



A Virtually Greener Approach to Healthcare

CLINICAL QUESTION

What are the environmental impacts of physicians implementing virtual care in their practices, and how does this affect patient care?

BOTTOM LINE

Virtual care is a low-carbon alternative to in-person visits, significantly reducing greenhouse gas emissions through the elimination of patient travel, clinic energy use, and PPE waste. Despite some emissions still being created from digital technology, the overall environmental impact is drastically lower. In appropriate clinical scenarios, virtual care is a practical and scalable strategy towards a more sustainable health system.

EVIDENCE

Vehicle Emissions

- One Ontario cross-sectional study showed a reduction of 3.2 billion km of patient travel from March 2020 to December 2021 due to 63 million virtual care visits across all specialties. This is a reduction of 545-658 million kg of carbon dioxide emissions (CO₂e) (Welk et al., 2022)
- A 2023 systematic review showed that all 23 papers on virtual care and its environmental impacts found a significant reduction in vehicle emissions. (Pickard Strange et al., 2023).

Clinic Emissions Avoided

- A Swiss paper calculated the average carbon emissions from a primary care appointment to be around 4.8 kg CO₂e. 45.7% of total yearly clinic emission were from staff and patient transport, 29.8% were from clinic heating and 5.5% were from medical consumables such as PPE (Nicolet et al., 2023).
- A 2022 paper estimates personal protective equipment use emits 65 g CO₂e per gown, 20 g CO₂e per mask and 52 g CO₂e per pair of gloves. 20 seconds of hand washing per visit uses water equivalent to 8 g CO₂e. These emissions are eliminated during virtual visits (Bartlett & Keir, 2022).

Emissions Associated with Virtual Care

- A 2024 Australian review on telehealth emissions showed that on average 7.7 kg CO₂e of carbon emissions were avoided when compared to in-person appointments, though they included both primary care and specialist visits. (de Sain & Irwin, 2024)
- A 2023 American study showed a 99.63% decrease in carbon emissions when comparing virtual visits to in-person appointments specifically in primary care. (Thiel et al., 2023)

Patient Experience with Virtual Care

- An Ontario thematic analysis showed that primary care patients describe virtual visits as more affordable, convenient and accessible. (Hatef et al., 2024).
- A 2015 review of 93 trials showed similar outcomes in heart failure, mental health and dermatology longitudinal management when comparing telemedicine and in-person cohorts. Patients with diabetes had significantly lower HbA1C % after 9 months of follow-up in the telemedicine group compared to in-

person. LDL and blood pressure measurements were also shown to be significantly decreased in the virtual care groups (Flodgren et al., 2015).

- A BC study on primary care clinics showed that 53% of patients aged 20-44 used a virtual visit in the past 4 years, compared to 0.8% of patients over the age of 85. 48% of patients who had a virtual visit stated they would have sought walk-in clinic care if the virtual option was not available, 11% would have gone to an emergency department, and 13% would not have sought care for their symptoms (McGrail et al., 2017).
- A Canadian study showed that physicians who implemented more virtual care into their practices during COVID-19 had lower rates of ER visits in their patient panels. This coincided with a reduction of viral respiratory infection transmission (Kiran et al., 2023).

Physician Considerations for Virtual Care

- Interviews with 28 health care practitioners determined that virtual visit appropriateness is best evaluated based on patient factors, such as acuity, physical exam necessity, patient comfort with technology, and ability of patients to articulate themselves in a virtual context (Gray et al., 2022).
- The College of Family Physicians of Canada found that diagnostic accuracy was between 71-91% in virtual appointments. This is similar to the accuracy derived from in person appointments (Sept et al., 2020).
- Patients triaged virtually with new or acute issues were nearly five times more likely to return for an in-person visit within 7 days compared to those first seen in person (Reed et al., 2023). With respect to management of longitudinal chronic conditions, virtual visits were not associated with increased mortality, emergency department visits, nor hospital admissions, however they were associated with an increased number of subsequent outpatient visits (Sina et al., 2025).
- Physicians must be aware of the drawbacks of virtual care, such as privacy concerns, risks of miscommunication on a virtual platform and limitations of patient assessment, when choosing to see patients virtually (Braund et al., 2023).

CONTEXT

- The COVID-19 pandemic forced physicians and health systems to find alternative ways to deliver remote care, specifically through virtual care appointments (Wosik et al., 2020).
- The healthcare sector comprises 4.6% of national GHG emissions in Canada (Eckleman et al., 2018). The Canadian Medical Association lists virtual care as one of nine strategies towards a net-zero health system (Canadian Medical Association, n.d.).
- Choosing Wisely Canada states "Don't conduct in-person visits where virtual assessment would provide equivalent clinical value and is preferred by the patient" as a climate-conscious recommendation for Family Medicine (Choosing Wisely Canada, n.d.).

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