Evaluation of a cardiac surgery advanced life support course

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The most critical emergency situation seen in cardiac surgical units is the need for chest reopening. While senior nurses often manage cardiac arrest they currently are not trained to open chests, which can be a life-saving action if performed efficiently. This article evaluates a three-day cardiac surgery advanced life support course with protocols to manage critically ill cardiac surgical patients who suffer a cardiac arrest and who need their chest reopening.

Little published research can be found on the results and outcomes of patients who have undergone chest reopening, even though this is a well-known phenomenon in cardiac surgical units. Most disciplines are well rehearsed in advanced cardiac life support with international guidelines providing the evidence base for practice in ‘closed’ arrest situations. However, there has been little guidance for health care practitioners caring for patients who have arrested after cardiac surgery in terms of when and who should open the chest (European Resuscitation Council, 1998).

Background

The latest European Resuscitation Council guidelines (ERC, 2005) recommend early reopening and internal cardiac massage (Mackay et al, 2002). With the reduction in junior doctors’ hours and the consequences of modernising medical careers, in future continuity of care will be maintained through a range of health care practitioners including senior nurses who may be leading these teams (Department of Health, 2001). The European Resuscitation Council (2005) recommends the training of non-medical staff to commence chest reopening, remove sternal wires and initiate internal cardiac massage while a surgeon is called.

These changes present challenges for all professions to equip health care practitioners of the future – nurses, junior doctors and other non-medical personnel – to be both competent and confident not only in ‘closed’ resuscitation but also to have the knowledge and skills to know when to open the chest and how to carry out this procedure and perform open chest compressions safely. This was the impetus that led to the development of a three-day course designed to teach and assess the knowledge and skills of practitioners who may be called upon to perform this procedure.

All disciplines attended the course including cardiac intensive care sisters, advanced nurse practitioners, consultant anaesthetists, specialist registrars, senior house officers, and surgical assistants and practitioners. The benefits of interprofessional and multidisciplinary learning, with practitioners learning not only from lecturers but also from each other, has been shown to be successful in promoting interprofessional collaborative working (Horsburgh et al, 2001).

Evaluation

Statistical evidence was collated that demonstrated significant improvements in the students’ performance before and after the course in areas such as:

- The time taken to perform airway checks;
- Assessment of breathing;
- Circulatory assessment;
- Treatment with oxygen;
- Appropriate treatment of the circulation;
- Requesting blood gases, chest X-rays and electrocardiographs (ECGs).

Evidence was recorded by videotaping students before and after the course.

In addition, a course evaluation was completed before students left the centre but it was thought that this may have affected the results. A further evaluation was therefore thought to be necessary as the expected benefits to patient care would not be achieved if the course was not a positive
experience for the students. In addition, as the course was in its infancy, honest feedback needed to be provided to the organisers and this might not have happened during the evaluation.

Method
A questionnaire was developed by a consultant nurse and a senior house officer in an effort to ascertain whether the course had any impact upon practice and whether students who had undertaken the course felt the course was beneficial and worthwhile. The questionnaire was sent to the 24 students who had undertaken the course. Only four were returned, and so they were sent out again. All students were sent another questionnaire, as anonymity had been strictly maintained and it was not possible to ascertain who had replied.

The questionnaire was as short as possible to encourage practitioners to complete it and there were only nine questions in a tick-box format.

Results
The eventual response rate was seven out of 24 questionnaires (30 per cent). Although the response rate may be considered poor it was very worthwhile. The questionnaire was as short as possible to encourage practitioners to complete it and there were only nine questions in a tick-box format.

The majority of attendees (86 per cent) reported that they had identified their own training need before attending this course. Only one (14 per cent) reported as ‘unsure’.

Twenty-nine per cent of respondents reported that they had witnessed chest reopenings since finishing the course. One reported that organisation had improved while another stated that they had concentrated on the ABCs because so many people were there and the basics were not attended to.

While the other students had not seen any chest reopenings, one who had witnessed two cardiac arrests that had not resulted in chest reopening reported, ‘I feel better in the emergency situation because of what I’d learnt on the course. I was more organised and able to organise others more efficiently.’ All the students reported feeling more confident in taking a role in a chest reopening scenario after attending the course.

Other comments included a request for examinations – both written and clinical – to be included, with a more comprehensive syllabus in line with other similar courses such as advanced life support (ALS) and advanced trauma life support.

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Overall enjoyment of the course was measured using a Likert scale. A total of 71 per cent of respondents indicated that it was ‘extremely enjoyable’, with the remaining 29 per cent stating it was ‘fairly enjoyable’.

The moulages (practice scenarios) used throughout the course were regarded as ‘extremely helpful’ by 57 per cent of respondents and as ‘helpful’ by 42 per cent. In addition, 14 per cent reported that the course lectures were ‘extremely helpful’ and 85 per cent reported that they were ‘helpful’.

The experience of interprofessional learning was reported as ‘extremely beneficial’ by 71 per cent and ‘fairly beneficial’ by 14 per cent, with a further 14 per cent of respondents ‘unsure’.

Discussion
Although the sample sizes are small, the results suggest that the course is meeting the needs of practitioners who will be expected in the future to perform this procedure. The evaluation implies that the course is beneficial.

The majority of students – six out of seven – had identified the need to go on the course themselves and knew of it by word of mouth as they worked...
with the team who had put the course together. They agreed there was a need for this type of course because open chest situations are often chaotic and haphazard with no real leader until the consultant surgeon arrives.

The students also enjoyed the course, which makes it more likely to result in learning.

The course is a mixture of formal lectures and practical scenarios. While the scenarios were felt to be beneficial by all the students, two reported that they increased confidence in the real-life situation, leading to a more organised performance of their team.

The use of scenarios has been shown to increase staff confidence at other advanced cardiac life support courses (Adams et al, 2002). Rivera and Gabriel (1995) also found that competence could be improved by practising essential roles in a controlled environment. This course provided specific roles so that all practitioners knew their role and the roles of their colleagues. Simulation of a variety of different cardiac arrest scenarios will ensure that the training reflects potential situations that nurses or indeed any practitioner may face in practice (Hamilton, 2005).

**Personal reflection**

The changes in the medical workforce within the NHS are resulting in changes for nurses who may in the near future find themselves in situations for which they are unprepared both theoretically and practically.

I am sure I am not the only practitioner who can remember attending cardiac arrests before the ALS protocols – now widespread – were firmly in place and witnessing haphazard and disorganised events. I now witness well-rehearsed resuscitation on wards some 20 years after protocols were developed. This course may equip nurses with the knowledge, skill and confidence to enable timely, safe chest reopening that may have a positive impact upon patients.

It is not known whether the unfavourable outcomes associated with chest reopening (of the three per cent of patients who underwent reopening for haemorrhage there was a mortality rate of 12 per cent) are linked to the length of time it takes to get the chest open or result from disorganised opening.

Only tentative conclusions can be drawn at this stage due to the small number of candidates who have attended the course but it appears that structured training and practice scenarios assist practitioners in their confidence levels when dealing with an acute emergency in the cardiac surgical patient.

Further large-scale studies will need to be undertaken as more candidates undergo the training, to assess the impact not only upon the students but also on patient outcomes. The future is exciting, provided nurses are adequately trained and educated to perform these new roles.