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Rapid  
response

## COVID-19 and cardiopulmonary resuscitation (CPR) in the out-of- hospital settings

A production of the Institut national  
d'excellence en santé  
et en services sociaux (INESSS)

This rapid response was prepared by scientific professionals in the health services division of the Institut national d'excellence en santé et en services sociaux (INESSS).

## RESPONSIBILITY

INESSS assumes full responsibility for the form and final content of this document at the time of publication. The conclusions do not necessarily reflect the opinions of the persons consulted during the development of the document. The findings herein are subject to change as the situation evolves.

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# COVID-19 and cardiopulmonary resuscitation in the out-of-hospital setting

## CONTEXTE

*This document and the findings it sets out were prepared in response to an inquiry from the Ministry of Health and Social Services (MSSS) in the context of the coronavirus (COVID-19) health emergency in Québec. The aim was to conduct a summary review of the published data and to mobilize key knowledge in order to provide information to policy makers and to health and social service professionals. Since this response had to be provided rapidly, the resultant findings are not based on a comprehensive search of the published data and a systematic assessment of the response quality, or on a highly developed consultation process. During this public health emergency, INESSS is keeping a watchful eye for new data that might warrant an update of this response.*

### **POSITIONS OF INESSS AS OF MAY 14, 2020**

The findings below are based on the scientific documentation and grey literature available at the time of writing and on the consultations performed, and are offered in spite of the uncertainty that exists in this documentation and in the approach used.

- In the contexte of COVID, the best practices for cardiopulmonary resuscitation (CPR) must take certain important principles into account: avoiding propagation of the virus and protecting the health of the lay rescuer, while assuring the best chances of survival for the victim.
- Community transmission is the main means by which SARS-Cov-2 spreads in Québec.
- CPR is a medical procedure that can generate aerosols, but when evaluated by component, manual ventilation methods and intubation are the manoeuvres that are the most likely to produce aerosols. The risks associated with chest compression and defibrillation are uncertain but such manoeuvres might be considered as being able to produce droplets.
- The protection of lay rescuers and health care workers is the priority during a pandemic.
- The professional societies and experts consulted state that resuscitation maneuvers should be carried out even during a pandemic, with the appropriate equipment and according to the expertise of the rescuers involved.

**INESSS is of the opinion that,** in the out-of-hospital setting for the care of adults:

- All persons in cardiopulmonary arrest should be considered as potentially at risk of transmitting the infection.

- Adequate protection equipment should be donned by the lay rescuer **before** starting cardiopulmonary resuscitation manoeuvres.
- Defibrillation and chest compressions should be carried out independently of the risk of the patient being infected with COVID-19, since there would be a low risk of these manoeuvres producing aerosols in the presence of the following equipment: surgical mask, eye protection, gloves, gown.
- Protection such as a surgical mask should be placed over the nose and mouth of the person in arrest before resuscitation manoeuvres are undertaken. If a surgical mask is not within reach of the rescuer, a piece of fabric or clothing can be used.
- The manoeuvres the most likely to generate aerosols, such as manual ventilation and intubation, must be undertaken by experienced and authorized persons wearing equipment that protects against aerosols and contact (N95 mask, eye protection, gloves and gown).
- If available, and according to the experience of the rescuer and availability of other helpers, certain equipment such as a bag valve or oxygen mask can be considered, along with the optimal protection against aerosols and contact.
- Once manoeuvres are terminated, the rescuer must dispose of the protective equipment in a safe manner so as to reduce the risk of contamination.

## **REQUEST FROM THE MINISTRY OF HEALTH AND SOCIAL SERVICES (MSSS)**

Over the past two decades, the rate of survival after experiencing a cardiac arrest in either the hospital or community (out-of-hospital) setting has continued to improve. This success relies on the rapid initiation of proven interventions, such as well-performed chest compressions and defibrillation [Edelson DP, 2020].

Nevertheless, the current COVID-19 pandemic presents important challenges for the established practices and processes of cardiopulmonary resuscitation (CPR) when undertaken outside of hospitals. If one considers that the objective of rapid initiation of intervention is to minimize the mortality and morbidity of all individuals involved, the pandemic context requires avoiding transmission of the virus and protecting the health of the person carrying out the resuscitation manoeuvres.

Community transmission is now the principal means of spread of the COVID-19 virus. Fear of contagion could, in the community or out-of-hospital setting, undermine best practices of resuscitation for an individual showing signs of cardiac arrest. Indeed, during this pandemic, lay rescuers must simultaneously consider the immediate needs of the victim and their own safety.

It is in this context that MSSS produced a *protocole de réanimation simplifié de la COVID-19 pour tous les milieux de soins prenant en charge des usagers hors des hôpitaux* (April 9, 2020 version). The protocol aims to standardize cardiopulmonary resuscitation in the pandemic context in all care settings managing victims outside of acute care hospitals. This includes long-term care facilities, outpatient clinics, privately-

run residences for the elderly, designated evaluation clinics, psychiatric units and all other out-of-hospital care settings.

**Summary of the MSSS protocol of April 9, 2020 concerning cardiopulmonary resuscitation in care settings managing victims outside of acute care hospitals**  
**[Ministère de la Santé et des Services Sociaux MSSS, 2020]**

The following guiding principles should be kept in mind:

- cardiac resuscitation manoeuvres pose a high risk of transmitting the COVID-19 virus;
- protection of lay rescuers and health practitioners is the priority during a pandemic;
- management of personal protection equipment (PPE) in these settings is essential.

The guideline is to not perform cardiac massage if the victim is not known to the responder or his/her COVID-19 status is unknown, probably positive or positive OR the care setting is experiencing a COVID-19 outbreak. Management of securing the airway and of ventilation should always be performed by an experienced practitioner (physician or paramedic) who is equipped with optimal personal protection. The guidelines consider that, in regions where community transmission has not been sustained, the absence of symptoms is an indicator of low risk.

Knowledge of COVID-19 and the modes of transmission of the virus are rapidly evolving. The evolution of the epidemic in the various regions of Québec is being better understood as the days and weeks pass. It is in this context that the MSSS wishes to be advised on the best practices of cardiopulmonary resuscitation in the community, out-of-hospital setting during the COVID-19 pandemic, in order to update its resuscitation protocol, if necessary, and also to possibly extend the reach of this protocol to other community settings such as the work environment.

## METHODOLOGY

### **Evaluation questions:**

1. What are the risks of contamination by COVID-19 for the various CPR manoeuvres carried out by lay rescuers?
2. Which CPR manoeuvres should be favoured in the out-of-hospital context and what protection is necessary to perform them?

### **Literature review**

#### ***Identification of publications:***

Search period: April 30 to May 4, 2020

Key words used: bystanders, resuscitation, cardiopulmonary resuscitation (CPR), adult, pediatrics, life support, covid-19, aerosol generating procedure, prehospital setting

Databases consulted: Pubmed, Google, Google Scholar

Languages: English, French

Other sources of information: publications by professional societies, articles and Websites of journals and governmental organizations

***Publication selection criteria:*** All articles and recommendations by professional societies in English or French specifically addressing CPR by lay rescuers in an out-of-hospital setting and the COVID-19 context were retained.

***Extraction and synthesis of data:*** Data extracted from retained publications by professional societies included: organization, country, date of publication, interventions, recommendations, limitations (see Table 1 in Appendix 1). The recommendations from the various professional societies were compared to determine the most common points.

**Bias and limitations:** The biases and limitations were evaluated informally, with particular attention paid to the methodologies used by the professional societies to produce their recommendations.

### **Processes of participation**

#### ***Consultation:***

The INESSS project team consulted an expert committee composed of health professionals in order to collect information and perspectives regarding the evaluation questions and the context. The final version of the document reflects this participative process; however, the experts consulted are not responsible for its content.

#### **Experts consulted:**

**Dr. Katia Dyrda**, cardiologist-electrophysiologist, Institut de cardiologie de Montréal

**Ms. Janick Goyette Lachance**, nurse clinician, Chef de secteur - Programme de chirurgie (Argenteuil et Saint-Jérôme)

**Mr. Salim Grim**, manager, programme de réanimation, Québec, Heart & Stroke foundation

**Dr. Francois de Champlain**, emergency physician, McGill University Health Centre, President of the Fondation Jacques-de-Champlain

**Dr. Marc Rhains**, medical and scientific co-manager, Unité d'évaluation des technologies et des modes d'intervention en santé (UETMIS), CHU de Québec-Université Laval

**Dr. Jasmin Villeneuve**, consultant physician, Comité des infections nosocomiales du Québec, Direction des risques biologiques et de la santé au travail, INSPQ

**Dr. Jean-Philippe Labelle**, general practitioner and hospital physician, Hôpital Pierre-Boucher, Longueuil

**Mr. Nicolas Poissant-Gilbert**, nurse clinician in the work environment, instructor at the Heart & Stroke foundation

The experts were invited to a virtual meeting on May 7, 2020 to discuss the data extracted from the literature, share their perspectives and exchange views on issues related to and the implications of the resuscitation protocol released by MSSS on April 9, as well as any modifications to consider for this protocol. After this meeting, iterative versions of the recommendations and the supporting document were circulated among the experts for their comments and validation.

### **Declaration of interests**

The experts were asked to orally declare their potential conflicts of interest or of role during the consultation by video conference. The following conflicts were reported:

- Dr. Marc Rhains has produced a guidance on behalf of UETMIS for the Comité des infections nosocomiales du Québec de l'INSPQ (the provincial nosocomial infection committee of the Québec public health institute) on the risk of airborne transmission of infections during cardiopulmonary resuscitation.
- Dr. de Champlain is President of the Fondation Jacques-de-Champlain charitable organization which promotes CPR in particular, as well as public access to defibrillation through the provincial DEA-Québec registry.

The other experts consulted, the authors of this report and their internal collaborators declared having no conflicts of interest. No external funding was obtained for the production of this report.

### **Validation and quality assurance**

The document was validated by the scientific coordinator and management responsible for its production. Validation of coherence with the rapid response template and the transparency of the methodological aspects was carried out under the responsibility of the scientific vice-presidency by the methodology and ethics division. A final validation of the rapid response was performed by the scientific vice-presidency of INESSS.

## SUMMARY OF THE COMPILED INFORMATION

### **Evaluation question #1: What are the risks of contamination by COVID-19 for the various CPR manoeuvres carried out by lay rescuers?**

Twelve documents were retained in response to this question. Cardiopulmonary resuscitation is a complex intervention consisting of several components: manual ventilation, chest compression, defibrillation and administration of medications and intubation. The risks of transmission of the COVID-19 virus associated with these various components vary according to several factors, such as the personal protection equipment available to the person performing the CPR manoeuvres (called the 'rescuer' in the present document), the confirmed, potential or suspected contamination of the victim by the virus and the mode of viral transmission.

The World Health Organization (WHO) describes two modes of transmission of SARS-Cov-2: by contact with droplets or by contact with aerosols. According to this organization, COVID-19 is primarily transmitted by droplets, either through direct contact with an infected patient with respiratory symptoms (at  $\leq 1$  m) or indirectly through contact with an environment contaminated by an infected patient [WHO, 2020].

Airborne transmission, distinct from contamination by droplets, refers to the presence of particles less than 5  $\mu\text{m}$  in diameter which can stay in the air for long periods and be transmitted to others at a distance of more than 1 m. Airborne transmission of the COVID-19 virus is also possible during certain medical procedures that can produce aerosols [WHO, 2020].

The recommended measures to ensure protection against droplets is the donning of a surgical mask and eye protection, while the personal protection equipment (PPE) to avoid viral transmission by aerosols requires wearing a N95 mask coupled with eye protection [WHO, 2020]. To protect against direct contact with the virus, wearing a gown and gloves are recommended, as well as thorough handwashing.

The nature of the medical interventions carried out on a patient at risk of having been infected by the SARS-CoV-2 virus has an impact on the type of personal protection required. Aerosol-generating medical procedures (AGMPs) require the wearing of a N95 mask in particular.

#### Cardiopulmonary resuscitation

In order to reduce the risk of contagion among health care professionals working in the COVID-19 setting, a list of many medical procedures associated with a known risk of generating aerosols (AGMPs) has recently been established by the public health institute of Québec (INSPQ) [CINQ, 2020]. In this case, INSPQ defines interventions at "known" risk to be those "that have been listed for many years as being associated with a heightened risk of airborne transmission of infections, such as tuberculosis, and recognized as such by the medical community" [CINQ, 2020]. With this definition in mind, the provincial nosocomial infection committee [CINQ, 2020] as well as WHO [WHO, 2020], associate cardiopulmonary resuscitation with a recognized risk of transmission of infectious aerosols.



In their recent publication, UETMIS (the health technology assessment unit) of the CHU de Québec [Asselin G, 2020] found 21 documents from various professional societies that addressed the risk of airborne transmission of infections during cardiopulmonary resuscitation. Based mostly on expert opinion, the majority of these professional societies identified CPR, including management of airways and chest compressions, as AGMPs, and recommended that rescuers wear PPE that protect against aerosols when undertaking these manoeuvres.

Similarly, the International Liaison Committee on Resuscitation (ILCOR) [ILCOR, 2020] and the Department of Health of Australia consider cardiopulmonary resuscitation to have the potential to generate aerosols.

#### Guidelines by component

Certain organizations have made more detailed recommendations according to individual CPR components. The health departments of the United Kingdom do not consider chest compression nor defibrillation to be AGMPs. However, both manual ventilation and intubation are considered AGMPs.

Given the lack of studies of high-quality methodology available, as well as the weak level of evidence associating the risk of airborne transmission of infections with CPR manoeuvres, the UETMIS of the CHU de Québec [Asselin G, 2020] classifies chest compression carried out as part of CPR to be an AGMP of uncertain and poorly-documented risk. The epidemiological studies identified by UETMIS did not permit the establishment of a causal link between chest compression and the risk of transmission of infection by aerosols.

For the specific case of the COVID-19 pandemic, nine professional societies that provided guidelines on the risk of transmission of infections during CPR manoeuvres were identified by the INESSS project team (Table 1 in Appendix 1). Seven of these (Ontario Health, the Heart & Stroke foundation, Canadian Red Cross, Public Health of England, the Resuscitation Council, the European Resuscitation Council and the American Heart Association) make a distinction between the risk of infectious transmission for the different components of CPR and consider chest compression and defibrillation to not be AGMPs.

For its part, ILCOR believes that chest compressions alone have the potential to generate aerosols, while Australia's Department of Health does not make any distinction among the different CPR components (Table 1).

## **Evaluation question #2: Which CPR manoeuvres should be favoured in the out-of-hospital context and what protection is necessary to perform them during the COVID-19 pandemic?**

### **Positions of professional societies**

In the out-of-hospital setting during the COVID-19 pandemic, seven of the nine professional societies presented in Table 1 recommend that lay rescuers immediately perform chest compressions and/or automated defibrillation, if available, when in the presence of an individual presenting signs of a cardiopulmonary arrest. When it is impossible to know whether the person in cardiopulmonary arrest is infected by COVID-19, it is recommended to use protection against the risk of droplets, that is, to wear a surgical mask and eye protection, as well as protection against the risk of contact by means of a gown and gloves.

The Resuscitation Council of the United Kingdom recommends that lay rescuers performing chest compressions use PPE that protects against droplets when available. The European Resuscitation Council recommends only performing chest compression and defibrillation when equipment that protects against droplets is available to the lay rescuer, but that in the presence of PPE that protects against aerosols, the rescuer can add manual ventilation to chest compressions.

Five organizations (the Heart & Stroke foundation, Canadian Red Cross, the Resuscitation Council, the European Resuscitation Council and the American Heart Association) also recommend placing clothing or fabric over the nose and mouth of the victim to prevent all potential propagation of the virus by air or contaminated saliva, in the case of known or suspected COVID-19 infection of the victim.

### **Perspectives of the consulted experts**

Taking into account the information extracted from the literature, their own experiences and perspective and the implications of all of these on the resuscitation protocol released by MSSS on April 9th, the experts are of the opinion that:

- the MSSS protocol should be standardized so as to be used uniformly irrespective of geographic region and risk of transmission of and infection by the COVID-19 virus, in order to avoid confusion and to promote rapid intervention;
- in the presence of an adult in cardiopulmonary arrest in the out-of-hospital setting, the protocol should make a distinction between the various CPR components to be performed, according to the associated risks of infection and the required protective equipment;
- CPR manoeuvres should be carried out regardless of the COVID-19 infection status (known or unknown) of the victim and his/her level of risk;
- the respect of the victim's preferences regarding level of medical intervention should be maintained in the COVID-19 context, if known;

- all intervention be preceded by the donning of protection against droplets by the lay rescuer;
- protection such as a surgical mask should be placed over the nose and mouth of the person in cardiopulmonary arrest before resuscitation manoeuvres are undertaken. If a surgical mask is not within reach of the lay rescuer, a piece of fabric or clothing can be used;
- continuous chest compressions and defibrillation should be performed on all adults in cardiopulmonary arrest;
- defibrillation, if available, should be favoured as the first intervention to be performed for a patient in cardiopulmonary arrest;
- the management of ventilation and of the airways in the out-of-hospital setting is to be undertaken only by an experienced practitioner (for example, a physician or paramedic) using PPE and other available devices (e.g. balloon or oxygen mask);
- the general protocol should be restricted to adult victims, but special considerations could be released subsequently for the pediatric population, given that mechanical ventilation is a crucial component of resuscitation in the latter group. In addition, keeping in mind an eventual deconfinement and the restarting of more risky activities (day camps, pools, sports teams, etc.), protocols adapted to the public at large in the pandemic context should also be available;
- adaptation of the protocol could be carried out according to various work environments, the different levels of training and competence of first aid personnel for the performance of CPR manoeuvres and the protective equipment available.

## CONCLUSION

The process of reviewing the literature and of consultation on the risks of COVID-19 transmission and the best practices of resuscitation in a cardiac arrest situation has shown the relevance of considering the different components of CPR separately and revising the MSSS recommendations according to these distinctions. It appears that chest compressions and defibrillation pose a lower risk than the ventilation components and should thus be performed without delay, as soon as adequate protective equipment is donned and without requiring knowledge of the status of the person in arrest (i.e., whether infected by COVID-19 or not). Several recommendations have been submitted to MSSS to support the revision of its April 9<sup>th</sup> protocol. To facilitate the desired modifications to the MSSS protocol, a provisional proposal for the revisions, validated by the consulted experts, is provided in Appendix 2.

## APPENDIX 1

**Table 1. Guidelines of professional societies on CPR in the context of the COVID-19 pandemic and the out-of-hospital setting - adults**

Organization (date)	Country	CPR	Chest compression	Manual ventilation	Defibrillation	Out-of-hospital recommendations (protection)	Limitations
<b>Ontario Health</b> [Ontario Health, 2020] (March 30, 2020)	Canada	X	X	X	X	<p><b>Protection against droplets</b> Chest compressions and defibrillation are not considered AGMPs</p> <ul style="list-style-type: none"> <li>For responders: wear a surgical mask, protective clothing, gloves and eye protection</li> </ul> <p><b>Protection against aerosols</b> Intubation and manual ventilation are considered AGMPs</p> <ul style="list-style-type: none"> <li>Wear a N95 mask (during AGMPs)</li> </ul>	Expert committee and a brief review of the literature
<b>Heart &amp; Stroke</b> [Heart & Stroke, 2020] (April 6, 2020)	Canada	X	X		X	<p><b>Protection against droplets</b> Place fabric, a towel or clothing over the nose and mouth of the victim to prevent all potential propagation of the virus through contaminated air or saliva</p>	Expert opinion
<b>Canadian Red Cross</b> [Canadian Red Cross, 2020] (April 27, 2020)	Canada	X	X		X	<p><b>Protection against droplets</b></p> <ul style="list-style-type: none"> <li>Place clothing or fabric over the nose and mouth of the victim</li> <li>Recourse to mouth-to-mouth respiration should be at the discretion of the rescuer. In this case, a barrier mask can be used to protect the rescuer.</li> </ul>	

<b>Australian Department of Health</b> [Australian Government Department of Health, 2020]	Australia	X				<p><b>Protection against aerosols</b></p> <p>CPR is an AGMP.</p> <ul style="list-style-type: none"> <li>• Protection must include a N95 mask, gloves, eye protection, gown</li> </ul> <p>Recommendations for protection against droplets: surgical mask, gown, gloves and eye protection</p>	Brief review of the literature, without mention of an expert committee
<b>Public Health England [Public Health England, 2020]</b> (Updated May 3, 2020)	UK		X		X	<p><b>Protection against droplets</b></p> <p>Chest compressions and defibrillation are not considered AGMPs.</p> <p>Recommendation to immediately commence chest compressions or defibrillation.</p> <ul style="list-style-type: none"> <li>• The wearing of a surgical mask and other protective equipment is secondary to initiation of cardiac massage.</li> <li>• In the community: if there is a risk of infection: wear a mask, apron/gown, gloves and eye protection</li> <li>• In residences for the elderly: wear a surgical mask, apron/gown, gloves and eye protection</li> </ul>	The recommendations arise from the following organizations: Department of Health and Social Care (DHSC), Public Health Wales (PHW), Public Health Agency (PHA) Northern Ireland, Health Protection Scotland (HPS), Public Health England and NHS England as official guidance. The Health and Safety Executive (HSE) also reviewed the <a href="#">PPE guidance</a> and reached a consensus on PPE use. The DHSC committee known as the <a href="#">New and Emerging Respiratory Virus Threats Advisory Group (NERVTAG)</a> also contributed to the recommendations.
<b>Resuscitation Council [Resuscitation Council UK, 2020]</b> (March 22, 2020)	UK	X	X		X	<p><b>Protection against droplets</b></p> <p>If there is a perceived risk of infection of the victim by COVID:</p> <ul style="list-style-type: none"> <li>• Cover the nose and mouth of the victim using cloth or a towel</li> <li>• Use PPE, if available to the rescuers</li> </ul>	
<b>European Resuscitation Council,</b>	Euro-pean Union	X	X		X	<p><b>Protection against droplets</b></p> <p>Recommendation for suspected or confirmed COVID-19 cases:</p>	Expert committee and a brief review of the literature

<p>[European Resuscitation Council, 2020] (April 24, 2020)</p>						<ul style="list-style-type: none"> <li>• Place a cloth over the patient’s mouth during chest compressions or defibrillation</li> <li>• Wash hands thoroughly with soap and/or use disinfectant.</li> <li>• Contact local health authorities regarding whether to be tested after having been in contact with someone possibly infected by the virus.</li> </ul> <p>If the rescuer has access only to equipment protecting against droplets: defibrillation and chest compressions; if he/she has access to a N95 and equipment protecting against aerosols: chest compressions and ventilation.</p>	
<p><b>AHA</b> <b>[AHA, 2020]</b> (April 9, 2020)</p>	USA	X	X		X	<p><b>Protection against droplets</b></p> <ul style="list-style-type: none"> <li>• Face mask or covering cloth to be worn by the rescuer</li> <li>• Cover the nose and mouth of the victim with a face mask or cloth</li> </ul>	
<p><b>ILCOR</b> <b>[ILCOR, 2020]</b> (March 30, 2020)</p>	Inter-national	X	X		X	<p><b>Protection against aerosols</b></p> <p>Chest compressions and cardiopulmonary resuscitation have the potential to generate aerosols.</p>	Weak recommendation; very weak level of evidence

## APPENDIX 2 – SIMPLIFIED COVID-19 RESUSCITATION PROTOCOL

– Proposal of revisions to the original protocol ([protocole original du MSSS](#)) –  
for health care settings managing persons outside of the hospital environment

### Objective and target population

The present protocol has been created to standardize cardiopulmonary resuscitation in the pandemic context in all health care settings managing an adult outside of an acute care hospital. This includes long-term care facilities, outpatient clinics, privately-run residences for the elderly, designated evaluation clinics, psychiatric units, readaptation and convalescence centres and all other out-of-hospital care settings.

This protocol does not apply to the pediatric population.

This protocol does not apply to work, daycare, school or home environments.

### Guiding principles

- Community transmission is the principal means of transmission of COVID-19 in the province.
- Certain cardiopulmonary resuscitation manoeuvres are considered to pose a higher risk of generating aerosols, notably mechanical ventilation and intubation.
- All persons in cardiopulmonary arrest should be considered as potentially at risk of transmitting the infection.
- The protection of lay rescuers and health care workers is the priority during a pandemic. Adequate protection equipment should be donned by the lay rescuer before starting cardiopulmonary resuscitation manoeuvres.
- Defibrillation and chest compressions should be carried out irrespective of the risk of the patient being infected with COVID-19, since there would be less risk of these manoeuvres producing aerosols.
- Management of the airways and of ventilation must be undertaken by an experienced practitioner (for example, physician, paramedic) wearing optimal personal protection equipment for airborne precautions, which includes wearing a N95 mask as well as eye protection, a gown and gloves.

### **Steps to follow in the presence of a person in cardiopulmonary arrest**

1. Ask for assistance.
2. Call 911 and mention if the emergency is taking place in a red zone.
3. Ask someone to check the chart of the person in arrest to see if a level of medical intervention (NIM) is documented, if applicable;
  - Rescuers have an OBLIGATION to respect the wishes of the cardiac arrest victim if these are known.
4. Take out the code cart and/or the defibrillator :
  - If there is no defibrillator available, the emergency dispatcher can help you find the closest-located public defibrillator or can help you over the telephone.
5. Put on gloves, a surgical mask, a gown and eye protection.
6. Place a surgical mask on the person in cardiac arrest. If a mask is not within reach, use a piece of fabric or clothing to cover the person's nose and mouth;
  - If available, a non-rebreathing oxygen mask can be used instead of a procedure mask and can thus provide passive oxygen.
7. Start cardiac massage immediately if there will be a delay before arrival of a defibrillator.
8. Place the defibrillation pads on the person. If shocks are recommended, start defibrillation, following the instructions on the defibrillator.
9. Start or continue cardiac massage and follow the instructions on the defibrillator, if being used, until help arrives.
10. Active ventilation with a balloon mask can be considered according to the level of experience of the rescuer, the availability of ventilation and protective equipment and the number of practitioners required for this manoeuvre.
11. Continue care according to the level of competence available until professional help (e.g. paramedics) arrive to take over or the victim begins to move.
12. Once the manoeuvres are finished, the protective equipment must be disposed of in a safe manner so as to reduce the risk of contamination.



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