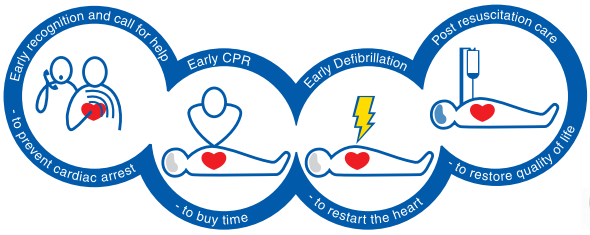
How HeartStart® FR2 can help improve survival from Sudden Cardiac Arrest

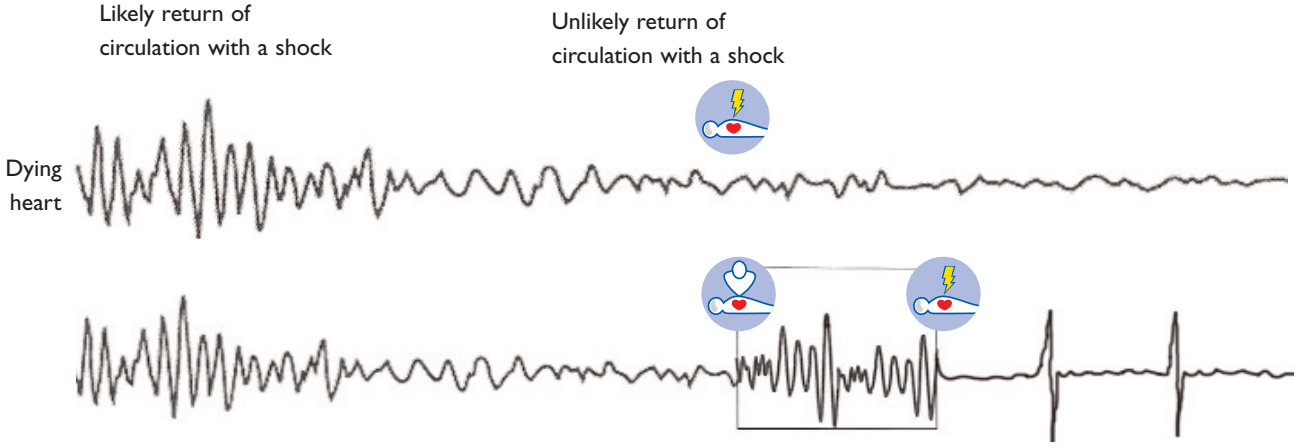


SMART CPR™ can decide whether the better initial treatment is CPR First or Shock First?

Until recently the focus for cardiac arrest patients in ventricular fibrillation has all been around getting the AED to the scene and to give a shock as quickly as possible. However, recent evidence indicates that this approach can be sub-optimal for patients where the response interval before arrival of the AED is more than 4-5 minutes.(1,2) Because bystanders are to a large extent either not willing or able to do CPR, most patients will not have been given effective CPR from the time of collapse until the AED arrives. This patient group, untreated effectively for minutes, is likely to benefit from 2-3 minutes of CPR by the professional responder before receiving a shock. (3,4) In such cases, therefore, the professional responder should start to provide CPR rather than give a shock to maximise the chances of survival. But how does the professional responder know if CPR has been done effectively before his arrival. Some response systems have decided to "play safe" and now give CPR before defibrillation in all cases of delayed response i.e. where the arrest is not witnessed by the professional responder. But this may result in unnecessary delays in giving a shock for some patients where the response time has been short or good bystander CPR has been given. So what is the answer?

For the first time an AED is now capable of making the decision on whether the appropriate treatment should be CPR first or shock first. The SMART CPR feature introduced in Heartstart FR2 evaluates the patient heart condition from a detailed mathematical analysis of the presenting heart rhythm and makes this decision for the responder.

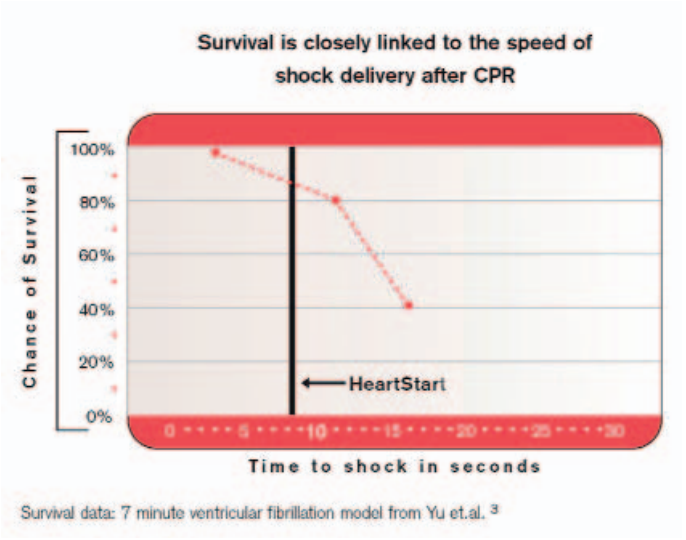
The FR2 can now be configured either to give a shock first – for systems that always respond in under 4 minutes, CPR first – for systems that always have very long response intervals, or the AUTO function where the AED decides on the appropriate therapy for each individual patient regardless of response interval or whether good bystander CPR has been done.



Reduce the time from end of CPR to shock delivery

Quick Shock™ enables shock delivery after only 9 seconds

AEDs need time, without the disturbance from CPR, to make a Shock/No-Shock decision, and to prepare for shock delivery. This inactive time reduces the chance for a shock to be successful and should be as short as possible. (5,6) CPR prepares the heart for the shock but the effect however is short-lived and ideally a shock should be given within 10 seconds of stopping CPR (7). Quick Shock technology in all Heartstart AEDs now enables a shock to be delivered after just 9 seconds.



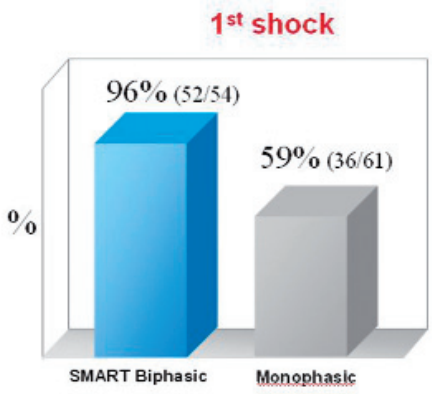
Survival data: 7 minute ventricular fibrillation model from Yu et.al. [3]

More CPR if the first shock is not successful

SMART Biphasic™ ensures high first shock efficacy

SMART Biphasic when launched in 1996 pioneered biphasic waveforms in defibrillators. Since then this waveform has demonstrated a near 100% success rate in converting ventricular fibrillation, the most common heart rhythm in SCA.(8) However, if the first shock is not successful giving another shock may not be optimal therapy. The patient is likely to benefit more from a period of CPR to prepare the heart for a second shock.

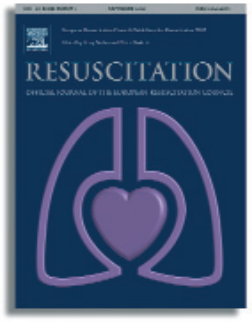
New guidelines for resuscitation from American Heart Association and European Resuscitation Council November 2005 therefore promote CPR after each shock. Heartstart FR2 Biphasic AED's can be configured accordingly.



SMART CPR, QuickShock and SMART Biphasic is a powerful combination for helping saving lives.

1. Cobb et.al. JAMA April 7,1999-Vol 281, No 13 "Influence of Cardiopulmonary Resuscitation Prior to Defibrillation in Patients with Out-of-Hospital Ventricular Fibrillation"
2. Wik et.al. JAMA March 19, 2003-Vol 289, No 11 " Delaying Defibrillation to give Basic Cardiopulmonary Resuscitation to Patients with Out-of-Hospital Ventricular Fibrillation – A Randomized Trial"
3. Weisfeldt et.al. JAMA 2002-Vol 288, No 23 "Resuscitation after Cardiac Arrest – A 3-phase Time Sensitive Model"
4. Valenzuela T. JAMA March 19, 2003-Vol 298, No 11
5. Eftestoel et al , Circulation 2002, Vol 105; 2270 -2272 " Effects of Interrupting Precordial Compressions on the Calculated Probability of Defibrillation Success During Out-of-Hospital Cardiac Arrest"
6. Steen S et al. Resuscitation 2003 ; Vol 58 249-258 " The critical Importance of Minimal Delay Between Chest Compressions and Subsequent Defibrillation: A Haemodynamic Explanation"
7. Edelson et al. Pabstratct prested at AHA Scientific Sessions, Dallas, November 2005
8. Schneider et.al. Circulation 2000;102(15):1780-1787 "Multicenter, Randomized, Controlled Trial of 150-J Biphasic Shocks compared with 200- to 360-J Monophasic Shocks in the Resuscitation of Out-of-Hospital Cardiac Arrest Victims

The 2005 Guidelines by AHA are available, free of cost, from The fact sheets on the science review, forming the basis for the 2005 Consensus on Science document, as well as the 2005 Guidelines, are available at no cost from www.c2005.org



The 2005 Guidelines by ERC, are available at www.erc.edu

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