AMA

COVID-19

TRANSMISSION AND PERSONAL PROTECTIVE EQUIPMENT (PPE)

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COVID-19 Transmission and Personal Protective Equipment (PPE)

Background

COVID-19 is transmitted between people through respiratory droplets and contact routes[1].

The extent of community transmission in Australia remains relatively low according to Commonwealth isolation and contact tracing data.

Droplet transmission occurs when there are virus particles in droplets of secretions e.g. when a person sneezes or coughs. It occurs in close contact (within 1m) with a symptomatic person. Droplets are usually too large to remain in the air for long periods of time. Droplets containing virus can also settle on surfaces in the immediate vicinity of the infected person – contact with which and transfer to your mouth/nose or eyes could result in transmission.

Airborne transmission is different. It refers to smaller, microscopic particles of dust or evaporated secretions which contain virus particles. They may remain in the air for longer and can be transmitted over greater distances than 1m. This is relevant is special medical circumstances only such as when intubation a patient, nebulising medications or performing a bronchoscopy (camera into the lungs). Therefore, this possible mode of transmission is only relevant for medical facilities. The highest risk appears to be with endotracheal intubation, which was associated with six times the risk (compared to control) of contracting SARS[2].

Recent COVID-19 transmission evidence

In analysis of 75,465 COVID-19 cases in China airborne transmission was not reported in any case[1].

Although COVID-19 has been cultured from a single patient stool specimen and toilet bowel[3-4], there are no reported cases of faecal-oral transmission to date.

In a recent study, it was reported that viable virus was measurable on stainless steel and plastic after three days, and in aerosols after three hours[5]. This finding cannot be used to replicate the clinical scenario of aerosol-generating medical procedures given the experimental method for generating the aerosol.

In COVID-19 rooms/wards where air sampling has occurred, there has been no recovered COVID-19 RNA (particles) detected[4,6].

Significant environmental contamination by patients with SARS-CoV-2 through respiratory droplets and faecal shedding suggests the environment as a potential transmission medium and supports the need for strict adherence to environmental and hand hygiene. However in a recent study sampling from frequent touch surfaces in patient rooms are not always positive. Post-cleaning samples from COVID-19 patient rooms were all negative, suggesting that current decontamination measures are sufficient[4].

Patient anteroom and corridor sampling has been negative[4], suggesting the risk of transmission from contaminated footwear is low. This reinforces the view that boots/shoe covers are not required in standard PPE.

In one patient with confirmed virus on a nasopharyngeal swab and in saliva, eight air samples were collected at a distance of 10cm from the patient's chin with and without wearing a surgical mask and no COVID-19 was detected[6].

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Conclusions

Based on emerging evidence regarding COVID-19, current Queensland Health and Commonwealth recommendations regarding PPE remain appropriate. This reinforces the expert view that:

- Surgical masks offer no advantage for well people living in the community. This practice has the potential to create a false sense of safety, especially when the mask is used improperly. It also diverts surgical masks from doctors' practices and hospitals where they have an evidence-based role in protecting staff.
- Doctors and other healthcare workers can be reassured that standard droplet and contact precautions (surgical mask, eye protection, gown and gloves) remain appropriate for the care of COVID patients with mild-moderate disease (which represents the large majority). This level of protection is sufficient when collecting nasopharyngeal/throat swabs from suspect cases.
- Airborne and contact precautions (P2 mask, eye protection, gown and gloves donned and doffed correctly) are only required when conducting an aerosol generating procedure, especially endotracheal intubation, or when caring for a patient with severe, respiratory disease, such as in an intensive care or high-dependency unit.
- Routine care of non-COVID patients can proceed as usual with standard precautions only. There is no need to apply extra precautions or use P2 masks for non-COVID patients (excepting those who are suspect cases who are undergoing further testing).

As emphasised by WHO, the rational and appropriate use of all PPE is critical in the response to COVID-19, which includes appropriate staff training, adequate procurement and availability.

References

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