



Eliminating Desflurane: Advancing Sustainable and Cost-Effective Anesthesia

GEORGI SAVOV ¹, JAMES TAUTKUS, MD ², HALEH SAADAT, MD, FAAP ³, and GALE SEGARRA ROBERTS, MD, FASA ³

¹ New York Institute of Technology College of Osteopathic Medicine, Old Westbury, NY, USA

² Quinnipiac University, Woodbridge, CT, USA

³ Anesthesiology, Quinnipiac University, Hamden, CT, USA



INTRODUCTION

Climate Change Impact

- Healthcare significantly contributes to global emissions.
- If the healthcare sector were a country, it would be the fifth largest emitter globally.
- American healthcare accounts for 8.5% of national and 4.5% of global greenhouse gas emissions.

Operating Room Emissions

- Desflurane is the largest source of OR greenhouse gases.
- One MAC-hour of desflurane equals the emissions of driving 370 km in a gas-powered car.

Global Warming Potential (GWP100)

- Desflurane’s GWP100 is 2540 and it has an atmospheric lifetime of 14 years.
- Its GWP100 is five times higher than isoflurane, ten times higher than nitrous oxide, and twenty times higher than sevoflurane.

Environmental and Financial Impact

- Desflurane has a four-fold higher greenhouse gas impact compared to TIVA.
- Reducing or eliminating desflurane can save institutions between \$30K - \$100K annually.

Project Focus

- We evaluated our desflurane use at St. Vincent’s Medical Center, Bridgeport, CT with the goal of reducing our environmental and financial impact.

RESULTS

- We ultimately removed all desflurane vaporizers from SVMC in April 2024.
- Although minimal low-volume use of desflurane continues at other Integrated Anesthesia Associates sites, SVMC saw no impact on our patient care or outcomes. This demonstrates the feasibility of permanent elimination of desflurane within a hospital system.
- Other institutions, e.g. Wake Forest and the University of Wisconsin also achieved substantial reductions in anesthetic-related carbon footprint with cost savings up to \$25,000 per month.³
- These outcomes highlight both environmental and financial benefits from reducing or eliminating desflurane use.

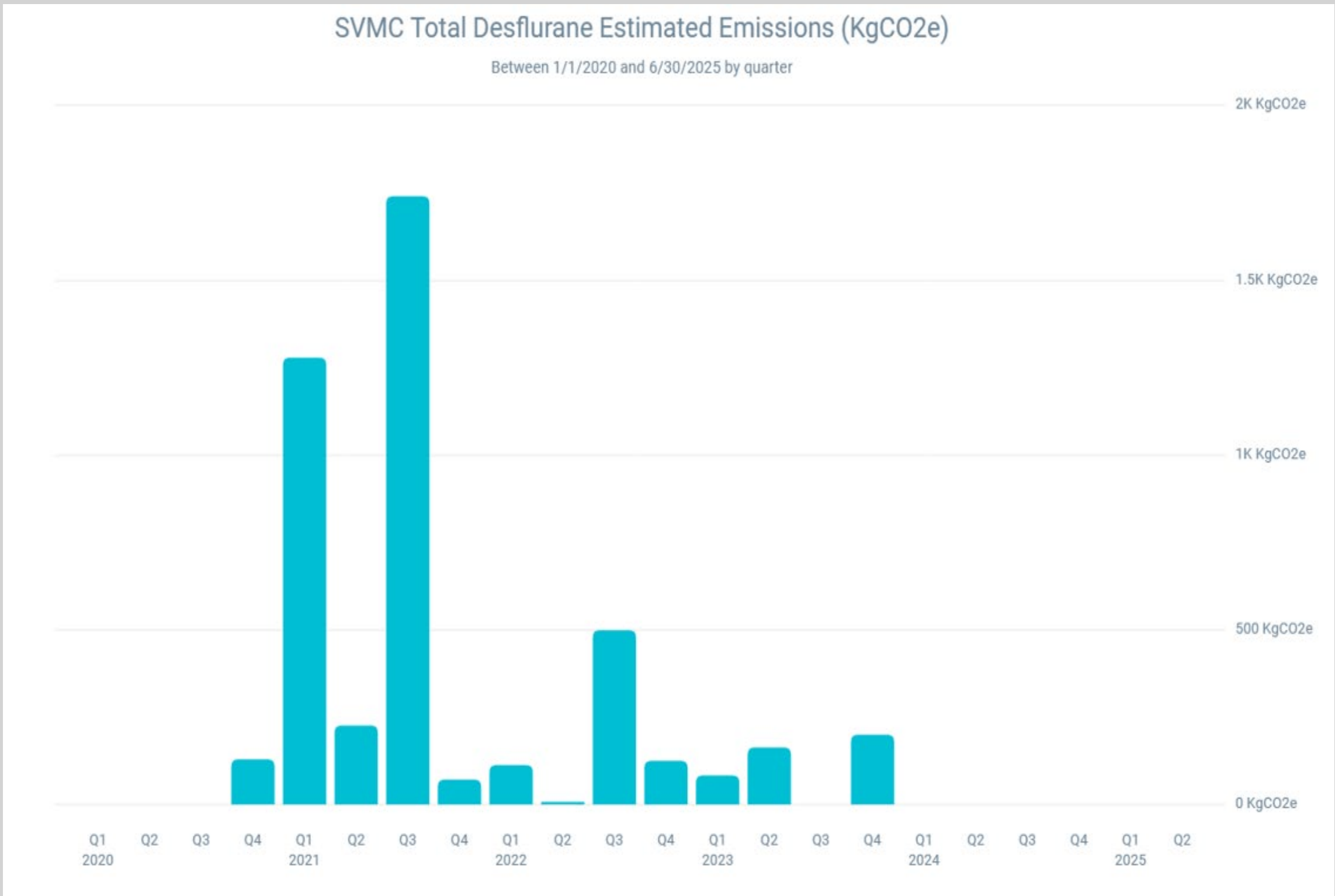


Figure 2
Desflurane emissions at Saint Vincent Medical Center

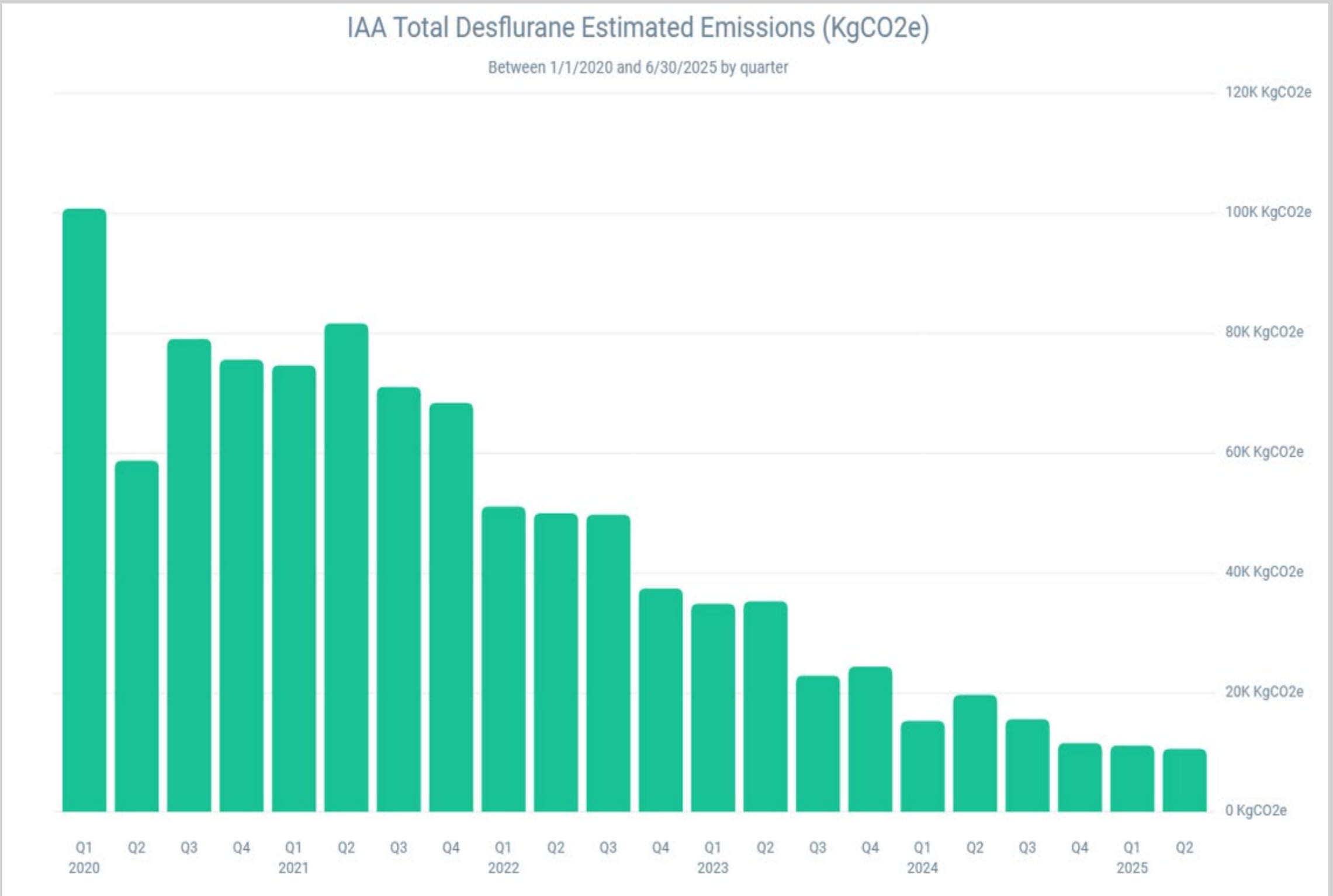


Figure 3
Desflurane emissions across all IAA facilities

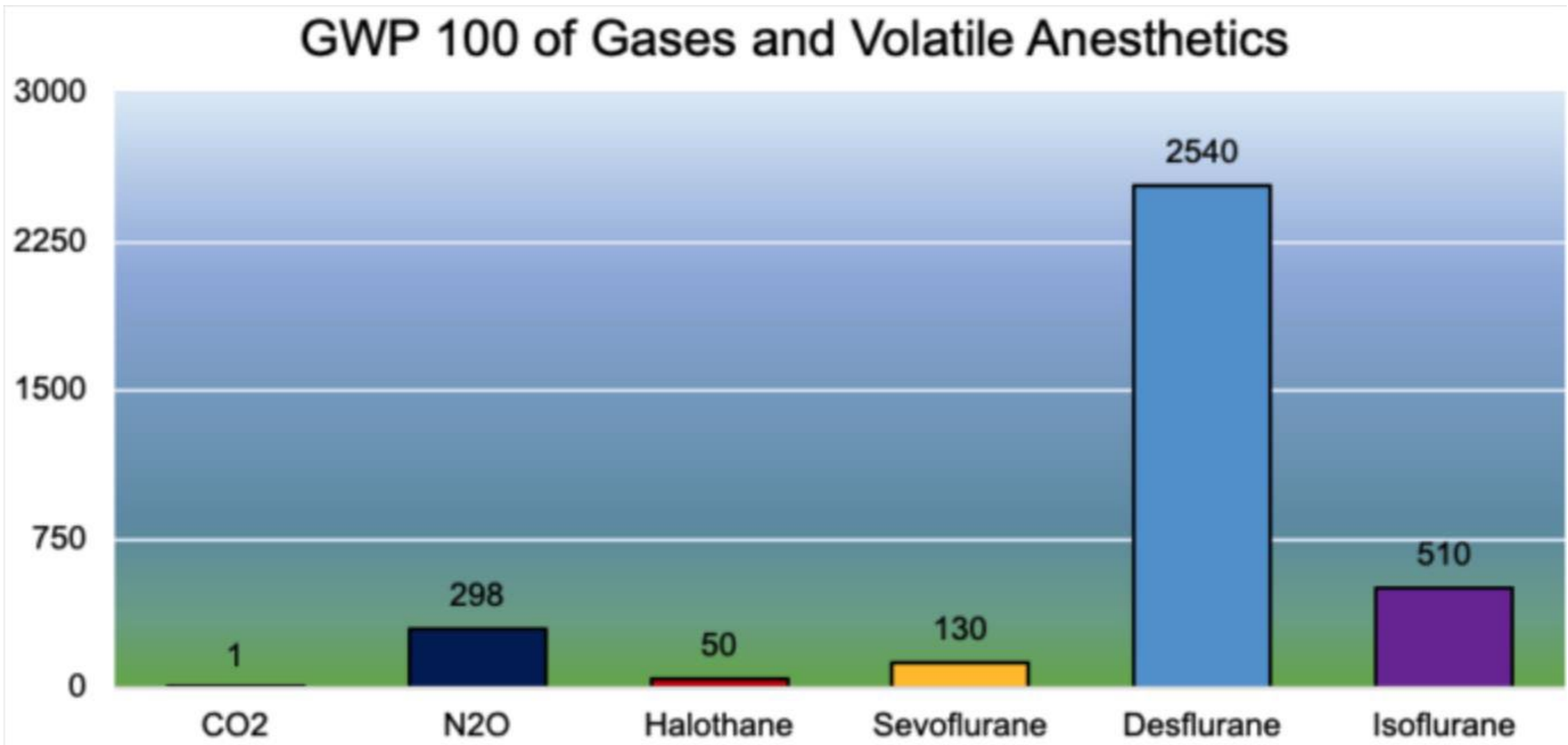


Figure 1
Global warming potential of volatile anesthetics

DISCUSSION

Clinician reluctance is a key barrier to adopting environmentally friendly practices.

Our methods to reduce volatile anesthetics use:

1. Education – lectures, newsletters.
2. Clinician use data – sustainability dashboards within EMR.
3. Real time pop-ups within EMR to lower fresh gas flows and/or chose a more sustainable anesthetic.

Global trend: More providers are removing desflurane and using eco-friendly anesthetics.

REFERENCES

1. US Environmental Protection Agency. Overview of greenhouse gases. <https://www.epa.gov/ghgemissions/overview-greenhouse-gases>
2. **Andersen, M. P. S.**, et al. (2012). Assessing the impact on global climate from general anesthetic gases. Anesthesia & Analgesia, 114(5), 1081-1085.
3. **Zuegge KL**, et al. (2019) Provider Education and Vaporizer Labeling Lead to Reduced Anesthetic Agent Purchasing With Cost Savings and Reduced Greenhouse Gas Emissions. Anesthesia & Analgesia, 128(6):p e97-e99.