

RTSO Filter Facts April 9th, 2020 Q&A

1. Does that filter for single limb Trilogy recommended as well? (N100 at vent and HME/filter at patient)?

- All turbine vents have an air intake filter (>5 microns) where room air is drawn into the device.
- Place a main inspiratory flow filter at the device outlet, prior to the patient circuit. Use a Bacteria Virus Filter with at least 99.99% efficiency at <3 microns, or better.
- When using a Single Limb non-heated circuit for an intubated patient, place a HMEF between the patient's artificial airway, and the Exhalation Port. The patient's exhaled gas goes thru the HME-filter before being released to the environment. (Make sure the HME has a Filter incorporated)

*Use best quality HMEF available, lowest resistance, highest efficiency tested at smallest particle size. Monitor the patient for signs of increased work of breathing. Consider adding pressure support to accommodate the increased resistance attributed to the filter. Monitor that the device disconnect alarm still detects with the HMEF at the end of the patient circuit. This is another reason to monitor closely. Ensure there are also Volume alarms as well to detect disconnect and hypoventilation.

When using Single Limb circuit for a patient via a mask interface it critical to ensure the mask DOES NOT have intentional leak.

Match the non-leak style mask with a F-DEP (Filtered -Disposable Exhalation Port 1075775) within the patient circuit and ensure to place a good quality Bacteria-Virus Filter over the outlet of exhalation port to filter exhaled gas before it escapes into the environment. As mentioned above, monitor closely any time filters are added.

HMEF generally not recommended for NIV by mask due to the airway resistance. If this is the only alternative, then as mentioned above monitor closely and consider increased support levels to combat the increased resistance.

Courtesy of Erin Monaghan-Phillips

2. For a PB 560 Ventilator with single limb circuit with heated humidity and not a HME what the is the appropriate filter? should it be placed on the exhalation valve? if so, should it be changed frequently due to moisture?

Ideally a filter is placed on the ventilator side and at the patient wye. Please consult manufacturers device use instructions for further details.

3. Will the PowerPoint be available after this session?

Yes.

4. N100 internal filters in the exhalation manifold of the ventilator: can these be reused? can we sterilize the disposable to conserve supplies?

All medical devices are labelled with specific instructions re: single patient use etc. Please see individual manufactures device use instructions. PIDAC document: any medical device labelled as single use are not to be reprocessed. Please see Health Canada recommendations and guidance.

<https://www.cadth.ca/reprocessing-single-use-medical-devices-2015-update>

<https://www.canada.ca/en/health-canada/services/drugs-health-products/medical-devices/activities/announcements/update-notice-stakeholders-regulatory-approach-commercial-reprocessing-medical-devices-originally-labelled-single-use.html>

5. We are currently changing the HME Q24hours. Would it be reasonable to change it "PRN"? Is there a way to discern whether it's 'time' visually looking at humidity? Thinking of minimizing circuit breaks but not compromising filter efficiency.

It is suggested that you follow filter manufacturer recommendations for guidance. Visually looking is not an accepted best practice and is not supported by manufacturers at this time. Minimizing circuit breaks is a priority. Please see question 16.

6. Some spirometers do not have a filter - easy one eg. I think we should advocate moving forward for using only equipment that allows the attachment of a filter. Or the RRT should use an N95 mask to test. We are not testing right now but we can learn about improving best practices moving forward.

“It is strongly recommended to suspend the test for the confirmed or suspected cases of COVID-19 during the contagious stage, and to postpone the test for other patients if it is not imperative. Medical personnel should mandatorily adhere to the standard stratification of precaution measures. Patients/Subjects should be isolated in a separate area for testing. Disposable in-line filters must be used during pulmonary function testing. Cleaning and disinfection procedures for environment and equipment in pulmonary function testing laboratory should be paid more attention.” Tang, Pei-Fu, Hou, Zhi-Yong, Wu, Xin-Bao, Zhang, Chang-Qing, Wang, Jun-Wen, Xing, Xin, . . . Zhu, Yan-Bin. (2020). Expert consensus on management principles of orthopedic emergency in the epidemic of Corona Virus Disease 2019. Chinese Medical Journal, Chinese medical journal, 16 March 2020.

<https://www.ncbi.nlm.nih.gov/pubmed/32129580>

7. What do you recommend should we need to use gas machines for long term ventilation?

Please see document Canadian Guidance on Purposing Anesthesia Machines as ICU Ventilators & ASA website for up to date directions and tools.

<https://www.cas.ca/en/covid-19>

<https://www.asahq.org/in-the-spotlight/coronavirus-covid-19-information/purposing-anesthesia-machines-for-ventilators>

8. Do you recommend mechanical filters for bag valve mask (BVM) use in a Code Blue situation?

A mechanical filter provides a pleated hydrophobic membrane which is ideal for use in high-humidity environments, such as for critical care ventilators or manual resuscitators. Secretions, pulmonary edema, vomit and blood are commonly encountered during code blue resuscitations and the use of a mechanical filter may be superior to an electrostatic in these cases.

9. Is a Mechanical Filter always a HME?

Electrostatic and mechanical filters are available with or without heat moisture exchange properties. It should be noted that heat moisture exchange products can also be found without filtration. The main three categories of filters are: 1. Filters 2. Filters plus HME (commonly known as FHME) 3. HME only (no filtration)

10. Can you add a filter with active humidity without it becoming saturated with water?

You can expect humidity in this situation. The degree of humidity or speed of saturation of the filter will depend on a variety of factors such as the configuration of your ventilator filters, room temperature etc. Heated expiratory filters (passive or active) can reduce the amount of condensate in the filters.

11. Does every COVID patient on ventilator need an exhalation filter and can it be on every single ventilator or not?

The use of a filter on the exhalation side protects the healthcare environment from viruses and bacteria exhaled by the patient. Please refer to your ventilator device use instructions for guidance and specifications of recommended filters.

12. Re: LTV VENTILATOR. We don't use an HME, just a heated circuit on LTV vent.

Please see attached link from manufacturer. https://www.vyaire.com/sites/default/files/2020-04/vyr-gbl-2000138-ltv1200-series_emergency-setup-card_final.pdf

There is a possibility on some ventilators to change the circuit from a single limb or "J" circuit to a dual limb circuitry. Please consult with your ventilation representative for more details.

13. You have mentioned earlier that if electrostatic filter with heated circuit, water will leak through filter, does that mean virus will go across through the filter as well?

Electrostatic filters offer a high level of microbial removal and low resistance to airflow, however, have notable limitations. The filter membrane is made of a thin, hydrophobic, non-woven polypropylene material which has a permanent electrical charge induced during the manufacturing process. The superficial electrostatic charge attracts bacteria and viruses to oppositely charged sites on the membrane, causing them to become trapped.

Although some electrostatic filters offer a high efficiency rating, their effectiveness may be reduced in humid environments. In circumstances where both moisture accumulation and large pressure changes across the filter medium exist—such as with a cough from a patient on a ventilator or manual resuscitator—the integrity and efficacy of the filter may become compromised. These conditions may allow moisture droplets to pass through the filter, creating the possibility of pathogens to pass as well.

14. When supplies are limited, can HME be used as inspiratory and expiratory filter (with heated circuit)

Please defer to your manufacturer's device use instructions. In the event of a global shortage your ventilator representative should be contacted as an alternate.

15. If we are using mechanical filters with heated circuits for a prolonged period of time (e.g. short in supply), will the filter efficiency decrease over time.

Filter efficiency remains intact for the recommended lifespan cited by your filter manufacturer. Your individual filter vendor will have conducted testing to support its use for the prescribed period.

16. Does filtration efficacy decrease over time? Some of these filters have a maximum 24h use but should we be changing them more often if they are being used at the patient wye?

Filter efficiency remains intact for the recommended lifespan cited by your filter manufacturer. Your individual filter vendor will have conducted testing to support its use for the prescribed period. You may need to change the filter more often in cases where there is noted excess of moisture or increase in resistance. Remember according to the CRTO Infection Control Clinical Practice Guideline May 2008 “ the goal should be to use a system that requires minimal breaks in the ventilator circuit in order to reduce the spread of aerosolized droplets” http://www.crto.on.ca/pdf/PPG/Infection_Control_CBPG.pdf

17. With puritan Bennett, it uses special expiratory filter, if supply is out, what is your thought about havnig PB800 expiratory filter (reuse) with mechanical filter (change q12)

Several ventilators brands and models have proprietary filters or ventilator components. My suggestion is to contact your ventilation representative for direction. Also please refer to question 4 links for Health Canada’s recommendation on re-use of single use devices.

18. What do I use for filters with tracheostomy patients whom are spontaneously breathing?

Please see following webinar link: Putting Safety First During the COVID-19 Pandemic: Practical Strategies for Healthcare Workers and Patients with Tracheostomy by the Global Tracheostomy Collaborative

<https://www.gotostage.com/channel/c4d2288975ce453daf8d9e09860c8da4/recording/5684b06d845b4dd58ee404534687749b/watch?source=CHANNEL>

19. My CPR or ACLS is expiring, will I be granted an exception?

https://cpr.heartandstroke.ca/s/article/COVID-19?language=en_US

20. My NRP is expiring, will I be granted an extension?

Extensions are available until July 31st for NRP providers that are due for renewal

<https://www.cps.ca/en/nrp-prn>

21. Useful links

<https://www.crto.on.ca/members/emergency-preparedness/>

<https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/health-professionals/interim-guidance-acute-healthcare-settings.html#a4.11>

<https://www.cas.ca/en/covid-19>

<https://hcpresources-en.medtronic.ca/ventilation-2?elqTrackId=b5e92c73dc9445fc9ac8b99d9f1599c3&elqaid=2709&elgat=2>

<https://www.rtso.ca/covid-19-resources/>

<https://www.who.int/news-room/commentaries/detail/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations>

<https://hcpresources.medtronic.com/blog/the-role-of-filtration-in-protecting-clinicians-from-contagious-respiratory-pathogens>

Disclaimer: This document is provided for informational purposes only and does not replace formalized training or manufacturer's device use instructions.