Quality Improvement Project: STEMI Alert Notification System at HCA Florida Orange Park Hospital

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Background

• An ST-Elevation Myocardial Infarction (STEMI) is considered a cardiac emergency and requires concise and timely recognition to appropriately select patients to undergo a left heart catheterization and possible percutaneous coronary intervention (PCI).

• The assumed national average of STEMI cancellations due to inappropriate activations is approximately 15%.

• In the final quarter of 2022 at HCAFL-OPH, 57.9% hospital-wide and 55.6% ED/EMS STEMI activations were canceled.
Identification of the problem

A systemic evaluation of the method by which STEMI activations are made revealed breakdown in communication from EMS to ED physician, inaccurate cardiology on-call schedule, and inefficient communication of case details between EMS, ED physician, and Cardiologist.
QI Objective

To create and implement a new STEMI activation algorithm to ultimately reduce false cath lab activations, improve cath lab staff satisfaction, and improve the overall utilization of hospital resources.
Methods

- Research/Quality Committees have indicated this as a quality improvement initiative at HCA Florida Orange Park Hospital.

- A team consisting of emergency room physicians, cardiologists, and hospital administration then created an algorithm to streamline the approach to STEMI activations.

- The plan was implemented and was allowed a 30-day adjustment period. Following this, a prospective analysis of STEMI cancellations in the 2nd quarter of 2023 was performed.

- A cath lab staff satisfaction survey was given pre- and post- intervention with results seen in figure 3.
# Pre-Intervention Data

**Figure 1: Pre-Intervention 4th Quarter 2022 (October - December) CCL Data**

<table>
<thead>
<tr>
<th>STEMI Location</th>
<th>Total CCL Activation</th>
<th>Total STEMI Activation</th>
<th>CCL Activation (other than STEMI)</th>
<th>Number of Canceled STEMI</th>
<th>STEMI Cancellation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMS/Field</td>
<td>22</td>
<td>20</td>
<td>2</td>
<td>11</td>
<td>55%</td>
</tr>
<tr>
<td>Emergency Department</td>
<td>14</td>
<td>10</td>
<td>4</td>
<td>9</td>
<td>90%</td>
</tr>
<tr>
<td>Inpatient Floors</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Overall Total</strong></td>
<td><strong>38</strong></td>
<td><strong>32</strong></td>
<td><strong>6</strong></td>
<td><strong>22</strong></td>
<td><strong>68.8% (Hospital-Wide)</strong></td>
</tr>
</tbody>
</table>
Interventional Algorithm
### Post-Intervention Data

**Figure 2: Post-Intervention 2nd Quarter 2023 (April - June) CCL Data**

<table>
<thead>
<tr>
<th>STEMI Location</th>
<th>Total CCL Activation</th>
<th>Total STEMI Activation (other than STEMI)</th>
<th>Number of Canceled STEMI</th>
<th>STEMI Cancellation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMS/Field</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Emergency Department</td>
<td>26</td>
<td>21</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Inpatient Floors</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Overall Total</td>
<td>35</td>
<td>30</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
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Main Points

- In the final quarter of 2022, more than 60% of STEMI activations were canceled and after intervention the 2nd quarter of 2023 revealed a significant decrease in false activations to about 20%.
- There was no direct adverse effect on our D2B time as a result of the implementation of our new algorithm. 4
- There is major benefit to cath lab staff job satisfaction.
- Overall our data shows that after changing our facility’s pre-hospital STEMI activation policy, we experienced a decrease in false activations of the CCL team, as well as subjective improvement in our CCL staffs’ workplace satisfaction.
Conclusion

This reproducible multidisciplinary approach to the creation and implementation of the new STEMI activation algorithm resulted in a significant reduction in false activations, improved cath lab staff satisfaction, and better utilization of hospital resources.
References

1. Lange, David C., et al. “Cancellation of the cardiac catheterization lab after activation for st-segment–elevation myocardial infarction.” *Circulation: Cardiovascular Quality and Outcomes*, vol. 11, no. 8, 17 Aug. 2018,