



Contents lists available at ScienceDirect

Resuscitation

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

Letter to the Editor

The challenge of laypeople cardio-pulmonary resuscitation training during and after COVID-19 pandemic

Sir,

COVID-19 pandemic is impacting on all our life aspects,¹ included out-of-hospital cardiac arrest (OHCA) and resuscitation: the challenge is ensuring the best survival chance to OHCA patients, with or without COVID-19, without compromising rescuers' safety.^{2,3} Regarding laypeople, this issue is even more relevant as they are unlikely to have personal protective equipment (PPE) immediately available and as the risk of infection and the reluctance to perform mouth-to-mouth ventilation, the most common fears also in the pre-epidemic era,^{4,5} may lead to hesitation in performing CPR. ILCOR and national societies promoted guidance about how to perform CPR in COVID-19 era,³ suggesting at least compression-only CPR reserving mouth-to-mouth ventilation only if willing and able, especially in case of household member victim. Considering that OHCA most often occurs at home, the contagion risk seems therefore limited. However, a growing trouble we must deal with is the CPR training issue.

Bystander CPR is crucial in improving OHCA victims' survival and its increase over the years is the result of a massive training effort by scientific societies, institutions and associations. This was essentially based on Basic Life Support (BLS) courses where groups of people learned chest compressions and mouth-to-mouth ventilation on the same manikin separated by a simple personal face-shield. An unthinkable scenario henceforth. Social distancing and protective facemask will be our companions for months, perhaps years.¹ Training centers will try to make extraordinary efforts to organize themselves limiting the learners' number in training sessions, providing gloves, hand-sanitizers and hygienizing premises, manikins and AED trainer, but the issue related to mouth-to-mouth ventilation remains (Table 1). Sharing the same manikin for teaching this technique appears unthinkable, even using pocket masks, both because it's difficult to ensure safety (ventilation is an aerosol-generating procedure and trainees should remove their protective mask) and because of attendees' fear in performing this skill. A solution could be ensuring that each learner uses only "personal" manikin throughout the session, guaranteeing distancing during the course and perfect manikin hygienization after the course, also exchanging some parts (face, lungs). However, beyond the costs, it is difficult to guarantee a perfect hygienization, also considering the presumed learner's fear to perform mouth-to-mouth on a manikin used soon before by another person. Moreover, a person resulted infected by COVID-19 some days after the course could blame the training center of an improperly manikin hygienization.

Considering all aspects, the more straightforward and feasible thing seem to be withdrawing mouth-to-mouth ventilation at

Table 1

Issues related to CPR training and possible solutions to be adopted by CPR training centers.

Issue	Possible solutions
Maintaining correct social distancing	Limit the number of learners in training sessions Guarantee distancing among trainees during the course "Personal" manikin and AED trainer throughout the session (if possible)
Reducing droplet diffusion	Wear facemask for all the session Provide gloves to instructors and learners Hand sanitizers available to instructors and learners Hygienize the premises, the manikins and the AED trainer Avoid mouth-to-mouth ventilation
Reducing learners' fear of virus transmission	Clear information and preliminary session to adequately inform the learners about the measures put in place to reduce the risk of contagion

least until pandemic end. However, mouth-to-mouth ventilation is a required skill to obtain a BLS certificate and the BLS certificate acquisition is required even for laypeople in certain settings. Therefore, we believe that a scientific societies' position statement is urgently needed to allow a safe restart of CPR training for learners and instructors, probably allowing only compression-only CPR teaching to acquire a BLS certification at least until the epidemic disappears.

The risk is wiping out decades of training efforts in resuscitation field, causing an increase in OHCA mortality as COVID-19 indirect effect.

Funding

No specific funding were received for the present article.

Conflict of interest

None declared.

References

- Kissler SM, Tedijanto C, Goldstein E, Grad YH, Lipsitch M. Projecting the transmission dynamics of SARS-CoV-2 through the postpandemic period. *Science* 2020. <http://dx.doi.org/10.1126/science.abb5793>. Epub ahead of print. PMID: 32291278.
- Edelson DP, Sasson C, Chan PS, et al. Interim guidance for basic and advanced life support in adults, children, and neonates with suspected or confirmed COVID-19: from the emergency cardiovascular care committee and get with the guidelines®-Resuscitation Adult and Pediatric Task Forces of the American Heart Association in Collaboration with the American Academy of Pediatrics, American Association for Respiratory Care, American College of Emergency Physicians, The Society of Critical Care Anesthesiologists, and American Society

- 76 of Anesthesiologists: Supporting Organizations: American Association of Critical
77 Care Nurses and National EMS Physicians. *Circulation* 2020, <http://dx.doi.org/10.1161/CIRCULATIONAHA.120.047463>.
78
79 3 Couper K, Taylor-Phillips S, Grove A, et al. COVID-19 in cardiac arrest and infection
80 risk to rescuers: a systematic review. *Resuscitation* 2020, <http://dx.doi.org/10.1016/j.resuscitation.2020.04.022>.
81
82 4 Savastano S, Vanni V. Cardiopulmonary resuscitation in real life: the most frequent
83 fears of lay rescuers. *Resuscitation* 2011;82:568-71, <http://dx.doi.org/10.1016/j.resuscitation.2010.12.010>.
84
85 5 Baldi E, Bertaia D, Savastano S. Mouth-to-mouth: an obstacle to cardiopulmonary
86 resuscitation for lay-rescuers. *Resuscitation* 2014;85:e195-6, <http://dx.doi.org/10.1016/j.resuscitation.2014.10.001>.
87

88 Enrico Baldi^{a,b,*}

89 ^a Department of Molecular Medicine, Section of
90 Cardiology, University of Pavia, Pavia, Italy

91 ^b Cardiac Intensive Care Unit, Arrhythmia and
92 Electrophysiology and Experimental Cardiology,
93 Fondazione IRCCS Policlinico San Matteo, Pavia, Italy

94 Enrico Contri

95 AAT Pavia – Azienda Regionale Emergenza Urgenza
96 (AREU), c/o Fondazione IRCCS Policlinico San Matteo,
97 Pavia, Italy

98 Simone Savastano

99 Division of Cardiology, Fondazione IRCCS Policlinico
100 San Matteo, Pavia, Italy

101 Andrea Cortegiani

102 Department of Surgical, Oncological and Oral
103 Sciences (Di.Chir.On.S.), Section of Anesthesia,
104 Analgesia, Intensive Care and Emergency, Policlinico
105 Paolo Giaccone, University of Palermo, Palermo, Italy

106 * Corresponding author at: Department of
107 Molecular Medicine, Section of Cardiology,
108 University of Pavia, c/o Fondazione IRCCS

109 Policlinico San Matteo, Viale Golgi 19, Pavia, Italy.
110 E-mail address: enrico.baldi@unipv.it (E. Baldi)

111 23 April 2020

UNCORRECTED PROOF