Application for the National Lead Clinicians Group Awards for Excellence in Innovative Implementation of Clinical Guidelines

Project name: RESUS4KIDS: Paediatric Life Support for Healthcare Rescuers

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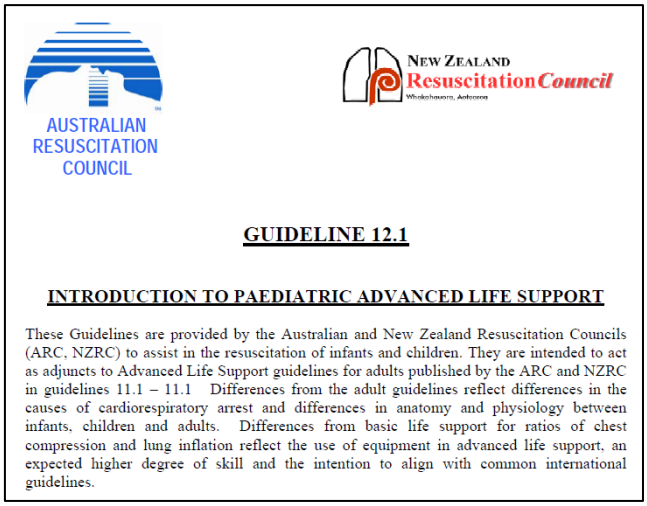
Name of institutions at which implementation has occurred:

- All Local Health Districts in New South Wales
- New South Wales Ambulance Service
- Sunshine Coast Hospital and Health Service, Queensland
- Metro South Hospital and Health Service, Queensland
- The Women's and Children's Hospital, South Australia
- University of Newcastle – Undergraduate Medicine and Nursing
- University of Sydney – Undergraduate Medicine

The specific guideline implemented:

The Australian Resuscitation Council
Guideline 12: Paediatric Advanced Life Support
Accessed originally in 2008 and again in 2010 when the guidelines were revised from http://www.resus.org.au
These guidelines are international consensus from the International Liaison Committee on Resuscitation (ILCOR, http://www.ilcor.org/en/home) and adapted for Australia by the Australian Resuscitation Council (ARC)


AUSTRALIAN RESUSCITATION COUNCIL

NEW ZEALAND Resuscitation Council

GUIDELINE 12.1

INTRODUCTION TO PAEDIATRIC ADVANCED LIFE SUPPORT

These Guidelines are provided by the Australian and New Zealand Resuscitation Councils (ARC, NZRC) to assist in the resuscitation of infants and children. They are intended to act as adjuncts to Advanced Life Support guidelines for adults published by the ARC and NZRC in guidelines 11.1 – 11.1 Differences from the adult guidelines reflect differences in the causes of cardiorespiratory arrest and differences in anatomy and physiology between infants, children and adults. Differences from basic life support for ratios of chest compression and lung inflation reflect the use of equipment in advanced life support, an expected higher degree of skill and the intention to align with common international guidelines.

Key disease / health area:

Paediatric collapse: the recognition and response, by a trained health care worker, to an infant or child who stops breathing or has a cardiac arrest.

Funding:

Phase 1	2008-9	NSW Ministry of Health via Child Health Networks	$ 100,000
Phase 2	2010-11	NSW Ministry of Health via Child Health Networks	$ 336,000
Phase 3	2011-13	NSW Ministry of Health via Child Health Networks	$ 1,309,597
Phase 3	2012-13	Laerdal Australia	$ 8,250

The majority of the funding was used to employ RESUS4KIDS educators and these were attached to LHDs in NSW, including NSW Ambulance

Background:

A key competency for all healthcare workers (HCWs) who care for children is the ability to respond to an infant or child in respiratory or cardiorespiratory arrest. However, evidence suggests that front line staff may not have the knowledge and clinical skills to respond to these relatively uncommon emergencies [1-3].Both in hospital and out of hospital paediatric cardiorespiratory arrest are rare events. Although uncommon, it is essential that HCWs are appropriately trained so they can respond immediately, leading to better outcomes for the child [4-6].

The ILCOR group produces a consensus on resuscitation every 5 years and these are interpreted by the Australian Resuscitation council (ARC) and created into national guidelines for Australian practice. The guidelines are accepted as standard of care by all major acute care organisations in Australia. Therefore, all HCWs when faced with a collapsed child should follow these guidelines. The guidelines cover both knowledge and clinical skills, and for HCWs to be proficient and confident in providing care based on these guidelines they have to receive regular training.

Within New South Wales (NSW) the availability of paediatric CPR training has been variable and dependent on where HCWs worked and what position they were in. The two major CPR courses, Advanced Paediatric Life Support and Paediatric Life Support are financially relatively expensive to attend, and take participants and instructors away from their workplace for one to three days. In 2008 the Child Health Network Clinical Nurse Consultants identified to NSW Health the issue of a lack of a standardised, time efficient, low cost, locally delivered paediatric CPR course in NSW. The local courses that did exist often failed to follow the ARC guideline as they failed to recognise the need for a different approach to collapsed children within a healthcare setting. These patients require advanced life support as defined by the ARC, not simple basic life support.

The aim of this project was to ensure that HCWs had the knowledge and clinical skills to follow the ARC guideline by creating a standardised, evidence based, paediatric life support course that would be available free to all HCWs in NSW, including NSW Ambulance. The course would have to be time efficient, to enable participants and instructors to be released from their normal duties to attend, available locally at ward and unit level, especially at rural sites and be able to be delivered by a variable education workforce.

An appropriately trained workforce would then be able to recognise and respond to a collapsed child in a timely manner, following the national guideline, leading to improved outcomes for patients. This is particularly relevant in paediatric practice as early intervention to a child with respiratory arrest may prevent progression to full cardiac arrest.

The approach to guideline implementation:

1. Identifying and establishing support from key stakeholders and the interdisciplinary clinical community including:

- Director of Paediatric Services, NSW Ministry of Health.
- Chief Executive, Sydney Children's Hospitals Network and Convenor Greater Eastern and Southern and Western Child Health Networks.
- Director of Children, Young People and Families, Hunter New England Local Health District and Convenor Northern Child Health Network.
- NSW Child Health Network coordinators and Clinical Nurse Consultants.
- Education Manager, NSW Ambulance.
- Local Health District (LHD) Executive Units including The Children's Hospital at Westmead, The Centre for Rural and Remote Education, Northern Sydney LHD, Western NSW LHD, Illawarra Shoalhaven LHD and South East Sydney LHD.
- Faculty of Medicine, University of Sydney and Faculties of Medicine and Nursing, University of Newcastle.
- Local clinicians and educators (medical, nursing and paramedic) as clinical champions.

Once established the steering committee, RESUS4KIDS educators, super trainers and instructors provided expert feedback, support and advocacy for the program.
Participants were encouraged to complete internet based course evaluations to assist in course design and modification.

2. Project timeline:

- Phase 1 2008-9 Course development and pilot program at rural and metro sites.
- Phase 2 2010-11 Course deployment across the Western Child Health Network.
- Phase 3 2011-13 Deployment throughout NSW and into other jurisdictions.

The number of courses and hence participant guideline acquisition continues to expand on a daily basis. Some HCWs are now completing the course for the second time.

3. Program design to implement the guideline:

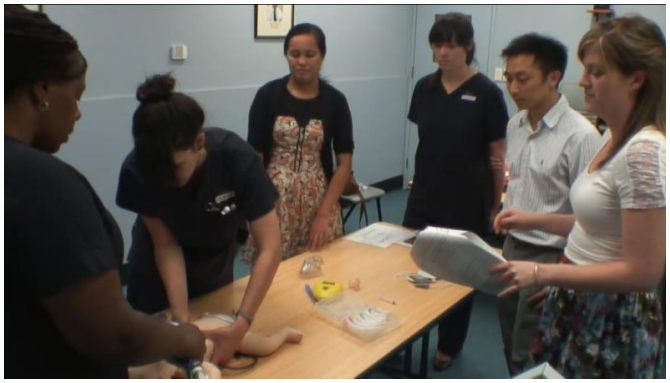
A screen shot of the e-Learning

- Innovative, multi-modal approach using e-learning as pre-learning to reduce the face to face time. This component taught the knowledge part of the guideline.
- E-Learning validated and highly evaluated by doctors, nurses and medical students.
- Ninety minute Short Practical Course. The face to face component, using a pause and discuss, scenario based format to reinforce knowledge and enable practise of the clinical skills from the guideline.
- Incorporation of a teamwork, leadership and communication module following current best practice consistent with the Australian Commission on Safety and Quality in Healthcare National Safety and Quality Health Service (NSQHS) Standards [7].
- Program designed to train local educators to deliver the Short Practical Course within a short time frame at unit and facility level, throughout NSW from the large tertiary children's hospitals to small rural sites. Interdisciplinary training was encouraged especially at rural sites where local ambulance would be part of the emergency response as well.
- Educating local super trainers to teach the train the trainer to encourage self-sustainment in LHDs.
- Establishing a local network of RESUS4KIDS educators skilled in delivering all parts of the program and able to advocate locally, addressing any particular local issues that might impact guideline uptake.

Barriers to guideline implementation and solutions:

Barrier	Solution
Lack of a standardised course for local educators to teach	Design of a multimodal course with e-Learning providing guideline knowledge and a Short Practical Course for knowledge and skill practise. Designed to be delivered locally at facility and unit level by local instructors.
Costs for individuals and organisations	No direct costs to individuals or LHDs in NSW, free to access. Indirect costs of staff release for attending courses or instructing reduced by shortening face to face teaching time to ninety minutes.
Lack of understanding of the need for a different approach to a collapsed child	Creating clinical champions and RESUS4KIDS educators with the knowledge to address concerns and explain the rationale for the guideline.
Local educators who lacked knowledge and confidence to deliver an education program on paediatric life support	Design of a multimodal train the trainer program to support these trainers, with a two hour face to face training session followed with a thirty minute e-Learning module prior to teaching the Short Practical Course. RESUS4KIDS educators were assigned to LHDs and as well as teaching the course and train the trainer program they were available to support instructors for their first few courses.
Lack of equipment to deliver local courses	Funds were provided to enable local facilities to purchase the equipment required to deliver the training locally.

Results of guideline implementation – uptake data:



An interdisciplinary Short Practical Course

- RESUS4KIDS is established to some extent in every LHD in NSW, including NSW Ambulance.
- As of February 2013:
  - 194,405 individual e-Learning lessons accessed.
  - 12,190 participants have completed the whole e-Learning module
  - 6,300 participants have completed the Short Practical Course.
  - 729 local instructors and 34 super trainers trained throughout the LHDs.
- The guideline is being taught on a daily basis throughout NSW.
- The program has spread into Queensland and South Australia, with current interest from the Victorian Paediatric Network.
- The program is available to other health jurisdictions in Australia and as the guideline is a national guideline the content of the course and the program methodology will easily apply.
- The program has become the preferred resuscitation option of the Clinical Excellence Commission's, DETECT Junior program in NSW.

Results of guideline implementation – anecdotes and case studies:

"As a busy general paediatrician both the e-learning and the practical components were useful a. refresh basic principles b. familiarise with the minor changes in the techniques adopted based on evidence. E.g. clarity on the shockable and non-shockable rhythm, DRSABCD c. e-learning modules gave me the flexibility to learn at my spare time"

"The programme clarified and simplified the resus process. I have worked in ED for approximately 20yrs and am an active team leader. The fantastic hands on experience helped me clarify some aspects and gave me some helpful hints in my leadership role to assist my colleagues during the resus process. Thank you"

"We took a phone call from Ambulance co-ord telling us that we had a 2 year old drowning 3 minutes away. After the initial horror I thought, no, I know these skills I have just done the RESUS4KIDS, I know what to do in this situation. When the child arrived they were asystolic and hypothermic. There were three of us who ended up doing the chest compressions, and we took turns doing them for 2 minutes as per RESUS4KIDS. We kept going with CPR until we got a heart rate of 100 beats per minute with a good output. Everybody really knew their role, there was fantastic teamwork, there was no yelling, there was no panic. It was a highly emotive situation but it flowed really, really well"

"We received a job for a 4 day old baby with breathing problems. The mother just said she had been breast feeding and the baby started gasping respirations, then became limp and stopped breathing. Approximately 20 minutes into the arrest, what looked like a perfusing rhythm was detected on the monitor, and we found a pulse with this. We extricated the little baby and urgently transported him to hospital and he was discharged only a few days later with no complications from the arrest. In the course of being a paramedic it's not often you see a seriously ill child, so the only thing you can really rely on, when you are faced with such a situation, is your training. I would highly recommend anyone in the health profession, that has any chance of dealing with a seriously ill child, to do RESUS4KIDS. If there is one thing you really want to be prepared for is that seriously ill child and you want to be doing the best you can on that day."

Key lessons learned and applicability to other programs:

- The need for a nationally recognised non-controversial guideline.
- The guideline must be perceived by clinicians as relevant to their clinical practice.
- The condition is uncommon, so a guideline is important.

- Engaging with current educators, who wish to deliver evidence based practice but do not have the resources.
- Provide as much of the resources as possible – helps standardisation and funds for equipment helps engagement.
- Accurate data collection on all parts of the program is essential to promote the program and obtain additional funding.
- A strong relationship with the technical team is essential to overcome the inevitable problems that arise with IT systems.
- The program has to appeal to the managers and the LHD executives as well as participants. The new NSQHS standards have given additional weight to the program.

Research undertaken as part of the project:

- O'Leary, F.M., Higgins, K., Fahy, K., Festa, M., Dart, K., Simpson, M. RESUS4KIDS A paediatric advanced life support course for health care providers. Emerg Med Australas. 2012 24 (Suppl. 1), 1–19.
- O'Leary, F. M. Paediatric resuscitation training: Is e-learning the answer? A before and after pilot study. J Paediatr Child Health. 2012 Jun;48 (6):529-33.
- Thomson, N. M., Campbell, D. E. and O'Leary, F. M. Teaching medical students to resuscitate children: An innovative two-part programme. Emerg Med Australas. 2011 Dec;23 (6):741-7.
- O'Leary, F. M. and 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 Aug; 22(4):324-9.
- Nogajski, R., Festa, M., Howse, J., O'Leary, F.M. Evaluating the RESUS4KIDS short practical course – A pre and post intervention self-administered questionnaire survey on health professionals. Presented at The World Congress of Internal Medicine, Melbourne 2010.

Promotion and presentations:

- Allwood, M. O'Leary, FM. RESUS4KIDS - Responding to clinical deterioration. Implementing the National Safety & Quality Health Service Standards. [Abstract - CHA: The Journey towards Excellence in Children's Healthcare, Sydney 2012].
- McGarvey, K. Fahy, K. O'Leary, F.M. RESUS4KIDS –an evidence based standardised interdisciplinary paediatric life support course for healthcare rescuers. [Abstract - 10th International Conference for Emergency Nurses, Hobart 2012].
- Howse, J., O'Leary, F.M. (2009), RESUS4KIDS: A pilot blended e-learning and practical resuscitation program for healthcare workers. [Abstract - 7th Australasian Conference on Safety and Quality in Health Care, Sydney 2009].

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3. Madden C. Undergraduate nursing students' acquisition and retention of CPR knowledge and skills. Nurse education today. 2006;26(3):218-27.
4. Berg MD, Nadkarni VM, Zuercher M, Berg RA. In-hospital pediatric cardiac arrest. Pediatric clinics of North America. 2008;55(3):589-604.
5. Moretti MA, Cesar LA, Nusbacher A, Kern KB, Timerman S, Ramires JA. Advanced cardiac life support training improves long-term survival from in-hospital cardiac arrest. Resuscitation. 2007;72(3):458-65.
6. Nadkarni VM, Larkin GL, Peberdy MA, Carey SM, Kaye W, Mancini ME, et al. First documented rhythm and clinical outcome from in-hospital cardiac arrest among children and adults. JAMA : the journal of the American Medical Association. 2006;295(1):50-7.
7. Australian Commission on Safety and Quality in Health Care. Safety and Quality Improvement Guide Standard 9: Recognising and Responding to Clinical Deterioration in Acute Health Care (October 2012). Sydney. ACSQHC, 2012.