

Africa Centres for Disease Control and Prevention (Africa CDC)

Infection prevention and control guidelines for ambulances transferring known or suspected COVID-19 cases



Introduction

These guidelines outline the minimum operational guidance for infection prevention and control (IPC) in ambulances transferring suspected or confirmed COVID-19 patients. Ambulance staff should be trained in the procedures outlined here as part of their induction and prior to starting work. They are to be supported by their operating organization with available personal protective equipment (PPE) and cleaning materials. These guidelines are subject to adaptation according to the specific operational context.

Standard infection control precautions must be used with all patients. These are principles of good practice intended to minimize exposure to and transmission of all infections, and should be applied in the care of all patients, all of the time. Standard precautions include hand hygiene, environmental cleaning and proper procedures concerning blood and body fluid spillages, sharps, waste, linen and PPE.

In addition, when transferring patients with suspected or confirmed COVID-19, contact and droplet precautions should be employed. It is advisable to put in place engineering controls such as screens between the driver and the patient to avoid the need for the driver to wear PPE. Windows in the rear of the vehicle should also be kept open to increase the number of air changes.¹

Ambulance staff should always receive a verbal handover from the medical team caring for the patient, if transmission-based precautions are required the ambulance crew is to be made aware of these before transfer. The medical team is also responsible for preparing the patient for transfer. If the ambulance team is collecting a patient from the community, they should be guided by local policy and risk assessment (screening or triage) when deciding on the need for transmission-based precautions.²

1. Hand hygiene

Hand hygiene is the single most important practice needed to reduce the transmission of infection in health care settings and is an essential element of standard infection control precautions. Hand hygiene includes handwashing with soap and water, or alcohol-based hand rub. Alcohol-based hand rub (containing at least 60% isopropyl or ethanol alcohol) should always be available in ambulance, as soap and water are not generally available during transit.

Additional notes of importance:

- ▶ If hands are visibly dirty they should be washed with soap and water.
- ▶ Alcohol hand rub can be used for decontaminating hands that are not visibly dirty, this must be carried out even if gloves have been worn.
- ▶ Avoid touching the face with hands that have not been cleaned, or with gloved hands.³

Hand hygiene should be performed before:

- ▶ any direct patient contact;
- ▶ eating, drinking or handling food;
- ▶ taking a break/going home;
- ▶ donning PPE.

Hand hygiene should be performed after:

- ▶ cleaning equipment or environmental surfaces;
- ▶ performing respiratory hygiene;
- ▶ any direct patient contact;
- ▶ doffing PPE, including gloves;
- ▶ handling waste;
- ▶ using the toilet.

2. Personal protective equipment

The PPE recommendations below are for health workers providing direct patient care while the patient is in the ambulance. For PPE recommendations for health workers not directly involved in patient care while in an ambulance, refer to relevant World Health Organization (WHO) and Africa Centres for Disease Control and Prevention (Africa CDC) guidance.^{4,5}

Important: PPE should be worn if there is any risk of the ambulance staff coming into contact with body fluids, even without suspicion of COVID-19 as per standard precautions. Body fluids do not have to be on the patient directly but could be indicated for activities such as cleaning and managing body fluid spills.

a. Gloves

Examination gloves must be worn as single-use items, and if heavy-duty gloves are used they should be cleaned and dried between uses. Gloves of any type should be put on immediately before the related activity and removed as soon as it is completed.

b. Aprons or gowns

Disposable fluid repellent gowns or aprons should be used if available. If these are not available, reusable gowns or aprons may be used with a defined decontamination process in place. Regardless of the type of gown/apron used, they should be worn to protect clothing from contamination. For extensive patient contact, gowns are preferable as they provide coverage of the back and arms. For tasks such as routine cleaning, aprons are appropriate if staff do not wear long-sleeved clothing. Reusable gowns and aprons must be cleaned and stored dry between uses.

c. Medical face masks

Medical masks are worn to prevent contamination of the nose and mouth with body fluids and should be worn whenever there is a risk of splashing or droplets.

They should:

- ▶ cover both the nose and the mouth;
- ▶ not be allowed to dangle around the neck after or between uses;
- ▶ be changed if they become wet or damaged.

The front of the mask should not be touched while/after being worn.

d. Respirator (N95/FFP2)

These masks are designed to filter small aerosols that may be produced during aerosol generating procedures (AGPs).

They should:

- ▶ be worn whenever AGPs are performed in an ambulance;
- ▶ not be adjusted once fitted to the health worker's face;
- ▶ be changed if they become wet or damaged.

Examples of AGPs include:

- ▶ intubation, extubation and related procedures (e.g. manual ventilation and open suctioning);
- ▶ cardiopulmonary resuscitation (CPR);
- ▶ bronchoscopy (unless carried out through a closed-circuit ventilation system);
- ▶ non-invasive ventilation (NIV) (eg bilevel positive airway pressure ventilation (BiPAP));
- ▶ continuous positive airway pressure ventilation (CPAP).

e. Eye protection

If eye splashing is likely, for example when cleaning an extensive body fluid spill, then eye protection should also be worn (i.e. goggles or face shield). This circumstance may be minimized by good preparation of the patient prior to transfer (i.e. covering open wounds and carrying vomit bags or bowls).

PPE should be removed in an order that minimizes the potential for cross-contamination as per Fig. 1. The order of removal should be applied even if not all items of PPE have been used.

Clean hands thoroughly immediately after removing all PPE.

Note: Coverall suits are not required to safely care for COVID-19 cases. If coverall suits are the only option available, staff should receive training in how to don and doff these correctly.

Figure 1. Instructions for donning and doffing personal protective equipment

HOW-TO GUIDE

PUTTING ON PPE

FOR CONTACT/DROPLET PRECAUTIONS

- 1 Perform hand hygiene**


Alcohol based handrub
Rub hands for 20-30 seconds.

 or

Water and soap
Wash hands for 40-60 seconds.
- 2 Put on gown**

- 3 Put on the mask**
Medical mask.

- 4 Put on eye protection**
Put on face shield or goggles.

- 5 Put on gloves**
Ensure glove is placed over the cuff of the gown.


Full PPE


HOW-TO GUIDE

TAKING OFF PPE

FOR CONTACT/DROPLET PRECAUTIONS

Ensure that infectious waste containers are available for safe disposal of PPE.
Separate containers should be available for reusable items.

Order of steps is important

1 Remove gloves



4 Remove eye protection

Remove face shield or goggles.



2 Remove gown

Ensure gown is pulled away from the body during removal and that clothing does not become contaminated and dispose of them safely.



5 Remove the mask

Ensure you are taking the mask off from the straps, avoid touching the mask.



3 Perform hand hygiene



Alcohol based handrub
Rub hands for
20-30 seconds.

or

Water and soap
Wash hands for
40-60 seconds.

6 Perform hand hygiene



Alcohol based handrub
Rub hands for
20-30 seconds.

or

Water and soap
Wash hands for
40-60 seconds.

3. Environmental cleaning

The following guidance applies to cleaning of all vehicles used for conveying patients.^{6,7}

- ▶ Vehicles should be checked and cleaned at the start of each shift.
- ▶ Routine decontamination should be undertaken after transferring patients with suspected or confirmed COVID-19.
- ▶ All visible surfaces, especially those that may have come in contact with the patient or materials contaminated during patient care (e.g. stretcher, mattresses, rails, control panels, horizontal surfaces in the ambulance, as well as fixtures and fittings, floors and walls) should be cleaned and then disinfected.
- ▶ The ambulance should be cleaned in an ordered process from the ceiling of the ambulance to the floor. Cleaner areas should be attended to before dirtier areas.
- ▶ Use a solution of detergent and water, with cleaning cloths (reusable clothes should be laundered and dried between each use). Particular attention should be paid to areas contacted by patients.
- ▶ Following cleaning, all surfaces should be disinfected with a 0.1% chlorine solution,⁸ 70% isopropyl or ethanol, or other viricidal disinfectants.
- ▶ Monitoring equipment should be decontaminated with a detergent and non-corrosive disinfectant (e.g. 70% isopropyl alcohol) between patients. Refer to manufacturers instructions for cleaning and disinfection of specific/sensitive clinical monitoring equipment.
- ▶ Floors should be mopped with detergent and water before disinfection with a 0.1% chlorine solution.
- ▶ Spraying inside the ambulance is not recommended.
- ▶ Appropriate PPE must be worn for cleaning (i.e. facial protection, gloves and apron). Sufficient supplies of PPE and cleaning equipment should be carried in the vehicle or stored at base. (See recommended equipment and consumables in Section 11).
- ▶ Minimize carrying non-essential equipment in ambulances to keep contamination to a minimum and to reduce cleaning workload.
- ▶ If disposable paper towels are not available, cleaning rags may be used but they must be laundered after each use. Several rags must be made available to allow a clean rag to be used each time.
- ▶ Make sure good ventilation is maintained while cleaning and decontaminating the ambulance by keeping all doors and windows open.

4. Body fluid spills

If there is a spill of body fluids in the vehicle it should be cleaned as soon as possible using the following steps.

- ▶ Gather cleaning equipment including absorbent paper towels, detergent and water, disinfectant and a clinical waste bag.
- ▶ Put on PPE including apron, gloves and eye protection and surgical mask.
- ▶ Cover the spill with paper towels, allow the fluid to soak into the material rather than actively wiping it up. The dirty material is then to be placed directly into a clinical waste bag, is not to be moved or carried unless it has been bagged properly.
- ▶ The area is then to be cleaned with disposable cloths and detergent, working in towards the centre of the dirty area. These towels are also to be placed in the clinical waste bag.
- ▶ Finally, once visibly clean, the area should be disinfected using paper towels and 0.1% chlorine solution.
- ▶ All paper towels and PPE should be placed into the clinical waste bag and disposed of responsibly at a health facility with appropriate waste management facilities (e.g. incinerator).
- ▶ Hand hygiene should be performed after PPE is removed.

5. Linen

If linen such as blankets and sheets are given to the patient for transport they are to be laundered at the health care facility before being used for another patient. Linen should not be shaken. See cleaning and disinfection guidelines for more details of how to manage Linen.^{2,3}

6. Sharps/splash injury

The risk of sharps injuries is to be minimized by avoiding the use of sharps inside the ambulance wherever possible. In addition, ambulance staff/drivers should be offered hepatitis B immunization in the same way as other health workers, through the employers occupational health scheme.

If an inadvertent sharps or splash injury is sustained, the following immediate actions should be followed:

- ▶ Irrigate under clean running water if possible, if not available use alcohol hand rub.
- ▶ Cover with a plaster.
- ▶ If a splash of body fluids on the eyes or mouth irrigate with clean water.
- ▶ Report to a medical officer at the health care facility as soon as possible.

7. Waste disposal

All used PPE and cleaning waste is to be disposed of as clinical waste at the health care facility. Any domestic waste produced by ambulance staff/drivers (e.g. food wrappers) should be disposed of responsibly through the normal domestic waste stream.

8. Patient placement/isolation

Ambulances should not transport patients with different communicable/infectious diseases simultaneously. Separate journeys should be made to keep them apart. Confirmed COVID-19 patients may be cohorted together during transfer.

Patients should be prepared for transport by medical staff at the dispatching unit. The patient should be toileted, offered a wash if contaminated with body fluids and provided with clean clothes if they are visibly soiled. All intravenous (or other) lines a patient might have in place should be properly secured before transport. Any open wounds should be dressed, and a vomit bowl or bag made available for the journey.

9. Transmission-based precautions

In addition to standard precautions, transmission-based precautions are required for patients with suspected/confirmed COVID-19.

a. Contact precautions

Contact precautions are required to prevent transmission of diseases by direct contact. If a patient requires contact precautions, PPE (apron/gown and gloves) must be worn for all patient contact, not just when there is a known risk for exposure to body fluid.

In addition:

- ▶ Patients should be separated from others, especially those with different sign/symptoms/conditions.
- ▶ Routine cleaning with detergent and water is to be followed by disinfection with chlorine, 70% isopropyl or ethanol, or other viricidal disinfectants.

b. Droplet precautions

Droplet precautions are required to prevent transmission of infection via respiratory droplets (e.g. during coughing and sneezing). Droplet precautions should be used in conjunction with contact precautions for all patients with suspected/confirmed COVID-19:

- ▶ When transporting a patient with droplet precautions, the patient should be encouraged to wear a surgical mask as long as they are capable of doing so. The mask should be worn throughout the transfer.
- ▶ If the patient cannot tolerate a mask, good cough hygiene should be encouraged and a tissue or similar provided to hold against their mouth and nose to 'catch' secretions from coughing, sneezing or nose-blowing.

Ambulance windows should remain open. If the ambulance has vents, outside vents should be open and exhaust ventilation turned to the highest setting. This precaution is especially important if the ambulance does not have separate driver and patient care areas, as it will create the maximum number of air changes in the area where the patient is placed.

Droplet precautions for staff:

- ▶ A medical mask and eye protection must be worn when working in close proximity of a patient (minimum 1 metre).
- ▶ The mask should be kept on for the duration of the episode of care or until the surgical mask requires replacement (e.g. it is wet or damaged).

- ▶ Medical masks are to be worn once only and then discarded as clinical waste, hand hygiene must be performed after disposal.

c. Airborne precautions

Airborne precautions are required for COVID-19, when aerosol-generating procedures (AGPs) are taking place. AGPs should only be carried out if essential. If the following procedures are performed in the ambulance then in addition to the PPE required for droplet and contact precautions, the health worker should wear a fitted N95 mask instead of a medical mask.

The N95 mask should be worn at all times an AGP is being performed and until the ambulance has been well ventilated afterwards (this can take up to one hour after the procedure).

N95 masks are designed to be single use, they should be discarded as clinical waste after use and hand hygiene performed.

10. Equipment and consumables needed for IPC in Ambulances⁹

- ▶ Non-sterile examination gloves.
- ▶ Aprons/gowns.
- ▶ Eye protection.
- ▶ Medical masks.
- ▶ N95 masks (for aerosol-generating procedures).
- ▶ Detergent.
- ▶ Chlorine (bleach liquid or chlorine powder/granules).
- ▶ Plastic waste bags (leakproof biohazard and domestic waste bags).
- ▶ Sharps container.
- ▶ Small bucket for mixing water and detergent.
- ▶ Floor mop and bucket.
- ▶ Paper towels and/or laundered cleaning cloths/rags.
- ▶ Alcohol-based hand rub.
- ▶ Vomit bowls or bags.
- ▶ Yellow caution tape or alternative system (e.g. chalk) for marking off any decontamination areas.

References

1. Infection prevention and control during health care when COVID-19 is suspected: interim guidance. Geneva: World Health Organization; 2020. Available from: <https://www.who.int/publications/i/item/10665-331495>.
2. Pandemic (H1N1) 2009 influenza: Summary infection control guidance for ambulance services during an influenza pandemic. London: UK Department of Health; 2009. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/356986/Pandemic_influenza_guidance_for_infection_control_in_ambulance_services.pdf.
3. WHO guidelines on hand hygiene in health care. Geneva: World Health Organization; 2009. Available from: <http://www.who.int/gpsc/5may/tools/9789241597906/en/>.
4. Rational use of personal protective equipment for coronavirus disease (COVID-19) and considerations during severe shortages. Geneva: World Health Organization; 2020. Available from: [https://www.who.int/publications/i/item/rational-use-of-personal-protective-equipment-for-coronavirus-disease-\(covid-19\)-and-considerations-during-severe-shortages](https://www.who.int/publications/i/item/rational-use-of-personal-protective-equipment-for-coronavirus-disease-(covid-19)-and-considerations-during-severe-shortages).
5. COVID-19 Guidance on use of personal protective equipment for different clinical settings and activities. Addis Ababa: Africa Centres for Disease Control and Prevention; 2020. Available from: <https://africacdc.org/download/covid-19-guidance-on-use-of-personal-protective-equipment-for-different-clinical-settings-and-activities/>.
6. Cleaning and disinfection of environmental surfaces in the context of COVID-19. Geneva: World Health Organization; 2020. Available from: <https://www.who.int/publications/i/item/cleaning-and-disinfection-of-environmental-surfaces-in-the-context-of-covid-19>.
7. Guidance on environmental decontamination in the context of COVID-19. Addis Ababa: Africa Centres for Disease Control and Prevention; 2020. Available from: <https://africacdc.org/download/guidance-on-environmental-decontamination-in-the-context-of-covid-19/>.
8. How to Prepare a 0.1% Chlorine Solution [Poster]. Geneva: International Committee of the Red Cross; 2020. Available from: <https://www.icrc.org/en/publication/poster-how-use-chlorine-clean>.
9. Infection prevention and control guidance and procedures. St Asaph: Welsh Ambulance National Health Service Trust; 2013. <http://www.ambulance.wales.nhs.uk/assets/documents/d1218d90-08e6-4171-93d4-a51dd413c061635654224633584392.pdf>.

Acknowledgement

With thanks to staff from the World Health Organization Regional Office for Africa for their support in the development of this publication.

**Africa Centres for Disease Control and Prevention (Africa CDC),
African Union Commission**

Roosevelt Street W21 K19, Addis Ababa, Ethiopia