Round-the-table teaching: a novel approach to resuscitation education

Kathryn McGarvey, RESUS4KIDS, NSW Child Health Networks, Australia
Karen Scott, Sydney Medical School, University of Sydney, Australia
Fenton O’Leary, Emergency Department, The Children’s Hospital at Westmead, Westmead, Australia

SUMMARY
Background: Effective cardiopulmonary resuscitation saves lives. Health professionals who care for acutely unwell children need to be prepared to care for a child in arrest. Hospitals must ensure that their staff have the knowledge, confidence and ability to respond to a child in cardiac arrest. RESUS4KIDS is a programme designed to teach paediatric resuscitation to health care professionals who care for acutely unwell children. The programme is delivered in two components: an e-learning component for pre-learning, followed by a short, practical, face-to-face course that is taught using the round-the-table teaching approach.
Context: Round-the-table teaching is a novel, evidence-based small group teaching approach designed to teach paediatric resuscitation skills and knowledge. Round-the-table teaching uses a structured approach to managing a collapsed child, and ensures that each participant has the opportunity to practise the essential resuscitation skills of airway manoeuvres, bag mask ventilation and cardiac compressions.
Innovation: Round-the-table teaching is an engaging, non-threatening approach to delivering interdisciplinary paediatric resuscitation education. The methodology ensures that all participants have the opportunity to practise each of the different essential skills associated with the Danger, Response, Send for help, Airway, Breathing, Circulation, Defibrillation or rhythm recognition (DRSABCD) approach to the collapsed child.
Implications: Round-the-table teaching is based on evidence-based small group teaching methods. The methodology of round-the-table teaching can be applied to any topic where participants must demonstrate an understanding of a sequential approach to a clinical skill.
INTRODUCTION

Timely and effective cardiopulmonary resuscitation (CPR) saves lives; however, research shows the quality of CPR in hospitals during a cardiac arrest is variable. Hospitals need to ensure that their staff have the knowledge, confidence and ability to respond to a paediatric collapse. This can be achieved through regular paediatric resuscitation training for all paediatric health care workers.

Health care worker education programmes should incorporate the principles of adult learning; in particular, the programme must appeal to the participants, be relevant to their clinical practice and be an effective use of their time. CPR skills can be improved and maintained by education that combines didactic teaching for knowledge acquisition with deliberate clinical skills practise in a controlled environment, with immediate feedback. The instructional methodology used to promote knowledge and skill retention is crucial in any resuscitation course, as decay after a relatively short period is well described.

Although there is consensus supporting the use of small group teaching in medicine, especially in resuscitation education, there is little evidence for its educational value other than in problem-based learning. This article aims to describe round-the-table teaching: a novel, evidence-based approach to small group teaching of paediatric resuscitation, which is integral to the course RESUS4KIDS. We begin with an overview of the course, followed by an explanation of round-the-table teaching.

RESUS4KIDS

RESUS4KIDS is a paediatric life-support course for health care rescuers that focuses on the first 10 minutes of a paediatric collapse. It follows the guidelines of the Australian Resuscitation Council, which states that trained health care workers in a health care environment provide advanced life support to infants and children. The course takes a blended approach, in which participants develop their knowledge about paediatric resuscitation through an e-learning component, and apply this in a short, face-to-face course focusing on practical skills. Previous research has validated the effectiveness of the e-learning component in developing participant knowledge.

Using the e-learning component as pre-learning shortens the face-to-face time of the course, and promotes interdisciplinary and multilevel education, as participants come to the session with a similar knowledge base. In the face-to-face course, clinical skills are practised using the round-the-table teaching approach. We first outline the evidence behind the approach, and then describe it.

ROUND-THE-TABLE TEACHING: THE RATIONALE

Round-the-table teaching combines a number of evidence-based, small group teaching methods to create a practical format for teaching paediatric resuscitation. The instructor-to-student ratio is 1:6, meeting the definition of small group teaching, which ensures that all participants can engage with the course content and the group, and have ample hands-on practical time. Rather than teaching clinical skills in isolation, a low-fidelity simulated learning environment using standardised scenarios is used, with a ‘pause and discuss’ format, allowing the instructor to enhance and direct learning, and to provide regular feedback.

In developing round-the-table teaching, the recommendations from the Best Evidence in Medical Education review in 2005 were combined with the Fishbowl teaching methodology. This method, primarily used to develop students’ medical interviewing skills, enables participants to learn from watching each other and undertaking individual practise. It involves two students in the middle of the room, with the rest of the group forming a circle around them to observe their discussion. Round-the-table teaching has taken this approach and modified it to teach practical clinical skills embedded in three simulated learning scenarios. Through this method, participants watch other participants perform individual skills within each scenario, then practise the skills themselves.

Finally, in the round-the-table teaching approach, the knowledge that participants acquire during the e-learning component is tested when they apply it to practical skills during the scenarios. Research in the cognitive sciences has shown learning and retention can be improved when students are tested on recently studied material. This is known as the ‘testing effect’. Roediger and Karpicke claim that learning and retention is improved because the act of retrieving information from memory changes the mnemonic representation underlying retrieval – and enhances later retention of the tested information.

ROUND-THE-TABLE TEACHING: METHODOLOGY

In round-the-table teaching a manikin is placed on a table in the middle of the room. The instructor stands on one side and the six participants stand around the other three sides as they work through three scenarios. A stepwise approach is used in each scenario in accordance with the DRABCD algorithm (Table 1). This algorithm was first introduced to participants in the e-learning module. Figure 1 demonstrates the
interaction between the course content, the participants, and the educational theory. Figure 2 illustrates the course in action.

The instructor begins each scenario by reading aloud the presentation of the (simulated) patient. The participant standing behind the head of the manikin begins the care of the patient according to the DRSABCD algorithm, starting with D (danger; see Table 1). When the instructor observes that the first step has been completed effectively, the first participant moves around the table, and participant 2, now at the head, undertakes step 2. In this way, participants move around the table, each responsible for a step in the algorithm. The instructor can pause and discuss the scenario at any time to provide clarification or feedback.

Steps A, B and C in the DRSABCD algorithm involve a clinical skill, such as bag and mask ventilation. In these steps one participant starts by demonstrating the skill, then the scenario pauses and all the other participants perform the skill in isolation, and rotate around the table. Care must be taken to ensure that when participant 6 starts to perform step C (circulation), participant 5 is at the head, performing bag and mask ventilation, as this step is performed in pairs in the RESUS4KIDS course (the approach for a single rescuer is different). After participant 6 has initiated the circulation skill, participants work in pairs to practise bag and mask ventilation and chest compressions. When the final pair...
performs the skill, all participants continue providing care of the patient as a team.

The team is now responsible for identifying a team leader, allocating roles and continuing their care of the infant: rhythm recognition, and proceeding along the shockable or non-shockable pathways as a simulation. The instructor can still pause and discuss at any point to clarify or emphasise a teaching point.

ROUND-THE-TABLE TEACHING AND RESUS4KIDS OUTCOMES

We have found the round-the-table teaching method easy to teach to instructors through a short ‘Train the Trainer’ course and short e-learning refresher, prior to instruction. In New South Wales, Australia, over 8500 participants have undertaken RESUS4KIDS (65% nurses; 17% doctors). The e-learning component alone has been shown to improve resuscitation skills in a simulation environment.3

The RESUS4KIDS course was evaluated using a pre- and post-intervention questionnaire composed of a nine-point Likert scale, administered to doctors and nurses who completed the course during the pilot in 2008. The questionnaire measured change in participants’ knowledge, confidence and ability (Figure 3), with paired Student’s t-tests detecting a statistically significant difference (p < 0.001) for all comparisons. The 68 participants completed the pre- and post- course survey (100% response rate). All regarded the course as relevant to their clinical role (mean Likert score 8.22), 97 per cent reported that they could apply the skills learned to their clinical roles and 97 per cent stated that they would highly recommend the course to colleagues. Figure 3 illustrates the participants’ positive change in perceived knowledge, confidence and ability to deal with a paediatric arrest. All changes had a significance of p < 0.001. Qualitative data have also been positive about the short face-to-face course and the round-the-table teaching method (Figure 4). More information about RESUS4KIDS is available at http://www.resus4kids.com.au.

APPLICABILITY TO OTHER SETTINGS

The round-the-table teaching method has a number of advantages. It ensures every participant demonstrates each clinical skill and has the opportunity to take the
Round-the-table teaching ensures every participant demonstrates each clinical skill and has the opportunity to take the lead.

**RESUS4KIDS Participants:**

- ‘The step by step practical had easy-to-follow explanations and plenty of time to practise, and you felt comfortable with what you were doing’
- ‘I enjoyed how non-threatening the practical session was.’
- ‘I enjoyed practising scenarios in a very supportive learning environment.’
- ‘I enjoyed the “round the table” way of conducting the practical learning.’

**RESUS4KIDS Instructor:**

- ‘The “round the table” format was particularly beneficial when teaching.’

**CONCLUSION**

Round-the-table teaching is an engaging method of teaching paediatric resuscitation to an interdisciplinary audience. It builds on currently accepted small group teaching theory, allowing individuals to be responsible for specific steps and all participants to practise clinical skills within a simulated environment. It can be applied to other topics quite easily.

**REFERENCES**

1. Hunt E, Fiedor-Hamilton M, Eppich W. Resuscitation Education: Narrowing the Gap Between Evidence-Based Resuscitation Guidelines and Performance Using Best Education Practices. *Pediatric Clinics of North America* 2008;55:1025–1050.

2. Madden C. Undergraduate nursing students’ acquisition and retention of CPR knowledge and skills. *Nurse Educ Today* 2006; 26:218–227.

3. O’Leary F, Janson P. Can e-learning improve medical students’ knowledge and competence in paediatric cardiopulmonary resuscitation? A prospective before and after study. *Emerg Med Australas* 2010;22:324–329.

4. O’Leary F. Paediatric resuscitation training: is e-learning the answer? A before and after pilot study, *J Paediatr Child Health* 2012;48:529–533.

5. Edmund S, Brown G. Effective small group learning: AMEE Guide No. 48. *Med Teach* 2010;32:715–726.

6. Kitchen M. Facilitating small groups: how to encourage student learning. *Clin Teach* 2012; 9:3–8.

7. Issenberg S, McGaghie W, Petrusa E, Gordon D, Scalese R. Features and uses of high-fidelity medical simulation that lead to effective learning: a BEME systematic review. *Med Teach* 2005;27:10–28.

8. Sutherland R, Reid K, Kok D, Collins M. Teaching a fishbowl tutorial: sink or swim? *Clin Teach* 2012;9:80–84.

9. Schmidt R, Bjork R. New conceptualization of practice: Common principles in three paradigms suggest new concepts for training. *Psychological Science* 1992;3:207–217.

10. Roediger HL, Karpickle JD. The power of testing memory: Basic research and implications for education practice. *Perspectives on Psychological Science* 2006;1:181–210.