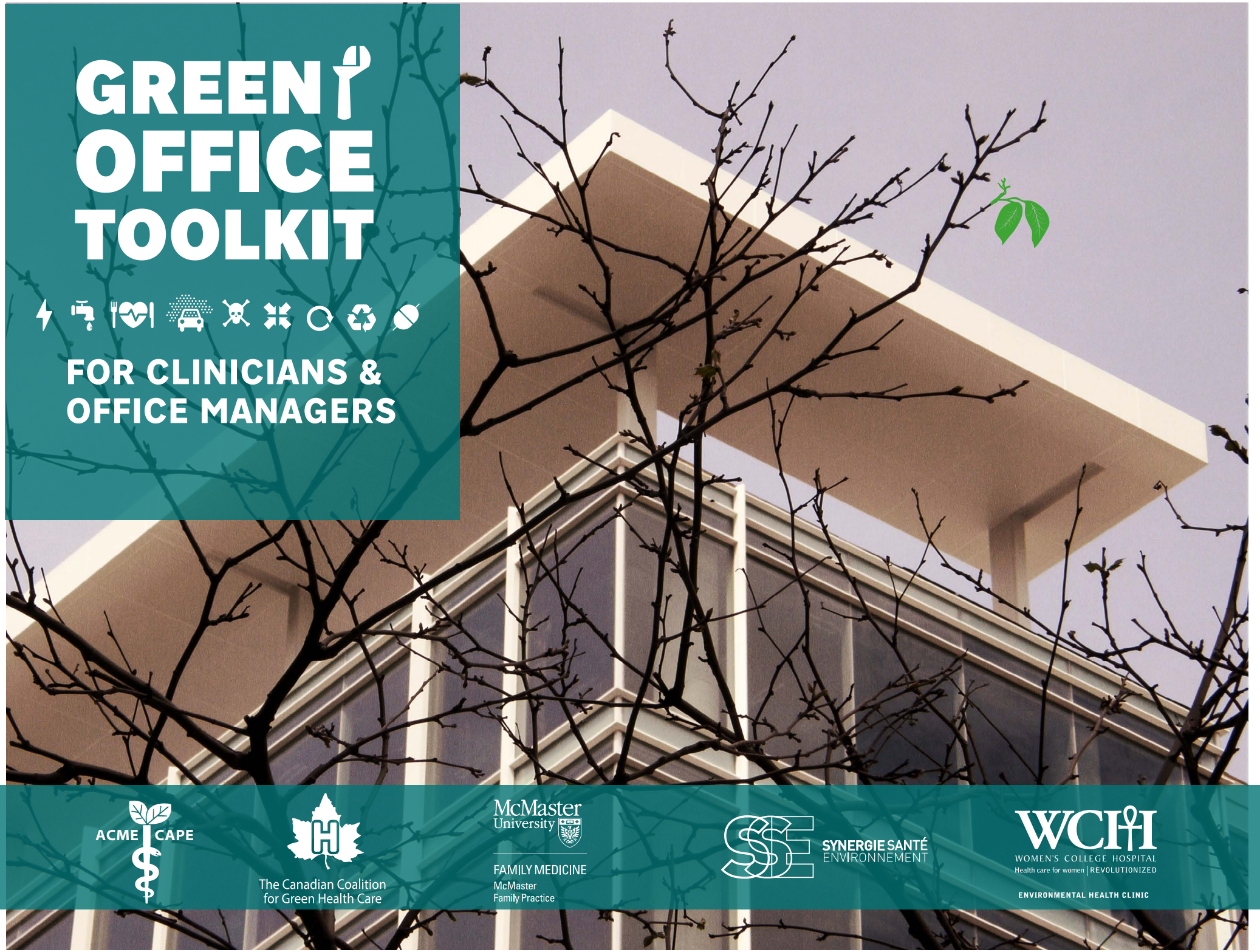
GREEN OFFICE TOOLKIT

FOR CLINICIANS & OFFICE MANAGERS



ACME CAPE

The Canadian Coalition for Green Health Care

McMaster University

FAMILY MEDICINE

McMaster Family Practice

SYNERGIE SANTÉ ENVIRONNEMENT

WCHRI

WOMEN'S COLLEGE HOSPITAL

Health care for women | REVOLUTIONIZED

ENVIRONMENTAL HEALTH CLINIC

GREEN OFFICE TOOLKIT

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1. INTRODUCTION

Welcome to the Green Offices Toolkit, designed to simplify and inspire the 'greening' of your health care practices. Here you will find practical and affordable ideas to make eco-friendly office improvements, and real life examples, with the ultimate goal of helping health professionals support the health and wellbeing of patients, while respecting the foundations of health for present and future generations. Healthcare is estimated to cause between 6-10% of all environmental harm (and ensuing illness) from Canadian society [1,2].

However, increasing numbers of clinics and health institutions across Canada and the world are looking at how they can have better impacts on the planet we depend on.

Having a green office doesn't have to be costly. In fact, the benefits of a green office can include cost savings, as well as a healthier office environment, and improved patient and staff experience. Cost savings mainly result from reduced waste and improved efficiency.

It is hoped that patients and clients may appreciate and learn from the examples set by their care providers, and take environmental and health-conscious actions in their own offices or homes. In addition, anything we do to reduce our environmental footprint will help reduce the impacts of climate change. The Lancet Commission on Climate Change has identified climate change as both the greatest global health threat and opportunity of the 21st century [3].

While there are many ideas beyond this toolkit on ways we can be better stewards for our environment, we provide a selection of tips and suggestions which are easy to implement, evidence-based or-informed, cost effective and appeal to a variety of clinical contexts. This may act as a starting point for more sustainable actions and inspire the process of striving towards a better future and healthier planet. As well, not every section is appropriate for all clinical situations: choose the parts that fit your context best and move forward.

> "Doctors and administrators can integrate principles of sustainability into their clinics without burning themselves out. The idea is to begin with popular and easily achievable strategies first, such as office recycling or bicycle racks. Examples exist in every office. After they're implemented, examine how successful they were, readjust, and consider the next move. "
>
> **- Dr. Jean Zigby, Past-President of Canadian Association of Physicians for the Environment, and Founding President of Synergie Santé Environnement**

2. HOW TO BEGIN ?

1. GET EVERYBODY ON BOARD, MANAGEMENT, CLINICIANS AND ADMINISTRATIVE STAFF

Directors and managers can lead the change by establishing environmental sustainability as a **core value** and integrating it into the cultural and corporate fabric of the organisation. This is often incorporated into a **"Triple Bottom Line" consisting of health, economic sustainability, and environmental values**. Explicit acknowledgement of such values can create a space for discussion, open doors for green investments, and foster a corporate culture that embraces environmental stewardship and climate change preparedness.

Clinical and administrative staff are sources of valuable innovation, and are key to implementing practices requiring behavioural change. Establish a "**Green Team**" to help bring focus to staff efforts, investigate issues and concerns, develop workable solutions and implement actions towards overarching goals. Task the team with devising a plan to educate staff on choice sustainable office practices. Use strategies such as face-to-face meetings, a green newsletter, email updates, lunch-and-learns. Consider inviting other relevant stakeholders to the table such as your waste hauler, housekeeping or landscaping staff, and suppliers of clinical and non-clinical goods and services. For example, if your practice shares lab services, periodically invite a representative to consult with your Green Team.

Now that you have decided to embrace environmental stewardship and climate change resiliency in your practice, you need to decide what exactly you want to do and how you are going to reach your final destination.

Reference: Vision and Mission Statements - a Roadmap of Where You Want to Go and How to Get There

VISION

This is a brief statement regarding what you want to achieve or accomplish. Your vision, for example, may be to deliver compassionate medical diagnosis and treatment in as environmentally-friendly a way as possible. Or to be leaders in environmental stewardship as we deliver high-quality care.

MISSION

This is the action part of the task referring to how the vision will be achieved. To follow sound environmental practices and reduce our practice's ecological footprint.

STRATEGY

How will you use your Mission to achieve your Vision? Be creative. You can have more than one way.

GOAL(S)... WHAT DO YOU WANT TO ACHIEVE? MAKE THIS A STATEMENT, OR MANY!

- Reduce ecological footprint
- Eliminate use of Styrofoam® in our practice
- Increase our rate of recycling by 30%
- Improve our purchasing practices to reduce waste packaging brought into our practice
- Reduce greenhouse gas emissions (GHG)
- Eliminate single-use drink containers

CREATION OF SYNERGIE SANTÉ ENVIRONNEMENT

In 2002, at the Local Centre for Health and Social Services of *Côte-des-Neiges* (Montreal), a family physician invited the director of materials and finance to form the first Green Team of a clinic in Quebec.

They had a simple vision: show that healthcare could begin caring for the environment by instituing recycling throughout the centre.

That initiative grew and spread into creation of the not-for-profit organization Synergie Santé Environnement in 2007, an organization that now collaborates with scores of health centres across Quebec to reduce their environmental impacts.

SYNERGIE SANTÉ ENVIRONNEMENT

2.2 ALLOT TIME AT OFFICE MEETINGS TO DISCUSS SUSTAINABLE MEASURES

Environmental stewardship should be on the agenda of regular office meetings. Give your Green Team a chance to share findings, successes and plans moving forward. Keep staff engaged and receive valuable feedback by suggestion box, bulletin board, e-mail, or the use of social media. Suggestions should be reviewed at each staff meeting.

2.3 SET GOALS AND DELEGATE TASKS.

Focus your office's efforts by setting goals with **explicit, quantifiable objectives**. Allow staff volunteers to sign-up as "green leaders" or as part of your "green team" with specific roles and responsibilities. Often, people are more encouraged to work if responsibilities are clearly delegated, and contributions are acknowledged. Show appreciation for their involvement and accomplishments.

2.4 PUBLICIZE

Once your office has a consensus of a common general goal (or goals), consider how to promote it, such as a periodic email, document or a poster. A discussion of your office's greening practices should also form part of your **staff orientation** practice. Management needs to be seen both supporting the initiatives AND participating in them.

2.5 MONITOR

Keeping track of your current green health can help set realistic goals, recognize when you have achieved them, and plan the next steps with your team.

ENERGY USAGE

- Consider a building Energy Audit to identify areas for improvement. Note that incentives from your utility company may be available to offset audit and upgrade costs.
- Keep a record of your utility bills to track improvement. Evidence of progress can be a great motivator!
- Check for energy savings tips from your electric company and online. Consider getting a smart energy meter to monitor regular usage and target areas for improvement.

WATER USAGE

- Review water bills to track improvement.
- Discuss conservation measures and incentives with your local water supplier.
- Learn locations of water meters to monitor water usage and enable leak detection.
- List fixtures that use water to identify potential areas for upgrades or improved habits.
- When purchasing equipment that uses water in process or for cooling, enquire about consumption rate and compare to competitor products.

WASTE PRODUCTION

- Conduct a waste audit of your organisation. Sample audit methodologies can be found online.
- Share audit findings with staff and encourage their suggestions on how to reduce waste to landfill, increase recycling, and reduce the amount of waste brought in through improved purchasing practices.
- Consider pilot projects to determine efficacy and how to navigate obstacles (e.g. changing habits, maintenance contracts, cost reduction).

2.6 CELEBRATE SUCCESS!

Recognizing the efforts and achievements of others can boost morale and motivate staff that may have been reluctant to get involved. You may consider material rewards, but simple messages of appreciation or public acknowledgement can also be meaningful. For example, send out a weekly or monthly email to recognize office achievements or list individual staff as "green champions" for their efforts.

3. IMPLEMENTATION TIPS

3.1 SAVE ENERGY

Reducing energy consumption in general is often described as one of the 'low hanging fruits' of office greening. Switching to more energy efficient appliances and improving consumption habits are relatively easy, and can also save money. If you're new to green offices, energy is a great place to get started. Nearly every form of large scale energy production has consequences for both society and the environment, including economic costs, ecological damage and human health implications from pollution. As populations continue to grow, it is becoming ever more important to reduce consumption, and rethink how various forms of energy are generated, harnessed, delivered and used.

MAKE USE OF ENERGY INCENTIVE PROGRAMS FOR AUDITS AND IMPROVEMENTS

- Provincial: Search for energy incentives in your province with Natural Resources Canada[4].
- Municipal: Visit your regional website for incentives to save on electricity, heating, water, and more.
- Commercial: Check with your local energy and gas providers for the latest incentives.

Image | giverontheriver.com

MIRAMICHI REGIONAL HOSPITAL

In just three years, Horizon Health Network cut its energy costs by $4.45 million and diverted 15,000 tonnes of greenhouse gases annually as a result of staff commitment and engagement, low-cost measures, and a facility-wide energy management system. The organization's achievements also garnered it the 2016 Wayne McLellan Award of Excellence in Healthcare Facilities Management and the 2017 Canadian College of Health Leaders Energy and Environmental Stewardship Award. Because of energy-saving ideas from the network and employees, the Miramichi Regional Hospital improved its ENERGY STAR score from 19 to 52 in less than three years. This leap in ENERGY STAR scores was largely a result of wood boiler and steam production system retrofits that have reduced steam production by 10 million pounds. The hospital also installed LED lights and dimmers, and now has a building automation system that is linked to its EMIS. Other facility-wide projects include ongoing LED retrofits, the installation of occupancy sensors, and the optimization and recommissioning of equipment and systems.

USE A PROGRAMMABLE THERMOSTAT

- Save energy by heating less: During evenings and weekends, the thermostat can be turned down. During warmer months, consider raising the temperature of the air coming from your air conditioning unit. According to research from the Government of Canada, lowering the temperature two to three degrees from the national average of 21°C was the optimum point for energy savings. Lowering the temperature more than this may lead to increased humidity and poor air circulation.
- For an instructive video on the Programming Your Thermostat in Canada, visit Natural Resources Canada [5].

PURCHASE APPLIANCES MINDFULLY

- Choose low energy usage appliances.
- Investigate appliances and equipment with the ENERGY STAR® logo and learn how to read the ENERGUIDE labels before making your purchase.
- Consider life-cycle cost of equipment and pay particular attention to yearly energy consumption. The cheapest product may not be the best buy in the long run.
- Investigate how to get the clinic Energy Star Certified.

TURN OFF APPLIANCES AT THE END OF THE DAY

- Eliminate/reduce 'phantom loads' or 'standby' power requirements by turning off equipment such as televisions and radios, monitors, printers and scanners when not in use or at end of day. This may also apply to clinical devices so look beyond just the office areas of your practice.
- Invoke sleep mode on computers and other similar devices.
- Insist all new electronics have sleep mode turned on when delivered by supplier.

USE COMPUTERS WISELY

- Change computer settings to "Turn off the Monitor Display after X minutes of inactivity" to save energy.
- Encourage manually turning off the monitor when not in use for 20 minutes or more, as even a monitor in sleep mode still uses energy.
- Make use of "power saving mode" on computers to enable system standby or hibernate features which use less energy than when the computer is running normally.
- Avoid using screen savers as they can increase a computer's energy use, prevent a computer from entering sleep mode, and are not necessary.
- Turn off computers at the end of day if applicable (some servers or computers controlling delicate medical devices may need to remain on).
- Consider placing "Turn me off" stickers next to the monitor's power button and the light switches as a reminder.

SAVE WITH LIGHTING

- Consider printing 'turn me off!' stickers to place next to light switches as reminders.
- Switch to energy-efficient LED lighting. Choosing the right fixtures and luminaries can mean long term energy savings and reduced GHG emissions. More efficient lights may cost more initially, but will save over time by nature of their lower wattage and longer lifespans.
- LED lights are available in a range of colour temperatures trending from warmer yellow to cooler white/blue. Choose wisely so as to ensure they are suitable for diagnostic and treatment areas where skin colour can be important. As incandescent lights are being phased out in Canada [6], more varieties of LED are expected to become available in upcoming years while prices are expected to drop. Check your local utilities for discounts and coupons.
- Switch off lights when not required. E.g. Examination rooms when vacant, during lunch breaks, at end of day,
- Off-Grid Outdoor Lighting: Consider solar-powered low-level lights for outdoor use if continuous night time lighting is required.
- Consider installing motion sensors in infrequently used rooms such as bathrooms and closets. Another great use for motion sensors is with outdoor spotlights and floods. Motion sensing switches are available at most hardware stores.
- Timed lighting can help in large offices to automatically turn lights off on evenings and weekends.
- Make use of daylight Specialized dimmers can be used to reduce lighting when daylight is available. They may be equipped with 'photocells' which respond to changing light levels, motion sensors, sunrise-sunset timers or a combination of these. Speak to an expert to determine the most appropriate type for your building's electrical system, and check the packaging of lightbulbs to ensure they are dimmable.

  - Strategically arrange desks to make use of daylight from windows or skylights, while avoiding potential glare on computer screens.
  - Shading sunny windows with deciduous trees, roll down shades or awnings can reduce air conditioning costs in the summer, while still allowing sun to heat the office in the winter.
  - Learn more from the video "Shading Your Home" with research engineer Frank Szadkowski from the Canadian Centre for Housing Technology. http://www.nrcan.gc.ca/science/expert/video/1491

LIGHT BULB COMPARISON CHART [7]

LIGHT SOURCE	LIFETIME (HOURS)	DIMMABLE
Typical incandescent	1,000	Yes
Halogen	2,500–5,000	Dimmable above 60% power
Compact Fluorescent (CFL)	8,000–10,000	Check label – varies by design and manufacturer
High-quality LED	25,000	Check label; may require a specific dimmer type

Important! CFLs contain mercury. Please see Reduce Toxics section.

LOW-CARBON ENERGY

Purchasing non-fossil fuel energy will reduce your greenhouse gas emissions[8].
If you own the building you may have greater choices for the energy you want to purchase.

- Purchase renewable energy services where available (e.g. Bullfrog power)
- Photovoltaic Systems
- Thermal hot water systems
- Geothermal energy systems

DESIGN AND RENOVATE ENERGYWISE

While many aspects of buildings and infrastructure are difficult to change once the initial construction is complete, smart building design can influence the energy requirements and environmental impact of the office throughout its lifetime[9].
If investing in a new construction, consider following LEED (Leadership in Energy and Environmental Design) or BoMA[10] Review certification standards (even if you decide not to certify) in order to get great and reliable ideas on the latest energy conserving and environmental designs [11].

In 2007, the Centre de Santé et de Services Sociaux du Nord de Lanaudière, became the first medical teaching clinic certified LEED in Canada! Since then a dozen more health centres and hospitals have certified, with many more learning from their examples. (e.g. McGill University Health Centre, Montreal)

WEATHER PROOFING

Reduce heating and cooling costs associated with air leaking and infiltration by installing proper weather stripping and sealing air leaks.

3.2 SAVE WATER

Clean and reliable water sources are essential to the health of society. Three basic steps to contribute to safe water are to be aware of your local water source, reduce consumption and avoid pollution. Reducing water consumption cannot only save money; it is an important step to reduce pressure on reservoirs and infrastructure from water distribution systems to wastewater treatment facilities, and ultimately preserve clean and safe water sources for future generations.

ENHANCE WATER HEATER EFFICIENCY

If the building's water heater is within the scope of your office management, consider the following:

- Set baseline temperature to 49°C: The Government of Canada's recommended baseline hot water temperature is 49°C, which is still high enough to prevent growth of harmful bacteria such as Legionella[12]. While the previous standard for hot water temperature was 60°C, this has led to scalding especially in young children, in addition to excess energy usage.
- Insulate hot water pipes with foam from the hardware store to prevent heat loss.

USE LOW FLOW FAUCETS

- Check whether your office has water efficient, low-flow faucets. The flow rate, in litres per minute (L/min), is often imprinted on the rim where the water comes out of the faucet. As a reference for current standards, the 2012 Ontario Building Code (O. Reg. 332.12) set the maximum flow rate at 8.35 L/min for installing new kitchen and lavatory faucets.
- Before swapping out your faucets/aerators, ensure infection control will not become an issue. Many hospitals have eliminated aerators for health and safety reasons.

SCHEDULE INSPECTIONS FOR TOILET AND PLUMBING LEAKS

A slow drip at 1 drop per minute can waste 200 litres per year[13] !

- Checking for toilet leaks can be as simple as putting a few drops of food colouring in the toilet tank. Come back after 20 minutes to check the toilet bowl; if the water is coloured, you have a leak. The City of Calgary offers simple instructions on fixing toilet leaks [14].
- Check for plumbing leaks – leaks don't only waste water and money; dampness can lead to mould, reducing the air quality in your office. To check for plumbing leaks, select a time when no one is at the office, and turn off all faucets and water fixtures in the building. Next, check the water meter to find out if water is still flowing. A low flow indicates a leak or unaccounted water fixture. If your water meter does not have a "low flow indicator," record the readout number and check it again after about 8 hours to see if it has changed. Access more helpful hints from the City of Toronto website[15].

ENCOURAGE STAFF TO REPORT LEAKS OR SUGGESTIONS FOR WATER CONSERVATION

Place signs in restrooms and staff kitchen such as "Please notify staff if we leak or drip."

CONSIDER TAP WATER OVER BOTTLED WATER

Choosing tap water avoids the packaging and higher costs associated with bottled water. In the bigger picture, supporting tap water also supports the public infrastructure and protection of natural water systems which provide clean water access for all.

- Consider a water fountain or water purifier to encourage reusable water bottles, which may be especially helpful in cities with hard water.

There are many types to choose from.

- Some helpful questions to ask include:
  - Does it require electricity?
  - If it uses a filter, how frequently must it be replaced?
  - How is it refilled with water?
  - What are the installation and maintenance requirements?
- Points to keep in mind:
  - All water purification methods are not equal and may vary in the extent of mineral, fluoride and chlorine removal.
  - Consider costs of maintenance and filter replacement.
  - Ensure that the system you invest in is designed to prevent mould and bacterial growth

USE HAND HYGIENE BEST PRACTICES

In cases where hands are not visibly soiled, the use of alcohol based hand rubs (ABHR) is listed as best practice by Public Health Ontario as of 2012 as a convenient alternative to hand washing [16]. Consider avoiding the purchase of hand rubs with other potentially harmful antiseptic chemicals like Triclosan, as they are considered no more effective than the ABHR standard while posing potential risks to environment and human health [17].

CONSIDER GREYWATER SYSTEM

Greywater systems use rainwater or non-potable water to supply fixtures which don't require drinking water such as toilets. Recent building codes are starting to clarify greywater systems standards, which mean that incorporating such systems into new buildings may become more accessible.

REDUCE TOTAL ENERGY USAGE

Reducing energy usage can indirectly reduce national water consumption. Did you know: electric power generation, transmission and distribution accounted for 67.6% of Canada's water withdrawals in 2013, whereas municipal usage made up 8.5%. [19] [19A]

CONSIDER REPLACING OLD TOILETS WITH NEW LOW FLUSH TOILETS AND URINALS

- Toilets can be the largest water users in a building. While older toilets typically used up to 13 litres per flush, low flush toilets use 6 litres, and high-efficiency toilets use 4.8 litres. Technologies such as dual flush toilets can use even less water. The 2012 Building Code of Ontario requires new homes or renovations to install high-efficiency toilets (4.8L) or 3/6L dual flush toilets, but in older buildings, there are many opportunities to replace 13L toilets that are still in use to save water and money. Be sure to read reviews and maintenance requirements if considering novel technologies.
- Check your city programs; some municipalities offer rebate programs for toilet upgrades.

CONSIDER LOW WATER AND LOW CHEMICAL CLEANING PROCESSES

- Ozonated water cleaning systems are being used in many health care settings
- Microfiber mops use less water and reduce cross contamination between areas [18].

DISCONNECT THE DOWNSPOUT

- This can prevent sewer overflow, and basement flooding [20]
  - Direct roof drain downspouts towards permeable surfaces, away from the building
  - OR utilize rain barrels, and use the collected water to irrigate outdoor vegetation.

INCREASE PERMEABLE SURFACES

- Permeable surfaces (e.g. porous paving, cobblestone, grass, trees and other native landscaping) allow rain to soak directly into the ground, rather than diverting water as runoff to storm drains. Some of the benefits of permeable surfaces include reduced flood risk for your city, reduced chance of combined sewer overflows (for cities which have combined sewers and storm drains), and less polluted runoff into streams and other bodies of water.
- Consider green roofs : Some advantages include improved water quality due to reduced stormwater runoff and fewer overflows of combined sanitary and stormwater sewage systems, increased habitat promoting biodiversity, lower temperatures for building roofs and the air above them in most climates, reduced energy consumption in some climates, improved sound absorption in the top floors of buildings and improved air quality.
- The economic benefits of installing green roofs include: Lower energy costs due to the cooling effect of plant respiration and insulation, shading and thermal mass of the plant and soil layers; less frequent roof replacement schedule due to greater durability than conventional roofs; reduced stormwater management costs [21].

MULTIPURPOSE LANDSCAPING

Well-planned green spaces can attract biodiversity, save water, promote native species, reduce maintenance costs (water, fertilizer), reduce load on city storm water drains, reduce heat island effect, improve air quality, and provide aesthetic appeal.

- Invite landscape maintenance team to join your Green Team
- Go pesticide free and place a display a sign "Pesticide Free"
- Consider using soaker hoses or drip irrigation instead of sprinklers to reduce water use
- Choose the best watering time(s) based upon your vegetation's requirements
- Ensure the sprinklers aren't on during periods of precipitation
- Conserve water through xeriscape gardening.
- Replacing lawns with a drought tolerant garden may reduce or eliminate the need to irrigate plants. Be sure to select varieties that are not known to produce or harbour common allergens.
- Native plants tend to be well suited for local climate and low water use.

Habitat for butterflies, ladybugs and birds can help create a landscape which takes care of itself. These natural predators help with pest management without the use of pesticides [22].

3.3 ENCOURAGE HEALTHY AND ECO-RESPONSIBLE DIETS

High meat consumption and intensive animal farming have been strongly linked to obesity, diabetes, colon cancer, and high cholesterol (with increasing evidence for coronary artery disease, stroke and other cancers) as well as air, water pollution, and climate change [23].

- Replace red and processed meat at meetings, luncheons and events with white meat or better, fish, beans, and lentils.
- If serving meat, avoid charring meat and cook meat at lower temperatures.
- Increase offering of fresh and tasty vegetables, fruits and whole-plant based foods to staff at events.
- Offer pitchers of tap water at every event.
- Collect and share healthy, plant-based recipes with colleagues and patients who are trying to improve their diet. In some cases, it could be beneficial to provide culturally-familiar recipes for patients to increase likelihood of adoption.
- For more information:

Nourish: The future of food in health care [23-A]

3.4 REDUCE TRANSPORTATION POLLUTION

The VGH Cycling Centre is a membership-based facility that is open 24 hours a day, all year round. With 174 bike racks (including 12 outlets for electric bikes) and eight bike lockers. It is one of the region's largest facilities for bicycle commuting and includes change rooms, showers, towel service, storage lockers and bike stands with tools and pumps [24].

- Walk or bicycle to work, but remember to review road safety first.
- Plan your walk or cycling route through greenways and parks, or away from major roadways to minimize exposure to traffic pollution.
- Speak with the building managers to implement bicycle racks to promote active transportation
- It may not be feasible to provide an office shower, but if there is significant staff interest in bicycling, inquire if nearby gym or pool facilities might offer a discounted staff membership for shower use.

TRANSPORTATION WAS CANADA'S SECOND LARGEST CONTRIBUTOR TO GREENHOUSE GAS EMISSIONS IN 2015 NEXT TO OIL AND GAS, AT 24% OF TOTAL ANNUAL EMISSIONS

Taking transit reduces air pollution and people who use public transit are more likely to meet daily exercise recommendations. Exercise has both immediate and long-term health benefits. It can reduce high levels of cholesterol, blood pressure, stress and weight, and can help manage osteoporosis, improve sleep, and reduce risk for type 2 diabetes, heart disease and stroke.It is also associated with increased worker productivity, job satisfaction and decreased sick days. A 2010 study in British Columbia suggests that air pollution, especially traffic-related pollutants, are associated with the development of asthma in children. The Heart and Stroke Foundation recommends "at least 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week, in bouts of 10 minutes or more" for adults. Other health effects linked to air pollution from traffic include worsening asthma symptoms, lung cancer, and heart disease. Go the extra mile by choosing more active forms of transportation for cleaner air and a dose of healthy exercise. Caveat: Ensure any recommendations for physical activity are appropriate for the ability level and safety concerns of each individual.

- Consider adding electric vehicle chargers for employees and visitors with plug-in cars. Check with local community and province for incentives.
- Let patients know about the Government of Canada's Public Transit Tax Credit [25.]
- Encourage staff to get off the bus or subway a stop earlier and walk the remaining distance to work and home
- Encourage staff to park the car further away from your workplace entrance.
- Encourage the use of stairs instead of taking the elevator.
- Make stairwells more esthetic, well lit, and address safety concerns
- Make appointments for walking meetings with co-workers in local green spaces.
- If bicycling is among your employees' or patients' options, consider providing road safety resources.
- When planning your next move, pick an office or clinic location that is transit-friendly, so that taking transit is the easy choice for patients and staff. This also makes healthcare more accessible for low-income patients or others who don't have personal vehicles.

DISCOURAGE VEHICLE IDLING[26]

- Many municipalities have enacted anti-idling by-laws. Contact your local municipality to find out more details. Publicize them.
- Install signs in the parking lot to discourage idling.
- Natural Resources Canada recommends turning your vehicle's engine off if stopped for more than 60 seconds.

VGH Cycling Centre – Award-winning bike facility for staff

DISCOURAGE VEHICLE IDLING

An average car can use over one cup of fuel for every 10 minutes it idles! For ideas and ready-made graphics, visit Natural Resources Canada's Idle Free Campaign. [26 A-B-C]

3.5 REDUCE TOXICS

- Invite the local pharmacist to participate in a meeting of your green team. They are greening too!
- Educate patients on safe disposal of unused and expired pharmaceuticals helps to ensure medication is not misused, and that potentially harmful drugs do not pollute water bodies and the environment.
- Review your patients' medications scrupulously and regularly to ensure each medication is up to date and appropriate.Educational resources are available in the polypharmacy toolkit developed by Nova Scotia's District Health Authorities and the Nova Scotia Department of Health and Wellness [28].
- Be aware of pharmacies near you with medication "take back" programs [29]. Most pharmacies probably accept medications, but call ahead, check www.healthsteward.ca or check the pharmacy website to confirm.
- Advise patients not to put medications down the toilet.
- When prescribing or discontinuing a drug, remind patients about safe disposal methods such as dropping off medicines to a local pharmacy, and let them know the nearest location.

PHARMACEUTICALS | SAFE PRESCRIPTION HABITS AND PATIENT EDUCATION ON DISPOSAL

Pharmaceutical production, use and disposal are responsible for a large portion of the day-to-day toxicity and greenhouse gas emissions (GHGE) from healthcare. The National Health Service (NHS) of England estimate they are responsible for 21% of the NHS GHGEs. [27]

REDUCE EXPOSURE TO COMMON POLLUTANTS FROM BUILDING MATERIALS

When renovating the clinic, ensure contractors are aware you wish to avoid or remove safely building materials that contain:

- Asbestos – e.g. older building insulation/plaster
- Lead – e.g. water pipes installed prior to introduction of lead-free regulations
- Volatile Organic Compounds (VOCs) – typically a bigger problem in buildings with recent renovation [30]
- Formaldehyde – e.g. off-gassing from flooring or particle board [31]

DEVELOP OFFICE PROTOCOLS FOR HAZARDOUS WASTE

- Adopt procedures for disposing of hazardous waste including: Mercury containing devices (CFLs, Cathode Ray Tubes, batteries, etc.)
- Adopt "best practices" according to national standards for hazardous waste spills to minimize toxic exposure to staff
- Review procedures for cleaning medical devices and adopt least toxic methods
- Be aware of common hazardous waste items in the office:
  - Printer ink (Order vegetable dye inks)
  - Construction materials
  - CFLs
  - Batteries
  - Electronic waste

REPLACE MERCURY THERMOMETERS AND MERCURY SPHYGMOMANOMETERS WITH NON-MERCURY CONTAINING ALTERNATIVES

Once in the environment, mercury can be converted to various forms, including a highly toxic compound known as methyl mercury, a potent neurotoxin that is readily absorbed, distributed and passed through the protective blood-brain barrier, affecting the central nervous system. It can accumulate in living organisms and biomagnify (i.e., increase in concentration) as it moves up the food chain (adapted from Environment Canada and Health Canada.[32 -B]

Alternatives to mercury using devices include digital, alcohol, or infrared tympanic thermometers and flexible forehead thermometers.

- Create an Inventory for mercury containing devices and develop a plan to minimize or remove risk (sphygmomanometers, thermometers, and thermostats)
- Join or Organize a Mercury Thermometer Exchange Event [32- B]

IMPLEMENT SAFE EMERGENCY CLEAN UP PROCEDURES FOR MERCURY SPILLS

A few helpful hints from Health Canada [33]:

- Do not put contaminated items in the washing machine
- Do not vacuum the spill
- Do not use a broom or a brush
- Do not pour mercury down the drain
- **Do not throw mercury or contaminated items in the garbage**
- Find a drop off location. Mercury is classified as a toxic substance in Canada due to negative impacts for health and environment. CFLs are safe for use as long as they do not break, but should be dropped off at a hazardous waste facility or other designated location (Find a location near you: earth911). Ensure staff are aware of safe clean up procedures in case a bulb is broken, avoiding using a vacuum or putting remains in a regular garbage can [34-35]

TAKE ADVANTAGE OF "GREEN BUILDING" INITIATIVES

Many government programs in Canada can help healthcare institutions save money and protect the environment by careful advance planning when designing new buildings [36].

MAINTAIN A FRAGRANCE-FREE CLINIC

- Install a sign in the waiting room with a message such as : "We share the air, scented products can hurt people with health problems like asthma and allergies. Thank you for your cooperation."
- Consider educating patients on the potential toxic effects of fragrance [37].
- Negotiate with your maintenance team to use fragrance free, 99.9% biodegradable within 30-day, cleaning products which accord with provincial best practices guidelines.

MAINTAIN A FRAGRANCE-FREE CLINIC

Synthetic fragrances are largely created from petrochemicals and are used as additives in thousands of products including perfumes, soaps, detergents, and cleaners. Fragrance is not a single ingredient but rather a term used to summarize a sub-set of chemical ingredients that together create appealing aromas. Some ingredients are potentially hazardous to human health as they contain substances known from occupational and animal studies to be carcinogens, developmental toxins, or neurotoxicants at higher exposure levels. In addition, some ingredients can act as endocrine disruptors at exceedingly low levels.

3.6 REDUCE, REUSE, RECYCLE...RECONNECT!

REDUCE PAPER USE AND CONSUMPTION OF RAW PAPER PRODUCTS

You can save trees and money and potentially improve office efficiency by consciously streamlining office communication processes.

- Review office processes which use paper, including use of note-pads, stationery, patient handouts, charts, photocopy and printer paper, brochures and business cards.
- Go electronic for communications and signatures, eliminating printing where possible.
- Set default on printers to double sided to save paper if the option is available.
- Set default printer settings to draft mode or “quick print” to save ink, after checking that the setting retains satisfactory print quality for most office uses.
- Install efficient electric hand dryers in restrooms in place of paper hand towels, or purchase recycled paper hand towels as an alternative.
- Cancel unread magazine subscriptions [38].
- Establish transparent and mandatory reduction targets with printer and fax paper usage. This will likely reduce use more than education alone.

REDUCE EXAM TABLE PAPER

There is no question that exam table paper should be changed whenever there is a foreseeable risk of contamination. However, table paper is not an infection control maneuver, but rather an esthetic. Replacing the paper after each appearance of crinkles is not necessary when the table is only being used for seating clothed individuals. Use your discretion as to when to change the paper to reduce waste while maintaining health and safety standards. Strategies to avoid unnecessary use of exam table paper:

- Arrange for patients to be directed to chairs rather than the table for their initial checkup, thereby possibly reducing the need to use the table and its paper cover.
- Keep at least two empty chairs in the exam room (one for the patient, and one for a family member) if patients tend to come with company.
- Consider keeping a recycling bin in the exam room for used and clean exam table paper, when recyclable paper is used.
- After removing soiled table paper, clean the table as per sanitary guidelines and do not replace the paper until it is clear patients will be examined disrobed on the table.
- Clean the table between patients instead of using table paper at all, as there is no demonstrated association between paper use and reduced infections.
- Educate patients about the waste of table paper when asked.

CRESCENT BEACH MEDICAL ARTS

Since the mid 1970’s, Dr. Charles King and his partner Wendy Wulff pioneered green family medicine practices in their Crescent Beach clinic in White Rock, British Columbia. The clinic’s environmentally conscious ethos was reflected in all aspects of the practice, from using reusable equipment where appropriate, and re-using and recycling all paper waste, to making green purchasing decisions such as selecting all paper products with post-consumer content and purchasing non-toxic cleaning supplies. The clinic composted their organic waste, and patients appreciated the fruits of their on-site edible garden. In recognition of their ground-breaking efforts, Crescent Beach Medical Arts was named, in the late 90s, the Greenest Small Office in BC by Hewlett Packard’s sustainability program.

REUSE (AND USE RECYCLED PRODUCTS)

Consider more sustainable options when sourcing common office paper products. Look for the EcoLogo symbol on products to know they satisfy the highest standard criteria for environmental safety and protection. Some examples to consider:

- Distribute used non-confidential single-sided paper for reuse by staff.
- Order office paper with recycled content of 30% or more
  - Caveat: Sometimes higher percentages can cause heavily used older printers to jam due to dust
- Inform patients by adding on handouts and letterhead:“this was printed on X% recycled paper”, and “Recycle please”.
- Purchase toilet Paper, Tissues & Paper Towels with 100% post consumer waste fibre.
- Use reusable plates, cutlery and cups instead of one-time use items. If disposables are a must, try to use recyclable or compostable items like paper or recyclable plastics rather than polystyrene.
- Integrate reusable Sharps Containers with your medical waste manager.
- Look for companies that reprocess your single use medical items, and look for hospitals that may be doing it already [39]!
- To aid in purchasing, learn about Common Environmental Labels and Claims in Canada [40].

RECYCLING

- Ensure recycling handling is included in maintenance contracts.
- Purchase and deploy recycling bins for office and waiting room.
- Bright signage and periodic staff education /reminders is a must in busy clinics to maintain acceptable rates of waste errors (bin contamination).
- Consider keeping additional recycling bins in exam rooms for unsoiled recyclable exam table paper.
- Post recycling guides from your municipality clearly by the main recycling bins. Note that each municipality’s recycling guidelines are different, as each local authority is responsible for running its local recycling program.

THE LOWER MAINLAND RECYCLING RENEWAL PROJECT [41]

The Lower Mainland Recycling Renewal project is the first of its kind for BC health authorities. The Recycling Renewal Program provides health authority-wide recycling of refundable beverage containers; rigid plastic and tin; soft plastic; mixed paper and batteries.Indicators tracked by the recycling team measure program success and effectiveness. Data for these indicators are obtained through the following:

Pre and post waste audits to determine the composition of the waste and recycling streams;

Pre and post surveys to measure staff awareness and satisfaction;

Post implementation visual audits to measure contamination, identify possible bin re-allocation and flag areas that may need further education;

Diversion rates calculated from vendor invoices using waste and recycling volumes to identify change in volumes and rates.

Over 500 site-level recycling champions were recruited, helping to inform placement of recycling bins, recycling signage and resource materials, as well as educating fellow staff in their departments. Achieving a 37% average recycling rate in 2016, the aim is 50% by 2020.

- Educate staff on the types of plastic, glass, metal, and paper products that are acceptable in your city.
- Ask for staff volunteers to take recycling home weekly if commercial pickup is not available
- Unusual items to recycle
  - Ink cartridges
  - Exam table paper
  - Shredded paper, cardboard, patient chart covers
- Program Promotion:
  - Assign a staff member to look after recycling to make sure people are using it correctly
  - Display signage: “We Recycle” in waiting rooms
  - Distribute an e-Handout on recycling
- Add aesthetic DO NOT throw lists to the walls beside bins (batteries, CFL light bulbs, paint, electronics, other hazardous waste).
  - See section on chemicals and hazardous waste - Earth911: http://search.earth911.com

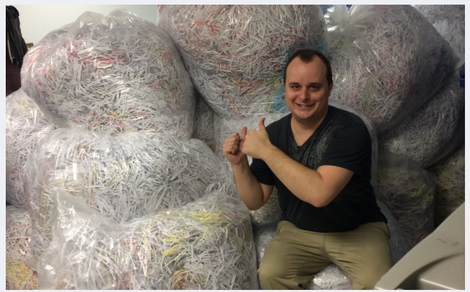
RECONNECT

- Look for organizations that will help your clinic while empowering the community.
- Invite volunteers from local environmental and social reintegration organizations to aid in attaining your goals reduce its eco-impacts.

COMPOSTING

While composting is not an issue in many offices where staff brings lunch from home, if food waste is an issue and of interest to staff, consider setting up an organic waste or compost bin after determining the volume of waste necessary to treat: If low-moderate volume, set up an organic waste bin with a covered lid in staff kitchen and assign a staff member to take the waste home.

- NOTE this activity requires diligent maintenance and a dedicated staff for regular removal (daily recommended) to prevent mould, unpleasant smells and insect vectors.



RECONNECT

In 2016, the Pierre-Boucher Hospital in Quebec began collaborating with the social reinsertion organization, *D’un couvert à l’autre*, to employ supervised individuals from the community with mental illness for shredding confidential paper, with supervision to ensure privacy, instead of paying for it to be shredded. The project saves the health institution thousands while developing skills and confidence in a marginalized portion of their community.

Mikael, proud trainee of the program *D’un couvert à l’autre*
Photo courtesy of SSE

- Keep in mind mess prevention for the staff who volunteer to take it home (e.g. line the bin appropriately with newspaper).
- Not all biodegradable plastics are compostable, and usually not in small composters.
- Participate in city composting programs if available in your clinic area and include it in maintenance contracts.

Consider installing an outdoor compost bin if volume or organic waste is sizable, city composting not available, and space outside allows. Keep the following guidelines in mind:

- Aeration is required through mixing the compost to prevent unpleasant smells. This can be accomplished through turning with a fork, or tumbling, in the case of a tumbler composting bin.
- Drain regularly to avoid buildup of fluid, which can lead to odour issues and handling challenges.
- Keep compost covered with a physical barrier which allows for air flow, or cover with a layer of leaves and dirt to keep animals and flies away.
- Consider ease of maintenance - A well designed tumbler composter may be a practical set up due to easy maintenance via turning, while keeping away smells, animals and vectors.
- Read independent reviews to assess if appropriate for your clinic space prior to purchasing.
- Plan who will harvest the compost or connect with local gardeners or nearby farms to harvest the compost if volumes are larger than volunteers can use.
- Visit these links and check your local municipality.
- For more information: Compost Council of Canada [42]

3.7. TALK ABOUT HEALTH EFFECTS OF CLIMATE CHANGE

In addition to taking action to reduce GHGs at their own offices and clinics, physicians can be prepared for the health impacts of climate change on their patients and their local community. Family physicians who can recognize the direct and indirect health effects of climate change will be able to discuss preventative and adaptive strategies with their patients. As highly respected members of the community, physicians are also contributing to climate mitigation and local preparedness by taking part in discussions of how climate change will impact health in their communities

- For more information

Health Effects Of Climate Change - An information brochure for family physicians from the Ontario College of Family Physicians

Responding to climate change in BC: What can physicians do?

4.EDUCATION

The greatest impact physicians and clinicians can have on the health of the environment is through their leadership and influence in their communities.

4.1 PATIENT EDUCATION

Physicians and clinicians are in an opportune position to positively influence the public through their intimate connection with patients. Patients may look to their physicians and caregivers as role models, and may be inspired by their health care provider's healthy and environmentally conscious lifestyle and recommendations.

4.2 COMMUNITY EDUCATION

Education in your community is an important step in creating a greener and healthier environment. Using aesthetic and creative imagery:

- Create an environmentally-friendly "tip of the week" program. Display it on waiting room screens or social media of your clinic.
- Advertise community events such as bike month, Earth Day or awareness walks for various environmental health issues.
- Prepare informational handouts for patients and staff on environment-related health topics such as active transportation, pharmaceutical disposal, energy and water conservation, chemicals or pesticides.
- Publicize your action plans, accomplishments or setbacks. Advertise your involvement:
  - Post a sign in your waiting room, restrooms and break room saying, "We conserve water/ energy for everyone's health."
  - Post a sign in restrooms asking users to conserve water and to report any leaks or drips and signs on lights to turn them off when not in use.
- Invite suggestions for sustainability from those working in the office and from your patients.
- Add environmentally-friendly ideas to your office website, newsletter, and bulletin boards.
- Offer a prize for the best idea or action each quarter.
- Schedule an educational luncheon with your local water utility, city or non-profit organization for a presentation to encourage sustainability in the office and at home. Some organizations and municipalities offer brochures or conservation kits.
- Develop, support or sponsor a community garden. Check with your agriculture extension office, city government, or garden clubs to learn how you can get involved.

4.3 FOR THE NEXT GENERATION OF HEALTH CARE PROVIDERS

Consider incorporating your own set of Green Office processes into resident training and research projects. Demonstrating environmental consciousness to the next generation of healthcare providers will lead to even greater changes than this generation can imagine [43].

4.4 ADDITIONAL GREEN OFFICE RESOURCES

CANADIAN COALITION FOR GREEN HEALTH CARE
greenhealthcare.ca

SYNERGIE SANTÉ ENVIRONNEMENT
gmr.synergiesanteenvironnement.org

GREEN GUIDE FOR HEALTHCARE
A comprehensive guide to reducing your office's environmental and health impact
wgghc.org

GREEN+LEADERS BC GREENCARE
bcgreencare.ca/program/greenleaders

CANADIAN ASSOCIATION OF PHYSICIANS FOR THE ENVIRONMENT (CAPE)
cape.ca

ENVIRONMENTAL HEALTH CLINIC
womenscollegehospital.ca/programs-and-services/environmental-health-clinic

4.5 PHYSICIAN INVOLVEMENT MAKES THE DIFFERENCE

"It began simply: Dr. Prud'Homme had an idea of recycling plastic containers used in dialysis. When I heard about it, I asked if he would be interested in trying to get the hospital to recycle more plastic. We brought this up to our Board with other physicians who thought this would be a great project to extend to the ORs, and things got rolling... There was so much waste, everybody got on board quickly for the project. It was inspiring!"

- Dr. Eric Notebaert, ER Physician

"After over 40 years of family practice, one of the aspects of my practice that I feel most proud of is that we honored our environmental values in the clinic. As a physician, I feel deeply troubled by the environmental issues we face, knowing that human health and wellbeing relies on healthy natural ecosystems. It's been important to me to contribute to the solutions, starting with minimizing the environmental impacts of my clinical practice, but also engaging with my community in addressing key environmental issues. At the end of the day, if we as physicians don't walk the talk, how can we expect others to?"

- Dr. Charles King, Family Physician

WHAT ARE ACTIONS PHYSICIAN CAN DO TO "RAMP-UP" SUSTAINABLE CHANGE IN HEALTHCARE?

1- **Drive the issue of greening your clinic home** to your staff or administration -for health reasons!

2- **Bolster the attempts of professionals, managers and directors to improve their impacts** by public or written support (in lounges or newsletters).

3- **Put your money where your mouth is**: Convince the suppliers of your healthcare products or services that you will purchase environmentally responsible services and products. Ask about them repeatedly. Divest from polluting and climate changing companies (e.g. mining, meat producing and fossil fuel corporations)---your wallet will thank you, and your children too.

4- **Contact higher level decision makers** (in your institution, community or province) to discuss your needs and concerns regarding greening your clinic. As a rule, they want to hear what physicians think is important. If your clinic needs the system to change to be sustainable, others do too.

5- **Lead by example**: Inspire younger physicians about the importance of decreasing environmental impacts across society, including healthcare. Engage other offices in your building, and share your greening initiatives with your patients. When physicians take action on environmental stewardship, they can inspire others in their community to do the same.

6- **Get informed about the important environmental issues** facing society today, and ways that physicians can make a difference. Consider supporting or joining the Canadian Coalition for Green Healthcare, the Canadian Association of Physicians for the Environment and in Quebec, Synergie Santé Environment [45]

Physicians are essential in leading and validating green healthcare endeavors. Whether through placing recycling bins in their offices, publishing seminal green healthcare documents, or negotiating with their medical board to begin a full scale environmental management system: when doctors pay attention, things happen...fast.

ACROSS CANADA, PHYSICIANS HAVE BEEN LEADING THE CHARGE FOR MORE ENVIRONMENTALLY RESPONSIBLE HEALTHCARE.

TAKE THE FOLLOWING EXAMPLES

2000 — The Canadian Association of Physicians for the Environment hold an environmental conference culminating in the foundation of the Canadian Coalition for Green Health Care.

2001 — Dr. Trevor Hancock, Public Health Specialist publishes the seminal document "Doing Less Harm: Assessing and Reducing the Environmental and Health Impact of Canada's Health Care System," describing environmental issues of Canadian Healthcare.

2002 — Dr. Susan Germain, Family Physician, publishes the first environmental footprint of a Canadian hospital.[44]

2007 — Dr. Jean Zigby founds Synergie Santé Environnement, a non-profit consultancy to assist health institutions achieve their sustainability goals in Quebec.

2008 — Then Medical Student Dr. Lisa Mu and the Ontario College of Family Physicians develop the Green Office Solutions for Physicians

2013 — The BC Lower Mainland Healthcare Organizations (LMHOs) launches the BC Greencare Community to systematically embed environmental, economic and social sustainability principles/policies across the LMHOs.

2014 — Dr. Éric Notebaert ER Physician & Nephrologist and Dr. Louis Prud'homme initiate the largest OR plastic recycling project in Quebec.

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Thank you to all individuals and organizations, committed to a healthy and sustainable environment, who work to develop, disseminate and communicate information to improve environmental practices of the health care system.

GREEN OFFICE TOOLKIT

ACME CAPE

The Canadian Coalition for Green Health Care

McMaster University
FAMILY MEDICINE
McMaster Family Practice

SYNERGIE SANTÉ ENVIRONNEMENT

WCHRI
WOMEN'S COLLEGE HOSPITAL
Health care for women | REVOLUTIONIZED
ENVIRONMENTAL HEALTH CLINIC