

16. First Responder Defibrillation Does Not Increase Survival from Sudden Cardiac Death in a Two-Tiered Urban-Suburban EMS System

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Purpose: The use of automatic external defibrillators (AED) by emergency medical service (EMS) first responders (FR) is widely advocated based largely on reports from one metropolitan area, but widespread impact on survival remains unproven. We hypothesized that the addition of AEDs to an EMS system with short FR and prolonged paramedic response times (4 vs. 10 minutes) would improve survival from sudden cardiac death.

Methods: Prospective, controlled, crossover study (AED vs. no AED) of consecutive cardiac arrests managed by 24 FR fire companies from 1992–1995 in a city of 440,000. Patients were stratified by the Utstein criteria. Primary end-point was survival to hospital discharge among patients with bystander witnessed arrests of cardiac etiology. Power was set at 0.8 to detect a 10% difference in survival.

Results: A total of 627 patients were studied. Groups were comparable for age, gender, history of myocardial infarction, congestive heart failure or diabetes, arrest at home, bystander CPR, and ventricular fibrillation (VF) as initial rhythm.

| | AED | No AED | p-value |
|-------------------------------|--------------|---------------|---------|
| All Cases | 7/304 (2.3%) | 14/323 (4.3%) | 0.2 |
| Bystander Witness/ Cardiac | 5/110 (4.6%) | 7/133 (5.3%) | 0.8 |
| Witnessed VF/VT | 5/ 77 (6.5%) | 8/104 (7.7%) | 0.8 |

Statistically significant differences were noted in race and EMS response times which did not impact survival. Deficiencies in EMS dispatch and bystander CPR were identified which may have affected survival.

Conclusions: Addition of AEDs to this EMS system did not improve survival from sudden cardiac death. Our study does not support routinely equipping first responders with AEDs as an isolated enhancement, and raises doubt about such expenditures in similar EMS systems.

17. Can EMS Providers Adequately Assess Trauma Patients for Spinal Injury?

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Hypothesis: Assessments to rule out cervical spine injury performed by emergency medical services (EMS) personnel correlate well with assessments performed by emergency department (ED) physicians. **Methods:** EMS providers completed a data form based on their initial assessment of all immobilized adult patients. Data collected included the presence or absence of: neck pain/tenderness; altered mental status; history of loss of consciousness; drug/alcohol use; neurological deficit; and other painful/distracting injury. Immobilization was considered to be indicated if any one of the six physical findings was present. The ED physician caring for the patient completed an identical data form based on his/her assessment. Physicians and EMS providers were blinded to each other's assessments. The amount of discordance between the physician and EMS assessments was analyzed using McNemar's Chi-Square for matched pairs.

Results: Five-hundred-seventy-three patients were included in the study. Physician and EMS assessments matched in 78.7% (n = 451) of the cases. In 13.6% (n = 78) of the cases, the EMS assessment indicated immobilization, but the physician assessment did not. In 7.7% (n = 44) of the patients, the physician assessment indicated immobilization, but the EMS assessment did not. The discordance between assessments was statistically significant ($p < 0.001$). The presence of neck pain or tenderness accounted for the most discordance.

Conclusion: EMS assessments to rule out cervical spine injury do not correlate well with physician assessments. Systems allowing EMS providers to decide whether to immobilize patients should follow those patients closely to ensure appropriate care, and to provide immediate feedback to the EMS providers.