Climate, Health & Sustainable Care

Inaugural Symposium

UNIVERSITY OF TORONTO

COLLABORATIVE CENTRE FOR Climate, Health + Sustainable Care

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climate.health@utoronto.ca

Environmental Co-Benefits of Reducing Low-Value Care

Thomas Bodley, Brenda Chang, Anita Rao

Moderator: Karen Cameron

UNIVERSITY OF TORONTO

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Acknowledgement

We want to acknowledge the support of the **New Initiative and Innovation Award - Network for Improving Health Systems** in allowing evidence and knowledge transfer of pharmacy and prescribing topics.

Climate Campaign

Thomas Bodley, MD MSc FRCPC

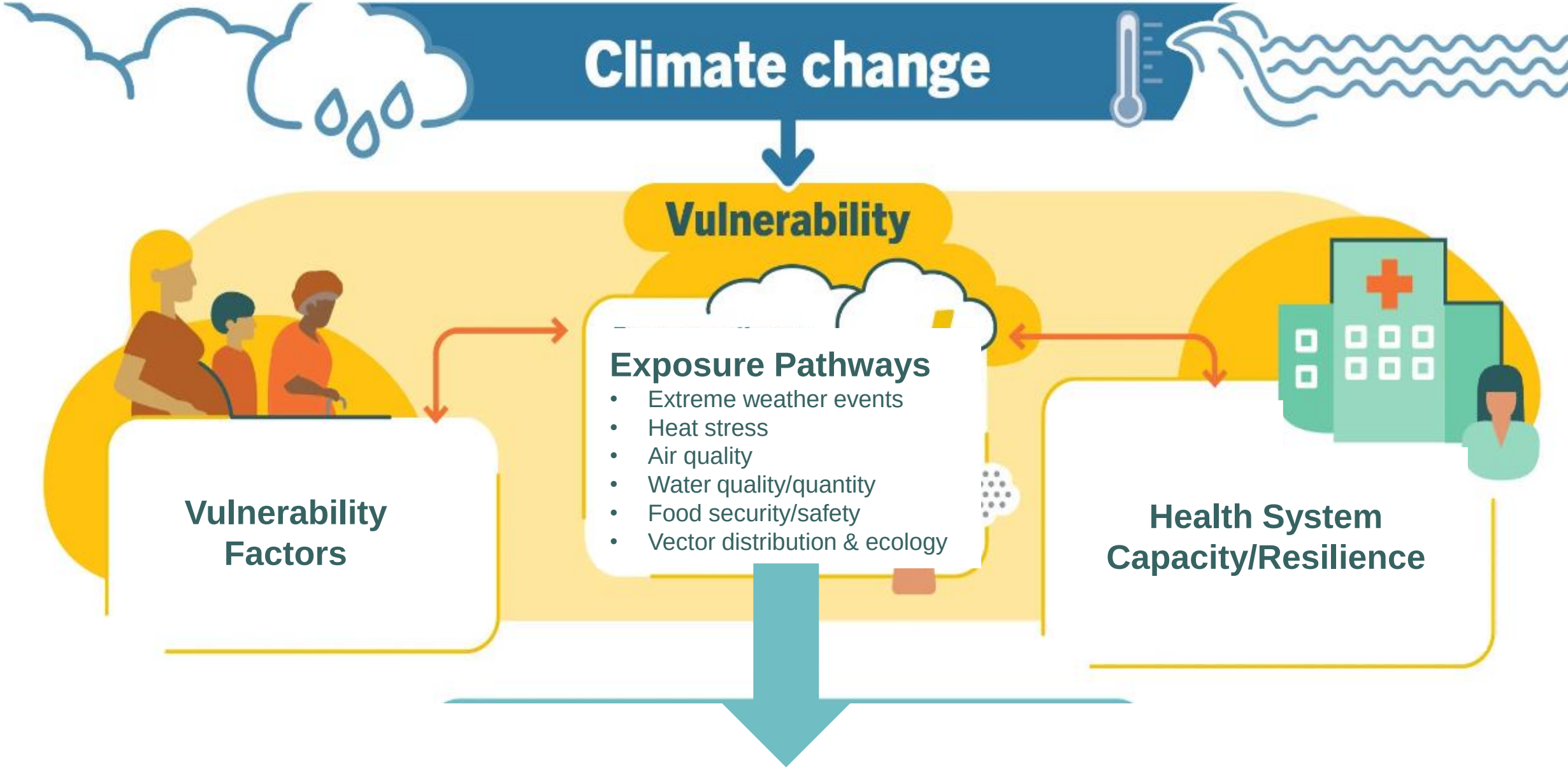
Critical Care and General Internal Medicine

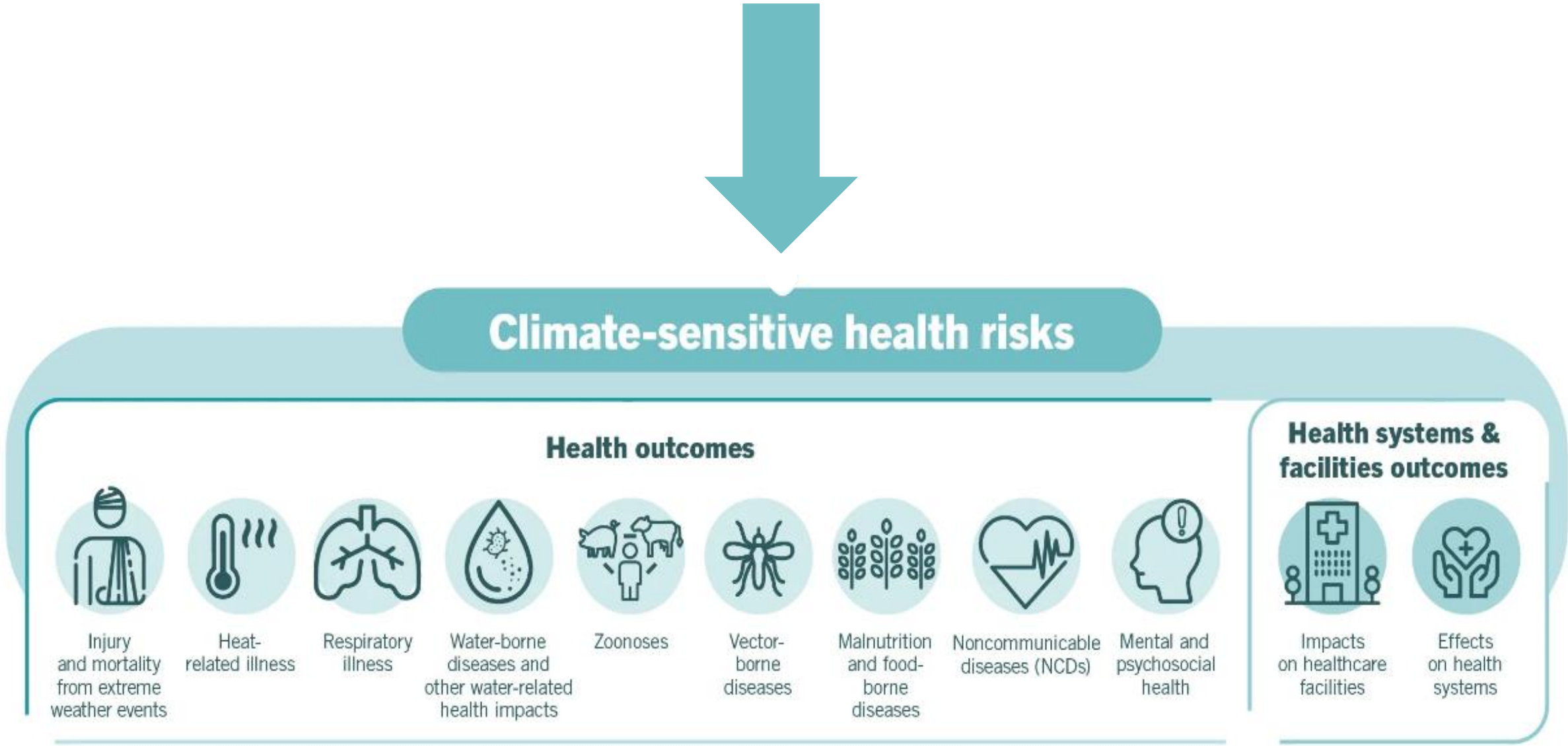
Quality Lead Critical Care, Scarborough Health Network

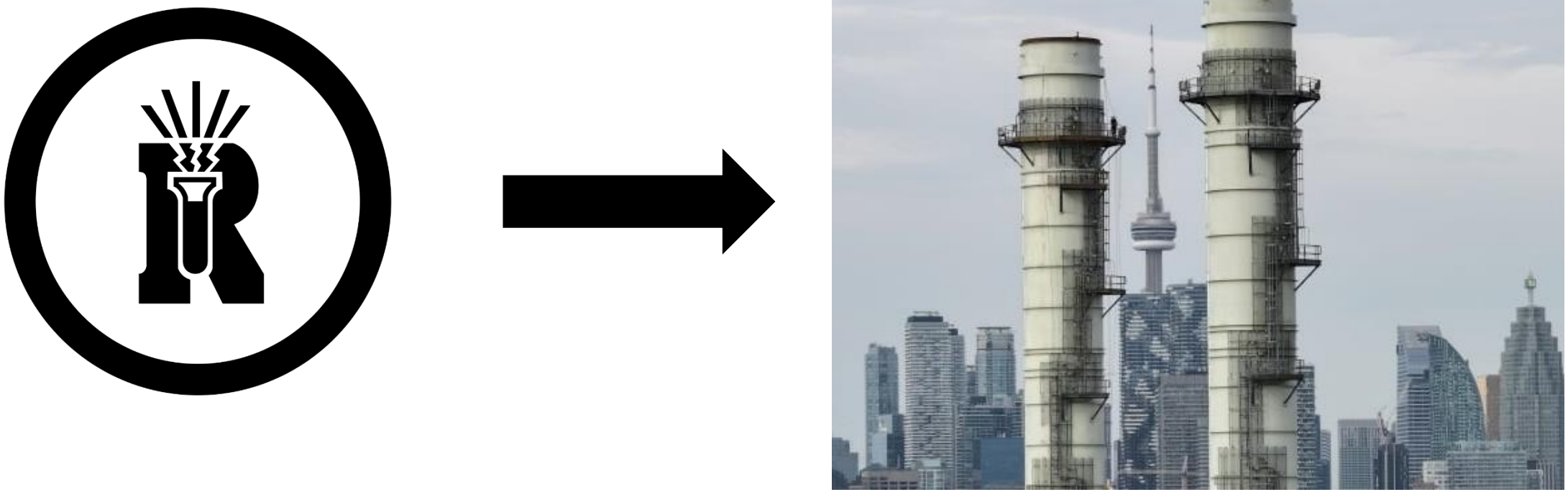
Co-Director Using Labs Wisely, Choosing Wisely Canada

Disclosure

Co-director of the Using Labs Wisely program at Choosing Wisely Canada


Climate change
Vulnerability
Exposure Pathways
• Extreme weather events
• Heat stress
• Air quality
• Water quality/quantity
• Food security/safety
• Vector distribution & ecology
Vulnerability Factors
Health System Capacity/Resilience

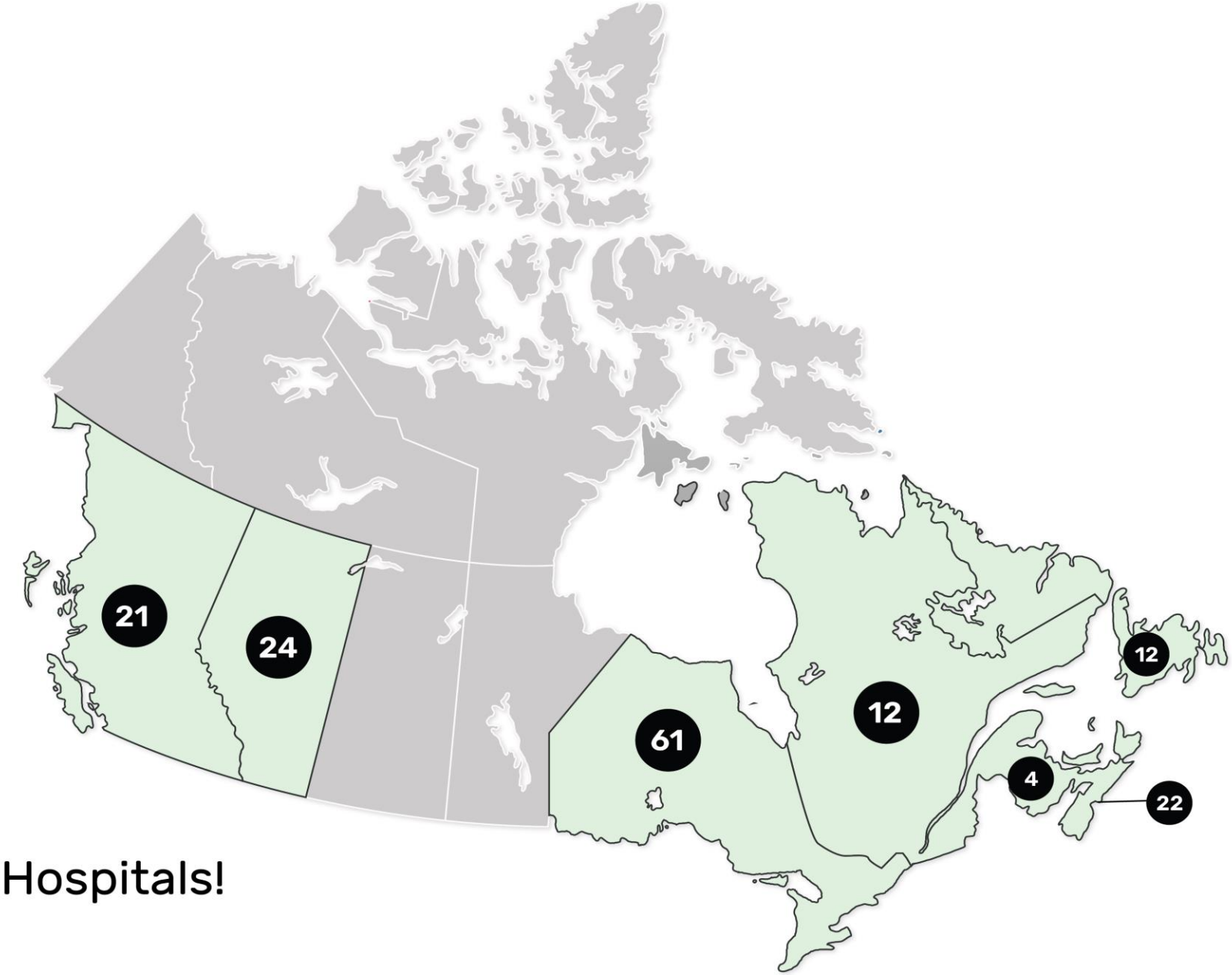

Climate-sensitive health risks
Health outcomes
Injury and mortality from extreme weather events
Heat-related illness
Respiratory illness
Water-borne diseases and other water-related health impacts
Zoonoses
Vector-borne diseases
Malnutrition and food-borne diseases
Noncommunicable diseases (NCDs)
Mental and psychosocial health
Health systems & facilities outcomes
Impacts on healthcare facilities
Effects on health systems



Choosing Wisely
& Climate Action

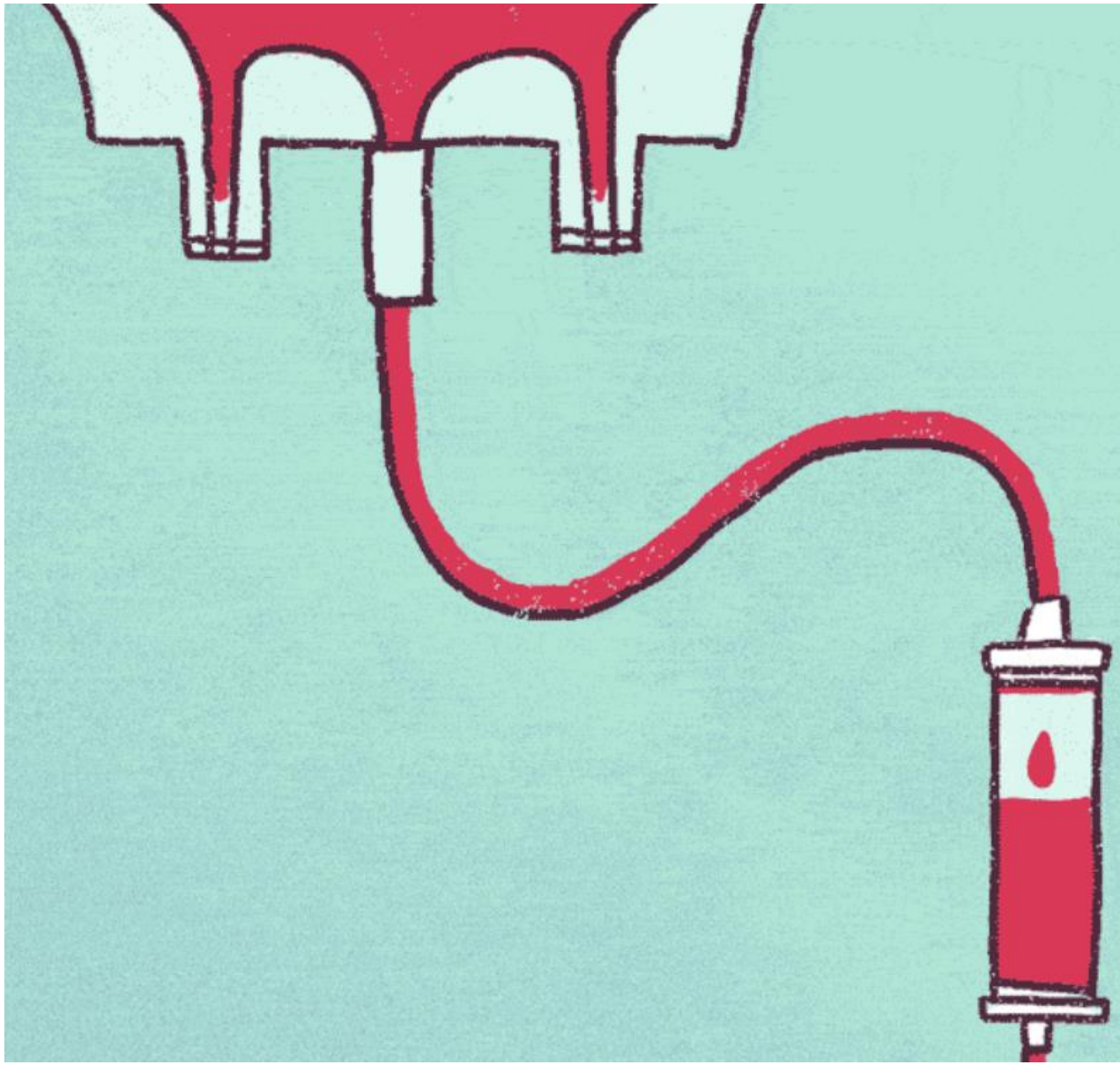
Choosing Wisely Canada – The Beginning

Using Labs Wisely.



As of October 2024

156 Participating Hospitals!



Using Blood Wisely.

An initiative of:

Choosing Wisely Canada
Canadian Blood Services
Héma-Québec

1. Benefits of Choosing Wisely in Practice

- Avoiding harm to patients
- Decreasing waste
- Improving access to high-value care

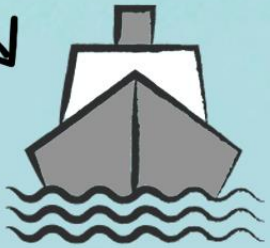
Everything we do has a carbon footprint

LIFE OF A PILL

IMPROPER DISPOSAL

INTO SOIL & WATER

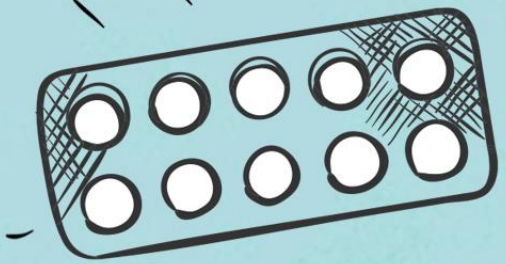
MANUFACTURING



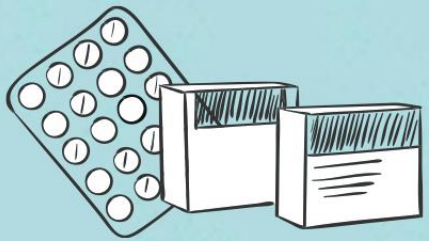
TRANSPORTATION TO PHARMACY

VISIT BETWEEN PATIENT & HEALTH CARE PROVIDER

PRESCRIPTION



DISPENSED



PLASTIC/ PACKAGING WASTE

POTENTIAL SIDE EFFECTS/ HARM

20+

Societies

50+

New climate-conscious recommendations

Review process

- Internal review to ensure that the recommendation meets the Choosing Wisely recommendation criteria
- Review with climate experts and patient advisors


Canadian Association
of Hospital Dentists


Canadian
Pharmacists
Association
Association des
pharmaciens
du Canada


caro
Canadian Association of
Radiation Oncology
acro
Association canadienne
de radio-oncologie


CSCC
CANADIAN SOCIETY
OF CLINICAL CHEMISTS


THE COLLEGE OF
FAMILY PHYSICIANS
OF CANADA
LE COLLÈGE DES
MÉDECINS DE FAMILLE
DU CANADA


coa
CANADIAN
ORTHOPAEDIC
ASSOCIATION


Canadian
Cardiovascular
Society


CAMB
AMBC


Canadian Association
of Gastroenterology
L'Association Canadienne
de Gastroentérologie


CASEM
ACMSE


CSIM
CANADIAN SOCIETY OF INTERNAL MEDICINE


CAPM&R
Canadian Association of Physical Medicine & Rehabilitation
Association canadienne de médecine physique et de réadaptation


SOCIÉTÉ
CANADIENNE DE
THORACOLOGIE
CANADIAN
THORACIC
SOCIETY


CRA SCR
CANADIAN
RHEUMATOLOGY
ASSOCIATION
SOCIÉTÉ
CANADIENNE
DE RHUMATOLOGIE


CANADIAN
ANESTHESIOLOGISTS'
SOCIETY


CCCS/SCSI
CANADIAN CRITICAL CARE SOCIETY
SOCIÉTÉ CANADIENNE DE SOINS INTENSIFS


CANADIAN ASSOCIATION OF
General Surgeons


Canadian Psychiatric Association
Association des psychiatres du Canada


Canadian Society of
Hospital Pharmacists
Société canadienne des
pharmaciens d'hôpitaux


Canadian
Nurses
Association

Choosing Wisely & Climate Action

Canadian Critical Care Society

Don’t use gloves when hand hygiene is sufficient.

College of Family Physicians of Canada

Do not conduct in-person visits where virtual assessment would provide equivalent clinical value and is acceptable to patient.

Canadian Thoracic Society

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.

Choosing Wisely & Climate Action

Canadian Society of Hospital Pharmacists

Don’t continue an intravenous medication when clinically appropriate to step down to oral therapy.

Canadian Nurses Association

Don’t bring surplus supplies into patient care rooms if they will need to be disposed of after the patient is transferred or discharged.

Canadian Society of Internal Medicine

Don’t prescribe heparin or low molecular weight heparin in situations where oral options are effective, preferred by the patient, and felt to be safe by the prescriber.

UNITY HEALTH TORONTO

Environmental Co-Benefits of Reducing Low-Value Care

Perspectives from a Primary Care Pharmacist

Brenda Chang, RPh, PharmD, ACPR
brenda.chang@unityhealth.to

October 22, 2024

Disclosures

Presenter Personal Disclosures

I have no current or past relationships with commercial entities.

Commercial Support Disclosures

This presentation has received no financial or in-kind support from any commercial or other organization.

Note: Use of some brand names may be mentioned for ease of understanding but there are no promotional intentions.

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Benzodiazepine project

- Dr. Noor Ramji, Dr. Emma Jeavons, Dr. Tina Hu, Dr. Rachel Skocylas, Celia Schwartz, Katie Sussman, Lisa Miller

Inhaler project and related work

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- Jessica Visentin, RPh, Gabrielle Busque, RPh, Megi Qirkollari, RPh, Justin O'Connor-Cook, RPh, Helen Spencer, RPh, Garen Chan

Low-Value Care

- **Low-value care** includes care practices (tests, treatments or procedures) that have been identified, using scientific evidence, to be unnecessary, ineffective or harmful in hospital, primary-care, long-term care or public-health contexts[1]
- Low-value care generates carbon emissions, waste, and pollution without improving patient or population health
- By reducing low-value care, we can produce “co-benefits” for the environment
- One of the most common examples related to medications is the use of antibiotics for a viral infection

Image from: https://choosingwiselycanada.org/using-antibiotics-wisely-across-Canada/

1. Parker G, Hunter S, Born K, Miller FA. Mapping the Environmental Co-Benefits of Reducing Low-Value Care: A Scoping Review and Bibliometric Analysis. Int J Environ Res Public Health. 2024, 21, 818. https://doi.org/10.3390/ijerph2107818

Medications and the Environment

- Canada's healthcare system is responsible for **4.6%** of the national total greenhouse gas emissions[1]
- Medications are estimated to contribute to **25%** of the carbon footprint of the healthcare sector[1]
- Canada has proportionally more emissions from medications than the US (~10%) and Australia (~18%)[1]

Image from: https://www.ti.ubc.ca/2023/06/20/143-reducing-the-adverse-environmental-impacts-of-prescribing/

1. Eckelman MJ, Sherman JD, MacNeill AJ (2018) Life cycle environmental emissions and health damages from the Canadian healthcare system: An economic-environmental epidemiological analysis. PLoS Med 15(7): e1002623. https://doi.org/10.1371/journal. pmed.1002623

Medications and the Environment

- Medications can be damaging to the environment in many ways[1]:
  - Manufacturing process
  - Excretion by the end user
  - Improper disposal
- A recent UK study found that the highest pharmaceutical concentrations are in areas of poor wastewater/waste management based on 1000 sampling sites in >100 countries[2]
- Concentrations of at least one pharmaceutical ingredient were found to be above levels considered safe for aquatic organisms, or of concern in terms of selection for antimicrobial resistance in ¼ of the sampling sites[2]

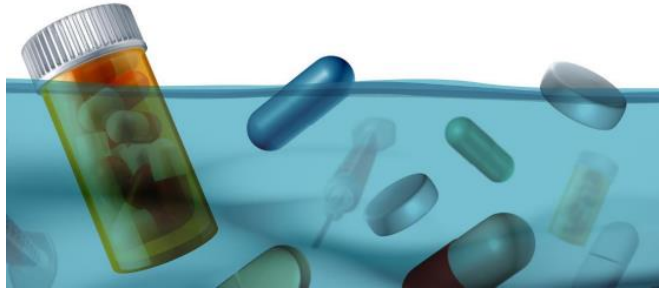


Image from: https://www.feam.eu/wp-content/uploads/Pharmaceuticals-in-the-Environment-Summary-report.pdf

1. Park JY, Miller FA. Climate Resilient, Low Carbon Sustainable Pharmacy version 1.0 (2023) [Internet]. CASCADES (Creating a Sustainable Canadian Health System in a Climate Crisis). [Cited Sept 11, 2024]. Available from https://cascadescanada.ca/resources/climate-resilient-low-carbon-sustainable-pharmacy-playbook/
2. Wilkinson JL et al. Pharmaceutical pollution of the world's rivers. Proceedings of the National Academy of Sciences of the United States of America. 2022 Vol. 119 No. 8 e211394711 https://doi.org/10.1073/pnas.2113947119

Medication optimization is a key **mitigation** strategy for supporting low carbon care

Actions proposed by CASCADES[1]:

1. Consider the environmental risks of medications when prescribing, during shared decision-making processes and when dispensing
2. Recommend change from high carbon/environmental impact products to lower impact alternatives where appropriate
3. Identify and discontinue unnecessary medications as appropriate
4. Encourage preventative and non-pharmacologic interventions where appropriate
5. Educate and review proper medication administration and device use to help improve adherence
6. Advise patients to return medications and medical sharps for disposal to a pharmacy

1. Park JY, Miller FA. Climate Resilient, Low Carbon Sustainable Pharmacy version 1.0 (2023) [Internet]. CASCADES (Creating a Sustainable Canadian Health System in a Climate Crisis). [Cited Sept 11, 2024]. Available from https://cascadescanada.ca/resources/climate-resilient-low-carbon-sustainable-pharmacy-playbook/

Examples from St. Michael's Academic Family Health Team

Family Practice at 61 Queen

Health Centre at 80 Bond

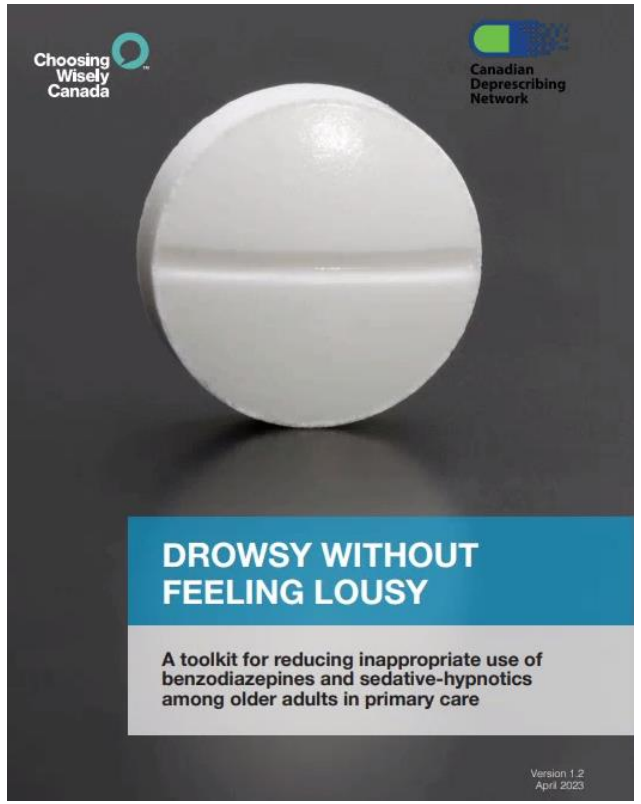
1. Benzodiazepine (BZD) Deprescribing in the Elderly

2. Metered-dose inhaler (MDI) to Dry-powder inhaler (DPI)

BZD Deprescribing Project

- Don’t use benzodiazepines or other sedative-hypnotics in older adults as first choice for insomnia, agitation or delirium.

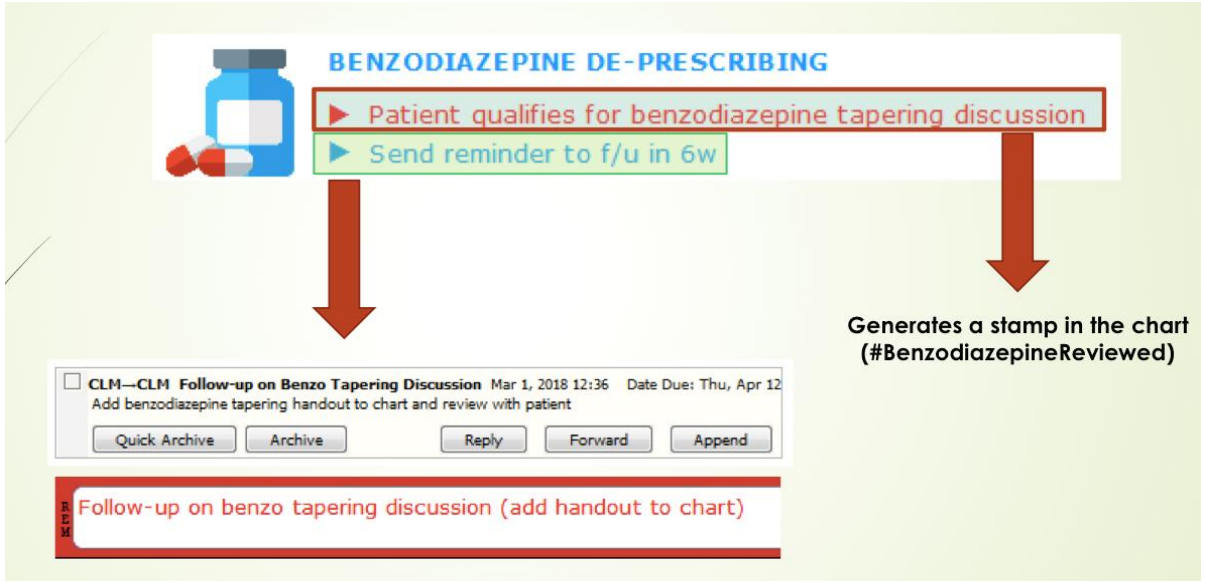
- Don’t routinely prescribe benzodiazepines or other sedative-hypnotics for promotion of sleep without first a trial of non-pharmacologic interventions.



https://choosingwiselycanada.org/toolkit/drowsy-without-feeling-lousy/

BZD Deprescribing Project

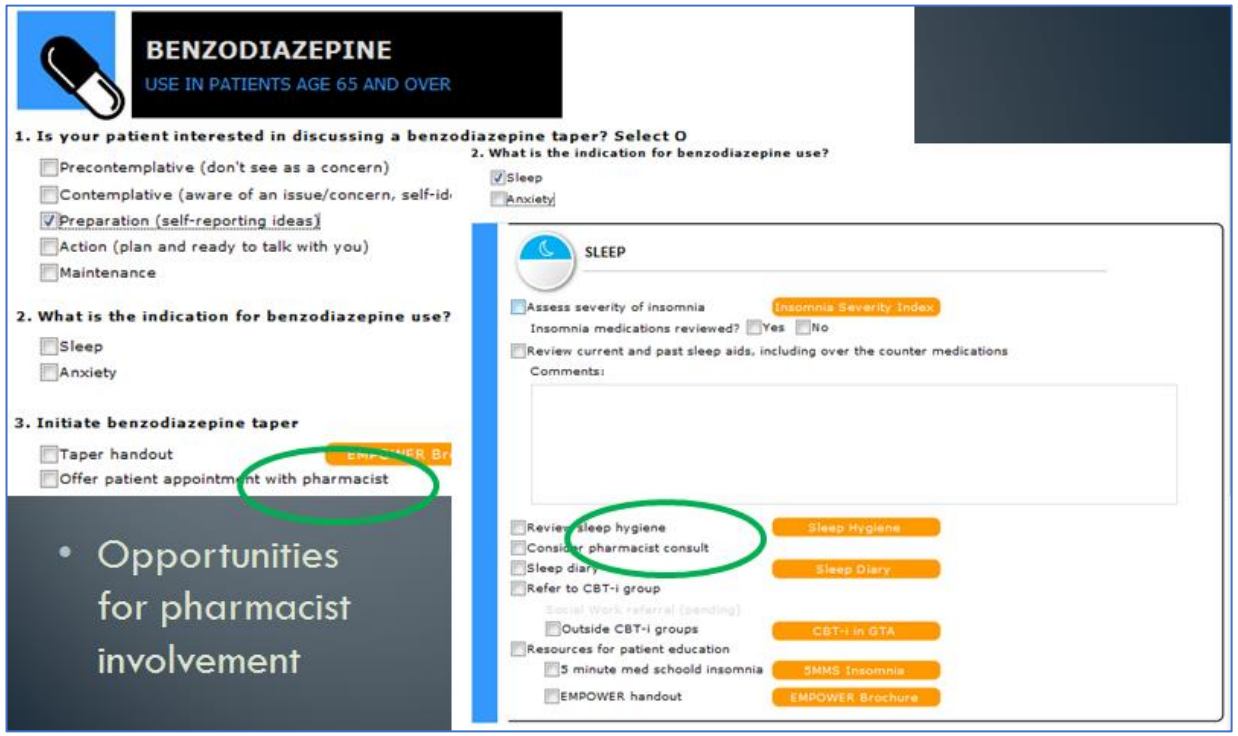
- Creation of a toolbar that appears for age ≥65 years and an active BZD Rx



- Identify and discontinue unnecessary medications as appropriate

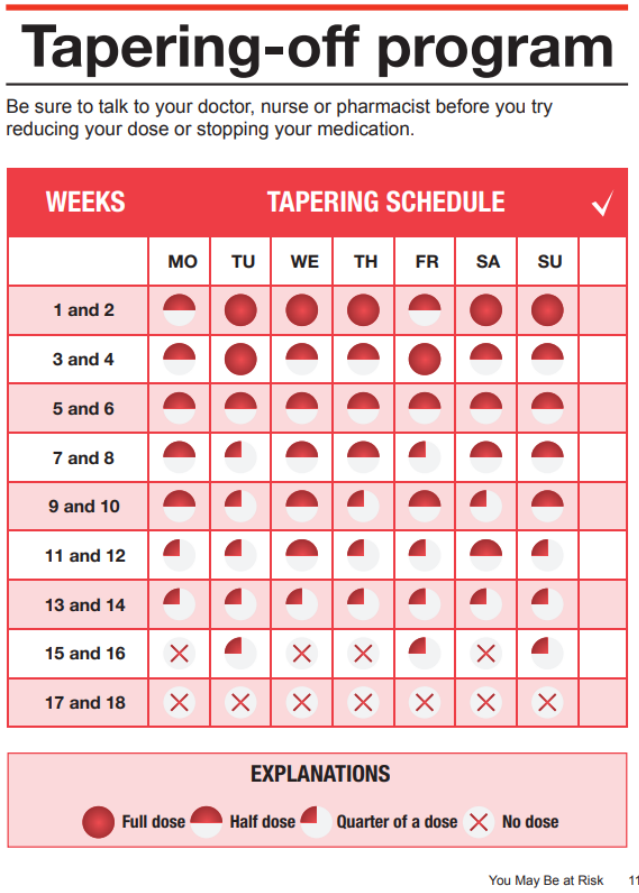
BZD Deprescribing Project

- Cascading form with tools, referral pathways, non-pharmacological options



- Identify and discontinue unnecessary medications as appropriate
- Encourage preventative and non-pharmacological interventions where appropriate

BZD Deprescribing Project



Tapering-off program

Be sure to talk to your doctor, nurse or pharmacist before you try reducing your dose or stopping your medication.

WEEKS	TAPERING SCHEDULE							✓
	MO	TU	WE	TH	FR	SA	SU	
1 and 2	◓	●	●	●	◓	●	●	
3 and 4	◓	●	◓	◓	●	◓	◓	
5 and 6	◓	◓	◓	◓	◓	◓	◓	
7 and 8	◓	◔	◓	◓	◔	◓	◓	
9 and 10	◓	◔	◓	◔	◓	◔	◓	
11 and 12	◔	◔	◓	◔	◔	◓	◔	
13 and 14	◔	◔	◔	◔	◔	◔	◔	
15 and 16	✕	◔	✕	✕	◔	✕	◔	
17 and 18	✕	✕	✕	✕	✕	✕	✕	

EXPLANATIONS

● Full dose ◓ Half dose ◔ Quarter of a dose ✕ No dose

You May Be at Risk 11

- EMPOWER handout
- Or individualized tapering plan created by the pharmacist

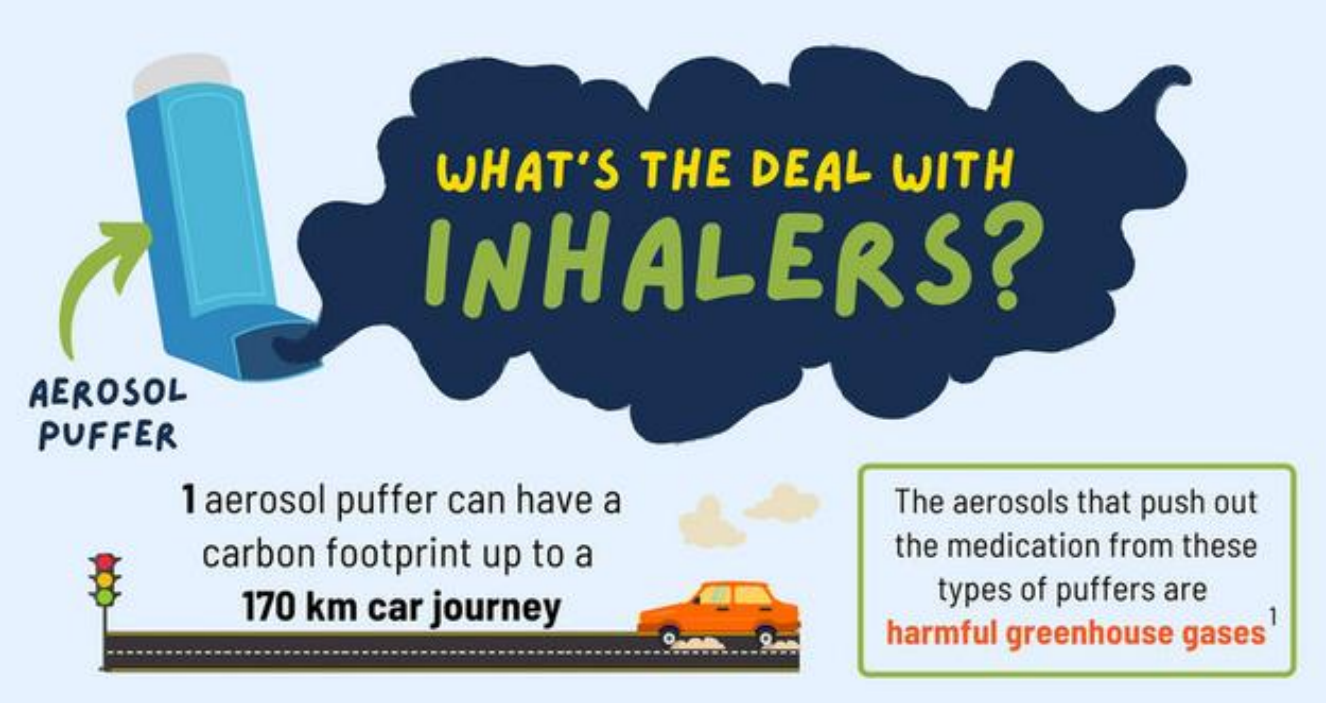
Sleeping pills and Anti-anxiety medications handout from: https://www.deprescribingnetwork.ca/patient-handouts

BZD Deprescribing Project

	Site	No. of patients ≥65 years on a BZD	No. of rostered patients ≥65 years	% of total rostered patients
Jan 2016	61 Queen	228	2257	10.10%
	80 Bond	78	808	9.65%
Feb 2018	61 Queen	95	2295	4.14%
	80 Bond	46	930	4.95%
Sept 2024	61 Queen	86	2861	3.01%
	80 Bond	64	1250	5.12%

- Toolbar removed by end of 2018 due to success (but EMPOWER tool kept)
- Prescribing trend continues to be low, particularly at one site

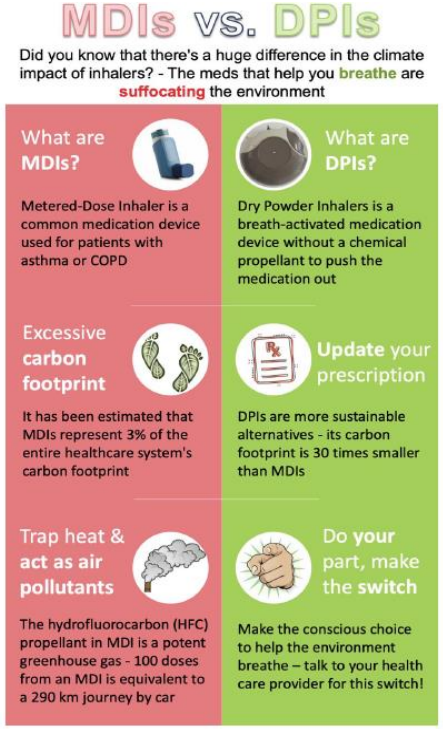
MDI to DPI Project

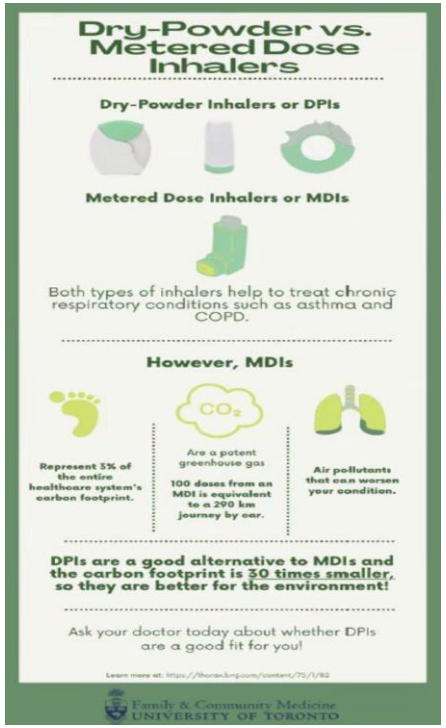


https://cascadescanada.ca/action-areas/pharmacy-and-prescribing
CASCADES - Patient Facing Inhaler Infographic - Page 1 (publitas.com)

MDI to DPI Project

- Waiting room and Exam room posters for shared decision making





- Consider the environmental risks of medications when prescribing, during shared decision-making processes and when dispensing

MDI to DPI Project

- Prescription “favourites” and prescriber tools to support choice in prescribing

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

ASTHMA IN ADULTS: GREEN INHALER OPTIONS

Cost estimates are based on generic pricing in all cases where a generic is available. Cost estimates are also based on pricing at Shoppers Drug Mart (includes markup and dispensing fee of $11.99). Cost may be 10-20% lower at Costco or independent pharmacies.

Reliever Therapy

SABA

Ventolin pMDI (salbutamol) 200 doses
100-200 mcg QID PRN (max 800 mcg/day)
100 mcg $18.67 ✓ ODB

Symbicort Turbuhaler (budesonide/formoterol) 120 doses
1-2 inh QID PRN (max 6 inh at a time and 8 inh/day) *
100 mcg $94.55 // 200 mcg $118.78
X ODB *(LU code does not apply for reliver therapy)*

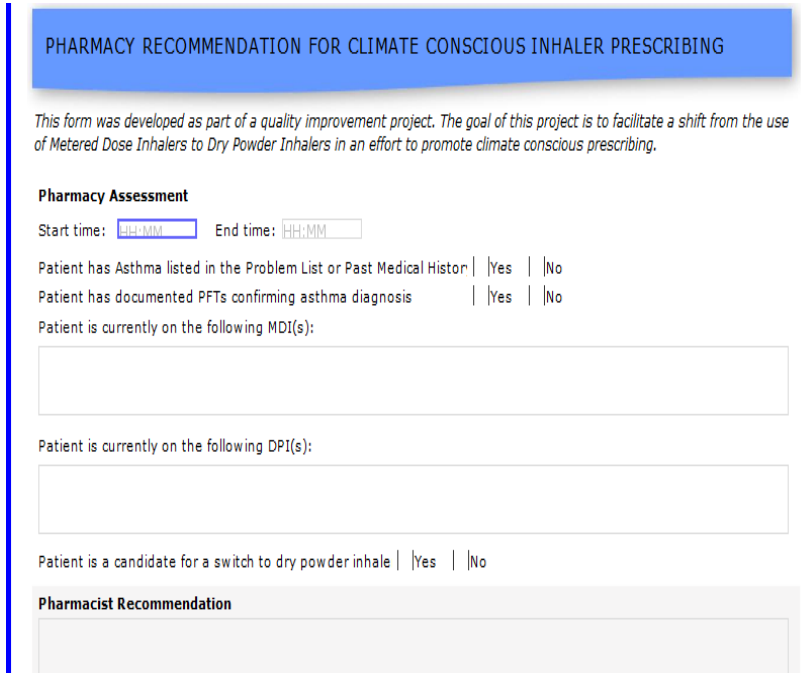
Bricanyl Turbuhaler (terbutaline) 100 doses
0.5 -1.0 mg QID PRN (max 3 mg/day)
0.5 mg $23.19 ✓ ODB

Class	Drug and Doses/Device	Device Type	ODB Coverage
SABA	Airomir HFA (salbutamol) 200 doses	pMDI	Yes
	Bricanyl Turbuhaler (terbutaline) 120 doses	DPI	Yes
	Ventolin HFA (salbutamol) and generics 200 doses	pMDI	Yes
	Ventolin Diskus (salbutamol) 60 doses	DPI	**No**
SAMA	Atrovent HFA (ipratropium) 200 doses	pMDI	Yes
SAMA/SABA	Combivent Respmimat (ipratropium/salbutamol) 120 doses	SMI	**No**
ICS	Aermony Respiclick (fluticasone propionate) 60 doses	DPI	Yes
	Alvesco (ciclesonide) 120 doses	pMDI	Yes
	Arnuity Ellipta (fluticasone furoate) 30 doses	DPI	Yes

- Recommend change from high carbon/environmental impact products to lower impact alternatives where appropriate

MDI to DPI Project

- Pharmacy intervention for change or discontinuation of inhalers



PHARMACY RECOMMENDATION FOR CLIMATE CONSCIOUS INHALER PRESCRIBING

This form was developed as part of a quality improvement project. The goal of this project is to facilitate a shift from the use of Metered Dose Inhalers to Dry Powder Inhalers in an effort to promote climate conscious prescribing.

Pharmacy Assessment

Start time: HH:MM End time: HH:MM

Patient has Asthma listed in the Problem List or Past Medical Histor | Yes | No

Patient has documented PFTs confirming asthma diagnosis | Yes | No

Patient is currently on the following MDI(s):

Patient is currently on the following DPI(s):

Patient is a candidate for a switch to dry powder inhale | Yes | No

Pharmacist Recommendation

- Recommend change from high carbon/environmental impact products to lower impact alternatives where appropriate
- Identify and discontinue unnecessary medications as appropriate
- Educate and review proper medication administration and device use to help improve adherence

MDI to DPI Project

- Waiting room posters for proper inhaler disposal

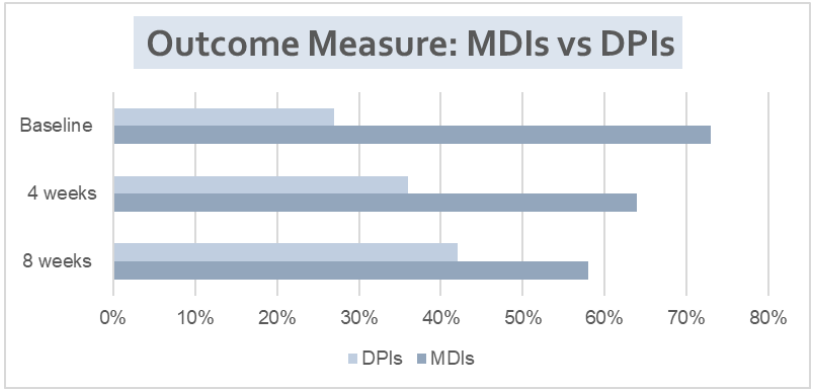
- Advise patients to return medications for disposal to a pharmacy

MDI to DPI Project

- Quality improvement results (medical resident project 2021)

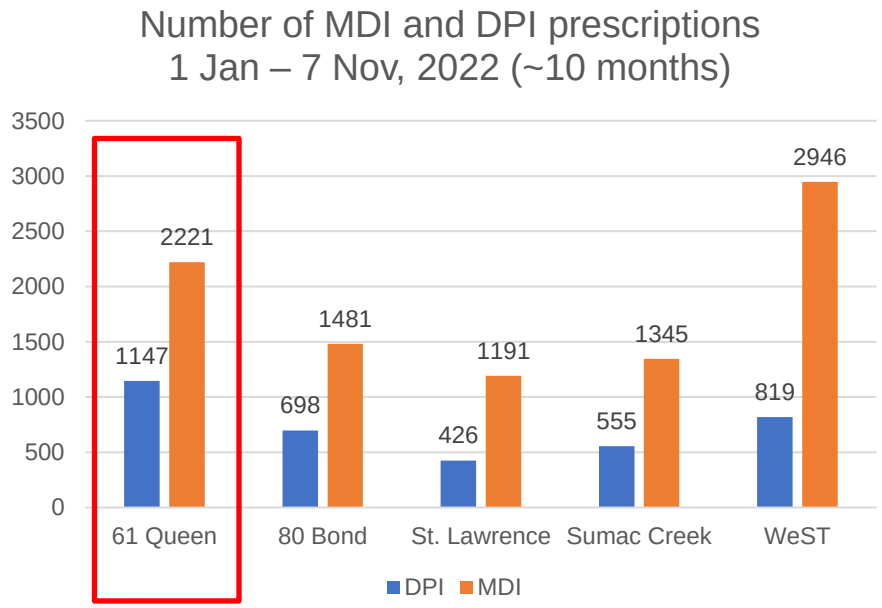
- "Favourites" used >1000 times
- Number of DPI prescriptions increased after the change ideas were implemented (p=0.0006)
- MDI:DPI was **1:1** after change ideas were implemented

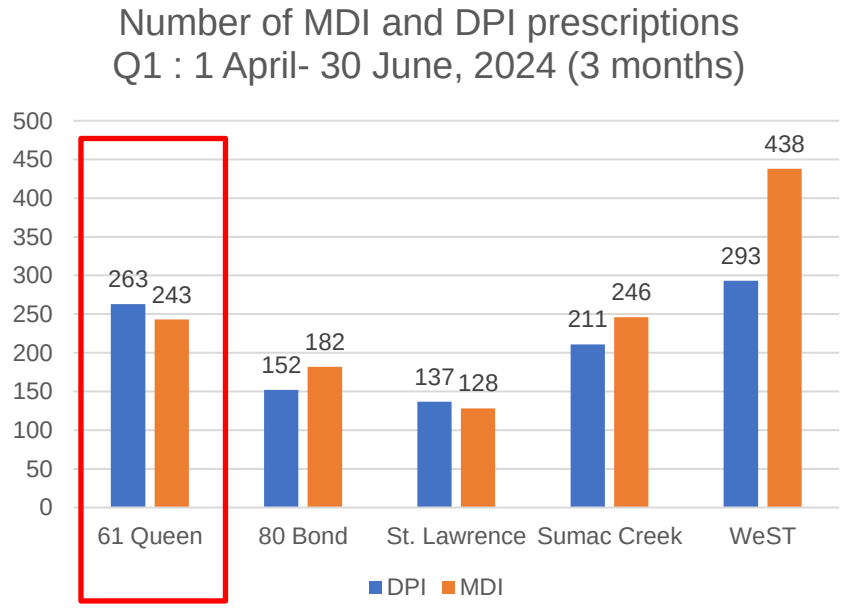
- Additional quality improvement results (pharmacy resident project 2023)



- There was a **15% decrease** in the percentage of MDIs and a **15% increase** in the percentage of DPIs 8 weeks post intervention, P=0.0003.
- Total number of inhalers reduced from 335 to 287 (**14% decrease**)

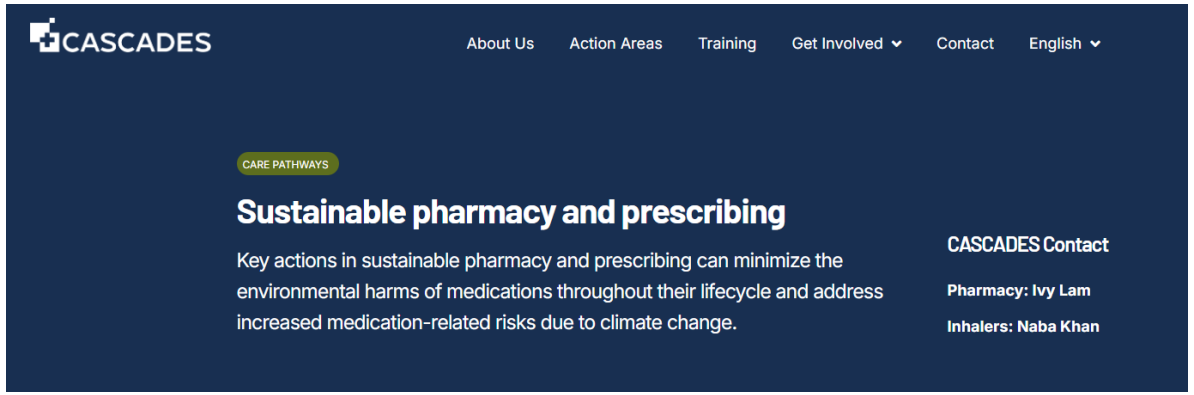
MDI to DPI Project





- Site with additional pharmacy intervention showed most significant shift in inhaler prescribing
- Trend to shifting MDI prescriptions to DPI prescriptions for all sites

Helpful resources



https://cascadescanada.ca/action-areas/pharmacy-and-prescribing/

https://www.deprescribingnetwork.ca

Takeaways…

- Medications are not always helpful to our patients and can be damaging to the environment
- Many opportunities exist for deprescribing and/or medication optimization which can support improved patient outcomes AND more climate resilient low carbon care
- Shift in prescribing habits may take time but it can happen
- Pharmacists can play a critical role in deprescribing and medication optimization efforts
- Learners may have an interest in planetary health and sustainability so consider including learners in sustainability initiatives

Thank you!

Low-Value Care

Eliminating Unnecessary Medical Gases

Anita Rao, MDCM, FRCPC

Disclosures

- I receive a salary from Trillium Health Partners as Physician Lead, Environmental Sustainability.
- I have received a stipend from CASCADES as Chair of the CASCADES Pan-Canadian Networks for Sustainable Perioperative Care.
- Funded trial: Our department received funding from Can-Health for trial of memsorb™.

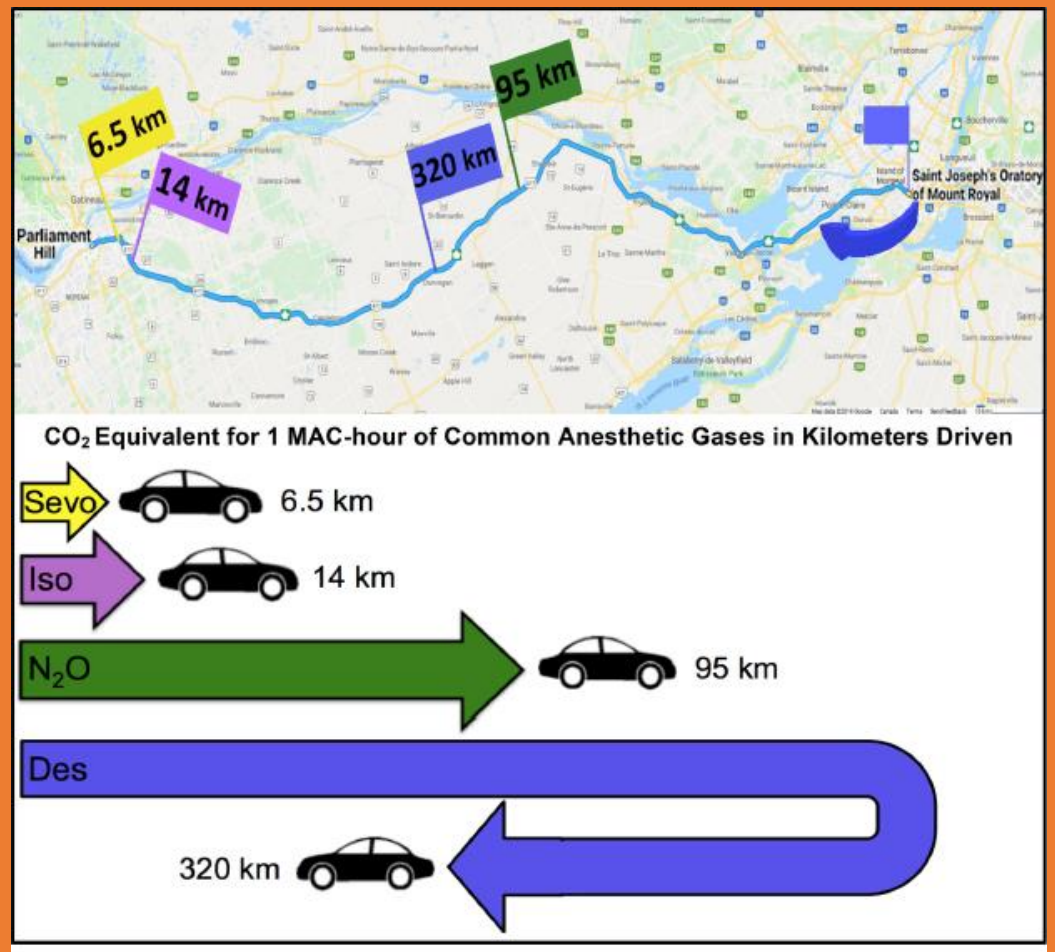
De-Implementation

Barriers to changing clinical practice:

i. Provider
ii. Patient
iii. Social Context
iv. Organization
v. Economic

van Dulmen SA, Naaktgeboren CA, Heus P, Verkerk EW, Weenink J, Kool RB, Hooft L. Barriers and facilitators to reduce low-value care: a qualitative evidence synthesis. BMJ Open. 2020 Oct 30;10(10):e040025. doi: 10.1136/bmjopen-2020-040025. PMID: 33127636; PMCID: PMC7604848.

Culprit Gases: Des and N20



Mary Hanna and Gregory Bryson, A long way to go: minimizing the carbon footprint form anesthetic gases, an J Anesth/J Can Anesth (2019) 66:838–839

Desflurane Elimination

Like MDI's, anesthetic gases are CFC. Desflurane has highest GWP = 2450.
20 years of research has shown that desflurane is not clinically superior to alternatives with much lower carbon footprint.
Current desflurane ban in NHS UK and proposed phase out in EU by 2026
Expensive and 20 times more polluting that the most common anesthetic gas

CANADIAN ANESTHESIOLOGISTS' SOCIETY

Consensus: Ditch the Des

Don't use desflurane when other anesthetic drugs and techniques are equally effective and less harmful to the environment – Choosing Wisely

WFSA WORLD FEDERATION OF SOCIETIES OF ANAESTHESIOLOGISTS

American Society of Anesthesiologists®

Barriers

- Some anesthesiologists prefer its pharmacokinetic profile
- Convince providers that the environment and health care resources are valuable considerations
- Unsupported concerns such as drug shortages, superiority for special patient populations

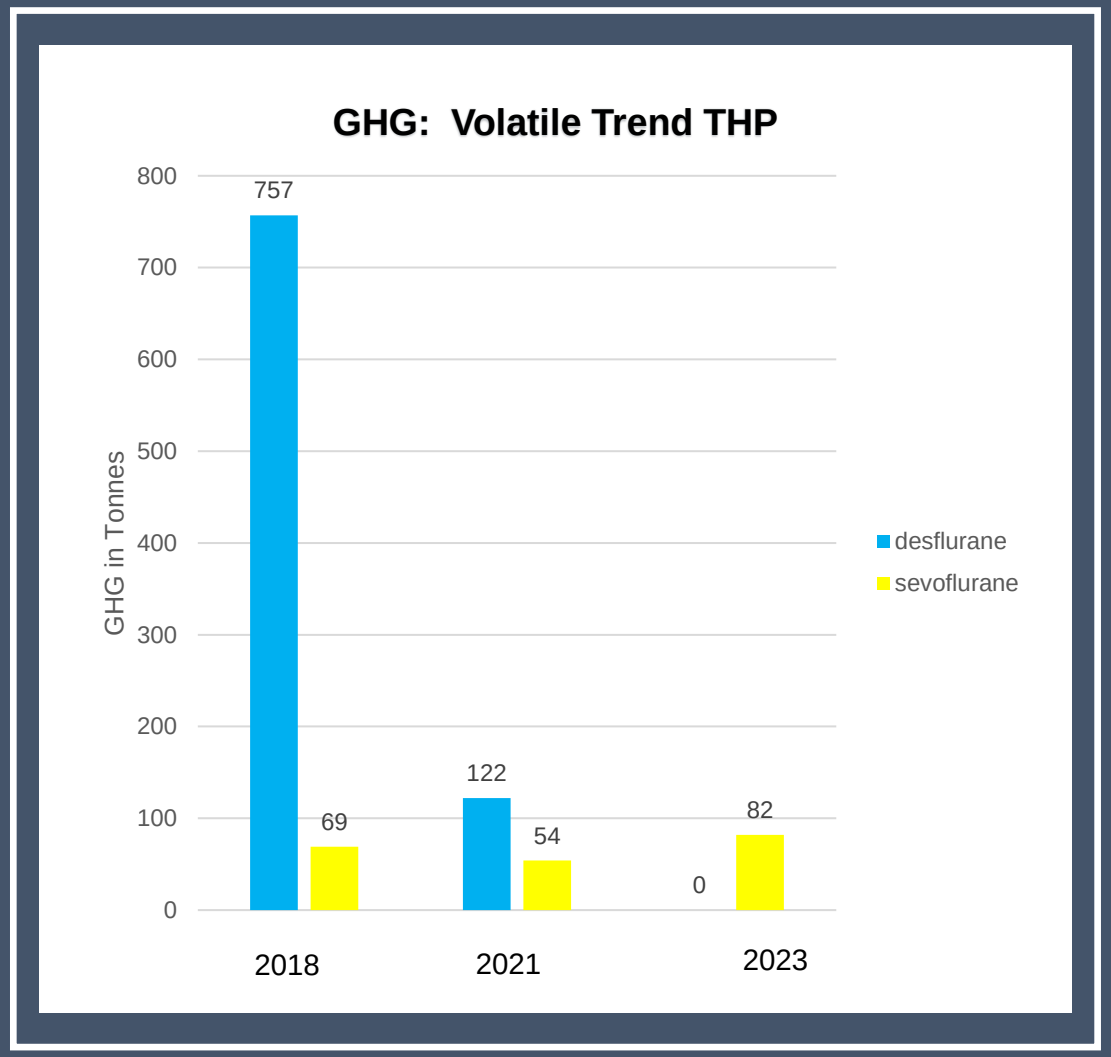
Advocacy Strategies

Bottom-up approach

- OA provides a “Greening the OR” rounds Approximately 20 departments/provincial/university rounds to date. Provide support to departments, resources and personalized advice.

Top-down approach

- Engaging with politicians and organizations such as political parties, Accreditation Canada, Canadian Standards Association, CASCADES

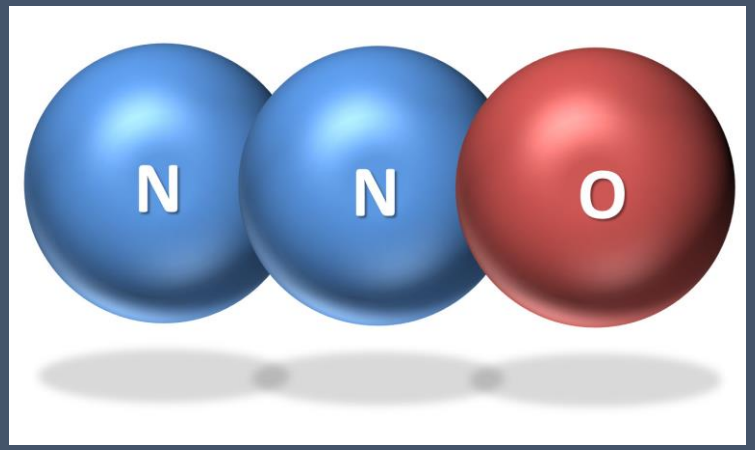


Desflurane elimination in a Large community Hospital

10-fold reduction in GHG and cost savings of $60,000/year

Ditched the Des!

Brockville General Hospital	Collingwood General and Marine Hospital	Grand River Hospital	Grey Bruce Health Services	Groves Memorial Community Hospital	Huntsville District Memorial Hospital	Kingston Health Sciences Centre
Lennox & Addington County General Hospital	Michael Garron Hospital (Toronto East Health Network)	North York General Hospital	Orillia Soldiers' Memorial Hospital	Perth Smith Falls District Hospital	Quinte Health	Scarborough Health Network
Sinai Health	Southlake Regional Health Centre	St. Joseph's Health Centre, Toronto	St. Mary's General Hospital	St. Mike's Hospital	Sudbury Health Sciences North	Sunnybrook Health Sciences Centre
The Hospital for Sick Children (SickKids)	Timmins and District Hospital	Trillium Health Partners	Unity Health Toronto	University Health Network	West Parry Sound Health Centre	Women's College Hospital



About Nitrous Oxide

- Historically used in healthcare facilities as an anesthetic gas and labour analgesia
- Diminishing relevance to the practice of anesthesia as better anesthetic gases have been developed over the past 30 years
- Very long-lasting greenhouse gas (114 years) with 273x the global warming potential compared to CO_2 and detrimental to our ozone layer

Current State

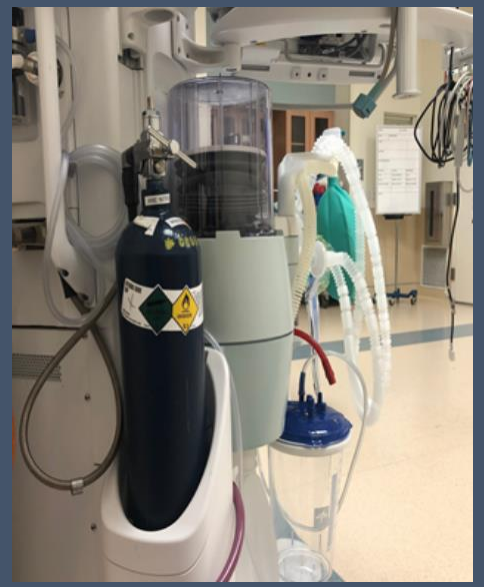
- Centralized nitrous oxide distribution systems have very high leakage rates in nearly every audited centralized system both in Europe and North America
  - >90% typically found regardless of preventative maintenance measures
- Impacting indoor air quality and likely exceeding occupational health and safety standards for gas concentrations when leaks occur in patient and staff areas: Canadian Centre for Occupational Health and Safety

Site	Leakage Rate	Amount of N2O (litres/yr)	GHG (tCO2e/yr)	Additional Notes
LHSC – Victoria Hospital	90%	1,000,000	580	
LHSC – University Hospital	99%	720,000	390	2 manifolds, negligible usage
Trillium Health Partners	Estimate >95%	2,150,000	1,250	$90k /year
Sunnybrook	99%	3,100,000	1,800	
Vancouver General Hospital	> 99%	520,000	265	
CHUM				
NHS Lothian Site 1	> 98%	970,000	570	Multiple sites with similar results

Centralized N2O Distribution Systems Audits

New Builds

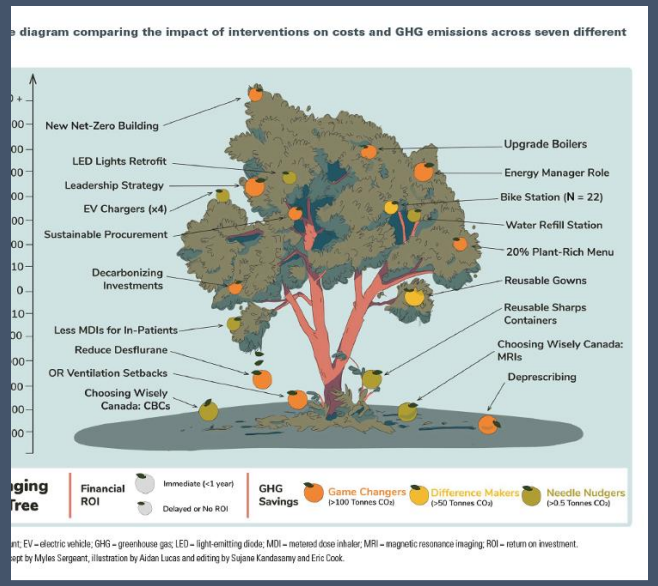
- Centralized N_20 systems should not be included in new builds.
- Joint Commission, AHQR and NHS have guidance documents supporting omission of centralized systems.



Goal

- **To align “CSA Z7396.1: Medical gas pipeline systems" with current best-practice.**
- **Strongly recommend eliminating nitrous oxide distribution systems from healthcare facilities where possible**

Ensuring they do not get built by default into new healthcare facilities



Sergeant M, Webster R, Varangu L, Rao A, Kandasamy S, Rampton M, Mathur N, Hategan A. Identifying Opportunities for Greenhouse Gas Reductions and Cost Savings in Hospitals: A Knowledge Translation Tree. Healthc Q. 2022 Oct;25(3):18-24. doi: 10.12927/hcq.2022.26946. PMID: 36412524.

Summary

- Medical Gases: Easy win for eliminating low-value care
- Triple bottom line
- No impact on quality of patient care
- Low Hanging fruit!

Spread the Message

Environmental Co-Benefits of Reducing Low-Value Care

Thomas Bodley, Brenda Chang, Anita Rao

Moderator: Karen Cameron

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