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FEDERATION
OF NURSES
UNIONS



Nursing Toolkit for Planetary Health

2023

My goal Make my workplace green!

I'm doing this for _____

About CANE

The Canadian Association of Nurses for the Environment (CANE-ACIIE) is a member of the Canadian Nurses Association (CNA) Network of Nursing Specialties and represents Canadian nurses and nursing students dedicated to the improvement of planetary health. CANE-ACIIE members are engaged in a wide variety of nursing practices, from direct care in both acute and community/public health, to education, research and/or administration. CANE-ACIIE has been increasingly recognised for its expertise in environmental and climate health in the years since its original foundation in 2008-2009.



About CFNU

The Canadian Federation of Nurses Unions is Canada’s largest organization representing Canada’s frontline nurses in every sector of health care – from home care, long-term care, community and acute care, including nursing students – and advocating on key health priorities and federal engagement in the future of public health care.



CANADIAN FEDERATION
OF NURSES UNIONS
LA FÉDÉRATION CANADIENNE
DES SYNDICATS D’INFIRMIÈRES
ET INFIRMIERS

A collection of regional nursing union logos is displayed within a light beige, rounded rectangular frame. The logos are arranged in three rows. The first row includes CNSA AETC (with a circular emblem of a nurse), Nova Scotia Nurses Union (with a stylized hand icon), UNA (United Nurses of Alberta, with a stylized 'U' icon), and NBNJ SUNB (New Brunswick Nurses Union, with a map of New Brunswick and the French name 'Syndicat des infirmières et infirmiers du Nouveau-Brunswick'). The second row includes Registered Nurses' Union (Newfoundland & Labrador, with a stylized star icon), ONA (Ontario Nurses' Association, with a stylized 'O' icon), and Manitoba nurses Union (with the tagline 'A COMMITMENT TO CARING'). The third row includes sun (SASKATCHEWAN UNION OF NURSES), pei nurses (Prince Edward Island), and BC NURSES' UNION (with the tagline 'Standing up for health care' and a stylized 'B' icon).

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From coast to coast to coast, we acknowledge the ancestral and unceded territory of all the Inuit, Métis and First Nations Peoples that call this land home. The Canadian Federation of Nurses Unions is located on the traditional unceded territory of the Algonquin Anishnaabeg People. As settlers and visitors, we feel it's important to acknowledge the importance of these lands, which we each call home. We do this to reaffirm our commitment and responsibility to improve relationships between nations, to work towards healing the wounds of colonialism and to improve our own understanding of local Indigenous peoples and their cultures.

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Nursing Toolkit for Planetary Health



CFNU and CANE

In 2021, Canada was one of 60 countries to sign on to the COP26 Health Programme, committing to build a climate-resilient and low-carbon health system. Nurses armed with knowledge, skills, and networks can support planetary health and lead efforts to achieve sustainability in the provision of health care. This toolkit will guide frontline nurses to take action and influence health care decision-makers to promote sustainability on all levels of health care delivery.

The goal of this toolkit is to provide nurses with the resources required to be leaders in health care sustainability within three spheres: individual, unit and facility. The toolkit will help nurses influence sustainable changes for individual nurses carrying out daily tasks, for units within a facility, and for health care facility decision-makers. The toolkit also provides a list of available resources from various expert sources. Most importantly, through CANE's involvement, this toolkit can facilitate connections among nurses and facilities working toward the same goals.

The Canadian Federation of Nurses Unions (CFNU) is partnering with the Canadian Association of Nurses for the Environment (CANE) to support nurses working to tackle climate change.

CANE represents Canadian nurses dedicated to improving planetary health amongst nurses and people in Canada. "Planetary health" is a recent term that arises from Indigenous knowledges and understandings of human interconnectedness to nature, other species and the Earth.¹⁻³ It describes the idea that to support and sustain human health and well-being, we need to promote and maintain the health and well-being of the Earth, including its living and non-living systems.

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Message from Linda Silas



There has never been a more urgent time to sustain the health and well-being of our planet. The COVID-19 pandemic showed us the repercussions for our health when we fail to account for the large-scale effects our species is having on the natural world. Nurses and our fellow health workers bore the brunt of the crisis that ensued.

I am proud to deliver this toolkit on sustainability for our health care system with our comrades in the Canadian Association of Nurses for the Environment (CANE). The CFNU and CANE are united in our shared understanding that tackling climate change and the health of our planet must be integrated into our work as nurses. We understand clearly that the health of our patients, clients and families is intrinsically linked to the health and well-being of our planet.

Shortly after the CFNU released our discussion paper on climate change and health in May 2019, the COVID-19 pandemic hit, and it forced nurses' unions to devote virtually all of our resources toward protecting our members through occupational health and safety precautions and advocating for rigorous public health measures to protect all people in Canada. Nurses' unions are also dealing with devastating worker shortages that have crippled our health care system. For many in this country there was another crisis affecting our health and stretching the limits of our health care system that could not go ignored: climate change and, as a result of it, the extreme weather events increasing in frequency and severity.

For residents of western Canada, the summer of 2021 was an utterly devastating time. The western heat dome, which was responsible for 619 heat-related deaths, is considered the deadliest weather event in Canada to date. Temperatures reached new records across the region, with Lytton, B.C. measuring the highest temperature on record – 49.6°C. The town burned the following day in a wildfire. And in my home province of New Brunswick, Hurricane Fiona set another record as the costliest and most intense tropical or post-tropical cyclone to ever hit our country.

Nurses have an indispensable role to play in addressing the impacts of climate change and being leading advocates for sustainability in our workplaces. This toolkit is designed to equip nurses with the information and resources to become influential changemakers for a more sustainable, resilient and low-carbon health care system.

I am grateful for the leadership displayed by CANE and for the wonderful contributions they made in creating this toolkit for the benefit of all nurses in Canada. The CFNU looks forward to working with fellow nurses and health workers on shepherding in a new era of sustainability in our health care systems. Thank you for being a part of it.

In solidarity always,

Linda Silas, CFNU President



Message from Jacqueline (Jack) Avanthay Strus



As the current CANE president, I am delighted that we were able to collaborate and partner with the CFNU in the creation of this toolkit, which we hope will help to guide nurses in integrating action on climate change and sustainability in all realms of practice in the promotion of human and planetary health and well-being. As nurses, we need to continue to be at the forefront of the integration of planetary health. We need to move past the biomedical model of health that permeates the health system today and continue to explicitly talk about planetary health. This involves not only integrating ecologically informed nursing practice but weaving it into nursing research and theory. By moving past the anthropocentric view of health, we can lift the nursing profession up beyond the tasks and stereotypes, and move towards transformative life-affirming nursing practices.

Jacqueline (Jack) Avanthay Strus, CANE President

A handwritten signature in black ink, consisting of a large, stylized 'J' followed by a flourish.

I passionately believe that as stewards of the land, we must acknowledge how all our actions – of the past, now and in the future – impact the health of the planet, to make the world a better place so that all of humanity and species will flourish.

Dr. Barbara Astle, RN, PhD, FCAN
(personal communication)

Introduction: Climate change and nursing practice

What do you think of when you hear the term “climate change”? A few years ago, the most likely image that came into your mind would have been that of a polar bear on a shrinking ice floe. However, today that image has changed to one that is more personal, perhaps of images in the news of homes and communities devastated by floods, wildfires or severe storms, and families who have lost family members, homes and belongings.

More and more people are concerned about the effects of climate change on their own lives. Numerous polls have found that people worldwide are increasingly worried about climate change and want government and decision-making bodies to take real action to reduce harm from climate change now and in the future.^{5,6} Other research has found that Canadians want more education about climate change.⁷ Young Canadians, in particular, are experiencing negative perceptions about their future, with climate emotions that negatively affect their daily lives.⁸

In 2019, the CFNU published an important discussion paper outlining the significant health implications of climate change. This work recognised the enormous potential of nurses to help patients and communities in preparing for and adapting to the effects of the growing climate crisis, and to become advocates for creating a sustainable and healthy future for the planet.⁹ Since the publication of this document, we have seen more and more evidence of the consequences of climate change, both in Canada and around the world. These exceptional and frightening events are predicted to become increasingly common in future years if warming continues.¹⁰ In other regions of the world, typhoons, hurricanes, droughts, and other natural disasters – the frequency and severity of which are augmented by climate change – are causing immense suffering and claiming many lives.^{11,12}

A June 2021 heat dome in British Columbia brought overwhelmingly high temperatures in many parts of the province for several days resulting in the deaths of over 600 people. A new heat record of 49.6 degrees was set in Lytton, British Columbia, followed by out-of-control wildfires destroying the town of Lytton and causing devastating damage

for the Lytton First Nation community. These exceptional and frightening events are predicted to become increasingly common in future years if warming continues.¹ The heat wave highlighted inequities associated with climate events and the need for adequate preparation and planning. For example, more people died under the BC heat dome in poorer neighbourhoods. More than half of those who died lived alone; many were living with chronic physical or mental health conditions, or had ineffective or non-existent cooling systems.

On a positive note, there is a window of opportunity to reduce the negative health impacts associated with climate change since actions to reduce greenhouse gas emissions and prepare for climate change bring direct health benefits for Canadians. But we must act fast. The [UNFCCC](#) (UN Framework Convention on Climate Change) defines climate change as change caused directly or indirectly by human activity, which adds on to the already existing natural climate variation.¹³ Unfortunately, despite the ample evidence demonstrating the dire outlook for the global population in the absence of bold and ambitious action, governments' actions are lagging.

This toolkit focuses on how nurses can contribute to climate action at the:

- **Individual level** by practicing environmentally friendly habits
- **Unit level** by addressing day-to-day nursing practice
- **Institutional level** by raising awareness and advocating for policy changes



Furthermore, this toolkit can be used as a guide to prepare and organise meetings with senior leadership within the institution. Suggestions and compelling arguments for the benefits of implementing ecologically friendly changes are included. The objective is to promote sustainable economic, policy and social transitions so that future generations can inherit a healthier and safer planet Earth.

Health and climate change

Climate change has been found to significantly influence human health outcomes and negatively impact those with poorer socioeconomic status and those in developing nations disproportionately.^{14,15}

To learn more about the relationship between climate change and health, please see the section on “Health and climate change” of this toolkit.

The health of people around the world is at the mercy of a persistent fossil fuel addiction.¹²

The Lancet Climate Countdown report, 2022

People worldwide are increasingly feeling the impact of climate change on their health and well-being, and these compounding crises amplify those harms.

Do you know someone whose health has been affected by climate change?

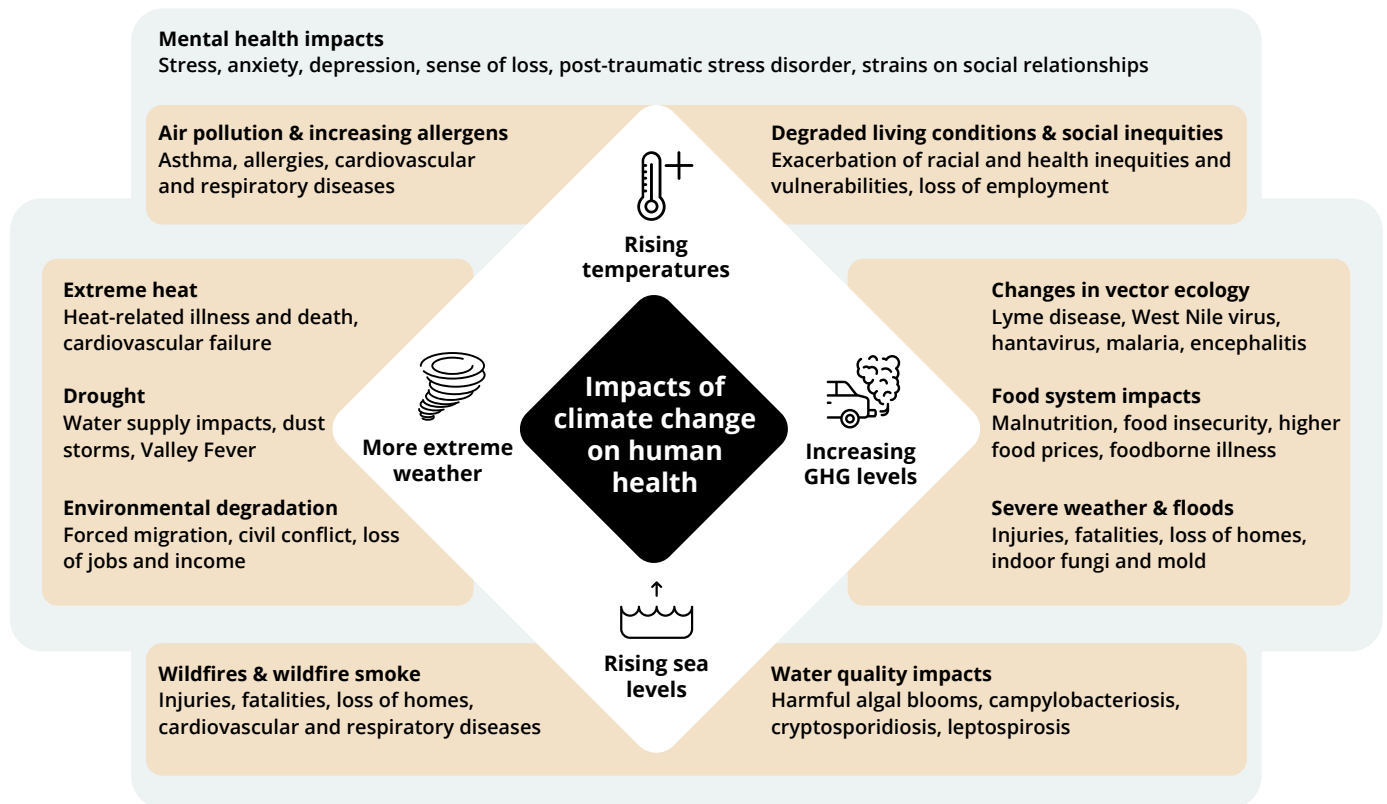


Image source: Adapted from *Impacts of Climate Change on Human Health* (CDC, J. Patz).

<https://www.cdph.ca.gov/Programs/OHE/pages/CCHEP.aspx>

Nursing and climate change

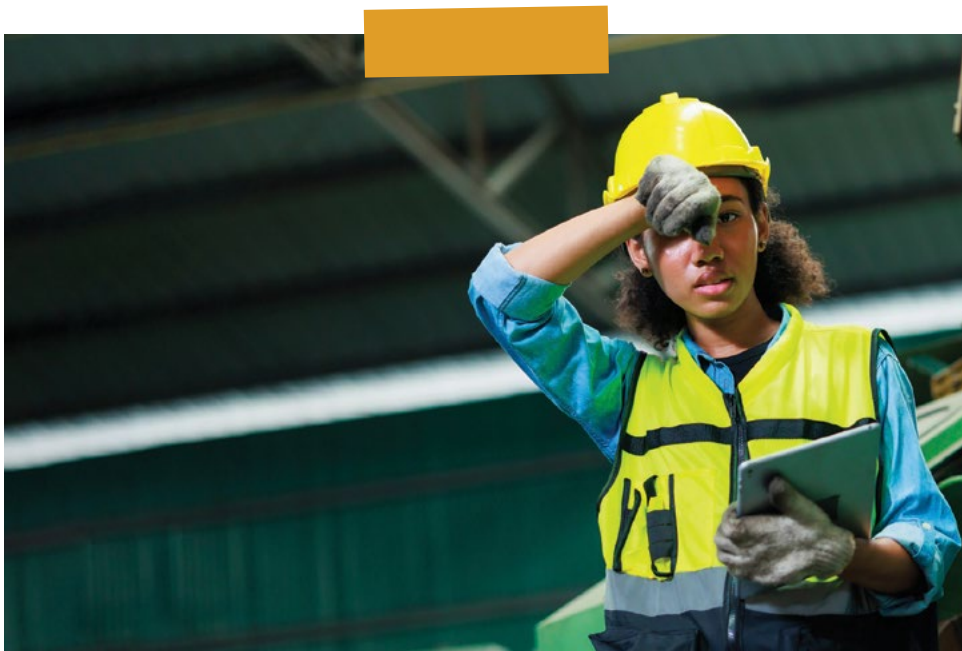
Nurses should care about climate change because it is both the biggest challenge and public health opportunity of our times.¹⁶⁻¹⁸ It is also important to know that taking action on climate change brings multiple health benefits.¹⁹

As the 2019 CFNU discussion paper so aptly describes, *"... nurses are one of the most trusted professions, able to assist communities to reduce greenhouse gases and transition to a climate-friendly future in the name of improving our shared health."*⁹

It's time for nurses to act by Martin and Vold

Health care systems aim to promote and preserve population health and respond to added pressures placed on them by climate change, such as patient admissions due to extreme weather-related illnesses and injuries. However, the health care sector is a significant contributor to greenhouse gas (GHG) emissions and pollution globally. In Canada, the health care sector contributed approximately 4.6% of the country's total GHG emissions, which is the third highest per-capita greenhouse gas emissions from health care in the world.²⁰ Nurses should be aware of the contributions of the health care sector to the climate crisis through resource consumption, carbon emissions, waste, and air and water contamination.²¹⁻²³ This underscores the urgent need to decrease the sector's carbon footprint.

Historically, nursing and nursing theory have limited views of the environment to local and individual levels without sufficiently exploring the impact of the global physical environment on patient health.^{24,25} For example, a nurse might understand that extreme heat can exacerbate respiratory conditions, for which a patient may take an MDI puffer. Still, they might not explore the contribution of MDI puffer use to air pollution or more frequent extreme heat events nor suggest an alternative, less carbon-intensive, medication delivery system. Nurses' perceptions of climate change and health are varied: some nurses do not think climate change is a global health concern, others believe that it is outside of their role as a nurse, and still others understand the issue but feel powerless or unsupported to take professional action.²⁶⁻²⁸ However, there is increasing awareness among nurses and nursing organisations about the urgency to reduce the global environment's impact on the health of local populations.



Nurses are ideally equipped to engage in climate action! We are the largest group of health care professionals, highly respected,^{29,30} and able to work with individuals, families, and communities to find solutions to complex health problems.²⁵ We have a strong history of advocating for social justice and policies that support population health. Nurses are highly skilled professionals who find creative and practical solutions to problems daily. We possess expertise in communicating complex information to different audiences and are connected to the human dimensions of illness and health. Nurses mobilise entire teams around a patient to ensure excellent patient care, from environmental services, allied health, facilities, food services, supply management and physicians, through to almost every department of the hospital.³¹ Nurses are the experts that know the ins and outs of the health care system, and understand the importance of humanised and individualised patient care. We are at the heart of health care and have the skills to bring everyone together to take climate action!

What are the impacts of climate change in Canada?

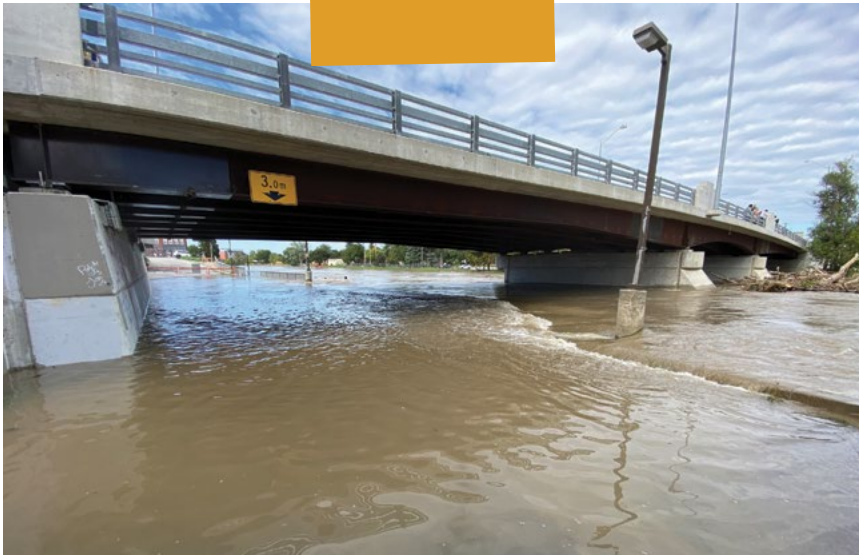
Canada's changing climate is causing profound and long-lasting impacts on our society, economy and environment. Higher temperatures, shifting rainfall patterns, extreme weather events and rising sea levels are just some of the changes already affecting many aspects of our lives. Changes in climate are expected to intensify over the coming decades.¹⁰³

Canada is warming at about double the global rate. And northern regions are warming three times as fast.³³ This warming is occurring across Canada as well as in the oceans around us, with the most significant warming occurring in the north, the Prairies and northern British Columbia.

The average annual temperature in northern Canada has risen by 2.3°C since 1948, especially in winter when we see permafrost and sea ice melting.

Reduced ice cover and permafrost degradation will affect infrastructures and Indigenous ways of life in Northern communities, with major impacts on social, cultural and economic well-being.

In other parts of the country, changing animal and insect distributions, changes in precipitation, increased temperatures, rising sea levels and coastal erosion will have significant impacts on transport, water and food supplies, buildings, energy, communications and other sectors of Canadian society.^{32,33}



Flooded roads under a bridge in Ontario



Has climate change ever affected where you live?

Background: What do nurses need to know?

Climate science basics in a nutshell: what exactly is climate change?

The difference between weather and climate

It is important to understand that the words 'weather' and 'climate' do not have the same meaning. We love to talk about the weather and how it changes from one day to another. 'Weather' is what we see outside from one day to the next, one season to another, or even from one moment to another. These are changes that we notice easily.

On the other hand, 'climate' is defined as the average weather conditions over time, ranging from a few months to thousands or millions of years. This has usually been predictable over time.^{34,35} We have a pretty good idea of what to expect from month to month and year to year in regions of the world. People living in tropical areas of the world have learned to adapt to hot and humid conditions over time, the same way that others living in much colder climates in other parts of the world, such as the Arctic, have learned to live with long periods of intense cold, snow and ice. For more information, you can explore the [National Geographic](#) educational site.

'Climate change' means significant change in climate over several years; these changes are more subtle and less noticeable than weather changes at any given time. 'Climate change' is defined as a change in the state of the climate directly or indirectly linked to human activity, but the main cause is a result of human activity.^{13,26}

The Earth's climate has undergone major changes in its 4.5-billion-year-old lifetime. For example, there have been cooler and warmer periods, such as the Cretaceous period, 144 to 65 million years ago, when dinosaurs still roamed the Earth. This was long before humans existed. The Earth was about 5-10°C warmer, sea levels were 50-100 metres higher, and carbon dioxide (CO₂) levels were about five times higher than now.³⁷⁻³⁹

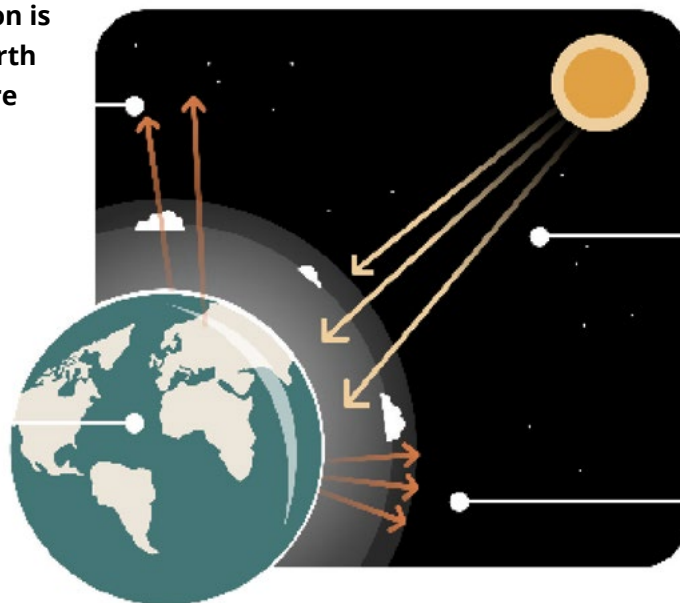
About 20,000 years ago, when the last ice age reached its peak, Canada was almost entirely covered by glaciers and ice sheets up to thousands of metres thick. It is not easy to imagine what this was like! The average temperature of the Earth at that time was only 4°C lower than it is now.^{40,41} The last ice age ended around 11,700 years ago, followed by a long period of temperate and stable climatic conditions very suitable for humans, allowing them to thrive and spread across many regions of the world.⁴²

In more recent history, there was a 500-year-long cold period known as the '[little ice age](#)' in Europe and North America during the 14th to the 19th century. Art lovers are familiar with paintings of ice skaters on canals in 16th century's Holland and England during this time. Average global temperatures during this period were about 1 to 1.5 °C cooler than today.^{43,44} Changes such as these, of greater and smaller magnitude, occurred over time because of various correlated factors such as the slant of the Earth on its axis, variations in the pathway it follows orbiting the sun, changes in the amount of energy the Earth receives from the sun, changes in the configuration of continents and oceans, and also because of volcanic eruptions.^{41,42}

- The Earth's atmosphere is composed of different gases, some of which are greenhouse gases. Water vapour (H₂O), carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄) and ozone (O₃) represent this type of gas. These gases vary in their capacity to retain and radiate heat, with methane and nitrous oxide being much more powerful. However, because there is so much more CO₂ in the atmosphere, this is the one that scientists focus on in regard to global warming.⁴⁵

Some solar radiation is reflected by the Earth and the atmosphere

About half the solar radiation is absorbed by the Earth's surface, which warms it



Solar radiation powers the climate system

Infrared radiation is emitted from the Earth's surface

Image source: Adapted from *British Geological Survey, 2022*.
<https://www.bgs.ac.uk/discovering-geology/climate-change/how-does-the-greenhouse-effect-work/>

- Greenhouse gases are essential to life on Earth and surround the Earth a bit like a blanket, with the ability to trap heat from the Sun and warm the planet.
- The natural greenhouse effect allows the Earth to maintain a stable temperature of about 15°C, by reflecting some of the Sun's rays, mostly from snow and ice, and absorbing enough to warm the ground and air.³⁴⁻³⁶
- Without this, our Earth's average temperature would be closer to -18°C.^{45,46}
- The temperature at the Earth's surface has been gradually increasing since the end of the 19th century. This is particularly true in the Polar Regions, causing us to lose some of that albedo, or reflective effect, from snow and ice.
- Over the past 200 years or so, since the Industrial Revolution, increases in the burning of fossil fuels like coal, oil or gas for energy, transport, industry, agriculture, forestry, land use and consumer goods have raised greenhouse gases to new heights and thickened that blanket, increasing the concentration of CO₂ in the atmosphere and causing temperatures to rise. This phenomenon is known as global warming.^{12,42}
- As of 2021, average global temperatures were found to be approximately 1.1°C higher than average temperatures in the pre-industrial period, commonly identified as between 1850-1900^{14,15}, and current climate projections estimate that there will be a rise in global temperature [of 2.7°C to 3.1°C or more](#) by the end of the century.^{12,47}
- For many people a 1°C or 2°C temperature increase might seem insignificant, but nurses know that what might seem like small shifts in temperature in the body can have important systemic effects. This is the same with the Earth.
- A 2018 special report from the IPCC made it clear how important it is to keep global warming under 1.5°C to avoid catastrophic challenges to life on Earth with escalating impacts to humans, animals and the Earth system.⁴⁸
- In addition to temperature changes, concentrations of greenhouse gases, ocean warming and pH, glacial mass, the amount of sea ice and the average global sea level are other signs that indicate climate change is happening.⁴⁷ Temperature data recorded since 1880 show that this warming trend continues to break records over different years. The year 2020, for instance, tied with 2016 for the warmest year on record.⁴⁹ The ocean has also been warming rapidly over the past 20 years, with 2021 attaining record heat levels.⁴⁷
- The main cause of this warming is the increase in human-caused greenhouse gases, mainly carbon dioxide (CO₂).
- The higher the concentration of CO₂, the higher the Earth's temperature increases.
- Aside from temperature changes, the concentration of greenhouse gases, ocean warming and pH, the average sea level, amount of glaciers and sea ice are also

important indicators of climate change.⁴⁷ One of the reasons that it has been hard for people to understand the importance of climate change is that it has been occurring in ways that are not always visible to us. But concern has grown as we have begun to see these effects in much more obvious and less subtle ways: the extreme heat waves, floods, unpredictable weather patterns and extreme weather events such as torrential rainstorms, windstorms, or unusual and unexpected seasonal changes.

- The big concern is the speed with which the change is occurring. This means that significant increases in greenhouse gases from human activity are causing a rise in global temperature, which is accelerating and leading to increasing impacts on both human health and well-being, and that of wildlife and ecosystems around the world.

Climate change and health

There is no doubt that climate change is part of our new reality. This urgent global health issue will affect the health and development of every person throughout their lives. Although this may feel overwhelming to all of us at times, it is crucial to recognise that nurses have an enormous potential to positively impact health through individual and



organisational climate action. Nurses are used to caring for patients with life-changing diagnoses, supporting patients and families in finding ways to cope with their health condition, helping them find inner resources, organising priorities of care and planning for the future. The diagnosis of climate change is also a daunting challenge to absorb. Still, it is clear that taking action for patients, families, communities and/or the larger society brings enormous benefits for physical and mental health, as well as helping to diminish inequities and engender [a sense of hope](#).

This section aims to provide information on the health impacts of climate change since it is important to understand how best to take action to reduce risks and promote health for all.

Acting now is critical and will save lives and money. A better world is possible, but we must come together without delay.⁵⁰

David Suzuki

- Climate change, pollution and the collapse of [biodiversity](#) have been identified as the greatest global health threats of the 21st century.^{51,52}
- These are closely linked in their causes and consequences on human and ecosystem health.
- Climate change is already impacting health and health systems in Canada, and impacts will worsen.
- The Canadian health care system is also responsible for 4.6% of the country's total greenhouse gas emissions and >200,000 tonnes of other pollutants with significant impacts on human and eco-system health.⁹⁸
- Climate change affects the social and environmental determinants of health which are clean air, clean water, adequate food and secure shelter, the fabric upon which we depend for living and thriving.
- It is also increasing the vulnerability of people globally to other ongoing threats to health.
- There is a need to prepare for and adapt to the ongoing impacts of climate change for individuals, families, communities and health care systems.
- Climate change is increasing the frequency and severity of existing health risks related to extreme heat, wildfires, storms, floods, air pollution, inadequate water quality and availability, the provision of safe and affordable food, and new types of infectious and chronic diseases.^{12,53}

- This adds to already high levels of stress and mounting costs for people, facilities and programs working to maintain and improve health. The COVID-19 pandemic highlighted the need for resilient health care systems and supply chains, and the disruptions in the availability of vital supplies that directly impact patient care.
- The availability and accessibility of health care services can also be significantly impacted by climate events, such as floods, wildfires and extreme weather, depriving the most vulnerable populations of essential health care services.
- Climate impacts on health can be short- or longer-term, even extending to multi-generational effects, particularly relating to cultural losses.^{53,54}
- Climate change is also profoundly affecting cultural identities through the loss of cherished places, practices, and traditional foods.
- Canadians are exposed to direct effects, such as heat and extreme weather, and indirect effects, such as infectious diseases, including vector-borne or water-borne illnesses,⁵³ food and water contamination, loss of income, and other socio-economic effects resulting from climate events.
- Northern Indigenous communities are at high risk from melting permafrost and sea ice, loss of traditional hunting grounds and food sources, and disruption of social and family connections. These exacerbate pre-existing health and socio-economic inequalities associated with a history of discrimination, colonialism and racism.⁵⁵
- Floods in Quebec and the Maritimes, forest fires across Canada, droughts in the Prairies and melting permafrost and sea ice all have significant effects on Canadians in terms of their physical and mental health, their livelihoods, their sense of belonging, and their ability to plan their lives now and in the future.



Populations at higher risk

- Climate change affects people, communities and countries differently: the 2021 *Lancet* report, the recent 2022 IPCC report and the 2022 Health Canada report clearly show growing social, economic and health inequalities related to climate change.
- It is also expected to increase poverty and migration of populations both within the country and across borders.
- Although everyone is and will be affected by climate change, some populations bear a greater burden than others, and these are the ones who have contributed least to causing climate change.
- There is a wide range of social, economic, historical and political factors influencing people's exposure and vulnerability to environmental risks, and some populations or communities are disproportionately affected by climate events.
- These include racialized communities, Indigenous communities, isolated northern communities, small island states, and poorer countries and communities.
- Gender inequalities add another dimension to this risk. Women are disproportionately affected by the impacts of climate change worldwide. This is not intrinsic to women, but is rooted in gender divisions in land, labour, decision-making power and other aspects of life.
- People at high risk also include people with chronic diseases; older people, for example, who often live with multiple health problems and take medications that increase their risk; people with reduced mobility; people with mental health problems or disabilities; pregnant or breastfeeding people; marginalised communities; people experiencing homelessness and people living in inadequate or overcrowded housing.
- At high risk are also children, born or not yet born, whose lives and health will be affected by climate change throughout their lives.
- We must work towards both mitigation and adaptation to prevent the worsening of climate impacts and to protect health and health care systems.
- Successful adaptation can only be made with a framework of inclusiveness, equity and climate justice, in meeting the needs of racialized, minoritised, marginalised and low-income communities.^{53,56}
- Extreme heat events can have multiple impacts on health, particularly of certain groups of people, which include pregnant people, the very elderly and the very young; extreme heat events are becoming increasingly common in Canada.

Climate change possible consequences

1. Air pollution

- a. Air pollution is mainly due to burning fossil fuels, but forest fires, which are becoming more intense and frequent due to climate change, add to the problem.
- b. It is one of the most significant environmental risks to health in Canada and globally.
- c. It causes millions of premature deaths each year and the loss of millions more healthy years of life.⁵⁷
- d. A study from July 2022 in BC found that exposure to air pollution in Canada is leading to nearly 8,000 deaths annually, and that there is no safe level of air pollution.⁵⁸
- e. Even low concentrations of fine particles released into the air from wildfires, wood-burning stoves and vehicles' fossil fuel emissions have been found to increase the risk of death in people already suffering from cardiovascular and heart disease, diabetes, pneumonia or respiratory diseases such as COPD.
- f. In the elderly, air pollutants are also associated with Alzheimer's and Parkinson's disease, and the link between exposure to polluted air and increased miscarriage, premature birth and low birth weight is well established.

2. Food insecurity

- a. Food insecurity occurs when people do not have secure access to sufficient quantities of safe and nutritious food.
- b. Food insecurity and undernutrition were key risks highlighted in the *Lancet* Climate Countdown, IPCC and Health Canada reports of 2022.
- c. Food insecurity is a very serious problem for many people in Canada, with disproportionate effects on those living in poverty and those living with negative impacts of structural inequities such as discrimination and colonialism, including Indigenous communities, racialized groups, people living with disabilities, children, single parents, social assistance recipients and low-income people.⁹⁶
- d. 5.8 million Canadians lived in food-insecure households in 2021, with numbers rising in 2022.¹⁰⁰
- e. Food insecurity jeopardises mental and physical health and well-being and often brings increased health care costs.^{96,97}
- f. It can also lead to nutritional deficiencies that contribute to other illnesses and affect the educational achievement of children and young people.

- g. Over 800 million people are undernourished globally, and climate change is increasing food insecurity for populations through rising temperatures, changing precipitation patterns and more frequent extreme weather events.
- h. Globally, food systems contribute to 30% of greenhouse gases and about 70% of freshwater use ([EAT-Lancet forum](#)). These contributions come from industrialised meat and livestock farms, which continue to grow.
- i. In addition, about a third of [food produced globally](#) is lost or wasted, making it critical to move towards climate goals and reduce stress on the environment.⁵⁹
- j. Rising temperatures, ground-level ozone and excess CO₂ are also affecting the quality of food in terms of protein, zinc and other nutrients, as well as changes in the oceans, marine life and fish stocks.
- k. This has disproportionate effects on those who are already poor and undernourished.
- l. The dietary and health co-benefits of adopting a plant-based diet and reducing meat consumption are consistent with the current [Canada's Food Guide](#), as well as contribute to reducing greenhouse gas emissions and ecological impacts, improved overall health and reduced health care costs.⁶⁰

3. Water insecurity

- a. Water quality, food scarcity and climate change are directly linked. Water-borne diseases are associated with heavy rains, drought and extreme weather events such as floods.
- b. With floods comes possible chemical contamination, e.g., heavy metals, persistent organic pollutants (pesticides, solvents, pharmaceuticals and industrial chemicals) in the water supply, linked to flooding of fields, industry and homes.
- c. Climate change brings an increased risk of droughts around the world, including in certain regions of Canada, with impacts on the availability and quality of water for consumption, hygiene, leisure and irrigation.

4. Infectious disease

- a. Climate is an important factor that can influence the transmission and occurrence of diseases globally and in Canada.
- b. Increasing temperatures and humidity facilitate the proliferation and spread of infectious diseases, such as Lyme disease.⁵³
- c. The term “climate sensitivity” is used to describe diseases that may arise increasingly in Canada and elsewhere in the world because of even small changes in climate. There is a wide range of illnesses considered to be climate-sensitive, including those caused by mosquitoes, ticks or other

arthropods such as West Nile virus and Lyme disease, to zoonoses such as rabies and hantavirus, resulting from direct transmission from animals, as well as seasonal influenza and enteroviral infections from person-to-person contact, and those contracted through inhalation of environmental contaminants (e.g., bacteria or fungi) such as Legionnaires' disease or cryptococcus.⁵³

- d. If humans persist in a path of environmental disruption through practices such as industrialised agriculture and deforestation, we will likely continue to see the emergence of new viral pathogens and pandemics, such as the COVID-19 pandemic that is still causing significant harms.⁶¹
- e. With increasing temperatures, precipitation and other climate-induced changes, risks of Lyme disease and West Nile virus, already present in Canada, are expected to increase, and so are the risks of diseases transmitted by other types of ticks or mosquitoes.
- f. In Canada the risk is compounded by the fact that the population is older, with an already heavy presence of chronic diseases.
- g. Some people such as those with more outdoor exposures, or pregnant people, are more vulnerable.

See the CASN [Nursing and Climate Driven Vector-Borne Disease](#) modules for more information on vector-borne disease and climate change.

5. Allergies

- a. With global warming comes an increase in the seasonal duration and amount of pollen for many allergenic plant species.^{53, 62}
- b. Warm seasons prolong pollen production and numbers and increase the potency of airborne pollens, which increases allergic rhinitis caused by these pollens.
- c. Northern cities (which are warming faster than the global average) face increasingly high allergy risks.
- d. In many provinces, such as Quebec, we will see lengthening of the pollen season, territorial expansion of allergenic species, and increased concentrations of pollen or fungal spores.⁶³

6. Extreme weather events

- a. Extreme heat events, severe storms, floods, wildfires, coastal erosion and droughts are examples of natural hazards the frequency and intensity of which are influenced by climate change. These hazards can cause loss of life and various health problems, including mental health and stress-related illnesses.
- b. These events can result in damage to infrastructure and disruption of

health services.

- c. Severe weather events can often result in injury or even death, as well as damaging property and causing major disruptions to people's lives, financial well-being and social security.

7. Mental health issues

- a. We know that climate change poses serious risks to mental health and well-being.
- b. Mental health impacts from climate change are growing with climate-related disasters and can lead to anxiety and depression.
- c. Disruptions to well-being can put people at higher risk of other negative psychological outcomes, including post-traumatic stress disorder (PTSD) and substance use disorders.
- d. Young people, in particular, are feeling a sense of loss as they see a future that is potentially less prosperous, less peaceful and less healthy.
- e. The literature shows us that mental health consequences can include PTSD, anxiety, depression, ecological grief and survivor's guilt, fatigue and suicidal ideation resulting from extreme weather events such as heatwaves, floods, hurricanes and forest fires.
- f. It can also bring weakened social ties, increased stress levels, substance abuse, aggression and violence related to resource scarcity.
- g. In addition, there is worry, anxiety and a sense of impending doom associated with climate change awareness and fear for the future.
- h. On the other hand, individuals and communities with access to physical and psychological support may experience post-traumatic growth and develop more resilience and reduced mental health impacts after an adverse event.
- i. Thus, in the face of a catastrophe, such as seen with the COVID-19 pandemic, people may experience feelings of optimism and altruism, and find compassion, generosity and a sense of meaning that support the resilience of the wider community.⁶⁴
- j. In addition, when people take action to respond to climate change, such as participating in climate protests, volunteering with an environmental organisation or taking part in cleanup projects, it can benefit their mental health and foster a sense of hope.
- k. Some Indigenous communities use cultural approaches to mental health care, for example, nature healing which brings people onto the land to create, make, cook, share stories and connect with the land and culture.⁶⁵

Resources

- Video [How to Talk to Your Kids About Climate Change Anxiety](#) by American Psychiatric Association.
- Video [Eco anxiety: Supporting young people to navigate the climate crisis](#) by YouthLink Scotland
- [Climate Atlas of Canada: Taking Action on Our Climate Emotions](#)

Nursing action: In your own practice

Climate change and the nurses' role in clinical practice

As individuals, you might already be taking [climate action in your personal life](#), which is a powerful foundation for change which fosters hope for the future. This toolkit will help you translate climate action from your personal life into your professional practice.

Nurses' potential for climate action can be found throughout the patient care cycle, from admission through initial and ongoing assessments, planning, interventions, patient education, discharge, teaching and planning, and continuing to ongoing care. People are already seeking care for concerns linked to climate change and other environmental health factors, and nurses need to know how to recognise these and respond effectively.

Nurses can lead in assessing risk factors and vulnerabilities, helping people to realise the deep connections between their health and their physical environment, and understanding how their physical and mental health can improve from climate action. In clinical practice, nurses should include climate change impacts in every aspect of patient care and collaborate with and inform colleagues and students about risks, vulnerabilities and interventions related to climate change. These must consider patient context: their family, cultural and gender identity, and the reality of their lives and concerns. In clinical responses, linking regional risk factors or events to patient care throughout the whole care cycle needs to become a normal part of care.

It is also important to recognise that Canada's health care systems continue to be impacted by climate change, and the provision of health care during climate events is a high priority. Following Hurricane Maria in 2017, supplies of vital equipment and medications were disrupted, leaving patients and health care providers without important treatments.

Clinical nursing actions involve:

- Assessment for climate-related health vulnerabilities or risks
- Education about the links between climate and health

- Assisting patients to prepare for climate events considering their health condition and/or circumstances
- Assisting patients to recognise opportunities to reduce their own contribution to the climate crisis
- Informing patients about resources in their region, including alerts, air quality index, emergency preparation, emergency shelters, etc.
- Providing information on medications, equipment, living conditions, etc. specific to patients in relation to their discharge

The magnitude of our jewel of a planet's health crisis is enormous. But the timeliness, impact and scale of the solutions that nurses and midwives will muster could evince the very best of our professional – and human – potential.⁶⁶

Anne E. Kurth, PhD, CNM, MPF, FAAN
Dean and Linda Koch Lorimer Professor, Yale University School of Nursing

Climate change and patient care

Background

Understanding the links between health and climate can offer some guidelines about where we might begin to act. Some questions that can help you to understand your specific context are:

- Who are the people around us, our patients, our communities and our clients?
- What is their situation: what risks or vulnerabilities exist where they live and work?
- Are they at higher risk because of their age or developmental stage?
 - Very young or very old
 - Have mobility challenges
 - Have a physical or mental health condition

- Are dependent on a caregiver
 - Are pregnant or breastfeeding
 - Depend on regular medications or treatments
- Who are the people we work with? How can we tap into their strengths and capacities in supporting patients/clients in addressing risks related to climate change?
 - What groups, organisations or leaders do we work with, and how can we collaborate with them to build on our combined knowledge and action potential?
 - What other people, departments, groups or organisations exist around us that we can contact to build coalitions that can benefit from our understanding and expertise?

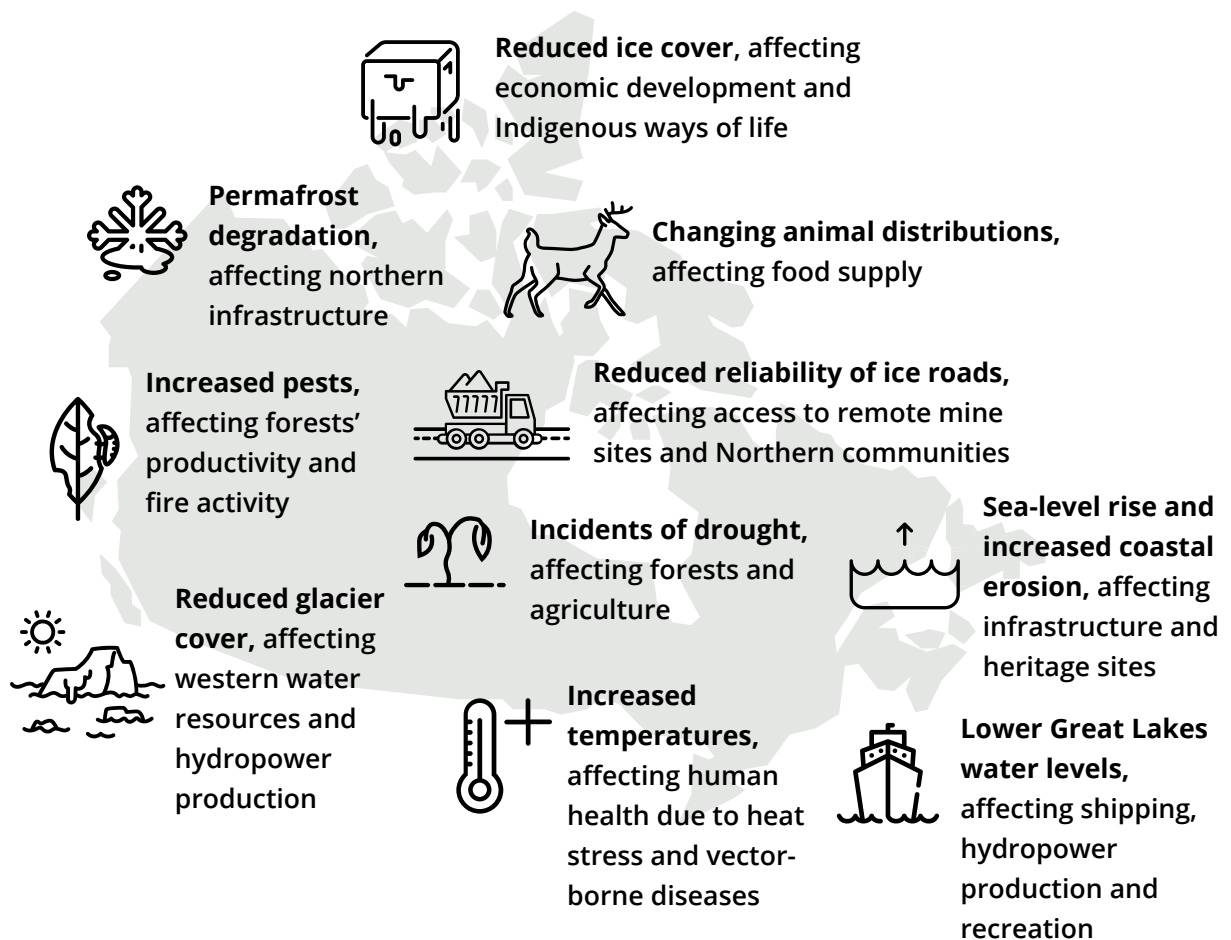


Image source: Adapted from Warren, F. and Lulham, N., editors (2021). *Canada in a Changing Climate: National Issues Report*; Government of Canada, Ottawa, ON. www.ChangingClimate.ca/National-Issues. See [Climate Atlas of Canada](#) for regional risks.

- What are the [changing conditions where we live](#), and how are these changing over time in ways that affect human and ecosystem health and well-being?
- What patterns of behaviour are common to us, our community and our institution, that contribute to the climate burden? For example, in thinking about transport, energy use, dietary practices, purchasing practices and care of our greenspaces and landscapes.
- Are there ways that we can start to address these and reduce that burden on an individual, collective and institutional level?
- What are the 'low-hanging fruits' with which we can start the process?
- What can we do in our [personal lives](#) to make changes that reduce our own contribution to climate change and our risk from climate events?

A CLIMATE framework is a helpful tool to begin integrating a climate action approach into nursing care in an emergency room setting.⁶⁷

A CLIMATE mnemonic includes the following domains:

A – Act immediately to stabilise life- and limb-threatening conditions

C – Consider the climate and health etiology of symptoms

L – Learn from a climate health history

I – Implement a climate-and-health-focused assessment

M – Manage the ongoing care of the climate-related emergency

A – Act to integrate an action plan that includes physiological and psychological climate symptoms

T – Treat urgent climate symptoms and consequences

E – Evaluate, educate and refer for long-term follow-up

Climate action and the nursing process

Climate action can be integrated into each step of the nursing process, from initial assessment throughout the cycle of care to discharge and follow-up care. The considerations discussed below are not comprehensive but are meant as a starting point to help you begin including these components in your nursing practice. Climate action will be centred on the specific patient/family and their situation, coherent with patient-centred nursing care.

Assessment

Health history

1. Risks and vulnerabilities

Consider factors that may place patients in a high-risk community or group related to age, developmental stage, pregnancy, reduced mobility, chronic illness, systemic barriers and inequalities, occupation or other circumstances.

- Elderly or very young
- Pregnant or breastfeeding
- Women
- Non-binary, 2SLGTBQIA+



- Indigenous and/or remote northern populations
- Racialized, minoritized or marginalized persons
- People lacking fluency in one of the official languages
- Outdoor workers, migrant or temporary workers
- People with disabilities and/or mobility issues
- Immunosuppressed or undergoing cancer treatment
- People with reading difficulties
- People with communication difficulties
- Low-income individuals or families

2. Consider the patient's living circumstances

- Do they live in their own home, residence, low-income housing, shelter? Are they experiencing homelessness or living in a temporary shelter?
- Where is their home located?
 - In a rural or urban area
 - Within a flood zone, coastal area
 - Area with a high-traffic volume
 - Area near green space or parks
 - Area at risk of extreme weather events such as cyclones
 - Area at risk of reduced precipitation or drought



- Area at risk of precipitation events
 - Area at risk of increased vector-borne diseases
 - Heat island or area with few green spaces
 - Northern regions which are subject to melting permafrost and loss of sea ice
- Do they live alone or with multiple other people?
 - Are they reliant on a caregiver for activities of daily living (ADLs)?
 - Are they responsible for other household members for their ADLs?
 - Are they able to be in contact with family, neighbours or friends in case of need?
 - Do they have easy access to information or alerts for weather or other climate-related events?
 - What is the quality of the air they are exposed to? Are there industrial or traffic fumes? Is there dust from agriculture or construction? Is there haze or smoke from wildfires in other areas that have drifted into their area?
 - Do they have a [Hepa filter](#) for air entering the home in case of wildfire smoke or other harmful emissions?
 - Do they have access to information about [air quality](#) in order to plan activities?
 - Is there a risk of mould in the house secondary to dampness from inadequate air circulation, post-flood conditions, etc.? See the Health Canada [guide](#) outlining health risks, prevention and removal of mould.
 - Do they have access to air conditioning or adequate ventilation, clean air and cool spaces, clean water and adequate food?
 - Do they have reliable access to electricity, or is there a risk of power outages that can affect their access to needed medical devices, pumps or oxygen?
 - What is their financial situation? Does this affect their ability to reduce risk, pay for electricity, transport, health care or personal care services, medical devices, mobility equipment, etc.?
 - Do they use [natural gas](#) for home heating or cooking?
 - Do they have adequate ventilation?
 - Do they have appropriate oven hood fans for cooking or open windows to vent the gas outside? Note that the use of gas for cooking can raise levels of nitrogen dioxide to levels that increase the risk of asthma.
 - Is it possible to switch to electric/convection stove cooking instead?

- What is their occupation, and does it put them at higher risk for heat stroke or kidney disease, such as construction or agricultural workers?
- Do their leisure activities put them at risk for heat stroke or other climate-related health issues (e.g., outdoor sports in areas with polluted air, staying in enclosed areas with inadequate ventilation or areas with a known risk for Lyme disease or other vector-borne diseases)?

3. General health state

- Are they dependent on medical devices such as oxygen or mobility devices?
- Do they have or require special dietary routines or devices?
- Do they have other health conditions or treatment regimens? If so, do these conditions make them more vulnerable to the effects of climate change, such as heat or vector-borne disease?
- Do they need regular treatments that depend on medical/nursing services?

4. Symptom assessment

- Does the person have a pre-existing physical or mental health condition?
- Use an understanding of the various physical and mental health consequences of climate change to consider symptoms or reasons for seeking care in the context of climate change.



Smog clouds over city of Toronto

- Are symptoms linked to acute or longer-term climate change issues, from more overt to more subtle implications on health?
 - Could their respiratory, cardiovascular or other physical or mental health symptoms be related to or exacerbated by climate events or conditions such as floods, wildfire smoke, air pollution, or stress following a climate-related event?
 - Have they recently experienced a climate event directly or indirectly, such as those noted above?
- When a child presents with repeated asthma exacerbations, assess:
 - Where does the child live and attend school or daycare?
 - Are these in high-traffic areas?
 - Are these in urban heat islands?
 - Are there accessible green spaces or parks nearby?
 - Are they exposed to seasonal pollens from weeds or grass?
- Does your patient's headache or asthma attack or other symptoms in fact result from climate-related events or issues?
- In terms of infectious disease, knowing how patterns of vector-borne disease are changing can guide your thinking in assessment of symptoms and risks.

5. Medication

- What about the medications they take and what possible climate-related risks are associated with these medications?
- Are their symptoms related to changes in the effectiveness of their medications altered by excess heat or cold when storage of medications is a challenge?
- Are there concerns about obtaining essential medications?

6. Climate awareness and preparedness

- Assess understanding of how climate change affects their health and how to take steps to reduce future health impacts.
- Provide information and education to increase this understanding.
- Assess their access to green spaces, parks, gardens and nature, and their understanding of the physical and mental health benefits associated with time in nature.

- Assess the type of leisure activities they enjoy and how these can affect adaptation or resilience to climate impacts on health.
- Assess access to air conditioning, safe cool shelters, or clean air shelters in case of emergency.
- Assess capacity to obtain food and other necessities during heatwaves or in poor weather.
- Assess issues concerning food storage related to heat or other climate events.
- Assess knowledge of whom to contact in case of an emergency climate event.
- Assess access to health services or medications in anticipation of power outages.

Interventions

Thinking about climate change as a context for care also impacts interventions, with a lens of deepening awareness. Understanding that symptoms and health conditions can be related to climate helps redirect your thinking about treatments, prevention and reducing readmissions.

Nursing practice

What about your practice habits and the climate impact on your care? Are there changes you can make to reduce waste, have more reusables, use less disposables and be conscious of reducing unnecessary waste? Health care supplies contribute to climate change throughout their life cycle from natural resource extraction, manufacturing, transportation – to the end of their life cycle. Solid waste contributes to GHG emissions through methane produced by anaerobic decay, nitrous oxide from waste combustion and waste transportation.

What part of your practice could you change to reduce climate impact?

- Can you reduce those extra dressing supplies, medication cups or cups for water?
- Can you obtain reusable gowns for care of patients in isolation instead of disposable ones?^{68,69}
- Do you use gloves appropriately and wisely? Are there care activities when it is sufficient to wash your hands instead of wearing gloves?⁷⁰
- It is important to be mindful of occupational health and safety protocols. So let's avoid waste whenever possible while recognizing that worker safety always comes first.
- Are there possibilities to limit use of disposables, not just in treatments but also in food services, medication administration, bedding and all the multiple items used for patient care?
- In the [operating room](#), you can advocate for changes, including switching from inhaled anaesthetics to intravenous, regional or neuraxial anaesthesia when clinically safe and appropriate, teach colleagues about the importance of avoiding the use of desflurane and nitrous oxide (N₂O) when using inhaled anaesthetics, and minimising fresh gas flow rates, including during inductions.⁷¹
 - St. Mary's Hospital in Quebec has eliminated desflurane use and reduced fresh gas flow rates, which reduced GHG emissions by 88% (991,550 to 21,970 kg CO₂eq) and a 60% cost reduction.
 - [Greening the Operating Room checklist from Practice Greenhealth](#) provides many ideas for reducing the carbon and environmental impact in the operating room, including replacing blue wrap with [reusable steel cases](#) for instruments.



Patient care

- What is needed to help understanding vulnerabilities or risks in your patients and their family, and what can be done to reduce those risks?
- What education can you provide that will help the patients to protect themselves from climate-related health impacts?
 - Provide information and education to increase understanding of links between their health condition and climate change.
 - Teach about the air quality index and other ways to reduce exposure to poor air quality indoors and outdoors.
- Medications management
 - Are there adjustments needed in relation to climate risks such as extreme heat?
 - Teach patients about medication storage, how temperature might affect efficacy of medications, increased risk for dehydration, or masking of symptoms.
 - Are the patient and their family and caregivers aware of these? Do they know whom to turn to for medication adjustments?
 - Are your patients with asthma [using their devices correctly](#)?
 - Are they using puffers (MDI), which contain powerful greenhouse gases as propellants? Is it appropriate to discuss switching to more sustainable inhalers, such as dry powder inhalers, which have a much lower carbon footprint and are equally effective in controlling asthma?



Woman using a dry powder inhaler

- If continuing with MDI, teach patients to return their MDI and other expired medications to the pharmacy for correct disposal.
- Patients often have a significant role in influencing physicians and other health care providers (HCP) in changing practice. This is an opportunity for them to check with their HCP to see if they are eligible for dry powder inhalers.
- Teach patients how to correctly dispose of asthma medication devices. They are often disposed of with medication and gases still in the inhaler, which continue to produce GHG emissions.
- Collaborating with pharmacies
 - Recovering or recycling medication containers and devices
 - Medication reconciliation
 - Ensuring patients are not taking unnecessary medications
 - Ensuring patients have adequate understanding of how, why and when to use their medications and devices
 - Proper disposal of pharmaceuticals (current and expired)
 - Create a climate resilience plan to ensure adequate supplies during climate events

Education

Teach patients about the links between their health and climate.

- Teach patients about the benefits of active transport vs. driving (walking, bus, subway and cycling as appropriate).
- Teach them how symptoms can be related to air quality, heat, mould, dust, fumes, pollen.
- Inform them about ways to monitor air quality, pollen and mould.
- Teach them how to recognise symptoms of extreme heat exposure: dizziness, nausea, confusion, muscle cramps.
- Share with your patients and their families some helpful infographics – e.g., [Health Care and Climate Change](#) by Health Care Without Harm, and [Health and wellbeing impacts of climate change](#) by WHO and Public Health Wales.

Encourage patients to prepare for climate events at home.

- Instruct them to set up an emergency preparation kit with necessary medications and supplies.

- Teach about medications and the [precautions related to heat and medications](#).
- In areas at risk of flooding, are they aware of associated risks related to contaminated water or water-borne infectious disease?
- In areas of risk for insect-borne disease such as West Nile virus, are they aware of [preventative measures](#)?
 - Getting rid of areas of standing water where mosquitoes breed
 - Wearing protective clothing, i.e., long sleeves and pants, hats, shoes and socks; appropriate use of insect repellents (DEET or Icaridin) and keeping screens on doors and windows intact
- In areas with increased risk of stinging or biting insects, is there awareness of [prevention methods when outside](#)? Long sleeves, long pants, socks, wear light coloured fabrics for clothing, avoid flowered or dark fabrics, avoid walking barefoot; avoid fragrances, use approved insect repellent; keep food in sealed containers; avoid swatting or running from insects.
- Teach about health co-benefits that come from adaptive strategies such as using alternative transportation options, including walking, public transport use and biking, adopting dietary changes, and medication adjustments.



Evaluation

- Is there any new information that we need to incorporate into our patient care or teaching?
- Have our teaching strategies been effective?
- What other teaching do we need to provide?
- Has the patient's condition changed?
- Do we need to make any adjustments to our plan of care relating to these changes?
- Has the patient/family demonstrated an understanding of the links between their health and climate change?
- Are they able to discuss changes they have begun or plan to make regarding their health in the context of climate risks?
- Are there barriers to their implementation of recommended actions?

Discharge and continuity of care

When we send patients home, are we considering climate change risks or events that are both ongoing and acute, and community-specific? It is important to be aware of regional climate risks, to keep up to date and to take these into consideration.

Patient discharge considerations

- Have we informed the patient about risks related to their health condition, living conditions, regional climate risks, stage of life and medications?
- Have we informed them about how to prevent heat-related illness?
 - Address dehydration and thirst.
 - Guide to activities during extreme heat, i.e. do errands and go outside earlier in the day or evening when the weather is cooler, avoid outdoor activities when temperatures and poor air quality peak.
 - Medications: consider storage and risks related to heat.
 - Use air conditioners, if possible, as well as shades, curtains and blinds to block out sun in the daytime. Know where to access cooling centres.
 - Know symptoms related to heat and when to report to HCP.

- What are we doing to ensure patients are not returning to the same situation that caused them to become ill in the first place?
- What kind of resources can you organise for them that address inequities and risk?
 - Consider reaching out to [CANE](#) to help you develop resources where they do not exist.
 - Consider developing up-to-date discharge instruction documents that provide information on taking local climate risks into consideration. Make them available electronically and in print in your patient's language of choice. E.g., [We Breathe Climate Change](#) is illustrated in four languages.
- Do they have emergency phone numbers and locations of shelters or family/friends who will support them?
- Can you ensure a network to break the isolation of those living alone, to keep in contact with in the event of extreme weather?
- In an area at risk for severe events, such as wildfires or extreme weather, do they know how to prepare and plan for a potential evacuation, including essential items, supplies, routes, communication methods, etc.?
- Is it safe for them to return to their community? Is there a risk related to recent events such as exposure to mould or increased risk for vector-borne disease?
- Consider providing a [Park Prescription \(PaRx\)](#). This is a project based on the benefits of engaging with nature (<https://www.parkprescriptions.ca>).



A kit for emergencies (radio, water bottles, flashlight and more)

- Consider the option of [Social Prescribing](#), which aims to link people to community support to address needs and ongoing inequities, breaking isolation for vulnerable people, connecting to others in the community, and promoting autonomy, mobility and overall improved situation.
 - It is important to be mindful that the concept of social prescribing has long existed for Indigenous peoples and communities and is not something invented by Western medicine.

Continuity of care considerations

- Have we communicated our findings about their climate-related vulnerabilities to those who will do the follow-up care?
- Are we making sure patients will be connected to necessary resources, aware of available services in their area and ways to access them if required?



Name one change you'd like to make in your practice this year to reduce climate impact:

Nursing climate action: In your unit

Team up: how to create a Green Team

Creating a Green Team focused on climate action within your organisation is an effective way to develop sustainable practices and target problems specific to your workplace. What is a Green Team? [Green Teams](#) exist in many different types of organisations, in communities, schools, businesses and health care. In the health care setting, Green Teams are multidisciplinary groups of individuals who are passionate about and focused on reducing the climate and environmental impact of the health care sector by raising awareness, advocating for change and creating specific initiatives. These teams take many forms and exist in many different settings. Green Teams may involve a small group of individuals or a large group from multiple sectors within the health care organisation. They can exist anywhere from acute care to long-term care or community care settings. For examples of Green Teams across Canada, take a look at the Green Team Project at <https://greenhealthcare.ca/>

I think the most important thing is to just find other people. Trying to think through this by yourself is a recipe for feeling like a failure and getting dispirited very, very quickly. The benefit of being part of a broader movement is knowing that some people are doing some things, and other people are doing other things, and nobody has to do everything.

- Naomi Klein⁷²

There are many benefits to creating such a group, including sharing ideas across various specialties, professions, services and departments; brainstorming solutions; addressing departmental and organisational climate challenges; making climate-conscious changes to current practices; and building a collaborative relationship with administration for ongoing climate action.⁷³ Creating a Green Team does not need to be complicated. Follow the steps below to create your own Green Team and address important climate action issues within your organisation!

- Check your organisation's guidelines for creating a committee. This may involve administrative approval before making your intentions public. Reach out to your manager, unit leadership, sustainability coordinator or administration to indicate your desire to create a Green Team, outlining the benefits this would bring to the workplace and the population it serves. See the "Engaging with leadership" section of this toolkit for tips on collaborating with your health care organisation leadership, including sample email templates.
- Announce your intention to start a Green Team through your organisation's communication networks (e.g., posters, bulletin boards, emails, monthly newsletters, committees' meetings, etc.).
- Gather interested parties from various units and across departments (i.e., environmental services, waste management, facilities, infection control, dietary professionals) and fix a recurring date and time for the meetings that work with your schedules, resources and ability to participate. Keep in mind that virtual meetings can help improve attendance, but personal connections and a sense of community can be enhanced with face-to-face meetings.



- Determine the structure of your team: leader, secretary, treasurer, etc., or non-titled positions.
- Identify the team's objectives as a group. This could include finding out what initiatives are already underway, engaging in practical changes that reduce the climate impact of the unit or the hospital in general, and choosing the 'low-hanging fruit' to start with. It could also involve bringing climate action to the administration's attention, making policy changes for major climate-related issues known within the organisation, or identifying potential climate-associated activities within your organisation.
- Meet and discuss your findings, observations and concerns from your unit/departmental and professional perspective. Identify the carbon hotspots within your unit/sector that are contributing to the climate impact of your organisation and that can be potential starting points. Following [Robert's Rules of Order](#) to run your meetings can be helpful.
- Develop specific goals to reduce the climate impacts identified in your meetings (e.g., reducing plastic waste in operating room and pharmacy areas, reducing paper use in the unit, adding recycling options, addressing workplace culture and understanding of environmental sustainability, etc.).

Nursing processes and workflow: how to integrate sustainability into your practice

Physical waste in health care

Physical waste in health care has increased due, in part, to rising hospitalisation rates, an aging population and a shift to more single-use products. The COVID-19 pandemic exacerbated the problem and exposed weaknesses in the health care system in handling the increasing volumes of medical waste being produced and providing safe care while minimising climate impacts.^{74,75}

Health care supplies contribute to climate change throughout their life cycle, from natural resource extraction, manufacturing, transportation, to the end of their life cycle. Solid waste contributes to toxic pollutants and GHG emissions through methane produced by anaerobic decay, nitrous oxide from waste combustion, and transport of waste.²³ The International Council of Nurses (ICN) notes that much of the medical waste stream passes through our hands and that we are active participants in waste disposal procedures.⁷⁶ This

means nurses can play a key role in establishing and maintaining more environmentally responsible practices to manage physical waste produced in hospitals.

Our actions impact our environment; therefore, it is crucial we understand policies on waste management in our setting and even provincially/territorially to ensure the safe disposal of waste. Sadly, many of the practices to manage hospital waste result in the release of toxic pollutants that can enter the environment⁷⁷ and put patients and communities at risk.⁷⁸

Nurses can identify waste practices that are outdated, not to current standards or negatively impacting the environment. They can act as stewards in promoting responsible waste management in their facility, on their units and with patients. Moreover, nurses can identify and collaborate on ways to reduce physical waste altogether. Consider having your unit or facility participate in [Waste Reduction Week](#), a Canada-wide initiative.

A pediatric intensive care unit nurse at Montreal Children's Hospital has done a lot of work with improving waste management on her unit. [The story of this Nurse Clinician, Vanessa D'Aquila](#), was covered by CASCADES (led by the University of Toronto Centre for Sustainable Health Systems) at <https://cascadescanada.ca/>

Waste segregation

Segregation is one way we can lower the harmful effects resulting from the formation of medical waste. We need to start with a good understanding of the different types of physical waste that exist in health care (infectious, pathological, sharps, chemical, pharmaceutical, cytotoxic, radioactive and non-hazardous) and ensure our disposal practices are meeting best practice standards aimed to reduce environmental harm while maintaining worker safety.⁷⁹ There are also opportunities to properly segregate and divert recyclable materials from the waste pathway. Each province and territory has standard operating procedures for waste disposal and recycling based on [Canadian Council of Ministers of the Environment guidelines](#). Knowing where to dispose of and how to manage a product after use can help limit potential exposures of individuals and the natural environment to pathogens or hazardous chemicals.

When providing direct care to patients, we are involved in choosing which products we use and/or bring into a patient's room, and how they are discarded. Even though nurses follow protocols on waste management, we may dispose of things inappropriately or unnecessarily. This occurs for many reasons, some of which may be due to old habits, inconvenience, or perhaps a lack of awareness of policies that have changed or been updated.

An example of this may be throwing away the entire contents from a dressing change into the biohazard bin, when, in fact, only the initial dressings next to the patient's skin require disposal in biohazard containers, while the rest could go into the regular garbage. Some packaging from opening new products, such as thin cardboard or paper, could be recycled.

Biohazard bins are made of hard puncture-resistant plastics and are subject to more rigorous waste management guidelines. Not filling them up as often would lower the rates of their disposal and the climate impact of transporting, handling and incinerating hazardous waste. Segregating plastic and paper supplies from dressing trays for recycling would also avoid unnecessarily filling trash bins.

Strategies

- Introduce signage for proper waste disposal in areas of your unit/facility with receptacles.



Image source: Staff of Alberta Health Services⁸⁰

- Try to make proper waste segregation convenient. For example, have enough of the appropriate bins near each other with clear signage.
- Collaborate with waste management services to ensure proper disposal practices and overcome barriers in disposing of waste/recycling properly (i.e., avoid contamination).

Pharmaceutical waste and sharps

Disposal of medications is a growing problem as more drugs are approved to treat diseases, and they end up in waterways, ground soil and even drinking water. 55% of adults aged 18 to 79 used at least one prescription medication in the past month, and spending on prescription medication accounted for 13% of total national health expenditures in 2019.⁸¹ Individuals taking medications can excrete pharmaceutical derivatives into wastewater through urine and stool. Unused medications are often flushed down the toilet, dumped down sinks, or end up in landfills where they leach into the ground.

Waste generated from needles used to administer medications also contributes to the waste stream. Nurses often draw up, administer and dispose of medication given via intramuscular (IM), subcutaneous (SC) or intravenous (IV) routes. However, increasingly patients are learning to self-inject medications like methotrexate (cytotoxic medication that is used in the treatment of rheumatic disease). Patients are often taught injection techniques by nursing staff, and it is important that this education includes how to handle and dispose of the medication and needles properly.

Strategies

- Always handle drugs according to policy and in the safest manner possible that reduces exposure to people and the natural environment.
 - Collaborate with hospital and community pharmacies to enable proper disposal of medications.
 - Never discard pharmaceutical waste into the sink, toilet or garbage.
 - Use designated containers when discarding medications so they can be deactivated and disposed of properly.
 - Ensure you thoroughly label all medications so they can be handled and discarded correctly.
- Provide education to patients on the safe handling and disposal of their medication.
- Encourage patients to only refill the prescriptions for medications they are actively taking and avoid refilling ones they are no longer on.

- Educate patients to bring unused medications to their local pharmacy for drug reclamation and never flush or discard medications down the sink or in their regular garbage.
- Inform patients of pharmacy programs such as [Fiole Verte](#), which offers medications in reusable glass containers, and advocate for such practices to be used in your health care organisation.
- When appropriate, encourage practitioners and patients to undergo a med review. Are the medications your patient is on still appropriate, given the clinical picture?
- Support patient practices that would contribute to positive lifestyle changes that could result in de-prescribing. E.g., improved diet and activity in type 2 diabetes could potentially result in no longer needing to be on anti-glycemic medication.
- Suggest and discuss the possibility of bringing reusable sharps containers into your practice setting to lower the quantity of hard plastics ending up in landfills.

PPE

PPE is a significant source of non-hazardous waste which heightened with the arrival of the COVID-19 pandemic. From June 2020 to June 2021, an estimated 63,000 tons of COVID-related PPE from Canada's health care system and the general public ended up in our landfills.⁸² Sadly, a significant portion has not ended up in the appropriate waste stream. We see masks and gloves littering public places like parking lots and even beaches. All we need to think about is how often we don a new mask and gloves on a single shift alone – and the problem is apparent. The rate at which we consume PPE products in health care has become astronomical. So, what can we do?

Strategies

- Think before you use! Is it the right time or the right PPE for the task you are about to complete? Gloves are estimated to be the most overused personal protective equipment in health care. A campaign by the Royal College of Nursing (RCN) in the UK called *Gloves Off* addresses the overuse of gloves. As a part of this campaign, the RCN produced a video called [Glove Awareness Week 2022](#). A collaboration of sustainable health care organisations in Quebec launched a campaign in October 2023 called [Gloves not all the time](#) to promote appropriate glove use in health care.
- Is there an option for reusable PPE over disposable? For example, [reusable isolation gowns](#), when manufactured to adequate standards, are more effective, less costly and decrease emissions over disposable gowns.^{83 93} Recent research on reusable gowns in Canada found that uptake and support of reusable PPE systems across the

health care system can increase resilience during future pandemics and other supply chain disruptions, including extreme weather events.⁹⁹ Safety, security and financial, social and environmental sustainability are amongst the many benefits to the health care workforce and the health system with reusable PPE.⁹⁹

- The safety of workers and patients is the priority. Still, it is possible in many instances to meet occupational health and safety standards and reduce climate impacts.
- If your rural health care facilities lack sufficient infrastructure to process and verify gowns, it might be possible to join with other regional health care facilities to gather a larger amount of potential reusable gowns to make the longer trip to a commercial health care laundry more attractive. Even better if the trucks are zero-emission vehicles!

Plastics/single-use items

Plastics are everywhere in health care, with a significant amount in the form of single-use devices. A product uses energy and resources throughout its life cycle, which begins when raw materials are extracted from the earth and ends when the materials from the products are reused, recycled or discarded. Understanding that every product we encounter has a life cycle can help us to choose wisely the amount and types of materials we use in care and why we should push for more reusable or biodegradable products.

- Scan your unit for plastic products that could be replaced with reusable, biodegradable or recycled versus disposable (e.g., plastic medication cups, denture cups, surgical and kidney basins, disposable gowns, plastic urinals, bedpans). This may be an opportunity for advocacy to encourage your organisation to green its purchasing practices.
- [Choosing Wisely](https://www.choosingwisely.org/) (<https://www.choosingwisely.org/>) what products to use with a patient and only using what is necessary at that moment of care.
- Create a list for patients of items to bring with them to cut back on single-use items or excess use of items. Some examples would be: denture and hearing aid storage cases to avoid using hospital plastic containers; refillable water bottles versus disposable cups; bring a comforter for planned admissions (hospital blankets never seem warm enough no matter how many extra blankets are added); bring slippers with good soles over using flimsy disposable hospital slippers.
- Reduce paper use and ensure paper is properly recycled.
 - Only print fax confirmations for faxes that do not go through.
 - [The Ottawa Hospital](#) switched to electronic platforms to reduce paper use and saw a 45% decrease in paper and printing costs over two years.
 - Opportunity for purchasing 100% recycled paper.

Reducing waste as the gold standard

We know that segregation and proper disposal practices are important, but the ultimate goal should be to reduce the amount of waste produced overall. We are practitioners at the point of care, and much of the waste stream travels through our hands. We are well-positioned to identify unnecessary waste created in our efforts to manage the health of our patients, along with strategies to reduce or eliminate unnecessary waste altogether. As trusted professionals, we are also a valuable resource for educating patients on the environmental impacts of care and how they too can contribute to waste mitigation in their own daily activities. Even though we follow strict waste protocols, we know that each unit has its own nuances in tackling waste, and the products used in care vary in each area. Start by scanning and noting easy opportunities where waste could be reduced. You do not need to tackle the problem alone – engage your co-workers, housekeeping, managers and even patients to find ways to minimise waste and the health care footprint.

Strategies

- Stay up to date with current practice standards in your setting and province or territory.
- Identify waste practices in your setting that are outdated or need modifying.
 - A user-friendly French-language resource <https://gmr.synergiesanteenvironnement.org/matieres/> can help you determine how to dispose of different types of waste.
- Identify habits in your practice or unit routines that may be contributing to improper waste segregation and make changes towards best practice.
- Does your unit have a way to dispose of recyclable products such as cardboard packaging and plastics? If not, work with your colleagues and management to start a recycling program.
- How can food waste and food packaging waste be minimised in your nursing lounge (e.g., switching to reusable water and coffee cups, reusable utensils).
- Engage with management and staff to discuss implementing sustainable practices in your area, such as a recycling program or procuring products that minimise waste (e.g., switching from disposable gowns to reusable and sourcing products that can be resterilized).
- Provide patient education on how to minimise waste in their care.
 - Changing linen only when visibly soiled or after a reasonable time period.

- Bringing their own case for dentures/hearing aids as opposed to using the disposable plastic cups provided at the hospital.
- Discourage hoarding of supplies and materials at bedside.
- Use posters and infographics to educate staff and patients on ways to reduce waste. Your facility may already have posters about proper waste segregation.
- Track the use of commonly disposed of products in care and, as a team, create a fun target challenge to find ways to reduce waste. Repeat the challenge to reduce waste 10 or 15% further.
- Encourage equipment to travel with the patient throughout their stay. If they are using a nasal cannula for oxygen or accumulated any dressing supplies, these should go with them upon transfer to a new room or unit.
- Only bring in what is needed for supplies and care. Avoid hoarding.



Name one wasteful practice you'd like to change in your unit:

Nursing action: Within your facility/ health care authority/institution

Change starts small. It begins with you as an individual with a desire for change. That desire may come from exasperation at all the waste that hospitals produce. It could come from the anxiety or grief you experience looking at the present and future impacts of climate change. It may be a natural disaster that you, a friend, a family member or a patient experienced or saw in the media. You want to make things better or seek justice by advocating for vulnerable people who may not have the platform or the opportunity to advocate for themselves. Regardless of what drives that desire – you have it, otherwise you would not be reading this toolkit. You are probably looking for ways to turn that desire into practical action or change. This is what this toolkit is designed to provide.

Advocacy can seem daunting, and problems can seem so large that they are impossible to fix. Be careful with this thinking. Start small. Some changes may be immediate, others within a year, and others will take years. Sand is easy to dig, whereas hard granite will take years to chisel away. Your changes may be easy like sand or hard like granite, but both can be moved eventually with hard work and perseverance. You can be sure that individual action is very important and should never be negated; it is a crucial element in solving the climate crisis.

You can be the change your organisation, your patients, your community and our planet need. Start right now and send that email or talk with that person about the idea(s) you have.

The health care setting

Different people will see different things that need to be changed. Changes might include prescribing differently to reduce waste, streamlining processes, changing food sources or practices, installing a green roof or bike parking. The possibilities are endless and only

confined to your creativity and imagination. Each opportunity requires engaging with different people in the organisation, including those you might not normally have contact with. You might need to engage with the CEO and executive or maintenance and facility managers, dietary, food services, environmental services and other nurses. The challenge within your team is determining which projects to prioritise as your time and energy is limited. Consider the following when deciding on a project.

- What can be easily accomplished? Sometimes an easy, quick win will help mobilise others into action and boost morale.
- What has a big impact? Certain changes will decrease GHG emissions and pollution more than others.
- Look to the five Rs for opportunities:

- Refuse
- Reduce
- Reuse
- Repurpose
- Recycle

What can health care professionals like nurses do?

Nurses are integral to the health care sector and possess a powerful and unique set of skills, knowledge and experience with health care organisations. Nurses' voices are instrumental in bringing about positive change in the workplace and beyond.



There is a window of opportunity now for nurses to support [planetary health](#) and lead efforts to achieve sustainability in health care. The development of green health policies and practices requires leadership, coordination, education and accountability. It is essential to step up, speak out and engage with the people in the organisation that make decisions (e.g., purchasing, waste management, facilities). Advocacy rarely sees results from the first phone call or email; it is important to follow up on requests and move change forward (developing processes, contacting suppliers and other partners, and promoting staff education and engagement).

Engaging with leadership

When engaging with leadership about environmental sustainability, you should consider the following:

- Find out what the organisation is already doing to promote environmental sustainability. Is there already a person or team working towards sustainability?
- Leverage both financial co-benefits and small successes to influence bigger asks. E.g., savings from reduced paper consumption could be diverted to purchasing more expensive but sustainable products.
- Stories, cases and narratives are effective communication tools. A human story conveys the urgency of a need more than any statistic, but you should have the statistics ready to demonstrate that this story is not an isolated occurrence.
- Reach out to your local union bargaining unit president.
- Seek engagement from local levels of leadership, such as your manager or educator, before approaching organisational leadership:
 - Make it clear how initiatives align with the goals of the organisation.
 - Local leaders may be able to help you to know who to talk to and how to tailor your message to operational leaders.
- Leaders and aspiring leaders want to look good. Promoting these changes as a way for the organisation to be an innovative leader in the field may be effective.
- Consider how initiatives could boost organisational morale through recognition and [friendly competitions](#) (e.g., active transport or energy-saving competitions between units).

- Invite co-workers to attend an environmental sustainability event with you (e.g., [webinar](#), lunch and learn).
- Corporate challenge campaigns, like [Let's Bike Ottawa](#), give concrete actions that people can opt in to.
- Publicly recognize people and teams for their efforts. This can also boost morale!
- Engage in casual conversations about your perspective on health care and climate change.
- Create a newsletter or write a short piece for a newsletter that can be emailed to staff.
- Put up posters in elevators, public areas, staff bathrooms (try to keep them visually appealing).

Alberta Health Services

RGH OR RECYCLING PROGRAM

What can be recycled?

- ✓ Cloth Wraps – Tape Removed
- ✓ Loose Plastic Packaging
- ✓ Plastic Sheets
- ✓ Plastic Supply Packaging
- ✓ Hard Plastics – Rinsed if Applicable
- ✓ Plastic & Paper Wrapping – Separated
- ✓ Paper Items & Packaging
- ✓ Plastic Light Handle Covers

What cannot be recycled?

- ✗ Liquids
- ✗ Tinfoil
- ✗ Masking Tape
- ✗ Confidential Patient Information
- ✗ Small Plastic & Paper Items
- ✗ Plastic & Paper That Cannot Be Separated

Image source: Staff of Alberta Health Services⁸⁵

- If you are trying to reduce waste, posters at the point of consumption are useful reminders. These can be placed in medication rooms and storage rooms. Get the hospital administration on board with these posters. They can pay to have them made and ensure that they will not be removed. Waste reduction is cost reduction for management – an easy-selling point.
- Lead by example.
- Make sure that your work feels inclusive to all on your unit (nurses, allied health, physicians, service workers, environmental service workers).

Communicating with leadership

Emails to hospital executives need to be relatively formal and concise. Consider using a SBAR format (situation, background, assessment and recommendation). Be clear about who you are, what you want, why you want it, and request follow-up. It may be helpful to mention formal position papers, agreements or organisational policies that support your request. Examples include:

- CFNU position statement [Canada's Nurses and Climate Change](#)
- Canadian Nurses Association's [Climate Change and Health Position Statement](#)
- Canada's commitment to [World Health Organisation's COP26 Health Programme](#)
- Canadian Medical Association's policy for [Environmentally Sustainable Health Systems in Canada](#)
- Ordre des infirmières et infirmiers du Québec (OIIQ) [position statement on the impacts of climate change on population health and nursing practice](#) (in French)

Always start the email with a salutation using their formal name. Then introduce yourself, what unit you work on, and if you have met or talked with this individual before, remind them of that time. It is important to build a working relationship with this person as much as possible. Outline the issue succinctly. Anecdotal stories can be useful in creating a strong impetus for action, but make sure to keep them brief. Explain why the situation needs to be addressed. Then give recommendations for concrete actions that the individual can take. If possible, suggest a timeline. End with a cordial greeting, a salutation and your full name with a clear email signature block containing your credentials (like RN, BScN), job title, etc.

An email is a great way to get the conversation started. It is important to meet and speak with leaders either virtually or in person. Take notes at your meetings; it can be helpful

to follow up with an email summarising what was discussed and what action items were agreed upon. Be open to learning about the organisation. Some initiatives may align with already developed organisational plans and could be asked for first as they would likely meet less resistance.

Sample email

Good morning Dr. Toolkit,

My name is GreenNurse, and I am an RN working on Unit 33. Several of my colleagues and I are deeply concerned about the health care sector's significant contribution to climate change and its negative health consequences for Canadians. We want to promote environmentally sustainable practices at Toolkit Hospital and increase resiliency and preparedness for climate-related health challenges.

We believe that participation in the [Canadian Coalition for Green Health Care's \(CCGHC\) Green Hospital Scorecard](#) survey tool would be an effective place to start. CCGHC is a leader in health care sustainability, providing hospitals with a high-quality resource network. The Green Hospital Scorecard is a free climate performance benchmarking tool that will allow Toolkit Hospital to identify opportunities to decrease our climate impact and reap financial co-benefits.

We request a short meeting with you to discuss this. Please let us know your availability so we can organise a meeting.

We look forward to connecting with you. Please do not hesitate to contact me with any questions or concerns.

Kind regards,

GreenNurse, RN, BScN
Unit 33 – Ophthalmology
Toolkit Hospital
<Local Union>

How can your organisation support environmental sustainability?

Grassroots teams and actions are important in the innovation and implementation of environmentally sustainable initiatives in health care. However, without support from the top-down structures and policies, grassroots initiatives are limited in their ability to create change. Changes are most successful in health care settings when they do not add to frontline workloads,²³ are cost-effective and reflect the benefits of climate action.

Some specific questions that might help you identify ways in which your organisation can take climate action are:

- Question the status quo: why do we do things this way?
- What climate concerns are the most prevalent in our organisation (water contamination, plastic waste, energy consumption rates, CO₂ emissions, etc.)?
- Which department produces the most waste? Would this area be the best place to start with a waste reduction project?
- Is there a climate-friendly alternative that could replace the current practice without compromising the quality or security of care?
- Are we practising in an evidenced-informed manner or out of habit?
- What are some options for our organisation? Create SMART goals (specific, measurable, attainable, realistic and timely) to resolve the issues you have identified. SMART objectives can be presented to the organisation's executive.
- Think outside the box. Climate-friendly options are being researched and innovated regularly. Depending on your target organisation's budget, geographical location and waste production, multiple options may be available to reduce the climate impact. Imagine how these new technologies would fit into your organisational processes. Find out if your organisation has a technology or innovation department, or look to outside organisations that promote innovation, such as the Connected Health Innovation Hub [OROT](#).
- Monitor the amount of waste created by daily procedures in your frontline role. Consciously monitoring the amount of discarded plastic packaging and other non-recyclable waste generated from nursing procedures can help identify large waste-producing procedures (dressing changes, catheter insertion, IV drugs, etc.).

There are some specific ways that your organisation can support environmental sustainability. These include the following.

A formal dedicated sustainability position or team

Having funded sustainability position(s) helps to create legitimacy and permanency to the work and provides dedicated hours for sustainability work that can be difficult to find on busy patient care units and in-between shifts. This dedicated person or team can help raise awareness and bridge communication among frontline staff, the organisation and experts to help implement sustainable initiatives and make them successful. Consider reaching out to your local union representative for help in advocating for the creation of such a position. You can also contact the [Canadian Association of Nurses for the Environment \(CANE\)](#) to connect with other nurses across Canada involved in climate action teams.

Health care climate hotspots

Not all health care activities result in the same climate impacts. The supply chain accounts for 71% of greenhouse gas (GHG) emissions, while direct facility emissions generate 17%, and purchased energy (electricity, heating, cooling, steam) account for 12% of health care GHG emissions ([Health Care Without Harm and ARUP, 2019](#)). A small change in a high-impact area may make a more significant difference in decreasing health care's climate impact than a large change in a low-impact area. It is important to evaluate what is big, what is easy, and what is symbolic. Successful easy changes can help garner support for bigger changes but may not make much of a difference themselves. For example, waste treatment only makes up 3% of emissions and requires a lot of effort to reduce, but it is highly visible, raises awareness and engages hospital staff. Considering these factors can help you and/or your team determine where to start and what to ask for.

Name one action you'd like to take to increase your organisation's environmental sustainability support:

Creating policies to support an increasingly sustainable supply chain

Organisational policies should support environmentally friendly purchasing choices. Sustainable supply chain refers to the entire process of obtaining goods, from raw material extraction, production, transport, delivery, use and disposal performed in a way that minimises environmental impacts.⁸⁶ Sustainable supply chains reduce environmental impact throughout all steps of the manufacturing process. Environmentally conscious organisations can seek to reduce their carbon emissions through sustainable supply chains or buying local products. For the health care sector, many items are specialised and not produced locally, requiring shipping and outsourced manufacturing. Recognizing areas where climate impact can be reduced within the supply chain is essential to making large-scale improvements (shifting to electric transport vehicles).

Many choices about suppliers and what supplies are purchased are based on cost-effectiveness. However, policies should consider life cycle costing and life cycle assessment analyses, which look at the financial and environmental costs of products over their entire life span. There is increasing data to support the cost-effectiveness of many reusable devices and supplies over single-use items, despite higher initial costs. Examples of these include [laryngoscope blades](#)²², [blood pressure cuffs](#) and [some surgical instruments](#).⁸⁷

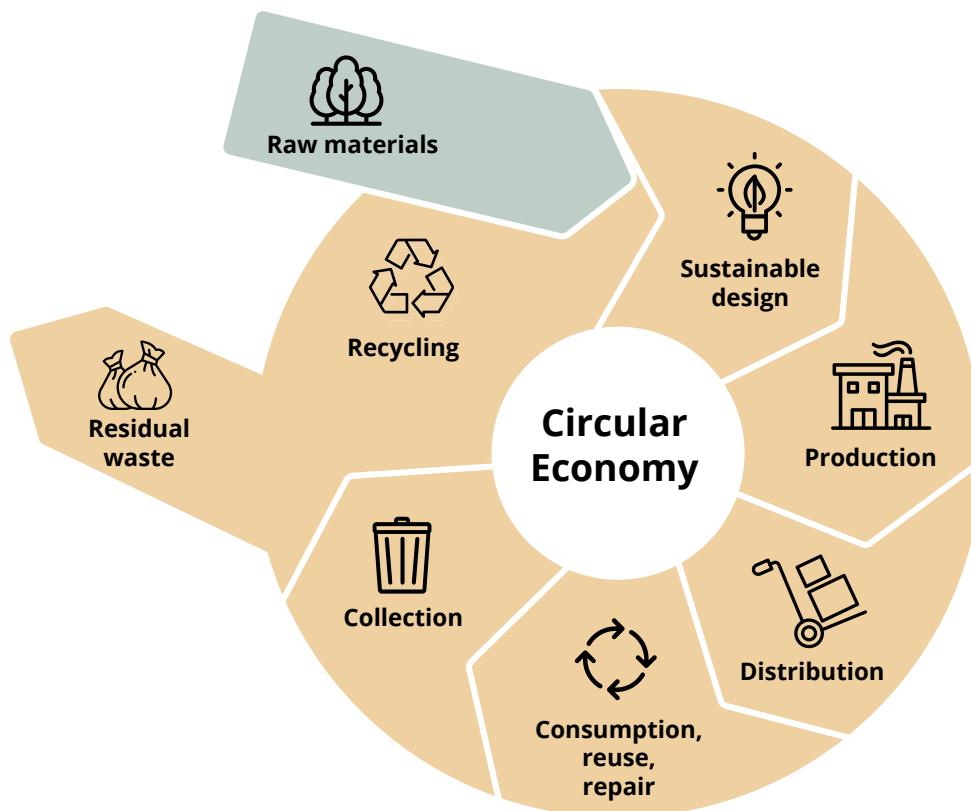


Image source: Adapted from *Circular economy model* (European Parliament). <https://www.europarl.europa.eu/news/en/headlines/economy/20151201STO05603/circular-economy-definition-importance-and-benefits>

Organisations should be encouraged to work with suppliers who provide sustainable options. For example, [Rockyview Hospital's Green 'n Healthy team](#) in Calgary collects used single-use devices such as sequential compression devices, staplers and LigaSure. These items are then sent back to [Stryker](#), who reprocess and remanufacture used products so that they can be reused.

Energy conservation

Minimising the consumption of natural resources, particularly carbon-intense resources, is an essential component of climate action for health care organisations. Low-carbon energy sources such as wind, solar, nuclear and hydroelectric power can drastically reduce the health care industry's carbon emissions and provide financial co-benefits for organisations.

Here are some ways Canadian hospitals are working to reduce their energy consumption.

- [Woodstock Hospital](#) in Ontario has installed 135kW roof-top solar panels.
- Rockyview Hospital's [Green 'n Healthy Committee](#) held an energy reduction competition between two departments, and the winning team decreased their electrical consumption by 9%.
- [Cambridge Memorial](#) has worked with [Honeywell](#) to update their lighting and HVAC systems and has saved ~1,000,000 kWh of electricity, ~200,000m² of natural gas, and ~\$200,000 annually.
- [Unity Health Toronto](#) has implemented energy-efficient retrofits, heat recovery systems and many more innovative projects, and has saved 15 million kWh equivalents.

These types of changes require collaboration with facilities and maintenance teams and capital projects teams to be successfully realised. Consider engaging with them early and inviting them to any sustainability team you wish to start.

The 5 Rs: *refuse, reduce, reuse, recycle, repurpose*

As nurses, we can apply the 5 Rs at the bedside, on our units and at the facility level. For bedside and unit waste reduction and diversion to be successful, the facility and municipality must also process items appropriately. Across Canada, many hospitals choose to purchase reusable supplies and have implemented facility-wide recycling and composting programs. There are also many creative ways to implement the 5 Rs:

- Ross Memorial Hospital's [Go Green Team](#) has implemented a vermiculture program to transfer food waste into compost, which is then used in the continuing care

therapy garden that produces herbs and vegetables, which are then used to make healthy cafeteria meals.

- [Sinai Health](#) donated old equipment (hospital beds, mattresses, etc.) through Hope & Healing International to a non-profit clinic that provides free medical care in Eswatini.
- St. Joseph's Healthcare Hamilton's Environmental Co-Operative Program collaborated with suppliers to decrease packaging.⁸⁸
- Rockyview Hospital's Green 'n Healthy team in Calgary collects and returns used single-use items, such as sequential compression devices, staplers and LigaSure, to [Stryker](#) for reprocessing and remanufacturing. This results in 216 kg of waste diverted monthly from landfill.
- The [Jewish General Hospital](#) is recycling pacemaker batteries.

Take a moment and think if the item you are discarding could be used for another reason or by another department. That old cork board might not serve your department any longer but could be just the thing a neighbouring unit needs!

Sustainable transport

- Consider working with public transport agencies to offer discounted passes to hospital employees.
- Advocate for low-carbon transport infrastructure
 - Bike cages, lockers, showers
 - Receptacles for charging e-bikes and electric vehicles – [Woodstock Hospital](#) in Ontario has installed 21 electric car charging stations
- Carpool or walking buddy program or app
- Participate in a week-long national [Commuter Challenge](#). [Providence Care Hospital's](#) staff used more active and sustainable transportation during the challenge, resulting in 5,712 km logged, 366 L of fuel and 932 kg of CO₂ emissions avoided.

Sustainable food

Consider how to reduce food waste and increase [plant-forward](#) options.

- Would your hospital cafeteria/food court consider switching to biodegradable or reusable food containers and utensils? How could food packaging waste be minimised?

- Work with the cafeteria, dietary and patient food services to transition patient and cafeteria menus to mostly plant-based whole foods and reduce meats, eggs and dairy.
- Increase the proportion of locally-sourced foods in the cafeteria and patient food services. Purchasing local food decreases carbon emissions from transportation, is typically fresher, and supports local economies.
 - [Halton Healthcare](#) in Ontario increased their locally sourced food purchases from 3% to 30% and are working towards achieving 50%.
- Take a [healthy food pledge](#) to provide local nutritious and sustainable food.
- Get some ideas and help from [Nourish Leadership](#) such as implementing gardening projects within health facilities or serving local culturally appropriate foods.
- What some hospitals are doing:
 - St. Justine Hospital and Rockyview hospital are providing:
 - Patient-centred meals, on-demand meal delivery, and increased choice, flexibility and control
 - [Collaboration with food services](#) to provide healthy, plant-based, locally sourced diet options
 - Northern Health Authority in British Columbia:
 - Implemented a [traditional food program](#) in partnership with Nourish Canada at the Haida Gwaii Hospital and Health Centre with locally sourced foods
 - Conducted a nature-based gardening intervention project in a long-term care facility, reducing isolation and increasing connections to nature.¹⁰¹
 - [Unity Health Toronto](#):
 - Eliminate plastic and polystyrene foam materials (plates, utensils, take out containers, etc.)
 - Compost bins and oil-recycling
 - Consider a [Getting to Green workshop](#) in your organisation to help you to develop effective sustainable initiatives.
- Consider how to reduce food waste and increase plant-forward options.



Image source: Staff of Alberta Health Services⁹⁰

Is there a sustainable food practice that could help your organisation?

Engaging in friendly competition

Your organisation can engage in friendly competition with other health care organisations working towards sustainability. These are often led by organisations such as [Care Without Carbon](#), [Synergie Santé Environnement](#), BOMA Canada and the [Canadian Coalition for Green Health Care](#) (CCGHC). For example, CCGHC has a [Green Hospital Score Card](#) competition, in which CCHC works with hospital partners to benchmark environmental sustainability by looking at energy and water conservation, waste management, pollution prevention and corporate commitment. Each year awards are given to hospitals that have performed well in several sustainability categories. CCGHC also helps its member organisations to become more sustainable through access to best practice information and goods and services that help reduce health care's climate impact.

Sample email

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<Local Union>

Including environmental sustainability in organisational strategic goals and policy

Grassroots initiatives should align with the vision and strategy of the organisation. Firstly, you can explain how your requests or proposals align with the organisation's existing vision. This is likely to increase interest and decrease resistance. However, the organisation should be encouraged to include environmental sustainability in its vision, strategic goals and policy initiatives. For example, [Alberta Health Services](#) has a provincial policy outlining its commitment to environmental sustainability. [Unity Health Toronto](#) and [Woodstock Hospital](#) outline sustainability (specifically energy conservation) as one of their organisational accountabilities. Manchester University National Health Service in the United Kingdom has developed a three-year [strategic plan](#) to reduce its climate impact.

Creating policies mandating the collection of environmental impact data

It is important to collect environmental impact data, such as emissions, waste and resource consumption. This data will help to identify opportunities for improvement and areas for focused work. Continued data monitoring will allow for the assessment and evaluation of environmentally sustainable initiatives.

Improving organisational awareness

Most health care organisations have annual required organisational learning for their employees. They teach to advocate for the inclusion of education around environmental sustainability, the relationship between health care and climate change, and what they can do as individuals to help decrease the climate footprint of their facilities.

If the organisation is already involved in more facility-focused sustainability actions, such as retrofitting boilers or installing automatic faucets, it can be helpful to make sure they are sharing this information. Knowing that the organisation is taking action towards sustainability can encourage those already involved and those who are interested but hesitant.

It is also important to ensure that the organisation is aware of any unit-based Green Teams or sustainability initiatives. There may be opportunity to offer the unit for pilot projects and help operationalize top-down actions.

Conclusion

We are delighted to have been able to collaborate as a partnership between the CFNU and CANE on the creation of this toolkit, which we hope will help to guide nurses in integrating action on climate change and sustainability in all realms of practice, and in the promotion of human and planetary health and well-being for current and future generations.

Suggested resources

App [Anaesthetic Gases Calculator](#)

Canadian Association of Physicians for the Environment (2019). [Climate Change Toolkit for Health Professionals](#)

Centre for Sustainable Health care (UK). [Resource library](#)

Université de Laval. [Climat, santé, action](#)

Health Care Without Harm, Europe, 28 November, 2022 webinar recording in English, French, Spanish, Dutch and Greek. [How to reduce the impact of plastics in health care](#)

[Maillon Vert \(Quebec\)](#) – helping organisations to develop more sustainable pharmacy practices and reduce GHG emissions

Martin, W. & Vold, L. (2019). Canadian Federation of Nurses Unions (CFNU). [Climate change and health: It's time for nurses to act](#)

Royal College of Surgeons of Edinburgh. [Green Theatre Checklist](#)

Royal College of Nurses. [Glove Awareness](#)

[NurSus TOOLKIT](#) project from our colleagues in Europe (available in English, French, Spanish, Dutch, German and Polish languages)

Pan American Health Organization. [Smart Hospital Toolkit](#)

Sustainable Healthcare Coalition. [Care Pathway Carbon Calculator](#)

The Global Fund (2022). [Avoidance, Reduction and Safe Management of Health Care Waste](#) (allocation period 2023-2025)

Suggested resources

App [Anaesthetic Impact Calculator: Calculate a carbon footprint](#) by Kevin Scott

Australian Academy of Science (2022). [How has climate changed?](#) _

BBC (2 November 2022). [What is climate change? A really simple guide](#)

Canadian Association of Physicians for the Environment (2019). [Climate Change Toolkit for Health Professionals](#)

Centre for Sustainable Health care (UK). [Resource library](#)

Université de Laval. [Climat, santé, action](#)

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Sustainable Health care Coalition. [Care Pathway Carbon Calculator](#)

The Global Fund. (2022). [Technical Brief: Avoidance, Reduction and Safe Management of Health Care Waste](#)

What is Climate Change? [Crash Course Geography #14](#)

Glossary

1. **Anthropogenic** – resulting from or produced by human activities. These activities include burning of fossil fuels, deforestation, land use and land-use changes (LULUC), livestock production, fertilisation, waste management and industrial processes.
2. **Anthropocene** – the proposed name for our current geological epoch, from the time when human activity began to have a significant impact on the planet's climate and ecosystems.
3. **Carbon footprint** – corresponds to the whole amount of greenhouse gases (GHG) produced to, directly or indirectly, support a person's lifestyle and activities. Carbon footprints are usually measured in equivalent tons of CO₂ during the period of a year, and they can be associated with an individual, an organisation, a product or an event, among others.
4. **Greenhouse gases (GHG)** – those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of terrestrial radiation emitted by the Earth's surface, the atmosphere itself and by clouds. This property causes the greenhouse effect. Water vapour (H₂O), carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄) and ozone (O₃) are the primary GHGs in the Earth's atmosphere. Moreover, there are a number of entirely human-made GHGs



in the atmosphere, such as the halocarbons and other chlorine- and bromine-containing substances, dealt with under the Montreal Protocol. Beside CO₂, N₂O and CH₄, the Kyoto Protocol deals with the GHGs sulphur hexafluoride (SF₆), hydrofluorocarbons (HFC) and perfluorocarbons (PFC).

5. **Intergovernmental Panel on Climate Change (IPCC)** – an independent body that assesses the scientific literature and provides vital scientific information to the climate change process. The current structure of the IPCC consists of three working groups: Working Group I address the science of climate change; Working Group II deals with impacts, vulnerability and adaptation; and Working Group III with mitigation.
6. **Life cycle assessment** – the systematic analysis of the environmental impacts of a product or process at all stages of development from raw material extraction through to final disposal.
7. **Life cycle costing** – the systematic analysis of the costs of a product or process through its entire lifespan.
8. **Climate change mitigation** – making the impacts of climate change less severe by preventing or reducing the emission of greenhouse gases (GHG) into the atmosphere. Mitigation is achieved either by reducing the sources or increasing storage of these gases — e.g., by increasing use of renewable energies, establishing cleaner transportation systems, or by increasing the size of forests. In short, mitigation is a human intervention that reduces the sources of GHG emissions and/or enhances the sinks.⁹¹
9. **Planetary health** – a fairly recent term that describes the idea that in order to support and sustain human health and well-being we also need to promote and maintain the health and well-being of the Earth, including its living and non-living systems.¹⁸ This concept has deep roots both in Indigenous knowledges and understanding of interconnectedness in nature.^{3,92,93}
10. **Climate change adaptation** – anticipating the adverse effects of climate change and taking appropriate action to prevent or minimise the damage they can cause, or taking advantage of opportunities that may arise. Examples of adaptation measures include large-scale infrastructure changes, such as building defences to protect against sea-level rise, as well as behavioural shifts, such as individuals reducing their food waste. In essence, adaptation can be understood as the process of adjusting to the current and future effects of climate change.⁹⁴
11. **Sustainable supply chain** – “fully integrates ethical and environmentally responsible practices into a competitive and successful model. End-to-end supply chain transparency is critical; sustainability initiatives must extend from raw materials sourcing to last-mile logistics, and even to product returns and recycling processes.”⁹⁵

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