

# Assessment of cardiopulmonary resuscitation in the membership examination of the Royal College of Physicians

**ABSTRACT** – The poor performance of doctors in cardiopulmonary resuscitation has been described in several studies. The problem has been addressed in the last few years by simplifying treatment algorithms, establishing standards of competence, and creating a training framework. Resuscitation skills are also assessed during formal examinations such as those for the membership of the Royal College of Physicians (MRCP(UK)). In 1994 and 1996, we assessed the resuscitation skills of the candidates at our centre during the short-case section of the MRCP examination. With the correct preparation, there was no difficulty in carrying out detailed assessment of basic life support, defibrillation and advanced life support. This assessment was carried out separately from that of the examiners and did not interfere with the running of the short cases. The resuscitation skills of this small sample of an important group of doctors in training grades were unsatisfactory, and we suggest that more should be done to raise standards.

The BRESUS study of 3,765 cardiopulmonary resuscitations showed that only 39% of resuscitation attempts were successful<sup>1</sup>. With the chances of immediate survival falling rapidly with delay, the margin for therapeutic error is small. Despite this, the ability of doctors to resuscitate with speed, competence and effective team coordination remains in question. Junior doctor candidates for the second part of the membership of the Royal College of Physicians (MRCP) examination, who are potential resuscitation team leaders, lack knowledge of treatment algorithms and have inadequate basic life support (BLS) and defibrillation skills<sup>2</sup>. Consultants receive little training<sup>3</sup> and often perform poorly in BLS<sup>4</sup>. The need to raise standards in resuscitation was recognised by the Royal College of Physicians of London. Their recommendations in 1987 provided a framework for training<sup>5</sup>; testing of resuscitation skills can also be performed during the practical section of the MRCP examination.

In 1992 the European Resuscitation Council (ERC) introduced guidelines that simplified treatment algorithms and gave emphasis to defibrillation – the

treatment most likely to improve survival<sup>6,7</sup>. We felt that a fresh assessment of resuscitation skills in MRCP candidates was indicated as this would reflect both standards of practice and uptake of the new algorithms among potential resuscitation team leaders. In addition, we wanted to look at the practical problems of performing such assessments in the context of the examination. With the agreement of College examiners, 45 of the 48 candidates at one centre were assessed in basic and advanced life support (ALS) skills during the short-case section of the MRCP Part 2 examination in 1994 and 1996. This article describes the practical aspects of organising this, the method of assessment and the performance of the candidates.

## Methods

Resuscitation was performed in an area adjacent to, but isolated by a door from, the clinical examination area. The area was large enough for manikin resuscitation by a team of three. A Laerdal ALS manikin with computer printout facility, an S & W 600 and Lifepak 9 manual defibrillators (in 1994 and 1996 respectively), electrode leads, Gudel airway, Ambubag, bag mask, pocket mask and standard drug resuscitation pack were used. The equipment was set up and tested the day before the examination.

An experienced resuscitation training officer (RTO) with ALS instructor status was responsible for marking the candidates independently of the examiners. The RTO prepared a clinical scenario which allowed assessment of BLS, defibrillation and ALS within the time constraints of the 30-min short case examination. This clinical scenario was fixed for all candidates as it simplified marking and avoided delays in running the sessions. The course of the resuscitation was guided by the RTO in the following manner, taking an average of 5–7 min to complete:

1. The candidate was told that a junior nurse on the ward had found a patient who had collapsed. The nurse (played by a helper) would go for help if asked, returning a little later to assist.
2. The candidate was left for 60–90 seconds to assess the patient's condition and to perform single-person BLS on the manikin. They were allowed a choice of ventilation methods: mouth-to-mouth, pocket mask or Ambubag/mask.
3. On connecting the electrodes to the monitor, the computer was programmed to display ventricular

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fibrillation (VF). The candidate was required to perform a sequence of two direct current (DC) shocks with the manual defibrillator.

4. The rhythm was then changed to electro-mechanical dissociation (EMD). At this stage, the candidates were informed that a team of assistants had arrived and given the option to delegate continuing resuscitation tasks.
5. The candidates were questioned on the possible causes and treatments of the condition.

A check list based on ERC<sup>6,7</sup> and the Resuscitation Council (UK) ALS course examination was used by the RTO for assessment (individual items are listed in Tables 3–5). A manikin computer was used to identify correct hand positions in BLS assessment. In accordance with ALS course standards, a fail mark was given in each section if a candidate made any of the following fundamental errors:

1. BLS:
  - failure to assess airway, breathing and circulation;
  - failure to achieve effective ventilations (that raised the chest wall) and compressions (correctly positioned and executed cardiac compression) in 70% of attempts.
2. Defibrillation:
  - failure to identify VF;
  - failure to discharge electricity safely;
  - incorrect paddle positions;
  - failure to check the pulse before administering a second DC shock.
3. ALS (the management of EMD):
  - failure to identify the condition;
  - lack of knowledge of the causes and treatments of EMD.

Because of time constraints, only the first defibrillation attempt was assessed, rather than the recommended sequence of three shocks. At the end, the RTO awarded each candidate an overall subjective grade of unsafe, poor, fair, good or very good.

The College examiners performed a separate subjective assessment of the candidate's competence in the manner of the short cases, but this was not included in the study. It had been decided in advance that the candidate could not fail the short cases on the basis of resuscitation performance alone. Examiners had the discretion to terminate the assessment before the end of the scenario or exclude a candidate from the assessment. In 1994, each pair of examiners brought their assigned candidate to the resuscitation area in a predetermined sequence during the short case sessions. At the second examination, the examiners did this in random sequence. With either method, we found no interruption to the flow of the short cases or interference with the examination of other candidates.

## Results

### *Overall performance of the candidates*

The overall performance was poor using ALS course marking (Table 1). The percentage of candidates passing BLS, defibrillation and the management of EMD was 16, 22 and 55% respectively. Several candidates were failed for committing predefined fundamental errors despite good overall performance. Of the 45 candidates, only two met ALS course standards by achieving passes in all three sections. Subjective grading showed that almost half the candidates had poor or unsafe skills (Table 2).

### *Differences between 1994 and 1996 candidates*

While the 1996 candidates achieved a higher number of passes in defibrillation and management of EMD (Table 1), fewer candidates completed the assessment of EMD. Subjective grading showed that 46% of the 1994 candidates and 48% of the 1996 candidates performed poorly or were unsafe in resuscitation (Table 2). The mean percentage of correct check list items attained by candidates in 1994 and 1996 were also similar – 68 and 74%. The percentage of candidates scoring the same or more than the mean number of correct check list items was 54% (1994) and 62% (1996).

### *Detailed assessment of skills (Tables 3–5)*

The entire group was particularly weak in ventilation and compression, and in checking for a pulse before discharging a second DC shock during VF. Use of the defibrillator was also suboptimal, with about 40% of the candidates making mistakes in charging and discharging

**Table 1.** Overall performance: passes in each section (%).

	No	BLS	Defib	EMD
1994	24	4 (17)	2 (8)	10 (42)
1996	21	3 (14)	8 (38)	11 (79)*
Total	45	7 (16)	10 (22)	21 (55)*

\*seven not assessed.

**Table 2.** Overall performance: subjective grades.

	No of candidates	Unsafe	Poor	Fair	Good	V. good
1994	24	7	4	4	6	3
1996	21	4	6	4	4	3
Total	45	11	10	8	10	6

**Table 3.** Performance in basic life support.

Checklist item	No of candidates (%) correctly performing item		
	1994 n=24	1996 n=21	total n=45(100)
Shake/shout	18	19	37 (82)
Assess ventilation	21	17	38 (84)
Assess pulse	23	18	41 (91)
Call for help	24	20	44 (98)
Basic life support ratio 15:2	18	16	34 (76)
Effective ventilation	6	4	10 (22)
Effective compression	13	6	19 (42)

electricity. The group had little problem identifying VF, and performed reasonably well in the management of EMD. The practice of new recommendations was variable. The precordial thump for cardiac arrest – which was not one of the check list items – was used by 13% of the candidates in 1994. This may reflect the recommendation that it be performed only after a witnessed arrest, rather than in the presented scenario. Charging of the defibrillator with the paddles on the patient, or in the defibrillator, was adhered to by 58% of the candidates.

#### Marking methods

The number of passes using ALS course marking was low (Table 1) and, for each individual, did not correlate well with the subjective impression of their skill. Those who were unsafe attained a pass rate of 3%; poor – 14%; fair – 30%; good – 46% and very good – 72%. ALS marking would have had difficulty identifying the above average candidate as even those with good subjective grades had low pass rates. However, the percentage of correctly performed check list items was a better reflection of the subjective performance, with the unsafe candidates averaging 51%; poor – 61%; fair – 75%; good – 86% and very good – 91%. The mean percentage of correctly performed items for the whole group was 71%, and all candidates with fair to very good grades achieved this or better. Only four of the 21 candidates with poor or unsafe grades performed at or above this level.

#### Discussion

MRCP candidates in the UK are frequently called upon to lead resuscitation teams. A high standard of resuscitation skill is therefore desirable. In their preparation for this examination, candidates should recognise that assessment of resuscitation is a possibility. Despite this, our study provides evidence that over a

**Table 4.** Performance in defibrillation.

Checklist item	No of Candidates (%) correctly performing item		
	1994 n=24	1996 n=21	Total n=45(100)
Identify ventricular fibrillation	22	20	42 (93)
Charging paddles on patient or in defibrillator	14	12	26 (58)
'Stand Clear' instruction	19	19	38 (84)
Correct paddle positions	12	15	27 (60)
Check pulse before second discharge	4	10	14 (31)

**Table 5.** Performance in management of electromechanical dissociation (EMD).

Check list item	No of candidates correctly performing item/no of candidates assessed		
	1994	1996	total (%)
Identify EMD	13/24	20/21	33/45 (73)
Prescribe adrenaline	18/22	15/17	33/39 (85)
Delegate continuing resuscitation tasks	14/22	14/18	28/40 (70)
Consider endotracheal intubation	15/22	9/15	24/37 (65)
Causes of EMD	19/23	14/14	33/37 (89)
Treatments of EMD	15/23	5/5	20/28 (71)

two year period the ability of this group of doctors to perform resuscitation remained poor. None of the candidates in 1994 and only two in 1996 would have passed the ALS course examination. The performance in BLS and defibrillation was particularly worrying, with very low pass rates in these two sections.

We accept, however, that the ALS course marking system may be too strict to apply in the context of this examination, and thus may be partly responsible for the high failure rates in each section. Candidate skill was therefore also assessed by ignoring fundamental errors and counting the total number of correctly performed check list items; this form of scoring failed to identify the candidates who scored well but committed isolated and dangerous mistakes. The subjective overall grading by the RTO provided a better reflection of resuscitation skills because it:

- was less rigorous than ALS marking,

- took into consideration important errors,
- identified most of the candidates who exceeded the mean number of correctly performed items, and
- approximated the type of assessment used by College examiners in this part of the MRCP examination.

The RTO grading showed that just under half of those assessed performed poorly or were unsafe in resuscitation.

An important reason why doctors perform poorly in resuscitation may be inadequate training. Almost all UK medical schools provide training for students and house officers<sup>3</sup>, but the retraining and testing of other junior and senior doctors remains haphazard in most hospitals<sup>8</sup>. Without retraining, basic resuscitation skills decay beyond six months<sup>9</sup>, and motivation is required to maintain personal standards.

Hospital resuscitation committees can recommend that resuscitation team leaders attend ALS courses. Certification of competence in resuscitation to an appropriate level could be a requirement for entry to the MRCP examination; a BLS certificate is already an entry requirement for the membership examination of the Royal College of General Practitioners. This may obviate the need for resuscitation assessment in the examination. Barring this, we feel that resuscitation testing should remain a well publicised option in the membership examination; this encourages the maintenance of minimum skills that the College would expect of its members. Rapid subjective resuscitation assessment can be performed by examiners during the short-case section of the examination without organisational problems. More detailed assessment is also possible and, on a wider scale, the College may find

this a useful way of monitoring the skills of a group of doctors who are in the front line of cardiopulmonary resuscitation.

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