**A NOVEL PREDICTION TOOL FOR ‘FALSE POSITIVE’ ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION ACTIVATIONS AMONG EMERGENCY PHYSICIANS AT PRIMARY PCI-CAPABLE CENTERS: A REPORT FROM THE ACTIVATE-SF REGISTRY**

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**Background:** Emergency room activation of the cardiac catheterization laboratory for an ST-Elevation Myocardial Infarction (STEMI) significantly reduces time to reperfusion. A preferential emphasis on timeliness may result in a high rate of ‘false positive’ activations, strongly signaling a need for a clinical decision-making tool to assist in the initial diagnosis.

**Methods:** We analyzed consecutive patients referred by emergency physicians for emergent cardiac catheterization for a possible STEMI at a tertiary care and an urban trauma center from October 2008 to September 2011. ‘False positive’ STEMI activation was defined as lack of a culprit lesion by angiography or assessment of clinical, electrocardiographic and biomarker data. Clinical factors associated with ‘false-positive’ activations in our dataset were evaluated in a multivariate logistic regression model and a prediction tool was generated. Bootstrapping (200 reps) was performed for cross-validation. A receiver operator curve of the novel prediction tool was calculated for goodness of fit.

**Results:** Of 472 activations by emergency physicians, 194 (43%) were ‘false positives’. Our novel clinical prediction tool included six factors: male gender, the presence of typical symptoms on presentation, no reported history of coronary disease, no history of drug use, the absence of left ventricular hypertrophy on EKG and the absence of q waves. This model closely predicted ‘true positive’ activations (AURC=0.82). When added to traditional electrocardiographic criteria the presence of at least 3 of these factors significantly improved specificity (46% to 66%), positive predictive value (69% to 79%) and negative predictive value (65% to 72%) while preserving sensitivity (83% to 84%) for detecting true STEMIs.

**Discussion:** The use of a novel clinical decision-making tool using data easily available to triaging physicians accurately identifies false positive activations for STEMIs without a loss in diagnostic sensitivity. Use of this prediction tool could potentially improve diagnostic discrimination and as a result reduce costs, and the attendant unnecessary risks for patients who do not warrant emergent angiography.