

Clinical Summary

Hospital Variation in Time to Defibrillation After In-Hospital Cardiac Arrest

Chan PS, Nichol G, Krumholz JM, Spertus JA, Nallamothu, BK. American Heart Association National Registry of Cardiopulmonary Resuscitation (NRCPR) Investigators *Arch Intern Med.* 2009;169(14):1265-1273

Purpose:

The objectives of this study were to use the results of an NRCPR survey of participating facilities to better understand variations and contributing factors of delayed defibrillation (>2 minutes) and its impact on survival at acute-care hospitals in the United States.

Methods:

During 2003-2007, investigators evaluated hospital variation in rates of delayed defibrillation (defined as longer than the two-minute standard from initial recognition of cardiac arrest to reported first attempt at defibrillation) and its impact on survival among 7479 adult inpatients with shockable rhythms at 200 hospitals within the National Registry of Cardiopulmonary Resuscitation.

Results:

- The initial cardiac arrest rhythm was VF in 64% and pulseless VT in 36% of the patients.
- Over 70% of the cardiac arrests occurred during evening or night hours or on weekends.
- Most cardiac arrests occurred in the ICU. One in six arrests occurred in non-monitored areas.
- The mean time to defibrillation was 1 minute.
- 18.3% (1369 of 7479) had a defibrillation time of more than 2 minutes.
 - 5.3% (396) treated at 3 minutes
 - 3.4% (254) treated at 4 minutes
 - 3.8% (282) treated at 5 minutes
 - 2.2% (164) treated at 6 minutes
 - 3.7% (273) treated at more than 6 minutes.
- 63.8% (4770) experienced a return of spontaneous circulation.
- 34.2% (2555) survived to hospital discharge.

Conclusion:

- There were clinically significant variations in hospital performance of defibrillation times for patients with in-hospital cardiac arrests.
- Rates of delayed defibrillation vary among hospitals but are largely unexplained by traditional hospital factors.
- Future research is needed to better understand best practices in the delivery of defibrillation at top-performing hospitals.

Physio-Control Discussion Points:

This study highlights the need for further analysis of code team response and time to defibrillation in U.S. hospitals. Times to defibrillation varied widely for unidentified reasons.

Lessons learned might be from the model developed by hospitals and EMS to improve STEMI care. In this model every step of the door-to-balloon process was documented and analyzed. Each STEMI case was analyzed, immediate feedback was given to the team and process improvements were implemented as new information was gathered. Improvements shaving off even a few seconds from time to treatment were made at every step of the process.

Similar analysis of processes and interventions in hospitals might improve time to defibrillation and overall resuscitation success.

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- All currently marketed LIFEPAK defibrillators collect emergency medical data, such as defibrillation shock and CPR record. This data can be easily downloaded through CODE-STAT™ with Advanced CPR Analytics, a post-event review tool that annotates chest compressions onto the patient’s continuous ECG report and calculates CPR statistics. Automated reports can be generated and feedback provided to the team.
- Heart Safe hospital assessments are offered by Physio-Control which provide your hospital with a written report that may identify process gaps as well as recommendations issued by healthcare related organizations such as AHA, ERC, and The Joint Commission.
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