Basic Training: BLS Use of the 12-Lead ECG

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1,100 square miles

Population
- 1.6 million day
- 1.2 million night

180,791 calls (2011)
134,503 transports (2011)
74% transports
Name: [Redacted] 12-Lead 1
ID: 103110113607 7/31/2010
Patient ID: 0109473 PR 0.210s
Incident ID: 66 100 76
Age: 59
Sex: [Redacted]

HR: 50 bpm Abnormal ECG **Unconfirmed**
11:33:32 Sinus bradycardia with 1st degree AV block
QRS: 0.145s Rightward axis
QT/QTc: 0.488s/0.444s Nonspecific intraventricular block
P-ORS: 66 100 76

x 1.0 05-150Hz 25mm/sec
Physio-Control, Inc. Comments:

116 EMSA W 3011371-134 LP1236510040
911 call to ED arrival
University of Oklahoma
Statewide EMS 12-Lead ECG Survey

• Standardized IRB-approved phone survey
• 185 licensed EMS transport agencies
• 185 agencies data obtained (100% response)
EMS Services in Oklahoma

Legend
- Ambulance Stations
- Multiple EMS Services Overlap
- Counties

Notes: EMS Services are represented to the best of our knowledge as of May 2008. The Service Areas are depicted with a range of colors to distinguish their boundaries. The hatched symbols represent those areas with two or more EMS Services covering the area.

Data Source: EMS Division, Medical Facilities Service, Oklahoma State Department of Health (data were collected through mailed surveys and phone follow-up with the EMS Services).

Created: 07.17.2008
Does your EMS agency have the ability to acquire a 12-lead ECG?

- Yes: 61.6% (114)
- No, skip to Question 13: 38.4% (71)
Which provider level most commonly applies the electrodes and obtains the 12-lead ECG?

- EMT-Basic: 3.5% (4)
- EMT-Intermediate: 3.5% (4)
- EMT-Paramedic: 92.0% (104)
- Registered Nurse: 0.9% (1)
Does your EMS agency transmit 12-lead ECGs to receiving hospitals?

- Yes: 9.7% (11)
- No, skip to Question 9: 90.3% (102)
What mechanism(s) does your agency utilize to transmit 12-lead ECGs?

- **54.5% (6) LIFENET System**
- **27.3% (3) Fax modem with monitor/defibrillator (e.g., Dial-Up/Cell)**
- **9.1% (1) Uploaded to laptop/tablet and sent via internet**
- **9.1% (1) Picture of 12-lead taken and sent by cellular phone**
Which provider level most commonly transmits the 12-lead ECG?

- EMT-Basic: 9.1% (1)
- EMT-Paramedic: 90.9% (10)

Emergency Medical Responder (First Responder)  EMT-Intermediate  Registered Nurse

EMERGENCY MEDICINE
UNIVERSITY OF OKLAHOMA
EMS DIVISION
The Role of the EMT-Basic in ACS?
The Role of the EMT-Basic in ACS

EMT-B

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O₂ VIA NC or NRB AS APPROPRIATE
APPLY CARDIAC MONITOR/OBTAIN 12-LEAD ECG (when available)
TRANSMIT 12-LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT
ASA 324 mg CHEWED BY PT (hold if taken < 6 hours or contraindicated)
ASSIST NTG SELF-ADMINISTRATION 0.4mg (hold if Sys BP ≤ 100 mmHg)
Do your EMS providers interpret 12-lead ECGs?

- Yes: 100%
- No, skip to Question 11: 1.8% (2)
If an ST elevation myocardial infarction (STEMI) is suspected on the 12-lead ECG, where does your EMS agency most commonly transport the patient?

- Closest hospital: 32.5% (37)
- Closest hospital with cardiac catheterization lab: 45.6% (52)
- Patient preference (may bypass closer hospital): 0.9% (1)
- Patient preference with cardiac catheterization lab (may bypass closer hospital): 21.1% (24)
For suspected STEMI patients transported to hospitals with cardiac catheterization lab ability, how is the lab most commonly activated?

- Directly by EMS prior to arrival ("Direct Field Activation"): 19.4% (21)
- Indirectly by EMS prior to arrival ("ED Physician Overread"): 13.0% (14)
- Not activated until patient arrives in ED: 67.6% (73)
5 Critical Events in EMS STEMI Care
1- System Activation
2 – Event Data Capture
3 – Event Data Communication
4 – Destination Determination
The Most Critical EMS Chemical for STEMI
5 – STEMI Definitive Care
EMS: STEMI Vision 20/20

Where are we headed?

5 Summary Points
1. Enthusiasm for clinical outcomes (and analysis of those outcomes) will transcend organizations, time intervals, & geographic boundaries. Electronic data archiving and manipulation must support meaningful impact studies.
2. The literature guiding us will change….so must we.
Werman et al Findings

- 55 EMT-Basics or EMT-Intermediates in rural Ohio
- 89/90 (99%) pts with correct lead placement
- 89/90 (99%) pts with successful ECG sent
  - No change in scene Rme time
- 85/89 (95.5%) sent ECGs “readable diagnostic quality”
3. The role of the EMT-Basic in ACS care will exponentially expand. Technology (and its pricing) must support this expansion.
4. Regional STEMI networks are essential in saving time. EMS will play increasingly critical roles in developing and maturing these networks.
5. The 2020 STEMI will be treated as a system response, not a passage “down the chain” of agencies and events. EMS will be better recognized for its integral role within the system.