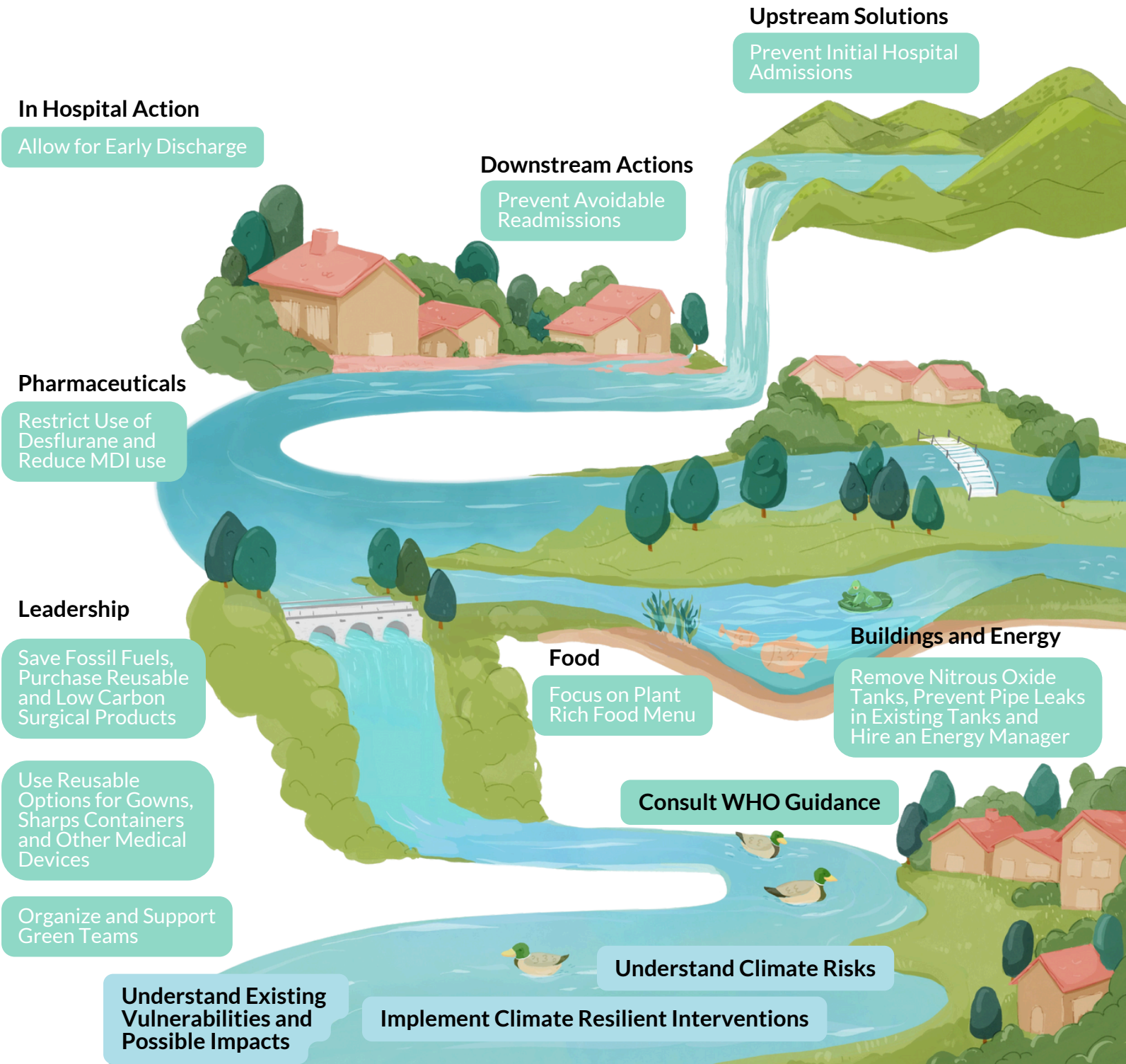


CLIMATE EMERGENCY JUMPSTART KIT: AN IMPLEMENTATION GUIDE TO STREAMLINE YOUR CLIMATE JOURNEY



INTRODUCTION

Climate change has been largely acknowledged as the greatest threat to humanity this century. Human and population health is intimately linked with the health of the planet. Despite its mission to heal, the health care sector is a significant source of greenhouse gas (GHG) emissions, contributing to environmental changes that undermine human health. This duality is forcing health care organizations to reevaluate health care delivery considering its impact on the planet.

The Climate Emergency Jumpstart Kit provides an overview of key actions, usable in conjunction with existing hospital sustainability guides or roadmaps, that health system leaders can initiate within a year to move towards a climate-resilient, carbon-zero, and environmentally sustainable health system.

The Jumpstart Kit is in three sections:

1. Hospital resource-value alignment by enabling patients to age and die in their community;
2. Top 10 Mitigation Items for Hospitals;
3. Building Climate-Resilient Health Care Facilities; and

It is important to note that a hospital is most likely to succeed in its sustainability efforts through a consistent and cohesive workplace culture centered on climate-friendly practices. This can begin with a designated leader, for example, a Chief Sustainability Officer, coordinating these efforts through a cohesive strategic plan and incorporating these steps with existing or new Green Teams. An approachable first step for the CSO and/or Green Team would be to facilitate staff education on the impacts of climate change on human health, and in turn, the health care system's role in the climate crisis and steps to mitigate this.



TABLE OF CONTENTS

Health Care and the Climate Crisis	4
Enabling Patients to Age and Die in their Communities	5
Upstream Actions.....	6
Downstream Actions	7
In-Hospital Actions	8
Top 10 Mitigation Items for Hospitals	9
Building Climate-Resilient Health Care Facilities	12
References	13
Contributors	16



HEALTH CARE AND THE CLIMATE CRISIS

WHY IS THIS IMPORTANT?

The COVID-19 pandemic has taught us that we can focus the attention of the health care system on a clear purpose when there is a looming threat, and we would do well to remember this for other global crises as well, such as climate change. Climate action is required from all sectors of the economy including health care. This effort is crucial in order to achieve the Canadian government's net-zero carbon emissions goal by 2050. In addition, building climate resilience among health care institutions and their supply chains is urgently needed as they are already being impacted by a changing climate.

HEALTH CARE CONTRIBUTES 5% OF ALL GREENHOUSE GAS (GHG) EMISSIONS IN CANADA, WHICH IS GREATER THAN THE AIRLINE INDUSTRY.

The influence that health care can have in reducing emissions, but also reducing costs, is significant. In the United Kingdom, the National Health System estimated that numerous health-related interventions to reduce emissions could lead to yearly savings of £180 million.



New accreditation standards for governing boards as well as federal, provincial and local regulations, are requiring senior leaders to consider environmental stewardship in their strategic plans. This will affect enterprise risk management plans, capital investment plans, procurement policies and practices, and budgeting. In the future, recruitment and retention of new professionals will depend on their alignment with organizational priorities and commitments to shared values of social and environmental justice.



HEALTH CARE MUST CARE ABOUT PEOPLE AND THE PLANET WE INHABIT.

1. ENABLING PATIENTS TO AGE AND DIE IN THEIR COMMUNITIES

15%

As of 2023, only 15% of Canadians accessed palliative care services in their last year of life, even though most Canadian deaths occur in hospital settings. A comfort care approach allows the patient to spend more time at home, decreases the demand on system resources, and is planet-friendly. Addressing the current practice of resource-intensive, low-value care is paramount for a sustainable health system.



Canadian hospital admissions in the last year of life emit anywhere from 130,000 to 260,000 tonnes of GHGs annually. Time spent in hospital experiencing aggressive medical care at the end of life causes unnecessary generation of GHG emissions of little or no value to patients.

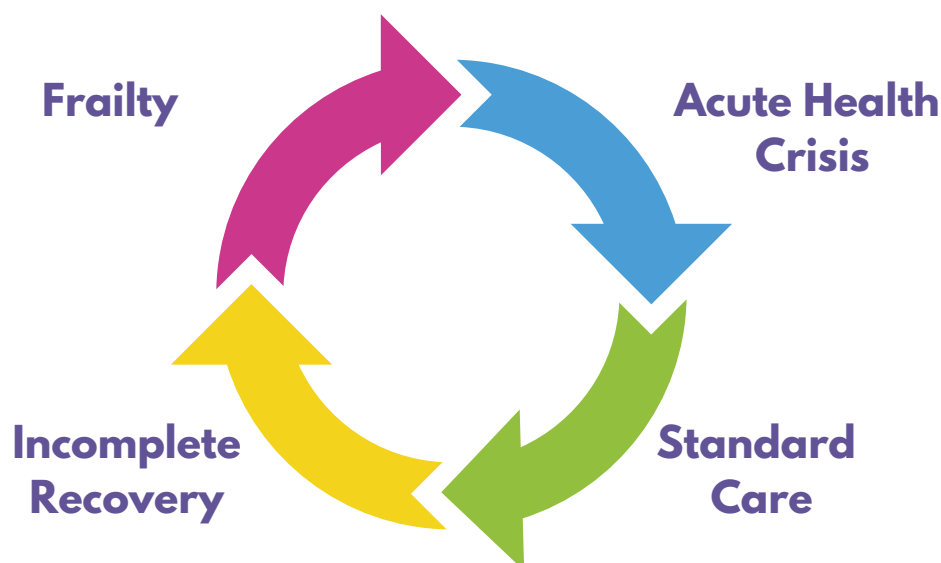


To empower patients to age in place and die at home, health care leaders and providers must recognize the fundamental driver of hospitalization in Canada: end stage frailty. Frailty is a progressive and eventually terminal condition resulting from the accumulation of health deficits over time.

THE FRAILTY CYCLE

The frailty cycle depicted below illustrates how frail patients, when faced with an acute health crisis, are vulnerable to incomplete recovery despite applying the standard of care, making them increasingly frail in the aftermath.

Acute care systems practice a problem-based approach to intervention which triggers this cycle, crippling many frail patients from ever getting back to their communities. Care models that apply a person-based/big-picture approach to care decisions stand to shift away from the perpetuity of medicalizing frailty. This is achieved through preventing hospital admissions, supporting earlier discharge for frail patients, and taking steps prior to discharge to prevent readmission. These strategies improve the patient experience while simultaneously improving resource efficiency, aligning interventions with value, and reducing GHG emissions.



UPSTREAM ACTIONS: PREVENTING INITIAL HOSPITAL ADMISSIONS



Primary Care Solutions: Understanding and engaging with Compassionate Communities.

Compassionate Communities normalize end-of-life experiences in the community and improve quality of life for people with a life-limiting illness. By encouraging community advocacy and practical support, they help with the physical, mental, social, and spiritual needs of those affected by death and bereavement. Primary care providers can share information on Compassionate Communities through waiting room brochures or social media to support community deaths.



Primary Care Solutions: Home visits to support frailty and end-of-life care.

Models that bring care to patients' homes improve access and move clinical decision-making upstream. In 2016, the Nurse Debbie program in British Columbia supported 469 frail patients at home, avoided 500 Emergency visits, and saved over \$3M. Home visitation from primary care providers is directly linked with a reduction in the need for emergency care and hospitalization and improves the odds of a community death.



Long-Term Care (LTC) Solutions: Informed care-planning for LTC residents.

Utilizing processes for discussing goals of care grounded in identifying frailty and predicting functional and cognitive outcomes of hospitalization stands to reduce hospital transfer. During the first wave of COVID-19, a team of Nova Scotia doctors with frailty expertise held virtual goals of care conversations with LTC residents. Post-consultation, acceptance of ICU care decreased from 80% to 12%, and over 60% of patients chose to avoid hospital transfer altogether.



LTC Solutions: Empowering just-in-time patient decisions regarding hospital transfer.

Allowing LTC residents to have the final say in their care can avoid harmful and undesired interventions. The Prevention of Error-based Transfers (PoET) project in southwestern Ontario found that by refocusing on the Health Care Consent Act and minimizing consent-related errors leading to unwanted hospital transfers, palliative care encounters aligned with LTC residents' stated wishes increased by 147%.



Paramedicine Solutions: Community check-ins on elderly patients.

Community Paramedicine programs send paramedics to hold routine drop-in sessions at social housing buildings at no cost to residents, and assess participants' vital signs and risk of social isolation, then share these records with a primary care physician. In 2016, Alberta Health Services was able to treat 88% of palliative patients in the home and saved \$1,100 per patient by treating them at home.

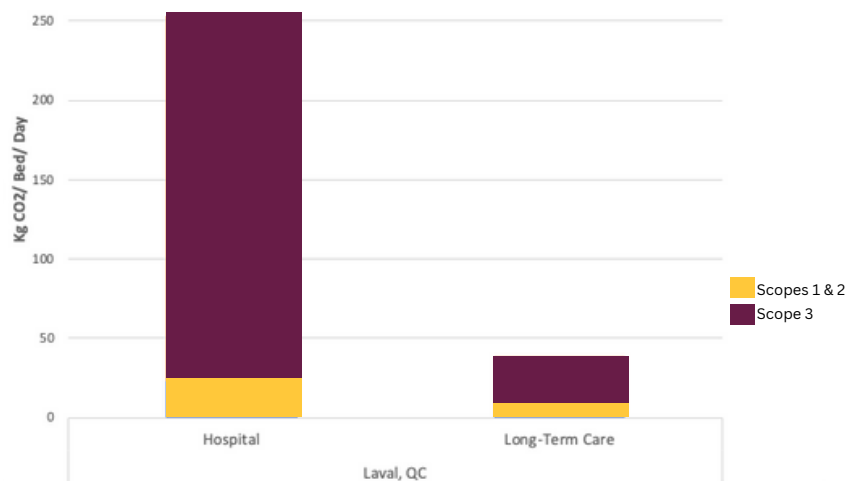


Figure 1. **Carbon Footprint of Different Health Care Facility Types.** One hospital bed day is estimated to be 23 kg CO₂e, while one long-term care bed day is only 3.5 kg CO₂e, and a home care bed day is less than half that at 1.3kg CO₂e. Data from Sergeant et al., 2024.

IN-HOSPITAL ACTIONS: ALLOWING FOR EARLIER DISCHARGES

1

LEVERAGING DECISION-SUPPORT TOOLS FOR EARLY PALLIATIVE CARE.

Applications like the Hospital One-Year Mortality ratio can be used to notify hospital teams which patients are at risk of dying within 12 months as soon as they arrive. Sharing information about the big picture with patients prior to undergoing intensive therapies often leads to demedicalizing the care experience, patients choosing care plans that promote comfort and match prognosis, and thus facilitating earlier discharge from acute care.

2

SYNERGY OF HUMAN RESOURCES AND TECHNOLOGY TO COORDINATE DISCHARGES.

Ontario hospitals that have employed discharge coordinators on their teams have a lower average length of stay compared to hospitals that have not. Electronic tools that provide a standardized information bank for discharge coordination also reduce the time required to coordinate discharges. Hospital investments in discharge coordination reduce the length of stay from a few hours to days depending on the level and complexity of the intervention.

3

ADDRESSING “THE USUAL SUSPECTS” THAT HOLD UP DISCHARGE.

Hospitals can promote high-quality, low-carbon care that supports a reduced length of stay by implementing the following:



Physiotherapy for early ambulation starting on the first day of admission. Patients who walk 600 steps between day 1 and 2 may be discharged 2 days earlier.



Protocols to remove bed-tethers like foley catheters within 2 days of insertion. Catheters left in for more than 2 days are associated with higher infection risk, mortality, and less discharge to home.



Avoid routine bloodwork. Routine phlebotomy is linked with iatrogenic anemia and can lead to patients remaining in hospital longer. Educating learners about the harms of routine bloodwork can reduce length of stay by 1 day.



Order sets supporting early transition to oral therapies. Changing from intravenous to oral medications (especially antibiotics) as soon as possible impacts the nursing workload, the patient experience, and the length of stay.

POST-OPERATIVE VIRTUAL HOMECARE.



An example of this is the surgical transitions program at Hamilton Health Sciences' Juravinski Hospital and Cancer Centre, which provides patients on discharge with a kit of equipment to capture vital signs and weight, so patients are able to recover at home while the hospital care team can monitor them virtually. Further, these programs can catch complications early, reducing the likelihood of hospital readmission.



PHONING FAMILY DOCTOR AT DISCHARGE.

Keeping the patient's primary care provider informed of the patient's health status at discharge allows the provider to follow-up in a timely manner. This includes post admission assessment and the coordination of tests and consults. Follow-up reduces the likelihood of readmission.

DOWNSTREAM ACTIONS: PREVENTING AVOIDABLE READMISSIONS

Training paramedics to conduct regular check-ins on frail and elderly members of the community, or those who have been recently discharged from hospital, can decrease hospital visits overall. Miller et al., in St. Paul, Minnesota piloted paramedics to follow-up on patients admitted with heart failure, COPD, and heart attacks and reduced total hospital admissions by 40%. Fitzsimons et al. studied sites in Eastern Ontario using a similar program found that sites employing community paramedicine had decreased emergency room and hospital visits.

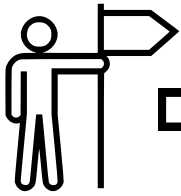
Identifying patients who may benefit from a goals of care conversation at discharge using tools like the Hospital Frailty Risk Score can aid patients at high risk for adverse events (including death) upon hospital readmission to the ICU. A goals of care conversation, palliative consultation, or another form of advanced care planning can open the door to less intensive and more comfortable care for these patients in the future.

COMMUNITY PARAMEDICINE FOR FOLLOW-UPS.



DISCUSSING GOALS OF CARE AT THE TIME OF DISCHARGE.

2. TOP 10 MITIGATION ITEMS FOR HOSPITALS



LEADERSHIP

- Transition investments away from fossil fuels.** By reassessing existing investment portfolios and moving funds to low-carbon investments instead, hospitals can save over 2,000 tonnes of GHG emissions and set themselves apart as leaders who include environmental sustainability on their foundation board agenda. As illustrated in the graphic below, in the average U.S. health care system, 28% of GHG emissions are from investments, highlighting the immense potential positive impact simply through redirecting investments. Canadian Universities have begun the shift, it is time for hospitals to follow suit.

Every top 10 mitigation item on this list is estimated to save hospitals at least 100 tonnes of GHG emissions per year for a model 200-bed hospital. These items also have low barriers to entry, and several of these items are either cost-saving or low-cost solutions.

Hospital leaders, whether this takes the form of Green Teams, a Chief Sustainability Officer, or other staff dedicated to sustainability can review these items and select the ones best suited for their facility. Backing by hospital leadership improves success rates once mitigation items are chosen.

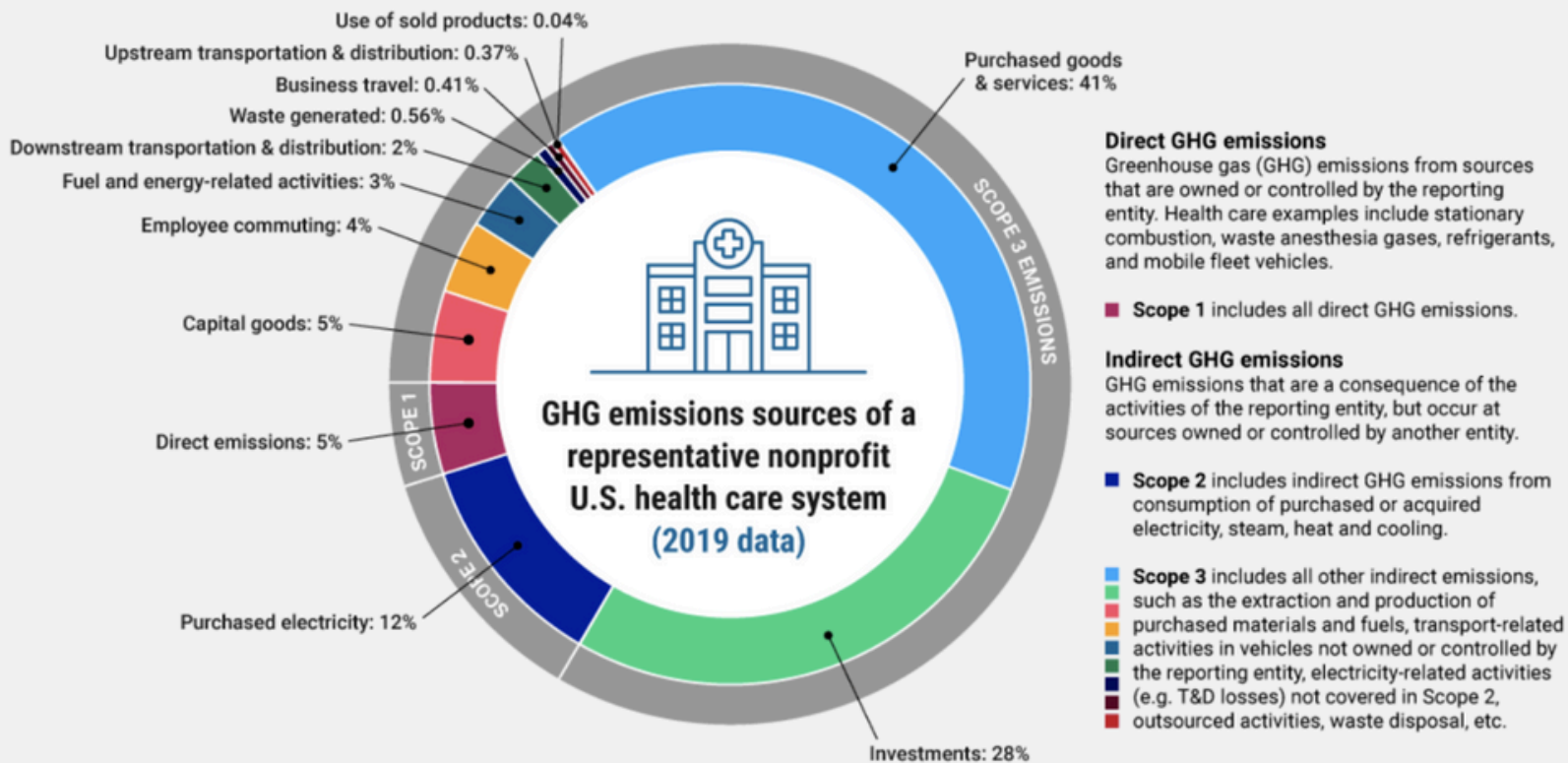
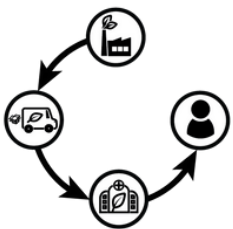


Image source: [Practice GreenHealth](#). Data source: ENGIE Impact Analysis



PROCUREMENT AND SUPPLY CHAIN

- Write a letter to suppliers.** Write a letter to your suppliers expressing an interest in purchasing products that are more sustainably made, reusable, or low-carbon options, and participating in a circular economy where possible. For example, CHEO and CCGHC developed a draft letter in 2016 for suppliers that can be used as a template. The letter should be followed shortly after by adding sustainability to RFP language.

The supply chain represents the majority of a hospital's overall GHG emissions; by encouraging vendors to produce more sustainable products, we can help transform the industry.



- Adopt an OR “pick list” policy for surgical procedures.**
 By using surgeon preference cards to more efficiently manage supplies for procedures, less equipment can be ordered, saving over 300 tonnes of GHG emissions per year and an annual cost savings of \$900,000 .
- Use reusable options where available, such as reusable gowns and other textiles, sharps containers, and medical devices.**
 Simply switching to reusable gowns and sharps containers alone can save over 100 tonnes GHG emissions per year at a 200-bed hospital.

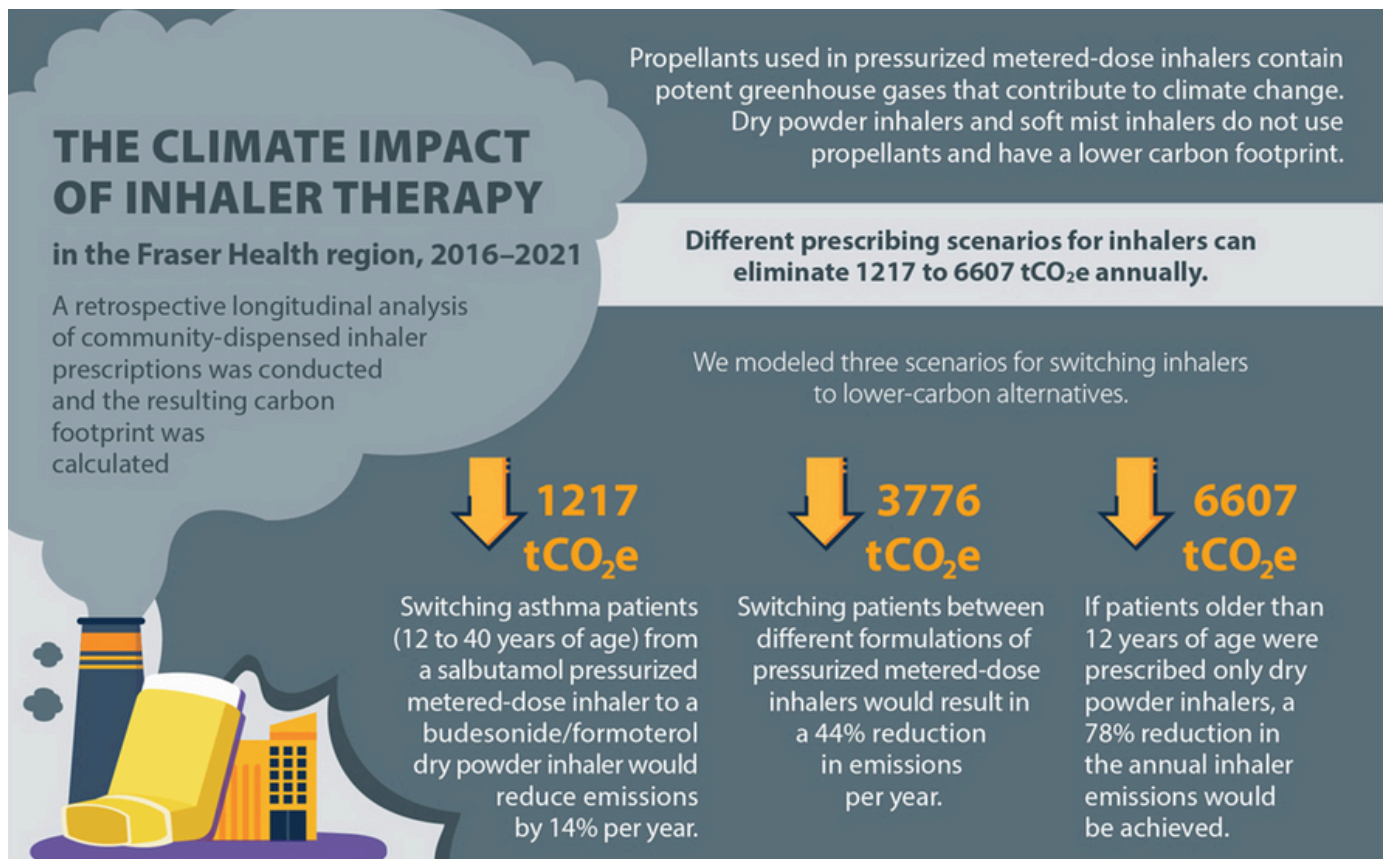


PHARMACEUTICALS

- Deprescribe and optimize medications, especially in cases of polypharmacy.**
 Not only does this limit the risk of further complications for patients, but with a 5% reduction in medications, a 200-bed hospital can save over \$600,000 per year and reduce GHG emissions by over 200 tonnes. The Canadian Coalition for Green Health Care offers guidelines on sustainable prescribing.

Also, by switching from Metered Dose Inhalers (MDIs) to Dry Powder Inhalers (DPIs), an additional 7 tonnes of emissions per year can be saved in a 200-bed hospital. A 2016-2021 retrospective longitudinal study in the Fraser Health region found that prescribing different formulations of pressurized MDIs could reduce emissions by 44% per year.

- Ban or restrict the use of desflurane.**
 By switching desflurane for lower-emission anesthetics, hospitals can save \$18,000 within the first year and reduce their GHG emissions by 318 tonnes.





BUILDINGS AND ENERGY

- Remove central nitrous oxide tanks and replace with portable tanks. Sunnybrook** Central nitrous tanks have been found to leak up to 99% from their piping, based on preliminary studies at Sunnybrook Health Sciences Centre in Ontario. Assuming a 1.89L/min leak rate is prevented, 366 tonnes of GHGs and \$6,150 can be saved per year. For future construction, avoid installing central pipe systems and use portable e-cylinder tanks instead for use at point-of-care, keeping them closed between cases.
- Hire an Energy Manager for the optimization of buildings and emissions.** An Energy Manager has been projected to save hospitals 136 tonnes of GHG emissions per year through recognizing where upfront investment will lead to long-term savings. Addressing OR ventilation setbacks can save \$75,000 per year, whereas LED light retrofitting and replacing oil boilers and gas have one-time costs of \$73,000 and \$1 million, respectively; however, these items have some of the highest emissions savings at 500 tonnes for OR ventilation setbacks and LED lights retrofitting, and over 1,000 tonnes saved from replacing oil boilers and gas.



FOOD

- Shift patient menus to more plant-rich options.** This can be achieved by beginning with the least popular meat-based menu items and replacing them with plant-based alternatives. A 20% reduction in meat-based options can save 170 tonnes of GHG emissions annually. An entirely plant-based patient menu can save a hospital \$35,000 annually, as the average plant-based menu item costs about \$0.82 CAD less than a meat-based item. In addition, plant-rich diets are associated with better health outcomes for patients through reducing the risk of cancer and cardio-vascular disease.



TRANSPORTATION

- Transition to virtual care appointments when possible.** In 2023, virtual appointments at Hamilton Health Sciences reduced approximately 2,747 tonnes of GHG emissions. At a 200-bed hospital, this would be equivalent to approximately 422 tonnes of GHG emissions saved per year. For those with long-term health conditions in the UK, the NHS estimated that £5.1 million or \$9 million can be saved through virtual care services, as well as reducing emissions and improving QALYs.

3. BUILDING CLIMATE-RESILIENT HEALTH CARE FACILITIES

Climate-resilient health care facilities (HCFs) are those that can anticipate, respond to, cope with, recover from, and adapt to climate-related shocks and stress, to bring ongoing and sustained health care to their target populations, despite an unstable climate.

a. To understand what climate-related weather events are expected to impact your HCF, consult with your local public health officials and municipality to access any reports on climate-related weather events already created for your area.



LOOKING FOR CLIMATE DATA?

The federal government website [ClimateData.ca](https://climate.data.ca) enables Canadians to:

- Access, visualize and analyze climate data
- Provides related information & tools to support adaptation planning and decision-making.

b. To identify possible climate-resilient interventions to undertake at your HCF, consult the WHO guidance for climate-resilient and environmentally sustainable health care facilities, which focuses on opportunities to enhance HCF climate resilience while also taking steps towards their environmental sustainability. Below are the topic-specific intervention tables for climate resilience:



Health Workforce Interventions



Energy Interventions



Water, Sanitation, and Healthcare Waste Interventions



Infrastructure, Technology, and Products Interventions

Where possible, prioritize nature-based solutions to preserve, protect, and sustainably use ecosystems with simultaneous climate mitigation and adaptation benefits to human health and society.

c. To understand the climate risks that HCFs may face, specifically in terms of existing vulnerabilities, possible impacts, and appropriate actions, consult the WHO document Checklists to Assess Vulnerabilities in Health Care Facilities in the Context of Climate Change. Separate checklists are provided for a range of climate hazards: floods; storms; sea-level rise; droughts; heat waves; wildfires; and cold waves. Each checklist focuses on the following areas to assess vulnerability in HCFs:



Identifying climate hazards of concern.



Assessing current vulnerability for each of the hazards, in each of the key components of HCFs.



Understanding potential impacts posed by climate variability and change in each of the key components of HCFs.

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This is a living document which will be revised as this field evolves. We welcome your comments and suggestions.

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