

How Canadian hospitals are decreasing carbon emissions

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Canada's health care system alone accounts for nearly 5% of the country's total greenhouse gas emissions, putting it ahead of the aviation industry.

In 2021, Canada joined more than 50 nations in committing to achieving low-carbon, sustainable health systems, but so far, much of the progress toward that goal has come from the voluntary efforts of individual physicians.

Myles Sergeant, a family physician in Hamilton, Ont., launched one such effort to cultivate partnerships on climate action across health care facilities, called PEACH.

He was inspired by a paper published in *The Lancet Planetary Health* that showed that more than 60% of the emissions generated by England's National Health Service were related to the supply chain, rather than the delivery of care (24%), or travel by staff, patients and visitors (10%).

Looking further into the issue, PEACH developed a checklist of the 20 most impactful actions hospitals could take to reduce their carbon footprint — in some cases, at low cost or savings. These included divesting foundation funds from fossil fuels, implementing Choosing Wisely programs to reduce waste, using reusable gowns and linens, adopting sustainable prescribing strategies, increasing plant-based food options for patients, and weighing sustainability in procurement contracts.

Recycling — the action that often comes to mind first when talking about sustainability — didn't even make the list.

First and foremost, Sergeant said, the biggest impact item is getting leaders on board. "You're not going to do anything at your facility if your leadership has not bought in [or] if your leadership is not asking the different departments to be involved."

Operating rooms also present ample opportunities for high-impact change.

They generate disproportionate amounts of waste and emissions, both due to stringent heating, ventilation and HVAC requirements, as well as the use of anesthetic gases, such as desflurane.

One carbon footprinting study found that surgical suites were three to six times more energy-intensive than hospitals as a whole, with preferential use of desflurane resulting in a ten-fold difference in anesthetic gas emissions among hospitals.

Desflurane has been shown to make up 80% of the greenhouse gases stemming from anesthetics in the atmosphere. It's also estimated to be 2540 times more potent as a greenhouse gas than carbon dioxide. Meanwhile, nitrous oxide is 298 times worse than carbon dioxide, and sevoflurane is 130 times worse.

Administering 2% sevoflurane to a patient for seven hours is roughly equivalent to driving 40 km — the distance between Toronto and Oakville. Using 6% desflurane for the same duration is equivalent to driving 1920 km — close to the distance from Toronto to Manitoba.

Anesthesiologist Sanjiv Mathur led Health Sciences North in Sudbury to become the first hospital in Canada to remove desflurane from its formulary entirely, reducing the hospital's annual greenhouse gas emissions by more than 700 tonnes.

Additionally, the hospital decreased its spending on anesthetic agents while observing no change in morbidity, mortality, or recovery room discharge time.

St. Joseph's Health Centre in Toronto and about a dozen other hospitals have since followed suit.

The whole process took three years, starting with Mathur educating colleagues during rounds, posting papers in the lounge, and placing stickers on the desflurane

machines. However, Mathur says, education alone isn't enough to effect change.

"We waste too much time on education; to be honest, we should have just gone right ahead," says Mathur. "Thankfully, in my department, we have enough people who are very concerned about the environment... so we took the desflurane off the machines [rather than leaving it up to individual choice]."

His next focus for reducing emissions is carbon pricing. Mathur says if there was carbon pricing on volatile anesthetics, the cost per bottle of desflurane would triple, making greener options like xenon, which has no carbon footprint, more competitive. "If you price pollution, nobody would be using desflurane," he says.

Anita Rao of the Environmental Sustainability Working Group says every physician making one change in their workplace could make a major difference to the health of the wider community.

"We all have agency within our own professions to green the environment and to make our workplaces more environmentally sustainable," says Rao. "They're not big changes, and they're not hard. Sometimes it's just going to somebody who orders the equipment in your office or the hospital and saying, 'Instead of ordering this plastic one, I found this reusable piece of equipment.' It's just a matter of awareness and mindfulness."

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