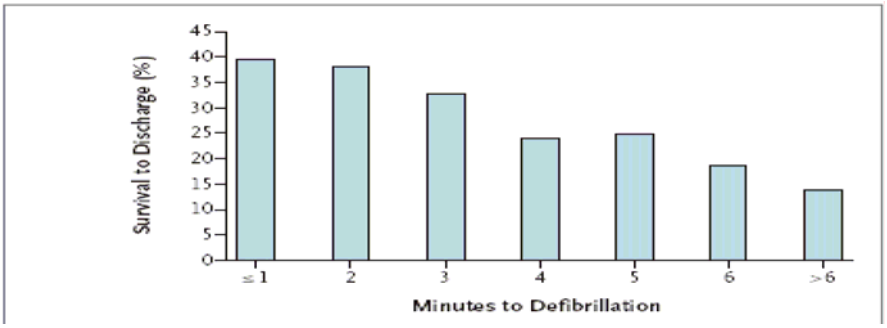
Delayed time to defibrillation after in-hospital cardiac arrest.

An important study from our American Heart Association's National Registry of Cardiopulmonary Resuscitation provides information to SAVE LIVES in your hospital. Our NRCPR Investigators published a study in The New England Journal of Medicine during January 2008. From 369 acute care hospitals they analyzed 6789 adult patients with in-hospital cardiac arrest in which the first identified rhythm was ventricular fibrillation or pulseless ventricular tachycardia; if the patient had multiple cardiac arrests during the same hospitalization, only the first (index) event was included. The time to defibrillation was calculated as the interval from the reported time of initial recognition of the cardiac arrest to the reported time of the first attempted defibrillation. *A priori* they defined delayed defibrillation as a time to defibrillation greater than two minutes. They also classified the study subjects according to whether their defibrillation time was 1 minute or less, 2 minutes, 3 minutes, 4 minutes, 5 minutes, 6 minutes, or more than 6 minutes.

They found that 30.1% of patients with cardiac arrests due to ventricular arrhythmia underwent defibrillation more than 2 minutes after initial recognition of their cardiac arrest. Patients with defibrillation delayed >2 minutes were significantly less likely to survive to hospital discharge; and among survivors, patients with delayed defibrillation were more likely to have major disabilities in neurologic or functional status.

When time to defibrillation was evaluated in discrete intervals, a graded inverse association was found between longer delays and survival, with a significantly lower likelihood of survival to hospital discharge with increased time to defibrillation. However, there was no significant difference in survival between defibrillation at 2 minutes vs. 3 minutes; but survival was decreased (P <0.001) when defibrillation was delayed >3 minutes (see figure).



Dose-response Figure with bar graphs of survival rate vs. time *(reproduced with permission from Chan PS, et al. Delayed time to defibrillation after in-hospital cardiac arrest. N Engl J Med 2008; 358: 9-17. © 2008 Massachusetts Medical Society. All rights reserved.)*

This study established that survival-to-discharge following in-hospital cardiac arrest due to ventricular fibrillation/pulseless ventricular tachycardia is strongly dependent on minimizing time to defibrillation. These data reinforce our AHA Guidelines and NRCPR Gold Standards that recommend first shock in within 3 minutes from recognition of an arrest with an initial rhythm of ventricular fibrillation/pulseless ventricular tachycardia. In-hospital providers should analyze the ECG rhythm and provide shocks for shockable rhythms as promptly as possible after the first signs of cardiac arrest. Importantly, an initial shock occurring >3 minutes after an in-hospital cardiac arrest due to ventricular fibrillation/pulseless ventricular tachycardia should continue to be considered a Process of Care Exception (POCE), and trigger an investigation into the root cause of the delay. Every hospital should develop effective implementation plans to optimize prompt defibrillation and minimize defibrillation delayed >3 minutes.

Delayed time to defibrillation after in-hospital cardiac arrest. Chan PS, Krumholtz HM, Nichol G, Nallamothu BK: N Engl J Med 2008; 358: 9-17