakeholder satisfaction with transition of care processes
    • Increase engagement of staff in the success of the initiative
    • Look for opportunities to collaborate on other initiatives
Data Pre-Implementation

- EMS Arrival to EKG: 13 Min
  - Goal < 5 Min

- STEMI Indoor to Outdoor Time: 80 Min
  - Goal < 30 Min

- Transfer time btw Non PCI & PCI Facilities: 56 Min
  - Goal < 26 Min

- STEMI Door to Door Time: 159 Min
  - Goal < 56 Min

- Door to Balloon Time: 167 minutes
  - Goal < 90 Min
1. Project Selection

2. Current Situation Analysis

3. Solution Development

4. Project Implementation & Results
Implementation

Standardized Processes & Procedures
Implementation

STEMI TRANSFERS
Columbus Regional Hospital

ONE CALL: 812-375-3777
This call connects you directly to ED physician who will accept the transfer immediately
## Implementation

### EMS/ED/Transfer Performance Measures

<table>
<thead>
<tr>
<th>Description</th>
<th>Benchmark</th>
<th>January</th>
<th>February</th>
<th>March</th>
<th>Q1 Roll-up</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>Q2 Roll-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt. Return rate within 48 hours</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Pt. Return rate within 72 hours</td>
<td>0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Onset of Pain to Dispatch</td>
<td></td>
<td>58</td>
<td>186</td>
<td>45</td>
<td>96</td>
<td>244</td>
<td>96</td>
<td>160</td>
<td>167</td>
</tr>
<tr>
<td>Dispatch to EMS EKG Time</td>
<td></td>
<td>28</td>
<td>18</td>
<td>15</td>
<td>20</td>
<td>14</td>
<td>13</td>
<td>12</td>
<td>13</td>
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<tr>
<td>Dispatch to ED Transport Time</td>
<td></td>
<td>34</td>
<td>38</td>
<td>36</td>
<td>37</td>
<td>34</td>
<td>32</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>EMS arrival to EKG Time</td>
<td>5</td>
<td>23</td>
<td>9</td>
<td>7</td>
<td>13</td>
<td>6</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>EMS Time on Scene</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>15</td>
<td>14</td>
<td>15</td>
<td>15</td>
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<tr>
<td>Total time with EMS</td>
<td>-</td>
<td>30</td>
<td>94</td>
<td>67</td>
<td>64</td>
<td>27</td>
<td>26</td>
<td>28</td>
<td>27</td>
</tr>
<tr>
<td>EMS contact to PCI</td>
<td></td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>118</td>
<td>118</td>
<td>118</td>
</tr>
<tr>
<td>SMC Door to EKG time</td>
<td>5</td>
<td>7</td>
<td>9</td>
<td>11</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>EMS identified STEMI in the field</td>
<td>100%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Biomarker Turnaround Time</td>
<td>30</td>
<td>43</td>
<td>50</td>
<td>44</td>
<td>46</td>
<td>44</td>
<td>37</td>
<td>26</td>
<td>36</td>
</tr>
<tr>
<td>Door to Biomarker result time</td>
<td>-</td>
<td>68</td>
<td>74</td>
<td>65</td>
<td>69</td>
<td>76</td>
<td>57</td>
<td>41</td>
<td>58</td>
</tr>
<tr>
<td>Door to Needle time</td>
<td>≤30</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>SMC STEMI In-door to Out-door Time</td>
<td>≤30</td>
<td>NA</td>
<td>106</td>
<td>87</td>
<td>97</td>
<td>47</td>
<td>37</td>
<td>40</td>
<td>41</td>
</tr>
<tr>
<td>STEMI Transfer time between non-PCI &amp; PCI facilities</td>
<td>26</td>
<td>NA</td>
<td>57</td>
<td>68</td>
<td>63</td>
<td>44</td>
<td>28</td>
<td>25</td>
<td>32</td>
</tr>
<tr>
<td>STEMI Door to Door Time (i.e., SMC indoor to PCI indoor)</td>
<td>≤56</td>
<td>NA</td>
<td>163</td>
<td>155</td>
<td>159</td>
<td>91</td>
<td>65</td>
<td>65</td>
<td>74</td>
</tr>
<tr>
<td>First STEMI EKG to Cath Lab</td>
<td>≤51</td>
<td>NA</td>
<td>105</td>
<td>137</td>
<td>121</td>
<td>85</td>
<td>62</td>
<td>61</td>
<td>69</td>
</tr>
<tr>
<td>STEMI Door to Balloon Time</td>
<td>≤90</td>
<td>NA</td>
<td>142</td>
<td>192</td>
<td>167</td>
<td>137</td>
<td>96</td>
<td>92</td>
<td>108</td>
</tr>
</tbody>
</table>
Data Post-Implementation

Faster TAT in every key process

- **EMS Arrival to EKG**
  - Q1: 13 Min
  - Q4: 8 Min

- **STEMI Indoor to Outdoor Time**
  - Q1: 80 Min
  - Q4: 36 Min

- **Transfer time btw Non PCI & PCI Facilities**
  - Q1: 56 Min
  - Q4: 20 Min

- **STEMI Door to Door Time**
  - Q1: 159 Min
  - Q4: 60 Min

- **Door to Balloon Time**
  - Q1: 167 Min
  - Q4: 60 Min
Implementation – Confirmed Benefits

• Intended Benefits
  – Tangible
    • Improved door to balloon times
    • Improve patient outcomes
  – Intangible
    • Increase stakeholder satisfaction with transition of care processes
    • Increase engagement of staff in the success of the initiative
    • Look for opportunities to collaborate on other initiatives

62% Improvement
Door to Balloon Times
Implementation

Goal: Best in Class Performance

- Door to balloon times under 90 minutes (best in class)
- Address to balloon times under 120 minutes for non PCI hospital (best in class)

Results

- Door to balloon times \(<\ 60\) minutes (best in class), outperforming hospitals that have a catheterization lab!
Thank you for allowing me to share our story of how we have broken down barriers and worked together to put the people of our communities first in everything we do.

Contact information:
Susie Schnitker RN BSN CEN
sschnitker@schneckmed.org