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## Letter to the Editor

# The “four-finger ruler” as a novel, simple and easy technique for hands placement during CPR training

Cardiopulmonary resuscitation (CPR) training for laypeople has been markedly stimulated in out-of-hospital cardiac arrest (OHCA). Continuous effective chest compressions is a key element to provide organ perfusion and improve clinical outcomes.<sup>1</sup> The effectiveness of chest compressions includes correct hands position on the chest, compression rate between 100 and 120 cpm, compression depth between 5 and 6 cm, and complete chest release after each compression. The optimal hand position due to chest compression was reviewed by the International Liaison Committee on Resuscitation (ILCOR) with recommendation of the middle or center of the chest.<sup>1</sup> ILCOR has also mentioned the use of the lower third of the sternum for hands placement for chest compression associated with higher peak arterial pressure and lower end-tidal carbon dioxide pressure in adults,<sup>2</sup> infants and young children.<sup>3</sup> Both techniques have very-low-certainty evidence due to the lack of clinical trials focusing on neurological outcomes and survival.

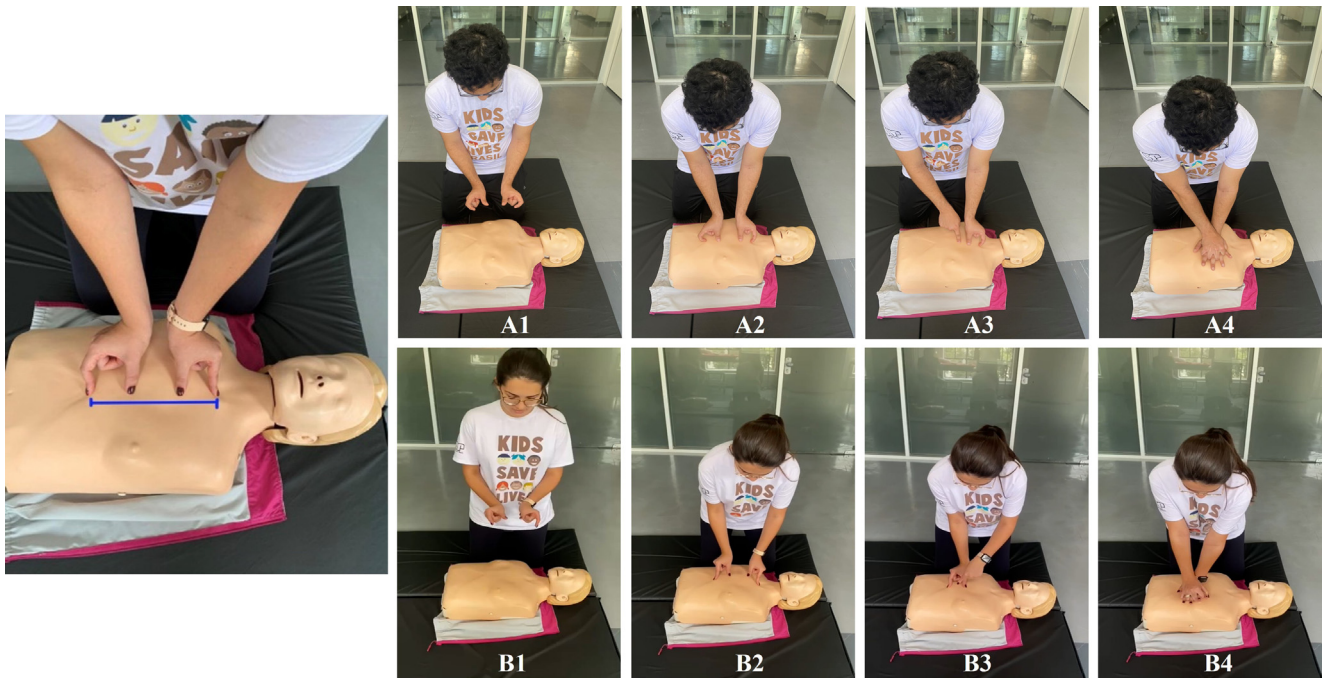
Recently, Fijačko et al.<sup>4</sup> showed five teaching approaches to determine the lower half of the sternum for chest compression among instructors in Europe: (a) the little finger-thumb, (b) the hand-thumb, (c) the X-cross, (d) the knee to shoulder, and (e) the arm under armpit approach. We would like to add a new simple and easy technique to perform optimal hands position on the chest for CPR training, named “four-finger ruler” (Fig. 1), developed in KIDS SAVE LIVES BRAZIL Project (KSLB). The “four-finger ruler” can be used to correct place hands on the chest, and it is based on two anatomical points identification: the suprasternal notch and the xiphoid process. At the same time, learners can visualize three parts of the chest using the “four-finger ruler” and may select the middle of the chest to place hands (Fig. A) or the inferior sternum (Fig. B) for CPR. However, there is lack of clinical evidence (neurological outcomes and survival) using both chest spots.

The KSLB has performed face-to-face basic life support trainings at schools, reaching 7,475 laypeople. In a sub-group of 868 learners

(aged between 7 and 35 years, 249 male), we evaluated skill’s acquisition of hands position on the chest using a checklist (yes = success and no = failure).<sup>5</sup> Although we did not perform comparisons with the other five approaches, reported by Fijačko et al.,<sup>4</sup> we found the “four-finger ruler” technique very friendly to users, novel and easy to perform due to trainings. From 861 learners (mean age 17 years, 248 male), 99.1% succeeded to acquire the correct hands position skill for CPR using the “Four-finger ruler” technique. Therefore, we suggest to add the “four-finger ruler” technique as a novel, simple and easy approach for CPR training.

## Conflicts of Interest

Bernd W. Böttiger is the treasurer of the European Resuscitation Council (ERC); Chairman of the German Resuscitation Council (GRC); Federal Medical Advisor of the German Red Cross (DRK); Member of the Advanced Life Support (ALS) Task Force of the International Liaison Committee on Resuscitation (ILCOR); Member of the Board of the German Interdisciplinary Association for Intensive Care and Emergency Medicine (DIVI), Founder of the ERC Research NET and the German Resuscitation Foundation, Co-Editor of “Resuscitation”; Editor of the Journal “Notfall + Rettungsmedizin”, Co-Editor of the Brazilian Journal of Anaesthesiology. He received fees for lectures from the following companies: Forum für medizinische Fortbildung (FomF), Baxalta Deutschland GmbH, ZOLL Medical Deutschland GmbH, C.R. Bard GmbH, GS Elektromedizinische Geräte G. Stemple GmbH, Novartis Pharma GmbH, Philips GmbH Market DACH, Bioscience Valuation BSV GmbH. Naomi K. Nakagawa is the Brazilian Coordinator of Kids Save Lives Brazil; Member of the Science and Education Basic Life Support Committee of the European Resuscitation Council, and Co-Editor of Clinics.



**Fig. 1 – “Four-finger ruler” technique to determine three parts of the chest for correct hands position during CPR training. (A1) use four fingers as a ruler; (A2) mark the suprasternal notch and the xiphoid process dividing the distance between them in three parts; (A3) localize the middle part; (A4) place the heel of one hand, cross fingers with straight arms, and initiate chest compression; (B1) use four fingers as a ruler; (B2) mark the suprasternal notch and the xiphoid process dividing the distance between them in three parts; (B3) localize the inferior sternum; (B4) place the heel of one hand, cross fingers with straight arms, and initiate chest compression. There is a video for clarification: <https://www.youtube.com/shorts/YalpZsTiMbl>.**

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N.K. Nakagawa<sup>\*</sup>  
I.C. Salles  
M.M. Costa  
J.L. Pinho

<sup>a</sup> University of São Paulo, Medical School, KIDS SAVE LIVES BRAZIL, Education, Assessment and Intervention in Cardiovascular and Pulmonary Group, Av. Dr. Arnaldo, 455, CEP 01246-903 São Paulo, Brazil

B.W. Böttiger

University of Cologne, Department of Anaesthesiology and Intensive Care Medicine, University Hospital, Medical Faculty, 50923 Cologne, Germany

<sup>\*</sup> Corresponding author.

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