Available online at www.sciencedirect.com

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation

Editorial

KIDS SAVE LIVES: ERC Position statement on schoolteachers' education and qualification in resuscitation

Educating schoolteachers in CPR and qualifying them to teach CPR to children as part of the worldwide "KIDS SAVE LIVES" initiative (Fig. 1) will help improve survival after sudden out-of-hospital cardiac arrest (OHCA) considerably and sustainably.[1,2] Teachers can easily be educated to become competent in Basic Life Support (BLS; CPR in this position statement includes all measures of BLS – chest compressions, ventilation and the use of an automated external defibrillator (AED)) instructors for their schoolchildren within four hours by using specially developed CPR instructor courses.[3]

OHCA is the third leading cause of death in developed countries.[4] The overall survival rate after cardiopulmonary resuscitation (CPR) by emergency medical services (EMS) is currently below 10%.[5–7] As up to 70% of OHCAs are witnessed by bystanders, the most promising way to really improve overall survival in OHCA worldwide is to enhance the rate of bystander CPR.[8–14] There are several effective possibilities to increase lay CPR rates worldwide, and one of the best and most sustainable ways to do so is to increase mandatory nationwide CPR education of schoolchildren.[1,2,15–18] Schoolchildren will grow up and may maintain the acquired skills for the rest of their life. Besides that, they can easily serve as multipliers by teaching CPR to their families and friends.[1] Countries where CPR education of schoolchildren has been mandatory for decades show impressively higher bystander CPR rates,[2,10,11,13] and this concept is starting to spread all over Europe, in the United States and in the rest of the world.[19,20] The European Resuscitation Council (ERC) has committed to the promotion of CPR education for lay people in basic life support since 1992, culminating in the first European Restart a Heart Day on the 16th of October 2013 with the motto "Children Saving Lives".[21–23]

CPR education in schoolchildren successfully increases their CPR knowledge and skills, and strengthens their self-confidence in helping OHCA patients.[24,25] CPR education in children facilitates the development of this psychomotor skill just like swimming, playing an instrument or riding a bike: they will never forget and remember lifelong how to save a life.[1,2] A key question is how to implement CPR education of schoolchildren in the most effective way in all schools all over the world. Schoolteachers have long-lasting experience in teaching children, and there is already evidence that schoolteachers educated in CPR are able to teach schoolchildren as effectively as any healthcare professional.[1,2,25] In addition, schoolteachers are motivated to educate and they can serve as initial multipliers. Subsequently, CPR knowledge and skills can be spread further by asking children to serve as peers for other children, or to teach all their family members and friends.[1,2]

The ERC has developed 10 principles as an action framework for the education of teachers and for the qualification of schoolchildren in CPR. It consists of a two-steps CPR teaching approach, firstly by teaching CHECK–CALL–COMPRESS,[3,8,9,12,23] and secondly by teaching ventilation and the use of an AED.[3,12] Teachers already know how to teach, and our program adds the specifics of CPR education.

The responsible people in the Ministries of Education and/or Ministries of Schools and other leading politicians of each country should implement a nationwide program for educating the schoolteachers to become fully competent in CPR and, thus – with their help –, to educate schoolchildren in CPR.[1] KIDS SAVE LIVES has an enormous potential to save hundreds of thousands additional lives every year or, in other words, most probably one life every two minutes.[1,2,23]

The 10 ERC principles on schoolteachers' education and qualification for CPR training of schoolchildren[1,2]:

1. CPR education of schoolchildren – two hours per year and starting as early as possible and at the latest at the age of 12 years – has been endorsed in 2015 by the World Health Organization (WHO), and schoolteachers should facilitate that approach.
2. The ERC recommends that all schoolchildren should be taught the concepts of CPR, including compressions and ventilations. The actual skills are best taught at different stages. Schoolteachers should teach primary school children in a first stage the

[1] The ERC includes into the terms school, schoolchildren and schoolteachers all types of schools, from kindergarten to higher education including medical schools and universities.

[2] During infectious epidemics (like the COVID-19 pandemic), potential transmission of virus has always to be taken into account. This might also impact teaching and delivery of CPR. Therefore, both should always stay with the local recommendations. Moreover, the International Liaison Committee on Resuscitation (ILCOR) and the ERC have developed actual Guidelines for these specific situations that can be found at https://costr.ilcor.org/document/covid-19-infection-risk-to-rescuers-from-patients-in-cardiac-arrest and at https://www.erc.edu/ https://erc.edu/covid.

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 and all over the world.

BLS skills: CHECK–CALL–COMPRESS. In a second stage, we recommend teaching the skills of ventilation and the use of an automated external defibrillator (AED).

3. Teachers can teach the specifics of CPR to schoolchildren as effectively as healthcare professionals – indeed they are primarily qualified to teach children.
4. The ERC proposes that the qualification for educating CPR to schoolchildren can be obtained by a four hours CPR "teach the teachers" course.
5. The ERC recommends the use of commercially available manikins or low-cost manikins for teaching CPR to schoolchildren. To stimulate engagement, new technology applications (e.g. smartphones apps, social media, serious games and virtual reality) as teaching methods are highly useful and recommended.
6. All schoolteachers should be educated in CPR as part of their curriculum they have to fulfill to become a certified teacher. For every school and/or for every 1000 schoolchildren, we recommend that at least ten teachers should be trained as certified CPR instructors. The school medical service may provide additional support for teaching CPR to schoolchildren and should be involved into the program.
7. Each school should have at least one teacher and one deputy teacher responsible for sustainable CPR education. They should be the lead of the CPR education in a school driving the program and curriculum integration.
8. Following schoolchildren CPR education, the ERC recommends that teachers foster learning and dissemination of CPR competences by enabling their schoolchildren to become multipliers. The homework – we suggest in the following two weeks – is to show 10 other people how to do CPR, to write peoples' names down and to bring this information back to school.
9. Educating schoolteachers and schoolchildren in CPR will also increase safety in schools, competent help is always available, not only for all schoolchildren, but also for all teachers and other people present.
10. Saving a life is a child's play. CPR needs only two hands and a bit of competence to save a life. Educating teachers and subsequently schoolchildren in CPR will help to save hundreds of thousands additional lives annually worldwide.

Conflicts of interest

Bernd W. Böttiger is European Resuscitation Council (ERC) Board Director Science and Research; Chairman of the German Resuscitation Council (GRC); Member of the "Advanced Life Support (ALS) Task Force of the International Liaison Committee on Resuscitation (ILCOR); Member of the executive committee of the German Interdisciplinary Association for Intensive and Emergency Medicine (DIVI); Associated Editor of the European Journal of Anaesthesiology (EJA), Co-Editor of "Resuscitation"; Editor of the Journal "Notfall + Rettungsmedizin"; Robert T. Greif is ERC Board Director of Training and Education; Chairman of the "Education, Implementation, Team (EIT) Task Force of the ILCOR. Andrew Lockey is Vice President of the Resuscitation Council UK; Koen Monsieurs is Chair-elect of the ERC; Nicolas Mpotos is owner of a company of CPR self-learning and assessment software, ERC Board Member, DC EDU and ERC SEC ALS member; Nikolaos Nikolaou is a Board Member of ERC; Jerry Nolan is Chair of ERC; Editor of Resuscitation and ILCOR ALS Task Force member; Federico Semeraro is BLS SEC Co-Chair of the ERC and member of ILCOR BLS Task Force and ILCOR Digital Communication Working Group; Sabine Wingen is assistant of the Executive Board of the GRC. Marios Georgiou declared no conflicts of interest.

Acknowledgement

We cordially thank all schoolchildren, teachers, politicians, medical personnel, colleagues and all others who have been involved in our respective activities over the last years. Several authors are supported by the ERC Research NET.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at https://doi.org/10.1016/j.resuscitation.2020.04.021.

REFERENCES

1. Böttiger BW, Bossaert LL, Castrén M, et al. Board of European Resuscitation Council (ERC). Kids Save Lives - ERC position statement on school children education in CPR.: "Hands that help - Training children is training for life". Resuscitation 2016;105:A1–3, doi:http://dx.doi.org/10.1016/j.resuscitation.2016.06.005 Epub 2016 June 22.
2. Böttiger BW, Semeraro F, Altemeyer KH, et al. KIDS SAVE LIVES: school children education in resuscitation for Europe and the world. Eur J Anaesthesiol 2017;34:792–6, doi:http://dx.doi.org/10.1097/EJA.0000000000000713.
3. Dirks B, Wingen S, Rücker G, Greif R, Papaspyrou H, Böttiger BW. Modularer Lehrerausbildungskurs des Deutschen Rates für Wiederbelebung (GRC) für den Wiederbelebungsunterricht in Schulen–Positionspapier des GRC nach der Empfehlung der Deutschen Kultusministerkonferenz und dem aktuellen GRC-Mustercurriculum. Notfall+Rettungsmedizin 20194:, doi:http://dx.doi.org/10.1007/s10049-019-0609-x.
4. Taniguchi D, Baernstein A, Nichol G. Cardiac arrest: a public health perspective. Emerg Med Clin North Am 2012;30:1–12.
5. 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 midsized urban/suburban area. Heart 1999;82:674–9.
6. Monsieurs 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.
7. 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–e31.
8. Böttiger BW, Lockey A. World Restart a Heart initiative: all citizens of the world can save a life. Lancet 2018;392:1305, doi:http://dx.doi.org/10.1016/S0140-6736(18)31774-4.
9. Böttiger BW, Lockey A, Aickin R, et al. Over 675,000 lay people trained in cardiopulmonary resuscitation worldwide – the "World Restart a Heart (WRAH)" initiative 2018. Resuscitation 2019;138:15–7, doi:http://dx.doi.org/10.1016/j.resuscitation.2019.02.033 Epub 2019 March 2.
10. 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.
11. 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.
12. Böttiger BW, Dirks B, Jost U, et al. The 10 fundamental principles of lay resuscitation: recommendations by the German Resuscitation Council. Eur J Anaesthesiol 2018;35:721–3, doi:http://dx.doi.org/10.1097/EJA.0000000000000865.
13. Riva G, Ringh M, Jonsson M, et al. Survival in out-of-hospital cardiac arrest after standard cardiopulmonary resuscitation or chest compressions only before arrival of emergency medical services: nationwide study during three guideline periods. Circulation 2019.
14. 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.
15. 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.
16. Böttiger BW, Van Aken H. Training children in cardiopulmonary resuscitation worldwide. Lancet 2015;385:2353.
17. 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.
18. Greif R, Lockey AS, Conaghan P, Lippert A, De Vries W, Monsieurs 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.
19. Semeraro F, Wingen S, Schroeder DC, et al. KIDS SAVE LIVES – three years of implementation in Europe. Resuscitation 2018;131:e9–e11, doi:http://dx.doi.org/10.1016/j.resuscitation.2018.08.008 Epub 2018 August 8.
20. Nakagawa NK, Silva LM, Carvalho-Oliveira R, et al. KIDS SAVE LIVES BRAZIL: a successful pilot program to implement CPR at primary and high schools in Brazil resulting in a state law for a training CPR week. Resuscitation 2019;140:81–3, doi:http://dx.doi.org/10.1016/j.resuscitation.2019.05.009 Epub 2019 May 20.
21. Georgiou M. Restart a Heart Day: a strategy by the European Resuscitation Council to raise cardiac arrest awareness. Resuscitation 2013;84:1157–8.
22. Lockey AS, Georgiou M. Children can save lives. Resuscitation 2013 S0300-9572(13)00025-7.
23. Böttiger BW, Lockey A, Aickin R, et al. All citizens of the world can save a life" – The World Restart a Heart (WRAH) initiative starts in 2018. Resuscitation 2018;128:188–90, doi:http://dx.doi.org/10.1016/j.resuscitation.2018.04.015 Epub 2018 April 19.
24. Wingen S, Schroeder DC, Ecker H, et al. Self-confidence and level of knowledge after cardiopulmonary resuscitation training in 14 to 18-year-old schoolchildren: a randomised-interventional controlled study in secondary schools in Germany. Eur J Anaesthesiol 2018;35:519–26.
25. 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.

B.W. Böttiger*
Department of Anaesthesiology and Intensive Care Medicine, University Hospital of Cologne, Cologne, Germany

A. Lockey
Emergency Department, Calderdale Royal Hospital, Halifax, United Kingdom

M. Georgiou
American Medical Center, Nicosia, Cyprus

R. Greif[a,b]
[a]*Department of Anesthesiology and Pain Therapy, Bern University Hospital, University of Bern, Bern, Switzerland*

[b]*School of Medicine, Sigmund Freud University Vienna, Vienna, Austria*

K.G. Monsieurs
Emergency Department, Antwerp University Hospital, Edegem, Belgium

N. Mpotos
Faculty of Medicine and Health Sciences, Ghent University and Department of Emergency Medicine, St. Lucas General Hospital, Ghent, Belgium

N. Nikolaou
Department of Cardiology and Cardiac Intensive Care, Konstantopouleio General Hospital, Athens, Greece

J. Nolan
Warwick Clinical Trials Unit, University of Warwick and Department of Anaesthesia and Intensive Care Medicine, Royal United Hospital, Bath, United Kingdom

G. Perkins
Warwick Clinical Trials Unit and University Hospitals Birmingham NHS Foundation Trust, University of Warwick, Coventry, United Kingdom

F. Semeraro
Department of Anaesthesia, Intensive Care and EMS, Maggiore Hospital, Bologna, Italy

S. Wingen
Department of Anaesthesiology and Intensive Care Medicine, University Hospital of Cologne, Cologne, Germany

* Corresponding author.
E-mail address: bernd.boettiger@uk-koeln.de (B. Böttiger).

Received 3 April 2020
Available online xxx

http://dx.doi.org/10.1016/j.resuscitation.2020.04.021