Choosing Wisely and the climate crisis: a role for clinicians

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There are growing calls for healthcare to confront it's role in the climate crisis. Estimates suggest that carbon emissions from healthcare constitute 5% of net global emissions. To put this into context, emissions from all air travel are estimated at 3.5% of net global emissions.[1] Health systems, organisations and clinicians have been called on to lead efforts to reduce emissions given that the climate crisis presents a major threat to human health.

Ensuring appropriateness of care, and reducing overuse are central planks of strategies suggested in the literature and are increasingly being enacted by large healthcare systems and provider organisations to reduce healthcare's climate impact.[2] However, individual clinicians are often left with little guidance or support in terms of how to do this in practice. To illustrate, the Agency for Health Care Research and Quality (AHRQ) within the United States Department of Health and Human Services recently released a guidance document for healthcare organisations on measures and actions to mitigate climate change, however there is no guidance for clinicians.[3]

Choosing Wisely campaigns, first launched in the United States in 2012 and now present in over 30 countries globally, can be leveraged by individual clinicians as a feasible strategy to help address the climate impact of their practice. Choosing Wisely emerged from concerns of sharply rising healthcare costs and estimates that a third of all healthcare offered no clinical value to patients.[4] Campaigns are anchored in evidence-based lists of recommendations developed by national clinician societies that identify frequently overused tests and treatments that are not supported by scientific evidence and may expose patients to harm. Campaigns seek to raise awareness about overuse among clinicians and are increasingly focused on scaling interventions to implement recommendations.[5] The major mobilisation effort of Choosing Wisely campaigns can be leveraged for climate co-benefits. Co-benefits is a concept from climate policy described as a win-win strategy which addresses two or more goals with a single policy measure and that avoids making trade-offs between climate and development goals.[6]

This article suggests possible actions for individual clinicians to address their contributions to healthcare's climate impact through three main approaches: identification of specialty-specific climate-intensive overuse priorities; advancing quality improvement targeting climate-relevant measures in the micro practice environment; and advocacy to influence change at the individual, organisational and system levels.

IDENTIFICATION OF CLIMATE-INTENSIVE OVERUSE PRIORITIES

The vast majority of healthcare's climate impact is through indirect emissions which are related to the supply chain, known as Scope 3 emissions. For example, estimates suggest that approximately 82% of healthcare emissions in the United States are indirect, which is why frameworks for decarbonisation emphasise appropriateness and reducing waste.[7] Measurement is vital to healthcare quality for both improvement and accountability; however, metrics are limited for emissions associated with healthcare-induced emission and waste.[8] Further, strategies for reducing emissions such as those proposed by the AHRQ framework are outside of day-to-day clinical practice. While there are efforts to advance measuring emissions at the organisation and health system level, like focusing on energy use in healthcare facilities, these will likely not resonate with clinicians. Drawing on the AHRQ interventions to reduce emissions at the organisational

level, we propose approaches for individual clinicians based on Choosing Wisely recommendations. Table 1 translates organisation-level interventions to offer examples of individual actions across diverse practice settings.

Choosing Wisely recommendations have identified several large categories of waste which cross-cut clinical specialties, including avoiding unnecessary laboratory test ordering and medication overuse. A principle driving the development of campaign recommendations is that the tests, treatments and procedures under consideration should be common and used frequently, again demonstrating relevance to indirect emissions from the healthcare supply chain. The specific examples of laboratory tests and medication prescribing are relevant to clinicians in daily practice and can be implemented in multiple settings.

Laboratory testing has emerged as an overuse priority, which has become even more pressing with the COVID-19 pandemic related global supply chain disruptions and shortages.[9] Overuse in laboratory tests is pervasive and common, with estimates suggesting 16% to 56% of laboratory tests are unnecessary.[10] This has a significant downstream effect and can drive further testing or procedures, referrals and treatments, all of which have considerable waste and emissions. Avoiding low-value laboratory tests reduces harm to patients, minimises redundant staff time, carbon from patient travel to and from laboratory facilities, and reduces waste of single-use tubes, syringes and pipettes.

Similarly, medication overuse has a major downstream impact. The National Health Service (NHS) in the UK has conducted the most detailed accounting of the health systems' climate impact and attributes a staggering 25% of the NHS total emissions to pharmaceutical supply chains.[11] Reducing unnecessary prescriptions impact individual patients' quality of care by decreasing potential drug interactions and side effects, however it can also decrease planetary harm by curbing pharmaceutical supply chain emissions.

There are relatively few clear-cut examples of where clinicians can make a change that has an immediate climate impact, making specialty-specific Choosing Wisely recommendations that target common areas of overuse so instructive.

Commonly cited opportunities to do so include substitution of the highly volatile anaesthetic gas desflurane with greener alternatives like sevoflurane.[12] Similarly, metered dose inhalers contain hydrofluorocarbon propellants which are potent greenhouse gases and can be substituted with dry powder inhalers for many patients.[13] More data are needed on other climate-intensive areas of healthcare and sustainable substitutions, to help inform clinician decision making.

Shared decision making and conversations with individual patients are important to reduce overuse as it elicits patient preferences and treatment goals. However, given reducing healthcare's climate impact is a co-benefit of reducing overuse, shared decision making should focus on risks and benefits to individual patients. For example, while some patients may be interested in learning about the climate co-benefit of switching inhalers, a switch should remain a shared decision.[14] Unconsented switches of inhalers can drive feelings of disempowerment and a loss of personal control, leading to misuse and medication errors.[15]

QUALITY IMPROVEMENT IN THE CLINICAL ENVIRONMENT

Quality improvement efforts have traditionally been designed to improve measures associated with effectiveness, timeliness and efficiency; however, sustainability is increasingly recognised as a domain of quality.[16] Applying the lens of sustainability to well-established quality improvement methods can enable a focus on reducing waste and emissions, advance the nascent science of measuring emissions from healthcare, and draw on measures relevant to clinicians and decision makers.

Choosing Wisely recommendations in perioperative specialties have emphasised reducing unnecessary pre and post laboratory and imaging tests for low-risk surgical procedures. These can delay surgery, tend not to change risk estimates established through physical examination and history taking and lead to additional downstream testing which has risks to patients and healthcare costs. A recently published initiative to decrease routine postoperative bloodwork after uncomplicated bariatric surgery quantified patient outcomes, laboratory processing costs as well as environmental impact through the number of blood tubes saved from landfills.[17] Similarly, toolkits are being developed for surgical departments to address the outsized waste and climate impact of operating rooms and surgical care which generate an estimated third of all hospital waste. These toolkits emphasise measurement of impact in patient outcomes, cost savings and climate-relevant measures such greenhouse gas emissions. Change ideas and strategies are varied, and include reducing overuse of instruments in surgical kits, emphasising reusable products to drive waste reduction, and anaesthetic substitution.[18]

Since physicians and other healthcare professionals already draw on quality improvement tools to implement and measure practice change, the application of these same approaches to begin to measure the climate impact of clinical changes is a feasible extension. Creative approaches to measure climate impact in a way that is tangible and clinically relevant are needed. For example, life cycle analysis in healthcare is a nascent but growing area of inquiry.[19]

ADVOCACY: LEAD FROM WHERE YOU STAND

There are growing voices from practising physicians, clinician associations and medical students that the climate crisis demands immediate action. Clinicians

Table 1 Organisational strategies for healthcare decarbonisation that can be adapted by individual clinicians

Categories	Choosing Wisely recommendations (source)	Climate impact	Potential measures of climate co-benefits	Quality improvement approaches to support change
Community/Primary care				
Decrease energy use	Avoid unnecessary imaging for uncomplicated low back pain (College of Family Physicians of Canada)	Imaging tests from CT scans consume energy	Imaging energy outputs Greenhouse gas emissions from vehicle travel	Diagnostic triage with clinical alerting features, imaging types and timing alongside structured communication and education tools for patients. Hall *et al*. Do not routinely offer imaging for uncomplicated low back pain *BMJ* 2021; 372 :n291
Decrease transportation	Don't hesitate to use virtual care to complement in-person visits in order to meet the needs of residents in long-term care during the COVID-19 pandemic (Canadian Society for Long-Term Care Medicine) Don't send a patient for a specialist visit that requires several hours of transport if the visit can be done virtually or by a local physician (Society of Rural Physicians of Canada)	Patient travel can have greenhouse gas emissions, particularly for patients travelling across large distances	Greenhouse gas emissions from vehicle travel Greenhouse gas emissions from vehicle travel	Leverage virtual care tools and platforms, as clinically appropriate. Patient and provider education.
Reduce harmful gases	Don't initiate medications for asthma (eg, inhalers, leukotriene receptor antagonists or others) in patients ≥6 years old who have not had confirmation of reversible airflow limitation with spirometry, and in its absence, a positive methacholine or exercise challenge test, or sufficient peak expiratory flow variability (Canadian Thoracic Society)	Metered dose inhaler (MDI) propellants are gases with high global warming potential	# of MDI prescriptions	Prescribing tools including inhaler comparison tables for pharmacists, electronic medical record tools to favourite low-carbon inhalers, patient and provider education. https://cascadescanada.ca/wp-content/uploads/2022/07/CASCADES-INHALER-PLAYBOOK-FINAL_EN.pdf
Decrease unnecessary medication use	Not all patients with simple respiratory tract infections will need antibiotics (British Society for Antimicrobial Chemotherapy)	The development, supply chain and distribution of antibiotics contributes to indirect emissions	Overall volume of antibiotic prescriptions	Audit and feedback to physicians on appropriate antibiotic prescribing. Tools for shared decision making—viral prescription pad, delayed prescription. Patient and provider education. Leis *et al*. Prescriber-led practice changes that can bolster antimicrobial stewardship in community healthcare settings. *Can Commun Dis Rep.* 2020 Jan 2;46(1):1–5.
Reduce overuse of medical devices and supplies	Don't use arthroscopic debridement as a primary treatment in the management of osteoarthritis of the knee (Canadian Orthopaedics Association)	Unnecessary procedures generate single-use plastic waste, use other disposable surgical and hospital resources and energy-intensive operating rooms	# of knee arthroscopies versus conservative management for degenerative knee disease	Decision aids to facilitate shared decision making between clinicians and patients. Patient education programmes that support self-management of knee osteoarthritis. Barlow, T., Rhodes-Jones, T., Ballinger, S. *et al*. Decreasing the number of arthroscopies in knee osteoarthritis – a service evaluation of a de-implementation strategy. *BMC Musculoskelet Disord* 21, 140 (2020).
Hospital/specialist care				
Decrease energy use	Don't initiate chronic dialysis without ensuring a shared decision making process between patients, their families and their physicians (American Society of Nephrology)	Dialysis is a resource-intensive process which consumes large amounts of water, electricity and single-use plastic materials	Energy outputs from dialysis clinics Greenhouse gas emissions from vehicle travel	Decision aid to facilitate shared decision making with patients about conservative kidney management. Wong *et al*. A Patient Decision Aid About Conservative Kidney Management in Advanced Kidney Disease: A Randomized Pilot Trial. *Am J Kidney Dis*. 2023 Feb 4:S0272-6386(23)00065-3.

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Table 1 Continued

Categories	Choosing Wisely recommendations (source)	Climate impact	Potential measures of climate co-benefits	Quality improvement approaches to support change
Decrease transportation	Don't deliver care (eg, follow-up) in a high-cost setting (eg, inpatient, cancer centre) that could be delivered just as effectively in a lower-cost setting (eg, primary care). (Canadian Association of Medical Oncologists, Canadian Association of Radiation Oncology, Canadian Partnership Against Cancer, Canadian Society for Surgical Oncology)	Hospital care is more resource-intensive and energy intensive	Greenhouse gas emissions from vehicle travel	Leverage virtual care tools and platforms, as clinically appropriate. Patient and provider education
Reduce harmful gases	Minimise amount used of all anaesthetic gases and avoid, where possible, the use of anaesthetic gases with high global warming potential	Desflurane has high global warming potential	Desflurane use	Abandon desflurane and nitrous oxide, and substitute with other comparable gases. Optimise fresh gas flows via a circle system for general anaesthesia, instead of using a semi-open circuit. Patient and provider education. Shelton *et al*. Towards zero carbon healthcare: anaesthesia. *BMJ*. 2022 Oct 13;379:e069030.
Decrease unnecessary medication use	Don't prescribe a medication without conducting a drug regimen review (Canadian Geriatrics Society)	The development, supply chain and distribution of medications contributes to indirect emissions from healthcare	Polypharmacy in older adults	Computerised decision support for pharmacists, geriatricians, family physicians and internists. Electronic alerts for medication review. Patient and provider education. Rankin *et al*. Interventions to improve the appropriate use of polypharmacy for older people. *Cochrane Database Syst Rev*. 2018 Sep 3;9(9):CD008165.
Reduce overuse of medical devices and supplies	Don't collect more blood than what is needed. Use short draw tubes, consider add-on testing, and reduce or combine duplicate orders (Canadian Society for Medical Laboratory Science)	Unnecessary laboratory tests generate single-use plastic waste, use other disposable laboratory resources and energy, and generate emissions from patient travel	# of blood tubes used monthly on a specific unit over time	Audit and feedback to physicians on ordering compared with institutional benchmarks, as well as peer comparisons. Electronic medical records changes to restrict ordering routine, repetitive daily laboratory tests, limiting ordering periods to defined timeframes, or creating alerts that display prior stable results for the test being ordered. Provider education. Silverstein *et al*. Reducing routine inpatient blood testing. *BMJ*. 2022 Oct 26;379:e070698.

MDI, Metered dose inhalers.

can have a broad influence advocating for our patients and population health. This does not mean that individual clinicians need to advocate at the policy level but rather each can play an advocacy role based on their sphere of influence.

Clinician educators can raise awareness among trainees and colleagues by including climate-relevant or planetary health content in curricula or as a focus at conferences or continuing medical education activities. Individuals who serve in administrative or leadership roles within their own organisations can support quality improvement efforts to reduce overuse alongside green procurement policies and strategies to reduce waste.[20]

Healthcare systems and leaders can be an influential voice on governments to reduce emissions and lead by example. At the COP26 Summit in 2021, 50 countries committed to creating climate-resilient, low-carbon and sustainable health systems, with 14 (including the UK) setting a target of net zero emissions by 2050.[21] However, reaching net zero emissions in healthcare requires an implementation plan. On a global level, through national organisations, specialty societies and in other organised institutional positions, clinicians can advocate for robust strategies to cut waste, and address healthcare's climate impact.[22]

CONCLUSIONS

The urgency of the climate crisis, and its impact on health demands immediate action. The complexity of the climate crisis makes it challenging for an individual clinician to believe that their actions can have an impact. Leveraging Choosing Wisely recommendations and approaches to reducing overuse offer tangible steps for individual clinicians to curb the climate impact of their practice.

We propose that by reducing common areas of overuse in practice, clinicians will drive a co-benefit of reducing healthcare's climate impact. For example, reducing unnecessary laboratory test ordering and

prescription medications cross-cut many specialty society lists of recommendations and have a climate impact through indirect emissions associated with healthcare supply chains. These activities can help clinicians raise awareness of the relationship of healthcare to the climate crisis. Choosing Wisely campaigns around the world plan to work together to promote an understanding that reducing overuse decreases harms to patients, reduces healthcare waste and protects the climate, in turn protecting human health.

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