



Canadian Agency for  
Drugs and Technologies  
in Health

## RAPID RESPONSE REPORT: SUMMARY OF ABSTRACTS



**TITLE: Hydrophobic Submicron Breathing Circuit Filters for Infection Control: Clinical Effectiveness and Guidelines**

**DATE:** 16 May 2016

### RESEARCH QUESTIONS

1. What is the clinical effectiveness of hydrophobic submicron filters for use in anesthesia breathing circuits?
2. What are the evidence based guidelines regarding the use of hydrophobic submicron filters in anesthesia breathing circuits?

### KEY FINDINGS

No relevant health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, or evidence-based guidelines were identified regarding hydrophobic submicron filters for anesthesia breathing circuits.

### METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library, University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2011 and May 10, 2016. Internet links were provided where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

### SELECTION CRITERIA

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

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**Table 1: Selection Criteria**

<b>Population</b>	Adults and children undergoing anesthesia and needing a breathing circuit
<b>Intervention</b>	A hydrophobic submicron filter (example: PALL Ultipor 25 filter) used in: <ul style="list-style-type: none"> <li>• a breathing circuit that is marketed as a reusable circuit (filter changed between patients)</li> <li>• a breathing circuit that is marketed as single use but is being reused between patients, with the filter changed between patients</li> </ul>
<b>Comparator</b>	single use, single patient breathing circuit
<b>Outcomes</b>	Q1: infection risk, cross contamination, patient safety Q2: guidelines regarding the use of hydrophobic submicron filters, guidelines regarding the reuse of breathable circuits with the filters.
<b>Study Designs</b>	Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, evidence-based guidelines

## RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

No relevant health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, or evidence-based guidelines were identified regarding hydrophobic submicron filters for anesthesia breathing circuits.

References of potential interest are provided in the appendix.

## OVERALL SUMMARY OF FINDINGS

No relevant literature was identified regarding hydrophobic submicron filters for anesthesia breathing circuits; therefore, no summary can be provided.

## REFERENCES SUMMARIZED

### **Health Technology Assessments**

No literature identified.

### **Systematic Reviews and Meta-analyses**

No literature identified.

### **Randomized Controlled Trials**

No literature identified.

### **Non-Randomized Studies**

No literature identified.

### **Guidelines and Recommendations**

No literature identified.

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**APPENDIX – FURTHER INFORMATION:**

**Clinical Practice Guidelines – Methodology Not Specified**

1. Infection prevention and control guidelines for anesthesia care [Internet]. Park Ridge (IL): American Association of Nurse Anesthetists; 2015. [cited 2016 May 13]. Available from: <http://www.aana.com/resources2/professionalpractice/Documents/Infection%20Prevention%20and%20Control%20Guidelines%20for%20Anesthesia%20Care.pdf>  
See: *Anesthesia Breathing System*, page 16
2. Anesthesia equipment reprocessing [Internet]. Vancouver (BC): College of Physicians and Surgeons of British Columbia; 2015 Apr. [cited 2016 May 13]. Available from: <https://www.cpsbc.ca/files/pdf/NHMSFP-AS-Anesthesia-Equipment-Reprocessing.pdf>
3. Checking anaesthetic equipment [Internet]. London: The Association of Anaesthetists of Great Britain; 2012. [cited 2016 May 13]. Available from: [http://www.aagbi.org/sites/default/files/checking\\_anaesthetic\\_equipment\\_2012.pdf](http://www.aagbi.org/sites/default/files/checking_anaesthetic_equipment_2012.pdf)  
See: *Airway Equipment*, page 12

**Non-Randomized Studies – Alternate Intervention**

4. Hübner NO, Daeschlein G, Lehmann C, Musatkin S, Kohlheim U, Gibb A, et al. Microbiological safety and cost-effectiveness of weekly breathing circuit changes in combination with heat moisture exchange filters: a prospective longitudinal clinical survey. *GMS Krankenhhyg Interdiszip* [Internet]. 2011 [cited 2016 May 13];6(1):Doc15. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3252668/pdf/KHI-06-15.pdf>  
[PubMed: PM22242096](#)

**Laboratory Studies**

5. McGain F, Algie CM, O'Toole J, Lim TF, Mohebbi M, Story DA, et al. The microbiological and sustainability effects of washing anaesthesia breathing circuits less frequently. *Anaesthesia*. 2014 Apr;69(4):337-42.  
[PubMed: PM24502257](#)
6. Heuer JF, Crozier TA, Howard G, Quintel M. Can breathing circuit filters help prevent the spread of influenza A (H1N1) virus from intubated patients? *GMS Hyg Infect Control* [Internet]. 2013 [cited 2016 May 13];8(1):Doc09. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3746606/pdf/HIC-08-09.pdf>  
[PubMed: PM23967395](#)
7. Spertini V, Borsoi L, Berger J, Blacky A, eb-Elschahawi M, Assadian O. Bacterial contamination of anesthesia machines' internal breathing-circuit-systems. *GMS Krankenhhyg Interdiszip* [Internet]. 2011 [cited 2016 May 13];6(1):Doc14. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3252669/pdf/KHI-06-14.pdf>  
[PubMed: PM22242095](#)

### Review Articles

8. Juwarkar CS. Cleaning and sterilisation of anaesthetic equipment. *Indian J Anaesth.* 2013 Sep;57(5):541-50. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3821272>  
[PubMed: PM24249888](#)
9. Wilkes AR. Heat and moisture exchangers and breathing system filters: their use in anaesthesia and intensive care. Part 1 - history, principles and efficiency. *Anaesthesia.* 2011 Jan;66(1):31-9.  
[PubMed: PM21106035](#)
10. Wilkes AR. Heat and moisture exchangers and breathing system filters: their use in anaesthesia and intensive care. Part 2 - practical use, including problems, and their use with paediatric patients. *Anaesthesia.* 2011 Jan;66(1):40-51.  
[PubMed: PM21118189](#)

### Additional References

11. Reusable anesthesia breathing circuits considered [letter]. *Newsletter: official journal of the Anesthesia Patient Safety Foundation [Internet].* 2011 [cited 2016 May 13];26(2). Available from: [http://www.apsf.org/newsletters/html/2011/fall/06\\_dearsirs.htm](http://www.apsf.org/newsletters/html/2011/fall/06_dearsirs.htm)