



# Inhaler Tamper Seal SBAR

Prepared for Pharmacy Operations



**DISCLAIMER – The data regarding number of inhalers purchased provincially and at Island Health is confidential and has been edited with fictional numbers to illustrate the environmental impact analysis.**

## Situation

Metered-dose inhaler (MDI) waste at Island Health leads to an outsized environmental impact on the Health Authority's carbon footprint and has significant financial implications. One possible area for improvement is to review where pharmacy places the MDI tamper seal, so that an MDI that is dispensed but not used by a patient can be re-dispensed to a different patient rather than wasted.

## Background

MDIs contain hydrofluoroalkane (HFA), a potent greenhouse gas that expels the medication from the canister with each actuation. Each MDI contains the greenhouse gas equivalent of driving between 112 to 290 km by car.<sup>1-2</sup> Island Health purchases over 9,500 salbutamol inhalers yearly which corresponds to 100,000 tonnes CO<sub>2</sub>, or the equivalent of driving almost 500,000 kilometers in a standard gasoline powered vehicle.<sup>3</sup> Because of their outsized environmental impact, MDIs are an easy target for intervention to decrease our healthcare-related carbon footprint.

Island Health is committed to operational excellence and providing high quality care through climate change response. The Island Health strategic framework includes active support of environmental sustainability best practices which include climate-conscious prescribing to minimize carbon footprint.<sup>4</sup> The Critical Air Project is a climate-conscious prescribing initiative based at Island Health whose mandate is to decrease healthcare-related GHG emissions through an evidence-based quality improvement framework; it has been endorsed by the Medication Safety and Therapeutics Quality Council (MSTQC).

Our review of practices across the health authority reveals there are two ways in which MDIs are tamper sealed (Images A & B). At Royal Jubilee Hospital (RJH) and Victoria General Hospital (VGH), MDIs are placed in a plastic bag with a tamperproof seal across the top before being sent to the ward (Image A).



Image A – tamper seal across plastic bag



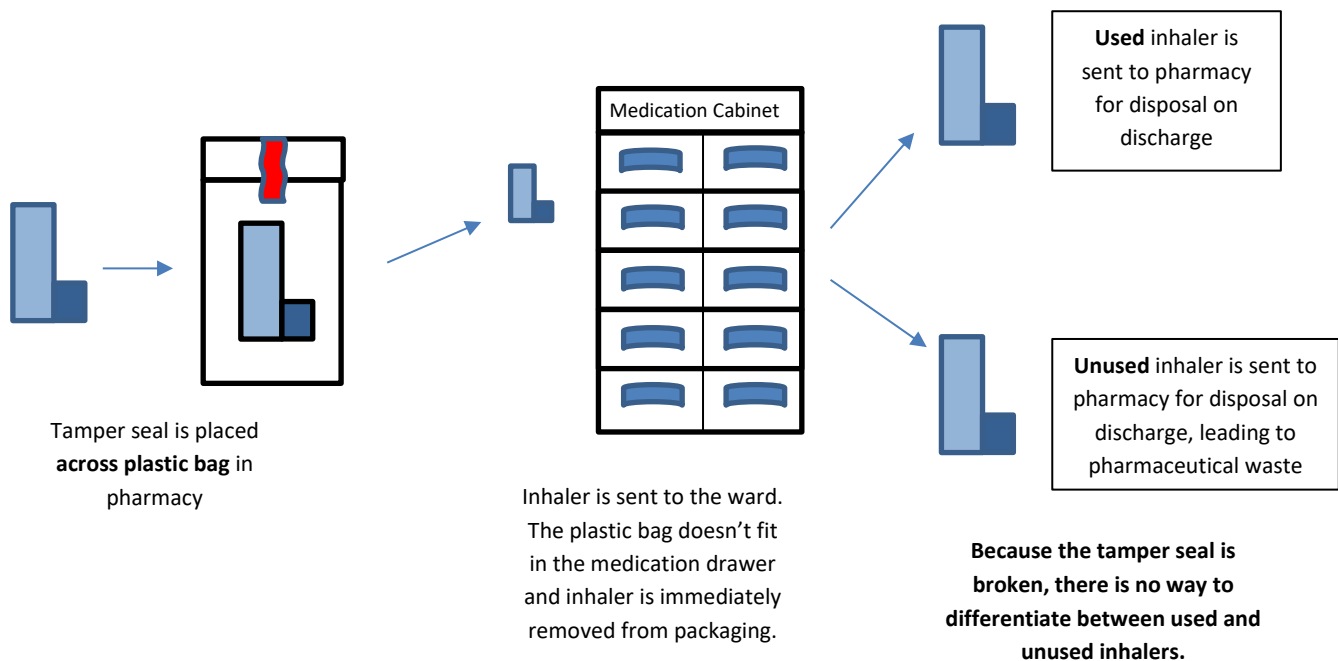
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Image B – tamper seal across inhaler cap

Once on the ward, the inhaler is placed in a patient’s designated drawer on a medication cart by nursing. This plastic bag does not fit in the medication drawer and our survey shows that a significant percentage of nurses immediately remove the inhaler from the plastic bag to place it in the patient-specific medication drawer, thereby breaking the tamper seal.<sup>5</sup> This leads to unintended consequences, illustrated in Schema A. Once the tamper seal is broken, there is no reliable way to determine whether the inhaler has been used by the patient. Therefore, each inhaler without a tamper seal will be sent for disposal at the end of a patient’s hospital stay, whether it has been in contact with the patient or not.

This leads to waste of unused inhalers that could otherwise be repurposed, increased pharmaceutical disposal costs for the Health Authority and significant climate impact due to the carbon intensive nature of MDIs.



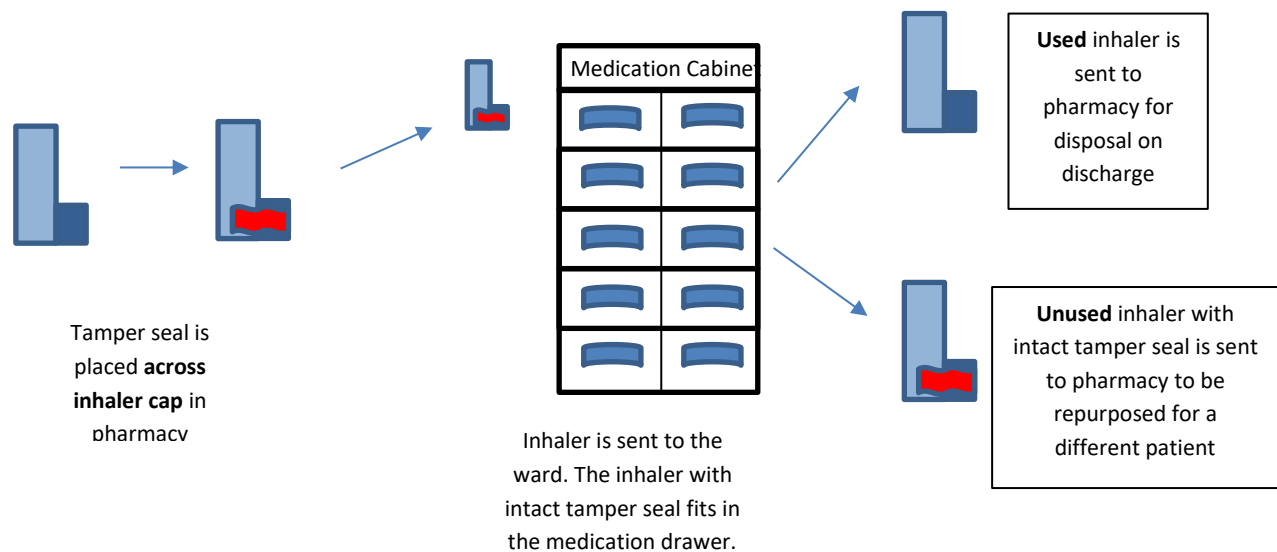
Schema A; Current inhaler tamper seal location and clinical implications at RJH and VGH

Excluding RJH and VGH, all other hospital pharmacies at Island Health place the tamper seal across the inhaler cap (Image B; see Appendix 1).

Among sites with the tamper seal across the inhaler cap, representatives describe it is visually obvious to determine whether the seal is intact. At these sites, if an unused inhaler with an intact tamper seal is returned to pharmacy, it is disinfected and repurposed for a different patient (Schema B; see Appendix 1).

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Schema B; Proposed inhaler tamper seal location and clinical implications at RJH and VGH. Current state at other Island Health sites.

## Assessment

A local practice survey and environmental scan of practice has found that the inhaler tamper seal location at RJH and VGH (Image A) has led to unintended consequences including waste of unused inhalers, which has significant financial and environmental implications. Other sites across the island employ a different tamper seal location (Image B) that allows unused MDIs to be dispensed to a different patient, resulting in less waste.

## Recommendation

At RJH and VGH, we recommend relocating the tamper seal across the inhaler cap (Image B) and adopting a model similar to the one already in place other Island Health sites (Schema B). This would be a practice change for pharmacy operations at RJH and VGH.

We have reviewed this proposal with Dr Infection-Control-Physician, division head for medical microbiology and medical director for Microbiology & Infection Prevention at Island Health. Dr Infection-Control-Physician reviewed the current state and proposed changes. She did not identify any infection control-related concerns with relocating the tamper seal across the inhaler cap. Infection Control is supportive of the proposed change.

Dr Infection-Control-Physician presented this proposal to the Infection Prevention and Control Group. They recommended standardizing the repurposing of unused inhalers to include cleaning with an Acel wipe prior to returning to circulation.

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The environmental impact is potentially significant and positive. The current practice leads to waste of unused inhalers, each of which contains up to 28,200 kg CO<sub>2</sub>e. With each unused inhaler that be repurposed, we save the GHG equivalent of driving between 38.8 and 290 km by car.<sup>1-2</sup> At a Health Authority level, this number is multiplied manyfold.

We anticipate a positive financial impact for Island Health, through decreasing inhaler waste which will lead to:

- Less need to purchase new inhalers if unused inhalers can be repurposed
- Lower disposal cost from decreased pharmaceutical waste

If the recommendation is accepted, leaders in pharmacy operations at RJH and VGH would need to ensure all their pharmacy technicians and assistants are aware of the change in practice to move the location of the tamper seal when dispensing MDIs, as well as to inspect the tamper seal when returned to pharmacy and if intact, remove patient label and return to stock to be re-dispensed.

## Relevant players to implementation

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Pharmacy Operations Coordinator, VGH	redacted
Pharmacy Technician Supervisor, VGH	redacted
Pharmacy Technician Supervisor, RJH	redacted

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## Amendment History

Date	Version	Comment	Author(s)
22Dec2022	1	Survey results assembled and first draft written	Valeria Stoynova
29Dec2022	2	SBAR conformed to Island Health template	Valeria Stoynova, Celia Culley
4Jan2023	3	Edited for clarity. Documented referenced.	Valeria Stoynova, Celia Culley
3Feb2023	4	Edited to include updated recommendations from infection control regarding unused inhaler repurposing	Valeria Stoynova
3Feb 2023	5	Redacted version created for Playbook	Valeria Stoynova

## References

1. CASCADES. Environmentally sustainable opportunities for health systems. 2022. Retrived from <https://cascadescanada.ca/wp-content/uploads/2022/07/June-2022-Inhalers-Infographic-Updated.pdf>
2. Stoynova V *et al.* Detailed inhaler comparison chart. 2022. Retrieved from: <https://cascadescanada.ca/resources/tools-templates/#inhalers>
3. HealthPRO Procurement Services. PHSA Purchasing Data 2021-2022 Fiscal Year, unpublished.
4. Island Health. Island Health's 2020-2025 Strategic Framework. Accessed November 21<sup>st</sup>, 2022 from <https://medicalstaff.islandhealth.ca/news-events/island-healths-2020-2025-strategic-framework>
5. Deng, M *et al.* An Assessment of Inhaler Workflow and Disposal Practices Among Nursing Staff. Island Health Pharmacy Summer Student Project 2022.

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## Appendix 1 - Survey of current practice and responses

- 1) When an inhaler returns to your dispensary with the tamper seal **intact**, do you return it to inventory and/or do you dispense it again to a different patient?
  - return to inventory
  - return to inventory and re-dispense
  - We return it to our Rx Inventory and then dispense to the next pt
  - Yes, we reuse them
  - We return it to inventory to be reused. It is NOT set aside in a special place to only be used to PSBs.
  - RJH Yes
  - VGH Yes, if an inhaler returns with the tamper tape intact, we return it to inventory
  
- 2) If yes, what is the process for doing this in terms of cleaning it, managing labels on it (eg. do you remove the old label or cover it with a new label or something else?), anything else you do/consider?
  - WCGH wipe w cavi wipe and return to shelf and crediting
  - NRGH returned inhalers are treated the same as our other returned medications like vials, etc. They are wiped down with Accel wipes after all patient specific labels have been carefully removed. Then we return them to stock to be re-dispensed.
  - NIH We remove the old label. At this point we do not clean as it never made it to the pt bedside.
  - SPH Remove old label and attach new patient label. If it's in sealed baggy, no need to clean it again.
  - CRH We (typically the fill person D8) confirms the tamper tape and cartridge are intact and the product is in good dating then completes the credit, removes the old patient label and puts the inhaler in the yellow return bin by the boxpicker. It is now returned to our inventory. I personally have not done any cleaning of an inhaler nor have I seen a co-worker clean them.
  - VGH Remove the old label, replace with a new one. The inhaler is dispensed in a Ziploc bag, and we tamper tape the bag closed, so it returns clean.
  
- 3) Is it sometimes difficult to tell if the tamper seal is broken?
  - WCGH easy to see if tamper tape has been tampered with
  - NRGH It usually isn't difficult to tell. If it is unclear, we throw away the inhaler.
  - NIH Not usually. If it looks sketchy in any way, we discard.
  - SPH usually easy to tell
  - CRH I have not seen a "questionable" tamper tape on a returned inhaler. I've found it visible obvious.
  - RJH easy to tell
  - VGH No, it is not difficult

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4) What type of tamper seal do you use for MDIs at your site: A or B or something else (if something else, please send picture)

- Answers

- A 2/7
- B 5/7



Image A – tamper seal across plastic bag



Image B – tamper seal across inhaler cap