



Automated External Defibrillation

Coronary heart disease (CHD) remains one of the principal causes of death in the United Kingdom; more than 135,000 people die each year following acute myocardial infarction. The majority of these deaths (around two thirds) occur suddenly outside hospital and complicate the early stages of infarction. The cause in most cases is ventricular fibrillation, a lethal yet readily treatable abnormality of electrical activation of the heart. Only one treatment has been shown to be effective, and that is defibrillation by an electrical countershock from a defibrillator. The crucial determinant of success however, is the time interval between the onset of the arrhythmia and the delivery of the countershock; survival falls by approximately 7-10% for every minute after collapse for patients in ventricular fibrillation (1). Basic life support can extend the time window for successful defibrillation but will not, in itself, restore a normal perfusing rhythm.

In the past, the use of defibrillators was confined to personnel who had been trained in ECG interpretation, which meant for practical purposes doctors, nurses and paramedics. The importance of early defibrillation by medical professionals is rightly stressed in the National Service Framework (NSF) on coronary heart disease and the national plan for the National Health Service. The use of defibrillators by lay personnel (so called 'first responder defibrillation' or 'public access defibrillation') seeks to extend further the availability of this life saving treatment, the most important cause of premature death in the UK.

With the Automated External Defibrillator (AED) the process of ECG interpretation and preparation for administration of the defibrillatory shock are automated. Little is required of the operator other than to recognise that cardiac arrest may have occurred and attach two adhesive electrodes to the chest wall of the casualty.

The operator is guided step by step through a programmed protocol by written instructions on a screen and audible voice prompts. The automated defibrillator records and analyses the heart's electrical activity and if the electronic algorithm detects a rhythm likely to respond to a shock (ventricular fibrillation or tachycardia), it will charge itself to a pre-set level and indicate to the operator how it should be delivered. The sensitivity and specificity of modern automated defibrillators are impressive and in practically no circumstances will they permit the delivery of any electrical countershock to someone who does not require one. All current models incorporate sophisticated recording facilities for later playback and analysis for audit or training purposes.

A recent advance in automated defibrillator technology has been the introduction of the first responder defibrillator. This is a compact, lightweight AED with simplicity of operation the key feature. It is designed for long periods of storage between use and is particularly suited to the needs of first aiders and trained lay persons. There are already many reports of their successful use by members of the voluntary aid societies or cabin crew on aircraft. The UK government through the 'defibrillators in public places initiative' is seeking to extend the availability of such devices in busy public places like airports, railway stations and shopping complexes. They have embarked on an ambitious programme to train lay persons working at the sites. Initial training in the use of AED takes approximately 4hrs and retraining will be carried out approximately every six months.

1.Larsen, Eisenberg M, Cummins R, Hallstrom A. Predicting survival from out of hospital cardiac arrest:a graphic model. *Ann Emerg Med* 1993 j22:1652- 1658

Further information can be obtained from:

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