Climate Impact of Inhalers:

A call for professional practice change

Webinar developed by Kimberly Wintemute, Brenda Chang, Samantha Green, and Gabrielle Busque. Presented December 9th, 2021

Land Acknowledgement

We wish to acknowledge this land on which the University of Toronto operates. For thousands of years it has been the traditional land of the Huron-Wendat, the Seneca, and the Mississaugas of the Credit. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land

University of Toronto

Objectives

- Examine two recognized problems related to inhaler prescribing:
  - Over-prescribing, where no diagnosis is confirmed
  - Choice of inhaler type
- Explore carbon footprint of health care systems, and how inhalers contribute to it
- Imagine practice change that results in immediate reduction in greenhouse gas emissions: “High value, Low Carbon Care”

Structure of this Session

- Case Study
- Background
- Tools for Clinical Practice Change, Including Practice Assets
- Questions/Sharing of Ideas

Case Study

Lauren, age 25

- Requests renewal of salbutamol metered-dose inhaler (MDI)
- First prescribed 5 years ago
- Renewed twice since, without reassessment
- “I use it for my asthma every time I get a cold”

Lauren, age 25

- Does not use spacer device
- Will cough for three weeks if does not use inhaler
- Has never had breathing tests
- Chest clear, vital signs normal

Discussion: Poll Questions

1. What are we treating?

- Post-viral cough
- Typical upper respiratory infection
- Asthma
- Unknown

1. Is this inhaler “medically necessary”?

- Yes
- No
- I don’t know – more information is needed

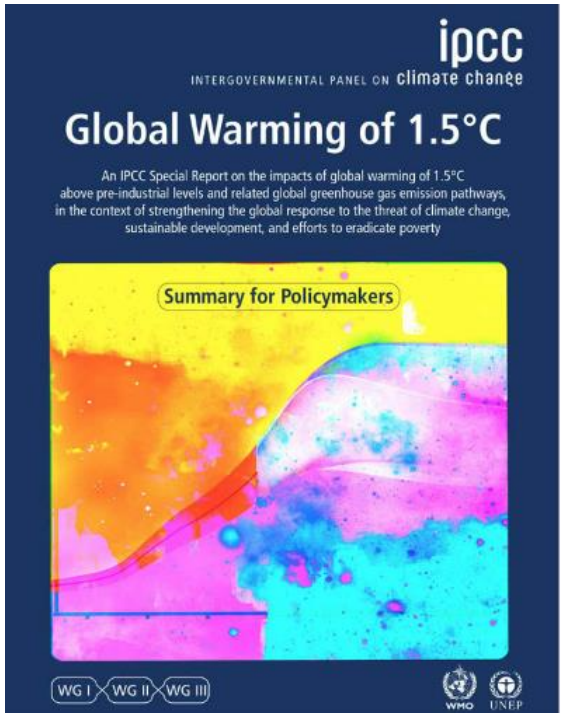
Background

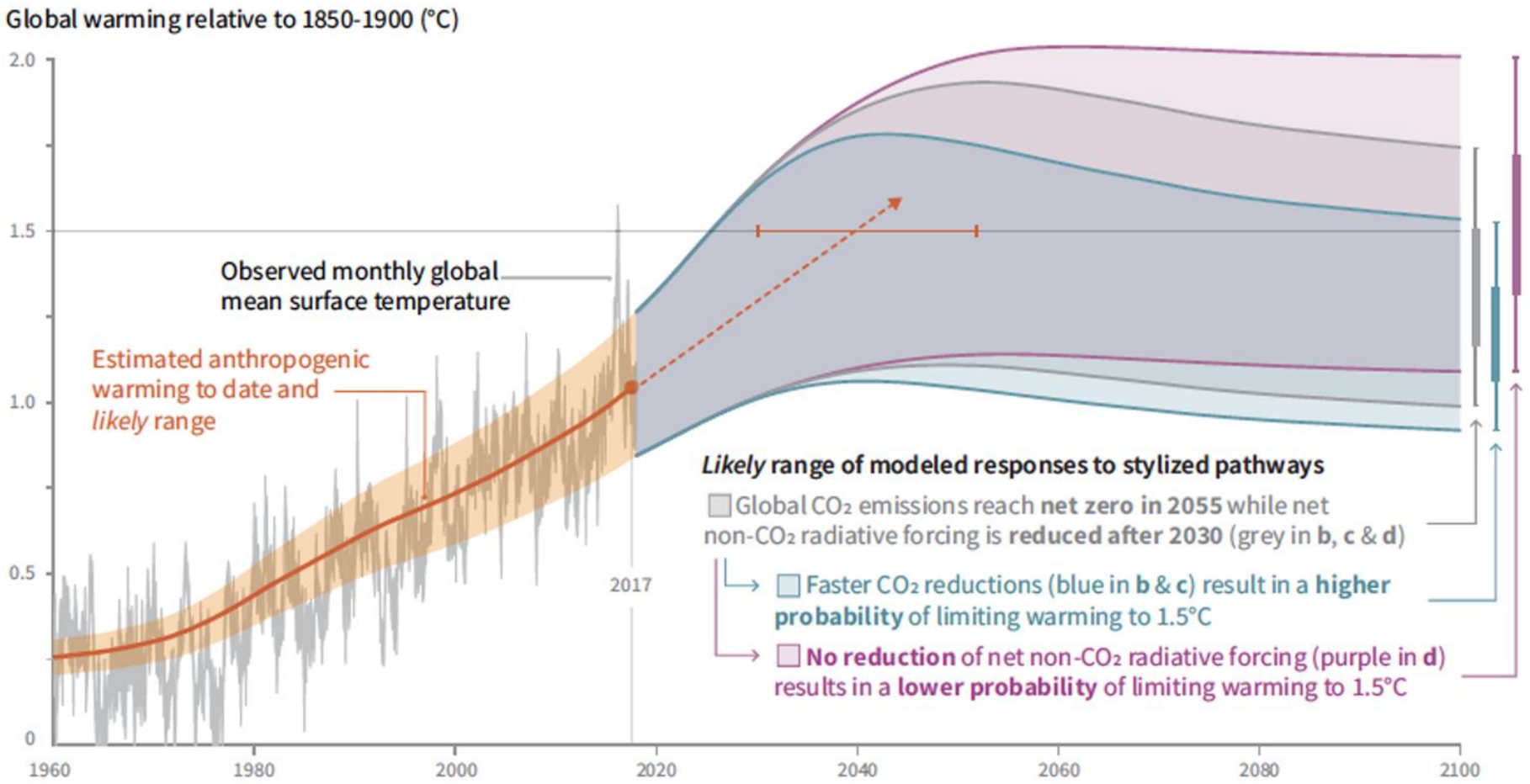
Climate Crisis

Intergovernmental Panel on Climate Change 2018:

10-12 years to avoid catastrophic and irreversible warming

Climate Crisis





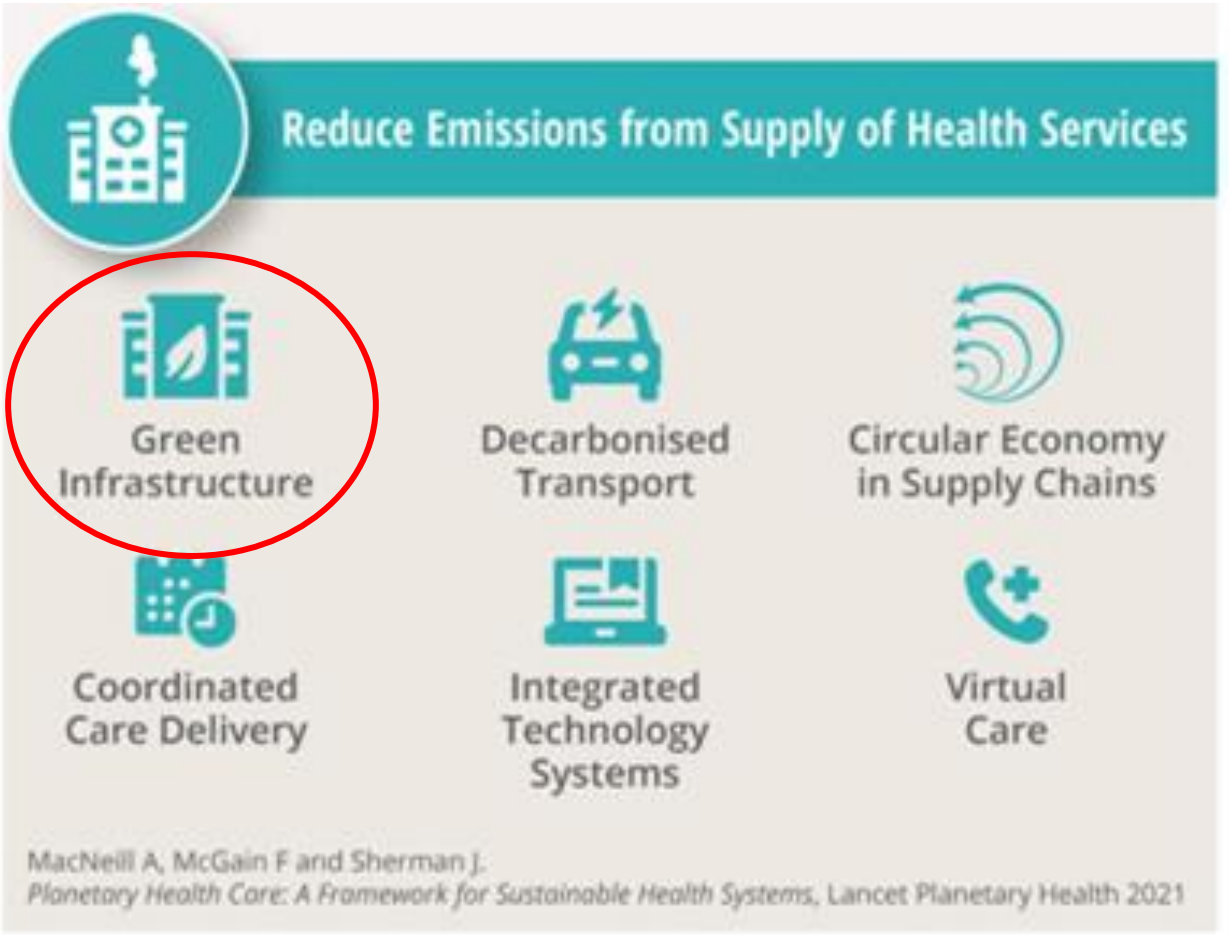
Climate Change in Canada

What is our role in Health Care?

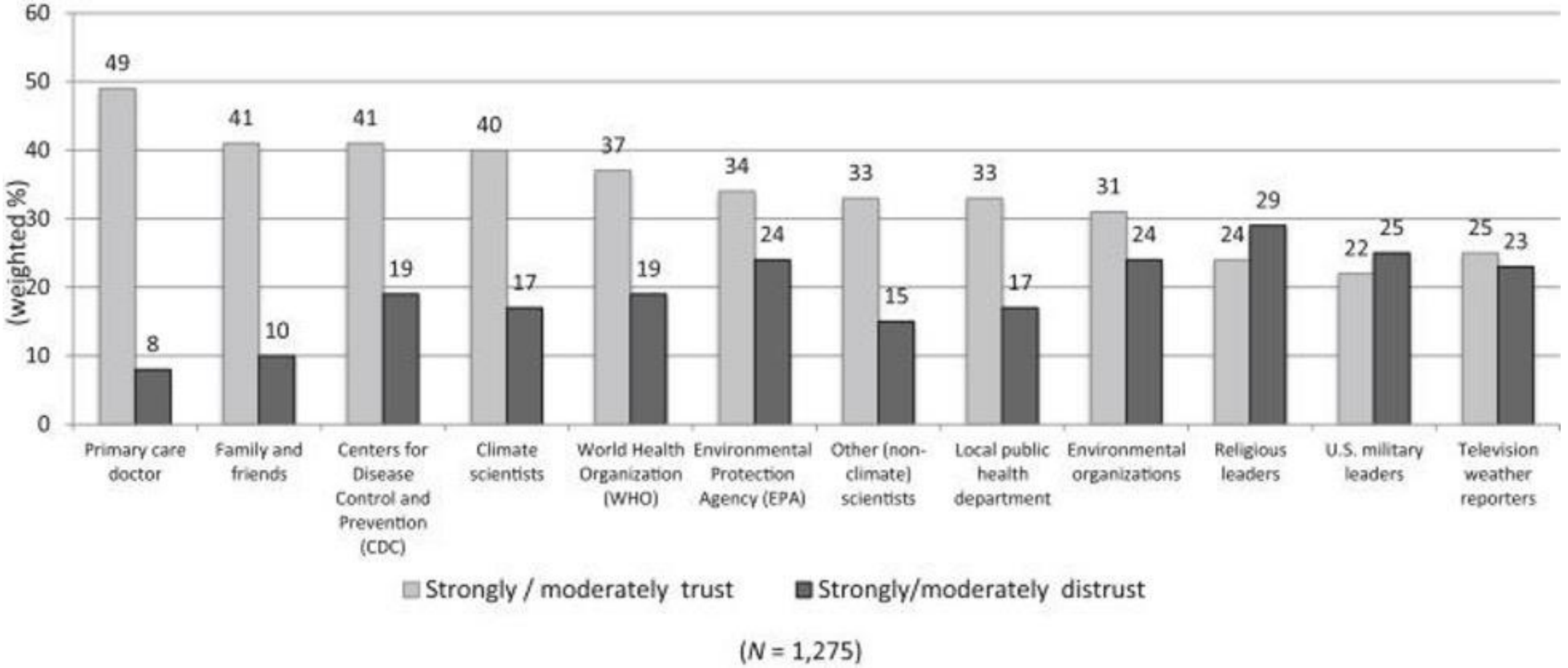
- Health care systems generate greenhouse gas emissions [1,2]
- Emissions contribute to poor health of individuals and populations [1,2]
- Multiple inextricable links between health and climate change [2,3]

1. Eckelman MJ, Sherman JD, MacNeill AJ. Life cycle environmental emissions and health damages from the Canadian healthcare system: an economic-environmental-epidemiological analysis. PLoS medicine. 2018 Jul 31;15(7):e1002623
2. The 2020 report of The *Lancet* Countdown on health and climate change. Available at https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)32290-X/fulltext
3. Canadian Medical Association. Available at https://www.cma.ca/news/physicians-concerned-about-climate-change-and-its-worsening-impact-health-cma-survey

Sustainable Healthcare System



We Are Trusted Voices



(*N* = 1,275)

Primary Care Prescriptions

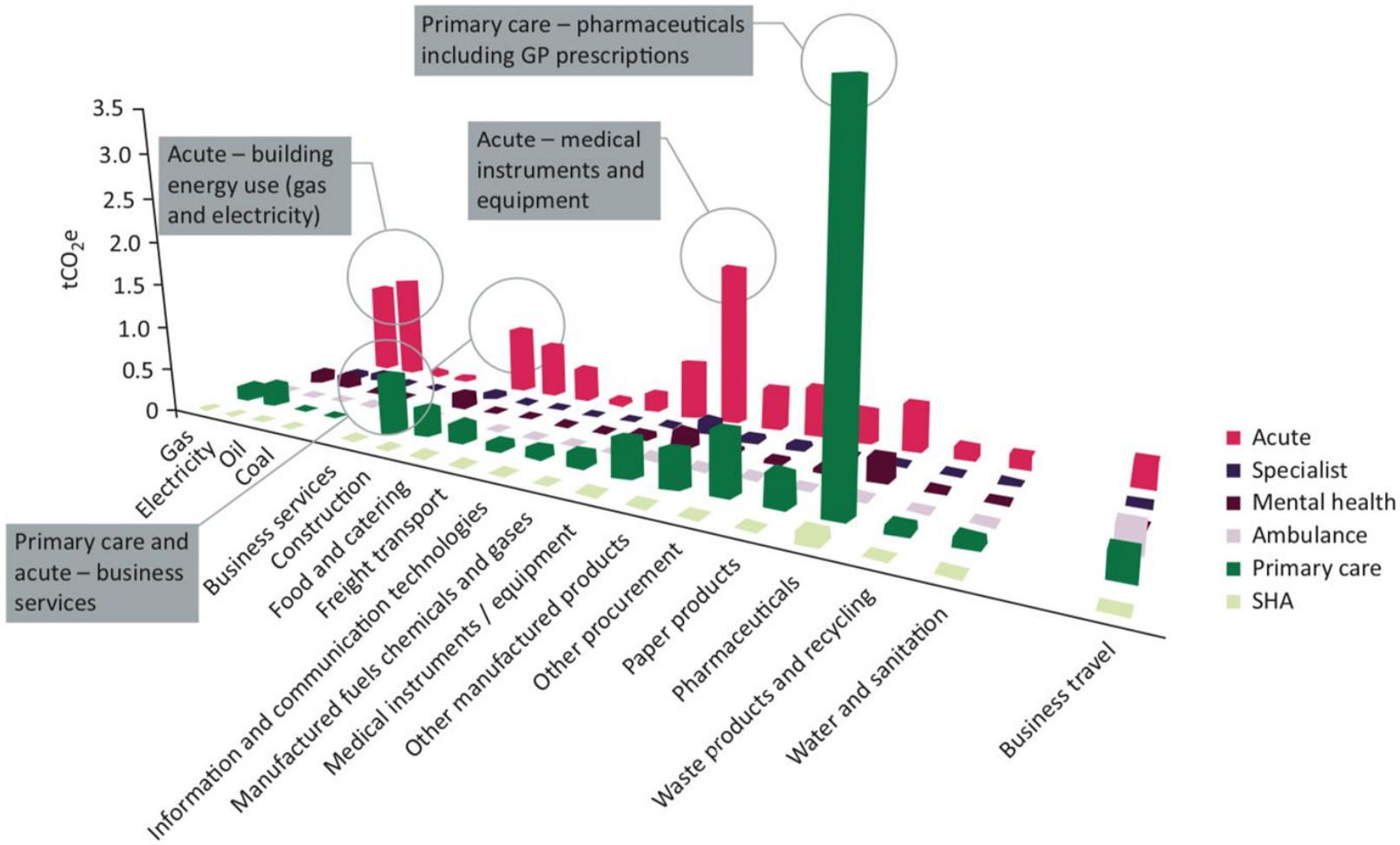
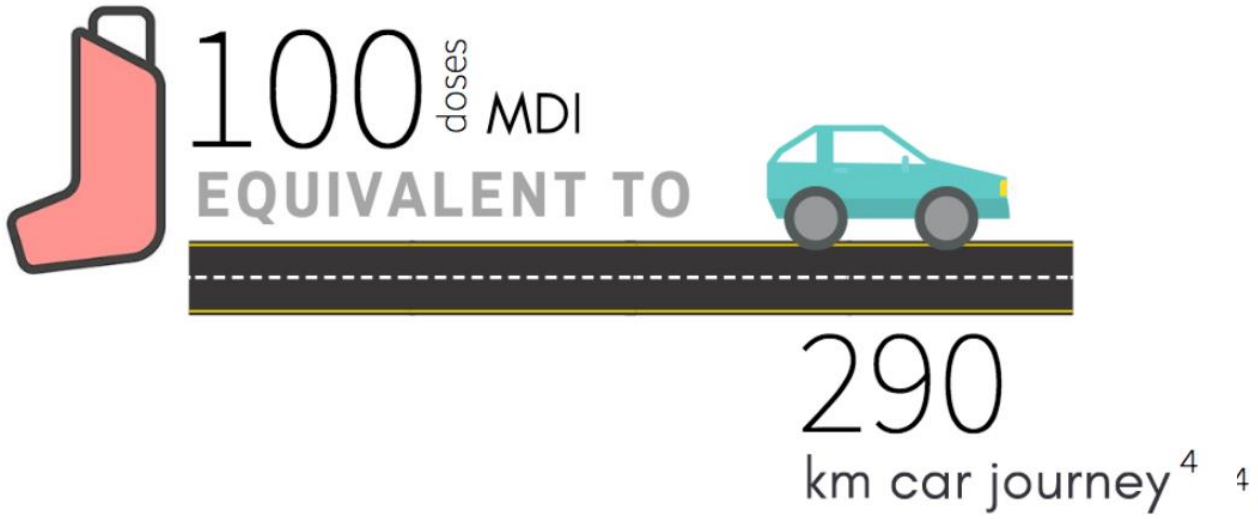


Fig 4. Goods and services carbon hotspots by healthcare sector. Source: *Goods and services carbon hotspots*. NHS Sustainable Development Unit, 2012.[10]
Reproduced with permission. SHA = strategic health authority

Inhalers

- Inhaler propellants are potent greenhouse gases



- Significant contributor to carbor footprint of healthcare sector

CENTRE FOR SUSTAINABLE HEALTH SYSTEMS

Centre for Sustainable Health Systems, University of Toronto.
https://www.sustainablehealthsystems.ca/inhalers

Proposed Action to Curb MDI-Related Emissions

- **Develop suitable prescribing practices around inhalers**
- **Encourage MDI alternatives**
- Ensure appropriate inhaler usage
- Practise sustainable recovery and recycling of inhalers

CENTRE FOR SUSTAINABLE HEALTH SYSTEMS

Institute of Health Policy, Management and Evaluation
UNIVERSITY OF TORONTO

Reliability of a “Diagnosis” of Asthma

- 1/3 patients labelled with asthma do not have asthma on objective testing [1,2]
- 80% of those with negative test results were on medication for asthma [1]
- If the basis of a patient’s diagnosis of asthma has not previously been documented, confirmation with objective testing should be sought [2]

1. Aaron et.al. JAMA. 2017; 317(3): 269-279. Re-evaluation of Diagnosis in Adults With Physician-Diagnosed Asthma
2. Global Initiative for Asthma (GINA) Guidelines 2020, page 26. Available at https://ginasthma.org/wp-content/uploads/2020/06/GINA-2020-report_20_06_04-1-wms.pdf

Recommendation: Canadian Thoracic Society

Choosing Wisely Canada™

Don't initiate medications for asthma (e.g. inhalers, leukotriene receptor antagonists, or other) in patients ≥ 6 years old who have not had confirmation of reversible airflow limitation with spirometry, and in its absence, a positive methacholine or exercise challenge test, or sufficient peak expiratory flow variability.

Upper Respiratory Illness

Observed typical duration of cough = **18 days**

VERSUS

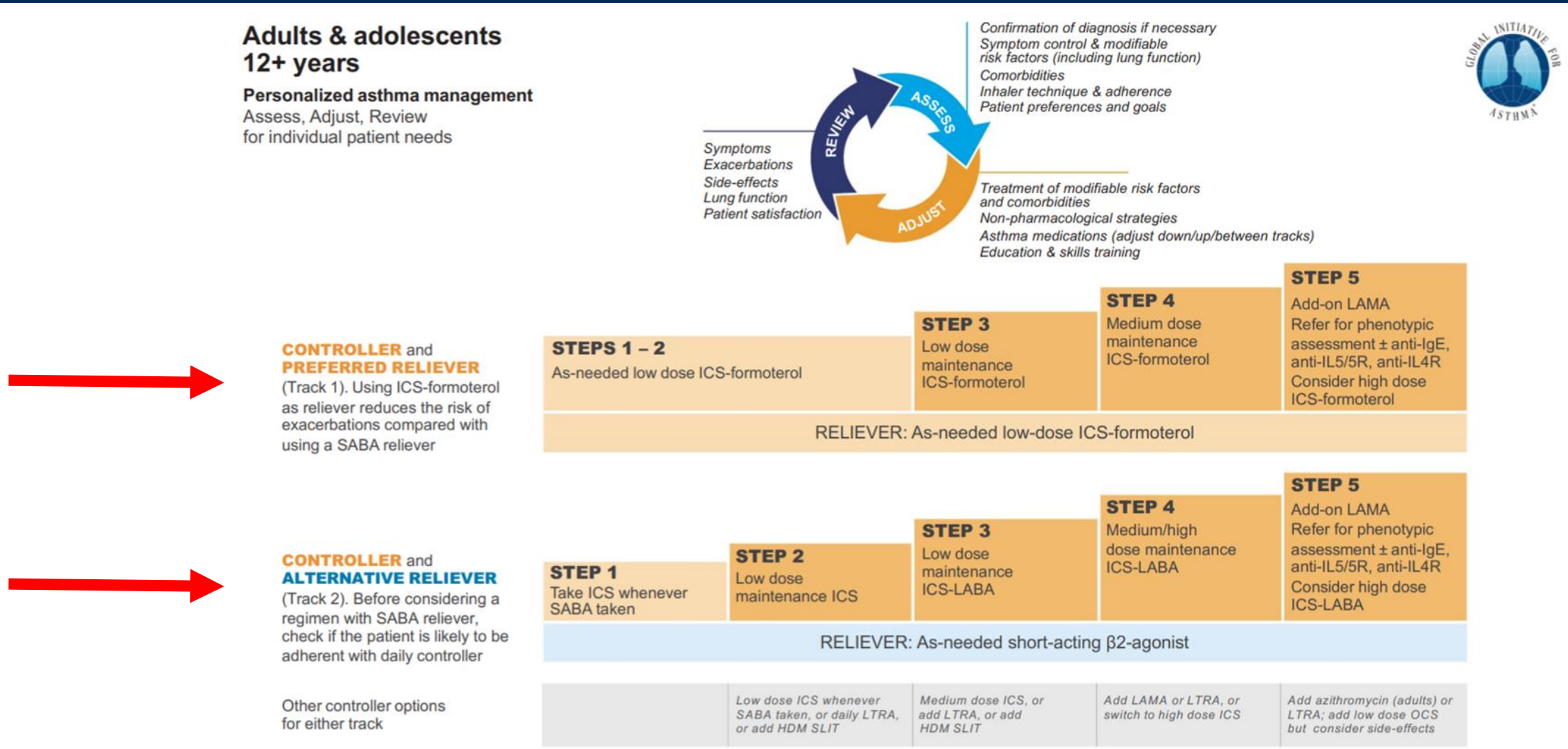
Patient expectation for duration of cough = **5-9 days**

Ebell MH, Lundgren J, Youngpairoj S. How long does a cough last?
Comparing patients' expectations with data from a systematic review of the literature.
Ann Fam Med. 2013 Jan-Feb;11(1):5-13. doi: 10.1370/afm.1430. PMID: 23319500; PMCID: PMC3596033.
https://pubmed-ncbi-nlm-nih-gov.myaccess.library.utoronto.ca/23319500/

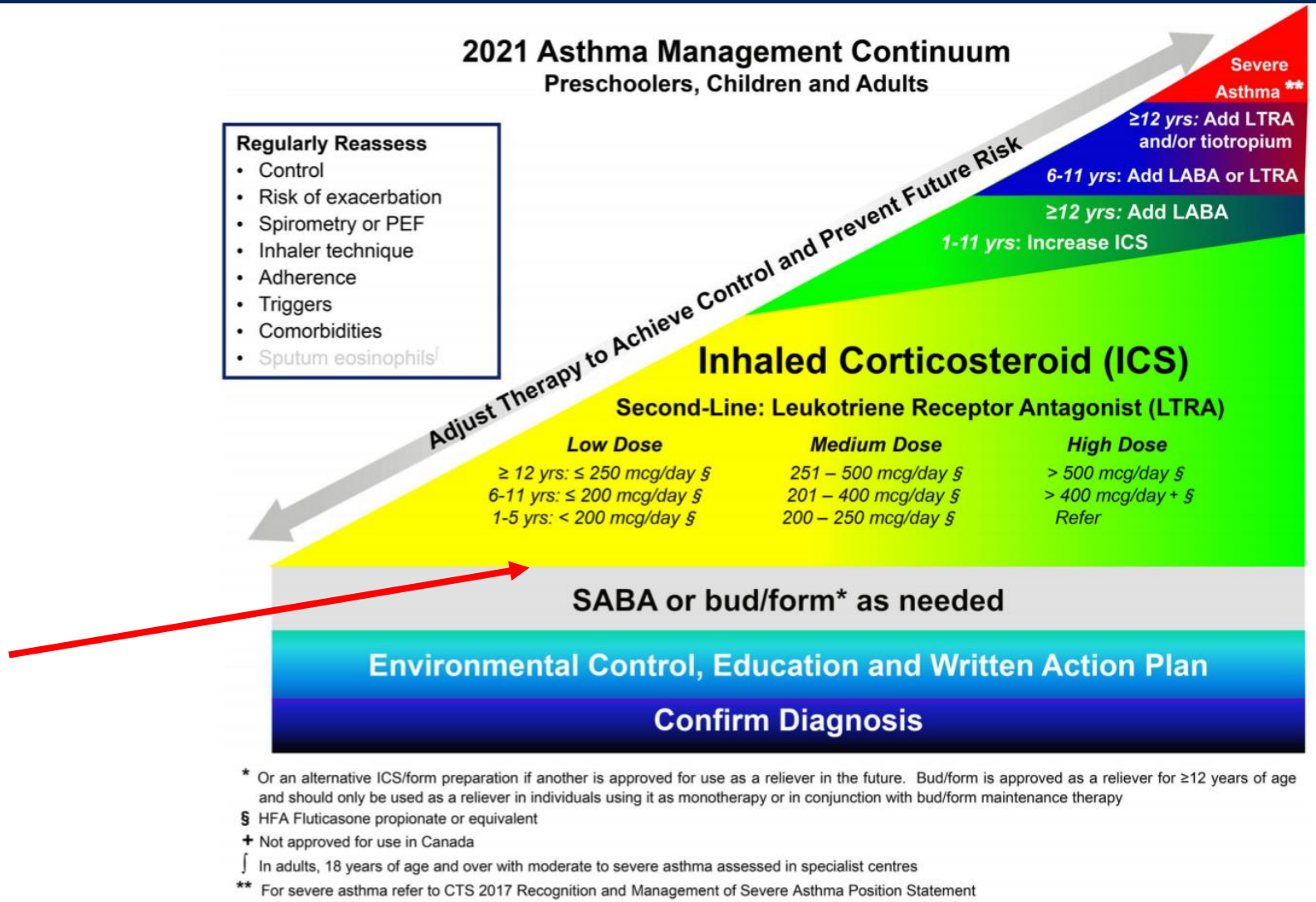
What are the potential harms of “over-prescribing” inhalers?

- Patient labels themselves as “sick”, believe they have chronic disease where there may be none
- Financial cost to patient / payer
- Medication side effects
- Environmental cost

Guidelines: GINA 2021



Guidelines for Very Mild and Mild Asthma: Canadian Thoracic Society 2021



https://cts-sct.ca/wp-content/uploads/2021/02/FINAL-CTS_Very-Mild-and-Mild-Asthma-CPG.pdf

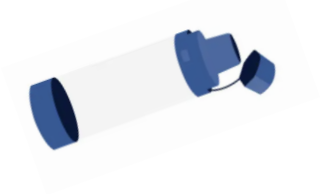
CTS Guidelines 2021: Definition of “control” changed

Characteristic	Frequency or value 2021	Frequency or value 2012
Daytime symptoms	≤2 days/week	< 4 days/week
Nighttime symptoms	< 1 night/week and mild	<1 night/week
Physical activity	Normal	Normal
Exacerbations	Mild and infrequent*	Mild and infrequent
Absence from work or school	None	None
Need for reliever (SABA or bud/form)†	≤2 doses/week	<4 doses/week
FEV_1 or PEF	≥90% personal best	≥90% personal best
PEF diurnal variation#	<10-15%	<10-15%
Sputum eosinophils·	<2-3%	<2-3%

Carbon Footprint of Inhalers

Metered Dose Inhaler (MDI)

- With spacer device



~10-28 kg CO_2e per inhaler

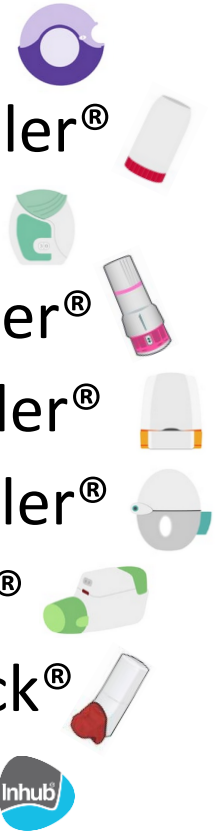
Soft Mist Inhaler (SMI)

- Respimat®

~0.8 kg CO_2e per inhaler

Dry Powder Inhaler (DPI)

- Diskus®
- Turbuhaler®
- Ellipta®
- Twisthaler®
- Breezhaler®
- Handihaler®
- Genuair®
- Respiclick®
- Inhub™



~0.5-1 kg CO_2e per inhaler

Images from: asthma.org.uk/advice/inhaler-videos & hs-design.com/project/schering-plough-asmanex-twisthaler & wixela.com & health.uconn.edu
https://northeast.devonformularyguidance.nhs.uk/formulary/chapters/3.-respiratory/the-environmental-impact-of-inhalers

Which inhaler for which patient?

MDI

- Slow, steady inhalation (4-5 sec)
- Need to sync breathing with release of medication

MDI + spacer

- Slow, steady inhalation (4-5 sec) OR slow, steady breathing in & out the mouth
- No need to sync breathing
- Preferred for preschoolers

DPI

- Quick, deep inhalation (2-3 sec)
- No need to sync breathing
- Larger than MDI
- Have a dose counter
- Generally easier to use
- Preferred for school aged children

Ramadan et al, 2017; Inhaler Steering Committee et al, 2013

What kind of difference can we make?

At time of prescribing

Default to or switch to a DPI from MDI

Carbon footprint reduction per inhaler

~ **8-36 kg** CO_2e per inhaler

Carbon footprint reduction per year

~**234 kg** CO_2e per patient
(daily controller only)

~**422 kg** CO_2e per patient
(daily controller + 2 doses SABA/day)

CO_2e savings Comparisons

Gasoline to hybrid car	500 kg
Meat-based to plant-based diet	500 kg
Avoiding all food waste	370 kg
Recycling	210 kg
Planting a tree	35 kg

DPI = Dry Powder Inhaler
MDI = Metered-Dose Inhaler
SABA = Short Acting Beta-agonist
CO_2e = carbon dioxide equivalent
= amount of greenhouse gas emissions X global warming potential

Janson et al, 2020; Wilkinson et al, 2019; British Thoracic Society 2020

Tools for Clinical Practice Change

Questions/Sharing of Ideas

Are you doing something to decrease MDI use?

...or to decrease environmental footprint in primary care?

Goals of Clinical Practice Change

1. Reduce unnecessary inhaler use
2. Prioritize DPI whenever possible
3. Bring environmental sustainability into discussions of inhaler type

Tools to follow:

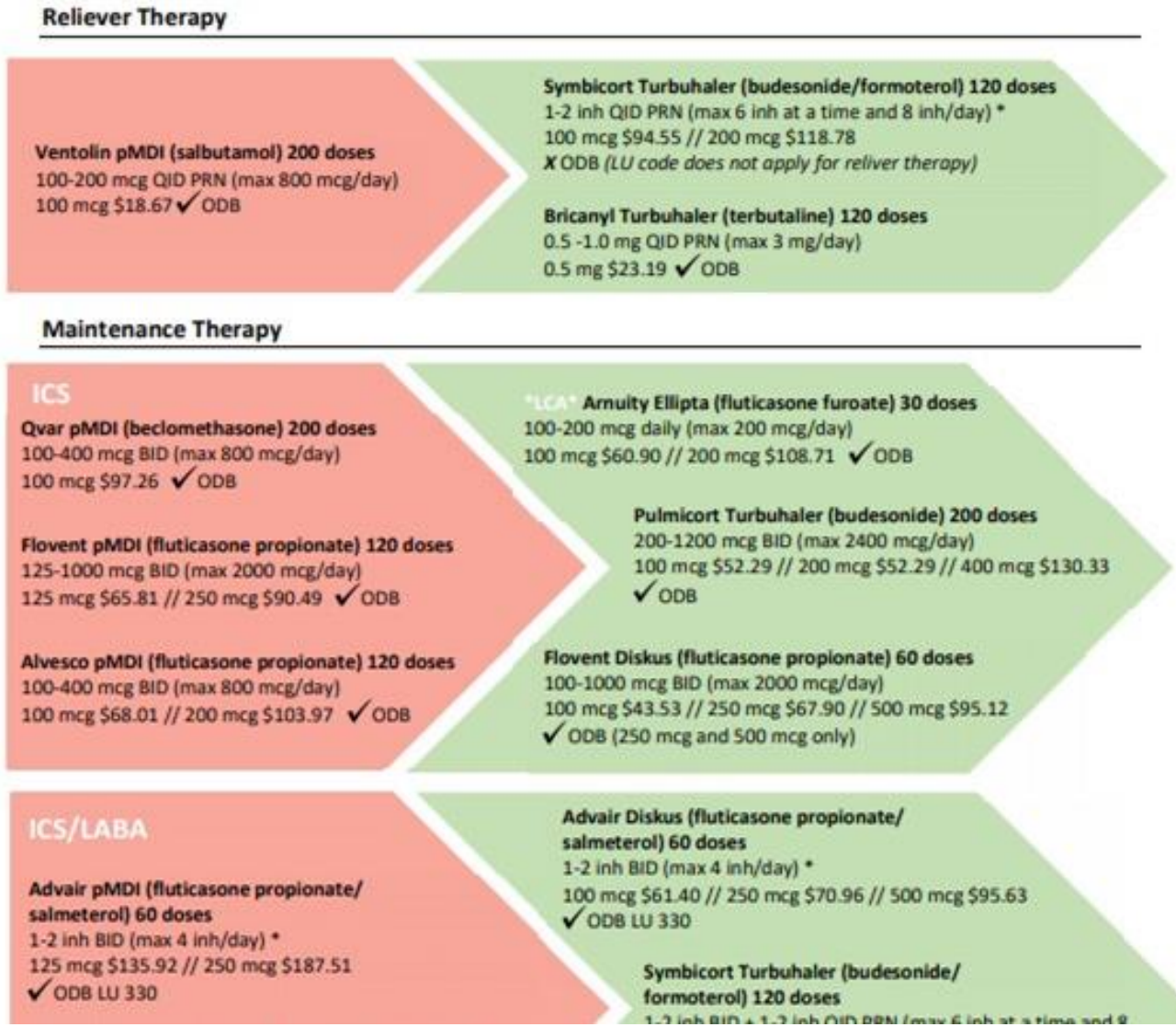
1. Reference Charts
2. Prescription Favourites
3. Letter to patient
4. Letter to community pharmacies
5. Office posters
6. Resident QI projects
7. Advocacy work
8. References for optimizing inhaler use

Reference Chart #1: Inhaler Cost Comparison

Class	Drug and Doses/Device	Device Type	ODB Coverage	Cost (as of May 2021)
SABA	Airomir HFA (salbutamol) 200 doses	pMDI	Yes	100 mcg - $19.09
	Bricanyl Turbuhaler (terbutaline) 120 doses	DPI	Yes	0.5 mg - $23.19
	Ventolin HFA (salbutamol) and generics 200 doses	pMDI	Yes	100 mcg - $18.67
	Ventolin Diskus (salbutamol) 60 doses	DPI	**No**	200 mcg - $24.90
SAMA	Atrovent HFA (ipratropium) 200 doses	pMDI	Yes	20 mcg - $36.68
SAMA/SABA	Combivent Respmimat (ipratropium/salbutamol) 120 doses	SMI	**No**	20 mcg/100 mcg - $48.10
ICS	Aermony Respiclick (fluticasone propionate) 60 doses	DPI	Yes	55 mcg - $33.14 113 mcg - $49.21 232 mcg - $69.44
	Alvesco (ciclesonide) 120 doses	pMDI	Yes	100 mcg - $68.01 200 mcg - $103.97
	Arnuity Ellipta (fluticasone furoate) 30 doses	DPI	Yes	100 mcg - $60.90 200 mcg - $108.71
	Asmanex Twisthaler (mometasone) 30 or 60 doses	DPI	**Yes (only 200mcg and 400mcg)**	100 mcg/30 doses - $58.43 200 mcg/60 doses - $58.89 400 mcg/30 doses - $58.89 400 mcg/60 doses - $104.90
	Flovent HFA (fluticasone propionate) and generics 120 doses	pMDI	Yes	50 mcg - $44.74 125 mcg - $65.81 250 mcg - $118.40
	Flovent Diskus (fluticasone propionate) 60 doses	DPI	**Yes (only 250mcg and 500mcg)**	100 mcg - $43.53 250 mcg - $67.90 500 mcg - $95.12
	Pulmicort Turbuhaler (budesonide) 200 doses	DPI	Yes	100 mcg - $52.29 200 mcg - $52.29 400 mcg - $93.57
	Qvar (beclomethasone) 30 doses	pMDI	Yes	100 mcg - $97.26
LABA	Foradil Aerolizer (formoterol) 60 doses	DPI	**Yes (LU code 132 – asthma)**	12 mcg - $77.61
	Onbrez Breezhaler (indacaterol) 30 doses	DPI	**Yes (LU code 443 - COPD)**	75 mcg - $67.53
	Oxeze Turbuhaler (formoterol) 30 doses	DPI	**Yes (LU code 132 - asthma)**	6 mcg - $52.36 12 mcg - $65.55
	Serevent Diskus (salmeterol) 60 doses	DPI	**Yes (LU code 132 - asthma)**	50 mcg - $85.92

Created by Brenda Chang, St. Michael's Hospital Academic FHT. Reviewed by Jessica Visentin and Rita Ha.

Reference Chart #2: Logical Switches to “Greener” inhalers



Created by Jessica Visentin, Team Pharmacist at SETFHT (reviewed by Rita Ha and Brenda Chang)

Reference Chart #3: Simplest Cost/Coverage for change to DPI

Very Mild Asthma (on salbutamol prn)	**Switch SABA to SABA:** terbutaline (Bricanyl) most cost effective; Symbicort as reliever alone more costly, not covered by ODB
Moderate Asthma (on fluticasone + salbutamol prn)	**Switch ICS +PRN SABA to ICS-LABA combination:** Symbicort as controller + reliever not much more costly, covered by ODB LU

Reference Chart #4:
SABA Options by cost / coverage

MDI			DPI		
Product	**Cost***	**ODB**	**Product**	**Cost***	**ODB**
Airomir® (salbutamol)	**120 actuations** 100 mcg ~$6	✓	Ventolin® Diskus (salbutamol)	**60 blisters** 200 mcg ~$10	✗
Ventolin®, generics (salbutamol)	**120 actuations** 100 mcg Brand ~$6 Generic ~$5	✓	Bricanyl® Turbuhaler (terbutaline)	**100 or 200 doses** 500 mcg ~$9	✓

***drug cost per inhaler, not including dispensing fee**

Reference Chart #5:
ICS Options by cost / coverage

MDI			DPI		
Product	**Cost***	**ODB**	**Product**	**Cost***	**ODB**
Alvesco® (ciclesonide)	**120 actuations** 250 mcg ~$50 500 mcg ~$80	✓	Flovent® Diskus (fluticasone propionate)	**60 doses** 100 mcg ~$30 250 mcg ~$50 500 mcg ~$70	100mcg ✗ 250mcg ✓ 500mcg ✓
Qvar® (beclomethasone)	**200 actuations** 50 mcg ~$40 100 mcg ~$70	✓	Arnuity® Ellipta (fluticasone furoate)	**30 doses** 100 mcg ~$40 200 mcg ~$80.20	✓
Flovent® (fluticasone propionate)	**120 actuations** 50 mcg ~$30 125 mcg ~$50 250 mcg ~$90	✓	Asmanex® Twisthaler (mometasone)	**30 doses (100, 400mcg) or 60 doses(200, 400mcg)** 200 mcg ~$40 400 mcg ~$40, $80	100mcg ✗ 200mcg ✓ 400mcg ✓
			Pulmicort® Turbuhaler (budesonide)	**200 doses** 100 mcg ~$30 200 mcg ~$70 400 mcg ~$100	✓

***drug cost per inhaler, not including dispensing fee**

Created by Gabrielle Busque

ODB e-Formulary; BCGuidelines.ca, 2015

Reference Chart #6:
ICS/LABA Options by cost / coverage

MDI			DPI		
Product	**Cost***	**ODB**	**Product**	**Cost***	**ODB**
Zenhale® (mometasone/ formoterol)	**120 actuations** 100/5 mcg ~$100 200/5 mcg ~$120	LU 330	Advair® Diskus, generics (fluticasone propionate/salmeterol)	**60 blisters** 100/50 mcg ~$90, $40 250/50 mcg ~$110, $50 500/50 mcg ~$160, $70	LU 330
Advair® (fluticasone propionate/ salmeterol)	**120 actuations** 125/25 mcg ~$110 250/25 mcg ~$160	LU 330	Breo® Ellipta (fluticasone furoate/vilanterol)	**30 blisters** 100/25 mcg ~$90 200/25 mcg ~$140	LU 330
			Symbicort® Turbuhaler (budesonide/formoterol)	**120 doses** 100/6 mcg ~$70 200/6 mcg ~$90	LU 330

***drug cost per inhaler, not including dispensing fee**

LU 330: For treatment of asthma in patients using optimum anti-inflammatory treatment, still experiencing breakthrough symptoms

Prescription Favourites

PS SUITE EMR

Favourite Type	Shortcut	Treatment
Clinic	#InhalerAsthma_ICS/LABA_Advair Diskus FLUT PROP/SALM 100/50mcg 4-11yrs	fluticasone propion-salmeterol 100-50 mcg/do...
Clinic	#InhalerAsthma_ICS/LABA_Advair Diskus FLUT PROP/SALM 250/50mcg ≥12yrs	fluticasone propion-salmeterol 250-50 mcg/do...
Clinic	#InhalerAsthma_ICS/LABA_Advair Diskus FLUT PROP/SALM 500/50mcg ≥12yrs	fluticasone propion-salmeterol 500-50 mcg/do...
Clinic	#InhalerAsthma_ICS/LABA_Advair MDI ***CONSIDER FIRST DPI e.g. Advair Diskus or Breo Ellipta	fluticasone propion-salmeterol 125-25 mcg/ac...
Clinic	#InhalerAsthma_ICS/LABA_Breo Ellipta FLUT FURO/VILA 100/25mcg ≥18yrs	fluticasone furoate-vilanterol 100-25 mcg/dos...
Clinic	#InhalerAsthma_ICS/LABA_Breo Ellipta FLUT FURO/VILA 200/25mcg ≥18yrs	fluticasone furoate-vilanterol 200-25 mcg/dos...
Clinic	#InhalerAsthma_ICS/LABA_Symbicort Turbuhaler BUDE/FORM 100/6mcg CONTROLLER + RELIEVER ≥12yrs	budesonide-formoterol 100-6 mcg/actuation ...
Clinic	#InhalerAsthma_ICS/LABA_Symbicort Turbuhaler BUDE/FORM 100/6mcg CONTROLLER ≥12yrs	budesonide-formoterol 100-6 mcg/actuation 1...
Clinic	#InhalerAsthma_ICS/LABA_Symbicort Turbuhaler BUDE/FORM 200/6mcg CONTROLLER + RELIEVER ≥12yrs	budesonide-formoterol 200-6 mcg/actuation ...
Clinic	#InhalerAsthma_ICS/LABA_Symbicort Turbuhaler BUDE/FORM 200/6mcg CONTROLLER ≥12yrs	budesonide-formoterol 200-6 mcg/actuation 1...
Clinic	#InhalerAsthma_ICS/LABA_Symbicort Turbuhaler BUDE/FORM 200/6mcg RELIEVER ≥12yrs **ODB LU NOT APPLICABLE	budesonide-formoterol 200-6 mcg/actuation 1...
Personal	#InhalerAsthma - Symbicort Turbuhaler 100/6mcg CONTROLLER + RELIEVER ≥12yrs	budesonide-formoterol 100-6 mcg/actuation Various

Add | Duplicate | Remove

Prescription Favourite:

Shortcut: + RELIEVER ≥12yrs Favourite Type: Personal Move to Clinic Favourites

Description: budesonide-formoterol 100-6 mcg/actuation Various

Name: **budesonide-formoterol 100-6 mcg/actuation**
1 inhalation 2 times daily for 30 days
For: Symbicort Turbuhaler as CONTROLLER
and 1-2 inhalations 4 times daily PRN for 30 days
as RELIEVER; max 8 inh in 24h from ALL doses; max 6 inh on 1 occasion; LU 330

Less Details | More Details

Quantity: 1 inhaler(s) Refills: Auto Discontinue

Instructions for pharmacy: LU 330

Created by St. Michael's FHT, Brenda Chang, Clincal Pharmacist

Inhaler Renewal Request Letter

Dear Patient,

Your pharmacy has asked me to renew your salbutamol (blue inhaler).

I wonder if you are open to changing the type of inhaler that delivers the medicine. You've been using the "aerosol" inhaler. We are moving away from these because the aerosol that pushes the puff out of the container is a strong greenhouse gas.

Stopping using the aerosol inhalers is an important step to reduce our effect on climate change and make the planet healthier.

Developed by Dr. Kimberly Wintemute at North York FHT.

Inhaler Renewal Request Letter

The new puffer would be “Bricanyl” (terbutaline, which works the same as salbutamol). It looks like a small cylinder, and is called a “turbuhaler”. There is no aerosol. Here is a link to a video that shows you how to use it: https://www.youtube.com/watch?v=02OPJUlsuhQ

Let me know if you are OK to switch to the Bricanyl.

Sincerely,

Your Healthcare Provider

Developed by Dr. Kimberly Wintemute at North York FHT.

Community Pharmacy Letter

Partnering to Decarbonize our Healthcare: MDI Deprescribing

To our community pharmacy colleagues:

We invite you to help us reduce our carbon footprint by switching eligible patients from metered dose inhalers (MDI) to dry powder inhalers (DPI) or soft mist inhalers (SMIs).

In honour of Earth Month, the South East Toronto Family Health Team (SETFHT) kicked-started an initiative to reduce our MDI prescribing. We also see this as a great opportunity for community pharmacy involvement. Each time a patient refills a MDI, there is an opportunity for you to connect with prescribers to educate them about the environmental impact of MDIs and to suggest a switch to an appropriate alternate. For ODB patients, this may work well as a Pharmaceutical Opinion.

See below for quick FAQs regarding the initiative. We have also attached several resources here (including a templated Pharmaceutical Opinion).

We look forward to working collectively to make our healthcare more sustainable.

If you have any questions or feedback, feel free to contact us at jessica.visentin@setfht.on.ca.

Regards,

Dr. Kit Shan Lee, Dr. Sam Tirkos and Jessica Visentin (SETFHT pharmacist)

Who are we?

SETFHT is a clinic comprising of a group of 23 family doctors, over 20 interprofessional healthcare providers and many medical residents and healthcare learners. We have two sites – one at 840 Coxwell Ave. and another at 1871 Danforth Ave.

Why should we deprescribe metered dose inhalers (MDIs)?

1) MDIs use a propellant that contain a potent greenhouse gas and contributes to climate change

   100 doses MDI = 290 km car ride

2) There are alternatives to MDI that offer similar, if not more effective, treatment in a medium that has a lower carbon footprint (such as dry powdered inhalers (DPIs) or soft mist inhalers (SMIs)

Pharmaceutical Opinion Template

Dear Dr. _____ *{prescriber name}*,

RE: _____ *{patient name}* DOB: _____

This patient requested a refill of their _____ *{inhaler name}*. We have filled this prescription for the time being, but would like to suggest a switch to _____ *{new inhaler name}* in advance of future refills.

This is in an effort to opt for a more environmentally sustainable option, as MDIs use a propellant that contain a potent greenhouse gas and contributes to climate change. **100 doses MDI = 290 km car ride**

For more details, see: https://www.sustainablehealthsystems.ca/inhalers

{if suggesting a switch from Ventolin to Symbicort for asthma patient, include the following}
In addition, the latest GINA guidelines recommend combination formeterol-budesonide (Symbicort) first line as both reliever and controller medication for asthma treatment.

{choose one of the following}
Please note, we have discussed this with the patient and they are open to switching inhalers.
OR
Please note, we have not yet had a chance to discuss this with the patient. If you have the opportunity, we would encourage you to do so.

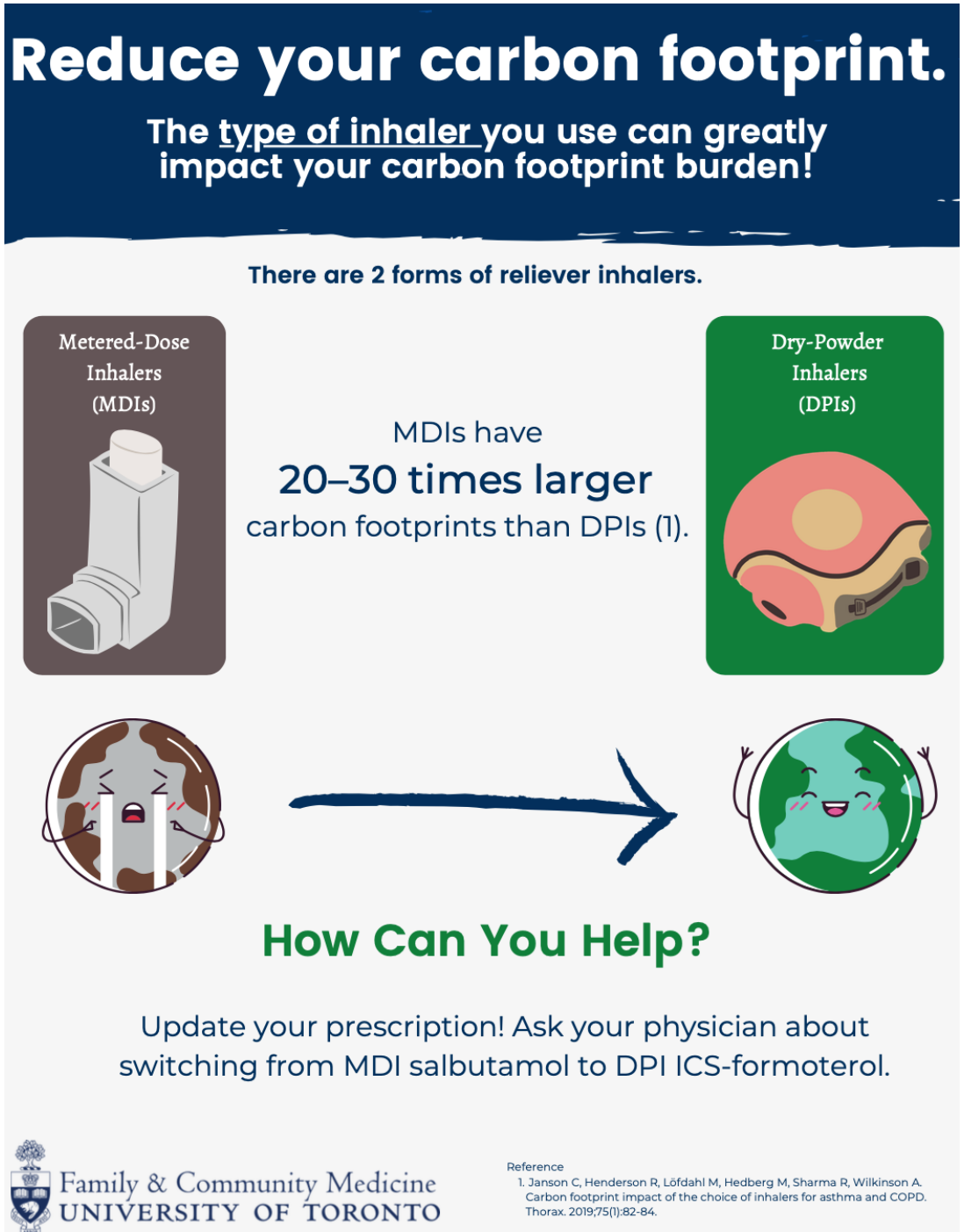
Regards,

Pharmacy Team

Created by Jessica Visentin, Team Pharmacist at SETFHT

Office Poster

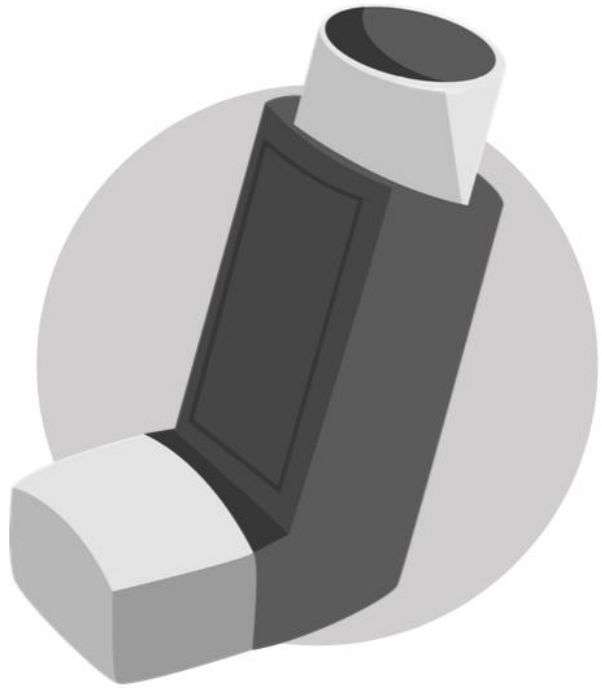
Created Grace Huang for St. Michael's FHT



Office Poster

Created by Dr Kimberly Wintemute from the NYGH FHT, with design assistance from Ms. Natassja Addeo, recent OCAD grad.

Inhalers shaped like this …



…contain a potent greenhouse gas that contributes to climate change.

Ask about whether switching to a different type of inhaler is right for you.

CENTRE FOR SUSTAINABLE HEALTH SYSTEMS

Institute of Health Policy, Management & Evaluation
UNIVERSITY OF TORONTO

Dalla Lana School of Public Health

Resident QI Project

Quality Improvement approach

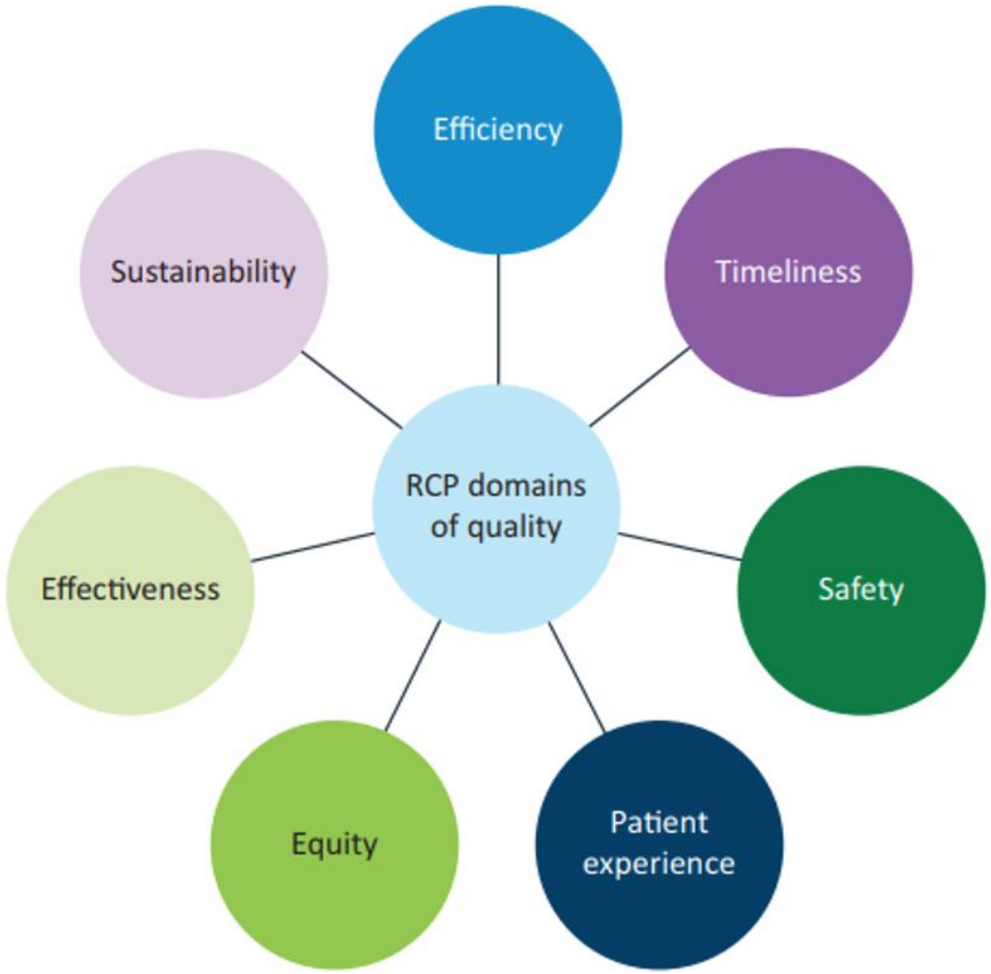


Fig 1. Domains of quality (adapted by the Royal College of Physicians from the Institute of Medicine).[1]

susqi.org

A Climate Change Intervention: Promoting Dry Powder Inhalers

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St. Michael's
Inspired Care.
Inspiring Science.

THE PROBLEM

Metered dose inhalers (MDIs), the most common inhaler type in North America, are a significant contributor to the healthcare system's greenhouse gas emissions. 100 doses are equivalent to a 290 km car ride.

The carbon footprint of dry powder inhalers (DPIs) is 30X smaller. DPIs are environmentally sustainable, and clinically appropriate for most patients.

THE GOAL

Promote environmental sustainability in primary care by encouraging providers to prescribe DPIs & de-prescribe MDIs.

UNDERSTANDING THE ROOT CAUSES

Why are MDIs so commonly prescribed?

PLACE
- Virtual care; difficult to sample other inhalers

POLICIES
- Some DPIs not covered
- No salbutamol DPI generic

PROVIDERS & PATIENTS
- Unaware of environmental impact
- Familiarity with MDIs
- Confusion re: many new inhalers

PROCESSES
- No EMR tools for inhalers
- Ease of re-prescribing; promotions refilling MDI Rx

EFFECT

THE CONTEXT

This project was piloted at the 80 Bond site of St. Michael's Hospital Academic Family Health Team.

IMPLEMENTING CHANGE IDEAS

1. FAVOURITE PRESCRIPTIONS
Developed favourite prescriptions on the electronic medical record PSS to allow for easy prescribing.

2. POSTER COMMUNICATIONS
Mounted posters throughout the clinic.

THE RESULTS

We examined the number of MDIs and DPIs prescribed over eight weeks before and after the change ideas were implemented (Fig. 1). The change ideas were implemented the week of Earth Day (April 22nd).

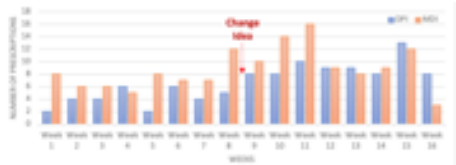

Figure 1. Bar graph of the number of prescriptions for dry powder inhalers and metered dose inhalers over 16 weeks. The change ideas were implemented in week 8, as indicated by the red arrow.

The prescription favourites were used by prescribers over 1,000 times. Overall, the number of inhaler prescriptions increased significantly after the change ideas were implemented ($p = 0.003$).

Within inhaler types, **the number of DPI prescriptions increased significantly after the change ideas were implemented** (Fig. 2).

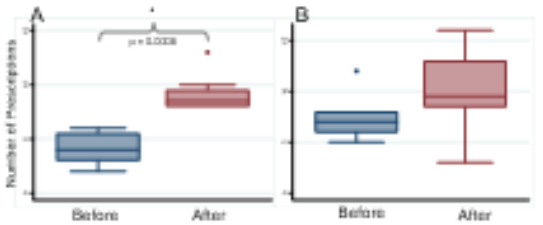

Figure 2. Box plots of the number of prescriptions for **A** dry powder inhalers and **B** metered dose inhalers over eight-week periods before and after the change ideas were implemented.

THE CONCLUSIONS

- This quality improvement project encourages providers and patients to consider environmentally sustainable DPIs.
- To raise awareness about the carbon footprint of inhalers, posters were mounted throughout clinic.
- To help providers easily prescribe inhalers, pre-populated prescriptions were created in the electronic medical record.
- After the change ideas were implemented, the number of DPI prescriptions increased significantly. The number of MDI prescriptions did not change.
- The project may have prompted providers and patients to discuss inhalers and provide prescriptions.
- However, the change in seasons may have resulted in increased demand for inhalers.
- Further analysis is required to examine how the results compare to previous years, and whether DPI prescribing will be maintained.
- Qualitative research is also required to explore provider and patient experiences with inhalers, including barriers to trialing DPIs.
- Overall, switching to DPIs is likely to have a positive effect on patient and planetary health, given the effects of MDIs on air quality and environmental health.
- Future PDSA cycles may consider using educational sessions, and pop-up functions in the EMR. While the first PDSA cycle of this QI project is promising, more cycles are required to trial the other change ideas.

Check out: sustainablehealthsystems.ca/inhalers for more information.

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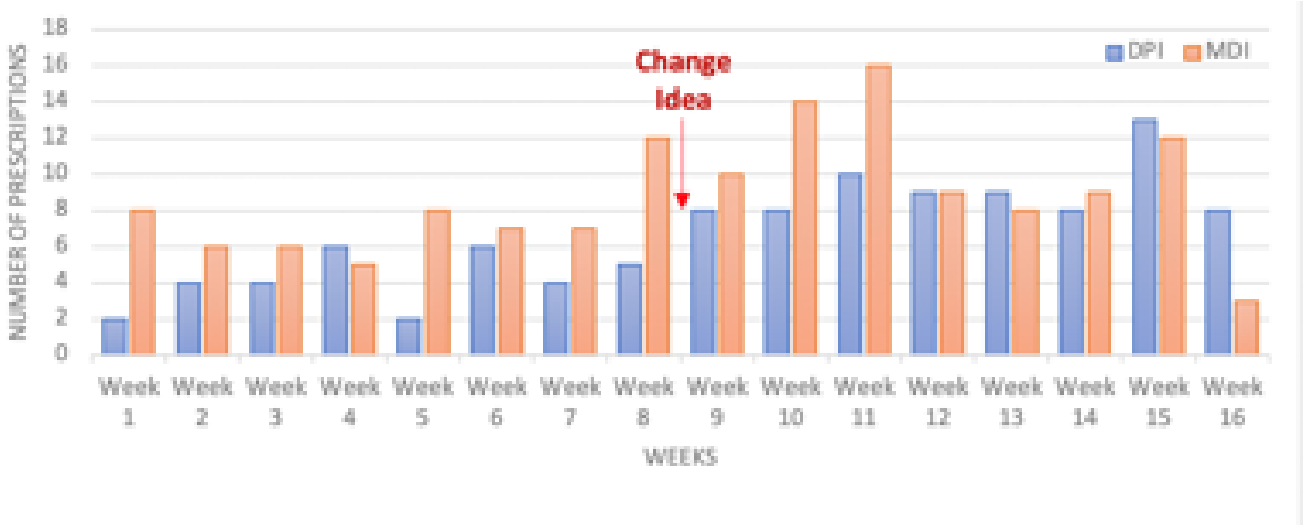


Figure 1. Bar graph of the number of prescriptions for dry powder inhalers and metered dose inhalers over 16 weeks. The change ideas were implemented in week 9, as indicated by the red arrow.

The prescription favourites were used by prescribers over 1,000 times. Overall, the number of inhaler prescriptions increased significantly after the change ideas were implemented ($p = 0.003$).

Within inhaler types, **the number of DPI prescriptions increased significantly after the change ideas were implemented** (Fig. 2).

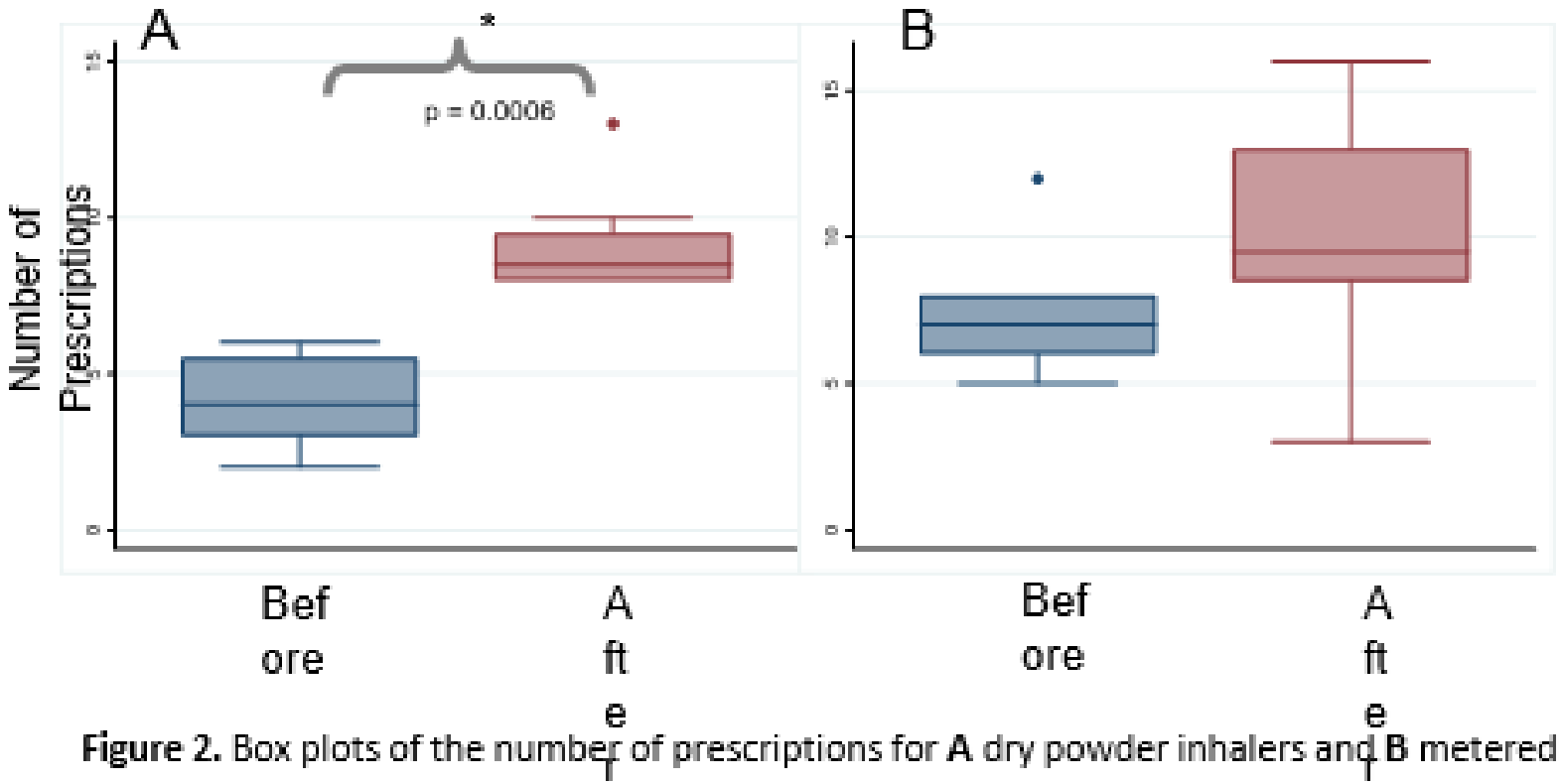
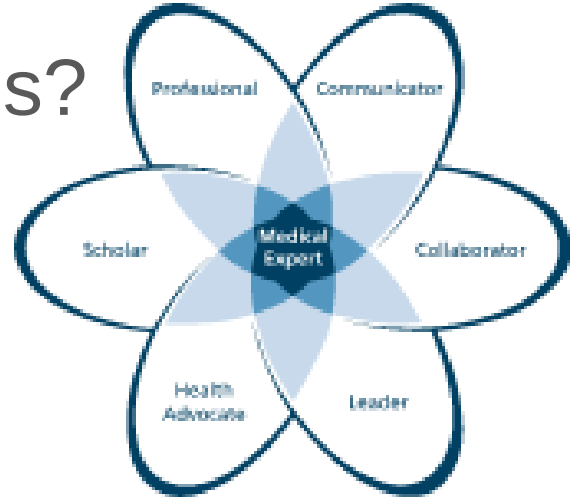


Figure 2. Box plots of the number of prescriptions for **A** dry powder inhalers and **B** metered dose inhalers over eight-week periods before and after the change ideas were implemented.

Advocacy

- Letter was submitted to staff at Ontario Drug Benefit Program requesting that all DPIs get added to formulary
- Group met with ODB program
- Upcoming meeting with Canadian Agency for Drugs and Technologies in Health (CADTH)
- Any thoughts on other policy-level interventions?



Resources for Optimizing Inhaler Technique

- Certified Respiratory Educators (many work within Family Health Teams and Community Health Centres!)
- Videos on correct use of DPI's
  - https://www.lung.ca/lung-health/get-help/how-use-your-inhaler (Canadian Lung Association: DPIs available in Canada)
  - https://www.youtube.com/watch?v=FhmYs-XGvvQ (Turbuhaler)
  - https://www.youtube.com/watch?v=02OPJUlsuhQ (Turbuhaler)

Lauren

- Patient with URI symptoms requesting salbutamol MDI
- Should we renew?
  - Yes
  - No