Can J Anesth/J Can Anesth (2022) 69:271–272
https://doi.org/10.1007/s12630-021-02136-6

CORRESPONDENCE

Please stop using nitrous oxide in routine clinical practice (comment on: Use of nitrous oxide in contemporary anesthesia—an ongoing tug of war)

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Received: 3 September 2021 / Revised: 25 September 2021 / Accepted: 27 September 2021 / Published online: 8 November 2021

Keywords nitrous oxide · environmental pollution · ecological impact · patient safety

To the Editor,

We would like to comment on the recent editorial by Chan *et al.*[1] and their remarks on the study by Obeidat *et al.*,[2] stressing the role of nitrous oxide (N_2O) in general anesthesia.

In our opinion, it behooves anesthesiologists to weigh the advantages and disadvantages of the anesthetics used—both for the individual patient and for the environment. In this regard, careful consideration of the entire life cycle of drugs and the resultant environmental impact is an important aspect of selecting anesthetics in clinical decisions making. All anesthetics, regardless of whether they are inhaled or intravenously administered, have an impact on climate change.

All inhalational anesthetics are greenhouse gases.[3] Their life cycle greenhouse gas emissions include waste gases released into the atmosphere and emissions (mainly CO_2) from other life cycle stages. As we know, desflurane has the greatest impact among anesthetics on life cycle greenhouse gas emissions: 15 times as much as isoflurane and 20 times as much as sevoflurane per minimum alveolar concentration hour when administered in an O_2/air mixture.

Greenhouse gas emissions increase significantly with all drugs when they are administered in an N_2O/O_2 additive. With all inhalational anesthetics, the effects of greenhouse gases are dominated by uncontrolled emissions because of unnecessarily high fresh gas flows. According to the United States Environmental Protection Agency, N_2O accounts for approximately 7% of all greenhouse gas emissions from human activities in the USA, including agriculture, wastewater management, and industrial processes. Nitrous oxide molecules have an atmospheric lifetime of 114 years and a global warming potential of 298; 1 kg of N_2O has almost 300 times the warming impact of 1 kg CO_2.[4] Furthermore, N_2O contributes to the depletion of the ozone layer. Based on United Nations Framework Convention on Climate Change data, N_2O alone adds an additional 0.7% to the carbon footprint of the healthcare sector for North America. Hence, every effort should be made to reduce the use of N_2O in healthcare. Anesthesia providers can have a huge impact in their daily practice by choosing anesthesia agents with a lower impact on climate change.

As one of the strategies, the use of N_2O should be avoided—this discussion is not new but started as far back as 1989.

Recently, pediatricians and obstetricians have been promoting the use of N_2O for analgesia. This is particularly common in children during painful procedures and during labour and large quantities of N_2O are required for analgesia. Given the increasingly palpable and disastrous effects of global warming and climate

This letter is accompanied by a reply. Please see Can J Anesth 2022; this issue.

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change, we believe that one should reject the use of N_2O in pediatrics and obstetrics if there are adequate alternatives available, such as topical local anesthesia for children and epidural analgesia or remifentanil infusions for parturients during labour.

Physicians should avoid unnecessarily high fresh gas flow rates for any inhaled medication. The logical consequence is anesthesia without using a N_2O/O_2 mixture and *metabolic flow* or at least *minimal flow anesthesia.*[5] There is no need for denitrogenation by means of high fresh gas flows, which are necessary to wash in N_2O. Thus, the advantages of rebreathing systems can be used right from the start, with no requirement for initially high fresh gas flows. For more detailed information or references please contact us at c.honemann@icloud.com.

We believe that N_2O should no longer be used in clinical routine today. We stopped using N_2O at the Marienhospital Vechta in 2003. With the introduction of remifentanil, the use of N_2O was abandoned at Bonn University Hospital. After a short period of time, nobody complained about missing N_2O in clinical routine.

Disclosures None.

Funding statement None.

Editorial responsibility This submission was handled by Dr. Stephan K.W. Schwarz, Editor-in-Chief, *Canadian Journal of Anesthesia/Journal canadien d'anesthésie.*

Funding Open Access funding enabled and organized by Projekt DEAL.

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