EDUCATION AND LEARNING

DR WHO: a workshop for house officer preparation

Judith Cave, Deirdre Wallace, Glenda Baillie, Michael Klingenberg, Catherine Phillips, Harriet Oliver, Katherine Rowles, Lisa Dunkley, Alison Sturrock, Jane Dacre

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See end of article for authors' affiliations

Correspondence to:
Dr J Cave, ACME, RFUCMS,
Archway Campus, 4th Floor,
Holborn Union Building,
Highgate Hill, London N19
5LW, UK;
j.cave@medsch.ucl.ac.uk

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Background: Newly qualified doctors should be competent in advanced life support (ALS) and critical care. The Resuscitation Council has published a course about ALS for undergraduate medical students (the intermediate life support (ILS) course). However, there is no undergraduate-level course on assessing and treating critically ill patients, despite the fact that postgraduate courses on this topic are extremely popular. We have developed a new course called Direct Response Workshop for House Officer Preparation (DR WHO), which teaches both ALS and critical care at an undergraduate level.

Methods: We taught the Resuscitation Council ILS course to our 2003–4 cohort of final year medical students ($n = 350$), and the new course (DR WHO) to our 2004–5 cohort ($n = 338$). Students filled in feedback forms immediately after the courses, and a subset repeated the feedback forms 4 months after they had started work as house officers.

Course evaluation: Student and house officer feedback was positive. The DR WHO cohort was more confident in caring for critically ill patients (18/26 (69%) were confident after ILS, and 40/45 (89%) were confident after DR WHO ($\chi^2 = 4.3$; $df = 1$; $p = 0.06$)). Both cohorts were competent in ALS, each with a mean score of 18.6/20 in a finals level practical examination on this topic.

Conclusions: The DR WHO course is popular with the students and practical to run. The course needs to be re-evaluated to determine the long-term competency of graduates.

The Royal College of Physicians (London, UK) recommends that medical students be competent in advanced life support (ALS) before graduation. It also recommends that students should be competent to recognise and treat critically ill patients,¹ because diagnosis and rapid treatment can prevent some cardiac arrests or intensive care admissions.^{2–3}

Altogether 92% of UK medical schools provided training in ALS,⁴ and a questionnaire study of 28 medical schools in the UK and Ireland found that 44% taught initial assessment of critically ill patients.⁵ There is a consensus statement that lists the core competencies for undergraduate medical students in emergency care, and the authors of this statement feel that undergraduate training in critical care is currently “fragmented”.⁶ There are well-established postgraduate-level courses in critical care,⁷ and during their first year of work all graduates from our medical school attend a one-day critical care course called the HELP course. The HELP course is extremely popular with junior doctors, and anecdotally they often comment that they wished they had done it before starting work.

The aim of this study is to develop a new undergraduate-level course covering both ALS and care of critically ill patients. At the end of the course, the students should be competent to respond to a cardiac arrest and initiate the universal algorithm. They should also be competent to assess critically ill patients, initiate life-saving treatment, and call for help when appropriate. Time and resource constraints confine the course to 1 day.

In designing the new course, we aim at emulating published best practice. To our knowledge, there are no published undergraduate-level courses in critical care. The course closest to this is the intermediate life support (ILS) course, which is a one-day course aimed at a variety of participants including medical students. The ILS course was designed, evaluated and published by the Resuscitation Council,⁸ but it does not cover care of the critically ill patient.

The new course we have developed is called the Direct Response Workshop for House Officer Preparation (DR WHO).

DR WHO combines methods and content from the ILS course with philosophy and material from postgraduate courses in critical care. The potential advantages of combining these two types of course are that critical care teaching before graduation will improve preparedness for practice, and that importing a philosophy from a postgraduate into an undergraduate course will yield consistent messages. The potential disadvantage of combining the two types of course is that the increased volume of material will be detrimental to the students' ALS training.

In this article, we describe the DR WHO course and evaluate the course by comparing it with the ILS course.

METHODS

This was a prospective cohort study. In 2003–4, we taught the Resuscitation Council ILS course to all final year medical students ($n = 350$). In 2004–5, we taught the DR WHO course to all final year medical students ($n = 338$).

We evaluated both courses as follows:

- Student feedback: Students who attended the courses filled in feedback forms at the end of the day.
- House officer feedback: Several months after the courses, we sent a follow-up feedback questionnaire to a subset of the students, who were then working as house officers. We asked them to rate the course in retrospect and to state how prepared they had felt when they started working for different aspects of critical care (eg, how prepared they were for using a defibrillator).
- Clinical assessment: At the end of their final year, all students sat a clinical examination including a 5-min station on ALS. In addition, the examination for the DR WHO cohort included a 5-min station about critical care.

Abbreviations: ALS, advanced life support; DR WHO, Direct Response Workshop for House Officer Preparation; ILS, intermediate life support

Box 1: Direct Response Workshop for House Officer Preparation course objectives

At the end of the course, you should be able to:

- Assess a critically ill patient accurately and appropriately
- Analyse and identify the problem
- Initiate management of hypoxia and hypovolaemia
- Decide whether you require help and communicate your findings to the assisting clinician
- Evaluate the patient's initial response to treatment
- Respond competently to a cardiac arrest
- Initiate the universal algorithm
- Safely operate a defibrillator

DR WHO—THE COURSE

The philosophy of the DR WHO course is to teach students to recognise and treat life-threatening problems (ie, hypoxia and hypovolaemia). Box 1 gives the objectives of the course.

After both seminars, there are workshops during which each student plays the role of a doctor managing a fictional case. The workshops are taught in groups of five, and allow the students to put the algorithms they have learnt into practice. Table 2 gives an example of one of the cases. The students receive feedback during the workshops, and at the end of the day they have a formal assessment.

We developed the cases for the workshops jointly, choosing cases that represent common scenarios a foundation year doctor might encounter, and that use all sections of the DR ABCDE algorithm. The scenarios were used, revised and re-used until they ran smoothly.

All facilitators on the DR WHO course were Resuscitation Council ALS Providers or Instructors, and all had attended the HELP course. All the facilitators were full-time clinical skills tutors, junior lecturers or accident and emergency doctors.

COURSE EVALUATION

Student feedback

All students filled in a feedback questionnaire after attending the course and the feedback was positive (fig 1). All students said that they would recommend the courses to a colleague. We found no appreciable differences in feedback between the ILS course and the DR WHO course.

We also collected students' comments, and the vast majority were positive. There were 41 favourable comments about the DR WHO sessions on recognising and treating critically ill patients—for example, "[The most useful session was] management of sick patient prior to arrest as this hasn't been covered as well in the past."

Table 1 Course timetable

09:00–09:10	Welcome and introduction
09:10–10:00	Seminar 1: Assessment and treatment of critically ill patients
10:00–11:00	Workshop 1: Basic and advanced airway management
11:00–11:20	Coffee
11:20–12:30	Workshop 2: Critically ill patient scenarios
12:30–13:15	Lunch
13:15–14:00	Seminar 2: ALS algorithm
14:00–16:00	Workshop 3: Defibrillation demo and ALS patient scenarios
16:00–17:00	Testing
17:00–17:15	Summary and close

ALS, advanced life support.

There were 17 favourable comments about the DR WHO case scenarios. There were also some negative comments: six students said that the timetable was too intensive—for example, "Too much info for one day, but good none the less" and five students commented that the course was repetitive—for example, [when asked what was least useful about the course] "BLS because we had resus training at our district general hospital."

House officer feedback

We administered follow-up questionnaires to the participants after they started work as doctors. The response rates were 39% (26/66) for the ILS cohort and 80% (52/65) for the DR WHO cohort. The retrospective feedback on both courses was positive, with the ILS cohort scoring a mean of 4.17/5 and the DR WHO scoring a mean of 4.24/5 on Likert scales (fig 2).

We also asked the house officers how prepared they had felt when they started working, for various aspects of critical care and ALS (fig 3). The DR WHO cohort felt more prepared for recognising critically ill patients: the percentage feeling well prepared rose from 69% (18/26) in the ILS cohort to 89% (40/45) in the DR WHO cohort. This difference was not significant ($\chi^2 = 4.3$; $df = 1$; $p = 0.06$). The ILS cohort felt more prepared for recognising cardiac arrest rhythms: the percentage feeling well prepared fell from 92% (23/25) in the ILS cohort to 80% (32/40) in the DR WHO cohort. Again this difference was not significant ($\chi^2 = 1.7$; $df = 1$; $p = 0.29$).

We asked the house officers for their comments about the courses. The most common suggestions for improving the ILS course were to increase the amount of teaching on preventing cardiac arrest ($n = 3$) and to increase the time spent on scenarios versus seminars ($n = 3$). We considered these comments when designing the DR WHO course.

The most common suggestions for improving the DR WHO course were to have more teaching on giving drugs in cardiac arrest ($n = 2$), and to have more practice scenarios ($n = 2$). One student said they needed more time to practice the scenarios.

Assessments

The clinical finals examination for both cohorts of students included a 5-min station on ALS. Reassuringly, the results were identical, with a mean score of 18.6 after ILS and 18.6 after DR WHO (maximum score = 20). The examination for the DR WHO cohort included a 5-min station on critical care. The mean score for this station was 16.8/20.

DISCUSSION

This article describes a new undergraduate-level course in ALS and critical care. The main feature of the DR WHO course is that it contains more teaching on critical care than the previously published ILS course. The evaluation of the DR WHO course reflected this; after attending DR WHO, house officers felt more confident in critical care. The DR WHO course was practical to run, and student feedback was positive.

There is considerable overlap between the DR WHO course and the Resuscitation Council ILS course, from which DR WHO was developed. The DR WHO course also overlaps with postgraduate courses with regard to care of critically ill patients—for example, the HELP course and the ALERT course.⁷ We advocate a continuum of critical care teaching from the undergraduate to the postgraduate level.

The DR WHO course has more content than the ILS course. We were therefore keen to investigate the standard of the ALS teaching in both courses and to ensure that it remained adequate in DR WHO. The two cohorts of students performed identically well at ALS in their final examinations. The assessment of students' ALS ability was based on a single

Table 2 Case scenario**Case A—Bleeding patient with hypotension****Clinical setting:**

You are the FY1 doctor covering the surgical wards. At 02:00 one of the nurses from Talbot Ward calls to tell you that Mrs Samuels in bed 10 looks a bit grey and is complaining of abdominal pain. She had a hemicolectomy 14 h ago.

When they answer the telephone call:

The doctor should ask for the observations. The patient meets the Medical Emergency Team calling criteria, so they should ask for the team to be called, and possibly for a cannula to be inserted.

Initial observations to be given to the doctor over the phone if they ask:

SpO₂ 91% on air. Pulse 120/min. BP 80/40 mm Hg.

Danger	Safe to approach
Responsive	Patient responsive but in pain
Airway	Look—patient is talking Listen—no stridor
Breathing	Look—not distressed, trachea central Listen—normal breath sounds Feel—good air entry bilaterally Measure—respiratory rate 32/min SpO ₂ 91% on air Treat—high-flow oxygen improves SpO ₂ to 98%
Circulation	Look—patient clammy and pale and JVP not visible Listen—heart sounds normal Feel—pulse weak and peripheries cool Measure—BP 80/40 mm Hg. Pulse 120/min. Urine output 20 ml in the last hour (patient catheterised) Treat—obtains intravenous access, takes blood and gives a fluid challenge. BP improves to 100/70 mm Hg and pulse falls to 100/min.
Disability	Look—patient is alert Measure—blood glucose is normal
Exposure	Look—abdomen distended with a recent scar Listen—no bowel sounds Feel—abdomen firm and tender Treat—recognises the need for surgical environment. Takes a full history and completes the physical examination. Reviews medical notes, operation notes and drug chart.

BP, blood pressure; FY1, foundation year 1; SpO₂, oxygen saturation.

5-min examination station, during which candidates were required to respond to a simulated cardiac arrest by initiating the universal algorithm and defibrillating a dummy. There may be some concern that this is not a sufficient test of ALS ability. However, it is a valid and commonly used test. In the future, we hope to assess our graduates' ability in ALS by work-place assessments including a 360° evaluation.

The DR WHO cohort felt less confident at recognising cardiac arrest rhythms. This is probably because the ILS course included a lecture on rhythm recognition, but the DR WHO course did not. This problem could be tackled by re-introducing

a lecture on rhythm recognition. We were pleased to note that there were no marked changes in confidence in airway management, basic life support, leading the cardiac arrest team or use of the universal algorithm between the two courses.

We interpret the results of this study with caution. The contemporaneous feedback was consistently positive, and this probably reflects the fact that students enjoy small group teaching on clinically relevant topics. We recognise that we have not fully investigated the long-term implications of the course changes we have implemented. The response rates from the house officers in the two cohorts were very different (39% v

Figure 1 Student feedback on the Direct Response Workshop for House Officer Preparation (DR WHO) course and the intermediate life support (ILS) course. *These were done only in the DR WHO course.

Figure 2 House officer feedback on the Direct Response Workshop for House Officer Preparation (DR WHO) course and the intermediate life support (ILS) course. *These were done only in the DR WHO course.

Figure 3 How prepared do house officers feel for different tasks? ILS, intermediate life support; DR WHO, Direct Response Workshop for House Officer Preparation.

80%). In the ILS cohort, the questionnaires were handed out by administrative staff during teaching sessions. We were reluctant to hand out the questionnaires ourselves, because of concerns that our presence, as course tutors, would bias the results. However, as is common with surveys of junior doctors, the response rate in the ILS cohort was very low. We changed the procedure for administering the questionnaires to the subsequent (DR WHO) cohort, and recruited individual house officers to hand out and collect the feedback forms. This yielded in a much improved response rate.

Although we asked the house officers how well prepared they felt after the courses, the relationship between confidence and competence in junior doctors is not clear, and there is evidence that junior doctors cannot assess their own ability at performing clinical skills.⁹ In a study about critical care, undergraduate students were asked how confident they were to perform several skills (eg, emergency management of hypoxaemia) and then assessed on a simulator. There was a non-significant correlation between the students' confidence and their scores in the assessment, again suggesting that confidence and competence are not reliably related.¹⁰ Despite the uncertainty about whether students who *feel* well prepared actually *are* well prepared, preparedness is an important end point. The General Medical Council suggests that a student should leave medical school "with the necessary knowledge, skills and attitudes to enable him or her to enter the pre-registration period of training with confidence and enthusiasm".¹¹ The most important endpoint is the doctors' performance in the clinical setting, hence our suggestion that, in the future, courses such as DR WHO should be evaluated by work-place assessments.

Simulation centres are an exciting field for further research into the teaching of critical care.¹² Since the implementation of our DR WHO course, a group in the US has performed a randomised study of critical care teaching by simulator. In the simulator arm, students were taught using a computer-controlled manikin that mimicked physical findings including heart and breathing sounds, and produced output on actual patient monitors. In the final assessment, students in the simulator arm performed better than the students in the other arm (who were taught by problem-based learning).¹³

The ultimate aim of developing the DR WHO course was to make undergraduate training relevant to the first foundation year (ie, doctors' first year of work). We were able to show that after starting work, house officers valued the DR WHO course, and their confidence for looking after critically ill patients had improved.

Authors' affiliations

J Cave, D Wallace, G Baillie, M Klingenberg, C Phillips, H Oliver, K Rowles, L Dunkley, A Sturrock, J Dacre, Academic Centre for Medical Education, Royal Free and University College Medical School, London, UK

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