Reasons for failure of staff to defibrillate in simulated setting in operating theatres

Reason for failure	No of subjects (n=48)
Safety:	
No warning call	7
No confirmation of arrest	22
Waiving paddles	21
Total No of failures	33
Knowledge:	
Incorrect placement of paddles	8
Wrong energy (100-400 J)	16
Interruption of shocks*	13
Total No of failures	30
Safety and knowledge combined	23

*By cardiopulmonary resuscitation in 11 and by administration of drugs in 6.

Operating theatres are often inaccessible to non-theatre staff, thus reliance on early arrival of the hospital resuscitation team may adversely affect outcome. This study confirms that the key advanced life support skill of defibrillation is still inadequate across a range of clinical experience, despite previous reports.[4 5]

It is of some concern that 69% of attempts failed because of inadequate safety, replicating the findings of Bell et al.[5] If used injudiciously, charged defibrillator paddles are dangerous to patients and staff. The 62% failure from lack of knowledge reflects inadequate training and skill retention. The absence of an initial pulse check to confirm arrest by 46% of candidates is worrying as interference from electrocardiographs in theatres may mimic ventricular fibrillation.

Optimum effect from defibrillation occurs within 90 seconds of onset of ventricular fibrillation[1]; only half of the candidates achieved this. Defibrillators are used infrequently and thus need to be "self explanatory." The covers and position of the buttons on the S&W defibrillator resulted in a significant delay. Unnecessary breaks between shocks for administration of drugs and cardiac massage caused further delay. Training and the use of (semi) automatic defibrillators might improve this.

All doctors in theatre who might operate alone should be competent in advanced life support. Such training is time consuming, and resources are not available to retest with sufficient frequency. The 100% positive response suggests there should be further study of the efficacy of random testing and use of "mock arrests" on maintenance of skills in advanced life support techniques.

This research was carried out before the publication of the 1997 guidelines from the Advanced Life Support Working Party of the European Resuscitation Council.

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1 Advanced Life Support Working Party of the European Resuscitation Council. Guidelines for advanced life support. *Resuscitation* 1992;24: 111-22.
2 Alderson K. Family sue over death after operation. *Times* 1996 March 2:3;cols 1-3.
3 Resuscitation Council UK. *Advanced life support handbook*. 2nd ed. London: Resuscitation Council UK, 1994.
4 Tham KY, Evans RJ, Rubythion EJ, Kinnaird TD. Management of ventricular fibrillation by doctors in cardiac arrest teams. *BMJ* 1994; 309:1408-9.
5 Bell JH, Harrison DA, Carr B. Resuscitation skills of trainee anaesthetists. *Anaesthesia* 1995;50:692-4.

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A memorable patient

Long term follow up

In 1968, although an obstetrician by training, I was appointed as general surgeon to a mobile surgical team embarked in the aircraft carrier *Eagle* to provide cover for the naval task group covering the withdrawal from Aden.

This eccentric appointment arose from a temporary shortage of available surgical specialists and was a cause of some amusement on board and some concern on my part. I was not reassured to hear that, in the second world war, the United States marine corps had recruited several obstetricians who were unwanted by the other services and found them to have the best battlefield mortality figures, since they were well used to working fast in a welter of blood. A further complication was that for operational reasons we would spend long periods at sea and would have no access to shoreside facilities. It was decided that, in addition to emergencies, we should carry out routine, relatively minor surgical procedures on board since we had the facilities.

The subject of this follow up was a seaman in one of the frigates who suffered the classic seaman's injury when, during a jackstay transfer—between two ships—he stepped back into the bight of a rope and was dragged up to the pulley block, almost completely avulsing his foot at the ankle joint. First aid was given in his ship and he was then transferred by helicopter to us. No attempt could be made to save the foot; there was too much tissue loss and an adequate stump could be fashioned only at mid calf level.

On waking, the patient complained that he had missed his tot; he asked what we had done with the limb and seemed reassured to hear that it had been thrown over the side. He seemed to think that this added a suitably Nelsonian touch. His behaviour following the operation impressed everyone; he was unfailingly cheerful, never complained, and showed none of the anxiety he should have had for his future. Some of the credit for this must go to the excellent chief petty officer in charge of the theatre and ward, who looked after him with skill and humour as only sailors can. We were able to evacuate him by helicopter to Gan Island after five days and thence by air to Britain. On the tenth day he set off on crutches for sick leave at home. I heard nothing further of him but continued to worry that I might not have given him an adequate stump.

In 1996, long after I had left the service, I received a letter addressed to me by name, forwarded by the navy's medical department with the cryptic note, "I do hope you'll be able to go." It was from the sailor's wife inviting me to his surprise retirement party after 23 years in the wine trade; apparently he had often said that he would like to meet me again. My former chief petty officer and I both attended; I half expected to be assaulted for the damage I had wreaked but it was an emotional reunion. He walked without a limp and his retirement present was a bag of golf clubs. I was dying to look at the stump but didn't like to ask.

It is not often in surgical practice that you get the chance of such long term follow up. I hope I do not get invitations to the retirement parties of my failures. My thanks are due to the patient and to the medical director general of the navy for permission to publish this memoir.

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