

The Climate Conversation: Incorporating Planetary Health into Shared Decision-Making

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Presenter Disclosure

Presenter: Wendy Levinson

- None to declare

Presenter: Samir Gupta

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 - **Other:** Inventor of the Electronic Asthma Management System and shareholder in spinoff company for computerized decision support - EAPOC

Questions for the Audience

- Have you ever talked to a patient about the potential impact of climate change on their individual health?
- Have you discussed with patients the pros and cons of different testing or treatment options as a function of their differing climate impacts?

Learning Objectives

- Describe how low-value care contributes to health system emissions and environmental impact
- Identify opportunities to incorporate climate considerations into shared decision-making conversations
- Apply practical tools and language to support patient-centered, climate-conscious care in clinical settings



Winnipeg

Fires could continue burning over winter: province

By [Danton Unger](#)

Published: November 25, 2025 at 6:21PM EST

Manitoba's zombie fires

Eric Rader, Wilderness Committee campaigner, breaks down zombie fires, caribou impacts, and why hotter forests demand stronger fire response.

For more information
03:50 / 04:35

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ENVIRONMENT

Wildfires in N.W.T. rage as smoke prompts air quality warnings in Prairies



By [Sean Previl](#) • Global News

Posted September 3, 2025 3:18 pm · 4 min read



Northern wildfire smoke

NEWS

CBC

British Columbia

B.C. wildfire season extends into fall, until stormier weather arrives

Fire prohibitions remain in effect for much of province



QUIZ

How do carbon emissions from the healthcare industry compare to the airline industry?

- a) Healthcare emits **LESS** carbon emissions
- b) Healthcare emits **MORE** carbon emissions
- c) Healthcare emits roughly the **SAME** amount

**Healthcare in Canada contributes 5% to our carbon emissions*

Should we talk about climate change with our patients?



Four reasons to talk about climate change

1 Physicians and patients are concerned—climate anxiety.

2 Unnecessary tests and treatments are potentially harmful to patients AND to the environment.

3 Part of shared decision making.

4 Some patients are on MDIs—potent greenhouse gas emitters.

Health Professionals' Views on Climate

- Survey of **304 physicians** (57.5% response rate)
- **90%** think doctors should support sustainable healthcare
- **35%** willing to limit treatment options to ↓ environmental impact
- **74%** recommend lower-impact meds (+ inform alternative)
- **72%** think physicians should participate in hospital sustainability programs; **71%** think clinical practice change needed

Patient Perspectives in Climate Change

Survey of **289 patients** (response rate 56%)

- **76%** want to ↓ healthcare's environmental impact (only **31%** know how)
- **5%** discussed environment & health with doctor
- **97%** say doctors should support sustainable healthcare

When 2 medicines equal in benefit, risk, cost but differ in environmental impact...

- **55%** want doctors to recommend greener option (but informed about the other option)
- **25%** prefer harmful options not be mentioned

Actions Clinicians Can Take on Climate



Consider whether tests or treatments are necessary.

01



Substitute treatments.

02



Implement improvements in quality.

03



Change routine practices.

04



Advocate to change health systems.

05

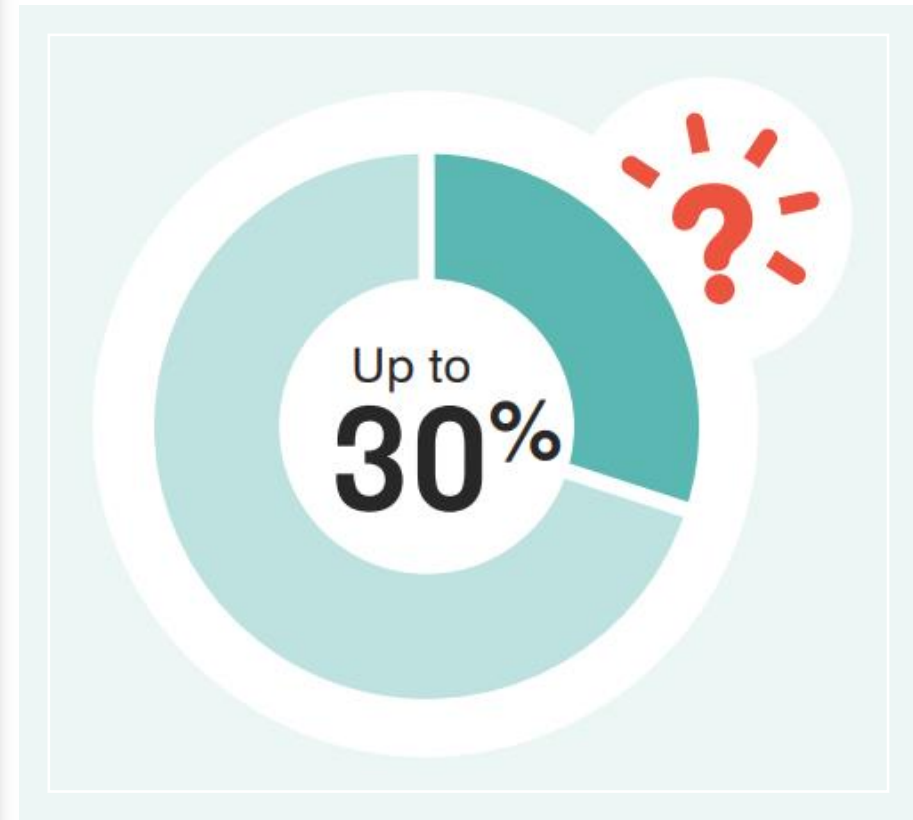


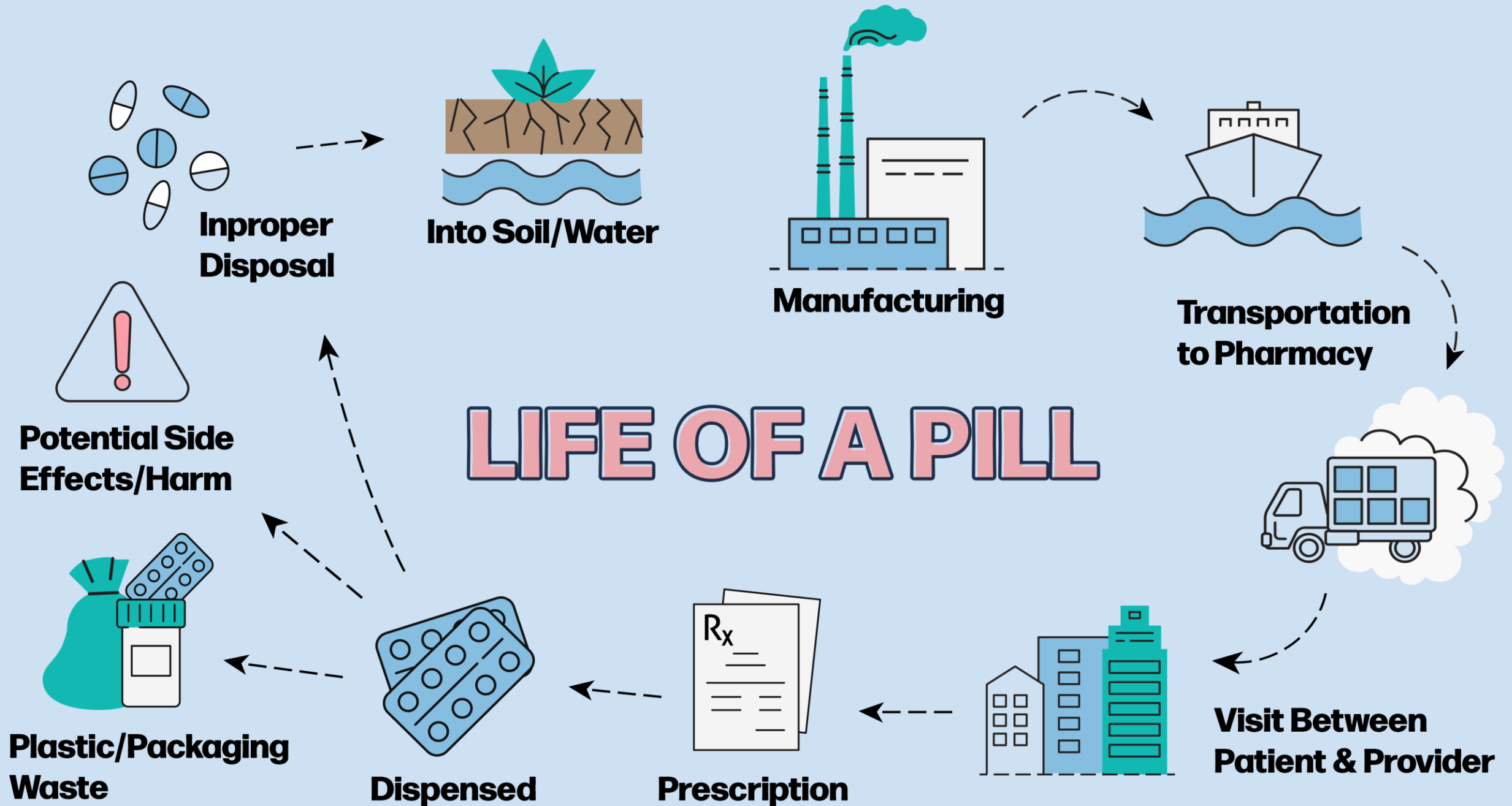
Overuse of Tests and Treatments in Canada

Progress Report
November 2022

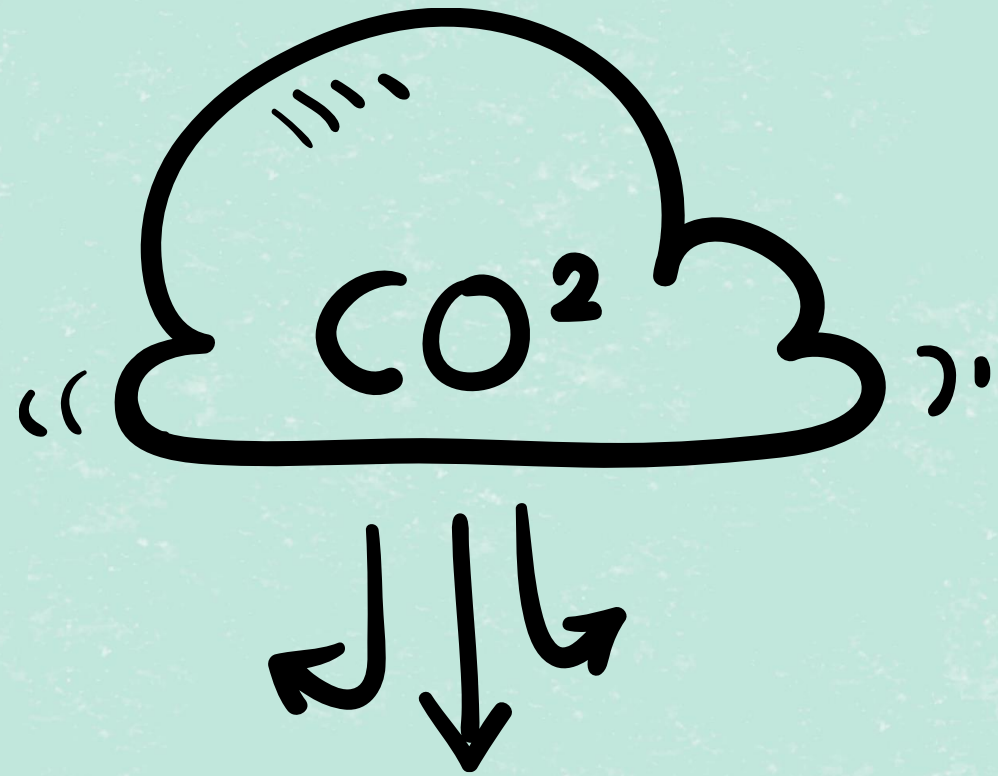
Choosing Wisely Canada

Canadian Institute for Health Information
Institut canadien d'information sur la santé





Everything we do has
a carbon footprint, so
let's eliminate what's
unnecessary.



CHOOSING GASES WITH LOWER GLOBAL ENVIRONMENTAL IMPACTS

1 HOUR use of **DESFLURANE**



is equivalent to a **370 KM** ^{CAR} JOURNEY⁶



compared to **50 KM** ^{CAR} JOURNEY for **1 HOUR** use of **SEVOFLURANE**⁶

Climate-Conscious Recommendations



77 climate-conscious recommendations, developed by **27** clinician societies that aim to improve planetary health without compromising patient care.



www.choosingwiselycanada.org/climate

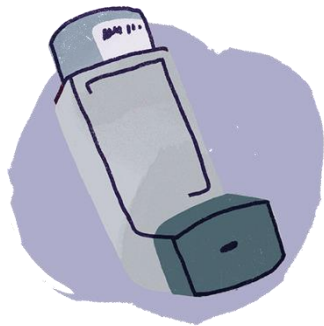
Choosing Wisely & Climate Action



Don't use gloves when hand hygiene is sufficient. | Canadian Critical Care Society



Don't continue an intravenous medication when clinically appropriate to step down to oral therapy. | Canadian Society of Hospital Pharmacists



Don't prescribe greenhouse gas-intensive MDIs for asthma [...] where an alternative inhaler with a lower carbon footprint [...] containing medications with comparable efficacy is available, and where [...] patient preference has been considered. | Canadian Thoracic Society

Choosing Wisely & Climate Action

Don't use desflurane when other anesthetic drugs and techniques are equally effective and less harmful to the environment. | Canadian Anesthesiologists' Society

Don't routinely open all case cart items unless they are or become necessary to the procedure. | Canadian Association of General Surgeons

Don't dispose of non-contaminated wrapping materials in contaminated waste bins. | Canadian Orthopaedic Association

Shared Decision-Making

Seek your patient's participation.

01

Help your patient explore and compare treatment options.

02

Assess your patient's values and preferences.

03

Reach a decision with your patient.

04

Evaluate your patient's decision.

05

Healthcare's Carbon Footprint: The Role of Inhalers

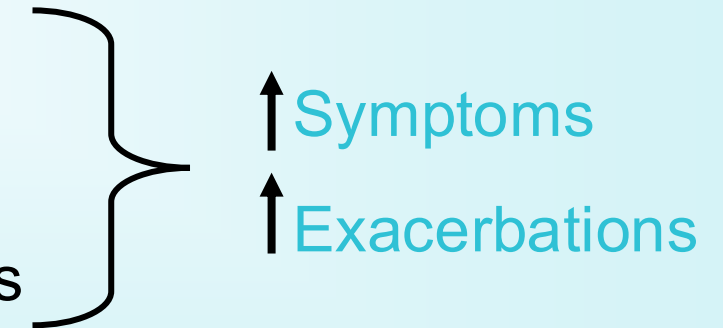


- The metered-dose inhaler (MDI)
 - To generate aerosol clouds, MDIs use various hydrofluorocarbons (HFCs) as propellants, which are potent GHGs
 - Production, use and disposal of a single canister of the most commonly prescribed MDI release an amount of GHGs that is equivalent to a 137-km car journey
 - MDIs account for 3.5% of the UK Health System's carbon footprint



The Irony...

- The very patients who use these GHG-emitting devices for respiratory diseases bear a **disproportionate burden** of the harmful health effects of climate change
- How?
 - **Heat waves**
 - Increases in **particulate matter** (pollution)
 - Including through forest fires
 - Higher **pollen** concentrations and longer pollen seasons



Hong C, Proc Natl Acad Sci USA, 2019

Jain P, Nat Clim Chang, 2022

Tiotiu, Int J Environ Res Public Health, 2020

Anderegg, Proc Natl Acad Sci USA, 2021

Device Selection

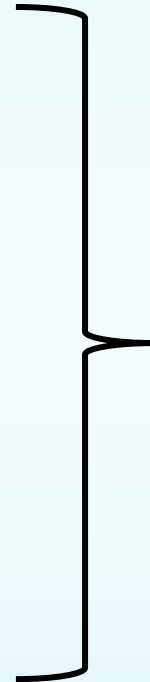
- Depending on the type and amount of propellant used, the production, use and disposal of an MDI has an overall carbon footprint that is 8–12 times higher than that of DPIs or SMIs
- Almost every class of medication for asthma and COPD has a DPI/SMI option, in some cases for the same molecule
 - Even when patients do need/want an MDI, some MDIs have a lower carbon footprint than others
- Some treatment approaches featuring DPIs as opposed to MDIs are considered to be of equivalent efficacy
- US Data: lowest GHG inhaler replacement would reduce GHGs by 92% and social costs of inhalers from 5.7B to 470M (10 years)

Yang, CJRCCSM, 2021

Feldman, JAMA, 2025

Market Distribution

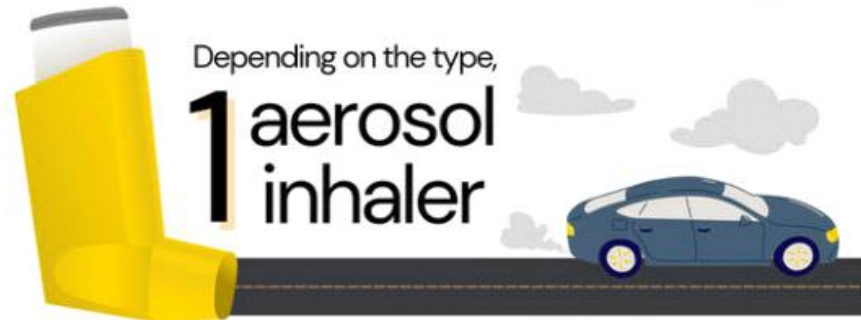
- In **asthma, MDIs comprise:**
 - 94% of SABA agents
 - 56% of ICS agents
 - 47% of ICS/LABA agents
- In **COPD, MDIs comprise:**
 - 95% of SABA agents
 - 47% of ICS/LABA agents
 - 100% of SAMA agents



**Avoidable
MDI Use**



Thinking about how you can be
more climate friendly?



Depending on the type,
**1 aerosol
inhaler**

can have the same carbon footprint
as driving up to **170 km**
in a gas car*

However, there are
greener inhaler options!

Talk to your provider

about whether any of these **greener options** might be right for you!

To learn more, visit
cascadescanada.ca/yourinhaler

*Stoynova V, Culley C, Liang K. Detailed Inhaler Carbon Footprint Chart. Available from
cascadescanada.ca/resources/inhalers/

This project was undertaken with the financial support
of the Government of Canada.

Canada 

What Would GHG Alterna

- Asthma/COPD:
 - Switching 25%
 - Switching 25%
equivalent strat
 - Switching 25%

Total



cting Lower

olving an MDI to an
n footprint MDI

ually

- 58 300 passenger vehicles off the roads each year

Caveat: Not Everyone Can Use a DPI...

- Very young
- Very old
- Acute exacerbation
- Suboptimal PIF (e.g. severe disease)
- Dexterity/vision/coordination/cognition issues (technique)
- Cow's milk protein allergy

Even if you **can**, you **MUST** be **educated** and **evaluated** carefully with any start, and especially with a switch

What Could Possibly Go Wrong?

- Switch with inadequate education
 - Incorrect technique
 - Poor adherence
 - Patient inability to use new device



Exacerbation



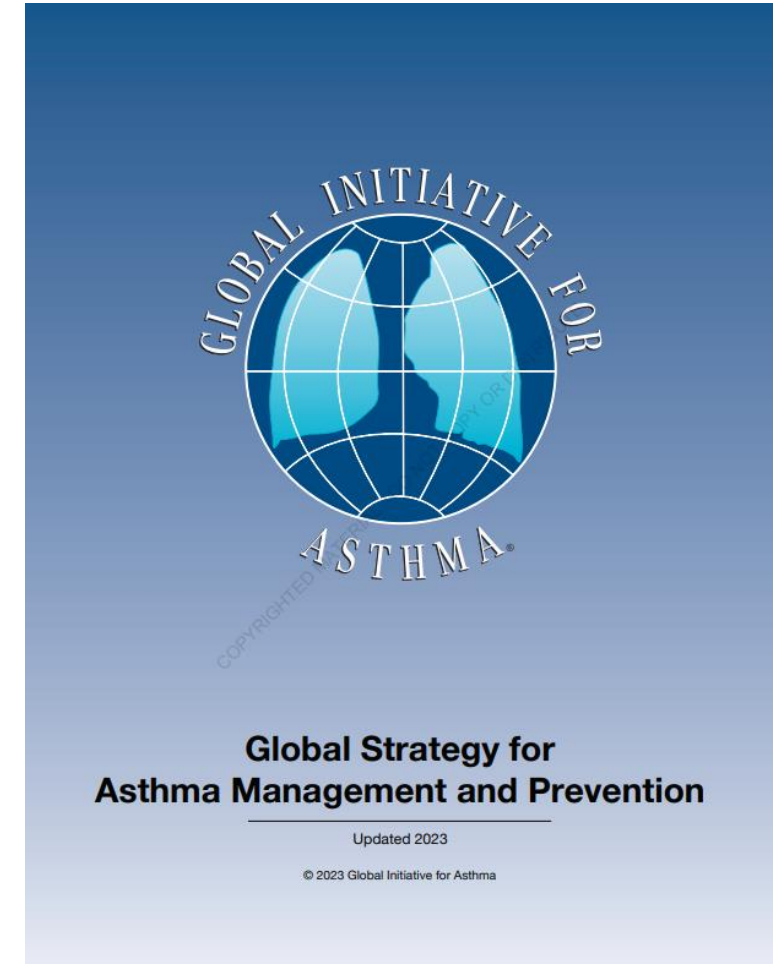
1 day of hospitalization = 6 months of MDI utilization

GUILT!!

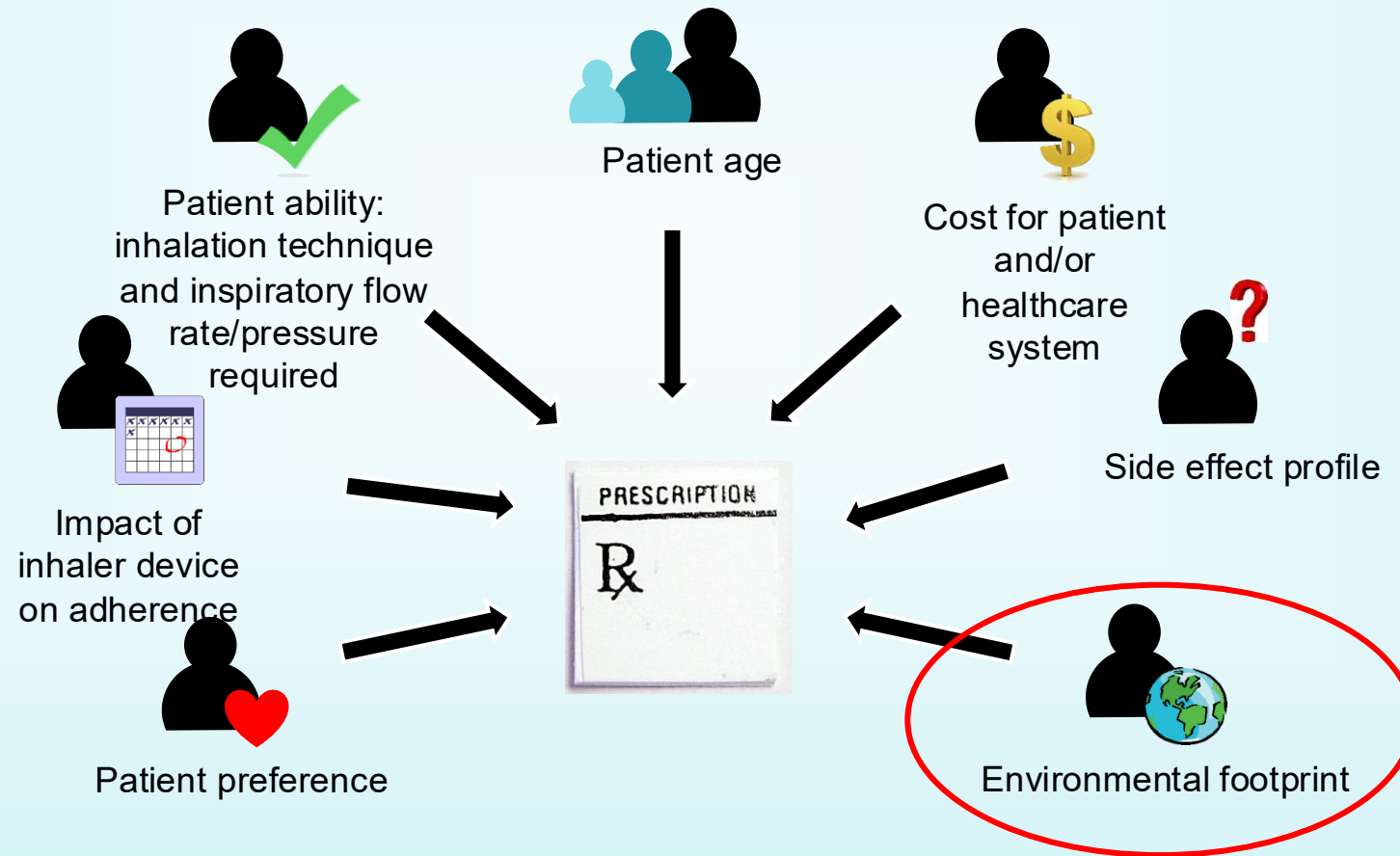


Clinicians need to be aware of the potential to place an additional burden on patients of so called “*green guilt*”

“Clinicians need to be aware of the potential to place an additional burden on patients of so called “*green guilt*”, which could impact negatively on adherence and increase the risk of exacerbations.”



Inhaler class and device selection requires careful **consideration** with active **patient engagement**:



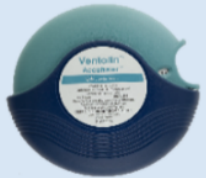









A 45-year-old otherwise healthy female with longstanding well-controlled asthma presents to her general practitioner for a routine visit, and requests a salbutamol metered-dose inhaler (MDI) prescription renewal.

Which Inhaler Device Should Your Patient Use for Asthma Symptom Relief?

A Conversation Aid



Considering a new device? Always remember **safety first!**
 Can the patient properly use the device? Is education being provided? Will they adhere to its use? **Hover for more!**

Your inhaler options:	Dry Powder Inhaler			Metered Dose Inhaler	
	Reliever only		Reliever containing steroid	Reliever only	
	<p>Ventolin (salbutamol) Diskus (200 mcg, 1 puff/dose) 60 puffs per device Approved for Ages ≥4</p> 	<p>Bricanyl (terbutaline) Turbuhaler (500 mcg, 1 puff/dose) 100 puffs per device Approved for Ages ≥6</p> 	<p>Symbicort (budesonide/formoterol) Turbuhaler (200/6 mcg, 1 puff/dose) 120 puffs per device Approved for Ages ≥12</p> 	<p>Teva-Salbutamol HFA (100 mcg, 2 puffs/dose) 200 puffs per device Approved for Ages ≥4</p> 	<p>Ventolin (salbutamol) HFA Apo-Salbutamol HFA Salbutamol HFA (Sanis) (100 mcg, 2 puffs/dose) 200 puffs per device Approved for Ages ≥4</p> 
<p>Carbon Footprint Per inhaler¹</p>	<p>Equivalent to 3 KM</p>  <p>in gas powered car journeys</p>	<p>Equivalent to 2 KM</p>  <p>in gas powered car journeys</p>	<p>Equivalent to 4 KM</p>  <p>in gas powered car journeys</p>	<p>Equivalent to 47 KM</p>  <p>in gas powered car journeys</p>	<p>Equivalent to 137 KM</p>  <p>in gas powered car journeys</p>
<p>Approximate retail cost per inhaler²</p>	<p>\$15 (plus the cost of a maintenance steroid inhaler, unless asthma is very mild)</p>	<p>\$10 (plus the cost of a maintenance steroid inhaler, unless asthma is very mild)</p>	<p>\$105 (no maintenance inhaler needed if asthma is mild or very mild)</p>	<p>\$10 (plus the cost of a maintenance steroid inhaler, unless asthma is very mild)</p>	<p>\$10 (plus the cost of a maintenance steroid inhaler, unless asthma is very mild)</p>

A 45-year-old otherwise healthy female with longstanding well-controlled asthma presents to her general practitioner for a routine visit, and requests a salbutamol metered-dose inhaler (MDI) prescription renewal.

Introducing the concept

Since we are considering renewing your prescription, it's a good time to re-evaluate your ventolin inhaler, and make sure that you're aware of all your options. Is that OK?

Providing education

I know you have been on this type of inhaler – called a metered dose inhaler, or MDI - for a number of years now.
You may or may not be aware that these MDI inhalers contribute to climate change because they emit greenhouse gases. But there are actually newer devices available now called dry powder inhalers, or DPIs, that are also an option for you, and don't have that environmental impact.

Comparing pros and cons of each option

There's a DPI that contains the same medication as your current ventolin MDI, but will reduce the carbon footprint of your treatment by about 90%. Here's how they compare (show Conversation Aid).

Discussion

**Inhaler Selection Conversation Aid
(and more!):**

lungtoolkit.com

EXTRA SLIDES

Disposal Matters Too...

- There is often **medication remaining** in the device when MDIs are thrown out (with proportional propellant!)
 - Many patients cannot reliably identify when their **MDI is empty**
 - Especially because most do not have a dose counter
 - ~30% of devices have **substantial medication remaining** at disposal
 - ~70% end up in a **landfill**
- In a landfill, propellant **leaks out**, contributes to GHGs, and leftover medications contaminate local water
- Patients can return inhalers to *some* **pharmacies** (5 provinces) – but these are **incinerated and not recycled** (“Health Steward”)
 - A 30-40% GHG savings with incineration
 - Harmful chemical release from plastic incineration



A Better Option: Recycling

- Compared to landfill disposal, recycling saves 4-18 kg CO₂ (eq) per inhaler
- Infrastructure and planning for disposal/recycling is lacking in Canada
- Enter GoZero:
 - Separates inhaler materials
 - Both the metal and plastic are recycled, processed, and sold for reuse
 - Propellant gases are extracted, neutralized
 - Only powdered medications are incinerated after they have been extracted
 - GoZero boxes are shipped directly to sites and include a prepaid return label



Market Forces Drive Innovation

Trixeo Aerosphere approved in the UK as first inhaled respiratory medicine using next-generation propellant with near-zero Global Warming Potential



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