

Cardiopulmonary resuscitation: a survey of standards among junior hospital doctors¹

William F Casey FFARCS

Department of Anaesthetics, Addenbrooke's Hospital, Cambridge CB2 2QQ.

Summary: The theoretical knowledge of cardiopulmonary resuscitation of 50 junior hospital doctors was examined, and an attempt made to assess their practical ability to manage a collapsed patient. Major defects were found in both the doctors' theoretical knowledge and their practical abilities. Only 8% were able to manage a cardiopulmonary arrest adequately. Suggestions are made as to how standards might be improved.

Introduction

In 1960, Kouwenhoven and his colleagues revolutionized the management of cardiopulmonary resuscitation (CPR) when they described closed chest cardiac massage. In 1973, a set of guidelines for the performance of CPR were formulated by a National Conference on Cardiopulmonary Resuscitation and Emergency Cardiac Care (1974) in the United States and recommendations were made for the training and testing of health care personnel in basic cardiac resuscitation. These recommendations were updated in 1979 (National Conference 1980) and are now becoming universally accepted. In the United Kingdom, they have been adopted by the British Heart Foundation and the Community Resuscitation Advisory Council and appear in the current handbook of the British Red Cross and St John Ambulance Brigade (*First Aid Manual* 1982). Unfortunately, most doctors remain unaware of them.

Anyone regularly attending cardiac arrests will quickly become aware that the actual management of patients by both nursing and junior medical staff is frequently far from optimal: there is often a failure to maintain a clear airway, ventilation is frequently neglected and external cardiac massage often appears ineffectual.

In most hospitals, junior medical staff are assumed to be competent to perform CPR and so receive no formal training on appointment. When training is offered, relatively few newly appointed doctors attend. Their consequent lack of familiarity with resuscitation equipment at cardiac arrests is frequently embarrassingly obvious. An attempt was therefore made to test the theoretical and practical ability of junior medical staff to manage a cardiopulmonary arrest before offering formal instruction based on the above-mentioned guidelines.

Method

All newly appointed house officers were requested to attend the anaesthetic department for assessment and training in CPR. Those who did not initially respond were telephoned and firm appointments made for them to attend. Fifty doctors were eventually assessed within two weeks of their appointment.

Before any instruction was given, each doctor was asked to complete a twenty-question multiple choice questionnaire (MCQ) on basic CPR. This sought to determine their ability to recognize and initiate treatment of a cardiopulmonary arrest in both adults and children. No attempt was made to assess their knowledge of drugs, the recognition of arrhythmias or the use of a defibrillator. They were then shown a resuscitation mannequin (Resusci-Anne:

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Laerdal) and asked to assume that it was a real patient whom they had just discovered cyanosed and apparently unconscious. They were told that they were alone and without equipment and were asked to demonstrate their initial management of such a patient. They were observed for two minutes and, whenever possible, a video recording was made of their resuscitation attempt.

Results

Fifty doctors were assessed within two weeks of appointment. Thirty-two were house officers, 18 of whom were beginning their first pre-registration post, and 18 were senior house officers with varying degrees of previous experience. All but three were graduates of British medical schools.

Although only knowledge of the basic first aid management of a collapsed patient was sought, the average score in the MCQ was 50%. This poor result was due to: (1) the lack of a logical approach to the management of a collapsed patient; (2) a lack of awareness of the recommended rates of ventilation and cardiac compression; (3) ignorance of the optimal ratio of ventilation to cardiac compression; and (4) a particular lack of knowledge of the management of infants and children.

In the practical test, none of the 50 doctors would have fulfilled Safar's (1981) rigorous criteria for effective basic CPR. Four doctors (8%) did adopt a logical approach to resuscitation and were able to ventilate the mannequin and perform cardiac massage in an effective manner. Their overall performance was considered to be satisfactory.

Twenty-five doctors (50%) were unable to maintain a patent airway and ventilate the mannequin, and 37 (72%) were considered unable to perform effective cardiac massage. Most performed it far too slowly and only compressed the sternum 30–40 times in the two-minute test period. Safar (1981) considers that 60 compressions should be performed in the first 100 seconds. Several doctors, most of them female, also failed to compress the sternum far enough and so would be unlikely to produce an adequate cardiac output (Tables 1 and 2).

Discussion

The ability to recognize and treat a respiratory or cardiac arrest is a basic medical skill that all doctors are generally assumed to possess. In those hospitals in which medical and nursing staff are well trained in CPR, over 70% of patients who develop ventricular fibrillation can be resuscitated and 50% survive to be discharged from hospital (MacIntosh *et al.* 1979). In those communities in which attempts have been made to train the general public in basic CPR, equally impressive results have been obtained. Of 109 patients in Seattle who had documented ventricular fibrillation outside hospital and received CPR from a bystander, 43% survived to be discharged from hospital (Dalen *et al.* 1980).

Generally, however, standards are not so high. Studies of hospital medical staff in the United States have disclosed that, although most considered themselves competent to manage a cardiorespiratory arrest, fewer than 4% were able to perform basic CPR to recognized standards (Nelson 1981, Lowenstein *et al.* 1981). This may have medicolegal consequences in the United States where proficiency at CPR is now a condition of licensure in some States and where the Committee for Hospital Accreditation now requires that all staff physicians be certified proficient in basic CPR (Dalen *et al.* 1980). Some medical

Table 1. Basic CPR skills of 50 junior hospital doctors

Able to establish patent airway	48 (96%)
Able to ventilate mannequin	25 (50%)
Able to perform cardiac massage	12 (24%)
Able to ventilate and perform cardiac massage	4 (8%)

Table 2. Failure to perform adequate external massage

Performed massage too slowly	37 (74%)
Insufficient sternal compression:	16 (32%)
Males (<i>n</i> = 30)	5 (16%)
Females (<i>n</i> = 20)	11 (55%)

schools have given a lead, with all staff including the dean and the chairmen of all clinical departments undergoing training and certification in CPR (Howe *et al.* 1978).

In the United Kingdom, many doctors, when they qualify, admit they do not know how to manage a respiratory or cardiac arrest (Wakeford & Roberts 1982). During this study, several junior house officers confided that they much appreciated a period of practical instruction as they found themselves on the hospital resuscitation team and yet were unsure of what to do. Conversely, most senior house officers believe they can manage a cardiac or respiratory arrest although, curiously, more claim to be able to manage the former than the latter (Yates & Wakeford 1983). Some of those approached felt affronted when asked to complete an MCQ and demonstrate their ability to perform CPR, yet their performance in both the theoretical and practical tests was not significantly better than that of the junior house officers.

Previous studies, all from the United States, have shown that doctors consistently overrate their own ability to perform CPR and, when tested, results have been uniformly poor (Nelson 1981, Lowenstein *et al.* 1981, Webb & Lambrew 1978). Theoretical instruction alone is of much less value than time spent practising with a mannequin. A checklist, to serve as an *aide-mémoire*, has been commended (McSwain *et al.* 1979) and I believe that video recordings may well prove to be valuable teaching aids. All those doctors in the present study who saw their performance on video commented on how useful, if embarrassing, it was. They were amazed at how disorganized they appeared and at how much time they wasted doing nothing.

Training programmes require an initial modest cash outlay, but once started are very time-consuming as lectures and demonstrations need to be constantly repeated to new groups of staff. This is tedious but necessary if standards are to be maintained. The end result, however, is an increase in the number of patients both initially resuscitated and subsequently discharged from hospital, who have one-year (75%) and five-year (20%) survival rates that compare very favourably with the results of far more expensive and time-consuming procedures (Debard 1981).

Studies in both the UK and the United States suggest that the standards of CPR as practised by junior medical staff are scandalously low. If improvements are to be made, this fact must first be recognized. The Americans are seeking to raise standards by legislation and compulsory training. In the United Kingdom, an alternative approach is more likely to find favour.

The General Medical Council (1980) has already suggested that resuscitation should be taught during a period of attachment to a department of anaesthetics. Such teaching should not be solely theoretical; all students should have access to training mannequins and should be able to satisfy their teachers at the end of their attachment that they can maintain a patent airway, ventilate and perform external cardiac massage on such a mannequin. It should not prove too difficult to introduce a test of CPR into the final MB examination and this might provide a powerful encouragement for students to perfect their skills. Local medical students now receive such training during the first few weeks of their clinical training and it has proved extremely popular.

Every hospital should have a named consultant with responsibility for resuscitation. He should ensure that adequate equipment and drugs are available and coordinate a training programme. It is well nigh impossible to compel junior medical staff to attend such training programmes, so ultimate responsibility for maintaining standards must devolve to individual consultants. They should satisfy themselves that both they and their junior medical staff know how to optimally manage a cardiorespiratory arrest. Until they do, resuscitation attempts will remain confused and disorganized charades, resources will be wasted and needless deaths will continue to occur.

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