

PROJECT CHARTER

Planetary Health Rounds

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Goal

1 What do you want to achieve?

This goal of this project is to implement an educational intervention within the Medical Teaching Unit (MTU) block at Dalhousie University. Using the familiar structure of Rounds, the Planetary Health (PTH) Rounds model provides dedicated time for residents going through the MTU to discuss and learn about the impacts of healthcare on climate change, while also considering the impact of climate change on patient health. Guided by a champion with clinical expertise and knowledge of healthcare sustainability, the case analysis and ensuing conversation focuses on identifying potentially unnecessary and/or low-value care and opportunities to provide care with the same, or improved, patient outcomes that is more environmentally sustainable.



Goal

1 What do you want to achieve?

This educational intervention uses the HealthcareLCA database, an open-source repository of published life cycle assessment (LCA) literature related to healthcare services, products and processes. LCAs provide information on different environmental impact categories, including global warming potential from GHG emissions. Some caveats apply when using this information to better understand healthcare's environmental impact:

Generalizability of estimated GHG emission calculations

The data and studies from the LCA literature may not apply directly to the MTU context, necessitating cautious interpretation of the findings as rough approximations meant to guide discussion. Learners must be encouraged to consider the limited generalizability of GHG emission estimates in the studies and to consider how local context, processes and power sources impact the estimates. Factors to consider when comparing your hospital to the site or region in which a study was performed include (but are not limited to) differences in:

- Electricity grids
- Supply chains, including transportation and packaging
- Waste management practices
- Test batching (e.g. are routine chemistry tests, such as electrolytes and creatinine, batched as a single test)

Focus on GHG emissions

LCAs conduct cradle-to-grave analyses of healthcare interventions to better understand many facets of interventions' impacts on the environment. GHG emissions and global warming potential is only one impact category that is measured by LCA. Given the introductory nature of this project, assessing and discussing other impact categories (such as ocean acidification or eco-toxicity potential) of healthcare interventions was not included. GHG emissions were chosen as the metric of focus as they are widely available in LCA publications, provide a standardized numeric way of assessing impact on climate (i.e. CO₂e), and can be easily converted to understandable terms to generate interest in the subject. Given the urgency of climate change, a focus on global warming potential is appropriate.



Scope

2

Define the limits of what you want to be included in the project and consider the environmental impacts you are targeting for change.

Project Scope: This project integrates planetary health (Pth) education into the MTU via monthly Pth rounds led by junior residents rotating on the MTU. A preparatory session early in the MTU block, led by senior internal medicine resident Pth champions, equips learners with an understanding of how to use the HealthcareLCA database to find published literature that provides estimates of GHG emissions, and to contextualize the environmental impact using a GHG equivalency calculator. The focus of Pth rounds is a case-based analysis meant to highlight ways in which climate change may have impacted the patient's health, estimate the environmental impact of healthcare interventions, and identify potentially unnecessary care or deviation from best practices to fuel discussion about instances in which high-quality patient care could have been delivered using more sustainable alternatives.

Objectives:

- 1. Understand the GHG emissions associated with care:** Use the HealthcareLCA database (and other relevant sources), to get information on the environmental impact of routine practices and materials on the MTU
- 2. Understand the impact of climate change on patient health:** Discuss the ways in which climate change is impacting the health of patients on the MTU, facilitating a more comprehensive approach to patient care.
- 3. Identify Low-value Care:** Identify clinical practices that did not benefit patients and discuss opportunities to provide high-quality care that has implications for environmental sustainability.
- 4. Connect, Educate and Build Awareness:** Use Pth Rounds to disseminate knowledge amongst the broader healthcare team on the impact of climate change on health and the GHG emissions associated with various care practices; generate interest from other clinical groups on developing their understanding of planetary health; and match Pth educational champions with opportunities to collaborate and teach interdisciplinary groups (e.g. nursing education days, pharmacy society grand rounds, etc.)



Scope

2

Define the limits of what you want to be included in the project and consider the environmental impacts you are targeting for change.

Exclusions: The following will not be included in the P+H Rounds:

Current Patients: The project will not include the review of current inpatients to ensure patient care practices and clinical decisions are not biased.

Measuring changes to GHG emissions from the MTU: this project aims to improve understanding of the link between healthcare practices and GHG emissions but will not measure changes to healthcare practices that arise from new knowledge acquisition.

Beyond MTU: While the project may offer insights applicable to other departments, its primary focus is on the MTU setting and its specific practices.

Non-clinical hospital practices: Scope 2 emissions (i.e. electricity use, hospital infrastructure energy requirements), and other emissions sources like food services are not included in GHG estimations presented in each case analysis. Analysis and discussion are limited to interventions that the care team has the direct ability to modify for future practice. Transportation related emissions may be inconsistently reported and discussed (i.e. if patients arrived by ambulance or if they required a procedure at a different site, this may be included in the analysis and discussion as directly related to a clinical intervention).



Problem/Opportunity Statement

3 Briefly state the problem you want to solve or the opportunity you want to realize.

Climate change is a threat to health and wellbeing. In Canada, the healthcare sector contributes a significant portion (around 5%) of the nation's greenhouse gas (GHG) emissions (1). This environmental impact highlights the need for initiatives aimed at reducing the GHG emissions of the healthcare industry. Medical learners have expressed interest in understanding how they can contribute to minimizing these emissions (2–6). Furthermore, the Royal College of Physicians and Surgeons of Canada has recognized planetary health as an emerging concept to be integrated into the next iteration of CanMEDS competencies (7). The Canadian Society of Internal Medicine, in collaboration with Choosing Wisely Canada, has released eight evidence-based recommendations aimed at making internal medicine practice more environmentally friendly (8), highlighting the significant potential sustainability impact of changing the way internists practice. Up to 30% of patients receive tests, treatments, and procedures that are potentially unnecessary (9) and can lead to harm; these also have implications for healthcare GHG emissions. Given the context, there is an opportunity to embed sustainability curriculum into core internal medical rotation, educating trainees about healthcare's environmental impact and the connection between climate change, health and internal medicine.



Current State of the System/Process

4 What do things look like today?

The Medical Teaching Unit (MTU) block in internal medicine residency offers a unique chance to teach residents about delivering high-quality patient care while identifying evidence-based opportunities to reduce healthcare's environmental impact. Residency training plays an important role in teaching doctors about resource stewardship and appropriate care, and published frameworks have included non-bedside, case-based sessions as a means of integrating this subject matter into curricula (10). However, in speaking with leaders in medical education, no formal curricula on teaching GHG-reducing practices were identified in Canadian teaching units. This gap highlights a missed opportunity to integrate environmental education into medical training, preparing future healthcare professional to incorporate sustainability into their practice.



Root Cause Analysis

5 What gets in your way?

Lack of formal educational curricula on teaching unit

Despite the interest residents have in learning about ways to provide the best quality patient care that is also environmentally sustainable, there is no formal opportunity in curricula to discuss the GHG emissions of healthcare provision and the opportunity to mitigate those emissions through evidence-based interventions.

Workload and lack of protected time for non-patient care activities

The increasing demands on internal medicine services since the pandemic have led to heavy workloads for resident physicians, limiting their ability to engage in non-patient care activities like PTH rounds.



Design the Improvement & Define Change Ideas

6 What are your ideas to achieve your goals, address your root causes and close the gap from your problem statement?

Lack of formal education in curricula on teaching unit

Recognizing the gap in the curriculum, this project aims to introduce an innovative educational intervention within the MTU block. Using a case-based rounds format, learners are engaged in discussions around identifying unnecessary or low-value care that contributed to GHG emissions and identifying opportunities that provide high-quality patient care while increasing the potential for environmental sustainability.

Workload and lack of protected time for non-patient care activities

Climate action education sessions must be prioritized and viewed as valuable opportunities for reflection and learning, not additional burdens. We have advocated for adjustments in clinical operations to ensure protected time for PTH rounds and other structured MTU teaching sessions.



Design the Improvement & Define Change Ideas

6 What are your ideas to achieve your goals, address your root causes and close the gap from your problem statement?

Embedding Planetary Health Rounds (PTH Rounds) into a clinical teaching unit in Five Steps

1. Prep learners

Resident champion(s) introduce the concept of Planetary Health and the bi-directional relationship of healthcare and climate change to junior learners early on their MTU block. Discuss resources like the Healthcare LCA database and introduce learners to the format and outline for PTH Rounds.

[View the preparatory slide deck](#)

2. Select a case

Encourage learners to select common internal medicine clinical presentations to facilitate broad discussion. To prevent bias on clinical decisions, the patient selected should be discharged prior to PTH Rounds.

3. Estimate GHG emissions

Learners complete a full chart review extracting data about medications, imaging, lab work, transportation and length of stay. They then use the [HealthcareLCA database](#) to find information on the units of carbon dioxide equivalent (CO₂e) of similar tests, procedures, medications, and other data. A calculator, (such as the Environmental Protection Agency's [Greenhouse Gas Equivalencies Calculator](#) or Natural Resources Canada's [Greenhouse Gas Equivalencies Calculator](#)) is used to convert the CO₂e units into easily understood values.



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4. Present findings

Monthly PtH Rounds are embedded into the teaching schedule near the end of the MTU block. Learners, attending staff and healthcare team members on the MTU gather in person and virtually for the case presentation. Presenting learners identify what impacts climate change may have had on the patient prior to hospital admission and describe the estimated GHG emissions based on the chart review.

[Link to example case review](#)

5. Guide Discussion

The presence of a PtH Rounds champion, with clinical expertise and knowledge of planetary health, is critical to provide additional context and facilitate group discussion around structured questions, including:

- What areas contributed the most to the total emissions for each stay?
- What tests/treatments were potentially unnecessary?
- How can climate change's local and global impact be mitigated for this patient?
 - Preparing patients with weather adaptation strategies (i.e. "hot day" medication lists, air filters, cooling techniques)
 - Discussing optimal prescription medication use/deprescribing
 - Informing on plant-forward diets that support health
- How can we modify future care practices for similar patients to reduce unnecessary interventions contributing to emissions?



Measure & Test Impact

7 How will you estimate the impact of your changes?

What are you trying to accomplish?	What environmental impacts are you hoping to mitigate through this change?	Metrics required to assess impact	Data sources for metrics	Timeline for/frequency of data collection
Educational intervention	Through participating in P+H Rounds, residents and other members of the MTU learn about the impact of climate change on health and healthcare's contribution to climate change. Participation also allows for learning about low-value care and opportunities to provide care with the same, or improved, patient outcomes that is more environmentally sustainable.	Knowledge gained Intent to change Changes to attitudes and beliefs about climate change and health	P+H Rounds evaluations Pre/post implementation survey	After each P+H Rounds session Before implementation and 18 months post-implementation



Measure & Test Impact

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Results

Overall, PTH rounds were successfully implemented in five out of seven blocks during the pilot phase (excluding the December holiday block, and March break block). Full and consistent attendance of MTU learners was supported by protecting time and space for rounds and catering each session with a plant-forward lunch. Attending physician and other health team member attendance at rounds varied based on clinical activities of the day, and provision of advanced notice of rounds in the morning. Despite the intention of a hybrid format, suboptimal technology created a barrier to fulsome attendance virtually for off-site attending physicians and Green MTU project team members, who found it challenging to listen to and participate in the discussion.



Measure & Test Impact

7 How will you estimate the impact of your changes?

Post-attendance evaluation

1. Knowledge gained: Most participants (92%) agreed or strongly agreed that they gained new knowledge and/or skills
2. Intended changes: The majority of responses indicated a positive intention to change practices, with common themes including advocating for early and safe discharge, critically considering the necessity of tests, and minimizing unnecessary investigations and paper waste. Suggested changes aimed to reduce the environmental impact without compromising patient care, demonstrating a high level of engagement with the session's objectives.
3. Barriers to implementation: Anticipated barriers mentioned included systemic issues, such as slow system changes at administrative levels, organizational resistance, and financial barriers. Specific challenges like systemic barriers to reducing length of stay, fear of "doing nothing" (actively changing care) on admission days, and resistance from older healthcare members were noted.
4. Overall rating: The session was rated positively, with an average rating of 'good' to 'excellent'. A notable 8% did not agree with the session's impact, either because their current actions were already aligned with sustainable practice or due to anticipated systemic and financial barriers limiting their ability to change practice.
5. Suggestions for Improvement: Recommendations for improvement included providing more resources before the session, implementing calculators to measure GHG emissions, expanding the topics covered, and increasing interactivity. A need for more tangible ideas to reduce emissions, balance of open discussion, and addressing session length was also expressed, requesting more time for active learning and discussion.



Measure & Test Impact

7 How will you estimate the impact of your changes?

Pre/post implementation

We intend to conduct a follow-up evaluation to assess the impact of embedding PTH Rounds on the MTU on the attitudes, beliefs and culture around climate change of the internal medicine program. This evaluation is planned for the Spring of 2025. See below for pre-implementation survey results of internal medicine residents:

Question	Strongly disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I consider environmental sustainability as an important dimension of quality patient care	0%	0%	0%	17%	33%	28%	22%
I can list a few examples of the effects of climate change on human health	0%	0%	0%	6%	17%	39%	39%
I know what healthcare professional in my field can do to take action to reduce negative environmental impacts	0%	6%	28%	22%	22%	11%	11%
I know how to best inspire other to be interested in climate change issues	6%	22%	39%	6%	17%	11%	0%
I apply climate change principles in my healthcare practice	0%	22%	28%	22%	22%	6%	0%
I apply climate change principles at home	0%	6%	0%	0%	39%	44%	11%



Embed & Spread

8 What steps have been taken to ensure lasting change? How could it be spread to other contexts?

Micro (What can you do?)

- Identify learner champions who will come together to empower junior learners in preparation for rounds.
- Set the schedule for when the preparatory session occurs and when rounds occur. Ideally these are 2-3 weeks apart.
- Ensure technology is adequate to allow for broad participation in-person and virtually
- Advertise PTH rounds in advance and broadly amongst interdisciplinary staff on the teaching unit, as well as learners and attendings off-service who may wish to join.
- If budget permits, provide lunch to attendees, keeping environmental sustainability in mind when choosing the menu
- Make sure at least one PTH champion is present to facilitate a rich discussion during rounds



Embed & Spread

8 What steps have been taken to ensure lasting change? How could it be spread to other contexts?

Meso (What can you do within your organization?)

- Facilitate spread of sustainability culture on the unit by integrating other health professionals into rounds through advanced notice, and engagement of groups during pre-rounds case analysis.
- Consider virtual collaboration with other internal medicine clinical teaching units to have national PTH champions attending select sessions.
- Explore the potential for adapting the case-based PTH Rounds model to other residency programs and hospital systems within Dalhousie University and across Canada, including in other health professional groups (e.g. pharmacy, paramedicine, primary care).



Embed & Spread

8 What steps have been taken to ensure lasting change? How could it be spread to other contexts?

Macro (What can your organization do?):

Research and Quality Improvement: P+H rounds provide an avenue to generate interest in research projects and quality improvement (QI) initiatives relevant to planetary health and sustainability. Our experience with this pilot has:

- Identified high usage products, processes, and interventions with notable deficits in LCA-driven GHG emission data. We have engaged with experts in the relevant fields to discuss projects to address this literature gap. Participation in rounds has empowered learner involvement on teams undertaking local healthcare LCA work.
- Generated discussion around the overlap between planetary health and healthcare sustainability amongst learners who are already engaged in QI projects and intend to apply a planetary health lens to them.
- Highlighted opportunity areas to address low-value care on the MTU with the potential for future QI work for learners on a scholarly activity block.
- Advertised the MTU as a sustainability-centric unit and an experimentation ground for research and QI in this area. Many provincial groups, including Choosing Labs Wisely, Infection Prevention and Control, and Pharmacy have engaged with the MTU to develop, test, and try projects geared at reducing “waste” in the system.



Embed & Spread

8 What steps have been taken to ensure lasting change? How could it be spread to other contexts?

Macro (What can your organization do?):

Curriculum Expansion: Expand educational content for broader discussion on topics such as:

- Medications with high emissions and deprescribing opportunities
- Choosing Wisely climate conscious recommendations for internal medicine
- Patient adaptation and protective behaviors in the face of extreme weather
- The role of diet in health and the health of the planet
- The benefits of exercise and nature prescribing in conjunction with pharmaceutical deprescribing



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