

A photograph showing a person's hand gently touching the bark of a tree. The tree is covered in vibrant green ivy leaves. In the background, a bright sun is shining through the trees, creating a warm, golden glow. The image is partially obscured by a dark green overlay on the left side where the text is located.

PPE and the Environment: Understanding Healthcare's Carbon Footprint

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30 March 2026

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Objectives

- Describe how healthcare/IPAC and the environment impact each other
- Highlight how PPE contributes to climate change and plastic pollution
- Practice stewardship in use of PPE



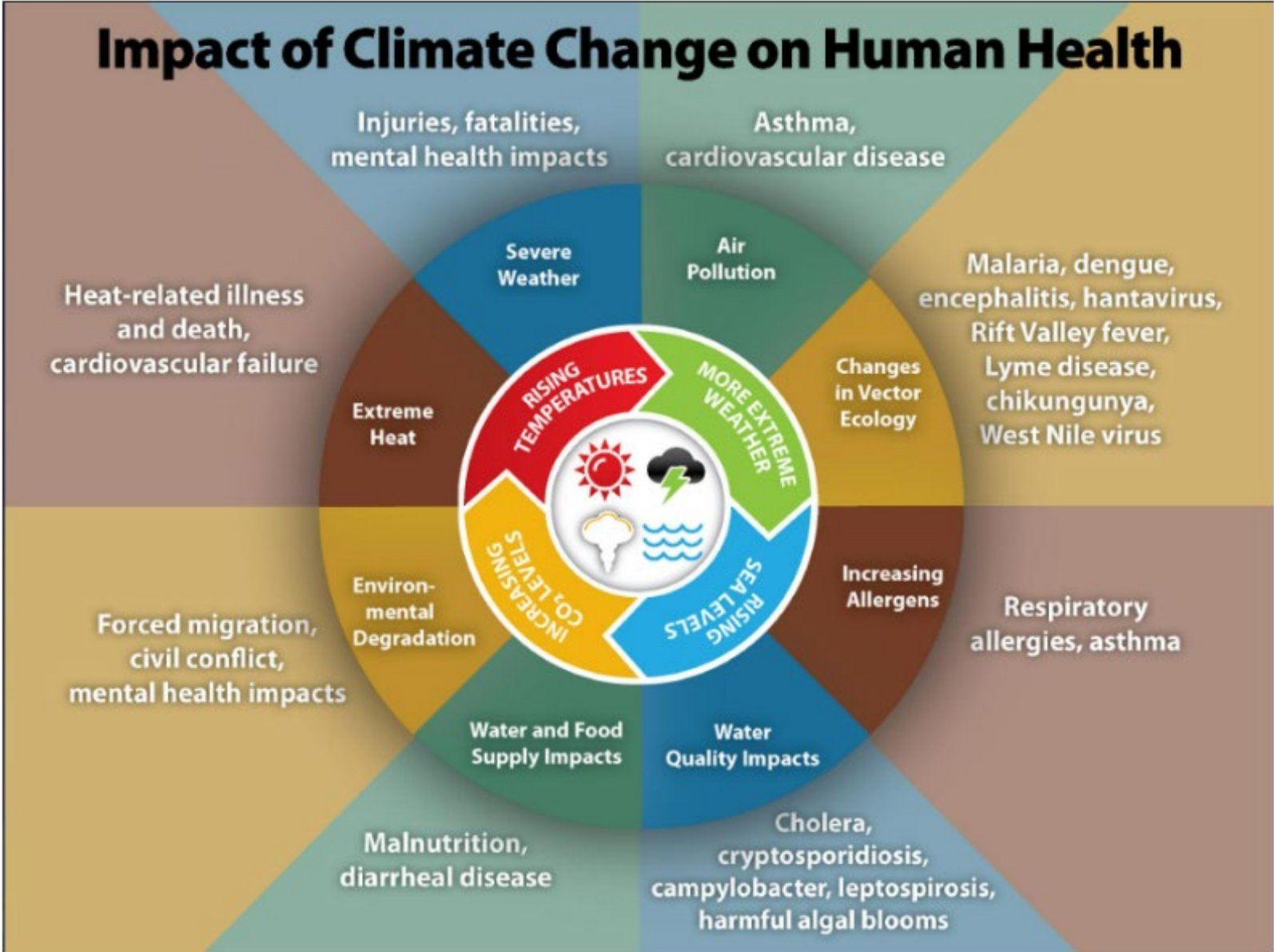
So, what does climate change have to do with IPAC?





Climate change impacts the health of humans and all life on the planet

IPAC aims to keep patients safe and reduce costs, enhancing quality improvement



Climate effects on human health, according to the Centers for Disease Control and Prevention.





Greatest global threat of the 21st century

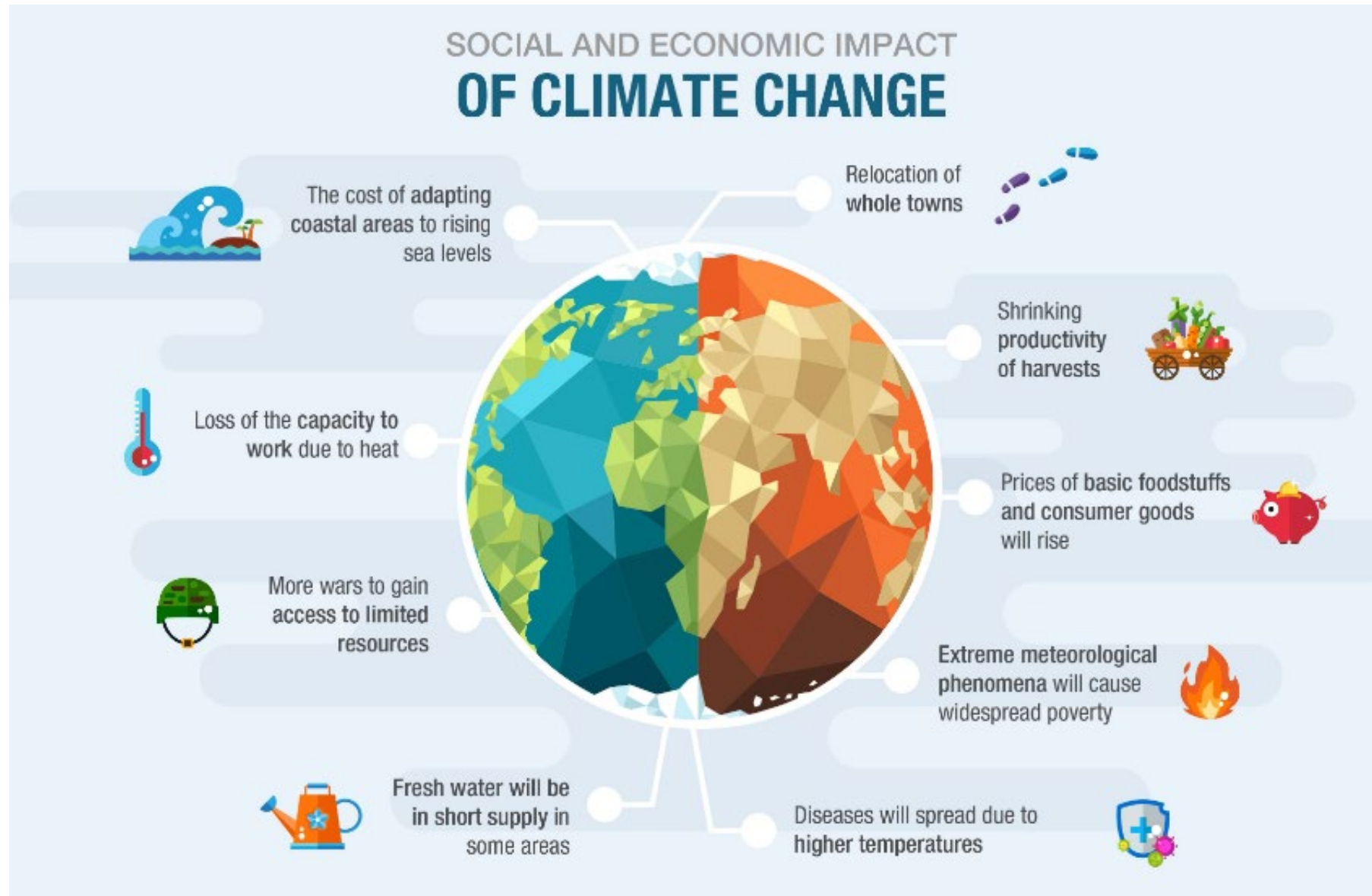
“Climate change is happening now and its impacts are being felt around the globe. The World Health Organization (WHO) estimates that a staggering one in four deaths can be attributed to preventable environmental causes and climate change is exacerbating these risks.” – WHO, 2015

Health:

- Additional 250,000 deaths/year between 2030 and 2050
- Heat-related illnesses, infectious diseases, noncommunicable diseases, adverse pregnancy outcomes
- West Nile Virus
- ?MDR *Candida auris*

The indirect disease burden from air pollution and toxic emissions is now at the level of medication errors that led to the patient safety movement.

Climate Change has social and economic impacts





Health Care

If the global health care sector were a country, it would be the **5th largest emitter on the planet.**

a new report:
HEALTH CARE'S CLIMATE FOOTPRINT



Health Care
Without Harm



Medical Equipment

Transportation

Single use

Packaging

Microplastics – in food chain, water, air, biofilm (AMR), humans

Nanoplastics - in cells



Medical Equipment



- About 8 million tons of pandemic-related plastic waste was estimated to have been generated globally as of August **2021**, most coming from hospitals – and about 25,000 tons ending up in the oceans
- Disposable medical equipment use more than doubled between 2005 and 2020, and has risen exponentially further since, due to the increased use of personal protective equipment (PPE) during the COVID-19 pandemic



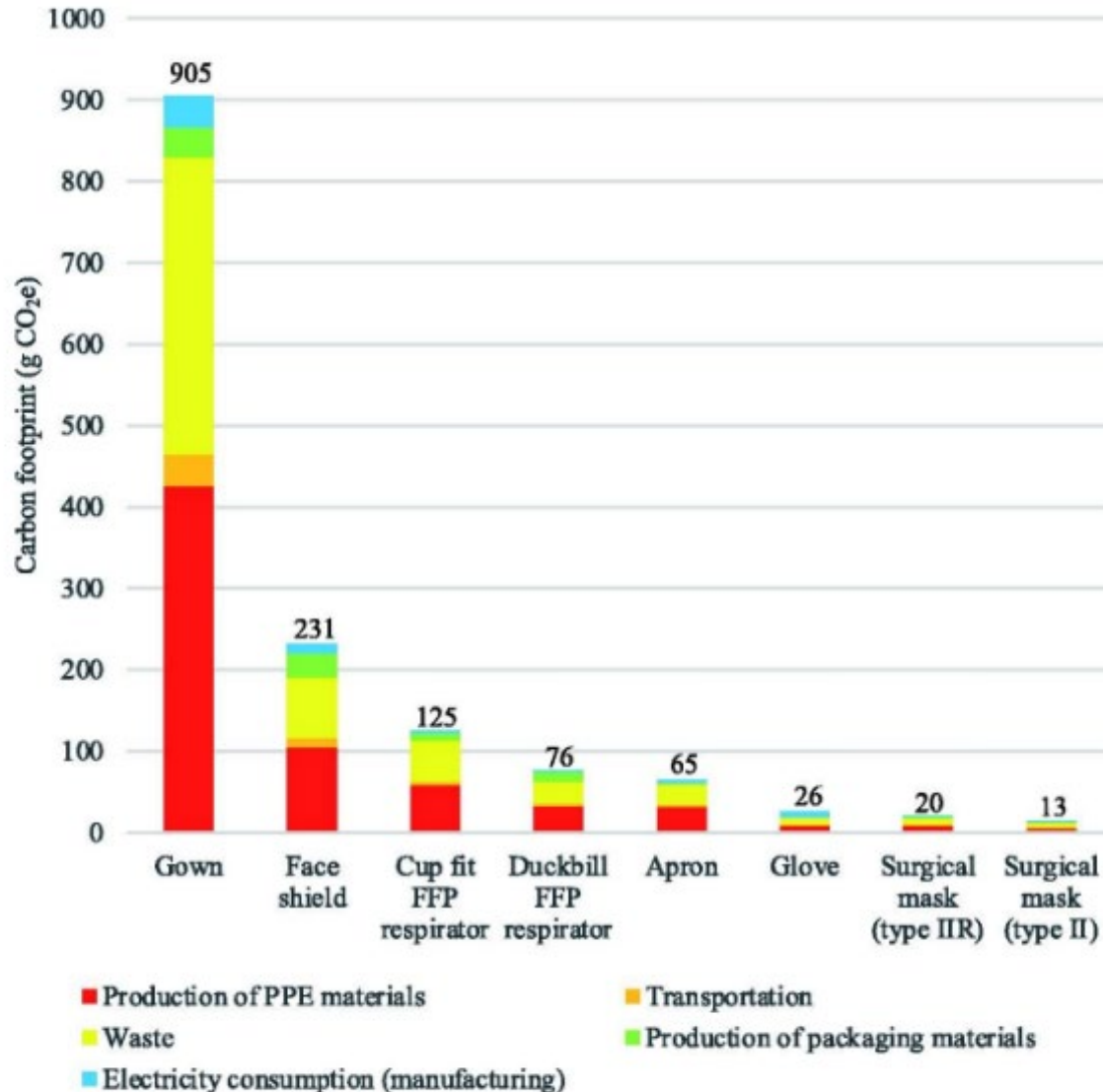
Personal Protective Equipment (PPE)



ONE-TIME USE PROTECTION HARMING EARTH
25,900 TONS WASTE GENERATED WAS PANDEMIC-ASSOCIATED

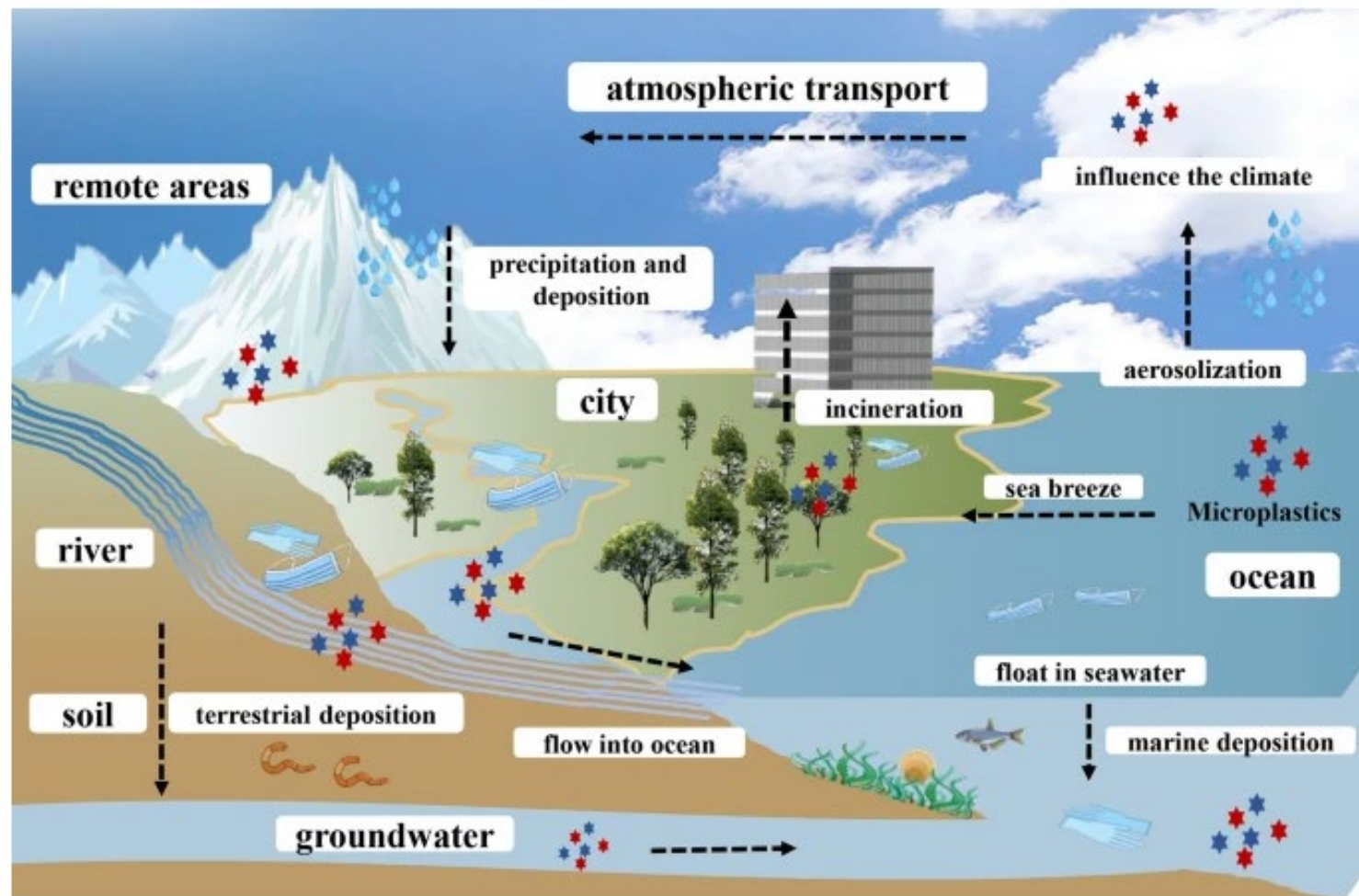


PPE: Sustainability and Waste



“The estimated damage to human health was 239 DALYs (disability-adjusted life years), impact on ecosystems was 0.47 species year (loss of local species per year), and impact on resource depletion was costed at US \$12.7m (GBP £9.3m)”

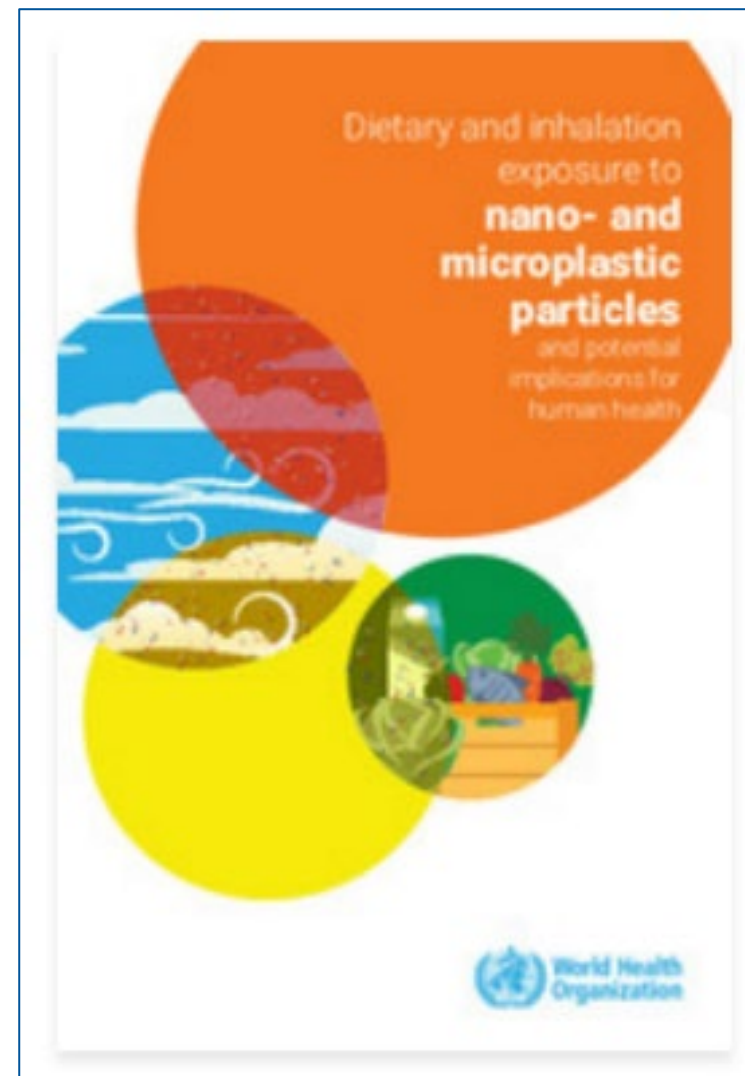
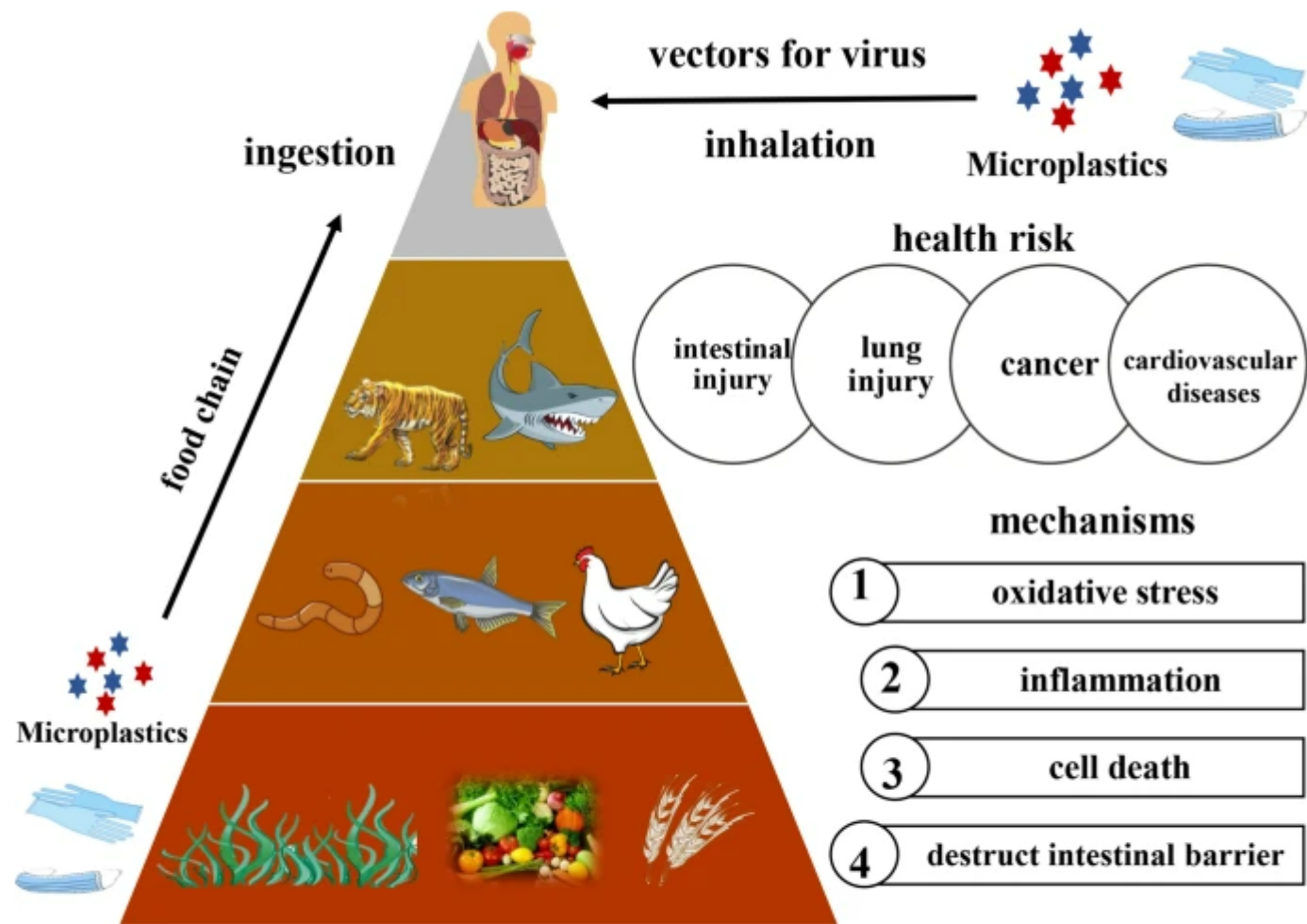
PPE goes to the sea – and the air!



The protective equipment-associated plastic and microplastic cycle. Disposed protective equipment is massively accumulating plastics and microplastics in different environments, making microplastic cycle and polluting the aquatic, terrestrial, and atmospheric environments



Microplastics



Potential risks of protective equipment pollution to human health. Human can be exposure to the protective equipment associated microplastics by ingestion and inhalation, resulting in diseases through many mechanisms

Other Position Statements

Canadian:

- 2009: CMA/CNA: [Towards a sustainable health system: a call to action](#)
- 2020: Anaesthesia: [Environmental sustainability in anaesthesia and critical care](#) – circular economy
- 2022: CMA: [Environmentally sustainable health systems](#)
- 2024: CNA: [Planetary Health](#)

International:

November 18, 2024:

ICN: [Position statement calling for urgent climate action](#)

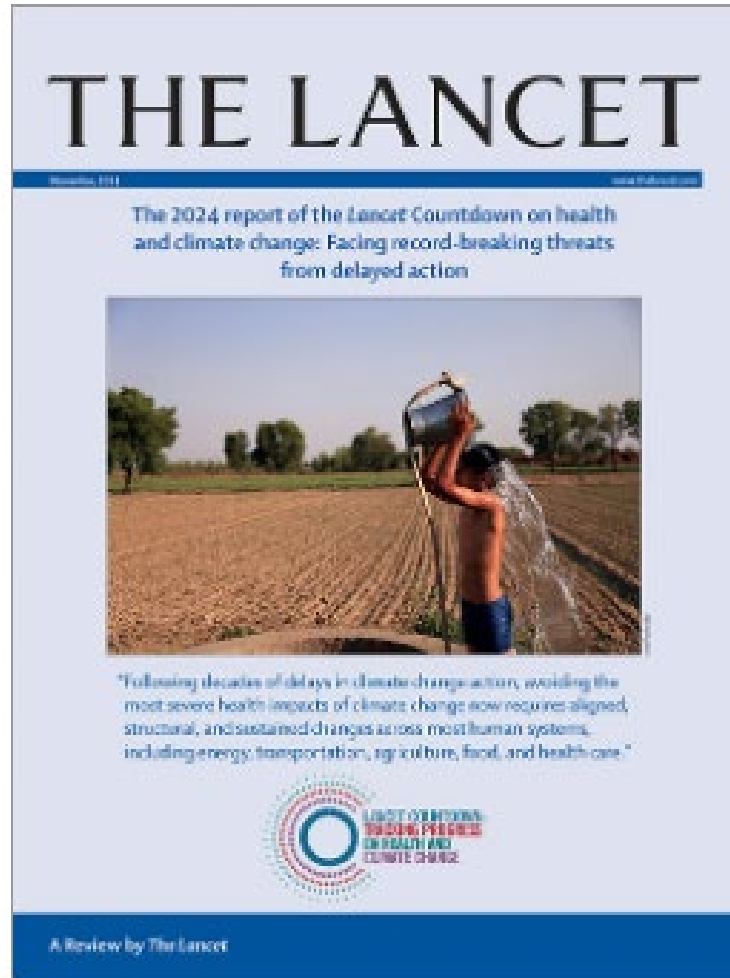


ICN marks COP29 Health Day with strengthened Position Statement calling for urgent climate action

Geneva, Switzerland, 18 November 2024 – As the Conference of the Parties (COP29) hosts Health Day in Baku, the International Council of Nurses (ICN) has released an updated [position statement](#) reflecting the increased urgency of climate action and emphasizing the importance of nurses as critical actors in addressing environmental challenges. The statement describes climate change as “the single greatest health threat facing humanity with profound implications for human health and well-being” and calls on nurses, nursing associations and governments to take immediate action to promote sustainability and transition away from fossil fuels.

The newly revised position statement outlines the escalating scope and severity of climate-driven health harms, which include extreme weather events such as heat waves, floods, droughts and wildfires and negative impacts on nutrition, mental illness, population displacement, economic growth and poverty reduction.

Campaigns and Resources



- [Lancet Commission on Sustainable Healthcare \(LCSH\): Lancet Commission on Sustainable Healthcare \(LCSH\) < Yale Center on Climate Change and Health](#)
- [Sustainable Healthcare | The Joint Commission – 2024 resources – including accreditation](#)
- [The 2025 report of the Lancet Countdown on health and climate change – Oct. 28](#)
 - “Mean annual temperatures exceeded 1.5°C above those of pre-industrial times for the first time in 2024. Despite ever more urgent calls to tackle climate change, greenhouse gas emissions rose to record levels that same year . . .”

[The 2024 report of the Lancet Countdown on health and climate change: facing record-breaking threats from delayed action - The Lancet](#)



Strategies



THE INTERNATIONAL FEDERATION
OF INFECTION CONTROL

**APIC and IFIC:
Environmental
Sustainability**

CO₂ Reduction



REDUCE

100%



REUSE

38-56%



RECYCLE

3-4%?

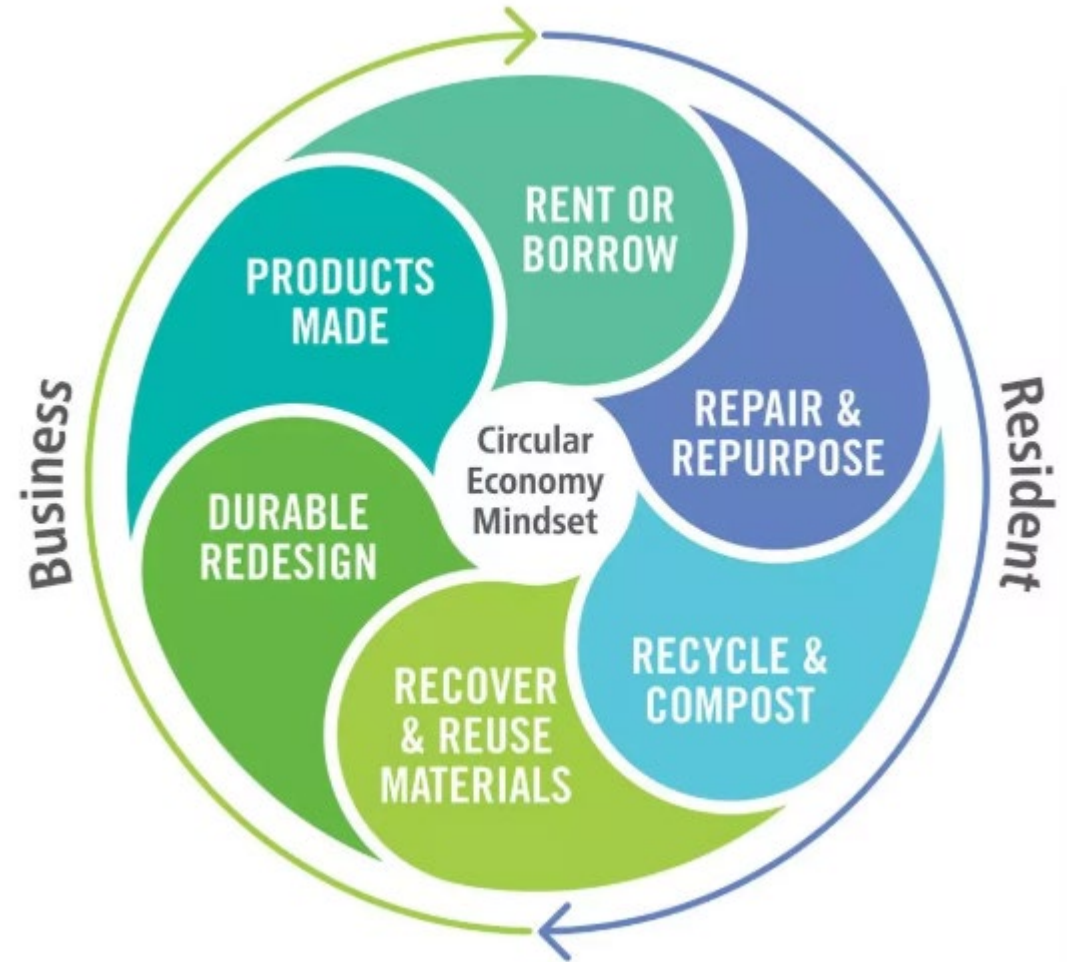
Single use: 0%



Sustainability Terminology

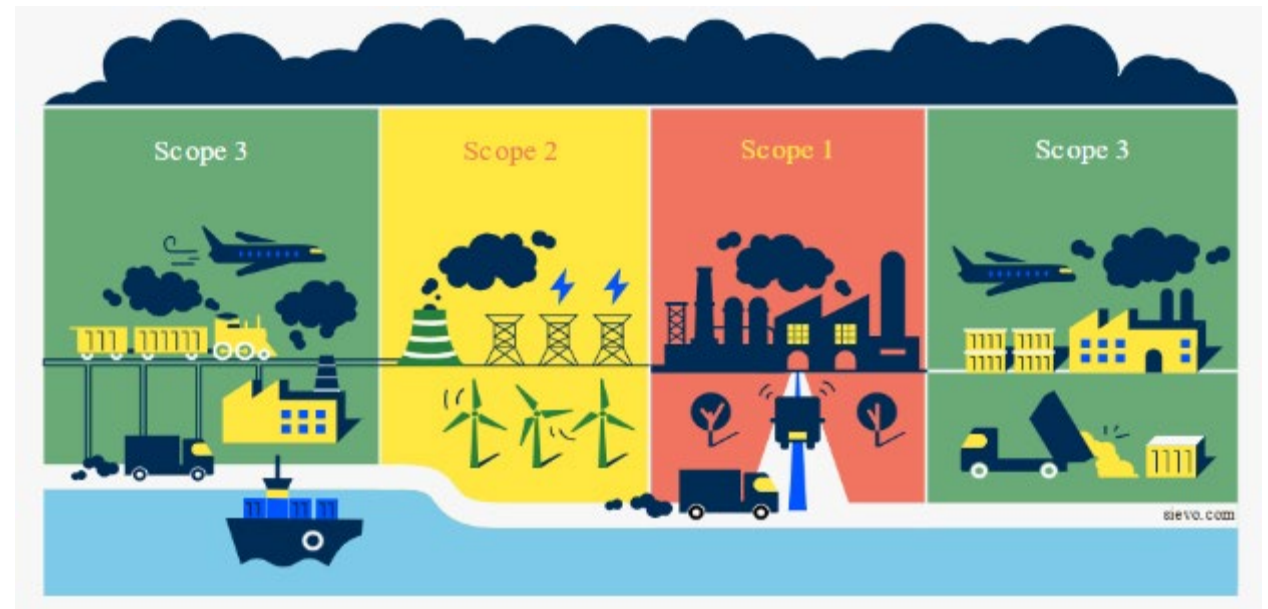
- **Circular Economy:** An economy that retains and recovers as much value as possible from resources by reusing, repairing, refurbishing, remanufacturing, repurposing, or recycling products and materials. – [Government of Canada, 2022](#)

A shift from a linear/throw-away to a circular mindset to extend the lifecycle of goods, food and resources through better design and continuous reuse, so nothing goes to waste.



Environmental performance metrics

- Quantifiable indicators used to assess and track an organization's or country's impact on the environment. Key metrics include:
 - Carbon emissions
 - Energy consumption
 - Water usage
 - Waste generation, including plastics
 - Social and governmental metrics



Carbon emissions:

Scope 1: Direct emissions

Scope 2: Indirect emissions from electricity, steam, heat, cooling

Scope 3: Supply chain emissions

Sustainability Awareness

Greenwashing: the deceptive practice of misleading consumers or investors about a company's environmental practices or the environmental benefits of a product or service.

Tactics include:

- Vague or misleading language (“natural”, “eco-friendly”)
- Misleading labels (“certified”)
- Irrelevant claims (“green”, “recycled materials”)
- Exaggerating progress (no credible plan – “greenhushing”)
- Hiding negative impacts (“biodegrades” in landfill – into microplastics with methane emission)



ISO 14001:2015 - ISO 14001 - Environmental management systems:

- Internationally recognized standard for environmental management systems (EMS) reduction in waste production, resource consumption, and pollutant emissions, ultimately resulting in a minimized environmental footprint
- Culture of continual improvement

IPAC Canada Position Statement on Environmental Stewardship, Sustainability, and Planetary Health Related to IPAC



POSITION STATEMENT



Environmental Stewardship, Sustainability, and Planetary Health Related to IPAC

This document was developed by IPAC Canada based on best available evidence at the time of publication to provide advice to Infection Prevention and Control Professionals. The application and use of this document are the responsibility of the user. IPAC Canada assumes no liability resulting from any such application or use.

Background

Infection prevention and control (IPAC) practices are both impacted by and contribute to climate change and pollution. The World Health Organization (WHO) has identified climate change as the greatest global threat of the 21st century.¹ Canada is warming more than twice as fast as the global rate, and the Canadian Arctic almost four times as fast.² Extreme weather events from climate change are increasingly impacting the health of Canadians directly, through heat stroke^{3,4} and cardiorespiratory issues.^{5,6} Global warming has contributed to the rise in diseases like Lyme disease in Canada, spread by vectors which can now live further north,⁷⁻⁹ and the simultaneous emergence of multidrug resistant *Candida auris* in three continents may be linked to thermal adaptation.¹⁰

Health care, despite having a goal of doing no harm, is a significant contributor to climate change,⁹ and if it was a country, health care would have the fifth largest carbon emissions in the world.¹¹ The indirect disease burden from air pollution and toxic emissions is now at the level of medication errors that led to the patient safety movement.^{12,13} Environmental deterioration also results from issues beyond carbon, including ecotoxicity, air quality, and water pollution.¹⁴

Negative environmental impacts from health care begin with raw materials¹⁵ and manufacturing. Disposable medical equipment use more than doubled between 2005 and 2020, and has risen exponentially further since, due to the increased use of personal protective equipment (PPE) during the COVID-19 pandemic.^{16,17} About 8 million tons of pandemic-related plastic waste was estimated to have been generated globally as of August 2021, most coming from hospitals – and about 25,000 tons ending up in the oceans.¹⁸

The manufacturing process of metals used in healthcare equipment, especially for 'single-use' metal items, produces toxic byproducts. Petrochemicals are used to manufacture most 'disposable' items (e.g., plastic gloves/PPE/wipes) and their packaging.¹⁴ Transportation of healthcare products further pollutes the environment, including with microplastics from vehicle tires.^{13,14} Microplastics have been identified throughout the human body, including in the brain,¹⁹ placentas, and breast milk, primarily via inhalation and ingestion, and may increase risks of malignancy.²⁰ Nanoplastics can infiltrate cells.²¹ The effect of increased plasticization on human health remains largely unknown.^{22,23} In the environment, including hospital wastewater systems,²³ microplastics serve as a platform for biofilm growth, potentially fostering the growth of antimicrobial resistance,²⁴ such as in Gram-negative pathogens.^{25,26}

March 31, 2025



Poster presented at the 2025 IPAC Canada Conference



IPAC and Anesthesiology: Collaborating for Sustainability



Madeleine Ashcroft, RN CIC; Lisa Hutchinson, MD; David Ohrling MD; Melissa Ho, MD; Kate Sinclair, MSc

Issue / Background

Climate change is the greatest global threat of the 21st century,¹ caused by fossil fuel emissions, including those from petroleum-based plastics production. Health care generates massive amounts of emissions and plastics,² including from 'single-use' items, PPE, and wipes. Micro- and nanoplastics are now ubiquitous in the environment and in every organ of human bodies, and their effects are largely unknown.³

Project

IPAC Canada develops position statements and practice recommendations to address gaps and/or controversies in best practices, striving to provide guidance based on principles that can be applied beyond a single item or instance.

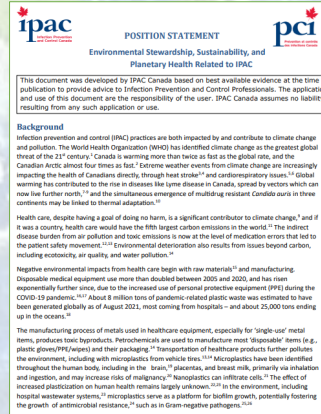
A member of the Ontario's Anesthesiologists Environmental Sustainability Working Group reached out to IPAC Canada for guidance in relation to extending the use of anaesthetic circuit tubing. The Anaesthesiologists and IPAC Canada's representative met regularly to:

- Discuss successes and challenges in reducing 'single-use' items;
- Share published literature related to sustainability; and
- Explore strategies for reducing 'single-use' items while maintaining exemplary IPAC standards of practice.



Results

Initial discussions sparked a much-needed focus on sustainability in IPAC, which led to the development of IPAC Canada's position statement on environmental stewardship, sustainability, and planetary health. This paved the way for ongoing collaboration for more sustainability projects.



Environmental Stewardship, Sustainability, and Planetary Health Related to IPAC Position Statement

Everyone has a role!



Key Actions

- Form a Sustainability Committee
- Develop staff literacy in planetary health
- Involve IPAC in supply chain and procurement processes, consider impact and reuse as default
- Focus on prevention for conservation
- Hand hygiene every time; gloves based on personal risk assessment
- Engage with industry partners for innovative waste reduction
- Collaborate across facilities, sectors, and specialties!

Lessons Learned

- The majority of ICPs are unaware of:
 1. The environmental impact of IPAC practices during the SARS-CoV-19 pandemic, or
 2. Effective mitigation strategies
- International publications and local experience highlight specific IPAC-related issues and actions for quality improvement including:
 - Thoughtful and evidence-based use of resources;
 - Consideration of both people and the environment; and
 - Collaboration with like-minded professional organizations will lead to advances and actions that benefit healthcare, people, and the planet.

Next Steps

Following the guiding principles in this statement, we are collaborating to develop a best practice document to reduce anaesthetic circuit waste.

Contact

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Madeleine.Ashcroft@thp.ca

Image source: Healthcare Plastics Recycling Council: <https://www.hprc.org/healthcare-plastics-recycling>
References: ¹World Health Organization. WHO calls for urgent action to protect health from climate change -- sign the call [Internet]. Geneva: World Health Organization; 2015 Oct 6. Available from: <https://www.who.int/news/item/06-10-2015-who-calls-for-urgent-action-to-protect-health-from-climate-change-sign-the-call>
²Wazir C, Mortimer F, Stanciffl R, Khutta M. Plastics in healthcare: time for a re-evaluation. J Soc Med. 2020 Feb;113(2):49-53. doi:10.1177/0141076819880054.
³Chen H, Cooper C, Brand R, Pech M, Gurdal M, Savelle A, Woodruff T. Effects of microplastic exposure on human health: a rapid systematic review. Environ Sci Technol. 2024 Dec 11;58(12):22843-64. doi:10.1021/acs.est.2c09246.

Canadian Sustainability Collaborations

A screenshot of the CASCADES website. The header is dark blue with the CASCADES logo (a white cross icon followed by the word 'CASCADES' in white) on the left. Navigation links in white text include 'About Us', 'Action Areas', 'Training', 'Get Involved', 'Contact', and 'English' with a dropdown arrow. The main content area has a dark blue background with a faint, light blue geometric pattern of squares and lines. The main heading 'CLIMATE ACTION + HEALTHCARE' is in large, bold, white, all-caps font. Below it, the subtitle 'Creating a Sustainable Canadian Health System in a Climate Crisis' is in a smaller, white, all-caps font.

CASCADES

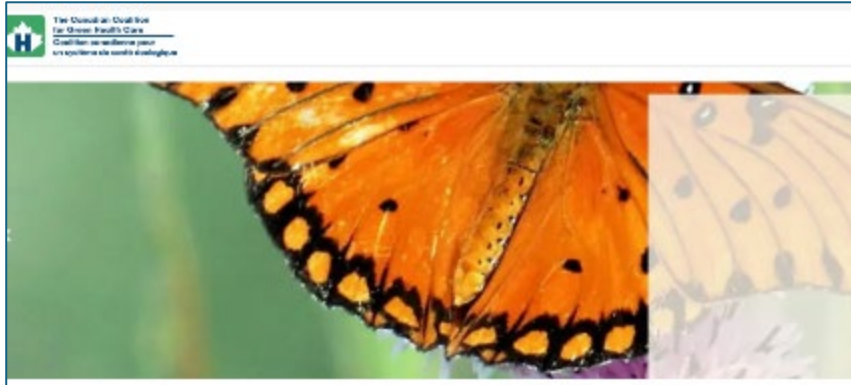
About Us Action Areas Training Get Involved Contact English ▾

CLIMATE ACTION + HEALTHCARE

Creating a Sustainable Canadian Health System in a Climate Crisis

[CASCADES](#)

Sustainability Collaborations – a sampling



[Canadian Coalition for Green Health Care](#)



US & Canada

Health Care Without Harm seeks to transform health care worldwide so that it reduces its environmental impact, becomes a community anchor for sustainability, and a leader in the global movement for environmental health and justice.



Canadian Health Association for Sustainability & Equity (CHASE)

[CHASE](#)

[Health Care Without Harm](#)

[PEACH](#)



UNIVERSITY OF TORONTO



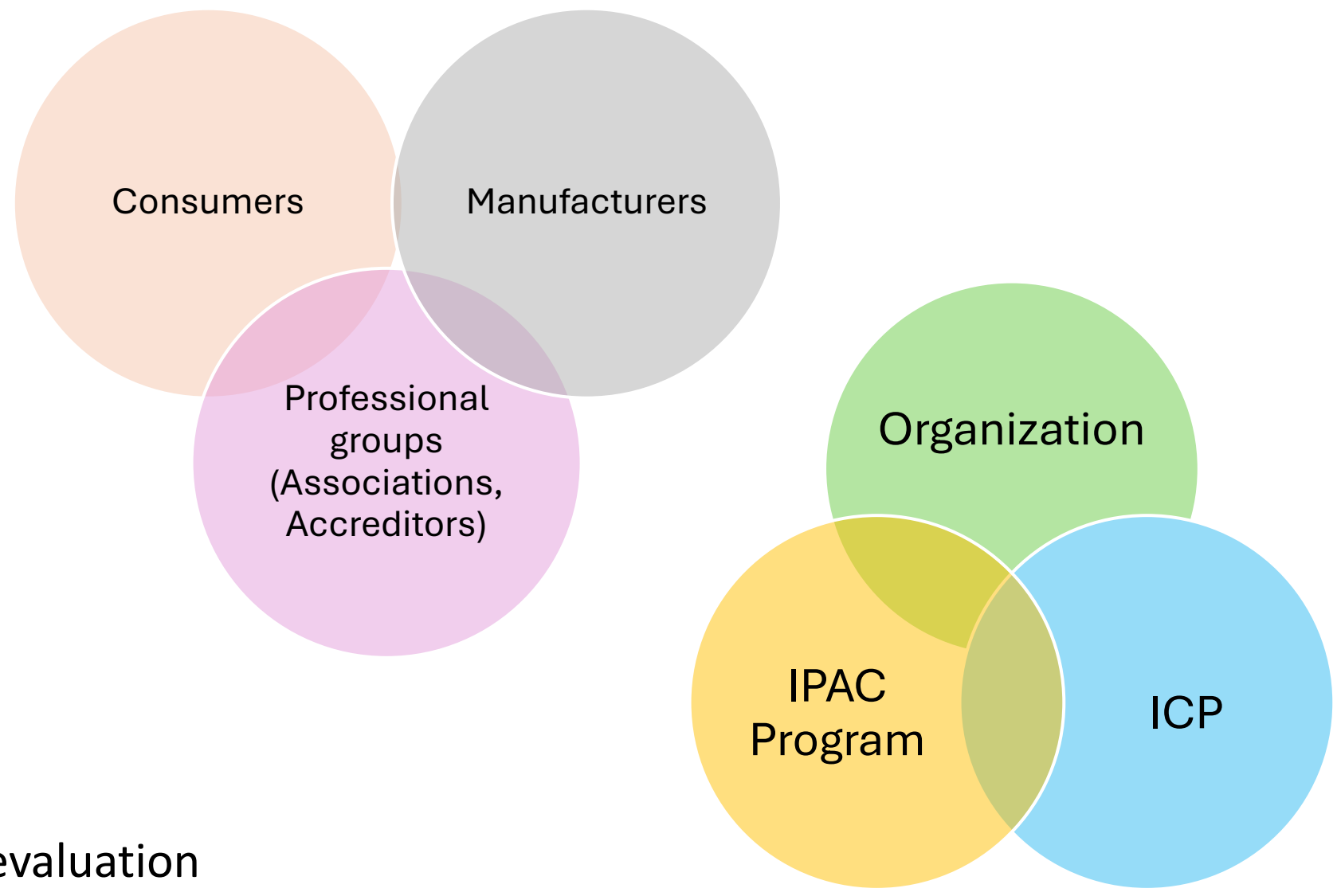
COLLABORATIVE CENTRE FOR Climate, Health + Sustainable Care

[Collaborative Centre for Climate, Health, & Sustainable Care](#)

A screenshot of the PEACH Health Ontario website. The background is a dark, artistic image of trees and leaves. At the top, there is a navigation menu with items: "Health Sciences", "Home", "About PEACH", "Ideal Green Health Facility", "Our Impact", "Insights", "Eco Orders", and "Contact". The main heading reads "Welcome to PEACH Health Ontario" with a tagline below it: "Reimagining a health care system that prioritizes people and the planet." There is an "About Us" button at the bottom center.



Collaboration



- Knowledge
- Product selection and evaluation
- Reprocessing
- Manufacturers' instructions for use



Actions for IPAC

- Organizational
- IPAC Program
- ICP
 - Note for other healthcare workers, many elements of these items are applicable – IPAC is everybody’s business, and we need front-line input to push for the sustainable products we need!



Organizational Actions

- IPAC Program policies, procedures, and protocols include resource stewardship
- Organizational leadership:
 - Recognizes that sustainability is inherent in *quality* care
 - Includes environmental impact and sustainability in *risk-benefit* analyses of materials and processes
 - Establishes a *Sustainability Committee/Team*
 - Acknowledges *IPAC's contribution* to ecosystem damage
 - Includes *IPAC Team representation* on all sustainability projects
 - Supports IPAC input into the *multi-facility buyer groups*
 - Identifies *barriers and opportunities* to implement sustainable IPAC practices
 - Adheres to *government environmental policies*
 - Works to improve *staff literacy* in planetary health



IPAC Program Actions

Provide input into supply chain and procurement processes regarding product selection, (e.g., product evaluation committee, or similar), support ethical purchasing and sustainability, including:

- Awareness of their *ecosystem impact* (e.g., medical devices, sharps containers, medications [e.g., antibiotics], linens and detergents; and related processes such as recycling [especially plastics], disposal [e.g., antimicrobials], incineration, landfill [pollutants, bioaerosols])
- Recognition that *reuse is often the best strategy*, distantly followed by recycling and waste separation
- *Consideration that “biodegradable” items (e.g., gloves, masks) may not be better than conventional items, as their rapid biodegradation in anaerobic landfill conditions produces methane gas, which exacerbates climate change*
- Selection of *chemicals* (e.g., for environmental cleaning)
- Review of *manufacturers’ instructions for use*, considering products with safe reprocessing over those which, by their structure and function, could be reused but lack instructions
- Requesting *clear and consistent reprocessing guidelines*, environmental performance *metrics*, and details of ongoing *service*, and availability of *replacement* parts
- *Collaboration* with external partners to support extended *producer responsibility*



ICP Actions

The IPAC Professional should consider the environmental impact of products considered or in use, especially for IPAC best practices, including:

- Using recent *evidence*, including environmentally preferable and waste-sparing practices (e.g., [Choosing Wisely](#)) to *balance the desire to remove all infection risk at all costs with the need to protect planetary and population health*
- Focusing on *prevention* to conserve natural resources and reduce pollution
- Evaluating *costs and benefits* to both the environment and people, internally and externally
- Reflecting on practices to support sustainability, e.g., *personal risk assessment* for use of PPE
- Identifying opportunities to *minimize waste*, e.g. reducing PPE overuse, expiry, disposal of clean unused
- Reinforcing *hand hygiene and no-touch techniques* in preference to glove use
- Monitoring *reprocessing*, including cleaning, disinfection, and sterilization practices for quality and efficacy (accountability, excellence), and
- Engaging in *innovation*: participating in research in waste-reduction strategies, holding manufacturers *accountable*



Moving forward

- Increased sustainability literacy in ICPs and allied professions
 - Current
 - Students
- Consideration of the environmental impact of IPAC products and practices
- Working together for better products, including:
 - Reusable as default
 - Reprocessing instructions
 - Replacement parts
- Increasing focus on the impact of plastics on health
- (The impact of AI on electricity, water, land . . .)



Environmental Sustainability Challenges in Community Care

- Lack of sustainable funding may lead to ineffective short-term solutions, e.g.:
 - Inefficient procurement leads to having to get and use whatever is available
 - Staffing shortages may lead to new exposure . . .
- Unpredictable infection risks:
 - In home care:**
 - Client infections
 - Home care setting: hygiene, clutter, animals
 - Other people in the setting (e.g., spouse, children)
 - May lead to overuse/misuse of PPE
 - Especially gloves, masks, gowns
 - In day programs:**
 - Clients may hide symptoms
 - Symptoms may develop while onsite
 - Other clients and staff may be exposed





How can we act sustainably in community care?

- Community Care already lowers the overall carbon footprint of health care!
 - Community care prevents hospitalization
 - Localized care and rehabilitation reduces travel
- Sustainable procurement
- Collaborative action
 - [PEACH](#) (e.g., [webinars](#))
 - Ontario Health Teams
- At an individual level:
 - Best practices for IPAC, including hand hygiene, appropriate use of PPE
 - Up to date immunization
 - Educating others – peers, clients, families
 - Learning more yourself

Prevent Infection Transmission

Preventing transmission of infection results in less use of PPE, antibiotics, hospitalizations, etc.

10 Ways TO PREVENT INFECTION

- 1. **Keep personal items to yourself** (e.g., razors, toothbrushes, cups/drinks, lip gloss/balm)
- 2. **Clean your hands often**
- 3. **Keep yourself hydrated and skin moisturized**
- 4. **Get vaccinated**
- 5. **Keep your environment clean**
- 6. **Get fresh air**
- 7. **Practice food safety: Clean, separate, cook, chill**
- 8. **Stay home if you're sick**
- 9. **Cover your coughs and sneezes**
- 10. **Take your MEDS** (Meditate, Exercise, Diet, and Sleep)

APIC
The Association for Professionals in Infection Control and Epidemiology (APIC) is creating a safer world through the prevention of infection. APIC's nearly 16,000 members develop and direct infection prevention and control programs that save lives and improve the bottom line for healthcare facilities. APIC advances its mission through patient safety, education, implementation science, competencies and certification, advocacy, and data standardization. Visit us at apic.org.

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Arlington, VA 22202
www.apic.org
f in t y o i



Routine Practices

What we should be doing routinely – at **all times** and with all encounters - to prevent the spread of infection, including:

- **Risk Assessment**
- **Hand hygiene**
- **Personal Protective Equipment**
- **Control of the Environment** (Placement, Cleaning, Engineering Controls)
- **Administrative Controls** (Policies and Procedures, Healthy Workplace Policies, Respiratory Etiquette, Monitoring of Compliance with Feedback)

Risk Assessment

Risk assessment is what we should be doing with **every interaction** with a client:

- Also called ‘personal risk assessment’ (PRA) or ‘point of care risk assessment’
- Consider **what the client is doing**, e.g.,
 - Coughing, sneezing, speaking loudly
 - Appearing unwell, e.g., flushed, sweaty, new rash
 - Appearing unable to control body functions, e.g., confused, incontinent, belligerent
- Consider **what you are going to do to/with the client**, e.g.,
 - Sit facing for interview
 - Check temperature or other vital signs
 - Help with mouth care, cleaning up body fluids



Risk Assessment – How would you protect yourself?

- Touching body fluids or something contaminated them?
 - Hand hygiene & gloves
- Client is coughing and you can't stay 2 metres away?
 - Facial protection (mask & eye protection)
- Client is vomiting profusely and asking you for help?
 - Gloves, facial protection
- Client tells you that they think they have TB?
 - N95 respirator

Risk Assessment

Public Health Ontario | Santé publique Ontario
Partners for Health | Partenaires pour la Santé

This resource is an excerpt from the *Best Practices for Routine Practices and Additional Precautions (Appendix B)* and was reformatted for ease of use.

Performing a Risk Assessment Related to Routine Practices and Additional Precautions

An individual assessment of each client/patient/resident's potential risk of transmission of microorganisms must be made by all health care providers and other staff who come into contact with them. Based on that risk assessment and a risk assessment of the task, one may determine appropriate intervention and interaction strategies, such as hand hygiene, waste management, use of personal protective equipment (PPE) and client/patient/resident placement, that will reduce the risk of transmission of microorganisms to and from the individual.²⁸ When a client/patient/resident has undiagnosed symptoms or signs of an infection, interventions must be informed by organizational requirements.

Risk assessment steps to be performed by a Health Care Provider to determine an individual's risk of transmission of infectious agents and the rationale for associated protective measures

PERFORM A RISK ASSESSMENT	RATIONALE FOR ACTION
<p>Decision #1: Do I need protection for what I am about to do because there is a risk of exposure to blood and body fluids, mucous membranes, non-intact skin or contaminated equipment?</p> <p>Individual Risk Assessment #1</p>	<p>Intervention and Interaction #1:</p> <p>I must follow Routine Practices because there is a risk that I might expose myself to an infection that is transmitted via this route, or expose the client/patient/resident to my microorganisms (see algorithms)</p>
<p>Decision #2: Do I need protection for what I am about to do because the client/patient/resident has undiagnosed symptoms of infection?</p> <p>Individual Risk Assessment #2</p>	<p>Intervention and Interaction #2:</p> <p>I must alert someone about the client/patient/resident who has symptoms so that a diagnosis may be made, and I must determine what organizational requirements are to be put in place to protect myself and others.</p>
<p>Decision #3: What are the organizational requirements for this client/patient/resident who has an identified infection?</p> <p>Organizational Risk Assessment</p>	<p>Intervention and Interaction #3:</p> <p>I must follow the procedures proscribed for this infection to protect myself and others (see Appendix N).</p>

For more information please contact Public Health Ontario's Infection Prevention and Control Department at ipac@ohpp.ca or visit www.publichealthontario.ca

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This resource is an excerpt from the *Best Practices for Routine Practices and Additional Precautions (Appendix B)* and was reformatted for ease of use.

Routine Practices Risk Assessment Algorithm for All Client/Patient/Resident Interactions

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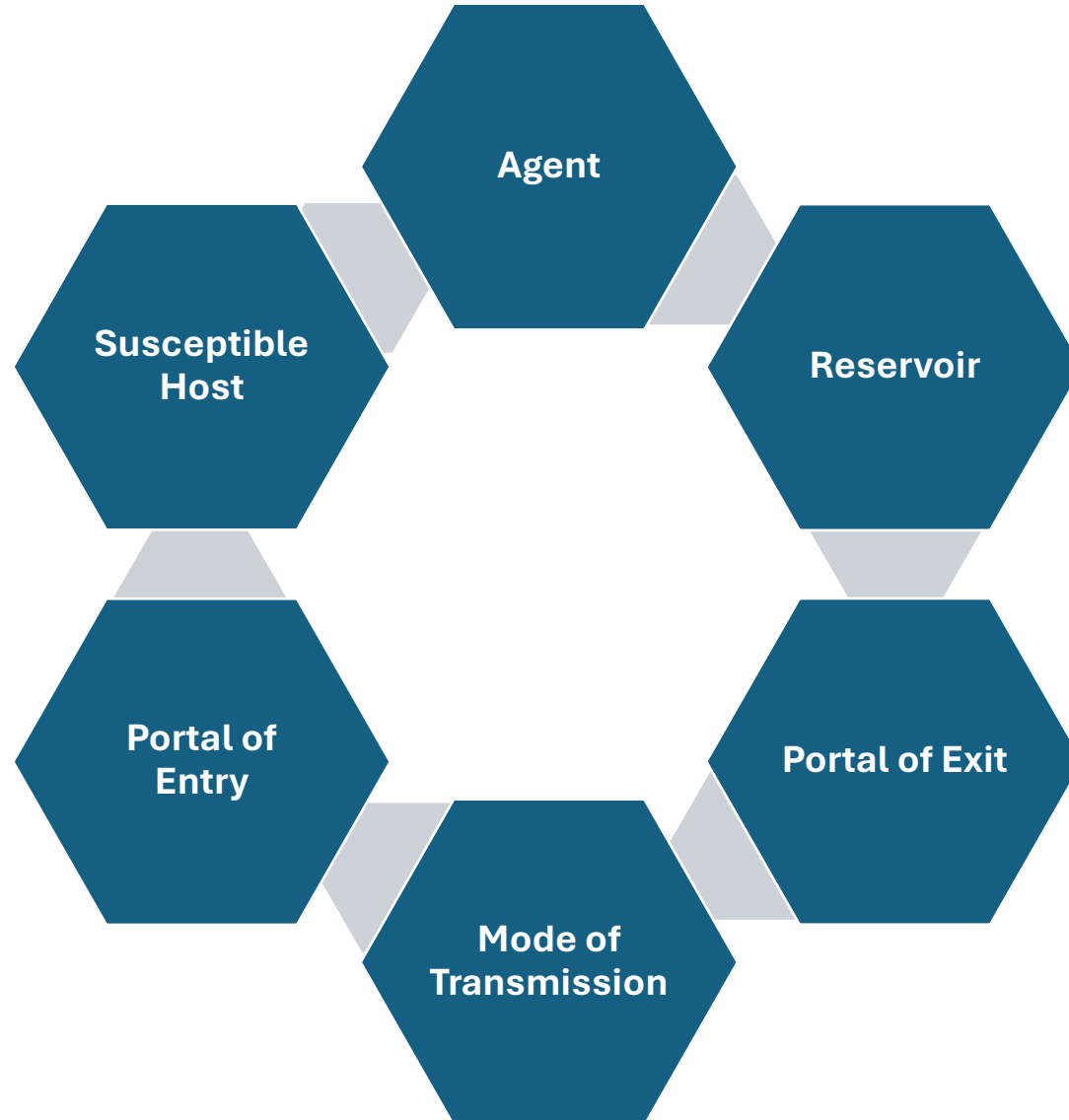
graph TD
    START([START]) --> A[Assess the anticipated interaction with the client/patient/resident (C/P/R) and/or their environment]
    A --> D1{Will I be exposing myself to a splash or spray of blood, excretions or secretions?}
    D1 -- NO --> D2{Will I have contact with the C/P/R's environment?}
    D1 -- YES --> D3{Will my hands be exposed to blood, excretions, secretions or contaminated items?}
    D2 -- NO --> E1((No further action required))
    D3 -- YES --> A1[Wear gloves Perform hand hygiene]
    D3 -- NO --> D4{Will my face be exposed to a splash, spray, cough or sneeze?}
    D4 -- YES --> A2[Wear facial protection]
    D4 -- NO --> D5{Will my clothing or skin be exposed to splashes/sprays or items contaminated with blood, excretions, secretions?}
    D5 -- YES --> A3[Wear a gown]
    D5 -- NO --> D6{Does the C/P/R have a known infection or symptoms of an infection?}
    D6 -- YES --> A4((Follow specific Additional Precautions))
    D6 -- NO --> E1
  
```

For more information please contact Public Health Ontario's Infection Prevention and Control Department at ipac@ohpp.ca or visit www.publichealthontario.ca

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Routine Practices – Chain of Transmission

- Agent - *bug*
- Reservoir – *where it grows*
- Portal of Exit – *way out*
- Mode of Transmission – *way about*
- Portal of Entry – *way in*
- Susceptible Host – *at risk person*



We need all of these to get infected!



Routine Practices

- Chain of Transmission – break the chain to prevent transmission!

1. Basic Principles

A. Mechanisms of Transmission of Microorganisms in Health Care Settings: The 'Chain of Transmission'

The transmission of microorganisms and subsequent infection within a health care setting may be represented by a 'chain', with each link in the chain representing a factor related to the spread of microorganisms. Transmission does not take place unless all six of the elements in the chain of transmission are present (Figure 1).

Transmission occurs when the agent, in the reservoir, exits the reservoir through a portal of exit, travels via a mode of transmission and gains entry through a portal of entry to a susceptible host.

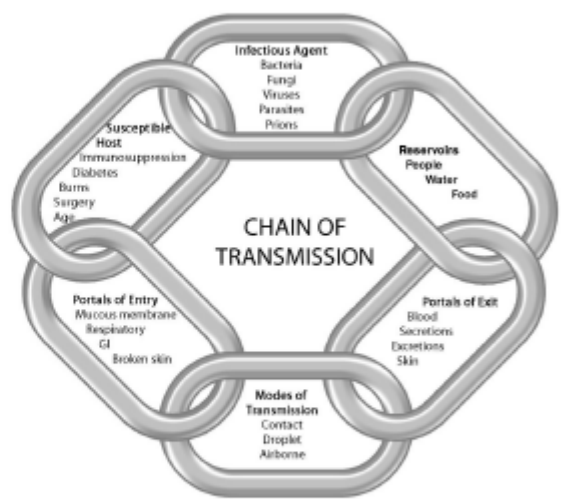


Figure 1: The Chain of Transmission

By eliminating any of the six links through effective infection prevention and control measures, or 'breaking the chain', transmission does not occur (Figure 2).

Transmission may be interrupted when:

- the agent is eliminated or inactivated or cannot exit the reservoir
- portals of exit are contained through safe practices
- transmission between objects or people does not occur due to barriers and/or safe practices
- portals of entry are protected
- hosts are not susceptible

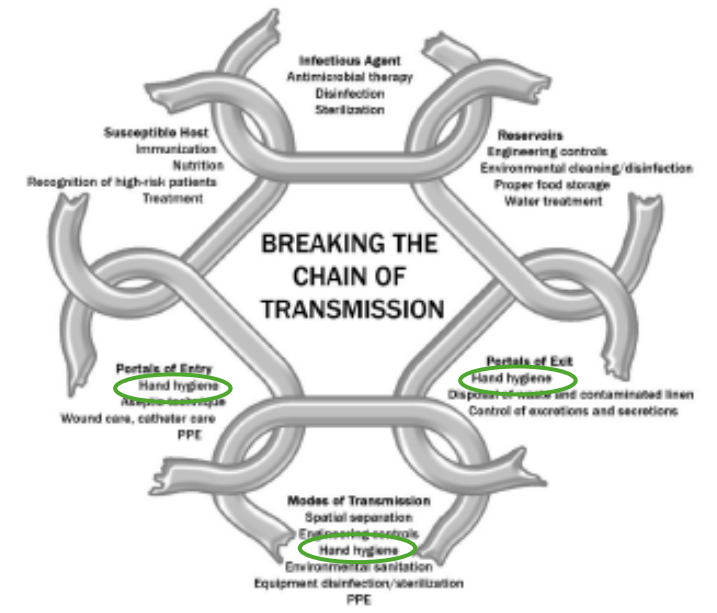


Figure 2: Breaking the Chain of Transmission

Routine Practices (to break the chain)

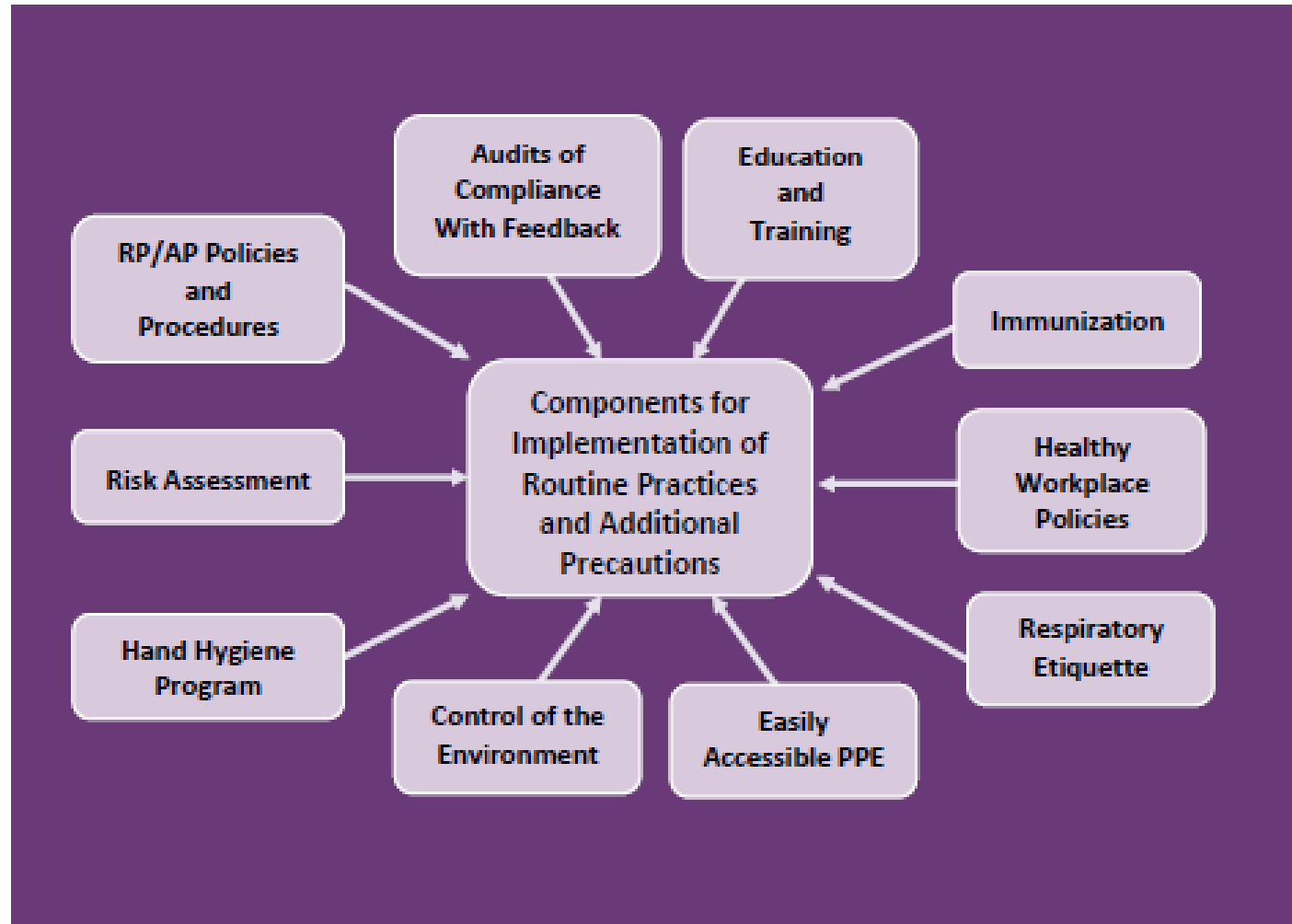
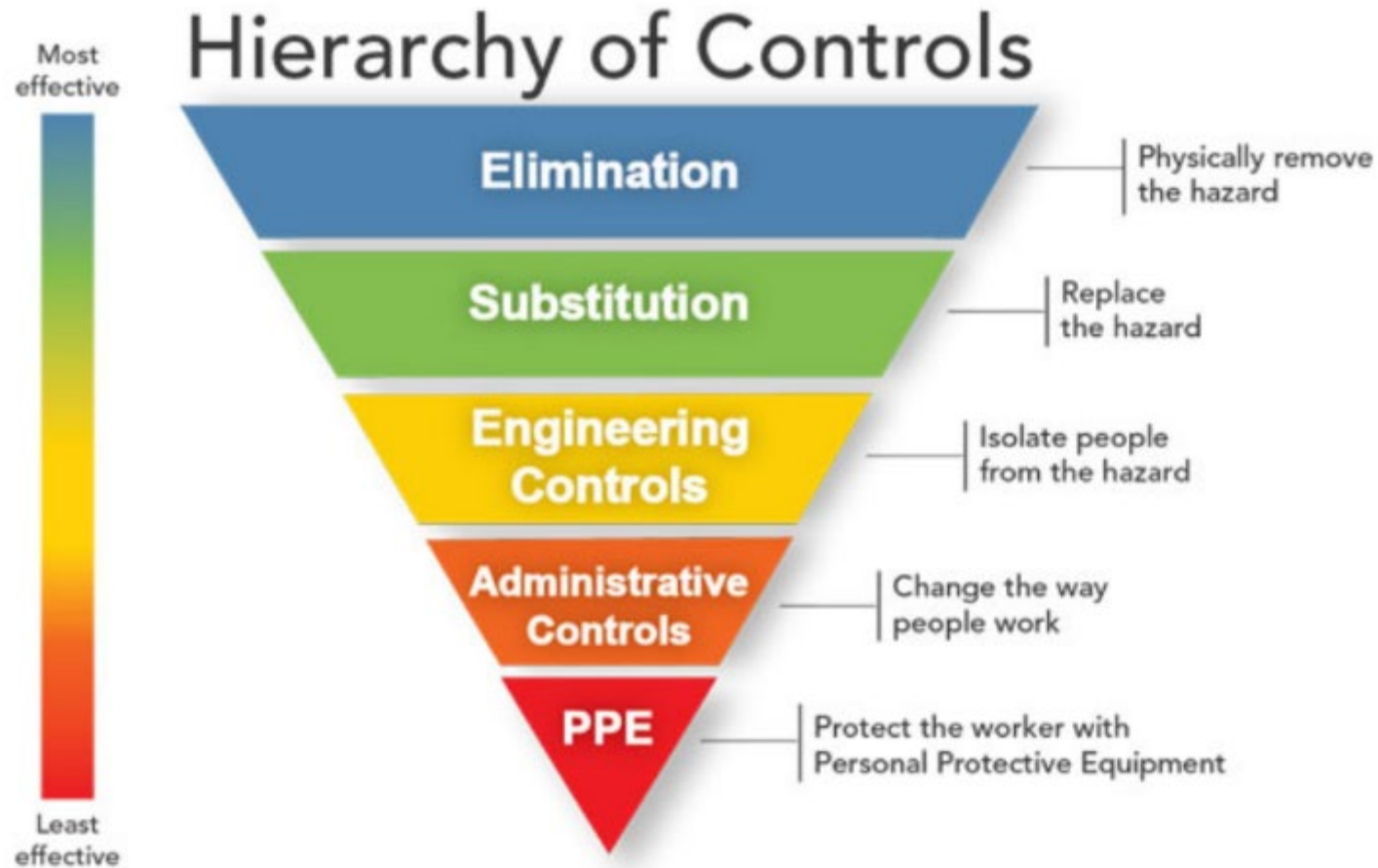


Figure 4: Components Required When Implementing Routine Practices and Additional Precautions

Routine Practices (continued)



Measures that remove the risk of exposure or infection at the source, e.g., **hand hygiene**, **immunization**, **staying home when sick**, using dedicated or single-use medical devices and biohazard sharps containers.

Measures that replace the risk of infection with safer alternatives, e.g., safety-engineered syringes/devices.

Measures in the physical environment that reduce the risk of exposure or infection, e.g., environmental cleaning and disinfection, optimizing indoor ventilation.


Policies, practices, and training that reduce infection risk, e.g., symptom screening, appropriate signage, sick leave policies, hand hygiene policies and education.


Wearing specialized equipment to reduce exposure risks, e.g., masks, eye protection, gowns, gloves, and respirators, based on a point-of-care risk assessment or when indicated.


Hand Hygiene


How to handrub

Rub hands for 15 seconds

- 


1 Apply 1 to 2 pumps of product to palms of dry hands.
- 


2 Rub hands together, palm to palm.
- 


3 Rub in between and around fingers.
- 


4 Rub back of each hand with palm of other hand.

Rub hands for 15 seconds


- 

5 Rub fingertips of each hand in opposite palm.
- 


6 Rub each thumb clasped in opposite hand.
- 

7 Rub hands until product is dry. Do not use paper towels.
- 

8 Once dry, your hands are safe.

 JUST CLEAN YOUR HANDS

For more information, please contact handhygiene@oahpp.ca or visit publichealthontario.ca/JCYH

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Hand rubbing with ABHR is gold standard for health care unless hands are visibly soiled

How to handwash

Lather hands for 15 seconds

- 

1 Wet hands with warm water.
- 

2 Apply soap.
- 

3 Lather soap and rub hands palm to palm.
- 

4 Rub in between and around fingers.

Lather hands for 15 seconds

- 

5 Rub back of each hand with palm of other hand.
- 

6 Rub fingertips of each hand in opposite palm.
- 

7 Rub each thumb clasped in opposite hand.
- 

8 Rinse thoroughly under running water.

- 

9 Pat hands dry with paper towel.
- 

10 Turn off water using paper towel.
- 

11 Your hands are now safe.

 JUST CLEAN YOUR HANDS

For more information, please contact handhygiene@oahpp.ca or visit publichealthontario.ca/JCYH

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4 Moments of Hand Hygiene

1. Before contact with person/environment
2. Before aseptic procedure (e.g., blood test, mouth care)
3. After risk of body fluid contact (e.g., after aseptic procedure, toileting assistance)
4. After contact with person/environment

Other times?


- After using the washroom
- Before and after food prep
- Before putting on and after taking off PPE
- Etc.

Your 4 Moments for Hand Hygiene



1 BEFORE initial resident / resident environment contact	<p>WHEN? Clean your hands when entering:</p> <ul style="list-style-type: none"> • before touching resident or • before touching any object or furniture in the resident's environment. <p>WHY? To protect the resident/resident environment from harmful germs carried on your hands</p>
2 BEFORE aseptic procedures	<p>WHEN? Clean your hands immediately before any aseptic procedure (e.g., oral dental care, eye drops, catheter insertion and changing a dressing)</p> <p>WHY? To protect the resident against harmful germs, including the resident's own germs, entering his or her body</p>
3 AFTER body fluid exposure risk	<p>WHEN? Clean your hands immediately after an exposure risk to body fluids (and after glove removal)</p> <p>WHY? To protect yourself and the health care environment from harmful resident germs</p>
4 AFTER resident / resident environment contact	<p>WHEN? Clean your hands when leaving:</p> <ul style="list-style-type: none"> • after touching resident or • after touching any object or furniture in the resident's environment <p>WHY? To protect yourself and the health care environment from harmful resident germs</p>

For more information, please contact handhygiene@whpp.ca or visit publichealthontario.ca/ICH





PPE: Gloves

For contact with body fluids/contaminated items/broken skin
Consider reducing misuse/overuse

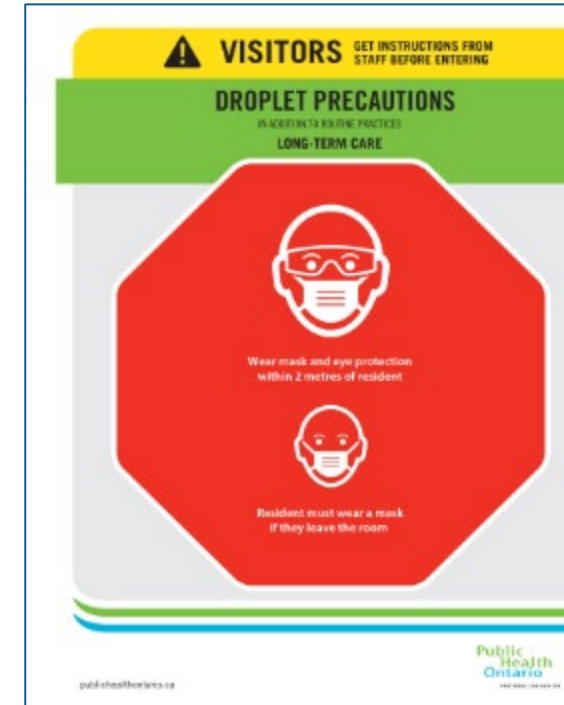
Appropriate Glove Use

- Appropriate to task
- Correct size
- Put on immediately before the activity
- Clean hands before putting on gloves
- Remove and discard immediately after the activity
- Hand hygiene immediately after glove removal
- Change or remove if moving from a contaminated to clean body site within the same client
- Change or remove after touching a contaminated site and before touching a clean site or the environment
- Do not wash or re-use gloves
- The same pair of gloves must not be used for the care of more than one client



Effective PPE Use

- Appropriate use of PPE:
- If the client is known or suspected of having a transmissible infection, Additional Precautions are required (in addition to Routine Practices):
 - Contact Precautions – gloves/gown
 - Droplet Precautions – mask, eye protection
 - Airborne Precautions – N95 respirator

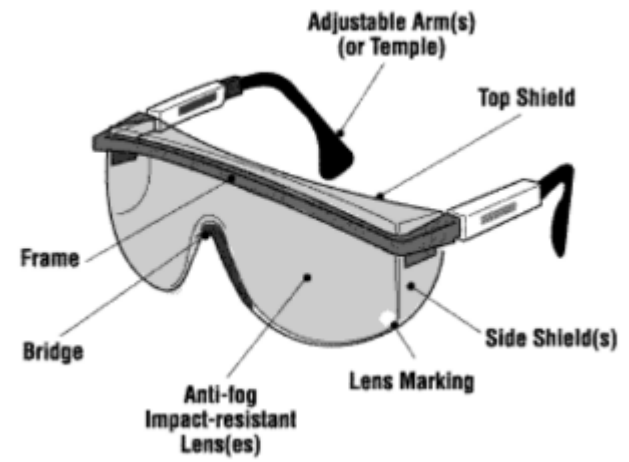


- Otherwise, make a risk assessment as per Routine Practices



PPE Use in Routine Practices

- Gloves: for contact with body fluids or items contaminated with them
 - Not a substitute for hand hygiene (which must be done before and after glove use)
- Mask: for risk of splashes or sprays to your nose or mouth
 - Also, for source control, e.g., if you have a cough
- Eye protection: for risk of splashes or sprays to your eyes
 - Consider reusable protective eyewear that you clean and disinfect yourself after each use
- Gown: for splashes or sprays to your arms or clothing
 - Would a plastic apron suffice (e.g., for showering, hair wash, etc. where it is water and not body fluids that are splashing)?



[CCOHS: Eye and Face Protectors](#)



Scenario #1 – Home Care

You are visiting Mrs. Green to provide an initial home care visit. Her notes state that she is 85 years old, with several chronic health conditions (diabetes and heart failure) and has limited mobility.

What would you do prior to your visit?

- Ask over the phone if she has any symptoms of infection (e.g., cold-like symptoms or upset stomach)?

What PPE would you bring with you to the visit?

- Gloves, medical mask, gown/apron, eye protection, ?N95
- Bring ABHR in case none is available in the home

What would you do on entering Mrs. Green's home?

- Hand hygiene
- Risk assessment
- Mask?



Scenario #2 – Day Program

Everyone in your seniors' day program is supposed to self-screen prior to arrival, and is screened again for infectious symptoms once they arrive. An hour after the program has begun, you notice Mr. Grey is coughing frequently.

What would you do?

- Clean your hands, put on a mask, and help Mr. Grey to move away from the rest of the clients
- Provide him with ABHR and a mask if he can tolerate it

What other actions would you take?

- Assess Mr. Grey for other symptoms of infection, e.g.:
 - Ask
 - Temperature
- Get him home

What would you do after Mr. Grey has left?

- Hand hygiene
- Thorough cleaning and disinfection of anything he touched and nearby surfaces



Summary

- Pollution (e.g., CO2 emissions, plastic) critically impact health
- IPAC has a major role in both creating and combatting this
- Environmental sustainability/stewardship aligns with IPAC practice/principles (e.g., risk assessment, ethical considerations)
- As healthcare providers, we can make a difference simply by cleaning our hands and using a risk assessment approach for mindful use of PPE

Let's be part of the solution!

