

# Options for The Sustainable Prescriber



1

## "What Matters to You?"

What do our patients want?  
Provide full information about therapeutic options, including harms.  
Ask about and listen to what is important to your patient:  
do they want more medications, or less?

2

## Social Prescriptions

Can underlying health factors be managed without medications?

Consider **Social Prescribing** for social determinants of health.

Does the patient need food, housing, income, or increased social connections?

Would the patient benefit from more exercise, or exposure to nature?

3

## Starting a Medication

Four principles of starting a medication:

**Effectiveness:** Is there good evidence for benefit of the medication?

**Safety:** Consider the harms of the medication.

**Convenience:** Consider the route, frequency and timing of doses, and how they 'fit' your patient.

**Cost:** Can your patient afford the medication? What is the cost to the environment?

4

## Medication Optimization and Deprescribing

Review resources from:  
**Canadian Medication Appropriateness and Deprescribing Network**

**Therapeutics Initiative**

**Deprescribing.org**

Consider resources by specialty and by patient population:  
**Choosing Wisely Canada**

Ask about all non-prescription products.

5

## Other possibilities, now and the near future

Can a medication switch be made?

Can you look at medication toxicity ratings and find a better choice?

Can you look at the environmental rating of the manufacturer?

Can manufacturers extend expiry dates?  
See full document for other possibilities...





## SUSTAINABLE PRESCRIBING CANADA

Although medications can be helpful when used appropriately, some of the medications we use are unnecessary and can lead to adverse effects, unnecessary costs to patients and the healthcare system, extra work for providers and environmental harms.

See [Overuse of tests and treatments](#).

## WHY IS IT IMPORTANT TO BE A SUSTAINABLE PRESCRIBER?

### Life cycle of a medication

- The extraction of active pharmaceutical ingredients and excipients from the earth is an emissions-intensive process. We also need to ship, manufacture, package and dispose of medications. These processes represent 48% of the greenhouse gas footprint of primary care. [1](#)

### Polypharmacy

- 10% of medications prescribed are potentially unnecessary. Beyond patient harms, this also leads to wasted time and money for patients and the healthcare system. *"When a clinician issues a prescription, it is usually because they genuinely believe that it is something the patient needs. Overprescribing is rarely the result of a faulty diagnosis....the extent of overprescribing is a result of weaknesses in the healthcare system and culture, not the skills or dedication of individual healthcare professionals. It is not easy to know the true extent of overprescribing, but.... the available evidence and our best estimate is at least 10% of the current volume of medicines may be overprescribed "* [2](#) [UK Department of Health and Social Care](#)
- Necessary medications can improve health. However, many patients do not want, or cannot afford, the prescriptions they are given. [3](#) In these situations, help the patient prioritize which medications they will take based on safety and efficacy.
- Patients often take over-the-counter medications, natural health products, or other supplements. Ask about these items as part of your regular medication reviews.

### Waste

- Medications are often disposed of in the toilet or in landfill which creates wastewater effluent. [4, 5](#)

## What matters to your patients?

- Ask patients "What matters to you?" and listen.  
[What matters to you?](#)
- When clinicians provide full information about benefits and risks of medications, many patients choose less, rather than more medications.  
[Choosing Wisely Canada - Four questions](#)
- Use shared decision-making tools.  
[What matters to you - Toolkit](#)

## Social Prescriptions



“Social prescribing is a means of connecting patients to a range of non-clinical services in the community to improve their health and well-being. It builds on the evidence that addressing social determinants of health such as socioeconomic status, social inclusion, housing, and education is key to improving health outcomes.” World Health Organization

- A toolkit on how to implement social prescribing  
[World Health Organization](#)
- A provider can write non-medical prescriptions in many primary care situations  
[Canadian Institute for Social Prescribing – A resource for health professionals](#)

### Income and Housing

- Assistance with income and housing prevents poverty and chronic diseases associated with lower socio-economic status. [6](#)
- Income also enables patients to buy their medications. If a patient cannot afford chronic disease medications, they may become sicker and require more healthcare. [7](#)

### Healthy, Sustainable Diets

- Ensure access to healthy food  
[Food Secure Canada](#)
- Inform patients about [Canada's food guide](#)
- Engage patients about the health benefits, and carbon footprint benefits, of plant-rich diets.  
[Nourish Leadership](#)

### Social Network

- The effect of social isolation on mortality is comparable to that of other risk factors such as smoking, obesity, and physical inactivity. [8](#)  
[Social Prescribing info page](#)

### Nature exposure

- "Research shows that kids and adults who spend more time in nature are happier and healthier."  
[Park Prescriptions](#)

### Exercise

- There are myriad of health benefits of exercise.  
[ParticipAction](#)
- "Rx Files" has created a prescription for exercise.  
[Exercise Rx Files](#)
- We can also recommend active transport.  
[Active Travel Toolkit](#)





## Starting a Medication



- Engage patients on the proper use of a medication - 50% of patients do not use them as directed 3
- If a medication is taken improperly it will not be as efficacious, which may lead to the need for repeated prescriptions, escalation of treatments, or progression of disease 9

Consider these four principles of rational prescribing: 10

### Effectiveness

- Use evidence to avoid unnecessary prescriptions when appropriate  
[Choosing Wisely Canada - Clear the Air](#)
- Consider tools to support decision-making such as the number needed to treat when thinking about benefits  
[TheNNT.com](#)
- And defer treatment with antibiotics  
[Choosing Wisely Canada - The Cold Standard](#)

### Safety

- Choose the medication with lowest harms/adverse effects.
- Consider and document from the outset, “How long will the medication be prescribed?”
- Make a plan with your patient to review medications after a set timeframe to avoid unnecessary ongoing or chronic use.
- Talk to your patients about the population harms of improper medication disposal. Encourage them to return unused medications to their pharmacy for disposal.  
[Management of Pharmaceutical Household Waste.](#)

### Convenience (adherence)

- Less frequent dosing results in better adherence and fewer drug-drug interactions
- Choose medications with once daily dosing when possible (improves adherence and decreases total number of tablets)

### The costs

- Consider the financial cost to patient (and health system): is there a more affordable equivalent? If a patient cannot afford all of their medications, help them prioritize which medications they will take based on safety and efficacy.
- Costs of potentially inappropriate medications and their consequences in Canadian older adults was estimated to be close to 2 billion per year in 2013 11
- Consider the environmental costs of production and of excretion.

## Medication Optimization and Deprescribing



- All patients can benefit from these interventions: one medication may be one too many for a patient.
- Polypharmacy is seen more frequently in older adults, patients with multiple comorbidities and in those who have had a recent discharge from hospital.
- Remember to review all over-the-counter products. Sometimes there are many!

### Deprescribe medications

- Refer to deprescribing resources for patients (e.g., brochures explaining the need to reassess medications over time, risks of certain medications) and providers (e.g., deprescribing algorithms, educational videos), found here:
  - [Canadian Medication Appropriateness and Deprescribing Network](#)
  - [Deprescribing.org](#)
  - [Choosing Wisely Canada](#)
  - [Therapeutics Initiative](#)
- Partner with your local pharmacists for medication optimization (Interprofessional collaboration is key).
- The process of optimizing medications typically results in less medication burden.

## Other Possibilities- now and the near future



### Now - Medication switches

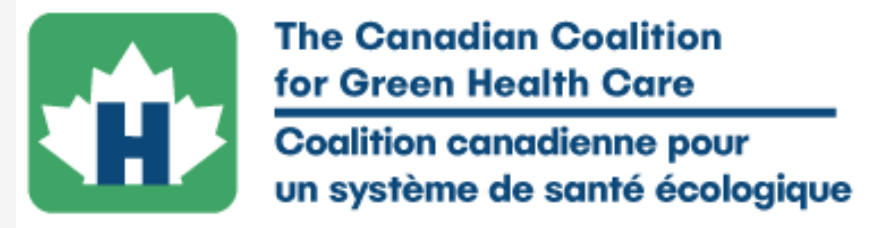
- When appropriate, switch to lowest environmental impact alternatives like dry powder inhalers (vs metered dose inhalers). [12](#)  
[CASCADES - Inhalers](#)

### What may be possible in the near future?

- Can we consider the environmental impact of the medications we prescribe and find the best alternative? [13, 14](#)
- Can we consider a medication's toxicity score, for example?  
Learn more at [Pharmaceuticals and environment - Sweden](#)
- Alternatively, can we consider the parent company's environmental rating?  
Learn more at [Science Based Targets initiative](#).
- Can we nudge manufacturers to explore longer expiry dates? [15](#)
- Can we redistribute medications across the health system? There are jurisdictions that transfer unopened packages between pharmacies.  
Learn more at [PharmaSwap - Netherlands](#)
- Consider other policy and advocacy ideas for enviro-informed prescribing in your jurisdiction...  
[Environmentally informed pharmaceutical prescribing - Scotland](#)

This document was created by:

**SUSTAINABLE PRESCRIBING CANADA**



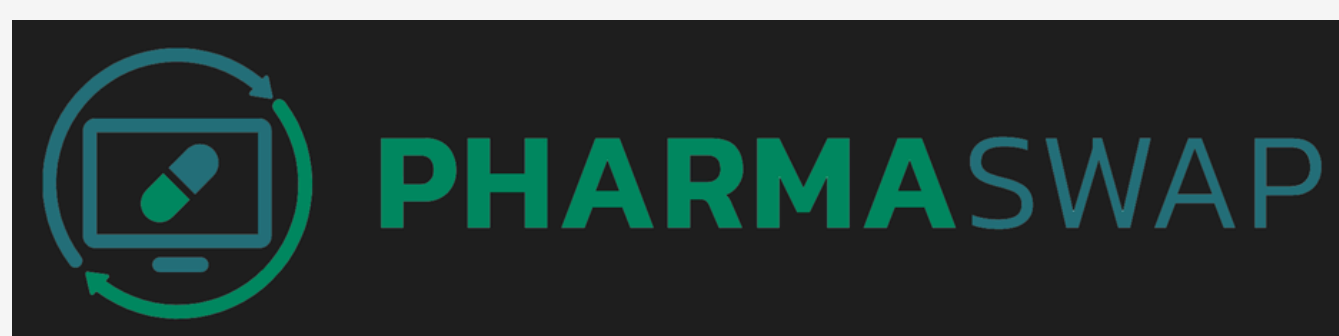
## A working group of the Canadian Coalition for Green Health Care

### References:

- 1 NHS Sustainable Development Unit. (2012). Goods and services carbon hotspots. NHS England breakdown of goods and services carbon footprint by organization type.
- 2 UK Department of Health and Social Care. Good for you, good for us, good for everybody: A plan to reduce overprescribing to make patient care better and safer, support the NHS, and reduce carbon emissions. 2021
- 3 Nieuwlaat, R., Wilczynski, N., Navarro, T., Hobson, N., Jeffery, R., Keenanasseril, A. & Haynes, R. B. (2014). Interventions for enhancing medication adherence. *Cochrane database of systematic reviews*, (11).
- 4 Thornber, K., Adshead, F., Balayannis, A., Brazier, R., Brown, R., Comber, S., Court, C., Davidson, I., Depledge, M., Farmer, C., Gibb, S., Hixson, R., Kirchhelle, C., Moore, K., Motta, M., Niemi, L., Owen, S., Pencheon, D., Pflieger, S., ... Tyler, C. (2022). First, do no harm: Time for a systems approach to address the problem of health-care-derived pharmaceutical pollution. *The Lancet Planetary Health*, 6(12). [https://doi.org/10.1016/s2542-5196\(22\)00309-6](https://doi.org/10.1016/s2542-5196(22)00309-6)
- 5 OECD. (2019). Pharmaceutical Residues in Freshwater: Hazards and Policy Responses. [cited 2022 Feb 17]. <https://doi.org/10.1787/c936f42d-en>
- 6 Haydon, E., Roerecke, M., Giesbrecht, N., Rehm, J., & Kobus-Matthews, M. (2006). Chronic disease in Ontario and Canada: determinants, risk factors and prevention priorities. Toronto, ON: *Ontario Chronic Disease Prevention Alliance*.
- 7 Ho, P. M., Rumsfeld, J. S., Masoudi, F. A., McClure, D. L., Plomondon, M. E., Steiner, J. F., & Magid, D. J. (2006). Effect of medication nonadherence on hospitalization and mortality among patients with diabetes mellitus. *Archives of Internal Medicine*, 166(17), 1836. <https://doi.org/10.1001/archinte.166.17.1836>
- 8 Naito R, Leong DP, Bangdiwala SI, et al. (2021). Impact of social isolation on mortality and morbidity in 20 high-income, middle-income and low-income countries in five continents. *BMJ Global Health*.
- 9 Fitzgerald, A. A., Powers, J. D., Ho, P. M., Maddox, T. M., Peterson, P. N., Allen, L. A., Masoudi, F. A., Magid, D. J., & Havranek, E. P. (2011). Impact of medication nonadherence on hospitalizations and mortality in heart failure. *Journal of Cardiac Failure*, 17(8), 664–669. <https://doi.org/10.1016/j.cardfail.2011.04.011>
- 10 Littman, J., & Halil, R. (2016). Potential effects of rational prescribing on national health care spending: more than half a billion dollars in annual savings. *Canadian Family Physician*, 62(3), 235-244.
- 11 Morgan, S. G., Hunt, J., Rioux, J., Proulx, J., Weymann, D., & Tannenbaum, C. (2016). Frequency and cost of potentially inappropriate prescribing for older adults: a cross-sectional study. *CMAJ open*, 4(2), E346–E351. <https://doi.org/10.9778/cmajo.20150131>
- 12 Jeswani, H. K., & Azapagic, A. (2019). Life cycle environmental impacts of inhalers. *Journal of Cleaner Production*, 237, [117733]. <https://doi.org/10.1016/j.jclepro.2019.117733>
- 13 *The German Federal Agency (UBA) reviewed the environmental risk assessment of 650 human pharmaceutical products. Approximately 10% of these substances were found to pose a potential environmental risk*  
Küster, A., & Adler, N. (2014). Pharmaceuticals in the environment: Scientific evidence of risks and its regulation. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 369(1656), 20130587. <https://doi.org/10.1098/rstb.2013.0587>
- 14 *Välvald is the pharmacy sector's guide to which pharmaceutical companies are more transparent about their sustainability work and sets requirements for responsible manufacturing.*  
*Once the pharmaceutical company meets certain criteria showing transparency in their sustainability efforts, all their OTC products will receive a Välvald symbol...*  
Swedish Pharmacy Association. Välvald. (2022). Pharmacies Guide for Greater Transparency [Internet] [cited 2022 Oct 10]. *Sveriges Apoteksförening*. Available from: <http://www.sverigesapoteksforening.se/valvald/>
- 15 Zilker M, Sörgel F, Holzgrabe U. A systematic review of the stability of finished pharmaceutical products and drug substances beyond their labeled expiry dates. *J Pharm Biomed Anal* 2019; 166:222-35. doi: 10.1016/j.jpba.2019.01.016. Epub 2019 Jan 11. PMID: 30660807.



The content of this document has been edited or reviewed by:



### Suggested Citation:

Sustainable Prescribing Canada. (2023). *Options for the Sustainable Prescriber*. PEACH Health Ontario.

Version 2, published Feb 2025. Original version published in 2023