Appropriate use of Hamilton Medical ventilators on patients with highly infectious diseases

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This article gives you an overview of possible measures to ensure protection against internal contamination of the ventilators as well as the protection of patients and clinical staff.

We recommend implementing the following steps to avoid contamination:

- Follow the **instructions for use** of the ventilator and consider the **WHO guidelines**.[1,2]
- Use an **inspiratory bacteria filter** to ensure non-contamination of the internal ventilator gas path.
- Protect the **expiratory valve outlet** with a bacterial filter or connect to a scavenging system, which is directly connected to the hospital suctioning system. The Hamilton Medical scavenging system comes preassembled and ready for installation.
- For **active humidification**, as with a HAMILTON-H900 humidifier, use a bacterial filter on the inspiratory and expiratory port, or alternatively use the Hamilton Medical scavenging system.
- For **passive humidification**, use a bacteria HME/HMEF filter between the proximal flow sensor and the patient to protect the airway against contamination. Be aware of changes in anatomical dead space and airway resistance.
- Contamination of the **flow sensor tube connectors** is avoided due to permanent rinse flow through the flow sensor tubing towards the patient.
- Use the **Stand-by function** prior to disconnecting the ventilator from the patient to avoid mucus dispersion from the circuit.
- Use **single-use consumables,** such as breathing circuits, flow sensors, airway adapters, expiratory valves, and filters, to minimize the risk of cross contamination when the ventilator is cleaned and set up for a new patient.
- Disinfect the outer surfaces of the ventilators during ventilation or after treatment of a patient with a registered hospital **disinfectant**. Consult the hygiene specialist in your facility regarding the appropriate disinfectant and follow the instructions for use of the manufacturer especially regarding contact time.
- For **suctioning,** use a closed inline suction system only.
- Reduce the need for **user interaction with the ventilator** by using Hamilton Medical's INTELLiVENT-ASV mode for intubated patients. INTELLiVENT-ASV continuously adapts the ventilation to the patient condition and requires fewer interactions by clinicians.[3,4]
- All turbine-driven Hamilton Medical ventilators (HAMILTON-C6/C3/C1/T1/MR1) are equipped with high-grade **HEPA filters** to keep the interior airway free of contamination. There is no need to change the HEPA filters more frequently than indicated in your regular maintenance plan.

Make sure that **all clinical staff involved in the handling of the ventilator** are informed about the above-mentioned measures.

1 Infection prevention and control of epidemic- and pandemic-prone acute respiratory infections in health care. World Health Organization. https://apps.who.int/iris/bitstream/handle/10665/112656/9789241507134_eng.pdf?sequence=1&isAllowed=y
2 Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected Interim guidance https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected-20200125
3 Beijers AJR, Intensive Care Med. 2014 May;40(5):752-3.
4 Arnal, J.M.,Minerva Anestesiol, 2018. 84(1): p. 58-67.

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