



## Editorial

## Kids Save Lives – ERC position statement on school children education in CPR.



### “Hands that help – Training children is training for life”

Sudden out-of-hospital cardiac arrest (OHCA) with unsuccessful cardiopulmonary resuscitation (CPR) is the third leading cause of death in industrialised nations.<sup>1</sup> After OHCA, the overall survival rates are 2–10%.<sup>2–4</sup> In Europe and in the US together, 700,000 people die of OHCA every year. The same applies to other industrialised regions of the world. Many of these lives could be saved if more lay people provided immediate CPR.<sup>2</sup> Emergency medical services (EMS) response times can be several (6–12) minutes or even longer. Unfortunately, following cardiac arrest, the brain starts to die after only 3–5 min without blood flow.<sup>5</sup>

Up to 70% of OHCA are witnessed by family members, friends and other bystanders.<sup>2,5</sup> Thus, the potentially lethal gap in time before EMS personnel reach the patient can be successfully bridged by laypeople. During the first minutes after OHCA in adults there is still oxygen in the blood and lungs, and immediate bystander chest compressions can save hundreds of thousands of lives each year.<sup>6</sup> Effective CPR is quite easy – laypeople are very unlikely to cause harm by attempting CPR. Bystander CPR increases the patient's chances of survival two- to four-fold.<sup>2</sup> However, bystander CPR rates are 60–80% in only a very few countries; in most countries the rate is far below 20%.<sup>7</sup>

Mandatory nationwide training of school children has the highest impact for improving the bystander CPR rate.<sup>8–13</sup> This appears to be the most successful way to reach the entire population. The highest bystander CPR rates are in some Scandinavian countries where education of school children in CPR has been mandatory for decades,<sup>12</sup> and this concept is starting to spread.

In support, the World Health Organization (WHO) has endorsed the “Kids Save Lives” Statement in 2015, a joint statement from the European Resuscitation Council (ERC), the European Patient Safety Foundation (EPSF), the International Liaison Committee on Resuscitation (ILCOR) and the World Federation of Societies of Anesthesiologists (WFSA).<sup>6,10,11</sup> This statement recommends two hours of CPR training annually from the age of 12 years in all schools worldwide. At this age, children are more responsive to instructions and they learn more easily to help others.<sup>9</sup> Starting at a young age also means that CPR is like swimming or riding a bike: children will not forget how to save a life.<sup>14</sup> Healthcare professionals, teachers trained to teach CPR and others can successfully teach school children, and all can serve as multipliers.<sup>15</sup> CPR knowledge and skills can be spread further by asking children to teach their family and friends.



**Fig. 1.** The “Kids Save Lives” logo has been developed by the Italian Resuscitation Council (IRC). We very much appreciate and acknowledge that the IRC is providing this logo for free to all participating in the “Kids Save Lives” campaign in Europe.

With the “Kids Save Lives” initiative (Fig. 1), we can help to improve the survival rate of people with OHCA by the factor of two- to fourfold. We can easily save 300,000 additional lives worldwide every year, nearly a thousand every day, and nearly one life every minute.

## The 10 ERC principles – increasing survival with “Kids Save Lives”:

1. Everyone can save a life – even children can save a life.<sup>9–16</sup>
2. Up to two hours of CPR training a year for school children is enough.<sup>9–11,15,16</sup>
3. Training must involve hands-on practice which may be augmented with theoretical – including virtual – learning.<sup>9</sup> Such training has also been performed without sophisticated equipment or specific resuscitation manikins.
4. Annual training of school children should start by the age of 12 years or earlier.<sup>9–11,15</sup>
5. Trained children should be encouraged to train other people. The homework for all children after such training should be: please train 10 other people within the next two weeks and report.
6. A wide range of people, including anaesthesiologists, cardiologists, emergency physicians, nurses, paramedics, medical and other healthcare students, trained teachers and many other volunteers can successfully teach school children in CPR – in schools, in hospitals and elsewhere.<sup>6,9,15,16</sup>
7. The responsible people in the Ministries of Education and/or Ministries of Schools and other leading politicians of each country should implement a nationwide programme for teaching CPR to school children.<sup>12</sup>
8. Every National Resuscitation Council (NRC) or similar organisation should support the implementation of a national initiative and “Kids Save Lives” campaign in its country.
9. With “Kids Save Lives”, children will also learn relevant social responsibility and social skills.<sup>9–11</sup>
10. National programmes that train school children in CPR can save more lives, improve productivity of society, and reduce healthcare costs.<sup>12,17</sup>

## Conflicts of interest statement

Bernd W. Böttiger is ERC Board Director Science and Research; Associated Editor, European Journal of Anaesthesiology; Speakers honorarium from Medupdate, FoMF, Baxalta, Bayer Vital; Chairman, German Resuscitation Council (GRC); Board Member, German Society of Anaesthesiology and Intensive Care Medicine (DGAI); Board Member, German Society of interdisciplinary Intensive Care and Emergency Medicine (DIVI); Associated Editor, Resuscitation. Leo Bossaert is ERC Board Representative of the Advisory Committee. Maaret Castren is Chair, European Resuscitation Council. Diana Cimpoesu has no conflicts, Advisory Representative of NRCs – ERC Board. Marios Georgiou is ERC Board Director External Affairs. Robert Greif is ERC Board Director Training and Education; Editor in Chief, Trends in Anaesthesia and Critical Care; Associate Editor, European Journal of Anaesthesiology. Monika Grünfeld has no conflicts. Andy Lockey has no conflicts. Carsten Lott has no conflicts. Ian Maconochie has no conflicts; Lead of the working group on the paediatric guidelines for ERC. Ronald Melieste is ERC Board Director Marketing. Koenraad G. Monsieus is ERC Director Guidelines and ILCOR. Jerry P. Nolan is Vice-Chair, European Resuscitation Council; Editor-in-Chief, Resuscitation. Gavin D. Perkins is Editor, Resuscitation; National Institute for Health Research Senior Investigator; Director of Research, Intensive Care Foundation, UK. Violetta Raffay has no conflicts. Joachim Schlieber is Chair, ERC International Course Committee for Immediate Life Support; Board Member, Austrian Resuscitation Council (ARC); Federico Semeraro is Chairman, Italian Resuscitation Council (IRC). Jasmeet Soar is Editor, Resuscitation. Anatolij Truhlar is ERC Board Effective NRC Representative. Patrick Van de Voorde has no conflicts. Jonathan Wyllie is ERC non-voting Board

member; Resuscitation Council UK executive member. Sabine Wingen has no conflicts.

## References

1. Taniguchi D, Baernstein A, Nichol G. Cardiac arrest: a public health perspective. *Emerg Med Clin North Am* 2012;30:1–12.
2. Böttiger BW, Grabner C, Bauer H, et al. Long term outcome after out-of-hospital cardiac arrest with physician staffed emergency medical services: the Utstein style applied to a mid-sized urban/suburban area. *Heart* 1999;82:674–9.
3. Monsieus KG, Nolan JP, Bossaert LL, et al., ERC Guidelines 2015 Writing Group. European Resuscitation Council Guidelines for Resuscitation 2015: Section 1. Executive summary. *Resuscitation* 2015;95:1–80.
4. Nolan JP, Hazinski MF, Aickin R, et al. Part 1: Executive summary: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations. *Resuscitation* 2015;95:e1–31.
5. Breckwoldt J, Schloesser S, Arntz HR. Perceptions of collapse and assessment of cardiac arrest by bystanders of out-of-hospital cardiac arrest (OOHCA). *Resuscitation* 2009;80:1108–13.
6. Böttiger BW. “A Time to Act” – Anaesthesiologists in resuscitation help save 200,000 lives per year worldwide: school children, lay resuscitation, telephone-CPR, IOM and more. *Eur J Anaesthesiol* 2015;32:825–7.
7. Gräsner JT, Bossaert L. Epidemiology and management of cardiac arrest: what registries are revealing. *Best Pract Res Clin Anaesthesiol* 2013;27:293–306.
8. Perkins GD, Handley AJ, Koster RW, et al., Adult basic life support and automated external defibrillation section Collaborators. European Resuscitation Council Guidelines for Resuscitation 2015: Section 2. Adult basic life support and automated external defibrillation. *Resuscitation* 2015;95:81–99.
9. Bohn A, Lukas RP, Breckwoldt J, Böttiger BW, Van Aken H. ‘Kids save lives’: why schoolchildren should train in cardiopulmonary resuscitation. *Curr Opin Crit Care* 2015;21:220–5.
10. Böttiger BW, Van Aken H. Training children in cardiopulmonary resuscitation worldwide. *Lancet* 2015;385:2353.
11. Böttiger BW, Van Aken H. Kids save lives – Training school children in cardiopulmonary resuscitation worldwide is now endorsed by the World Health Organization (WHO). *Resuscitation* 2015;94:A5–7.
12. Wissenberg M, Lippert FK, Folke F, et al. Association of national initiatives to improve cardiac arrest management with rates of bystander intervention and patient survival after out-of-hospital cardiac arrest. *JAMA* 2013;310:1377–84.
13. Greif R, Lockey AS, Conaghan P, Lippert A, De Vries W, Monsieus KG, Education and implementation of resuscitation section Collaborators. European Resuscitation Council Guidelines for Resuscitation 2015: Section 10. Education and implementation of resuscitation. *Resuscitation* 2015;95:288–301.
14. De Buck E, Van Remoortel H, Dieltjens T, et al. Evidence-based educational pathway for the integration of first aid training in school curricula. *Resuscitation* 2015;94:8–22.
15. Lukas RP, Van Aken H, Mölhoff T, et al. Kids save lives: a six-year longitudinal study of schoolchildren learning cardiopulmonary resuscitation: Who should do the teaching and will the effects last? *Resuscitation* 2016;101:35–40.
16. Plant N, Taylor K. How best to teach CPR to schoolchildren: a systematic review. *Resuscitation* 2013;84:415–21.
17. Kragholm K, Wissenberg M, Mortensen RN, et al. Return to work in out-of-hospital cardiac arrest survivors: a nationwide register-based follow-up study. *Circulation* 2015;131:1682–90.

B.W. Böttiger<sup>a,b,\*</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium

<sup>b</sup> Department of Anaesthesiology and Intensive Care Medicine, University Hospital and University of Cologne, Germany

L.L. Bossaert<sup>a,b</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium

<sup>b</sup> University of Antwerp, Antwerp, Belgium

M. Castrén<sup>a,b</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium

<sup>b</sup> Department of Emergency Medicine and Services, Helsinki University Hospital and Helsinki University, Helsinki, Finland

D. Cimpoesu<sup>a,b</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium

<sup>b</sup> University of Medicine and Pharmacy Gr.T. Popa Iasi, Emergency Department – Emergency County Hospital Sf. Spiridon, Iasi, Romania

M. Georgiou<sup>a,b</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium  
<sup>b</sup> American Medical Center Cyprus, Nicosia University  
 Medical School, Nicosia, Cyprus

R. Greif<sup>a,b</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium  
<sup>b</sup> Department of Anaesthesiology and Pain Therapy,  
 University Hospital Bern and University of Bern,  
 Switzerland

M. Grünfeld<sup>a,b</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium  
<sup>b</sup> Department of Emergency Medicine, Prehospital  
 Unit, Community Health Centre Kranj, Kranj, Slovenia

A. Lockey<sup>a,b</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium  
<sup>b</sup> Department of Emergency Medicine, Calderdale and  
 Huddersfield NHS Foundation Trust, Halifax, UK

C. Lott<sup>a,b</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium  
<sup>b</sup> Department of Anesthesiology, University of Mainz,  
 Germany

I. Maconochie<sup>a,b</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium  
<sup>b</sup> Department of Paediatric Emergency Medicine,  
 Imperial College NHS Healthcare Trust, Imperial  
 College, London, UK

R. Melieste

European Resuscitation Council (ERC), Niel, Belgium

K.G. Monsieurs<sup>a,b</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium  
<sup>b</sup> Department of Emergency Medicine, Antwerp  
 University Hospital and University of Antwerp,  
 Belgium

J.P. Nolan<sup>a,b</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium  
<sup>b</sup> Anaesthesia and Intensive Care Medicine, Royal  
 United Hospital, Bath, UK

G.D. Perkins<sup>a,b</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium  
<sup>b</sup> Warwick Medical School and Heart of England NHS  
 Foundation, Warwick, UK

V. Raffay

European Resuscitation Council (ERC), Niel, Belgium

J. Schlieber<sup>a,b</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium  
<sup>b</sup> AUVA Trauma Center Salzburg, Department of  
 Anaesthesiology, Salzburg, Austria

F. Semeraro<sup>a,b</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium  
<sup>b</sup> Department of Anaesthesia and Intensive Care  
 Medicine, Maggiore Hospital, Bologna Italy

J. Soar<sup>a,b</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium  
<sup>b</sup> Anaesthesia and Intensive Care Medicine,  
 Southmead Hospital, Bristol UK

A. Truhlář<sup>a,b,c</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium  
<sup>b</sup> Emergency Medical Services of the Hradec Králové  
 Region, Hradec Králové, Czech Republic  
<sup>c</sup> Department of Anaesthesiology and Intensive Care  
 Medicine, University of Hradec Králové, Czech  
 Republic

P. Van de Voorde<sup>a,b</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium  
<sup>b</sup> Department of Emergency Medicine, University of  
 Ghent, Belgium

J. Wyllie<sup>a,b</sup>

<sup>a</sup> European Resuscitation Council (ERC), Niel, Belgium  
<sup>b</sup> Department of Neonatology, James Cook University  
 Hospital, Middlesbrough, UK

S. Wingen<sup>\*,a</sup>

Department of Anaesthesiology and Intensive Care  
 Medicine, University Hospital and University of  
 Cologne, Germany  
 , on behalf of the Board of European  
 Resuscitation Council (ERC)

\*\* Corresponding author at: Department of  
 Anaesthesiology and Intensive Care Medicine,  
 University Hospital of Cologne, Kerpener Straße 62,  
 50937 Köln, Germany.

\* Corresponding author at: Department of  
 Anaesthesiology and Intensive Care Medicine,  
 University Hospital of Cologne, Kerpener Straße 62,  
 50937 Köln, Germany

E-mail addresses: [bernd.boettiger@uk-koeln.de](mailto:bernd.boettiger@uk-koeln.de)  
 (B.W. Böttiger), [sabine.wingen@uk-koeln.de](mailto:sabine.wingen@uk-koeln.de)  
 (S. Wingen).

<sup>1</sup> <http://anaesthesie.uk-koeln.de>.

1 June 2016