Abstract 12

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Title: MI Alert False Activation Reduction

Background:
St. Luke’s University Health Network employs a strategy called the “MI Alert” designed to allow the ED physician to diagnose and quickly initiate treatment of a ST Elevation Myocardial Infarction (STEMI). This includes activation of the interventional cardiologist and Cath Lab staff to prepare for an emergency procedure called Primary Percutaneous Coronary Intervention (PPCI) to open an acutely occluded coronary artery and restore blood flow to the heart muscle. The MI Alert policy defines the criteria to be utilized to determine if an MI Alert is appropriate. Occasionally the system is activated inappropriately which is identified as a false activation. Inappropriate Cath Lab Activations have a number of negative implications including poor resource utilization, unnecessary costs (at least $500 per false activation), patient safety risk, increased patient anxiety, work-life sleep issues of staff, negative affects on the career longevity of Cath Lab staff from burn-out, and potential community risk from the team rushing into the hospital to treat the after hours STEMI. False activation rates have been monitored by the MI (Myocardial Infarction) PI (Performance Improvement) Taskforce since 2011. Rates had been at acceptable levels at our primary PCI center, but as the team started covering three PCI centers within the network, and went from two call teams to one, need for even more emphasis on reduction of false activation became more imperative than ever. False activations were tracked from Pre-hospital providers and ED physicians. FY 13 demonstrated increasing false activation rates and staff burn out. Strategies needed to be identified and employed to reduce rates back to acceptable levels. Research was done of the ACC/AHA Guidelines and journals for best practice improvement strategies. The MI Alert false activations were analyzed for trends and opportunities to affect improvement. No universally accepted definition existed in research of what a false activation is. We defined and tracked the false activation by both the most generous definition and the strictest definition. Review of the literature identified false activation rates (by the most generous definition) up to 40% with some individual hospitals reporting even higher rates. OBJECTIVE: Reduce and maintain MI Alert false activations to less than 10% by the most generous definition of meeting minimal criteria for MI Alert and less than 20% by the strictest definition of no culprit lesion being found by FY 14.

Methods:
We needed to evaluate our baseline data, which is the etiology of the false activations and the false activation rates. We also needed to clearly define what a false activation was. We flowcharted our MI Alert process. The most generous definition was simply asking, “Were we wrong to call the MI Alert?” If the answer was, “No,” then it was not a false activation. It means
that minimal criteria for calling an MI Alert were met. This definition allows for conditions that may mimic a STEMI but are not a STEMI, such as takotsubo, pericarditis, or vasospasm. The strictest definition utilized was whether or not there was an identified culprit lesion on cath imaging. We evaluated CY 2013 data to identify the most common reasons for false activation. We reviewed 202 MI Alert system activations. There were 14% by the most generous definition and 26% by the strictest definition. Four of the false activations were from EMS and 29 were from the ED department. Summary: False Activation Reasons Did not meet STEMI ECG criteria 18: Tako Tsubo 3 Early Repol 3 No Culprit lesion 3 RAF 3 LBBB 2 HTN/LVH 2 Subacute presentation 2 STE not new 2 Paced 2 Vasospasm 1 Hyperkalemia 1 Barriers were identified and addressed. No clear definition for a false activation existed. It varied in the literature. There was also a general knowledge deficit among some our providers, both in-house and pre-hospital. Additionally, we also found some hesitancy to request a stat cardiology consult for clarity of borderline cases. To reduce false activations, we sent a memo out to all ED physicians with information from the Chief of Cardiology reminding them of the MI Alert policy, definitions and need to reduce false activations. We also emphasized to the ED physicians to utilize urgent cardiology consults for any “borderline” case or complicated case that may have contra-indications for invasive catheterization strategies. We continued a 100% review of all MI Alerts and suspected false activations were reviewed by the Medical Director for the CP Program. Any false activation from the ED was sent to that ED manager and ED Medical Director for internal PI review and feedback to the MI PI Taskforce. Any false activation from EMS was reviewed with the squad director and our EMS liaisons for PI. ED and EMS feedback of all successful MI Alerts including patient outcome data, cath images pre and post cath and copies of the ECG are sent on all Door-to-Balloon cases. The Medical Director of the Chest Pain Program did physician to physician calls as needed for case review. The ED Physician Champion started MI Alert case reviews with the ED Residents for PI and education purposes.

**Results:**

By the strictest definition we reduced false activation by 27 cases equating to at least $13,500.00 in savings to the cath team budget and more importantly, reducing the negative implications of inappropriate activation which improve patient safety, staff satisfaction and staff safety. We achieved our target goal and continue to monitor false activations monthly. Based on a 2-sample % defective test, our results were determined to be statistically significant. Network percent false activations (most generous definition) decreased from 14.9% (FY 2013) to 7.7% (FYTD 2014), p = 0.017, (p < 0.05). Network percent false activations and no culprit lesion (strictest definition) decreased from 27.9% (FY 2013) to 19.1% (FYTD 2014), p =0.025, (p < 0.05). All efforts have been shared across the three campuses within our network performing primary PCI with successful results.

**Conclusion:**

We have effectively reduced inappropriate activations of the MI Alert process and continue to monitor it from all 3 of our PCI centers. We are confident that in achieving our goals, we appreciated cost reduction, staff satisfaction, and efficient use of resources all in our efforts to provide top quality care to the communities we serve.