

## Using Personal Protective Equipment for Covid-19 in Intensive Care Settings: *Questions and Answers*

*Infection Prevention & Control (IPC) Guidance is developed on the best evidence available at any given time. It is for individual organisations to determine how best to implement it in order to protect their staff & patients. As the first wave of Covid-19 admissions declines, organisations need to consider how best to protect their staff from SARS-CoV-2 infection, but also protect their patients from the spread of other hospital pathogens.*

In this set of questions and answers, the Infection Prevention Society aims to explain how National guidance on the use of PPE needs to be applied to ensure the risk of cross infection between patients is minimised whilst providing appropriate protection from SARS-CoV-2 for staff and patients. We need to ensure that established infection prevention and control practices continue to be performed at a high standard in critical care settings to protect patients and prevent the spread of healthcare-associated infections such as antimicrobial resistant bacteria and *Clostridioides difficile*.

These statements have been developed by Dr Jennie Wilson (Professor, Healthcare Epidemiology, University of West London) and Dr Hugh Montgomery (Professor, Intensive Care Medicine, University College London and Whittington Health NHS Trust) in response to questions asked by staff.

### **Question: Is ICU a high-risk area?**

**Answer:** Since Covid-19 admissions requiring intensive care started to increase in early March 2020, many patients have required aerosol generating procedures (AGPs) that exposed staff to a higher risk of respiratory infection (e.g. intubation, extubation, tracheostomy, CPAP/BiPAP, high flow nasal oxygen). It was therefore agreed that ICU was a high-risk area. However, mechanical ventilation (with closed suctioning) is itself NOT an AGP and, whilst viral clearance might be slowed in the critically ill, they will not remain infectious indefinitely. The presence of a positive PCR from a viral swab does not necessarily mean that the patient remains infectious.

In the absence of a large second wave of infections, intensive care units will (over time) no longer be a high-risk Covid-19 area. Where possible, new admissions with known/suspected Covid-19 should be managed in designated isolation rooms, where those in the room performing an AGP should wear FFP3 respirator, gown and gloves.

**PHE Guidance 5.8.1:** For patients with possible or confirmed COVID-19, any of these potentially infectious AGPs should only be carried out when essential. Where possible, these procedures should be carried out in a single room with the doors shut. Only those healthcare staff who are needed to undertake the procedure should be present.

The situation with regards to high-risk status would need to be kept under review in conjunction with the demand for intensive care for Covid-19 patients.

**Question: Are accidental ventilator tubing disconnections AGPs?**

**Answer:** With the disconnection of the ventilator from the patient, any aerosols will come from the ventilator, not the patient. There may be respiratory droplets from patient secretions, but these are not aerosols.

**Question: The current PHE states that gloves must be worn at the high-risk area. When do I have to put them on and take them off?**

**Answer:** PHE guidance (below) says that gloves and aprons *are subject to single patient use according to standard precautions*. This means that *they must be removed and hands washed* between patient contacts and between tasks on the same patient. This is reiterated throughout the guidance.

The guidance also indicates that local risk assessment is required, and that the optimal boundaries of the high-risk area need to be defined by each organisation including the creation of an area for donning of sessional use items (e.g. mask, gown and eye protection). However, because *gloves and aprons are single use* and adherence to standard precautions is required they *should be donned and doffed close to the patient*. Gloves should be *changed between tasks on the same patient* and aprons changed when moving between patients. Gloves are readily contaminated by pathogens and, if not removed, these pathogens will be transferred to surfaces or patients.

Hands may be contaminated when gloves are removed and therefore *hand hygiene should be performed after gloves are removed and always between every patient contact*.

Once a patient is no longer infectious, then there is NO indication to wear gloves for their care except as indicated by standard precautions i.e. before direct contact with body fluid.

**PHE guidance (24<sup>th</sup> April 2020) on the use of PPE in high risk COVID-19 areas**

**5.8.2 Higher risk acute inpatient care areas**

Long-sleeved disposable fluid repellent gowns or disposable fluid repellent coveralls, FFP3 respirators, eye protection, and gloves must be worn in higher risk areas containing possible or confirmed cases, or as indicated by local risk assessment. If non-fluid-resistant gowns are used, a disposable plastic apron should be worn underneath. Gloves and aprons are subject to single use as per Standard Infection Control Precautions (SICPs) with disposal after each patient contact. Gowns or coveralls, respirators and eye protection may be subject to single session use (see Section 5.6).

A higher risk acute inpatient care area is defined as a clinical environment where AGPs are regularly performed.

**Question: Why can't we use alcohol gel to decontaminate our gloves or wear more than one pair and leave the hands covered by a glove?**

**Answer:** SARS-CoV-2 does not transmit through skin, and can easily be removed by usual hand hygiene (soap and water or alcohol gel). *It is therefore **not necessary to keep hands continuously covered with gloves***. When worn, *it is essential that gloves are disposed of after each patient contact (and between different task on the same patient)*, and *hands must be decontaminated* (using alcohol gel or soap and water) *after gloves are removed*.

Gloves should not be kept on and decontaminated with alcohol handrub as there is insufficient evidence to suggest this practice is safe. Moreover, transmission of pathogens between patients in some ICUs where double gloving and gelling gloves is practiced, provides *in vivo* evidence that these measures are inadequate to prevent cross infection and prevent harm to patients. No Covid-19 guidance (e.g. PHE, WHO, CDC) recommends either double gloving or washing gloves. Current recommendations on IPC in acute care settings in both the WHO hand hygiene guidance and the NICE accredited UK guidance, informed by thorough scrutiny of evidence by IPC experts, should therefore continue to be followed (Loveday et al 2014 Epic3).

**Question: Is it safe for the central work zone to be a 'clean' zone?**

**Answer:** The central work station and Computers-on-Wheels become contaminated if staff are wearing gloves all the time and moving between patients and such shared equipment (desks, computers, phones). This practice INCREASES the risk that pathogens are transferred between patients and is probably a key factor in the transmission of multidrug resistant pathogens between ICU patients. The way to eliminate this risk is to ensure that *gloves and aprons are ALWAYS removed after contact with a patient and hands decontaminated BEFORE touching any of this shared equipment. Hands should then be decontaminated again after touching the equipment*. Once all known/ suspected Covid-19 patients in intensive care can be cared for in single isolation rooms, the rest of the area can be returned to a clean zone.

**Question: Do we need gowns to protect us?**

**Answer:** The major risk to staff is from the **inhalation** of small airborne droplets generated during an AGP. The people performing the AGP are likely the ones at risk. The most important element of PPE is the FFP3 respirator. The mask also prevents accidental hand contact with the mouth, and goggles/ masks with the eyes. Small quantities of live virus from AGPs, or larger respiratory droplets from a non-intubated patient, may settle on clothing. However, to cause infection, the staff member must then transfer the virus from their clothing to their own mucous membranes, via their hands.

A gown helps to protect more of the uniform from contamination when AGPs are being performed. If the patient is no longer infectious, or AGP are no longer being regularly performed on suspected/known Covid-19 patients, then there is no infection control reason to wear a gown. Patients in intensive care can then be safely cared for (as has always been routine practice) by protecting the uniform with a plastic apron as this covers the part that is most likely to become contaminated with body fluid during usual care.

Wearing the same gown for a session of care and moving between different patients and using shared equipment INCREASES the risk of transferring pathogens from one patient to another. Following the guidance to protect the gown with a plastic apron can reduce this risk, however this requires ***aprons to be worn for any direct contact with the patient or their environment and always to be removed with the gloves when leaving the patient.***

**Question: Do hair covers add any benefit in protecting staff? We have got used to using them now.**

**Answer:** The human microbiome on the hair should rapidly destroy the small amount of virus laden droplet nuclei that might land on the hair, and hair covers are not necessary.

#### **References**

Public Health England (2020) COVID-19: infection prevention and control guidance PDF version of GOV.UK guidance. 24-02-2020.

World Health Organisation (2020) Infection prevention and control during health care when COVID-19 is suspected. 19 March 2020. Available: [https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-\(ncov\)-infection-is-suspected-20200125](https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected-20200125)

Loveday HP, Wilson JA, Pratt RP et al (2014) epic3: National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England. J. Hosp. Infect. 86:51 S1-570 [https://www.journalofhospitalinfection.com/article/S0195-6701\(13\)60012-2/fulltext](https://www.journalofhospitalinfection.com/article/S0195-6701(13)60012-2/fulltext)

World Health Organisation (2009) WHO guidelines on hand hygiene in health care. Available: <https://www.who.int/gpsc/5may/tools/9789241597906/en/>

Health Services Scotland. National Infection Prevention and Control Manual. Available: <http://www.nipcm.hps.scot.nhs.uk/>