Prearrival activation of the cath lab correlates with PCI center meeting sixty minute door to balloon time

David Wampler, PhD, LP; Preston Love, BS, RN; Joan Polk BA, LP; Brandi Wright BA, CSTR;
on behalf of Southwest Texas Regional Advisory Council's Regional Cardiac Systems Committee
University of Texas Health Science Center at San Antonio, Department of Emergency Health Science Center; Southwest Texas Regional Advisory Council

UT Health Science Center® PREHOSPITAL RESEARCH

STRAC Southwest Texas Regional Advisory Council

Introduction

Lower mortality due to STEMI is tightly and directly correlated with reduced time to reperfusion. The current national guidelines recommend 90 minutes from first medical contact to reperfusion. Given geographic constraints with proximity of a STEMI patient to a PCI center, the prehospital component of STEMI care is limited to scene time. As EMS identifies a STEMI and begins moving the patient towards PCI, preactivation of the cath lab can initiate a parallel process of readying the laboratory to reduce the time to device after arrival at the hospital. Fiduciary concerns make Prearrival activation of the cath lab controversial.

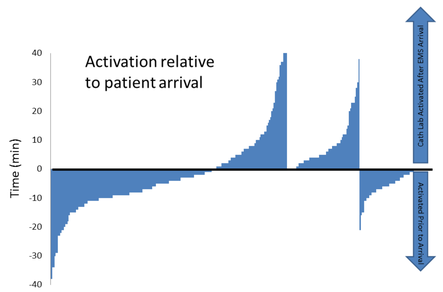
Methods

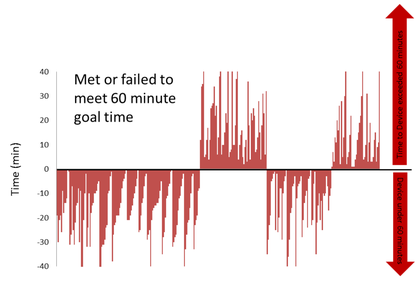
This was a retrospective review of prospectively collected regional cardiac systems committee process improvement data. All "Heart Alerts" from 2012 and 2013 were included. A true Heart Alert activation, for the purposes of this analysis, was prehospital notification and deployment of a device or reperfusion.

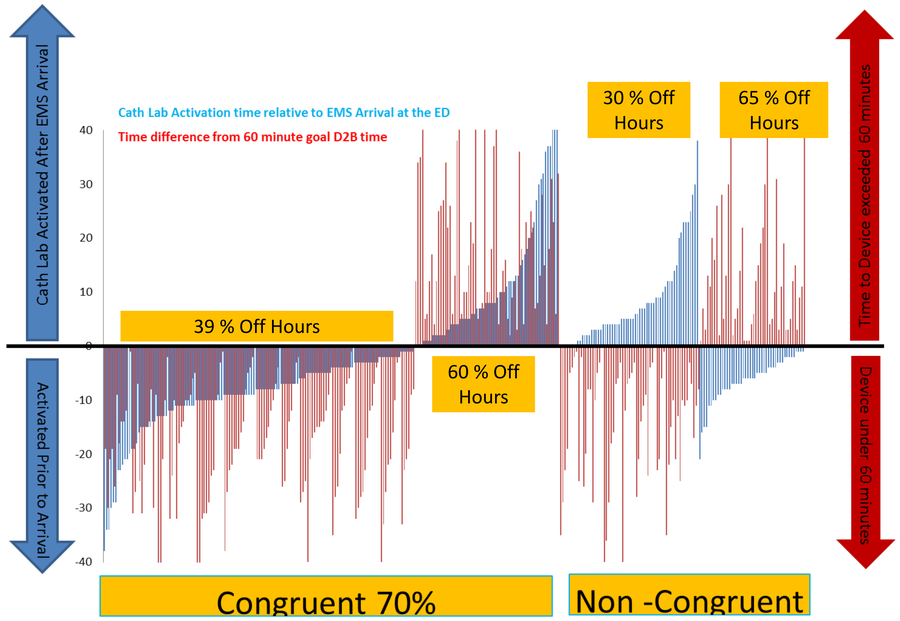
Data collection

The EMS electronic medical record alerts the PI committee of a Heart Alert. The prehospital data set is then matched to the hospital electronic medical record to identify PCI outcome. The activation delta was defined as time of cath lab notification minus patient arrival at the PCI center (i.e. cath lab activated before arrival the time delta is negative). The door to device is defined as EMS arrival at the emergency department to deployment. D2B data are presented as the time delta with respect to 60 minute goal time (i.e. a 50 minute D2B time is negative 10 minutes). Congruence was defined as both the cath lab activation time delta and meeting of the 60 minute goal time both negative or both positive. Non-congruent was defined as one of the time deltas positive and one negative.

Goal: The goal of this study was to determine the correlation of the prearrival activation of the cath lab with the PCI center meeting the 60 minute goal door to device time.







	Pre-activation	Post-Activation	Total
Met Goal	135 (75%)	61 (49%)	198
Missed Goal	46	63	107
Total	181	124	305

The two-tailed P value equals 0.0003

Off Hours

	Pre-activation	Post-Activation	Total
Met Goal	53	30	83
Missed Goal	38	18	56
Total	91	48	139

The two-tailed P value equals 0.7

On Hours

	Pre-activation	Post-Activation	Total
Met Goal	82	43	125
Missed Goal	16	25	41
Total	98	68	166

The two-tailed P value equals 0.003

True Activation
EMS activated the Heart Alert and patient had a stentable lesion

Activation Without Intervention
EMS activated the Heart Alert, there was sufficient evidence of a STEMI(i.e. Heart Alert criteria were met), but there was no verified lesion

False Activation
EMS activated the Heart Alert, the Heart Alert criteria were not met, and the patient did not have a stentable lesion

Missed Activation
EMS did not activate the Heart Alert, the initial 12-lead at the PCI center indicated STEMI

Results

During the two year period studied, the region included 795 heart alerts, of which 502 were determined to be true activations. There were also 219 false activations, and 38 missed activations.

Of the true activations, 181 (59%) had prearrival activation, and 197 (64%) had D2B within 60 minutes. Of the pre arrival activation group, 135 (75%) met the 60 minute goal time, and of the notification after arrival group (n=112) only 53 (44%) met the 60 minute goal time. Overall there was 70% congruence with 75% of the congruent pairs assigned to the prearrival-met goal group.

Conclusions

There was a high agreement with prearrival notification of the PCI laboratory with the meeting of the 60 minute goal D2B time. All organized STEMI systems of care should develop a mechanism where the EMS systems can initiate parallel process of transporting patient to the PCI center and the readying of the PCI laboratory and personnel.

Heart Alert Criteria

1. Patients with signs and symptoms of an Acute Coronary Syndrome (ACS)*

AND

2. ST segment Elevation of 1mm or more in 2 contiguous leads

If your patient does not meet Criteria 1 AND 2, a consult should be done with the receiving ED physician prior to declaring a Heart Alert

*ACS Symptoms include but are not limited to chest pain/tightness; radiation to back, abdomen, arm(s), neck, jaw or any combination; dyspnea; diaphoresis; nausea/vomiting; fatigue; weakness; palpitations; indigestion; syncope; pulmonary edema

**Heart Alert Criteria are regionally approved clinical and analytical findings which result in early activation of Interventional Cardiology services. The criteria identify a sub-group of cardiac patients who benefit from these time sensitive treatments. The criteria do not identify, or address other cardiac disorders/diseases that may require Emergency Department admission, evaluation and treatment.

Ver. 02-11-2010

Date	PCI Center	EMS Agency (or Walk-in)	EMS Unit #	Crew Names	Patient Name	Date of Birth	EMS Case #	Age	Race / Ethnicity	Zip Code of patient residence	Gender	Interfacility transfer?	Interfacility DIDO	Call Received in Dispatch	Time of Dispatch	Responding time	Arrive on Scene Time	Time at Patient Side	Time Transporting to Hospital	PCI Center ED Door Time	ECG Transmission	Cath Lab Activated Time	Cardiologist Activated Time	PCI Center Cath Lab Door Time	Balloon Time	D2B Time	True / False / Missed Activation	Comments	Culprit Vessel	Length Of Stay (LOS) in Days	Mortality	Peak cTrop I	Peak cTrop T	Peak Myoglobin	C-RP	CK-MB	EF	TIMI Quantitative Analysis	Symptoms to 911 Call	AS A	NT G	2nd NTG	O_2	MSO_4	Response Time	Time to EKG	Scene time	Transport time	911 to ER	911 to Cath	ED Time	Cath Lab Time	Activation Delta