STEMI Case Review and Lessons Learned

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STEMI CASE STUDIES

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• No personal or financial disclosures
TIME SENSITIVE METRICS

- Door to EKG: 10 min
- Door to EKG Interpretation: 10 min
- Door to STEMI Activation: ASAP
- Door in Door Out: 30-45 min
- Referral Door to PCI: 120 min
- FMC to EKG: 10 min
- FMC to STEMI Activation: ASAP
- Scene Time: As short as possible
- FMC to PCI: Straight to a PCI Center – 90 min
- Stop at Critical Access Hospital – 120 min
TIME SENSITIVE METRICS

Early Activation
+ 
Early Recognition
+ 
Timely Transport
+ 
Timely Reperfusion
= 
Saved Heart Muscle/Quality of Life
911 was called for an elderly male patient that awoke with CP radiating into his L arm and jaw

• **0526** – EMS arrived on scene to find this patient to be pale and diaphoretic
• **0528** – 12L EKG obtained

![EKG Image]

Does not meet STEMI criteria
CASE STUDY #1

• 0549 – Pt in VT – defib x1
• 0551 – Pt cardioverted x1 for VT with a pulse
• 0601 – Pt arrived to Critical Access Hospital ED
• 0605 – 12L EKG obtained

Meets STEMI Criteria!
CASE STUDY #1

- **0611** – Sanford Fargo One Call notified of STEMI patient
- **0616** – EMS dispatch notified of the need for patient transfer to Fargo
- **0620** – EMS at patient bedside in the ED
- **0631** – EMS departed the ED with patient, on the way to Fargo
CASE STUDY #1

• **0718** – Patient arrive to SMCF Cath Lab

- Pre PCI: 95% Proximal Left Anterior Descending Artery Occlusion
- Post PCI: 1 Drug Eluting Stent Placed
CASE STUDY #1

Patient discharged 2 days later!

<table>
<thead>
<tr>
<th>Measure</th>
<th>Actual Time</th>
<th>Goal Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMS FMC to EKG</td>
<td>2</td>
<td>≤10 minutes (National Goal)</td>
</tr>
<tr>
<td>STEMI EKG to One Call</td>
<td>6</td>
<td>≤10 minutes</td>
</tr>
<tr>
<td>STEMI EKG to Door Out</td>
<td>26</td>
<td>≤45 minutes (National Goal)</td>
</tr>
<tr>
<td>Transport Time</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>CCL Door to PCI</td>
<td>16</td>
<td>≤30 minutes</td>
</tr>
<tr>
<td>STEMI EKG to PCI</td>
<td>89</td>
<td>≤120 minutes (National Goal)</td>
</tr>
</tbody>
</table>

Early recognition of a STEMI is key for these patients.

The clock to stent placement starts with the STEMI EKG.

Great Door in Door out Time for the Critical Access Hospital!
CASE STUDY #2

911 was called for an 83 year old male with c/o jaw pain and chest pain

- **1040** - A local BLS EMS service arrived on scene
- **1046** – 12L EKG obtained

![EKG images]

Does not meet STEMI criteria
CASE STUDY #2

• 1059 – EMS departed the scene to intercept with an ALS EMS service
• 1122 – ALS intercept
• 1156 – EMS arrived to the Critical Access Hospital ED with patient
• 1159 – 12L EKG obtained
• 1233 – 12L EKG obtained

Serial EKG's are VERY important!!!

Meets STEMI Criteria!
CASE STUDY #2

- **1235** – Sanford Fargo One Call notified of STEMI patient. Sanford AirMed dispatch notified of the need for patient transfer
- **1246** – TNK administered to patient
  - THIS STOPS THE CLOCK TO PCI
- **1323** – Sanford AirMed staff at patient
- **1333** – AirMed departed the ED with the patient, on the way to SMCF Cath Lab
• **1554** – Patient arrived to SMCF Cath Lab

[Images showing pre-PCI, post-PCI with stent placement, and post-PCI with stent placed.]
CASE STUDY #2

Patient discharged 2 days later!

<table>
<thead>
<tr>
<th>Measure</th>
<th>Actual Time</th>
<th>Goal Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMC to EKG</td>
<td>6</td>
<td>≤10 minutes (National Goal)</td>
</tr>
<tr>
<td>STEMI EKG to One Call</td>
<td>2</td>
<td>≤10 minutes</td>
</tr>
<tr>
<td>STEMI EKG to Lytics</td>
<td>13</td>
<td>≤30 minutes</td>
</tr>
<tr>
<td>STEMI EKG to Door Out</td>
<td>60</td>
<td>≤45 minutes (National Goal)</td>
</tr>
<tr>
<td>Transport Time</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>CCL Door to PCI</td>
<td>N/A</td>
<td>≤30 minutes</td>
</tr>
<tr>
<td>STEMI EKG to PCI</td>
<td>N/A</td>
<td>≤120 minutes (National Goal)</td>
</tr>
</tbody>
</table>

Great initial EKG time from EMS = early recognition!

Early activation after early recognition is key for STEMI patients

This hospital knew that due to their location, the patient needed Lytics
• 2256 – 53 year old male presented to a Critical Access Hospital ED with c/o chest discomfort x3 days. About an hour PTA, the pain suddenly increased.
  • 12L EKG obtained

Meets STEMI Criteria!
CASE STUDY #3

- **2307** – Sanford Fargo One Call notified of STEMI patient
  - Due to the weather, air transport was not an option for this patient
    - End of October
- **2327** – Local ground EMS dispatch notified of the need for a transfer
- **2330** – TNK administered to patient
  - **THIS STOPS THE CLOCK TO PCI**
- **2338** – EMS at patient bedside
- **0007** – EMS departed the ED with patient, on the way to Fargo
CASE STUDY #3

• 0132 – Patient arrived to the SMCF Cath Lab
CASE STUDY #3

Patient discharged 3 days later!

<table>
<thead>
<tr>
<th>Measure</th>
<th>Actual Time</th>
<th>Goal Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door to EKG</td>
<td>0</td>
<td>≤10 minutes (National Goal)</td>
</tr>
<tr>
<td>Door to One Call</td>
<td>11</td>
<td>≤10 minutes</td>
</tr>
<tr>
<td>Door to Lytics</td>
<td>34</td>
<td>≤30 minutes</td>
</tr>
<tr>
<td>Door In Door Out</td>
<td>71</td>
<td>≤45 minutes (National Goal)</td>
</tr>
<tr>
<td>Transport Time</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>CCL Door to PCI</td>
<td>25</td>
<td>≤30 minutes</td>
</tr>
<tr>
<td>Referral Door to PCI</td>
<td>181</td>
<td>≤120 minutes (National Goal)</td>
</tr>
</tbody>
</table>

Great door to EKG time!!

The goal for Door to Lytics is 30 minutes
Make a plan with the Physician at the PCI center, have an RN ready to draw it up and administer

Even after TNK is given, it’s important to get the patient out the door as soon as possible
911 was called for a 52 year old female with CP

- **0810** – EMS arrived to find pt with c/o CP starting around 0600. Pt stated she felt her body was on fire and she was dizzy

- **0821** – 12L EKG obtained

Meets STEMI Criteria!
• **0823** – EMS departed the scene
• **0826** – Sanford Fargo One Call notified of STEMI patient
CASE STUDY #4

• 0917 – Patient arrived to Cath Lab

100% Proximal Left Anterior Descending Artery Occlusion

100% Mid Right Coronary Artery Occlusion

After Balloon Angioplasty

After Balloon Angioplasty
CASE STUDY #4

Sometimes in rural ND and MN cell phone reception isn’t the greatest

EMS bypassed the critical access hospital (to avoid backtracking) and came directly to the PCI Center

Patient discharged 2 days later!

<table>
<thead>
<tr>
<th>Measure</th>
<th>Actual Time</th>
<th>Goal Time</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMC to EKG</td>
<td>11</td>
<td>≤10 minutes (National Goal)</td>
<td>❤️</td>
</tr>
<tr>
<td>FMC to One Call</td>
<td>16</td>
<td>≤10 minutes</td>
<td></td>
</tr>
<tr>
<td>Transport Time</td>
<td>54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCL Door to PCI</td>
<td>20</td>
<td>≤30 minutes</td>
<td>❤️</td>
</tr>
<tr>
<td>FMC to PCI</td>
<td>87</td>
<td>≤90 minutes (National Goal)</td>
<td>❤️</td>
</tr>
</tbody>
</table>
• Minutes matter for these patients!
  • **Critical Access Hospital**
    • Early Recognition (EKG) and Early Activation (Calling the PCI Center are key for these patients, their recovery and quality of life after an MI
    • Know which PCI center you typically send MI patients to
    • Know which transport you normally use (Ground vs. Air)
    • Know the importance of serial EKG’s
    • Providers – have the discussion regarding Lytics with the accepting Provider
  • **EMS**
    • Early Recognition (EKG) and Early Activation (Calling the PCI Center are key for these patients, their recovery and quality of life after an MI
    • Know how far you are from the Critical Access Hospital vs the PCI Center
    • Know the importance of serial EKG’s while transporting a patient
THANK YOU!

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