





## Cardiopulmonary resuscitation in COVID-19

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The coronavirus disease 2019 (COVID-19) pandemic has caused and is still causing enormous medical, social, economic and political problems. New mutations, concerns about transmissibility, vaccine resistance, vaccination rates in particular professional and age groups, areas or countries, as well as the capacity of health care systems and individuals are a source of concern not only for politicians, medical personnel, physicians but for every member of society who is anxious about the future [1–3].

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic, among its many risks, also affects the risk of sudden cardiac arrest during the illness, during recovery and thereafter [4]. Avoiding deaths associated with deterioration of patient care due to an ongoing pandemic or the coexistence of COVID-19 with other conditions, including life-threatening conditions, is a significant concern [5]. For medical personnel working in both the in-hospital and prehospital setting, cardiopulmonary resuscitation (CPR) in patients with suspected or confirmed SARS-CoV-2 infection is associated with several technical issues related to the quality of chest compressions (CC) and the performance of advanced resuscitation measures, including airway management. The issue of responder safety is of particular importance: medical personnel should always be expected to be fully professional and to reduce the risk of infection, but rescuers, bystanders, and witnesses should also be considered based on their risk acceptance to vaccination and the relationship between the rescuer and victim. In first aid, it is acceptable to perform CC alone without ventilation, but it should be taken into account that even CC significantly promote aerosol generation and may

increase the risk of infection for those providing assistance [6].

Many medical personnel are willing to assist regardless of the risk of infection or danger to the rescuer, treating it as their mission, guided by dedication and responding with compassion for patients. An ethical attitude is essential to help with commitment and reduce patients' fears in a skillful way. However, care must always be taken to ensure that work is well organized and resources are available to minimize the risks to medical staff.

A different issue is the qualification of patients for treatment in the intensive care department/ /settings, including eligibility to attempt CPR and the potential ethical dilemmas associated with qualifying patients for advanced treatment when equipment and medical staff and other resources are limited [2]. Everyone has the right to appropriate treatment, and no one should be denied available treatment — to the extent that medical personnel and the health care system are able. The availability of appropriate procedures for health professionals to deal with the stresses on the health system is a way to protect them from the adverse effects of working in extreme conditions. When considering ethical issues, elements such as safety, accessibility, availability, and ability should be taken into account and the patient's real chances in the context of risk factors, conditions, and expected outcome [7, 8].

The qualification of patients for the initiation of CPR, including its duration and timing of termination of resuscitation, should also be considered in this regard. The use of personal protective equipment may affect the quality and thus the effectiveness of resuscitation actions undertaken [9, 10]. Another problem is the availability of medical

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emergency teams, the possibility to reach the scene of an accident in a short period when the health care systems are heavily overloaded, including the emergency medical services system — the availability of ambulances is reduced. In a hospital setting, the time of initiation of resuscitation actions may also be affected by the time of arrival and donning of full personal protective equipment.

It is worth noting that the ERC recommends that medical personnel should be properly protected during CPR, i.e. wear airborne-precaution personal protective equipment (PPE) including gloves, long-sleeved gown, filtering facepiece 3 (FFP3) or N99 mask/respirator (FFP2 or N95 if FFP3 not available) as well as eye and face protection (full-face shield/visor or polycarbonate safety glasses or equivalent) [7]. Note that international societies recommend that during resuscitation in healthcare settings, resuscitation teams should consist only of persons who have been trained in the proper use of PPE and who have access to and are provided with such equipment [7]. During CC, the risk of generating aerosols is very high, and airway management is also considered an aerosol-generating procedure. Particular attention should be paid to the use of high-quality filters connecting the self-inflating bag, the mask and supraglottic airway device or endotracheal tube to minimize the risk of virus spread [7].

Unfortunately, with the observed trend in the number and characteristics of patients with severe COVID-19, consideration should be given to performing CPR in children with SARS-CoV-2 infection, in whom cardiac arrest may be due to respiratory or other causes. In general, similar standards as for adults with SARS-CoV-2 infection apply, but special attention should be paid to the airway, airway management, and rapid recognition of life-threatening conditions in the child.

The COVID-19 pandemic affects resuscitation of both adults and children, organizational and practical issues, particularly demanding the organization and quality of the efforts undertaken. Given the current epidemiological situation, every

practitioner must be prepared to perform CPR in the specific circumstances accompanying with individual protective measures and the associated difficulties and limitations before such an event occurs.

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