



European Resuscitation Council Guidelines for Resuscitation 2005

Section 9. Principles of training in resuscitation

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Introduction

There are a variety of methods used for training in resuscitation. None are perfect and, in the absence of frequent practice, retention of knowledge and skills is suboptimal. The optimal interval for retraining has not been established, but repeated refresher training at intervals of less than 6 months seems to be needed for most individuals who are not undertaking resuscitation on a regular basis.^{1–12}

Objectives

The objective of training is to equip the learner with the ability to be able to undertake resuscitation in a real clinical situation at the level at which they would be expected to perform, be they be lay bystander, first responder in the community or hospital, a healthcare professional working in an acute area, or a member of the medical emergency or cardiac arrest response team.

Methods

Training should follow the principles of adult education and learning. Generally this will mean an

established European Resuscitation Council (ERC) course with small-group (four to eight members) participation using interactive discussion and hands-on practice for skills and clinical scenarios for problem-solving and team leadership.¹³ The ratio of instructors to candidates should range from 1:3 to 1:6, depending on the type of course.

Core knowledge should be acquired by candidates before the course by study of the course manual or an interactive CD designed for the purpose. The course should aim to produce an improvement in competence in the learner, and there should be a test of core knowledge and an ongoing assessment of practical skills and scenario management. Sophisticated manikins, simulators and virtual reality techniques may be incorporated into the scenario-based training.¹⁴

For basic life support (BLS) by lay people or first responders, home-based learning using a video or interactive CD with a simple manikin may offer a valuable alternative to traditional instructor-based courses.^{15–19} This method minimises candidate disruption and instructor time and finances. However, the role of the instructor should not be underestimated and, in addition to explaining situations that were unforeseen on the original video or CD, the instructor can act as a role model and provide invaluable enthusiasm and motivation.

Group participation has also been demonstrated to enhance the overall learning process.

Ethos

The course should be taught by trained instructors who have undertaken the relevant specific ERC course in teaching and assessment. Teaching should be conducted by encouragement with constructive feedback on performance rather than humiliation. First names are encouraged among both faculty and candidates to reduce apprehension, and the mentor/mentee system is used to enhance feedback and support for the candidate. Stress is inevitable,²⁰ particularly during assessment, but the aim of the instructors is to enable the candidates to do their best.

Language

Initially, the ERC courses were taught in English by an international faculty.¹³ As local instructors have been trained, and manuals and course materials have been translated into different languages, the courses, particularly the provider courses, are now taught increasingly in the candidates' native language.

Instructors

A tried and tested method has evolved for identifying and training instructors.

Identification of instructor potentials

Instructors will be individuals who, in the opinion of the faculty, have demonstrated good competence in the subjects at a provider course and, importantly, have shown qualities of leadership and clinical credibility and skills that involve being articulate, supportive and motivated. These individuals will be invited to take part in an instructor course called the Generic Instructor Course (GIC) in the case of Advanced Life Support (ALS) and European Paediatric Life Support (EPLS) courses, or Basic Life Support (BLS)/Automated External Defibrillation (AED) Instructor Course in the BLS and AED courses. An instructor course for Immediate Life Support (ILS) is under development.

The instructor courses

These are conducted for instructor potentials (IPs) by experienced instructors and, in the case of the

GIC, include an educator who has undertaken specific training in medical educational practice and the principles of adult learning. Details of these instructor courses are given below. There are no formal tests for candidates during the course, but assessment is done by the faculty and feedback is given as appropriate.

Instructor candidate stage

Following successful completion of an instructor course, the individual is designated as an instructor candidate (IC), normally taught on two separate courses under supervision, and is given constructive feedback on performance. After experience of two courses, the IC normally progresses to full instructor status, but occasionally the faculty decides that a further course is required or, rarely, that the candidate is not suitable to progress to be an instructor. An appeal can be lodged with the relevant International Course Committee, which makes the final decision.

Course director status

Selected individuals may progress to the status of the course director. They will be selected by their peers and approved by the relevant committee of the National Resuscitation Council or the relevant International Course Committee. Course directors must be relatively senior individuals with considerable clinical credibility, good judgement and impeccable powers of assessment and fairness. They will have embraced the educational principles inherent in the instructor course. Normally, individuals will have had experience of teaching on at least six courses and will have been appointed course codirector on at least one occasion.

Interchange of instructors

Interchange between instructors of different disciplines is possible. For instance, an ALS instructor may proceed directly to be an IC on an EPLS course, provided that he or she has passed the EPLS course and has been identified as an IP and vice versa. There is no need to repeat the GIC. Similarly, current instructors in the Advanced Trauma Life Support (ATLS) Course of the American College of Surgeons, having been identified as an IP in the relevant provider course, may proceed directly to being an IC in ALS or EPLS. Current American Heart Association Advanced Cardiac Life Support (ACLS) or Paediatric Advanced Life Support (PALS) instructors may proceed directly to IC status in the relevant course.

Code of conduct

All instructors must adhere to the code of conduct for the instructors, which is set out in [Appendix A](#).

The Basic Life Support (BLS) and Automated External Defibrillator (AED) courses

BLS and AED courses are appropriate for a wide range of providers. These may include clinical and non-clinical healthcare professionals (particularly those who are less likely to be faced with having to manage a cardiac arrest), general practitioners, dentists, medical students, first-aid workers, life-guards, those with a duty of care for others (such as school teachers and care workers), and members of first-responder schemes, as well as members of the general public.

Provider course format

The aim of these provider courses is to enable each candidate to gain competency in BLS or the use of AED. Details of appropriate competencies have been published by the ERC BLS Working Group and may be found on <http://www.erc.edu>. BLS and AED courses are developed and managed by the ERC International BLS Course Committee (ICC).

Each BLS or AED provider course lasts approximately half a day and consists of skill demonstrations and hands-on practice, with a minimum number of lectures. The recommended ratio of instructors to candidates is 1:6, with at least one manikin and one AED for each group of six candidates. Formal assessment is not usually undertaken, but each candidate receives individual feedback on performance. Those who need a certificate of competency for professional or personal use may be assessed continuously during the course or definitively at the end.

BLS provider and AED provider manuals, together with certificates, may be purchased from the ERC. Approved alternative manuals, translated if necessary into the local language, may also be used.

Instructor course

Many of the candidates attending a BLS or AED provider course are lay people, and some subsequently want to become instructors themselves. For this reason, the ERC has developed a 1-day BLS/AED instructor course. Candidates for this course must be healthcare professionals, or lay people who hold the ERC BLS or AED provider certificate and are des-

ignated as IP. The aim is to be as inclusive as possible regarding the course attendance, the over-riding criterion being that all candidates should have the potential and knowledge to teach the subject.

The BLS/AED instructor course follows the principles of the GIC, with an emphasis on teaching lay people. Following successful completion of the course, each candidate becomes an IC and teaches two BLS or AED courses before becoming a full instructor.

Introducing courses into a country

Many ERC BLS and AED provider courses are run by, or under the control of, the National Resuscitation Council. The normal procedure for introducing ERC BLS/AED courses into a country is that ERC international instructors visit that country to run a 2-day combined BLS provider, AED provider and BLS/AED instructor course. If there are local instructors (e.g., those who have passed an ERC course successfully, or who are ERC ALS instructors), they teach on the course in a 1:1 ratio of international to local instructor, with the course director (an international instructor) as an additional person who can support local instructors. After a successful course the local instructors become full ERC instructors, and the outstanding local instructors are selected to become instructor trainers. Subsequent courses are normally held in the language of the country concerned, and training materials are translated into that language. The candidates who are on the combined course qualify, hopefully, as ERC BLS/AED ICs. They then need to teach on one or two provider courses, under the supervision of full instructors, before becoming full instructors themselves.

The Immediate Life Support (ILS) course

The ILS course is for the majority of healthcare professionals who attend cardiac arrests rarely but have the potential to be first responders or cardiac-arrest team members.²¹ The course teaches the healthcare professionals the skills that are most likely to result in successful resuscitation while awaiting the arrival of the resuscitation team.²² Importantly, the ILS course also includes a section on preventing cardiac arrest, and complements other short courses that focus on managing sick patients in the first 24 h of critical illness when critical care expertise is not immediately available.^{23–25} There is a large group of potential candidates including nurses, nursing students, doctors, medical students, dentists, physiotherapists, radiographers and cardiac technicians.

Current ALS instructors and ICs can teach and assess on ILS courses. There is also a pilot project underway to develop specific ILS instructors. There must be at least 1 instructor for every 6 candidates, with a maximum of 30 candidates on a course.

Course format

The ILS course is delivered over 1 day and comprises lectures, hands-on skills teaching and cardiac-arrest scenario teaching (CASTeach) using manikins. The programme includes a number of options that allow instructors to tailor the course to their candidate group.

Course content

The course covers those skills that are most likely to result in successful resuscitation: causes and prevention of cardiac arrest, starting CPR, basic airway skills and defibrillation (AED or manual). There are options to include the teaching of the laryngeal mask airway and drug treatments during cardiac arrest. Once all the skills have been covered, there is a cardiac arrest demonstration by the instructors that outlines the first-responder role to the candidates. This is followed by the CASTeach station where candidates practise. ILS candidates are not usually expected to undertake the role of the team leader. Candidates should be able to start a resuscitation attempt and continue until more experienced help arrives. When appropriate, the instructor takes over as a resuscitation team leader. This is not always necessary, as in some scenarios resuscitation may be successful before more experienced help arrives. Set scenarios are used that are adapted to the workplace and the clinical role of the candidate.

Assessment

Candidate's performances are assessed continuously and they must show their competence throughout the ILS course. There are no formal testing stations, removing the threat associated with spot testing at the end of the course. Candidates are sent the assessment forms with the pre-course materials. The forms indicate clearly how their performance will be measured against a pre-determined criteria. Assessment on the ILS course enables the candidate to see what is expected and frame learning around achievement of these outcomes. The following practical skills are assessed on the ILS course: airway management, BLS and defib-

rillation. With a supportive approach, the majority of candidates achieve the course learning outcomes.

Equipment

The ILS course is designed to be straightforward to run. Most courses are conducted in hospitals with small groups of candidates (average 12 candidates). The course requires lecture facilities and a skills teaching area for each group of six candidates. There needs to be at least one ALS manikin for every six candidates. The course should be suitable for local needs. Course centres should try as far as possible to train candidates to use the equipment (e.g., defibrillator type) that is available locally.

Course report and results sheet

A course report and the results sheet are compiled by the course director and filed with the National Resuscitation Council and the ERC.

The Advanced Life Support (ALS) course

The target candidates for this course are doctors and senior nurses working in emergency areas of the hospital and those who may be members of the medical emergency or cardiac arrest teams.²⁶ The course is also suitable for senior paramedics and certain hospital technicians. The ILS course is more suitable for first-responder nurses, doctors who rarely encounter cardiac arrest in their practice, and emergency medical technicians. Up to 32 candidates can be accommodated on the course, with a ratio of at least 1 instructor for every 3 candidates. Up to a maximum of 50% of the instructors may be ICs. Groups for teaching should not exceed eight candidates and should be six ideally. Each instructor acts as a mentor for a small group of candidates. The course normally lasts for two to two and a half days.

Course format

The course format has very few formal lectures (four), and teaching concentrates on hands-on skills, clinically based scenarios in small groups with emphasis on the team leader approach and interactive group discussions. Mentor/mentee sessions are included, to allow candidates to give and receive feedback. Faculty meetings are held at the beginning of the course and at the end of each day of the

course. Social occasions, such as course and faculty dinners, add greatly to the course interaction and enjoyment.

Course content

The course content is based on the current ERC guidelines for resuscitation. Candidates are expected to have studied the ALS course manual carefully before the course.

The course aims to train candidates to highlight the causes of cardiac arrest, identify sick patients in danger of deterioration and manage cardiac arrest and the immediate periarrest problems encountered in and around the first hour or so of the event. It is not a course in advanced intensive care or cardiology. Competence in BLS is expected before the candidate enrolls for the course.

Emphasis is placed on the techniques of safe defibrillation and ECG interpretation, the management of the airway and ventilation, the management of periarrest rhythms, simple acid/base balance and special circumstances relating to cardiac arrest. Post-resuscitation care, ethical aspects related to resuscitation and care of the bereaved are included in the course.

Assessment and testing

Each candidate is assessed individually and reviewed at the end of each day by the faculty at their meeting. Feedback is given as required. There is a testing scenario towards the end of the course, and an on going assessment of the management of the sick patient and the need to be able to defibrillate effectively and safely. There is a multiple-choice question paper taken at the end of the course to test core knowledge. Candidates are required to achieve 75% to pass this test.

Course venue and equipment

The course requires four practical rooms, a lecture room, a faculty room and facilities for lunches and refreshments. At least two digital projectors and computers and up to four flip charts are needed. The practical rooms each should have an adult ALS manikin with ECG simulator and a defibrillator. Four adult airway manikins are required, together with the equipment for simple airway care and ventilation, tracheal intubation and placing a supraglottic airway, such as the laryngeal mask. Intravenous cannulae, syringes, infusion fluids and simulated drugs make up the list.

Course report and results sheet

A course report and the results sheet are compiled by the course director and filed with the national resuscitation council and the ERC.

The European Paediatric Life Support (EPLS) course

The EPLS course is designed for healthcare workers who are involved in the resuscitation of a newborn, an infant or a child whether in or out of hospital. The course aims at providing caregivers with the knowledge and skills for the management of the critically ill child during the first hour of illness and to prevent progression of diseases to cardiac arrest.

Competence in basic paediatric life support is a prerequisite, although a 90-min refresher course on BLS and relief of foreign-body airway obstruction is included. The EPLS course is suitable for doctors, nurses, emergency medical technicians and paramedics, etc., who have a duty to respond to sick newborns, infants and children in their practice.^{27,28} EPLS is not a course in neonatal or paediatric intensive care aimed at the advanced providers.

The course can accommodate 24 candidates with a ratio of at least 1 instructor for every 4 candidates. In exceptional circumstances, 28 candidates may be accepted with extra instructors. Experience in paediatrics is necessary to keep scenarios realistic and to answer candidates' questions, so a minimum of 50% of the faculty must have regular experience in neonatal or paediatric practice. Up to a maximum of 50% of the instructors may be ICs. Groups for teaching should not exceed eight candidates and ideally should be five or six; two instructors act as mentors for a group of five to seven candidates. The course normally lasts for two to two and a half days.

Course format

The new course format has fewer formal lectures (three). Teaching of knowledge and skills is given in small groups using clinically based scenarios. The emphasis is on assessment and treatment of the sick child, team working and leadership. Formal mentor/mentee sessions are included, to allow candidates to give and receive feedback. Faculty meetings are held at the beginning of the course and at the end of each day of the course. Feedback is also given to ICs after each series of workshops and after their lectures.

Course content

The course content follows the current ERC guidelines for neonatal and paediatric resuscitation. The course candidates are expected to have studied the manual before attending the course. In the future they also may receive a CD or a DVD for home training in BLS.¹⁵ A precourse MCQ is sent with the manual to candidates 4–6 weeks before the course. It is collected at the beginning and feedback is given during the course.

The EPLS is aimed at training the candidates to understand the causes and mechanisms of cardiorespiratory arrest in neonates and children, to recognise and treat the critically ill neonate, infant or child and to manage cardiac arrest if it occurs. Skills taught include airway management, bag-mask ventilation, log roll and cervical collar placement, oxygen delivery, an introduction to intubation and vascular access, safe defibrillation, cardioversion and AED use.

Each candidate is assessed individually and reviewed by the faculty. Feedback is given as required. A BLS assessment follows the BLS refresher course, and a second scenario-based test at the end of the course emphasises the assessment of the sick child and the core skills. There is a multiple-choice question paper taken at the end of the course to test the core knowledge. Candidates are required to achieve 75% to pass this test.

Course venue and equipment

The course requires four practical rooms, a lecture room, a faculty room and facilities for lunches and refreshments. At least one digital projector and computer and up to four flip charts are needed. Paediatric manikins (infant and child for basic and advanced techniques) and adjuncts must be available in each classroom. One defibrillator, one AED and one rhythms simulator device must also be available.

Course report and results sheet

A course report and the results sheet are compiled by the course director and filed with the national resuscitation council and the ERC.

The Newborn Life Support (NLS) course

This course is designed for health workers likely to be present at the birth of a baby in the course of their job. It aims to give those who may be called

upon to start resuscitation at birth the background knowledge and skills to approach the management of the newborn infant during the first 10–20 min in a competent manner. The course is suitable for midwives, nurses and doctors and, like most such courses, works best with candidates from a mixture of specialties.

The course is usually conducted over 1 day and runs best with 24 candidates, though up to 32 may be permitted. There should be one instructor for every three candidates in addition to the course director.

Course format

The NLS manual is sent to each of the candidates 4 weeks before the course. Each candidate receives a multiple-choice questionnaire, with the manual and is asked to complete this and bring it to the course. There are two 30-min and two 15-min lectures. The candidates are then divided into four groups and pass through three workstations before lunch. The afternoon is taken up by a demonstration scenario, followed by 2 h of scenario teaching in small groups and finally a theoretical and practical assessment by an MCQ and an individual practical airway test. The course concentrates on airway management but also covers chest compression, umbilical venous access and drugs.

Course venue and equipment

The venue requires a lecture room, four good-sized practical rooms, a faculty room and facilities for lunch and refreshments. A digital projector is required in the lecture theatre and a flip chart or a black/white board in each practical room. Ideally, one of the practical rooms should have hand-washing facilities. At least four infant BLS and four infant ALS manikins (ideally six of each) should be available, as well as other airway adjuncts. Four Resuscitaires, ideally complete with gas cylinders, should also be available.

Course report and results sheet

A course report and results sheet are compiled by the course director and lodged with the national resuscitation council and the ERC.

The Generic Instructor Course (GIC)

This course is for candidates who have been recommended as IP, emanating from the ALS or EPLS

provider courses. In some, the MIMMS course is undertaken under the auspices of the ALSG, and IPs from that course may take the GIC to qualify as ICs for teaching that course. There should be a maximum of 24 candidates, with a ratio of at least 1 instructor to 3 candidates. Instructors must all be fully experienced ERC instructors, not ICs. A key person is the educator. Groups should not exceed six candidates. The emphasis of the course is on developing instruction skills. Core knowledge of the original provider course is assumed. The course lasts for two to two and a half days.

Course format

The course format is largely interactive. The educator plays a key role and leads many of the discussions and feedback. There is one formal lecture on effective teaching and adult learning, conducted by the educator. This lecture is interspersed with group activities. The remainder of the course is conducted in small group discussions and skill- and scenario-based hands-on sessions.

Mentor/mentee sessions are included, and there is a faculty meeting at the beginning of the course and at the end of each day.

Course content

The course concentrates on teaching techniques and skills. Candidates are expected to have studied the GIC manual carefully before the course (reference manual). The theoretical background of adult learning and effective teaching is covered by the educator at the beginning of the course. The features of PowerPoint and the flip chart are demonstrated, and candidates have an opportunity to present a 5-min lecture and are given personal feedback on their performance. The principle of equipment familiarisation, followed by a demonstration by the faculty with subsequent candidate practice, is followed in all aspects of the course.

The teaching of skills is based on the four-stage approach. Scenario-based sessions use scenarios from the candidate's original provider course. Emphasis is placed on the role of the instructor throughout this teaching day, and each candidate has the opportunity to adopt the instructor role. Constructive feedback is a key element of the instructor role.

During the second day, the emphasis moves to assessment and, after demonstrations by the faculty, all candidates are offered the opportunity to act in the instructor assessor role for the assessment of skills and scenario leadership. Further sessions include the conduct of open and

closed discussions and the role and qualities of the instructor.

Assessment

Each candidate has ongoing assessment by the faculty throughout the course. Candidates' performances and attitudes are discussed at the daily faculty meetings and feedback is given as required. Successful candidates may proceed to the status of IC.

Course venue and equipment

This is as for the original provider course. If the candidates come from mixed backgrounds, then a variety of equipment is required.

Course report and results sheet

A course report is compiled by the course director and the educator. This and the results sheet are filed with the national resuscitation council and the ERC.

The Educator Master Class (EMC)

This course, normally held annually, is designed for those aspiring to become medical educators for the GIC. Suitable candidates are selected by the faculty, and generally must have a background and qualification in medical education or must have demonstrated a special commitment to educational practice over a number of years. They should have experience of a provider course and a GIC, and should have studied the background reading for the course.

The instructors for the course are experienced educators. A maximum of 18 candidates can be accommodated with 6 instructors. The groups should comprise a maximum of six candidates. The course lasts just under 2 days.

Course format

The course consists mainly of closed discussion groups for the whole course, led by one or two of the instructors, together with break-out small group discussions and problem solving.

Course content

The course covers the theoretical framework for medical educators, assessment and quality control,

teaching methodologies, critical appraisal, the role of the mentor, multiprofessional education strategies and continued development of the medical educator.

Assessment

Each candidate has ongoing assessment by the faculty throughout the course. Individual progress is discussed at a faculty meeting at the end of each day, and candidates are given the feedback as appropriate. Successful candidates may proceed to the status of educator candidate (EC), where they will be supervised and assessed by an experienced educator and course director until it is decided whether or not they will be suitable educators to work on their own.

Course venue and equipment

The course venue requires a lecture room and three break-out rooms. A digital projector and three flip charts are needed; no manikins are required.

Course report and results

The course director compiles a course report after consultation with the faculty. This, and the results sheet, are conveyed to the educator's national resuscitation council and the ERC.

Appendix A. European Resuscitation Council Code of Conduct

The Code of Conduct applies to all who instruct, or otherwise assist, at courses held under the auspices of the ERC.

It is essential that these individuals

- fully understand that accreditation, and continuing accreditation, of the individual instructor or assistant is dependent on observing this code as well as completing the necessary requirements for re-certification
- ensure that courses approved by the ERC are run in accordance with the ethos and regulations currently in force using the manuals, slides and other materials to ensure that consistent standards of attitude, knowledge and skills are achieved
- behave at all times while participating in courses or social events related to the courses, which are run under the auspices of the ERC, in a responsible manner and observe and other applicable professional codes of conduct

- cooperate with other instructors, educators and administrators (the faculty) and recognise and respect their individual contributions
- avoid any abuse of their position and maintain confidentiality about candidates' results and performance.

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