

# Safe Intrahospital Transport of Critically ill COVID-19 Patients

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## ABSTRACT

2019 corona virus disease (COVID-19) cases may be brought out of isolation rooms for a variety of reasons. One of the most important and unintended complication of transporting a COVID-19 patient is nosocomial spread of the disease. Thus, it is important to decide if patient transport is really necessary, and take precautions definitively when transport is indicated. Additionally, providing adequate level of patient care while maintaining the transport of a critically ill COVID-19 patient is essential. In this part, patient safety, health care worker safety, bystander safety and post-transport decontamination, which are the main principles forming the basis of safe critically ill COVID-19 patient transport were reviewed per the published reports and the recommendations of current guidelines.

**Keywords:** Patient Transfer, Pandemic, Coronavirus Infections, Critical Care

## Introduction

The primary indications of intrahospital transport in critically ill novel corona virus disease 2019 patients may be summarized as transfer between different inpatient clinics, radiological examinations and interventional procedures. All procedures carry high levels of risk for nosocomial spread of the disease when safety precautions are not appropriately taken (1). In addition to take efficient precautions to prevent nosocomial spread, patient care delivered during all steps of transport should be at the level of the care delivered in the intensive care unit environment. In this part, the measures to be taken in case of intrahospital critically ill COVID-19 patient transport are discussed with the support of recent literature.

## Patient Safety

Unnecessary patient transport should be avoided. All medical workups which need patient transfer should be carefully evaluated if they will have an impact on patient management and should only be done in necessary conditions. Alternative diagnostic procedures like using bedside ultrasound may be encouraged to minimise need for scans (2).

Early recognition of the the patients at high risk of deterioration is crucial and immediate transport is essential for these patients if intensive care unit admission is required (3). There should be hospital action plans for early detection of deteriorating patients with suspected/diagnosed COVID-19 infection and managing critical illness before intensive care unit admission. If necessary, endotracheal intubation should be performed before the transport to reduce complication risk about airway safety during patient transfer (4).

Transport staff should be well equipped and sufficient in terms of member quantity and qualification. Critically ill COVID-19 patients should be accompanied by at least a doctor and a nurse who are able to handle emergencies during transport (4). Continuous monitoring of vital signs (blood pressure, pulse and respiratory rate, pulse oximetry) should be provided and a separate defibrillator must be equipped if transport monitor doesn't have this function. Necessary drugs and medical equipments should be ready to use for a possible emergency medical response during transport. In addition, electrical power supply of the mechanical ventilator should not be interrupted during transport. Battery status of the transport ventilator should be checked regularly and the ventilator should always be ready to use. Backup battery should be provided if necessary.

## Health Care Provider Safety

All transport staff should be wearing appropriate masks and other personal protective equipments. All staff should be mask-fitted for respirators with minimum N95/FFP2 classification of air filtration (4). Other personal protective equipments should include gloves, fluid-repellent long sleeved gown and eye protection devices (goggles or a visor) (5,6). The sequence for putting on and removing personal protective equipments should be in order based on the level of precautions required. (The appropriate sequence is gown, respirator, goggles or visor and gloves while putting on, gloves, goggles or visor, gown and respirator while removing.)

To put on a surgical mask for patients is necessary during transport. In COVID-19 patients who don't need invasive mechanical ventilation; if the patient is breathing room air or nasal cannula is sufficient for oxygenation, patient should be putting on a surgical mask during transport (5). If higher oxygen concentration is required, non-rebreather masks with reservoir and exhalation filter should be used. High-flow nasal oxygenation and non-invasive positive pressure ventilation should be avoided during transport (4). Using bag-valve-mask should be avoided, if necessary, gentle bagging by two providers with a mask which is fitted with viral filter may help reducing aerosolization.

For patients who need invasive mechanical ventilation, unnecessary breathing circuit disconnection should be avoided during transport. Breathing circuits should be fitted with viral filters and should be kept intact. Using open breathing circuits should be avoided and viral filters should be added on to inspiratory and expiratory limbs of the breathing circuit for ventilators. If disconnection of the breathing circuit is necessary, endotracheal tube may be clamped for a short time period and reopened immediately after the circuit is connected in appropriate patients without spontaneous breathing (7). If bagging is required via bag-valve-mask for an intubated patient, viral filters should be added on between the mask and the endotracheal tube.

Preparation and transport of the body should be done organizedly after death. Staff should be wearing N95/FFP2 masks, gloves, fluid-repellent long sleeved gown and eye protection devices while preparing the body after death. Mortuary staff and patient relatives should be informed before the transport.

## Bystander Safety

There should be a previously planned dedicated transport route to each destination. Security precautions during the transport should be taken, arrival destination should be informed for the staff to be ready to handle a COVID-19 patient. Involving the security team may be beneficial to empty the route from bystanders before the transport. The security staff should be wearing a surgical mask.

## Post-transport Decontamination

Staff in appropriate personal protective equipments should perform terminal cleaning along the route right after the patient transport. Personal protective equipments should include surgical mask, gloves, fluid-repellent long sleeved gown and eye protection devices (goggles or a visor) (4). When transport to radiology department for scans is necessary, scans of the patients with COVID-19 may be performed at the end of the day to allow the terminal cleaning of the unit if possible.

## Conclusion

Due to the ongoing worldwide spread of COVID-19, it is expected that healthcare providers will be dealing with the disease for quite a while. It is extremely important to follow all precautions in a complete and appropriate order during the transport of infected patients, since the lack of just one link in the chain of rules can have important consequences. Thus, all efforts in regard to improving intrahospital organization and planning will ultimately contribute outcomes arising from preventable complications during patient transport.

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