



Sustainability in infectious diseases, microbiology, and infection prevention

7 MAY 2026

Presented by:
Michael Kurz, Dr. Susan Poutanen, Dr. Shaqil Peermohamed



Sustainability in Healthcare

What is sustainability?

- Meet our needs today without endangering future generations.

How we do that at UHN?

- Since 1999, the Energy & Sustainability team, part of Facilities Management-Planning, Redevelopment & Operations (FM-PRO), collaborates across all sites and departments to foster a culture of sustainability.
 - Work with us! ... green@uhn.ca

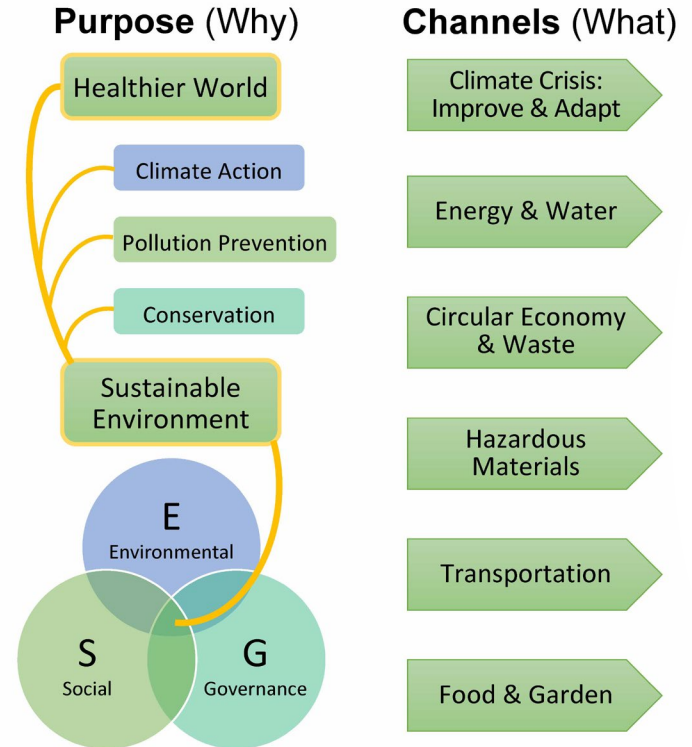
Now in UHN's Strat Plan!



Commitment to Inclusive and Sustainable Health Impact

Embedding diversity, equity and inclusion across UHN, creating a respectful and valued environment for all. To do so, we lead in environmental and social impact, integrating ESG leadership and acknowledging critical connections between social and environmental issues and evidence for a healthier, more resilient future.

A. STRATEGIC FRAMEWORK FOR SUSTAINABILITY AT UHN



Climate Change is a Threat Multiplier

- **Cause? Burning fossil fuels**
- Fossil Fuels: Oil, Gas, Natural Gas, Coal = climate pollution
- How: transportation, buildings, making/wasting material goods

Effects?

- Weirder, wilder, wetter weather
- Extreme storms, sea level rise
- Increased wildfires: ↑PM2.5
- Displaced people wildlife, extinctions
- Clinical: Vector-borne disease, Heatstroke, respiratory illness, Mental health
- Strains healthcare services & buildings



Cure? Climate Action

- Quickly transition from fossil fuels
- Electrify everything with clean electricity
- Use less energy and stuff
- Reuse/recycle what you can

<p>Vector-Borne Diseases</p> <p>Warmer climates expand the habitat of disease-carrying insects, leading to the spread of diseases such as malaria, Dengue fever, and Zika virus.¹¹</p>	<p>Respiratory Problems</p> <p>Poor air quality from pollutants and wildfires can worsen conditions like asthma, bronchitis, and other respiratory diseases.¹²</p>
<p>Heat-Related Illnesses</p> <p>Increased temperatures can lead to heat stroke, dehydration, and exacerbation of pre-existing health conditions.¹³</p>	<p>Water-Borne Diseases</p> <p>Rising temperatures and extreme weather can contaminate water sources, increasing the spread of cholera, diarrhea, etc.¹³</p>
<p>Food & Water Insecurity</p> <p>Extreme weather conditions can disrupt food production, leading to malnutrition and food insecurity, particularly in vulnerable communities.²²</p>	<p>Compromised Immune Systems</p> <p>Chronic stress and malnutrition due to climate-related factors can weaken immune responses, making populations more susceptible to infections and diseases.¹⁴</p>
<p>Mental Health Impacts</p> <p>Climate disasters (floods, fires, droughts) may lead to stress, depression, and climate anxiety.¹⁵</p>	

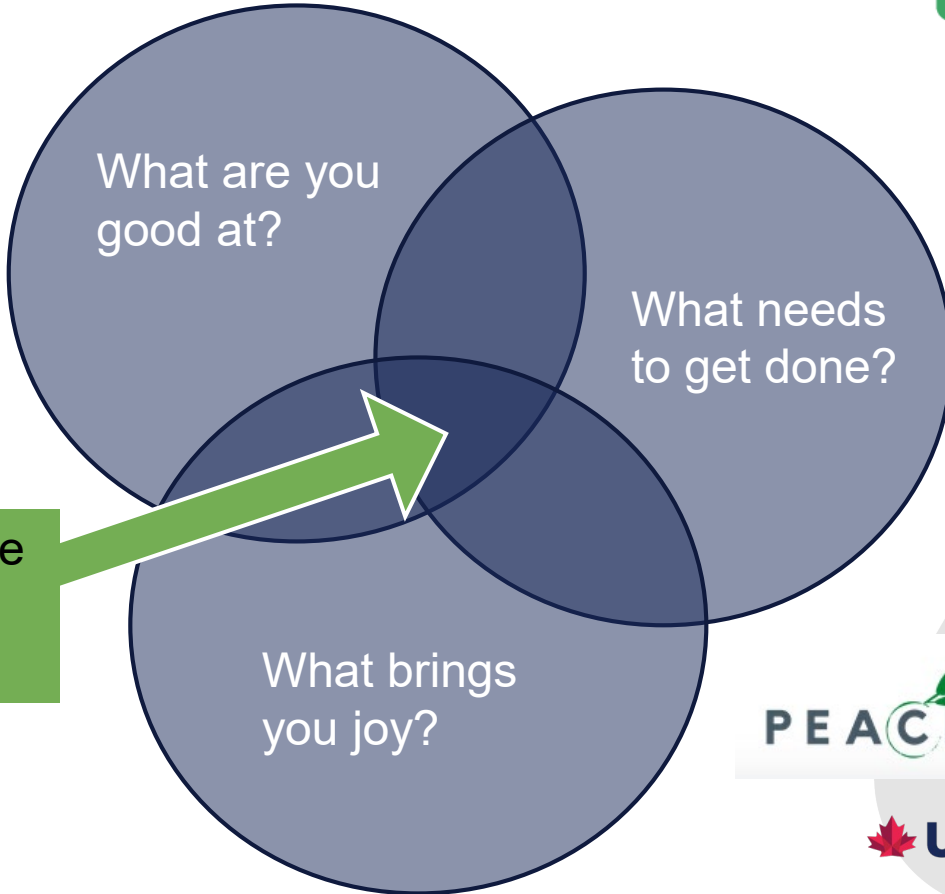
How many cars worth of GHG emitted by Canada's Healthcare sector?

A - 1 million cars

B - 10 million cars

C - 100 thousand cars

Climate Action – “How can I help?”



Sustainable climate action



The Canadian Coalition
for Green Health Care
Coalition canadienne pour
un système de santé écologique



my green lab.

Choosing
Wisely
Canada



SYNERGIE SANTÉ
ENVIRONNEMENT

CASCADES

PEACH



COLLABORATIVE CENTRE FOR
Climate, Health +
Sustainable Care



5R's Ranking Waste



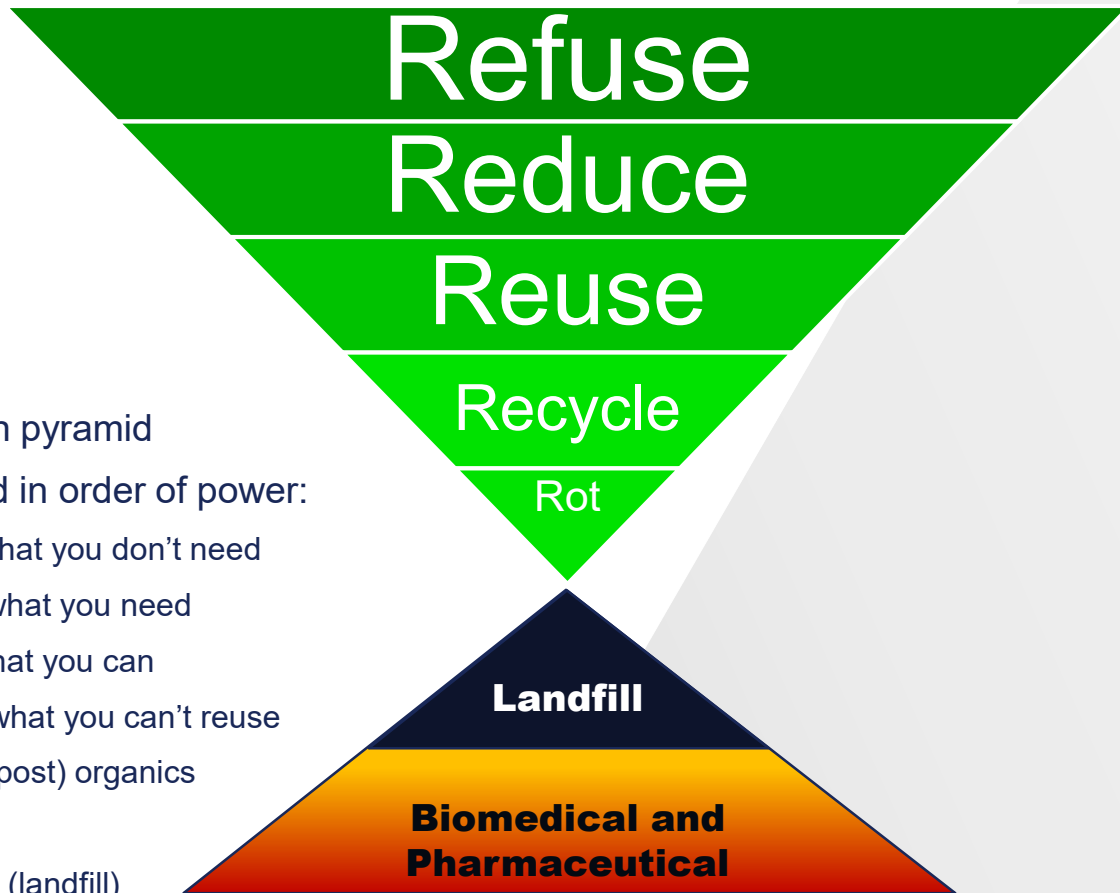
Upside-down pyramid

R's weighted in order of power:

1. Refuse what you don't need
2. Reduce what you need
3. Reuse what you can
4. Recycle what you can't reuse
5. Rot (compost) organics

Then Garbage (landfill)

Lastly, Hazardous waste



Linear Economy → Circular Economy

Linear Economy:

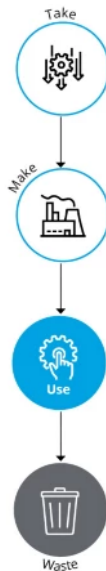
- Take > Make > Use > Waste
- No problem if we had 5 planets' worth of resources

Circular Economy:

gentler on resources, less/no waste

- Reduce, minimal take
- Reuse
- Refurbish
- Repair (right-to-repair, parts available)
- Recycle
- Remake
- Limited extraction of new materials

LINEAR ECONOMY



CIRCULAR ECONOMY



Green Procurement: Buying Better

The triple bottom line.



- Key concepts
 - Circular economy
 - Life-cycle costing:
 - Total cost of ownership
 - \$100 widget lasts 3x a \$50 version
 - \$100 is cheaper than \$50
 - Triple bottom line: People/Planet/Prosperity
- **(Put in your RFPs!)** Favour suppliers, products & services that lower their environmental impacts. Procurement has a green guide with ?? on:
 - **Energy efficient**
 - **Right to repair!!!** (*parts available/replaceable for 5+ years)
 - Reusable
 - Recyclable
 - Fewer/no toxic materials
 - Less packaging (ask vendors)
 - 3rd Party Eco-Certified



Life-cycle costing: Total cost of ownership



The Value of Recycling



- **Higher Value:** please save these ALL the TIME
- **eWaste**, Scrap Metal, batteries
- Metal cans, glass bottles(empty)
- Cardboard, paper,
- hard plastics



- **Lower Value:** and why NOT recycled everywhere
- Coffee Cups
- Soft Plastics
- Styrofoam
- Mixed materials



is there a reusable option?

Reminder! It might be gloves. It's always hand hygiene!



< GLOVE UP WISELY >

WHEN TO USE GLOVES

USE GLOVES WHEN HANDLING BLOOD, BODY FLUIDS, OR CONTAMINATED ITEMS.

NECESSARY FOR DEALING WITH TOXIC MEDICATIONS AND CERTAIN INFECTION PREVENTION TASKS.

IMPORTANCE OF HANDWASHING

HANDWASHING IS THE BEST WAY TO PREVENT INFECTIONS.

OVERUSING GLOVES CAN LEAD TO IMPROPER HAND HYGIENE AND INCREASED INFECTION RISK.

WHEN NOT TO USE GLOVES

NO GLOVES NEEDED IF THERE'S NO RISK OF EXPOSURE TO BLOOD, BODY FLUIDS, OR CONTAMINATION.

ACTIVITIES LIKE MEASURING BLOOD PRESSURE, GIVING INJECTIONS, BASIC PATIENT CARE, AND DISTRIBUTING FOOD DON'T REQUIRE GLOVES.

ENVIRONMENTAL IMPACT

UHN SPENDS \$4 MILLION ANNUALLY ON 66.5 MILLION GLOVES. BY IMPLEMENTING STEWARDSHIP PRACTICES, WE COULD SAVE \$720,000 PER YEAR AND REDUCE GLOVE WASTE BY 12 MILLION.



Minimize healthcare waste



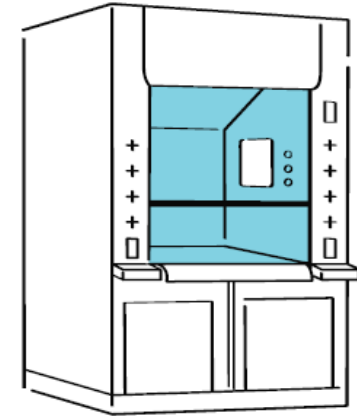
Promote the appropriate time for glove use



Wash your hands



Leadership support and guidance



Mike cleans his home (of climate pollution)

- Added attic insulation
- Replaced gas hot water tank w/ electric
- Replaced gas stove w/ induction
- Replaced AC with Heat Pump
- Total cost was under \$10,000
- Saving \$200 per year on utilities and \$100 per year on insurance
- Eliminated 4.5 tonnes/yr CO2 (like taking 1.5 cars off the road)



Thank you!

DRAFT Choosing Wisely Statements – Sustainability in Medical Microbiology

Susan Poutanen on behalf of Deborah Yamamura,
Philippe Lagacé-Wiens, Larissa Matukas



**AMMI
Canada**

Healthcare Stewardship
Resource Committee

TIBDN TORONTO
INVASIVE
BACTERIAL
DISEASES
NETWORK
Education Day
May 7, 2026

Industry Disclosures 2023-2026

- **Advisory Board/Consultant/Speaker**
 - Bruker
 - bioMérieux
 - AbbVie
 - Xediton
- **Family Member**
 - Signal1

Learning Objectives

By the end of this session, you should be able to:

1. List resources for green and sustainable clinical laboratories
2. Describe DRAFT AMMI Canada Choosing Wisely Statements on Sustainability in Medical Microbiology



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EFLM GUIDELINES FOR GREEN AND SUSTAINABLE MEDICAL LABORATORIES

Ed. 2022

PRODUCED BY THE EFLM TASK-FORCE GREEN LABS



SUSTAINABILITY IN LABS

Transform your lab: sustainable science starts here

Whether you are new to lab sustainability or ready for a refresh, explore practical actions, success stories, and expert tools to start greening your lab today.

THE SUSTAINABLE LAB PLAYBOOK

<https://greenlabs.eflm.eu/documents/EFLM-GREEN-LAB-BOOKLET-ENG.pdf>

<https://mygreenlab.org/programs/mgl-certification/certification-sign-up/>

Final Program Programme final



Calgary
20 Years of 2025
Collaboration and Engagement

09:00 - 10:00 **THE IMPACT OF CLIMATE CHANGE ON THE DELIVERY OF LAB MEDICINE IN CANADA**



Moderator:

Jessica Forbes (ON)

Speakers:

Shawn Clark (ON)

Sheri Scott (UK)

At the end of this session, participants should be able to:

- Describe the impact of climate change on epidemiology of infectious diseases in Canada.
- Discuss the impact of climate change on delivery of clinical and lab services in Canada.
- Consider the impact of clinical/laboratory medicine on climate change.

Environmental Stewardship, Sustainability, and Planetary Health Related to IPAC

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}

Published in 2025

https://ipac-canada.org/wp-content/uploads/2025/07/2025Mar31_Environmental_StewardshipSustainabilityandPlanetaryHealth_Position-Statement.pdf



**AMMI
Canada**

**Healthcare Stewardship
Resource Committee**

- **Jerome Leis (Chair)**
- **Shaqil Peermohamed**
- **Philip Lam**
- **Wayne Gold**
- **Marie-Félix Granger**
- **Susan Poutanen**
- **Philippe Lagacé-Wiens**
- **Deborah Yamamura**
- **Larissa Matukas**
- **Riccarda Galioto**

Sustainability in Microbiology

- ① **Don't use single use devices in laboratories when reusable environmentally-friendly options are available**



Rationale

- Single use plastics (e.g. inoculating loops, petri dishes, assay consumables) contribute to plastic waste, microplastic burden, and if incinerated, greenhouse gas production
 - Petri dishes contribute to 16,590 kg of CO₂ emission/yr
- **Use sustainable or reusable or bioplastic alternatives e.g. use bamboo toothpicks, NiChrome or platinum inoculation loops, bioplastic alternative labware (e.g. Planet-Safe[®])**

Sustainability in Microbiology

② Don't leave on laboratory instruments and equipment at the end of the day if they are not being used.



Rationale

- Clinical laboratories use 3-6 times more energy/m² than a typical office building; unused but activated equipment represents wasted energy and unnecessary greenhouse gas production
 - **Shut down BSCs, fume hoods, water baths, heating blocks, incinerators, unused incubators, thermocyclers, extractors**
 - **Turn off lights and adjust heating/cooling**
 - **Use “sleep” mode for overnight energy savings for computers or shut down if >24 hrs**

Sustainability in Microbiology

③ Don't use laboratory instruments and equipment that are not energy-efficient and that are not routinely maintained.



Rationale

- Energy efficient equipment that is properly maintained will use less energy and reduces costs and greenhouse gas emissions
 - **When purchasing new equipment, consider energy efficiency**
 - **Maintain regular maintenance for all equipment to ensure running at peak efficiency**
 - **Request for proposals should include energy efficiency, minimal packaging, minimal plastic waste, reusable components**

Sustainability in Microbiology

- ④ **Don't discard non-biohazardous waste into biohazardous waste receptacles.**



Rationale

- 85% of healthcare waste is non-hazardous waste; laboratory waste is put into landfills if non-hazardous, incinerated if bio-hazardous with by-products of atmospheric pollutants, or discarded safely to remove the potential for environmental leaching if hazardous chemicals
- **Ensure waste is sorted appropriately into non-hazardous, biohazardous, and chemical waste**
- **Reduce waste quantity; redistribute surplus materials; recycle materials**

Sustainability in Microbiology

⑤ Don't order unnecessary microbiology tests.



Rationale

- 21% of laboratory testing is estimated to be unnecessary; reducing this will result in reduced carbon emissions by decreasing energy consumption, volume of consumables, and waste
- **Develop diagnostic stewardship initiatives:**
 - reducing unnecessary repeat testing (urine C&S, ETT C&S, NP swabs for viral and low yield tests (e.g. stool C&S, O&P from inpatients))
 - **Utilize EMR to develop interventions to reduce unnecessary ordering**

Sustainability in Microbiology

⑥ Do participate in My Green Lab Certificate or other similar programs to help reduce the environment.



CERTIFICATION PROGRAM

My Green Lab[®] Certification

Join 5,000+ certified labs committed to sustainable science. Cut costs, improve efficiency, and embed green practices with the globally recognized lab certification.

[START CERTIFICATION](#)

Simple actions, big impact

Daily lab practices can lead to measurable environmental and cost-saving benefits. Here's the impact of key green lab actions.

<https://mygreenlab.org/programs/mgl-certification/certification-sign-up/>

Learning Objective

By the end of this session, you should be able to:

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Choosing Wisely and Climate Action for Infectious Diseases

- Infectious disease physicians are increasingly confronted with the consequences of a changing planet
- Urgent need to integrate **planetary health** principles into infectious disease practice
- Practical, actionable strategies for infectious disease physicians to align their day-to-day practice with the goals of planetary health
- Four key domains: **medications, waste reduction, travel, and energy use**

Medications: Don't prescribe intravenous (IV) antibiotics for patients who can safely be treated with an oral option, given that IV antibiotics have a higher carbon footprint.

- Evidence supports safe use of oral antibiotics
- Benefits to our patients, healthcare system, and planet



Medications: Don't pour antibiotics down sinks, toilets, or drains and don't dispose of antibiotics in the trash.

- Improper disposal of antibiotics poses serious risks to both human and environmental health
- UNESCO has identified antibiotics as emerging pollutants in wastewater due to their widespread ecological impact
- Regulated medication return programs
- Collaboration with local waste management



Medications: Don't delay or avoid recommended vaccinations given immunization prevents disease outbreaks that increase healthcare utilization and environmental impact.

- Planetary health benefits of vaccines
- Impact of climate change



Waste Reduction: Don't use non-sterile disposable gloves when hand hygiene is sufficient.

- Gloves are often used unnecessarily during routine healthcare interactions
- Risks of overusing gloves
- Disposable gloves and contribution to healthcare carbon footprint



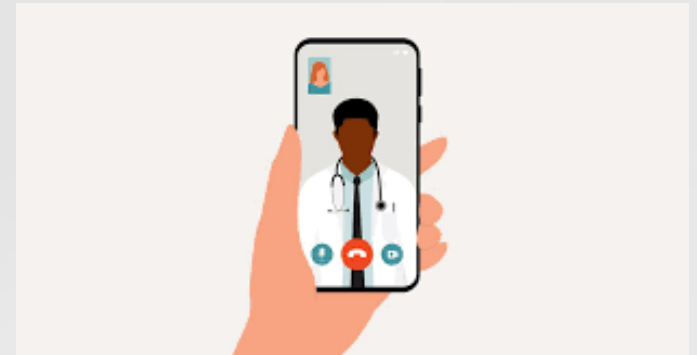
Waste Reduction: Don't print prescription or educational materials when providers and patients have access to digital communication.

- Transitioning to digital systems
- Benefits of digital prescribing, documentation, and communication
- Judicious paper use – simple yet effective



Travel: Don't book in-person appointments when a virtual visit is clinically appropriate.

- When safe and appropriate, virtual care is clinically effective
- Environmental benefits of virtual care



Travel: Don't book multiple specialist appointments on separate day patient visits when these can be coordinated into a single trip or multi-disciplinary clinic.

- Benefits of coordinating appointments on the same day when clinically feasible
- Care coordination strategies



Energy Use: Don't routinely perform repeat imaging for intra-abdominal infections, vertebral osteomyelitis, and epidural abscesses post-debridement given imaging is carbon intensive.

- Role of repeat medical imaging and environmental implications
- Reducing unnecessary imaging aligns with antimicrobial stewardship and planetary health principles.





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