

# POSITION STATEMENT

## Environmental Impact of Anesthetic Gases

Published June 2025



British Columbia  
ANESTHESIOLOGISTS' SOCIETY

# "If the world's health sector were a country, it would be the fifth largest carbon emitter on the planet"<sup>1</sup>

Anesthetic gases are used during surgery to keep patients unconscious. They are all greenhouse gases and possess significant Global Warming Potential (GWP) [2,3]. One of these gases, Nitrous Oxide (N<sub>2</sub>O), is especially harmful to the environment. It has a GWP of 310 (CO<sub>2</sub> has a GWP of 1). The use of N<sub>2</sub>O in anesthesia has been rapidly declining in recent years. In a recent survey of Canadian anesthesiologists and residents, only 16.5% of respondents used nitrous oxide on a daily basis, and 46.5% did not use the drug more than a few times a year [4].

Anesthetic gases contribute to 5% of harmful emissions from the entire healthcare sector [3], and medical gases contribute up to 40% of hospitals' direct emissions [5]. With regards to N<sub>2</sub>O, pipeline leakages alone (from plastic hoses used in booms, articulating arms, and ceiling pendants) contribute to upwards of 90% of the N<sub>2</sub>O consumption when measured against its actual clinical use.

With its decline in utilization, and leakages accounting for the vast majority of its use, it seems logical to propose that nitrous oxide does not have to be delivered through the main hospital gas supply lines. For anesthesiologists wishing to use N<sub>2</sub>O, options such as retrofitting cylinders to the back of anesthesia machines, or having portable supplies (lean supply of nitrous oxide on a cart, or portable Dollie's with regulators), would be more cost effective and environmentally friendlier alternatives. In view of this information above, BC Anesthesiologists' Society (BCAS) would support decommissioning central N<sub>2</sub>O pipelines in existing hospitals and no longer installing them in new hospitals.

In the 2023 and 2024 Canadian Anesthesiologists' Society (CAS) Guidelines to the Practice of Anesthesia [6], their section on Guidelines for Environmental Sustainability states. ***"The use of desflurane and N<sub>2</sub>O should be eliminated or minimized to the extent possible given local resources, locations, and the clinical context."***

Anesthesiologists are not just accountable to their patients, but also to the wider communities they serve. Protecting the health of our communities includes ensuring anesthetic practices minimize the effect on our environment. BC's Anesthesiologists support clinical practices that align with environmental sustainability and using agents with the lowest global warming potential [7, 8].

## References:

1. Healthcare Without Harm: Climate footprint report: Executive Summary. 2019. Retrieved from <https://noharm-global.org/documents/climate-footprint-report-executive-summary>.
2. Gadani H, Vyas A. Anesthetic gases and global warming: Potentials, prevention and future of anesthesia. Anesth Essays Res. 2011 Jan-Jun; 5(1):5-10.30560410.
3. Eckelman MJ, Sherman JU, MacNeill AJ. Life cycle environmental emissions and health damages from the Canadian healthcare system: An economic environmental-epidemiological analysis. rLosMeo.Zul8JUL 51:1a/2IUuzoza
4. Jain D, Ma HK, Buckley N. Impact of ENIGMA trials on nitrous oxide: a survey of Canadian anesthesiologists and residents. Can J Anesth 2018; 65: 730-1.
5. Collaborating to prevent nitrous oxide waste in medical gas systems\_FINAL 5-2-2023.pdf (practicegreenhealth.org)
6. [https://www.cas.ca/CASAssets/Documents/Practice-Resources/Guidelines/CAS\\_Final\\_Guidelines\\_2024.pdf](https://www.cas.ca/CASAssets/Documents/Practice-Resources/Guidelines/CAS_Final_Guidelines_2024.pdf).
7. Deb Axelrod et al, Greening the Operating Room and Perioperative Arena: Environmental Sustainability for Anesthesia Practice, ASA Task Force on Environmental Sustainability Committee on Equipment and Facilities. 2015.
8. Campbell M, Pierce T. Atmospheric science, anaesthesia, and the environment BJA Education, 15 (4): 173–179 (2015.)

This position statement was produced by Drs Asim Iqbal, Alison Tedder, Oliver Applegarth, Jacqueline Hudson and colleagues at the British Columbia Anesthesiologists' Society (BCAS) Environmental Interest Group with assistance and support from BCAS's Executive and Board.