Use of Personal Ventilation Hoods in the management of COVID-19 patients in NSW Healthcare Facilities

This document was produced with the assistance of staff from Western Health, Victoria Health.

Background

With the onset of the Delta outbreak of COVID-19 in New South Wales (NSW), there has been a rapid increase in the number of patients being admitted to hospital with some requiring either non-invasive ventilation and/or mechanical ventilation. Patients who are infected with Delta have high viral loads, especially early in their course and safe management of these patients in hospital settings is critical.

The application of the hierarchy of controls is essential in reducing the risk of transmission of COVID-19 to staff, patients or visitors. In particular, it is important to ensure air flow, ventilation and air changes/hour are appropriate. In some settings even when hospitals or health services correctly apply the hierarchy of controls, additional ventilation controls may be recommended if ventilation performance is not optimal (after an engineering assessment). This may include the use of air scrubbers and personal ventilation hoods for the management of patients with COVID-19 or other airborne communicable diseases.

The optimal approach and primary recommendation is for central ventilation and room airflow to be adjusted and managed first, and then moving through to these additional layer of controls only where this primary recommendation is limited or unable to meet requirements.

Reference: For more information on hierarchy of controls see CEC Infection Prevention and Control COVID-19 Manual.

Scope

This factsheet provides information about the application of personal ventilation hoods in the care of patients in clinical settings where the hierarchy of controls is already applied. The factsheet does **not provide** information on air scrubbers as these require further assessment and consultation with ventilation experts.

Personal Ventilation Hoods

The personal ventilation hood consists of a mobile steel and plastic frame, a plastic canopy, an exhaust fan and an H13 HEPA filter[1] (See Figures 1 and 2 below). The ventilation hood covers approximately half of an adult patient's body (the frame sits over the bed) and when the power is turned on creates a negative pressure environment within the hood with the aim to reduce particles or aerosols and thereby reduce the risk of transmission of infections such

[1] The H13 HEPA filter is a medical-grade air filter that can remove all particles of 0.21 microns and larger with 99.95% efficiency

as COVID-19. They are not recommended for patients with delirium or dementia. Paediatric sized hoods have been made by request but are not routinely available.

The personal ventilation hood is a novel technology that provides a physical barrier between a patient and the surrounding environment. The ventilation hood creates a negative pressure within the hood by actively extracting air away from the patient and filters expired air through a HEPA filter. The ventilation hood focuses on elimination and engineering controls that act to control the infectious particles at the point source and isolating health workers and the surrounding space from the hazard.

Preliminary data reports that the ventilation hood can remove more than 99.7 per cent of particles larger than 0.5µm and more than 98.1 per cent of particles smaller than 0.5µm[2]. However, it is a relatively new device and there is limited evidence on the effectiveness on the reduction of transmission risk when using the personal ventilation hood in healthcare settings and within the context of the COVID-19 pandemic.

The use of personal ventilation hoods in hospital general, respiratory and ICU wards may be considered by healthcare facilities if deemed necessary and appropriate by relevant stakeholders based on risk assessment and where all other controls are in place or have reached maximum capacity. For example, in an ICU that is an open area with no dedicated rooms; or a COVID-19 ward where multiple patients are being managed with non-invasive ventilation.

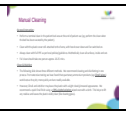
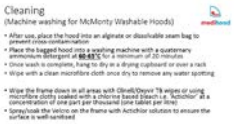
If personal ventilation hoods are used, health workers must be appropriately trained in their installation, use, and cleaning and disinfection protocols must be followed according to manufacturer guidelines. The use of this device will not eliminate the need for appropriate personal protective equipment (PPE) and other infection prevention and control strategies such as standard and transmission-based precautions. These devices are on wheels and therefore mobile. They can also be used with a battery pack to allow safe transportation of patients in a hospital. **Figures 1 and 2**

[2] McGain F, Humphries RS, Lee JH, Schofield R, French C, Keywood MD, et al. Aerosol generation related to respiratory interventions and the effectiveness of a personal ventilation hood. Critical Care and Resuscitation. 2020

Purchase of Personal Ventilation Hoods

If a decision is made to purchase and use personal ventilation hoods, this decision must involve the Infection Prevention and Control Unit Infectious Diseases team, Engineering or Maintenance department and have developed local procedures for use, cleaning and disposal. Follow manufacturer's instructions on installation, maintenance, cleaning and disinfection. However, most of these are being used as a single use item.

Additional Information

Specifications	
Western Health, Victoria, Clinical Practice Guidelines for the use of the personal ventilation hood	
Cleaning information – video by Western Health, Victoria	https://vimeo.com/452485053/530e984083
Cleaning PPT	
Washing Instructions	 Cleaning (Machine washing for McMonty Washable Hoods)