Devin Burrup, R2; Block 5, 2014

Reference Article: Paramedic Ability to Recognize ST-Segment Elevation Myocardial Infarction on PreHospital Electrocardiograms. Francis Mencl, MD, MS, Scott Wilber, MD, MPH, Jennifer Frey, PhD, Jon Zalewski, NREMT-P, RN, Jarrad Francis Maiers, MD, Mary C. Bhalla, MD. PreHospital Emergency Care; April/June 2013; Volume 17 / Number 2

Objective: This study evaluated paramedics' accuracy in recognizing STEMI on ECGs when faced with potential STEMI mimics.

Background: Identifying ST-segment elevation myocardial infarctions (STEMIs) by paramedics can decrease door-to-balloon times. While many paramedics are trained to obtain and interpret electrocardiograms (ECGs), it is unknown how accurately they can identify STEMIs. Therefore, this study was performed.

Method: This was a descriptive cohort study using a survey administered to paramedics. The survey contained questions about training, experience, and confidence, along with 10 ECGs:
   - 3 demonstrating STEMIs (inferior, anterior, and lateral),
   - 2 with normal results, and
   - 5 STEMI mimics (left ventricular hypertrophy [LVH], ventricular pacing, left and right bundle branch blocks [LBBB, RBBB], and supraventricular tachycardia [SVT]).
The overall sensitivity and specificity and the proportion correct was calculated with 95% confidence intervals (CIs).

Results/Discussion: There were 472 surveys collected between 7/2010 – 1/2011 from 30 municipal emergency medical services (EMS) agencies in five counties with 15 medical directors from seven hospitals. Of the respondents, 52% had 10 or more years of experience in the field. ECGs were routinely acquired by 99% and 95% had the ability to transmit ECGs from the field to the receiving hospital. The majority (69%) reported ECG training within the preceding year, 31% within six months. 74% of respondents declared they were confident in recognizing STEMIs. STEMI detection was measured as overall sensitivity 75% (95% CI, 73-77%) and specificity 53% (95% CI, 51%–55%).

There was no correlation between the paramedics' ability to correctly interpret STEMI on ECG and years of experience, recent ECG training, confidence in their own ability to interpret ECGs.

ECG Interpreted	Correctly Identified
Inferior MI	96% (453/472)
Anterior MI	78% (368/472)
Lateral MI	51% (241/472)
All 3 STEMIs	39% (185/472)
Left Ventricular Hypertrophy (as not STEMI)	37% (173/472)
Left Bundle Branch Block (as not STEMI)	39% (184/472)
Right Bundle Branch Block (as not STEMI)	79% (373/472)
Ventricular Pacing (as not STEMI)	53% (249/472)
Supraventricular Tachycardia (as not STEMI)	65% (307/472)
Normal EKG A (as not STEMI)	97% (459/472)
Normal EKG B (as not STEMI)	100% (472/472)
All EKGs	3% (14/472)

Limitations: Despite gathering information from several agencies in different counties with different medical directors, this still only represents a small region in a Midwestern state. Additionally, only 1 ECG representing the different types of STEMI was utilized, though they were actual transmitted ECGs and not from a book. It is not clear if this information is generalizable to all other EMS agencies in the US.

Bottom Line: Despite training and a high level of confidence, the paramedics in this study were only able to identify an inferior STEMI and two normal ECGs. Given the paramedics' low sensitivity and specificity, we cannot rely solely on their ECG interpretation to activate the cardiac catheterization laboratory. Future research

should involve the evaluation of training programs that include assessment, initial training, testing, feedback, and repeat training.