

CARDIOPULMONARY RESUSCITATION

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Sudden death from heart attack is the most common medical emergency within the hospital and in the community.

There is little doubt that cardiopulmonary resuscitation (CPR) when effectively performed, saves lives reducing the hospital mortality (1), and greatly improving the salvage rates in communities where bystanders can respond promptly before the arrival of trained personnel (2-4). This need for teaching CPR to lay communities has been recognised for a decade in several countries (2-4). These communities are now seeing the benefits of their conviction and action in the form of much improved survival not just in, but out of hospitals as well.

However, the immediate need for action lies in the training of doctors and nurses. The absence of a formal training programme has resulted in highly variable standards of practical experience in CPR among doctors. Older doctors who graduated before the age of modern CPR would have little opportunity to acquire such training especially in general practice. The younger doctors who have not received any formal practical training, learn by trial and error.

This deficiency in practical skills in CPR is well illustrated by the study of Webb et al (6) of 35 house officers in "all years of an internal medicine residency programme at a University-affiliated teaching hospital". The evaluation of their performance on manikins showed that half of the doctors were totally unable to blow air into the manikin and almost half were unable to compress the chest correctly. Less than a quarter just managed to ventilate or compress the manikin and none would have passed the American Heart Association Basic Rescuer Performance test in CPR.

It was with a view to remedy this situation, that a working group was formed at the Singapore General Hospital in 1982 to set up a CPR training programme. The aims of the scheme were:

- (1) form a faculty of instructors
- (2) train all house officers at the Singapore General Hospital
- (3) establish standards for CPR training and testing.

The committee adopted the well-tested American Heart Association Basic Life Support programme. The course consisted of lectures and demonstration on various aspects of Basic Life Support and ample time for manikin practice. At the end of the course, the students were tested on their theoretical knowledge and practical competence in resuscitation. Since April 1983, the Ministry of Health has supported the belief that all house officers should receive practical training and certification of competence in CPR. In 1984, 500 doctors and nurses were so trained.

The response from the trainees on completion of the course was favourable. The majority felt that the course had improved their practical skill from "poor" or "fair" to "good" or "excellent". At the end of course, all the students were able to score at least 70% in the theory papers with a mean score of 87%. Furthermore, 9 out of 10 trainees believed that CPR training should become compulsory for doctors (5).

Against the background of encouraging results from the Singapore General Hospital experience, it seems appropriate to extend this training scheme to doctors in private practice and to paramedics and lay communities.

The Basic Life Support Course

Basic life support aims at either:

- (1) preventing circulatory or respiratory arrest or insufficiency through prompt recognition and intervention, or
- (2) externally supporting the circulation and respiration of a victim of cardiac or respiratory arrest through cardiopulmonary resuscitation (CPR)

Common *indications* of BLS include:

- (1) respiratory arrest such as drowning, stroke, heart attack, airway obstruction by foreign body or other causes, drug overdose, electrocution, suffocation, accident or head trauma.
- (2) cardiac arrest in the forms of ventricular fibrillation, ventricular tachycardia without a palpable pulse, ventricular standstill (asystole) cardio-

vascular collapse (electromechanical dissociation)

Briefly the *steps* of CPR include:

- (1) establishing unresponsiveness
- (2) positioning the victim
- (3) airway
 - opening the airway
 - establishing breathlessness (look, listen, feel)
- (5) breathing
 - rescue breathing (mouth to mouth)
 - foreign body airway obstruction
- (6) circulation
 - establishing the presence or absence of pulse
 - activating emergency medical services
 - begin chest compression (if pulse is absent)

In order that resuscitation is carried out smoothly and urgently, the steps are performed in a drill-like order as shown above, except in special circumstances such as when a patient is being monitored.

In the basic life support course, no adjunctive equipment is needed. However, in a course designed for doctors and nurses, the use of adjunctive equipment such as those used in endotracheal intubation and cardiac defibrillation is relevant. This course is therefore termed a modified BLS course.

The audiovisual of the course include:

- (a) cardiovisual shows, slide talks, demonstrations of CPR on the manikin, of endotracheal intubation, of the use of defibrillator.
- (b) tests — multiple choice questionnaire on the theory of CPR and satisfactory practical performance on the manikin of 6 modules: adult CPR, infant CPR, foreign body removal in a conscious adult, and in an unconscious adult, in a conscious infant and unconscious infant.

The expansion of CPR training programmes require a large commitment of manpower and resources but the benefits clearly justify the effort.

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