Alberta Health Services

Therapeutic Interchange Supplemental Information

March 2020

Therapeutic Interchange: Nebule to Metered Dose Inhaler (MDI) with Spacer

Why are we implementing a province-wide therapeutic interchange for certain respiratory medication nebules?

- **To reduce the risk** of spread of infection, drug exposure to staff, medical air/oxygen misconnect, and adverse effects to patients, any order for nebulized ipratropium(Atrovent®), salbutamol(Ventolin®), budesonide(Pulmicort®), or ipratropium/salbutamol (Combivent®) will automatically be interchanged to a metered dose inhaler (MDI) with spacer whenever possible (see rare exceptions listed below).
- MDI with spacer produces outcomes that are at least equivalent to administration by nebulizer in both adults and pediatrics in the emergency department and inpatient settings.[1,2]
- Past experience within AHS and Covenant Health has been favorable.

What are the details of this therapeutic interchange?

- Upon receipt of an authorized prescriber's order for salbutamol (Ventolin®), ipratropium (Atrovent®), budesonide (Pulmicort®), or ipratropium/salbutamol (Combivent®) nebules (other than the exceptions listed below), a pharmacist will apply the approved interchange dosage via MDI with spacer.
- This therapeutic interchange has the lowest complexity at level 1 (or low complexity), meaning that NO additional patient specific information is required and minimal pharmacist assessment is required.
- The dose conversions have been used successfully within AHS and Covenant Health (and are supported in the literature); prescribers can still order any dose they choose if they order an MDI first.
- As with any medication, it is important to do a patient assessment of dose response.
- For dose conversion details, contact your local pharmacist.

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What are the exclusion criteria for this therapeutic interchange?

- Treatment by wet nebulization is restricted to orders meeting these criteria:
    - Severe asthma or status asthmaticus; **OR**
    - Patients who cannot be treated with MDI and spacer; **AND**
    - Orders adherent to one of these reasons MUST indicate 'Do Not Sub' and MUST indicate one of these above-listed reasons
- **NICU and neonatal patients are excluded** from this therapeutic interchange.

Do we need to purchase anything to comply with this therapeutic interchange?

- Yes, spacers must be purchased and available on hand, ready to attach to the MDI.

Which spacers are recommended for different patient ages and for those who are ventilated?

- **Using an MDI without a spacer is not recommended.**
- Though other products exist in the warehouses, here are the recommended:
    - **Up to age 4:** Supplier item number T0110650300010 (small sized mask) or T0110650200010 (medium sized mask)
    - **Ages 4 and up:** Supplier item number T0110650500010 (mouthpiece**)
    - **Ventilated patients:** Supplier item number T0185851 (collapsible spacer) or RTC 22D (adapter)
- **If the patient is over 4 yrs old and can hold their lips tightly around a mouthpiece and breathe through their mouth, they can generally use the preferred mouthpiece-type spacer (Supplier item number T0110650500010). In addition to other beneficial factors, **this mouthpiece-type spacer costs ~$20 less** than the mask-type spacer.
- Select the spacer with the best fit. Mask-type spacers should cover the nose and mouth snugly.
- Developmental or cognitive concerns may make use of a mouthpiece-type spacer difficult and may require a mask-type spacer.
- Some patients may have facial characteristics (e.g. small lower jaw, chubby cheeks) which mean that a size based on age alone may not fit.

Has the cost impact resulting from this therapeutic interchange been assessed?

- Yes. Pharmacy Services continues to gather nebule and MDI/spacer usage for the province, for all impacted medications. Combined with the experience of sites and zones that had previously made this practice change and including the cost of the various spacers, they're comfortable with costs of this practice. Cost analysis gives confidence that overall increase to direct costs will be negligible - with significant benefits gained.

How do I learn and teach patients the appropriate medication delivery technique?

- When used with a spacer, proper technique for MDIs becomes easier to achieve.

- Find Alberta's translated standardized technique instruction handouts at: https://cumming.ucalgary.ca/research/icancontrolasthma/resources/devices (Arabic, Chinese, English, Farsi, French, Hindi, Korean, Punjabi, Spanish, Tagalog, Urdu, Vietnamese)
- View and/or refer patients to short demonstration videos at: https://www.lung.ca/lung-health/get-help/how-use-your-inhaler (Canada) https://www.nationalasthma.org.au/health-professionals/how-to-videos (Australia)

What has been the experience of others who have made this therapeutic interchange?

- Many different therapeutic interchanges that select for delivery of drugs by MDI with spacer are already implemented throughout AHS and Covenant Health.
- Alberta jurisdictions have successfully provided therapy through MDI with spacer for the past several years, including through the Alberta Childhood Asthma Pathway (ACAP).

*What routine Infection Prevention and Control practices are required for **MDIs & spacers**?*

- Spacers are almost always considered single patient use devices; MDIs are always single patient use.
- Single patient use devices are not shared between patients and should be cleaned according to manufacturer instructions between uses on the single patient.
- Some spacer types are sold by the manufacturer as re-processable and re-usable. **Despite the manufacturers' instructions, we recommend that all spacers are treated as single patient use devices.** This recommendation is based on a review that included costs, provincial experience, time, safety, and supplies.
- In discussion with the Medical Device Reprocessing Department (MDRD) & Infection Prevention and Control (IP&C), it becomes difficult and time-consuming to track the number of cleanings per spacer and the cost savings are negated when you consider the time spent by staff.

*What routine Infection Prevention and Control practices are required for **nebulizers**?*

- Use of nebulizers is considered an Aerosol Generating Medical Procedure (AGMP).
- It is important to ensure that, when an aerosol is necessary, it is delivered as safely as possible.
- A point of care risk assessment is always necessary for AGMPs.
- Point of care risk assessment includes determination of whether respiratory symptoms are present (cough, fever, TB). If yes, a risk assessment is performed and the decision to isolate the patient and don PPE is made accordingly.

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What evidence supports this therapeutic interchange?

1. Cates CJ, Crilly JA, Rowe BH. Holding chambers (spacers) versus nebulizers for beta-agonist treatment of acute asthma. *Cochrane Database of Systematic Reviews* 2006, Issue 2. Art. No.: CD000052. DOI: 10.1002/14651858.CD000052.pub2.

2. Dolovich MB, Ahrens RC, Hess DR, Anderson P, Dhand R, Rau JL, Smaldone GC, et al. Device Selection and Outcomes of Aerosol Therapy: Evidence-Based Guidelines: American College of chest Physicians/American College of Asthma, Allergy, and Immunology. Chest 2005;127:335-71.

3. O'Malley C. 2015. Device Cleaning and Infection Control in Aerosol Therapy. Respiratory Care. Vol . 60 No 6.

4. Public Health Agency of Canada. 2011. Prevention and Control of Influenza during a Pandemic for All Healthcare Settings. Annex F. Retrieved from http://www.phac-aspc.gc.ca/cpip-pclcpi/assets/pdf/ann-f-eng.pdf

5. Tran K, Cimon K, Severn M, Pessoa-Silva CL, Conly J (2012) Aerosol Generating Procedures and Risk of Transmission of Acute Respiratory Infections to Healthcare Workers: A Systematic Review. PLoS ONE 7(4): e35797. doi:10.1371/journal.pone.0035797

If your question is not addressed here, please contact your local Pharmacy Department.