



**LOW CARBON
HIGH QUALITY CARE**

Evaluation Report

Learning From the Low-Carbon,
High-Quality Care Collaborative

Territorial Acknowledgements

Health Quality BC, which does its work throughout the province, would like to acknowledge that we are living and working with humility and respect on the traditional territories of the First Nations Peoples of British Columbia. We specifically acknowledge and express our gratitude to the keepers of the lands of the ancestral and unceded territory of the xʷməθkʷəy̓əm (Musqueam), Skwxwú7mesh (Squamish), and səɪlɪwətaʔt (Tsleil-Waututh) Nations, where our Vancouver office is located.

Health Quality BC also recognizes Métis People and Métis Chartered Communities, as well as the Inuit and urban Indigenous Peoples living across the province on various traditional territories.

About Health Quality BC

Our purpose is improving health care quality across British Columbia.

Our work is to build a foundation of quality, and our impact means better health care for British Columbians.

We do this by delivering the latest knowledge from home and abroad to champion and support high-quality care for every person in BC. This system-wide impact requires creativity, innovative thinking, and evidence-informed strategies to shift culture, improve clinical practice and accelerate health care partners' improvement efforts.

We are uniquely positioned to build strong partnerships with patients and communities, care providers, health leaders, policymakers, senior executives, academics and others. These connections enable us to nurture networks, recognize the needs of BC's health care system and build capacity where it is needed the most. We provide advice and make recommendations to the health system, including the Minister of Health, on matters related to quality of care across the province.

To learn more about our work and how we help improve the quality of care, visit healthqualitybc.ca.

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Low-Carbon, High-Quality Care Collaborative

The Low-Carbon, High-Quality Care (LCHQ) Collaborative, which took place over 10 months, was aimed at accelerating efforts to reduce health care's environmental footprint through clinical practice changes that enhance improvements in the dimensions of quality.

Eighteen teams across BC moved the health system one step closer to improving health care quality while decreasing the environmental costs of how we deliver care. Teams had access to clinical and quality improvement expertise, peer-to-peer learning and mentorship, and curated resources.



Why this Collaborative?

The World Health Organization has identified climate change as the biggest global health threat of the 21st century. Many people in British Columbia are already experiencing the effects of climate change from weather events like heatwaves and floods, to growing concerns about food safety and security, the spread of diseases, impacts on mental health, and more.¹

Clinical service delivery within the health system is a large consumer of energy and resources, and a major producer of emissions and waste. These environmental impacts of care are substantial with up to 5% of global greenhouse gas emissions coming from health care systems, almost on par with the aviation industry's environmental impact.² Environmental sustainability is a key component of high-quality care, with strong linkages between the carbon impact of clinical activities and health care quality, as defined by the [BC Health Quality Matrix](#).

Health care professionals are well-positioned to decrease the environmental costs of how we deliver care by changing individual practice, influencing health system decision-making, and setting clinical standards that support low-carbon, high-quality care. As a health care system, this is a necessary step to mitigating our environmental impact and ensuring sustainable models of care. Local champions in BC are leading the way in identifying opportunities and taking local action toward solutions for more sustainable health systems that focus on:

- 1 Reducing the demand for health services,
- 2 Ensuring appropriate care to avoid unnecessary investigations and treatment, and
- 3 Reducing emissions from the supply of health services, while optimizing the efficiency of care delivery.³

Our collective efforts to embed environmental sustainability into high-quality care helps to align action toward a low-carbon, environmentally sustainable, climate-resilient health system.



What We Did

We used the well-known collaborative model, developed by the Institute for Healthcare Improvement, designed to support the spread and implementation of clinical practices. The goal of the Low-Carbon, High-Quality Care Collaborative was to spread known practices, foster innovation, share knowledge about co-benefits of low-carbon practices that improve the quality of care, and reduce carbon emissions from clinical practices of participating teams. We convened an advisory group, with clinical expertise and knowledge related to practice changes in the perioperative setting and climate-conscious inhaler practices. The advisory group helped us curate best-known practices from literature and experiences. With their expertise, we developed robust change and measurement strategies to provide a place for teams to start generating change ideas along with ways to measure their progress.

Change and Measurement strategies for each stream can be found here:

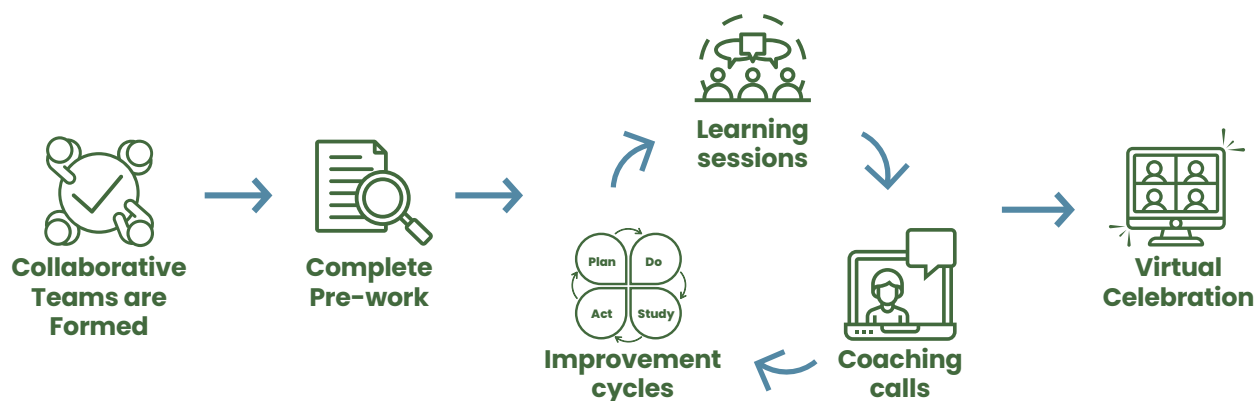
Climate Conscious Inhaler Practices

GOAL: To implement low-carbon inhaler practices related to the management of asthma and COPD.

Sustainable Perioperative Practices

GOAL: Apply sustainable approaches to improve patient experiences and perioperative efficiencies.

Teams participated in learning sessions, coaching calls, and completed improvement cycles where they worked through testing of small-scale change using Plan-Do-Study-Act (PDSA) cycles.⁴ We virtually celebrated together at the end of the Collaborative with teams sharing their successes, learnings and next steps in their low-carbon, high-quality care journeys. We used the LCHQ Collaborative to demonstrate what is possible as we continue to build knowledge on how to make improvements in this newly explored area of low-carbon, high-quality care.



Who We Engaged

Over 100 health care professionals engaged with us over the course of the Collaborative in various ways. Eighteen multidisciplinary teams across BC participated. They worked from a robust change package and measurement strategy, and participated in the learning sessions and webinars, coaching sessions with Health Quality BC (HQBC) improvement advisors, and action periods to implement local practice changes.

The LCHQ Collaborative featured two streams, selected as areas where leading practices are already starting to drive change across the health system:

- Nine teams focused on implementing low-carbon inhaler practices related to the management of asthma and COPD (inpatient or outpatient settings); one metered-dose inhaler, depending on the type, can have the same carbon footprint as driving up to 170km in a gas car.⁵
 - Inhaler teams were comprised of respiratory therapists, nurses, physicians, pharmacists, quality leads and clinical sustainability leads.
- Nine teams focused on introducing sustainable perioperative practices; an operating surgical suite has an estimated impact of over 3,200,000 kg CO₂e, equivalent to powering over 718 Canadian homes, annually.⁶
 - Perioperative teams were comprised of anesthesiologists, clinical nurse educators, nurses, quality leads and clinical sustainability leads.



Working Together for Action

Teams worked through challenges together during the Collaborative, such as competing demands with clinical workload, capacity constraints and limited published literature on the changes they were exploring.

We engaged with teams through multiple channels and methods, primarily through newsletters, coaching calls, an online Learning Portal, Zoom video conferencing, surveys and emails. The following is a quick overview on how these channels were used to engage with teams:



Newsletters: main form of communication with teams, used for assignment reminders, Learning Portal updates, team features, upcoming events



Coaching Calls: open for booking anytime to support teams with any challenges they may be navigating or questions they may have



Learning Portal: recordings, agenda, assignments, templates and other resources were posted here and helped those who could not make it to the live sessions stay engaged



Zoom: used to host learning sessions and webinars, also used Zoom polls, breakout rooms and the chat function for quick pulse check and engaging activities



Surveys: collected feedback and made adjustments to the Collaborative along the way



Emails: for any other inquiries or information teams needed

Teams found coaching calls, live engagement and recordings for asynchronous learning or catch-up to be particularly valuable. Below are some quotes from the overall program evaluation survey regarding the value these types of engagement provided:

“Coaching calls were very helpful to make our ideas into a plan that is feasible.”

“The coaching calls were imperative to my learning and to the overall success of my project.”

“Great resources that I could file away and share with colleagues.”

“I really enjoyed the collaboration during the breakout rooms!”

“Recorded sessions were invaluable – couldn’t always attend at the time but was able to ‘catch up’ at my own pace.”

There was engagement within and across teams. Teams worked together to submit monthly progress reports and complete learning session activities. Teams also learned from one another by sharing their work and storyboards with other teams, and had the opportunity to connect with different teams during the learning sessions. This was a highly valuable merit of the Collaborative, as mentioned in the overall program evaluation survey:

“I think this was valuable to meet with like-minded people, and to feel motivated and inspired to go and start my own environmental sustainability committee locally.”

“This was a valuable experience for me and it was great to connect with others in health care that also care about planetary health. Learning about other sustainable practices was inspirational.”

The Collaborative fostered a dynamic, two-way exchange both with faculty and between teams. This interconnected engagement supported teams in advancing their efforts and extending their impact by sharing progress with others. Reciprocally, teams supported the Collaborative faculty in understanding system constraints and challenges which helped determine the direction of content for learning sessions and coaching calls. It also created a meaningful network that encouraged growth and collaboration in various forms for not just the duration of the Collaborative, but also beyond it in their own communities. We look forward to staying engaged with all those who are interested through the [Low Carbon Champion newsletter](#), a mailing list that anyone can sign up for.

We also heard from participants how to make the Collaborative better meet their needs by modifying some of our structures such as shortening learning sessions and incorporating more opportunities for connection and interactive activities. Valuable feedback was provided via Zoom polls, event surveys, the overall program evaluation survey, and throughout the Collaborative through coaching calls and emails.

We know that time is valuable and limited, with many of the participants also providing clinical care to patients. We'll be looking at options for future Collaboratives, with shorter but more frequent virtual sessions to connect all together. Teams found the recordings of the sessions highly valuable, with 95% of participants saying that attending the learning sessions was a good use of their time.

What Great Things Happened?

When we celebrate both success and failing forward, we create stepping stones for the next success, which is a necessary part of our low-carbon, high-quality care journey. It's about the impact we have had today, but also the impact we are setting ourselves up for tomorrow.

Of the 18 teams, five achieved or surpassed their project goals with estimated reductions in carbon emissions, nine made demonstratable progress towards their project goals, and four had limited activity due to competing demands in their clinical care areas. Collectively, we made progress towards our overall goal of reducing carbon emissions in clinical practices from teams participating in the LCHQ Collaborative. Of the teams who were able to collect and analyze data from January 2024 to November 2024, the practice changes they focused on are saving the health system over 2,000 kg of CO₂e each month. We exceeded our initial goal of reducing carbon emissions from clinical practices of the participating teams by 10% and reached an estimated reduction of CO₂e by 57%.

Saving over 2,000 kg of CO₂e a month can be hard to visualize, but it's equivalent to driving over 10,000 km.⁷ When mapped out, it is equivalent to you and 30 of your closest friends each driving a gas car from Victoria to Tofino every month. Or your next family vacation driving across Canada from coast to coast.



The impact on reducing carbon emissions is substantial and implementing green practice changes are moving us one step closer to an environmentally sustainable, climate-resilient health system.

How did teams accomplish this reduction in carbon emissions? They looked at their clinical practices and identified change ideas to test and trial. They tracked data to see if the changes they were trialing made a difference. Some of the change ideas teams tried included reducing the number of high-carbon inhalers and swapping them for lower-carbon alternatives, moving to reusable linens from single-use items, decreasing the number of bottles of desflurane (anesthetic gas high in carbon emissions) they purchased and implementing best-practice protocols to increase efficiencies in a patient's hospital stay, to name a few.

The Collaborative wasn't just about reducing carbon emissions. It was also about paving the way forward to embed environmental sustainability into how we do our work. Teams also focused efforts on building a foundation of environmentally sustainable practices by forming regional sustainability teams, examining in-patient inhaler prescribing practices, undertaking extensive carbon footprinting analysis to guide future decisions, and engaging with others around the importance of framing environmental sustainability as a key component of high-quality care. The Low-Carbon, High-Quality Care Collaborative was just the beginning of reducing health care's impact on climate change while also maintaining and improving experiences and outcomes of care!



What We Learned

A key outcome of any Collaborative is to learn from working through a process to make things better. Especially in this context, where demonstrating what is possible through trialing and testing ideas, the learnings are as important as the results. To summarize the learnings of the LCHQ Collaborative, we used a framework that identifies three key elements for strategic improvement from the Institute of Healthcare Improvement (IHI).⁸ For improvement to be successful, you need the will to improve, ideas around alternatives to the status quo, and then to actually make those changes real or to execute the ideas into practice.



WILL

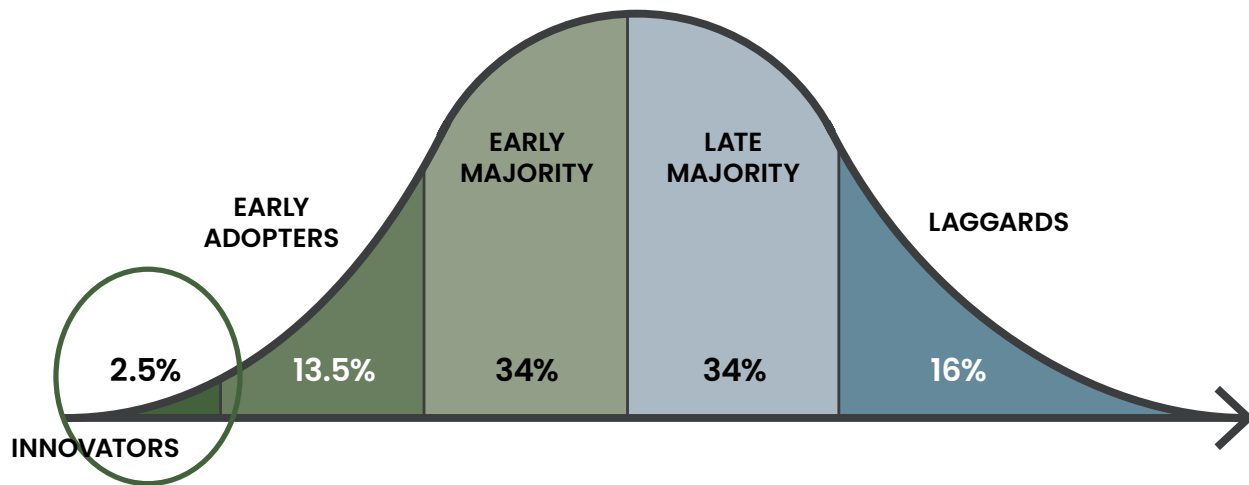
Achieving results of system change requires will at all levels to make a new way of working attractive and the status quo uncomfortable. Health professionals in BC have a strong interest and will to improve environmentally sustainable clinical practices. We had great engagement with teams who put countless hours and energy into their low-carbon clinical practice changes. We had respiratory therapists manually collecting data, teams developing robust excel sheets of carbon footprint data, and teams identifying high- and low-impact changes while working together to prioritize them. The will exists in the system and is strong, based on the amount of engagement and work that participants completed over the 10 months of the Collaborative. They worked through peaks and pits of progress and came out more knowledgeable and equipped to identify and implement environmentally sustainable clinical practices.



IDEAS

Although the change ideas were validated with our advisory group and based on local and national work in both inhaler practices and perioperative settings, the evidence to close the gap between knowledge and practice was a lot wider than we first envisioned. The Collaborative's teams were earlier in the change adoption curve and acted as innovators, rather than early adopters, due to the amount of trialing, testing and investigating the best way forward in order to implement their low-carbon change ideas.

Rate at which different groups adopt something new over time



Rogers E, (1985), Diffusion of Innovations, The Free Press, New York

This is a learning of the Collaborative, but also something to celebrate – health care professionals in BC are paving the way and demonstrating what is possible when it comes to supporting low-carbon, high-quality care!



EXECUTION

We heard, loud and clear over the course of the 10-month LCHQ Collaborative – data collection to identify whether our changes are working is not easy, particularly around environmental sustainability measures. We need simple and efficient ways to collect and display data to show improvement and to tell a story of the “why” behind what we are trying to accomplish. We developed data [tracking templates](#) for teams to follow data over time so they could learn if the changes they were making were resulting in improvements. In some cases, we got what we needed – but it took a lot of effort and is still a work in progress, all while learning along the way. We fine tuned our data tracking templates and will continue to support the health system to identify how they can measure progress in implementing low-carbon, high-quality care. We are working with Cascades Canada, Vancouver Coastal Health and Interior Health to support the development of a Quality Improvement (QI) Environmental Sustainability Toolkit to help teams categorize and measure their environmentally sustainable QI projects.

Where We Are Headed

We are continuing our mission to enable high-quality clinical care across the continuum of care that is driven by data and mitigates overall environmental impacts. We are currently concentrating efforts on broader system changes that support low-carbon, high-quality care by:

Exploring additional sustainable clinical practice changes that may be primed for spread and scale using a collaborative model.

Sharing resources, news and learning opportunities that focus on improving quality through a low-carbon lens in our Low-Carbon Champion newsletters.

Convening the Sustainable Clinical Services Working Group, a provincial body that provides leadership to support the planning and implementation of environmentally sustainable clinical care and services in BC.

Strengthening our definition of quality to include environmental sustainability as a key component to high-quality care, as defined by the BC Health Quality Matrix.

Participating as a member of the Standards for Quality Improvement Reporting Excellence (SQUIRE) Sustainability Extension Working Group to support the development and dissemination of an evidence-based extension for the SQUIRE guidelines for quality improvement projects aimed at environmental sustainability.

Creating a more environmentally sustainable health care system takes all of us – from those delivering care every day to those shaping systems and policies. As we continue to look at supporting clinical teams, we will also be broadening our focus to drive coordinated, strategic levers for change. Together, we can make care better for people and the planet.

Thank you to the many individuals and organizations who have contributed their time, energy, and ideas – your efforts are helping to shape a more sustainable future for health care in BC.

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