



# PlanetaryHealth

for Primary Care

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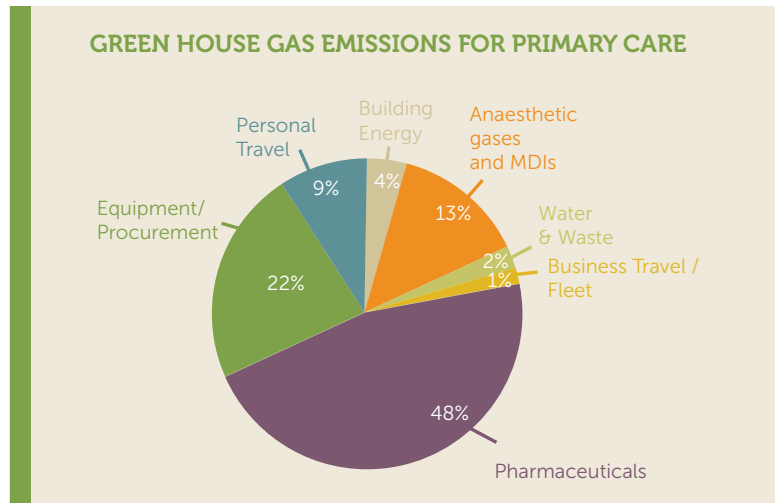
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# Introduction

The concept of “planetary health” considers “the health of human civilization and the state of the natural systems on which it depends”(1). It reminds us that human survival relies upon protecting the natural systems that sustain us - water, land and air. Yet climate change and environmental degradation pose the greatest threats to human health of the 21st century. People the world over are experiencing the symptoms of an increasingly unhealthy planet as wildfires, floods and extreme weather events take their toll(2, 3).



## A New Way of Thinking About Environmental Action in Healthcare

The healthcare sector is one of the most polluting sectors, contributing 5% of Canada’s total greenhouse gas (GHG) emissions (4). Traditionally, environmental action has focused on recycling and reducing physical waste and energy to power buildings and vehicles but the energy used in facilities accounts for only approximately 20% of the GHG emissions in healthcare(5, 6). The other 80% comes from what we don’t see - the upstream waste generated in the supply chain to produce materials required for medications, investigations, surgeries and hospitalizations. Unsustainable overconsumption of the planet’s resources is at the root of the problem and healthcare practitioners carry the responsibility for both their personal consumption and that driven by their professional practice. In primary care, 60-65% of our impact comes from prescriptions alone. Fortunately, adopting an environmental lens can reveal many opportunities to reduce waste and overconsumption through more sustainable clinical decisions(7). Every clinician can be a climate advocate by simply using existing tools at work in a new way, every day.

## Principles of Sustainable Healthcare

Planetary healthcare presents an opportunity to continue providing high quality care for patients today without compromising the health of future generations. It increases equity, reduces costs and can relieve burdens on patients and healthcare workers. This primer is designed around the four principles of environmentally sustainable healthcare: Reducing unnecessary care, empowering patients, shifting our focus towards health promotion and prevention, and choosing lower impact alternatives(8).



## Why Focus on Primary Care?

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Primary care providers are well-positioned to do this work given their expertise in health promotion and collaborative, patient-centered care.

High quality primary care can help patients avoid more intensive secondary or tertiary interventions which are associated with higher environmental impacts.

In private practice, there are fewer institutional barriers to change compared to inpatient settings and small, effective solutions can be implemented more easily. Due to the large number of primary care practitioners across Canada, even a few small changes, if widely adopted, could result in large cumulative impacts. However, although this primer is focused on primary care, many of the principles can be applied by practitioners in any discipline(7).



The carbon footprint of an average FP appointment is 6kg CO<sub>2</sub>e whereas each elective inpatient stay is estimated at 708kg CO<sub>2</sub>e(9).



### About this document

This primer is an introduction to planetary health in the primary care setting and is designed to highlight ways practitioners can integrate these principles into their clinical work. It is not intended to duplicate existing resources on other important topics such as political and personal actions or hospital-based solutions. It offers examples, practice tips and links to existing resources to educate, inspire and remove barriers to change, organized around the four principles. Readers may want to read it from start to finish or by sections.

**Additional information and resources can be found in the appendices. Here are a few options to get you thinking about how to make a difference right away:**

- > [Checklist for Change – ideas for easy wins that you can implement in your setting immediately](#)
- > [Our 15 minute video - a short overview of the four principles and practical applications.](#)



# Reducing Unnecessary Care

Medical advances in curing illness and extending human lifespans have led to the perception of healthcare as an absolute “good”. However, there is a point at which the benefits of more and more “health” care are outweighed by associated harms. Beyond this point there are diminishing returns and increased exposure to harms. There is an optimal level of care which limits both underuse of effective services and overuse of inappropriate interventions, resulting in the highest quality health for individual patients and populations.

Unnecessary care is defined as “care that provides minimal or no benefit, considering the harms, costs, alternatives and preferences of the patient(10).” It is estimated that up to 30% of the investigations and treatments ordered in healthcare are unnecessary and an additional 10% actually result in direct harm to patients(11). This unnecessary care increases wait times, wastes healthcare dollars and increases workloads.

Unnecessary care also has an enormous environmental cost, given the energy and resources required to extract, process, manufacture, package, transport and ultimately dispose of materials required for each medication, investigation and healthcare visit. Reducing unnecessary care is one of the most important ways to reduce our environmental impact while continuing to provide high quality care to patients.



**Environmental impacts, energy and resource use during life cycle of medications and medical supplies**

## Choosing Wisely Canada

Choosing Wisely Canada is the national voice for reducing unnecessary tests and treatments in Canada. They work with national clinician societies to identify frequently overused tests and treatments not supported by scientific evidence and mobilize health care providers and their organizations to adopt the recommendations. The objectives of Choosing Wisely Canada align closely with planetary health objectives that, while always positioning individual patient care at the forefront, also consider the value of tests and treatments in the larger context of the population and a sustainable healthcare system. In addition to recommendations, Choosing Wisely Canada has developed a number of patient and clinician resources.

## Teamwork and communication

Teamwork and communication are keys to reducing our impact by ensuring patients get the right treatment from the right provider at the right time. Effective communication between primary care providers and specialists, and among providers in multidisciplinary teams, avoids unnecessary care, improves safety, and provides a better patient experience(7). Efficient, patient-centred teams with shared electronic health records can avoid duplication and minimize excessive “tick box” data collection or investigations.

## Fear of “Missing Something”

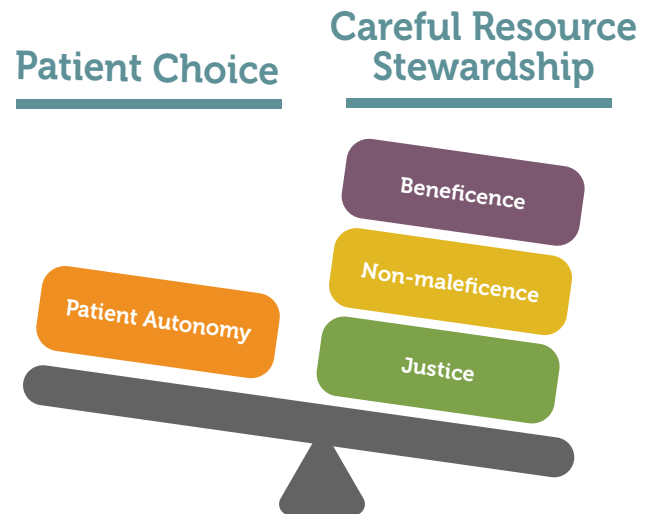
There are many drivers of overuse but one of the most common is fear of missing a diagnosis(12). According to the Canadian Medical Protective Agency, more malpractice suits result from overuse (complications or adverse effects) than underuse (missing a diagnosis from failing to order enough tests). Medicolegal experts advise that the most frequent contributor to litigation is a “lack of adequate communication between the physician and the patient.”(13, 14)

# Drivers of Over-use

- Failure to recognize harms
- Culture of “More is Better”
- Faith in screening/early detection
- Over-reliance on tests
- Time pressure
- Habit / tradition/ training
- Perverse financial incentives
- Lack of awareness of evidence
- Anxiety (patient or provider)
- Industry influence
- Patient requests
- Defensive medicine

## Ethics of Planetary Healthcare

Providers may worry that planetary healthcare appears to prioritize the environment above patient health, but this is a false dichotomy; appropriate high quality, patient-centred care optimizes patient health with benefits to the planet and health care system. Health professionals have a responsibility to balance all ethical principles, considering both the individual patient and the larger population in the short and long term. Resources within our healthcare systems and on our planet are finite and need to be distributed in the most equitable way to those who need them most. For this reason, the overall benefit of careful stewardship outweighs the principle of patient autonomy(15) when faced with a patient requesting a medically unnecessary service (e.g. antibiotics for a viral illness).



## Ethics of Resource Stewardship

(Adapted from Royal College of Physicians and Surgeons of Canada Resource Stewardship Curriculum Resource Toolkit)

## Overdiagnosis

“Overdiagnosis is one of the most harmful and costly problems in modern healthcare.” (16)

Overdiagnosis refers to “the labelling of a person with a disease or abnormal condition that would not have caused the person harm if left undiscovered”(16, 17) It comes in several varieties: over-detection from screening, **over-definition** from broadening criteria for diagnoses and **medicalizing** normal human experiences.

### Over-detection

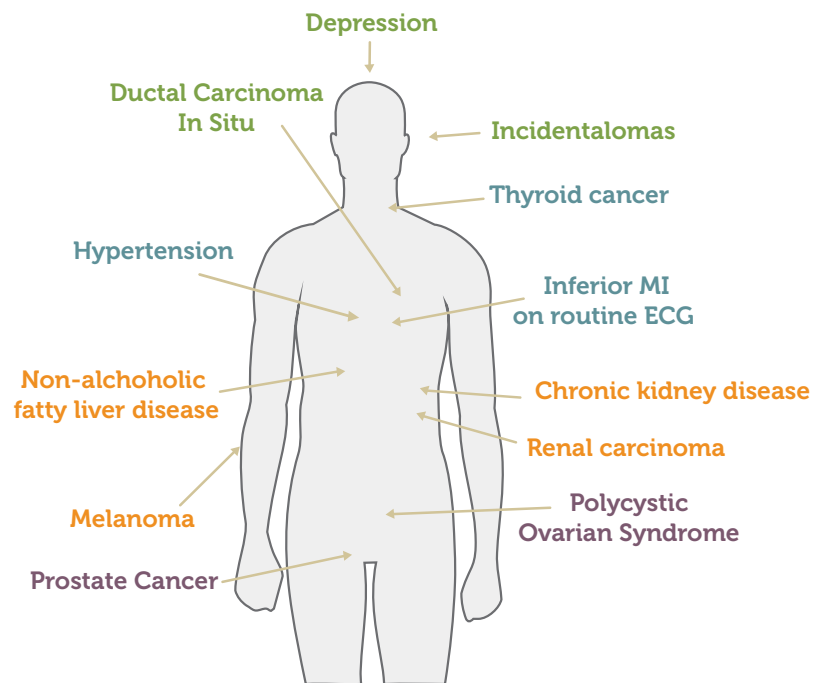
Many patients (and even providers) are surprised to learn of the prevalence of overdiagnosis and the harms associated with screening for early detection and treatment. Early detection may contribute to “lead-time bias”: extending the time between diagnosis and death (“survival time”) without improving actual survival, which reinforces the idea that all screening is valuable and may perpetuate more screening.

### How do we diagnose overdiagnosis?

On a population level we know we are over-diagnosing conditions when we see an increase in the incidence of a condition without any concomitant change in mortality.(21)

### Consider these examples:

- People in regions of the U.S. with high CT scanning rates have a higher risk of nephrectomy for incidentally detected renal masses(18). Most of these masses would not have led to patient harm if undetected.
- Thyroid cancer incidence rates in Canadian women increased from 3.9 to 23.4 per 100,000 since 1970 with no change in mortality rates(19) suggesting these cancers were over-diagnosed.
- An estimated 21-61% of ductal carcinoma in situ (DCIS) and 33-50% of prostate cancers would not have led to harm if undetected (20) (21)
- With more sensitive CT scanners, the incidence of pulmonary embolism increased from 62.1 to 112.3 per 100,000 adults but mortality stayed the same, suggesting the small emboli being detected were unlikely to be harmful but were exposing a greater number of people to harms of anticoagulation, anxiety and additional radiation(22).



### Commonly Overdiagnosed Conditions(23-30)

(Adapted from Dr Eddy Lang)

## Diagnostic Creep

“Diagnostic creep” refers to the gradual expansion of diagnostic thresholds and criteria to include ever larger numbers of people with conditions such as “pre-diabetes” and “borderline hypertension”. With the adoption of new diagnostic criteria, up to 65% of people over 80 would be diagnosed with dementia with no evidence of improved outcomes(21). Of people diagnosed with “pre-diabetes”, 2/3 do not develop diabetes when followed for 12 years(31).

Aggressive lipid lowering guidelines and targets for testing and treating are controversial and debated by many scholars(32, 33). Some prominent guidelines are developed by specialty societies with pharmaceutical industry influence, such as the latest Canadian lipid guidelines(34) supported by [pharmaceutical companies](#) who produce the new lipid lowering medications and whose authors report multiple [conflicts of interest](#).

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## Medicalizing Normal Human Experience

There are many parts of the normal human experience that can be unpleasant or unwelcome: teenage angst, occasional sleeplessness, grief, hot flushes, love handles and male pattern baldness. Pressure from direct-to-consumer advertising leads an ever-increasing number of people who identify with these symptoms to believe they have a diagnosis that requires treatment. This shifts the line between what is normal and what is a disease, and perpetuates the idea that there is a “pill for every ill”, including natural aging.

In primary care, many people will present with mild variations of the normal human condition that will be self-limited and respond well to conservative or non-pharmacologic treatments. Others will experience severe and debilitating symptoms that warrant treatment. The role of the primary care provider is to carefully and thoughtfully apply appropriate diagnostic criteria, clinical skills and a patient-centered approach to help patients recognize the difference and manage appropriately. For some patients, normalizing the human experience of imperfection, pain and grief can help them develop greater resilience and self-efficacy.

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## Harms of Overdiagnosis (16, 21)

Patients who are overdiagnosed may experience physical, psychological or financial harm. There are also direct and indirect costs to patients - time, missed work, insurance and costs of treatment. Unnecessary testing and treatment place an additional burden and expense on an already stretched system and contribute to increasing wait times, a potential cascading cycle of more testing, and increased risk of complications such as biopsy complications following mammograms or prostate screening. When viewed through an environmental lens, unnecessary testing and treatment associated with overdiagnosis results in ecological harm from increased pollution and utilization of energy and resources.

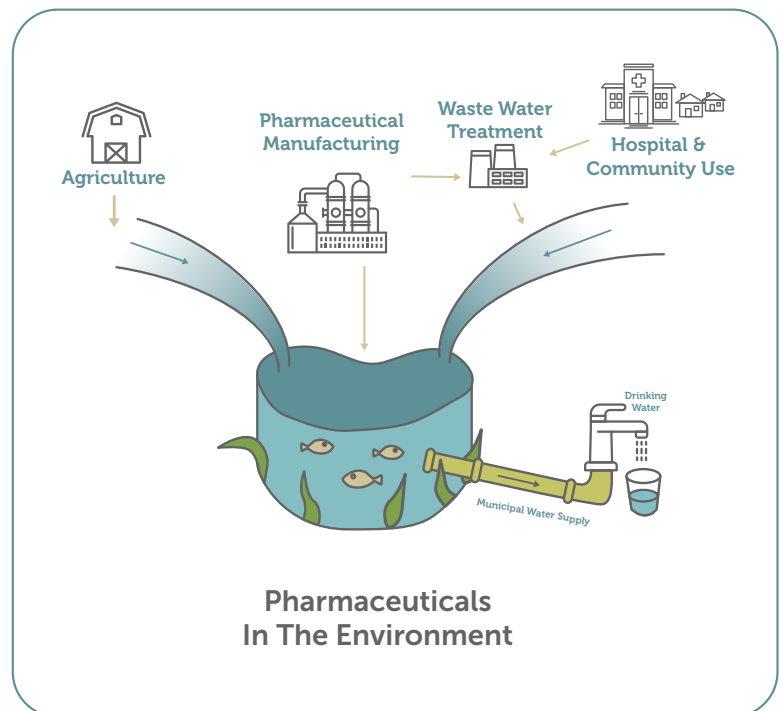
## How Can Primary Care Providers Respond?

- Be aware of conditions that can be commonly over-diagnosed and consider “de-diagnosing”.(35)
- Talk to patients about overdiagnosis and use [patient decision aids](#).
- Be aware that the appropriateness of recommendations depends on baseline risk and population prevalence (generally low in the undifferentiated primary care population) and that specialist guidelines may not apply to a primary care setting.
- Rely on guidelines and recommendations developed for primary care by teams free of industry or special interest influence, such as Therapeutics Initiatives, Choosing Wisely Canada, [UBC Provincial Academic Detailing](#), [Tools for Practice](#) and the [Centre for Effective Practice](#).
- Use the knowledge gained through longitudinal patient relationships to tailor recommendations to patient values and personal risk using a shared decision-making approach.
- Be familiar with up-to-date, evidence-based [screening guidelines](#) (when to screen and when not to screen).
- Help patients understand the concept of medicalization of normal human experience and “diagnostic creep” and the risks associated with excessive investigation or unnecessary treatment..
- Clearly document discussions and consent for accepting or rejecting tests or treatment.

## Medications

In primary care, pharmaceuticals account for 60-65% of the carbon footprint(5, 36) and 25% of healthcare emissions overall in Canada(37). Pharmaceutical manufacturing is more emission intensive than automotive manufacturing(38). In addition to resource use and greenhouse gas emissions associated with their production, packaging, transport and disposal, pharmaceuticals have other wide-ranging impacts on the environment and contribute to antimicrobial resistance.

Approximately 600 different medicines can be found in wastewater and effluent and little is known about their effects on the natural world and human health(39). Once consumed, 30-100% of medications are excreted(40) and 40% of patients dispose of unused medications improperly(39) in landfills or water systems. There are many opportunities to modify prescribing for patient and planetary health, especially in primary care where most prescriptions are written.



## Reducing your Prescribing Footprint

### Non- pharmacologic Options

Since all medications have an impact, avoiding prescriptions when appropriate is the most environmentally sustainable approach. In primary care settings where low-acuity, self-limiting conditions are prevalent, a wait-and-see approach, with encouragement to return if needed, is often recommended(41).

#### Tips to reduce your prescribing footprint

- **D**iagnosis – use established criteria to avoid mis- or over-diagnosis
- **O**ptions – consider and refer for non-pharmacologic options
- **P**atients – provide full information and hear patient preferences
- **E**vidence – know the evidence for indications, duration, risks
- **D**eprescribe – stop medicines that are no longer needed

Embracing the principles of “[Slow Medicine](#)”, which originated as Italy’s version of Choosing Wisely, allows practitioners to harness the healing power of time. Prescribing less can reduce workload through less long-term follow-up, refill visits, monitoring and complications. Although non-pharmacologic options are often recommended as first line therapy, practitioners with the authority and expertise to prescribe may be more comfortable using medications than other tools like motivational interviewing or cognitive behavioural therapy. Collaboration among members of the primary care team with complementary skills to support patients with diet, exercise, physical therapy, mental health counselling or social prescribing(42) can have longer lasting health benefits, fewer complications and lower environmental impact. See the appendix for a list of [health promotion](#) resources.

Although providers may sometimes assume that patients expect prescriptions,(43) when patients are well-informed about the true risks and benefits of medications they often choose less, or no treatment(44). Choosing Wisely Canada offers a number of [patient resources](#) about the risks and benefits of medications.



## Avoiding Frequently Over-prescribed Medications

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### Antibiotics

More than 90% of antibiotics are prescribed in primary care(11) and many are commonly over-used contributing to unnecessary adverse effects and costs to patients. Despite growing awareness, a 2020 study looking at 23 common conditions found that antibiotics were unnecessarily prescribed for 15 -28% of encounters(45). In children, 25% of prescriptions were not indicated. (46, 47)

#### Did you know?

Topical “triple” antibiotics (like “Polysporin”) have limited effectiveness and are not recommended for either minor wounds or surgical wounds. (47)

In addition to reducing adverse effects and costs, careful antibiotic stewardship would also reduce the growing threat of antimicrobial resistance (48). By 2050, it is predicted that deaths due to infections with multiple drug resistant pathogens will reach 10 million/year(49). Inability to reliably access effective antibiotics will compromise the safety of surgical and oncologic care. Using “delayed”(41) and “viral” [prescriptions](#) that educate patients about why antibiotics are not necessary can result in less antibiotic use(41, 50, 51). New evidence is finding that much shorter courses of antibiotics are as effective as longer courses and actually reduce antimicrobial resistance: 3 days for community acquired pneumonia, 5 days for cellulitis, 3-5 days for female urinary tract infections(52). [Do Bugs Need Drugs](#) is an excellent resource.

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### Proton pump inhibitors

These are some of the most frequently prescribed medications but they are often not needed long term and can have serious side effects. See the Choosing Wisely Toolkit [Bye-Bye PPI](#) for more information.

### Opioids and Sedatives

The indications for long-term prescriptions of opioids and sedatives are limited, and in some cases their prescription can contribute to iatrogenic medication use disorder(45, 53). [My Sleep Well](#) and [Dr Andrea Furlan's](#) site are excellent patient resources for sleep and pain. The Choosing Wisely Canada toolkit [Drowsy without Feeling Lousy](#) supports reduction of long-term prescription of benzodiazepines and other sedative hypnotics.

[Patients in the EMPOWER trial were given a pamphlet by their pharmacist on the harms and benefits of sedative-hypnotics, with a tool for tapering. 27% of people given the pamphlets discontinued using sedatives compared with 5% in the control group. \(53\)](#)

## Deprescribing

The importance of re-evaluating long-term medications is often overlooked. Because prescriptions are often renewed year after year, the cumulative burden on patients, payors and the planet can be substantial. In one New Zealand study of 222 elderly patients, 50% felt they were on too many medications, and 84% were willing to stop medications(54). Periodic medication reviews at refill visits or with the help of a pharmacist can reduce polypharmacy and associated harms. Asking patients to bring all of their medications to each visit can be helpful. The [Canadian Deprescribing Network](#) provides other valuable resources(55).

*"I feel helping patients to be on the least number of (and least complex) prescriptions will help compliance and lead to an increased feeling of health. A more simplified medication routine has done this for me."  
(Sandra Ketler, patient advisor.)*

## Minimizing environmental impacts of prescriptions

### What about "expired" medications?

Aside from tetracycline, there have been no recorded adverse events related to "expired" medications and studies have shown that most medications remain effective even 25 years later although many lose potency. Caution is advised if medication is critical (e.g.- for epilepsy, contraception, anaphylaxis). (57)

### Down the Drain!

Educate patients that it is never OK to flush or trash medications. This contributes to the harmful environmental impacts of pharmaceuticals. Return all unused medications to the pharmacy for proper disposal. Many pharmacies are part of the Health Products Stewardship Association.(56)

## Non-prescription Medications

Approximately 40% of Canadians regularly consume vitamin and mineral supplements, hoping to prevent disease, promote longevity, or compensate for dietary inadequacies(58). These products also require energy and resources to produce. Ask patients about the use of non-prescription products and encourage them to think critically about the risks and benefits, many of which are unknown. Many people assume that if products are freely available on the shelf, they are safe, effective and closely regulated, which is not the case(59, 60). For more information, direct patients [here](#).

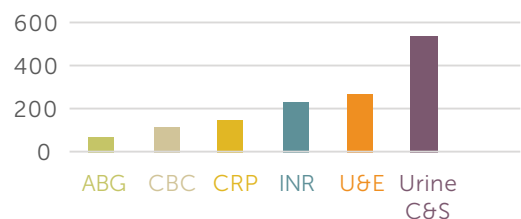
# Lab Testing

“We think only surgery, drugs, or radiation can be harmful. I am arguing that simple blood tests can be harmful... Rather than trusting a clinical picture, we feel we must wait for tests to prove it. Tests lead to tests – and, like with every single assay we do, 5 percent of the normal population will have a result outside the normal reference range. Tests need follow-up, repeating, explaining. They cause anxiety, they cost, they require appointments, travel, referrals, and time. Our patients’ time is the most precious commodity they have. We should not be wasting it.” (61)

Like medications, every lab test requires enormous amounts of resources and energy to produce the supplies needed to obtain, process, transport, analyze and dispose of each sample. **Medical labs are some of the most resource intensive parts of our system using 10 times more energy and four times more water than offices and generating billions of pounds of hazardous biologic or toxic chemical waste every year(62).** Although the impact of each individual lab test is small - for example, equivalent to driving a standard car 0.8 km for a complete blood count(63)- they add up: in Canada, over [1.2 million](#) lab tests are performed every day. Choosing Wisely Canada has excellent information on reducing low-value testing at [Lab Wisely](#).

## Resource Use During Lab Testing

The most effective way to reduce the impact of laboratory testing is to reduce ordering of unnecessary tests(63). Microbiologic tests (cultures) are particularly resource intensive due to the additional processing and storage required. An estimated 12–44% of ordered laboratory tests are not clinically indicated(64). Particularly in primary care, excessive testing in patients with a low pre-test probability of disease is associated with false positive results that lead to overdiagnosis and over-treatment.(65)



**Climate Change Impact of Laboratory Tests (CO2e g per test) (64,65)**

## Tips to avoid unnecessary lab tests:

- Ensure standing orders include only the required tests and frequency
- Consider “stepwise” investigation (link to “Slow Medicine”) – many labs will hold samples for a week and further testing can be done on the initial sample if needed
- Avoid “standard” orders like “CBC, BUN/Creatinine, electrolytes, LFTs...” unless there is a clear indication
- Avoid ordering full “panels” except for specific indications– for hepatic function screening, just ALT and ALP are usually adequate
- Order tests to confirm a diagnosis, not to look for one
- Ask “Is the result going to change my management?”
- Tailor standard recommendations to individual needs and preferences
- Avoid ordering follow-up for values just outside the normal range in healthy patients with no signs of illness; 1:20 tests in healthy people will fall outside the reference range (+/- 2 standard deviations)
- Check previous results and share with team members to avoid duplication
- In BC, clinicians can compare their ordering practices to others using their [Doctors of BC Mini Practice Profile](#).

A review of Vitamin D testing in Australia found 1 in 6 (4,457,657) people were tested in 2020, 76.5% of which were considered unnecessary, at a cost of >\$A87,000,000 and a carbon footprint equivalent to driving ~160 000–230 000 km in a typical car. (65)

## Change Idea:

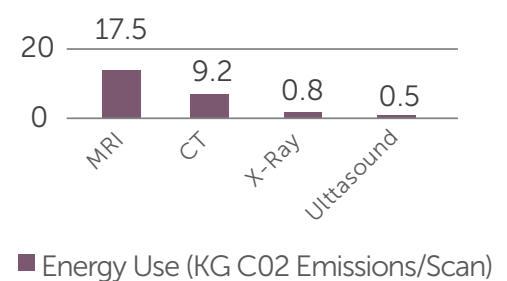
One BC clinic did a staff refresher on INR management and saw a 110% increase in appropriate call-backs and a 13% decrease in the number of INR's with no adverse events reported. This saved time and money for staff and patients and reduced the environmental impact of unnecessary testing.

## Medical Imaging

The energy used to operate imaging equipment, along with the “embodied energy” of the equipment itself, is substantial. In one study, medical imaging accounted for 4% of a hospital’s energy use(66). Another study estimated the operation of one CT scanner for a year was comparable to 5 four-person households, and one MRI scanner was comparable to 26 four-person households(66). CT and MRI have large carbon footprints in comparison to plain radiographs and ultrasound (US)(67).

A 2022 report by the Canadian Institute for Health Information and Choosing Wisely Canada(45) looked at frequently ordered tests that may be inappropriate or unnecessary. They reported that 24-31% of patients with lower back pain and no red flags continue to have imaging. Of children presenting to the emergency department with uncomplicated asthma or bronchiolitis, 30% have chest radiographs although it is not recommended and 33% of children with minor head injuries have CT scans despite not meeting the validated CT head rules.

### Energy Use For Imaging Modalities (67)



“The more CT scans you do, the more you realize that you are actually as (or even more) likely to find something... (the so-called “incidentaloma”) when you do them. This has a direct impact on cost, scanner utilization, and radiology time. It also has a more insidious impact on patient anxiety; up to 15% of people will require follow up and some will need interventional procedures” (61)

## Harms Associated with Overuse of Medical Imaging

Imaging has the same direct and indirect costs to patients, the system and the environment, whether the test is necessary or not. Other harms include:

- Exposure to radiation, and contrast. The amount of radiation in a typical chest CT scan is equivalent to 3 years of normal background radiation and 10 days for a chest x-ray.
- The 4 million pediatric CT scans done annually in the US are projected to cause 4870 future cancers(68)
- Increased wait times, leading to a perceived need for yet more machines
- Extra workload on imaging and clinic staff and physicians (reviewing and following-up results)
- Other associated environmental costs: disposal of contrast, radioactive materials (nuclear medicine) and physical waste (gowns, materials, cleaners)

Primary care providers play an important role in lowering emissions from imaging by choosing investigations with the lowest environmental impact and ordering only when results are likely to change management and improve patient outcomes.

See the table of Choosing Wisely recommendations for imaging relevant to family practice in [Appendix 3](#).(69) Also, see the great resources at the BC Patient Quality and Safety Council’s [Essential Imaging series](#).

## Call a Radiologist!

Radiologists are important partners who can advise on the most appropriate types of imaging and help interpret their findings and recommendations for follow-up. Providing an excellent history helps them better interpret the images. The Canadian Association of Radiologists has a [guide](#) to recommended investigations and follow-up(70).

## Patient Awareness

Patients tend to over-estimate the benefits and under-estimate the risks of imaging and may request inappropriate imaging(71). Providing information about the risks and benefits of imaging can be helpful. For example, after being given an infographic about head CTs for minor head trauma, “87% of respondents stated they better understood when a CT scan is appropriate, 93% felt they better understood the risks and 76% understood their doctor can often rule out serious illness without a CT scan(45).”

## Incidence of Incidentalomas

... found in

33% of chest CTs

33% of CT colonographs

22% of brain MRIs

22% of spine MRIs.

## Practice Tip

Choosing Wisely Canada offers many excellent [patient resources](#) on back pain, bone density, pre-operative testing, pulmonary emboli, headaches, etc. Save the site in your EMR or print posters to make discussions about unnecessary imaging easier.



# Empowering Patients

Patient and family-centred care is a cornerstone of safety and quality in healthcare. Engaging patients in shared decision-making and encouraging them to be active participants in the management of their own health conditions has been shown to improve patient outcomes and is essential for the sustainability of health systems worldwide(72, 73). This approach can also reduce the environmental impacts and costs of care by reducing unwanted care and helping patients be more independent and less reliant on intensive healthcare services(74). Although not aligned with most current high-volume, rapid-paced practice styles, having the opportunity to embrace the principles of [Slow Medicine](#) would allow providers to practice more patient-centred care.

“Health care may be the only industry in which giving customers what they really want would save money. Well-informed patients consume less medicine... the delivery of unwanted services is eliminated...[and] patients are far more likely to keep their conditions under control, leading to fewer hospitalisations and emergency department visits”. (74)

“Most patients want to be involved in making difficult health decisions. However, they may not be aware that they have options nor be invited to participate in decisions by their health professionals. Moreover, health professionals' usual approach to counseling patients about difficult decisions does not always lead to informed choices that are based on what matters most to the patient.” (75)

## Shared Healthcare Decision-Making

[Shared decision-making](#) is the process of engaging patients to participate in their own healthcare decisions, seeking fully informed consent prior to ordering tests or prescribing medications which carry known risks, similar to the standard practice for surgical procedures. **In the UK, only half of patients felt they were always involved in decisions(74, 76).**

For the majority of treatments there is no single best choice: over 3000 healthcare treatments were evaluated and classified as: 11% beneficial, 24% probably beneficial, 7% need to weigh known benefits versus risks, 5% probably not beneficial, 3% likely to be ineffective or harmful, and 50% insufficient evidence of usefulness(75). After making a medical diagnosis, providers also need to make a “preference diagnosis”(76) to identify each individual patient’s personal preferences for management. To learn more, read [“Are we wasting money on care patients don't want?”](#)

## There are several assumptions that impair effective shared decision-making:

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### Assuming providers know what patients want

Provider assumptions about what patients value are often incorrect. This can lead to inappropriate recommendations for treatment. In one study of breast cancer patients it was found that doctors believe that 71% of patients with breast cancer rated keeping their breast as a top priority when in fact it was only 7%. Furthermore, doctors believed that 96% of patients scheduled to undergo chemotherapy rate living as long as possible as a top priority when the actual figure was 59%(77).

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### Assuming silence is consent

Patients often lack sufficient information to know their options or which questions to ask. This can be exacerbated by the power imbalance, time-pressures and a traditional attitude of medical paternalism that creates an environment not conducive to questioning.

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### Assuming that Clinical Practice Guidelines (CPGs) are “rules” rather than suggestions

CPGs are designed to make clinical decision-making easier by distilling available evidence into simple dichotomous “effective/not effective” recommendations but the evidence may be derived from populations that don’t represent your patient (age, demographics, co-morbidities) and outcomes may reflect intrinsic biases of investigators or experts(78) that may not align with patient values. They are meant to be applied based on individual risks and preferences.

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### Assuming providers know why patients are non-adherent

A number of studies have found that approximately 50% of patients don’t take their medications as directed and 20-30% don’t take them at all(79). We assume this is unintentional, due to the challenges of navigating the complexity, side effects and costs of medication, lifestyle, and testing regimens. But many patients simply prefer not to take medications despite full understanding of the risks and benefits, opting for more natural alternatives or because the simple act of taking medicine reminds them of their illness every day(80, 81) which forces them to acknowledge being “sick”. Non-adherence can present a problem of under-use of appropriate medication but these statistics primarily reflect a failure of patient-provider communication(79) and result in significant waste.

## Benefits of Shared Decision-making(82, 83)

There are many benefits of shared decision-making. In one study, when patients were better informed, demand for major elective surgeries was reduced on average by 20% compared to usual care – 40 % for benign prostate disease, 20% for hysterectomy for menorrhagia, 20% for stable angina and 30% for herniated discs. Reassuringly, for a procedure where the medical evidence supported surgical intervention (spinal stenosis), patients who were well-informed were 40% more likely to choose surgery. A UK report estimated that maximizing patient engagement would save an estimated £30 billion annually (16% of the total health budget), far greater than the potential financial gain from improved adherence to evidence-based clinical guidelines(74, 76), with associated reductions in greenhouse gases and other pollution. In one study, training physicians in shared decision-making led to a reduction of the overuse in antibiotics for acute respiratory infections by 48%(50).

### Patients

- Improved understanding of risks & benefits of healthcare interventions
- Receive care based on patient-defined outcome measures
- Reduce risk for harm from unwanted tests (time, cost, adverse effects)
- Improved compliance
- Improved relationship with provider (trust, confidence, empowerment)
- Increased patient autonomy and agency
- Additional layer of protection from medical error

### Provider

- Better relationship with patients and increased joy in work
- Confidence in knowing care is aligned with patient preferences
- Reduced workload from providing unwanted care
- Increased knowledge and use of emerging evidence

### Environment

- Lower environmental impact of care due to less unwanted care

### Healthcare system

- Reduced unwanted treatments, tests and visits = lower costs
- Reduced workload for healthcare workers
- Shorter wait-times for procedures and investigations
- Healthier population
- More appropriate distribution of healthcare resources
- Benefits of Shared Decision-Making

Graphic and interactive patient decision-making tools help patients better understand risks and benefits of different interventions and the important difference between absolute and relative risks. Most patients and practitioners over-estimate benefits of treatments. Decision aids have been shown to reduce the number of people choosing major elective invasive treatments, a reduction in the number of people choosing prostate-specific antigen (PSA) screening and an increase in those choosing to start new medications for diabetes(82). **The median effect of decision aids on length of consultation was only 2.6 min longer (24 vs 21 min)(44).** Sharing the [Number Needed to Treat \(NNT\)](#) can be an eye-opening experience for patients (and a valuable reminder for providers)(84). Many patient decision aids have been created such as the [CVD risk calculator](#) this one for [osteoporosis](#), the [Canadian Task Force on Preventive Healthcare](#) “1000 person tools” for [prostate cancer](#) screening and [others](#).

## Using Patient Decision Aids

“Use of decision aids can help patients understand the “why?” I have experienced this several times and am happy with less testing once I know more about the reasons.”

**Sandra Ketler, patient advisor**

## Asking “What Matters to You?”

Asking “What Matters to You?” (WMTY) typically takes 90 seconds(85) and can improve outcomes and efficiency by avoiding unwanted care, complications of treatment and requirement for ongoing monitoring. In one [study](#), providers reported that by asking WMTY they changed their practice 60-70% of the time, learned something new 70-80% of the time and enhanced conversation or connection with patients 80-90% of the time. Another [study](#) found a reduction in falls and formal complaints and increased meaning in work. See [WMTY](#) and [Realistic Medicine](#). Consider using the mnemonic “FIFE” to remember to ask about “feelings, ideas, function and expectations”.

## Having Serious Illness Conversations

**“In Canada, dying is often an in-hospital, technology-laden experience. Rates of cardiopulmonary resuscitation (CPR) before death continue to increase among older adult patients in hospital, 1/5 of deaths in hospital occur in an intensive care unit. These observations contrast sharply with patient-reported preferences. A recent Canadian study found that 80% of older adult patients in hospital with a serious illness prefer a less aggressive and more comfort-oriented end-of-life care plan.” (86)**

There are many [resources](#) to help providers conduct serious illness conversations sensitively and respectfully to avoid unwanted and wasteful end-of-life care including the Choosing Wisely Canada [Time to Talk](#) campaign. Primary care providers are in the best position to do this proactively, involving family members rather than deferring the discussion to others during crises in hospital.

### Choosing Wisely Canada Recommendation

Don't offer tests or treatments without establishing your patient's prognosis, preferences, and goals of care. Potentially harmful or overly aggressive tests or treatments can be avoided by having discussions about goals and wishes.



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# Patient Self-Management

Patient self-care spans everything from being well-informed about general healthy lifestyles and managing minor ailments to testing, monitoring and treating medical conditions. There are many studies showing self-care can improve compliance, access, equity and quality which reduces costs of healthcare and environmental impacts. Self-care should be a coordinated extension of the existing system, not a default when the system fails to provide adequate care due to lack of access.

## Tips for Supporting Self-Management

- Select patients carefully based on capacity and patient preference and recognize too much “self-care” can be a burden for some patients with multiple co-morbidities.
- Remember more than half of working age adults in Canada (55% or 11.7 million) and 88% of adults over the age of 65 (3.1 million) have less than adequate health literacy skills(87). This can present a barrier to safe, appropriate participation in some self-management activities(88).

## Examples of Self-management

- Managing INRs (see below)
- Action plans for Asthma, CHF, & COPD
- Diabetes, hypertension self-monitoring
- Long refills and less frequent lab work for stable patients
- STI testing (BCCDC – [www.getcheckedonline](http://www.getcheckedonline))
- Encourage self-management of minor ailments with support of nursing hotlines, posters, handouts

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## INR Self-management

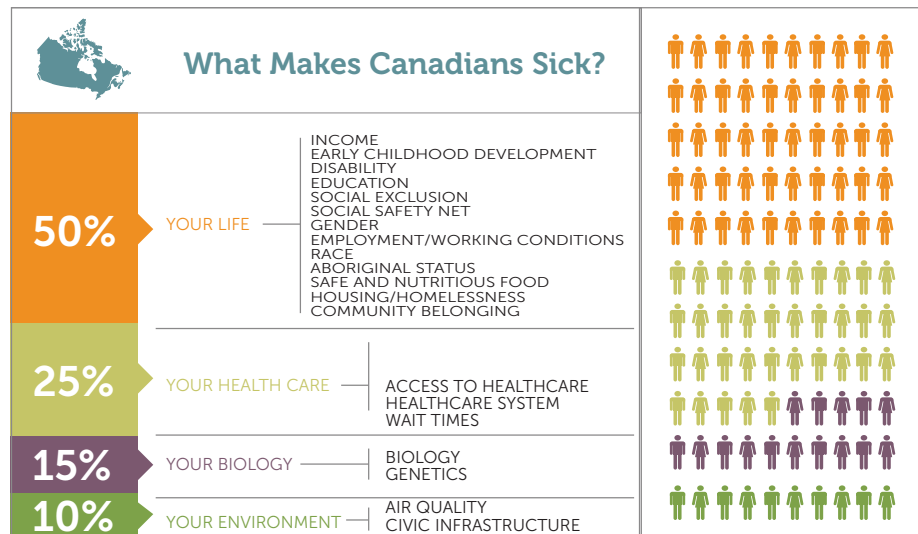
The WHO recommends self-management of INRs for selected patients. In a study of 310 patients over 12 months, patients managing their own INRs performed at least as well as usual care in maintaining INR within the target range, without any safety concerns (88). Patients can test INR using their own monitors (approximate cost: \$700-\$2000) and adjust doses using standard algorithms. Although the cost of self-testing may be prohibitive for some, others may prefer the convenience of home-testing. Having patients do self-monitoring and adjusting doses could reduce provider workload, costs to the system and environmental impacts without adverse patient outcomes.



# Health Promotion

An important approach to reducing our environmental impact as a health sector is to shift our focus from resource intensive care towards health promotion and prevention opportunities which have health, social and environmental co-benefits(89).

Our medical system, and the medical industrial complex that supports it, is designed to treat illness, with only 3% of the healthcare budget dedicated to prevention (90). Yet, an examination of the factors that truly affect peoples' health reveals the most important determinants are those outside of the formal medical system, such as income, environment, housing, nutrition, and early childhood development(91). The [Poverty Tool](#) produced by the Centre for Effective Practice, reminds us of the importance of these factors and provides a framework to assess and address poverty with patients.



Reference: CMA report [https://tfss.ca/wp-content/uploads/2017/11/What-makes-us-sick\\_en.pdf](https://tfss.ca/wp-content/uploads/2017/11/What-makes-us-sick_en.pdf)

Dedicating resources to prevention is fiscally responsible and promotes greater equity. Using a social accountability lens demands that we decide as a society, how to best use the finite healthcare to help the greatest number of people. This means reducing overuse and addressing underuse for certain populations(92). See this great [video](#) from Dr. Kaveh Shojania.

The primary care model, with its focus on prevention and early intervention, is widely acknowledged to be an essential element in a sustainable healthcare system. Emphasizing low-cost, high impact interventions such as HPV immunization to prevent cancer is an example of an effective prevention strategy and there are many such opportunities for health promotion, particularly when working in multidisciplinary teams.

## Did you know?

Statins in the US cost \$20 billion annually and postpone death on average by 10-17 days. This same funding could be used instead, to house at least a million families. (93)

# Social Prescriptions

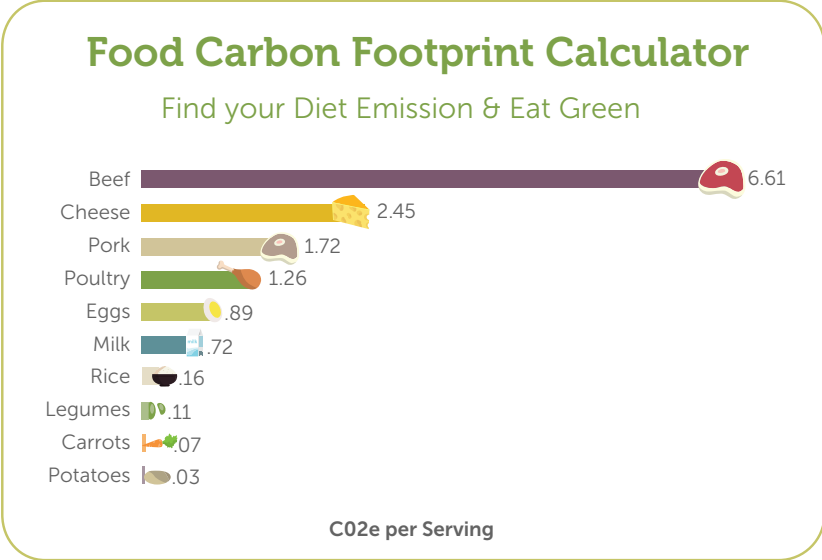
Connecting patients with providers who can assist with housing, finances and employment can help address some of the social determinants of health. Writing “[social prescriptions](#)” to encourage patients to engage in activities such as volunteering or joining a group can help prevent and treat illness by reducing isolation and loneliness, which are important determinants of health. Activities that involve volunteer service can enhance a sense of meaning and purpose and increase community resilience. Learn more from CASCADES’ [Primer](#) on Social Prescribing or the [Canadian Institute for Social Prescribing](#).

# Plant-rich diet

The [EAT Lancet Commission](#) concluded “Food is the single strongest lever to optimize human health and environmental sustainability on earth”(94) and the best way to engage this lever is to shift away from a meat-based diet towards one that prioritizes plant foods. Choosing to eat more plants and less meat, even one meatless meal per week, is one of the most important personal decisions people can make to reduce our contribution to climate change.

## Environmental Impacts of Meat Production

Animal agriculture is the biggest contributor to environmental degradation, currently responsible for 18% of human-induced greenhouse gas emissions(95). Compared to growing plants, animal agriculture also contributes disproportionately to air, soil and water pollution from fertilizers, antibiotics, heavy metals and pathogens and contributes to desertification and deforestation which threatens global biodiversity(95). Meat production, especially beef, is highly inefficient requiring 11x greater fossil fuel energy, 4-26x the water use and 6-17x more land than growing plants to feed humans directly(96).



Source: University of Michigan

## Health benefits of plant-rich diets

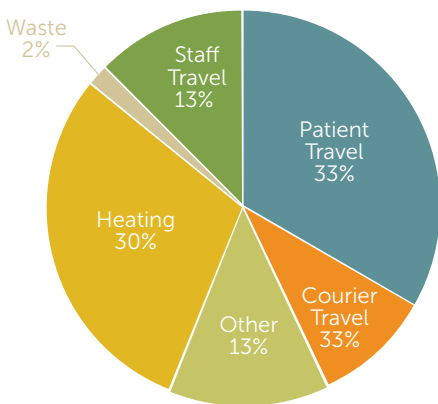
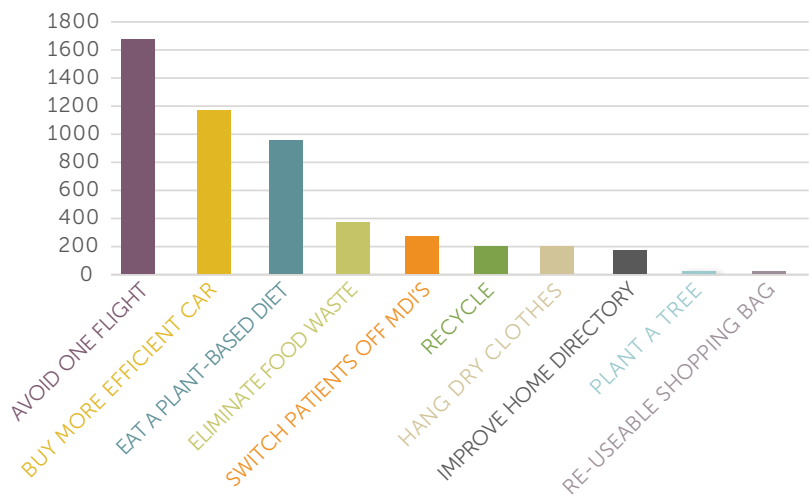
The current [Canada Food Guide](#) (CFG) supports the transition to a plant-rich diet which provides numerous health benefits: reducing risk of obesity, high cholesterol, diabetes and associated cardiovascular disease as well as lower risk of cancer, particularly colorectal cancer. As an additional co-benefit, many plant-rich sources of protein such as legumes are much more affordable than meat.

The CFG emphasizes the benefits of culturally appropriate wild and traditional foods which may not be plant-based but are more sustainable than western agricultural practices, and are more affordable in some remote regions where fresh produce is prohibitively expensive.

Here are some resources from the [CFG](#) and the [Hamilton Family Health Team](#), [the EAT Lancet Commission](#), [Nourish](#), and [Dr. Tushar Mehta](#).

“Transformation to healthy diets by 2050 will require substantial dietary shifts. Global consumption of fruits, vegetables, nuts and legumes will have to double, and consumption of foods such as red meat and sugar will have to be reduced by more than 50%. A diet rich in plant-based foods and with fewer animal source foods confers both improved health and environmental benefits.”  
 -(EAT Lancet,2022) (94)

## Approximate CO2e reduced/year



Breakdown of Non-clinical Annual CO2 Emissions in Swiss Primary Care Clinics

## Exercise & Active Transport

Physical activity is widely acknowledged to be a cornerstone of healthy living, providing both immediate and long-term health benefits(6, 97). Choosing “active transport” – walking, biking or rolling instead of driving - reduces greenhouse gases and air pollution. A study of primary care clinics in Switzerland showed patient and staff travel is responsible for 46% of non-clinical CO2 emissions, greater than heating (30%)(98). Encouraging patients and staff to use active transport can produce dual benefits for health and the planet. See this [article](#) on cycling(99).

## Health Benefits of Physical Activity

- Improved mental health: reduced insomnia, stress, anxiety, depression
- Prevention of hypertension, diabetes, obesity, heart disease, stroke, cholesterol, osteoporosis, osteoarthritis
- Increased work productivity and job satisfaction, fewer sick days
- Social benefits of activity with others
- Reduced asthma, lung cancer and cardiovascular disease from decreased air pollution
- Reduced climate change-related health effects

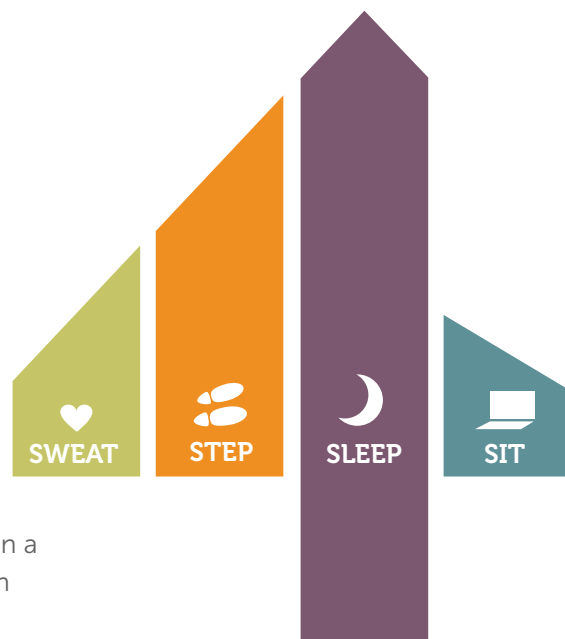
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The new Canadian Society of Exercise Physiologists [24 hour Movement Guidelines](#) helps shift our understanding from a traditional focus on dedicated periods of “exercise” to one that emphasizes the importance of what we do during the rest of our day. They recommend increased attention to reducing sedentary time and promoting restorative sleep.

## Write Prescriptions for Exercise and “Green” Prescriptions

Discuss with patients what kind of exercise they like to do, decide together on target frequency and duration and write it in a prescription(100). Exercising in nature has been associated with numerous additional mental and physical health benefits(101).

Canada’s Parks Prescription program(102) supports practitioners to prescribe nature for their patients. Research also shows that people who spend more time in nature feel more connected to the earth and do more to protect it(103). “Green” prescriptions that involve volunteering in natural spaces such as trail clean-ups or community gardening offer community and environmental benefits. See this Therapeutics Initiatives [article](#) for more great tips and resources such as the [Exercise is Medicine](#) site.



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## Walk with Me

Walking meetings have long been advocated by great thinkers like Aristotle, Dickens, Barack Obama and Steve Jobs. Walking stimulates creative thinking and creates a relaxed, positive environment for discussion(104). When a meeting involves only two or three people, this can provide an opportunity to incorporate activity into the day. In one small town in BC, mental health counsellors sometimes take patients for a “walking visit”, giving both therapist and client a dose of healthy activity, fresh air and nature. (personal communication).

# Tobacco and Alcohol

Tobacco is associated with numerous well-recognized adverse health effects but there are also environmental impacts which are less often considered. The short- and long-term health effects place additional burdens on patients as well as the health system. The associated medications, investigations and surgeries to manage complications of tobacco use require energy and resource inputs that have environmental consequences. Supporting our patients in reducing the consumption of tobacco and other harmful substances can have important individual and planetary health benefits. (105)

## The Global Carbon Footprint of Cigarette Production

"The cultivation of 32.4 Mt of green tobacco used for the production of the six trillion cigarettes manufactured worldwide in 2014, were shown to contribute almost 84 Mt CO<sub>2</sub> equivalent emissions to climate change...Tobacco competes with essential commodities for resources and places significant pressures on the health of our planet and its most vulnerable inhabitants." Offsetting the carbon emissions of smoking 1 pack/day for 50 years would require growing 132 tree seedlings for 10 years. (105)

Moderate alcohol use has similar environmental impacts from both its production and the health consequences of excessive use. Primary care practitioners can discuss the [new recommendations](#) for limiting alcohol to 1-2 drinks per week and share this [infographic](#).

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## Secondary Prevention (Screening) - Benefits and Risks

Secondary prevention involves population-based screening of asymptomatic, low risk patients for diseases or risk factors with a goal of early detection which ideally leads to better long-term outcomes. When appropriately applied, screening can optimize patient outcomes and reduces unnecessary environmental impacts, but there are only a small number of screening tests that have been proven to be effective and the timing and frequency of some of these remain controversial. For more information see the [overview](#) here and tips on [talking to patients](#). (106)

### The Dark Side of Screening

Our society has been conditioned, through years of encouragement from health providers and special interest groups, to believe in the critical importance of screening and early detection and many assume we can screen for - and then treat - almost anything if we catch it early enough. Unfortunately, this is untrue and many screening tests do not, on average, lead to better patient outcomes. As always, the decision to screen or not to screen should be made based on individual risks and preferences. Inappropriate screening can lead to misdiagnosis, over-diagnosis and over-treatment.

In some cases, different authors or organizations produce conflicting recommendations, even sometimes using the same evidence. Each guideline is influenced by the explicit or implicit objectives, priorities and values of the guideline development group which might include cost containment, a narrow focus on individual or target disease-specific outcomes, or broader systemic or population level outcomes. Breast cancer screening and lipid management are two examples of areas where recommendations vary(107, 108). It is important to be aware of any conflicts of interests within guidelines development teams - both commercial and single disease-focused interests - that may impair objective evaluation of the evidence and development of relevant recommendations.

## Whither the “Annual Physical”?

Although many patients continue to expect an “annual check-up”, many provinces do not consider this a medically necessity (and therefore insured) service. For most healthy patients the annual check-up and associated battery of tests is an expensive, resource intensive and unnecessary ritual that does not generally improve patient outcomes. [See Choosing Wisely patient resources.](#)

## Summary of Canadian Screening Guidelines for Average Risk, Asymptomatic Patients\*

(from the Canadian Task Force on Preventive Health Care, Choosing Wisely Canada and others)

### Recommended

Pap smear Age 25-70 q 3 years

Mammogram Age 50 – 75 q 2 years

Colon cancer FIT test 50- 74 q 2 years

Blood pressure – depending on risk factors

HgbA1c – no screening or q 3-5 years depending on risk

AAA – men once at age 65-80 (ultrasound)

Lipids– recommendations vary- at least once in a lifetime – [see this interesting video](#)

### Not Recommended

Colonoscopy

PSA

TSH

“Annual physicals”

Pre-operative lab work

Bone Mineral Density

Vitamin D

\*All screening guidelines should be tailored to individual patients using a shared decision-making approach.



# Environmental Alternatives

In primary care it is possible to choose products and practices with lower environmental impacts, such as medications, virtual care and office equipment and supplies.

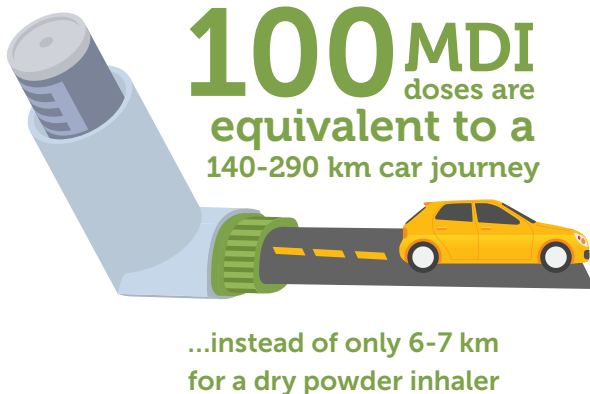
## Medications

### Lower Impact Medication Choices

Using non-pharmacologic options when appropriate can reduce environmental impacts, but when medications are necessary there are sometimes lower impact products available such as:

### Choose Dry Powdered Inhalers when Possible

Switching from metered dose inhalers (MDIs) to other forms such as dry powder (DPI) or soft mist inhalers (SMI) is one of the easiest and most impactful changes because most MDI propellants are potent greenhouse gas(109). **MDIs account for approximately 13% of the entire carbon footprint in primary care.** Almost 1 million SABA inhalers are prescribed every month in Canada. DPIs are appropriate for most patients. In Sweden, 70% of respiratory patients use DPIs. However, there are patients who may not be able to use DPIs including preschoolers and patients with markedly diminished inspiratory capacity. **Use the Easy Switch Guide for cost neutral options.**



### Easy Switch Guide for Lowest Cost, Non-MDI Inhalers

Switch from...	Switch to...
B- agonist (salbutamol) MDI	Bricanyl Turbuhaler 1-2 tid
Inhaled corticosteroid MDI	Pulmicort Turbuhaler
COPD Rx (salbutamol + ipratropium)	Combivent
Combination ICS / LABA MDI	Symbicort or Wixela

### Other ways to reduce impact of inhalers

- 1) Objectively confirm diagnosis with spirometry **since 33% of patients diagnosed with asthma do not have asthma when objectively tested and 67% of patients** who have been told they have COPD have not been objectively tested.
- 2) Avoid using SABA inhalers for post-viral coughs as the evidence reports this is not effective.
- 3) Teach proper technique – 12-71% of people use their inhalers improperly leading to increased waste and release of medication into the environment. DPIs are generally easier to use and have counters.
- 4) Educate about appropriate disposal – MDIs continue to release harmful propellant even when “empty” and not in use. These must be returned to the pharmacy for proper disposal. For other details and references go to [CASCADES](#) and the [Hamilton Family Health Team](#) resources.

## Tips for Lower-Impact Prescribing

- Use delayed prescriptions for antibiotics.(41)
- Consider 1-week trials of new medications.
- Promote pill-splitting – the environmental cost of producing, packaging and shipping an 80 mg tablet is similar to a 20 mg tablet. Check out this great [resource](#) on pill splitting which can also save patients money.
- Offer shorter duration prescriptions (one week, one month) for short term medications such as PPIs or NSAIDs, with refills if more are needed.
- Think about ways to minimize packaging: avoid over-packaged promotional samples, disposable “compliance” packs and frequent dispensing unless necessary.
- Educate patients about proper disposal of medication at pharmacies.
- Always review patient’s current medications before adding a new one.

## Choose oral instead of parenteral

Most of the environmental impact from medications is related to packaging and shipping, both of which are increased for parenteral formulations(110). Oral medications avoid the need for IV/IM supplies and extra visits. The use of insulin to manage diabetes, for example, is significantly more resource intensive than managing with oral medication(111). Some experts are challenging the use of IV-only antibiotic regimens for osteomyelitis and septicemia(112).

## Choose long-acting medications

Long-acting, reversible contraceptives (LARCs), such as IUDs or implants instead of oral contraceptive pills or condoms, offer both health and environmental benefits. LARCs are generally safer and more effective and some forms reduce menstrual flow with the additional environmental benefit of reduced sanitary supplies. One prescription every 5-10 years instead of every few months is more economical and convenient for patients and reduces work for providers.

## Anesthetic Gases

Although few primary care providers administer anesthetics, it is important to be aware of the enormous environmental impact of anesthetic gases and the significant differences between types of anesthetic gases used for surgery when talking to patients and anesthesia colleagues. Many facilities have phased out desflurane, which has the highest GHG impact, equivalent to 370 km of driving for one hour of anaesthetic(113), and are moving to towards more regional or intravenous anesthetics. Check out [CASCADES Playbook](#) and the [CAPE Toolkit](#).

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## Virtual Care

Pandemic-driven changes to medical practice, particularly the shift to virtual care, has led to significant decreases in both patient and provider travel, which previously accounted for 10-46% of the healthcare energy footprint in primary care (5, 98). Virtual care has co-benefits of reducing barriers to access and increasing convenience for many patients, particularly those in rural areas. Most patients and providers have now adopted a hybrid model. One geriatric clinic(114) in the UK found that a virtual visit generated 79% less CO2 emissions than a face-to-face visit. Switching to a 50% hybrid care model would save about the same as 56 surgical operations.(115).

Recognizing the environmental cost to visits, even virtual visits, should prompt providers to think about reducing unnecessary visits when appropriate by providing more refills for stable patients on long-term medications and encouraging self-management. “One-problem per visit” policies unnecessarily increase visits and are discouraged by the [Canadian Medical Protective Association](#). See section on [Slow Medicine](#). Providers can help patients find care closer to home when they move and even arrange to “swap” patients when feasible, to eliminate unnecessary travel. Patients can estimate the financial, time, and environmental savings associated with choosing a virtual visit using this [calculator](#) and clinics can calculate their environmental savings [here](#).

### Comparison of clinic-generated carbon emissions (kgCO<sub>2</sub>) for face-to-face vs virtual visits

	Face-to-face	Virtual
Energy use for rooms	0.065	0.065
Telecommunications	0.039	0.069
Personal protective equipment	0.152	0
Water use	0.008	0
Staff travel	1.68	0.56
Patient travel (5 miles / patient)	2.88	0
<b>Total emissions per visit</b>	<b>4.824</b>	<b>0.994</b>

## Clinic operations

### Rethink-Reduce-Reuse

Environmental action in healthcare has long been focused on energy saving, physical waste reduction and recycling so there are many excellent resources already developed that address these non-clinical topics, such as switching to 100% post-consumer recycled paper products or “Sugar Sheet” copy paper. Two of the basic principles of environmentally sustainable operations are 1) eliminating unnecessary products and 2) choosing re-useable over disposable products.

### Eliminate unnecessary products

Many products used every day, such as exam table paper, paper drapes, absorbent pads and gloves are often unnecessary. Re-thinking the use of these products can result in cost savings and reduced environmental impacts. Sterile gloves have a higher environmental footprint than non-sterile gloves due to the additional processing and packaging required(116) and are no longer recommended(117) for any office procedures, including IUD insertions, excisions and laceration repairs. There are many situations where no gloves at all are needed. See the [Gloves Off](#) campaign from the Royal College of Nursing in the UK. Similarly, it was found using tap water is as safe and effective as sterile water or saline to clean wounds(118). Looking around the office with a critical eye can help identify other products that may be unnecessary.

### Ditch the Exam Table Paper!

Physicians and MOAs at the Kimberley Medical Clinic decided to completely eliminate use of exam table paper, using only the bare vinyl exam table for most visits and offering patients cloth drapes for “bare bottom” exams. The feedback from patients was 100% positive and staff were empowered to make more sustainability changes. Despite the small increase in laundry, they calculated savings of \$718 and 8.2 km of paper per year.

**If every family physician’s office in Canada eliminated exam table paper, it would save 20,000 trees and 94,950 Km of paper and \$8,400,600.**

> [See toolkit - Appendix 6](#)

## Infection Prevention v. Sustainability: Finding the Balance

Since the time of Lister, Pasteur and Fleming, the war on microbes has led to some of the greatest advances in medicine and population health. But our sometimes overzealous quest to eliminate germs is now at odds with 21st century threats of climate change, antimicrobial resistance and damage to our ecosystems and microbiomes. Fear of infection has led to overuse of antibiotics, excessive use of toxic antibacterial cleaning agents, a rise in single-use disposable products, PPEs and policies on discarding even non-perishable products after arbitrarily assigned expiry dates. Policy-makers need to re-evaluate centuries-old assumptions to align with the evidence-based reality of today's new health threats. More studies are needed to generate the evidence to confirm what common sense would suggest; for example, sterilizing and re-using plastic otoscope speculae does not pose any significant risk to health. The Covid-19 pandemic only heightened our use of disposable and wasteful PPE and exposed our weakness in supply chain management. This [article](#) highlights the effects of steep and significant waste production in attempts to test and keep ourselves safe and the importance of finding reusable and sustainable options going forward.

### Choose re-useable products instead of single-use disposables

In almost every case, full life cycle analyses (LCAs) demonstrate cost, material and energy savings from reusable products such as vaginal speculae, instruments, cloth drapes, gowns, sterilization wrap (instead of "blue wrap"), wash cloths and procedure toweling which can all be used safely in the clinic. One participant in CASCADES Canada Story Campaign suggested using Boogie Boards or Rocket Paper instead of Post-it notes and re-purposing cytology fixative as whiteboard cleaner! See the [Stories](#) for other great tips.

### Example: Switching to metal vaginal speculae

In multiple studies, metal vaginal speculae were found to have much lower total life cycle CO2 emissions (and significant cost savings) than disposable speculae. In some studies the difference became evident after only 2-3 uses of the metal speculum and increased the longer the metal speculae were used(119). Further benefits could be obtained by using cloth instead of disposable sterilization pouches. (120)

### Best Cleaning Agents?

Many cleaning agents have toxic environmental effects. Alcohol- or hydrogen peroxide-based cleaning and disinfecting products are the safest for the environment. See the [BC PICNET](#) table (pg. 92) for more information.

For more **energy saving, environmentally preferable purchasing and recycling tips**, check out This [Green Office Toolkit](#), the [Hamilton Family Health Team](#) website or [CAPE's Climate Change Toolkit](#).

### Metal Speculae: What do patients and providers think?

A study by Ross et al found that "metal specula were highly acceptable to both practitioners and patients. Only asymptomatic patients were surveyed some of whom had not had prior speculum examination, a limitation of this study. Some staff were inexperienced in using metal specula, and may require brief training e.g. - warming metal speculums before use."

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## Conclusion

Adopting a planetary health lens provides a new way to think about environmental sustainability in primary care and offers an additional reason to embrace responsible stewardship recommendations. With many providers working together to incorporate the four principles of sustainable healthcare into our everyday work, we can help reduce the health sector's environmental footprint with additional benefits for patients, providers and health systems. To find out more about what primary care practitioners are doing across the country, see the stories from CASCADES' ["Story Campaign"](#).

# Appendices

## Appendix 1 - Checklist for Change

<b>Reducing Low-Value Care</b>	Stop prescribing antibiotics for viral URIs and asymptomatic bacteriuria	<input type="checkbox"/>
	De-prescribe whenever appropriate – make yourself a “star chart” for every medication you stop; challenge your colleagues	<input type="checkbox"/>
	Read and download the Choosing Wisely Canada <a href="#">guidelines</a> and try to follow them all!	<input type="checkbox"/>
	Ensure diagnosis of asthma or COPD have been confirmed when refilling inhalers	<input type="checkbox"/>
<b>Health Promotion</b>	Think of ways to reduce driving and encourage patients and staff to do the same	<input type="checkbox"/>
	Start writing <a href="#">social / nature / exercise</a> prescriptions	<input type="checkbox"/>
	Counsel patients about <a href="#">plant-based diets</a>	<input type="checkbox"/>
	Celebrate every patient who quits smoking in some way	<input type="checkbox"/>
<b>Empowering Patients</b>	Ask patients “How do you feel about this? Is it something you would like to do?” before ordering tests or treatments	<input type="checkbox"/>
	Use the <a href="#">CVD risk calculator</a> to determine need for medication and demonstrate benefits of <a href="#">lifestyle changes</a>	<input type="checkbox"/>
	Ask elderly patients “ <a href="#">What Matters to You?</a> ”	<input type="checkbox"/>
<b>Choosing Environmental Alternatives</b>	Switch patients from MDIs to DPIs using the <a href="#">cheat sheet</a>	<input type="checkbox"/>
	<a href="#">Eliminate exam table</a> paper completely	<input type="checkbox"/>
	<a href="#">Switch</a> from disposable to re-useable sterile wraps, drapes, devices	<input type="checkbox"/>

[> Download a printable version <](#)

# Appendix 2 - What Else Can I Do?

Look at your personal footprint – then reduce it! Use this [ecological footprint calculator](#) to find out how many earths we would need if everyone lived like you.

How to reduce your personal carbon footprint? (Examples of approximate amount of CO<sub>2</sub>e reduced per year for different actions)(121)

Action	Approximate CO <sub>2</sub> e reduced/year
Live car-free	23,700 – 117,700
Avoid one flight	700-2800
Buy more efficient car	1190
Eat a plant-based diet	300-1600
Improve home efficiency	180
Hang dry clothes	210
Eliminate food waste	370
Recycle	210
Plant a tree	6-60
Re-useable shopping bag	5

## Get Political

- Join the [Canadian Association of Physicians for the Environment](#) or read their [toolkit](#)
- Learn how to advocate for important environmental issues from the Canadian Medical Association [coaching program](#).

## Get involved in your community addressing the social and environmental determinants of health

Here are two examples of local physicians getting involved:

- [Trees for Life](#)
- [Community Food Recovery Program](#)

## Put your money where your mouth is – divest from fossil fuels

- Read [this article](#) about the importance of divesting from fossil fuels investments(122)

## Teach and role model principles of planetary health with students, residents and colleagues

## [Sign and read the planetary health declaration](#)

# Appendix 3. - Choosing Wisely Canada Recommendations

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## Lab Recommendations from Choosing Wisely Canada

Don't do annual screening blood tests unless directly indicated by the risk profile of the patient

1:20 tests result in values outside the normal testing range

Don't order repeat test ordering at a frequency that is not supported by the evidence

20% of tests in Canada are repeated too soon

Don't routinely measure Vitamin D in low-risk adults

Vitamin D testing often requires dedicated instruments, tubes and staff.

Don't order thyroid function tests in asymptomatic patients

25% of TSH tests do not conform with ordering guidelines

Don't request serum protein electrophoresis (SPEP) in asymptomatic patients in the absence of unexplained hypercalcemia, renal insufficiency, anemia or lytic bone lesions

SPEP and immunofixation are labour-intensive tests for lab staff and are often influenced by acute illness

Don't order repeated CBC and chemistry testing on inpatients in the face of clinical and lab stability

Just one blood draw per day can add up to ½ unit per week contributing to iatrogenic anemia

Don't order baseline lab testing for low risk patients undergoing low-risk, non-cardiac surgery

Testing can lead to abnormal results that can unnecessarily delay surgery

Don't order ANA as a screening test in patients without specific signs or symptoms of SLE or other connective tissue diseases

ANA is measurable in 25% of the population and most don't have and won't develop autoimmune disease

Don't order ESR to screen asymptomatic patient or as a general test to look for inflammation in patients with undiagnosed conditions

ESR is often a manual test that takes lab staff up to 90 minutes to complete

## Imaging Recommendations from Choosing Wisely Canada

Specialty	Concern	Recommendation
Family practice	Low back pain	Don't do imaging for lower-back pain unless red flags are present.
	Pre-operative screening	Don't order screening chest X-rays and ECGs for asymptomatic or low-risk outpatients.
	Osteoporosis	Don't order DEXA screening for osteoporosis on low-risk patients.
Headache	Migraine	Don't order neuroimaging or sinus imaging if exam is normal with no red flags
Hospital medicine	Simple syncope	Don't routinely obtain neuro-imaging studies (CT, MRI scans, or carotid Doppler ultrasonography)
	Delirium	Don't routinely obtain head (CT) scans in patients without risk factors
Emergency	Head and neck injury	Use validated CT head, C-spine rules ( <a href="#">link</a> )
		Don't order CT head scans in adults with simple syncope
	Pulmonary embolism	Don't order CT pulmonary angiograms or VQ scans unless indicated by risk stratification
	Ankle / foot injury	Use validated Ottawa ankle/ foot rules ( <a href="#">link</a> )
Paediatrics	Distal radial buckle fracture	Don't order follow-up radiographs for buckle fractures of the distal radius if asymptomatic
	Sacral dimple	Don't image a midline dimple related to the coccyx in an asymptomatic infant or child.
	Umbilical hernia	Don't order a routine ultrasound for umbilical and/or inguinal hernia.
	Osgood Schlatter	Don't order knee radiographs to diagnose Osgood Schlatter Disease in children.
Orthopedics	Hip or knee pain	Don't order a hip or knee MRI when x-rays demonstrate osteoarthritis
General Surgery	Inguinal Hernia	Don't use ultrasound routinely to evaluate clinically evident inguinal hernias.
Otolaryngology	Hoarseness	Don't order CT or MRI as initial investigation for chief complaint of hoarseness.
	Odynophagia, globus sensation	Don't order neck ultrasound to investigate odynophagia or globus sensation.
	Sudden sensorineural hearing loss	Don't perform computed tomography or blood work given its presumed viral etiology.
	Sinusitis	Don't order plain film sinus x-rays
	Nasal fractures	Don't routinely order a plain film X-ray in the evaluation of nasal fractures
Endocrinology	Abnormal thyroid function test	Don't routinely order a thyroid ultrasound unless there is a palpable abnormality of the thyroid gland.
Hepatology	Benign focal liver lesions	Don't perform computed tomography (CT) or magnetic resonance imaging (MRI) routinely to monitor benign focal liver lesions (e.g., focal nodular hyperplasia, hemangioma).

## Medication Recommendations from Choosing Wisely Canada

Don't treat asthma or COPD without objective testing (spirometry)

Don't offer therapies on the basis of survival benefit without establishing your patient's prognosis, preferences, and goals of care

Don't prescribe antibiotics for toothache or localized dental abscess.

Don't give prophylactic antibiotics prior to dental procedures to patients with total joint replacement or nonvalvular cardiac and other indwelling devices.

Don't routinely prescribe topical combination steroid/antifungal products

Don't use oral antibiotics for acne for >3 mo without assessing efficacy

Don't prescribe alternate second-line antimicrobials to patients reporting non-severe reactions to penicillin when beta-lactams are the recommended first-line therapy.

Don't use topical antibiotics on a surgical wound

Don't prescribe testosterone therapy unless there is biochemical evidence of testosterone deficiency.

Don't use antibiotics for upper respiratory infections that are likely viral in origin, such as influenza-like illness, or self-limiting, such as sinus infections of less than seven days of duration.

Don't continue opioid analgesia beyond the immediate postoperative period or other episode of acute, severe pain.

Don't initiate opioids long-term for chronic pain until there has been a trial of available non-pharmacological treatments and adequate trials of non-opioid medications.

Don't maintain long term Proton Pump Inhibitor (PPI) therapy for gastrointestinal symptoms without an attempt to stop/reduce PPI at least once per year in most patients.

Don't use antimicrobials to treat bacteriuria in older adults unless specific urinary tract symptoms are present.

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

Don't use antipsychotics as first choice to treat behavioural and psychological symptoms of dementia.

Avoid using medications known to cause hypoglycemia to achieve hemoglobin A1c <7.5% in many adults age 65 and older; moderate control is generally better.

Don't prescribe acute medications or recommend an over-the-counter analgesic for patients with frequent migraine attacks without monitoring frequency of acute medication use with a headache diary.

Don't forget to consider the behavioural components of migraine treatment, including lifestyle issues like regular and adequate meals and sleep, and management of specific triggers including stress.

During interruption of warfarin anticoagulation for procedures, don't 'bridge' with full-dose low molecular weight heparin (LMWH) or unfractionated heparin (UFH) unless the risk of thrombosis is high.

Don't routinely prescribe intravenous forms of highly bioavailable antimicrobial agents for patients who can reliably take and absorb oral medications.

In long-term care, don't continue or add long-term medications unless there is an appropriate indication and a reasonable expectation of benefit in the individual patient.

Don't prescribe vitamin B12 injections to clients with low vitamin B12 levels as first-line therapy.

Don't prescribe prophylactic antibiotics to prevent travellers' diarrhea.

Don't use glucosamine and chondroitin to treat patients with symptomatic osteoarthritis of the knee.

Don't routinely use acid blockers or motility agents for the treatment of gastroesophageal reflux in infants.

Don't administer psychostimulant medications to preschool children with Attention Deficit Disorder (ADD) but offer parent-administered behavioural therapy.

Don't recommend the use of cough and cold remedies in children under six years of age.

Don't prescribe oral antibiotics for children with uncomplicated tympanostomy tube otorrhea or uncomplicated acute otitis externa.

Don't use SSRIs as the first-line intervention for mild to moderately depressed teens.

Don't routinely use antipsychotics to treat primary insomnia in any age group.

Don't routinely use antidepressants as first-line treatment for mild or subsyndromal depressive symptoms in adults.

Don't prescribe bisphosphonates for patients at low risk of fracture.

# Appendix 4. - Sustainable Quality Improvement (SusQI)

Organizations across the globe are leveraging on the knowledge and motivation of healthcare workers on the frontlines in order to move towards a more sustainable industry. Quality improvement (QI) is one of the ways we can create specific, measurable and lasting change. Embedding sustainability into quality improvement is a way to move the needle forward by highlighting opportunities and strategies for minimizing our impact on the environment as the result of delivering care. The UK's Centre for Sustainable Healthcare is one of the leading organizations on sustainable QI and have coined the term "SusQI" in which sustainability is a domain of quality and outcomes are measured against the environmental, social and economic costs and impacts (1).

The Federation of Medical Regulatory Authorities of Canada states "All activities physicians undertake should be assessed for their value and effectiveness, as all should benefit from quality improvement."(2)

SusQI recognises that there are finite environmental, social and financial resources available in delivering care and that we should be considering all three of these costs in what is called the "triple bottom line". Each section of this toolkit highlights ways we can lower the systems environmental impact and SusQI is a tool we can use to implement these strategies into our practice.

## An example of quality improvement using a section of the toolkit and SusQI Framework:

### Deprescribing by eliminating unnecessary Rx's

**1. Define the problem:** You know many patients in your practice meet the definition of polypharmacy, some are experiencing various or all of the following consequences as a result: overlapping side effects, struggling financially as not all medications are covered by their insurance plan, and not able to manage the prescribing directions either missing doses or double dosing as there are just too many.

**2. Study the system:** You run a panel on your EMR to determine how many patients meet the criteria in your practice.

**3. Design Improvement:** Next you set a manageable goal to bring a set number of applicable patients in over the next 2-3 months for an in depth med review which can be done by the physician, pharmacist, or primary care nurse and work with the patient on deprescribing as appropriate any unnecessary medications.



Domains of quality (adapted by the Royal College of Physicians from the Institute of Medicine).<sup>1</sup>

#### 4. Measure Impact looking at your triple bottom line

i) What are the environmental impacts? Measure quantity of the reduction of plastic pill bottles, anecdotal and assumed reduction and diversion of pharmaceutical waste into water systems through inappropriate disposal and body excretion into waste water streams. Reduction in the use of resources in creating, packaging and distributing the medication. Reduced patient travel involved in filling, monitoring, and refilling Rxs.

ii) What are the social impacts? Patient reports they are able to effectively manage remaining medications. Reduced financial burden from cost of medications. Reduced burden from testing for monitoring medication levels or liver and kidney function. Improved quality of life due to reduced side effects.

iii) What are the economic impacts? Reduced cost to the system for: drug coverage, tests involved in monitoring requirements, repeat clinic visits for refills or change in prescriptions, specialized waste disposal for pharmaceuticals.

#### Tips

- Don't tackle QI alone.
  - Most provinces have support programs where coaches can help you define your problem statement, help set realistic goals, along with identifying and obtaining the resources you will need to carry out the project to completion.
  - You likely work in a multidisciplinary environment in which all members of the team can be active participants in QI work. Even your patients are part of the equation as in the example above, patients can self report, track vital signs, and provide valuable feedback.
- Become familiar with the PDSA (Plan, Do, Study, Act) Cycles.
- Take courses and education in QI and SusQI (reference SusQI Course).

#### Guides

Health Quality Ontario [Quality Improvement Guide](#)

CASCADES [Integrating Sustainability on Healthcare Quality Improvement Education Playbook](#)

CASCADES [Embedding Environmental Sustainability into Quality: a Framework for Canadian Health Systems](#)

CASCADES [Project Charter](#)

The Institute for Healthcare Improvement has a list of tools to support QI efforts found here:

<https://www.ihl.org/resources/Pages/Tools/default.aspx>

Healthcare Excellence Canada

<https://www.healthcareexcellence.ca/en/what-we-do/all-programs/hospital-harm-is-everyones-concern/hospital-harm-improvement-resource/general-patient-safety-quality-improvement-and-measurement-resources/>

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1. Centre for Sustainable Healthcare (nd) <https://www.susqi.org>
2. Federation of Medical Regulatory Authorities of Canada (2016). <https://fmrac.ca/fmrac-statement-on-physician-continuous-quality-improvement/>

# Appendix 5. - Slow Medicine

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Slow Medicine offers an approach to the practice of medicine that can lead to improved care for the patient, increased joy in work for the provider and sustainability for the health care system. A natural consequence of the practice of slow medicine will be a decreased carbon footprint.

What is slow medicine? It's a conceptual framework of assumptions, beliefs and values that provides an alternative to the current dominant framework of western medicine. Slow Medicine originated in Italy (after the Slow Food Movement). The 2011 manifesto defines the core values: Medicine that is Measured, Respectful and Equitable. Slow medicine is about making the space and time to allow the physician to practice wisely.

## Slow Medicine acknowledges the powerful intervention of time

- Time to listen to the patient - to hear what matters to them
- Time to examine the patient, review previous investigations
- Time to let the diagnosis reveal itself (where appropriate and safe to do so)
- Time to let the body heal itself when appropriate
- Time for the physician to step back, think, discuss with colleagues
- Time for the patient to arrive at the moment of readiness for change
- Time to await further study on new medications and treatments
- Time to address root causes
- Time to support healthy life choices
- Time to communicate accurately about the benefits and harms of interventions

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## What are some practical ways to introduce/increase slow medicine into your practice?

### Be Aware

Notice when you are rushing, what that feels like for you and the patient. Are you "doing more" when you are rushed? Is that "more" helping the patient?

### Pause

Consider stepping out of the exam room for 1 minute to reflect on your plan. Does it align with the Slow Medicine values?

### Ask

"Why am I ordering / referring?" "Whose needs does it meet?" "Does this cause harm?" "Are there simpler and safer ways to get those needs met?"

### Schedule

**Plan for some Slow Medicine time. You could start with 2 hours a week, or a half day, and try:**

- Longer appointments
- Time between appointments
- Chart reviews of complicated patients, then review with your patient and co-create a plan
- Ask what matters to them
- Connect with colleagues to ask questions about patients (avoiding referrals, visits, etc.)
- Appointments to focus on deprescribing

### Assess

- Did the volume or appropriateness of your ordering investigations, prescribing medications or referring change? What are the consequences? Are there fewer labs/investigations/consults to review? Fewer repeat visits?
- What was your experience of practicing slow medicine?
- What was your patients' experience?
- What was the impact on the health care system?
- Was there an impact on the environment?

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**Curious about slow medicine and other similar ideas? Check out these links:**

<http://slowmedicine.info/> <http://slowmedicine.nl/home%20english.html> <https://minimallydisruptivemedicine.org/>

# Appendix 6. - Eliminating Exam Table Paper – Toolkit

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- Exam table paper is unnecessary and cleaning of exam tables between uses is required regardless of paper covering(123) p 103
- Cloth drapes can be used for bare bottom exams if patients desire (but it is not necessary – similar to toilet seats but more hygienic since exam tables are cleaned between uses)
- Alcohol- and hydrogen peroxide-based cleaners are the most environmentally friendly(123) p. 92-93. One approved option is <https://www.avmor.com/product/ep50-cleaner-disinfectant/>
- Posting a notice to inform patients about the change can reassure them that there is no risk to their health and that you are caring for the environment (sample poster below)
- Meeting with staff and physicians to discuss the change prior to removing the paper can address concerns in advance and get buy-in
- Reassuring colleagues that this is being done in many other places including the BC Cancer Agency and the Children’s Hospital of Eastern Ontario along with countless primary care settings should reduce concerns(124, 125)
- Eliminating the exam table paper will save time, money, trees and energy, even considering a possible increase in laundry.
- In the study cited above, there were no concerns raised by staff or patients. Feedback was positive.
- Based on one study done in BC, one clinic saved: 8.2 km of paper, 1.7 trees and 579 kg CO2 per year(125).
- Using this data, if all family physician offices in Canada eliminated exam table paper we would save: 94,950 km of paper, 20,218 trees and \$8,400,600!

## Help us to reduce our environmental impact!

We are eliminating the use of unnecessary paper products like exam table paper and trying to reduce use of gowns and drapes



Thanks you for your support

**Caring for the planet is caring for people**

[Download this as a Printable PDF](#)

# Appendix 7. - Rx for Planetary Health

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**PlanetaryHealth**  
for Primary Care

## Rx for Planetary Health

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### Activity

\_\_\_\_\_ (walk/bike/dance, etc)

\_\_\_ Minutes \_\_\_\_\_ x per week

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### Plant-rich diet

Meat-free meals \_\_\_\_\_ days/week

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### Nature

\_\_\_ Minutes \_\_\_\_\_ x per week

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### Social

\_\_\_\_\_ (volunteer, go out with a friend, join a club, etc)

\_\_\_\_\_ x per week

[Download this as a Printable PDF](#)

# Appendix 7. – Additional Resources

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## Avoiding Unnecessary Care

- [Choosing Wisely Canada– excellent resources for providers and patients](#)
- [Therapeutics Initiatives – evidence -based information on medications](#)
- [UBC Provincial Academic Detailers – evidence -based information on medications](#)
- [Therapeutics Education Collaborative – medication myth busters – home of the Best Science \(BS\) Medicine podcast](#)
- [PEER Tools for Practice – evidence -based information on medications](#)
- [Rx Files](#)
- [CMA InfoPOEMS](#)
- [Canadian Deprescribing Network](#)
- [Slow Medicine \(Italian\)](#)
- [Do Bugs Need Drugs?](#)

## Empowering Patients

### Shared Decision Making

- [The NNT](#)
- [Absolute CVD Risk/Benefit Calculator](#)
- [Osteoporosis Decision Aid](#)
- [Ottawa Health Research Institute Decision Aid](#)
- [Testing Wisely](#) talking tips for patients requesting tests
- [Canadian Deprescribing Network](#)

### Serious Illness Conversations

- [Serious Illness Conversations](#)
- [Choosing Wisely Canada](#)
- [Speak Up](#)
- [BC Cancer Agency](#)
- [Advanced Care Planning](#) Patient resources (BC Specific)

## Health Promotion

- [Canadian Task Force on Preventive Health Care](#)
- [Dr Kaveh Shojani video](#)
- [Canadian Family Physician series on preventive healthcare](#)

## Plant-based diets

- [Canadian Food Guide](#)
- [Dr. Tushar Mehta’s video on plant based diets and his other video describing the health and environmental benefits of plant-based diets.](#)
- [Hamilton Family Health Team’s Green Team: patient resources, posters, videos, plant-rich eating prescriptions and more.](#)

## Physical Activity

- [The 24 Hr Movement guideline and a toolkit for using the guideline with patients](#)
- [Parks Prescription PaRx](#)
- [Exercise prescriptions](#)
- [Exercise is Medicine](#)

## **Environmental Alternatives**

### **Virtual care:**

- [Hamilton Family Health Team's great infographic](#)
- [CASCADES VR Playbook](#)

### **Metered Dose Inhalers**

- [CASCADES MDI Playbook](#)
- [Hamilton Family Health Team](#)

### **Office operations (energy saving, environmentally preferable purchasing and recycling)**

- [Green Office Toolkit](#)
- [Hamilton Family Health Team](#)
- [CAPE's Climate Change Toolkit](#)
- [Gloves Off campaign or this video](#)

### **Cloth instead of disposable sterile wraps:**

- [LacMac](#)
- [CIA Medical](#)
- [Medline](#)

### **Cleaning**

- [BC Infection Prevention Guidelines](#)
- [Ontario Infection Prevention Guidelines](#)
- [One approved option for cleaning](#)

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