

Like Desflurane? Let's Refrain!

Anaesthetic gases contribute to 5% of a hospital's carbon footprint, and make up the majority of healthcare's scope 1 emissions.

How bad are anaesthetic gases?

Desflurane is an anaesthetic gas with high global warming potential and long atmospheric lifespan. Per hour of use, desflurane has a much higher carbon footprint compared to lower carbon alternatives like sevoflurane and propofol. These alternative anaesthetics have similar efficacy but are 6 to 7 times cheaper.

Clinicians from the NUH Department of Anaesthesia initiated a Quality Improvement project to reduce desflurane use without compromising patient outcomes. This was subsequently rolled out to Alexandra Hospital (AH).

Agent	Atmospheric Lifetime (Years)	GWP ₁₀₀	CO ₂ e per bottle (kg)
Sevoflurane	1.4	140	53
Desflurane	14.1	2530	890
Nitrous Oxide	109	273	928 (Size E)

LCA Hourly Impact for FGF at 1L/min (MAC of 1)				
Agent	CO ₂ e (kg)	Cost (\$)	Distance Driven (km)	Environmental Issues
Propofol (TIVA)	1	12.31	6	Aquatic life toxicity
Sevoflurane	3	2.71	19	Greenhouse gas
Desflurane	81	22.13	509	Greenhouse gas

Ref: Hu et al. The Carbon Footprint of General Anaesthetics: A case study in the UK. Resour Conser Recycl, 2021 & NUH Dept of Pharmacy

Educating staff with stickers on anaesthetic machines showing the **per-hour environmental and financial impact of desflurane and lower-carbon alternatives.**

Best way to embed sustainability?

In the MMed anaesthesia exams, candidates are now expected to:
"Show an understanding of the environmental impact of anaesthetic practice including but not limited to, pharmacological agents, equipment and process of administering medical care, and the evolving solutions for these problems."

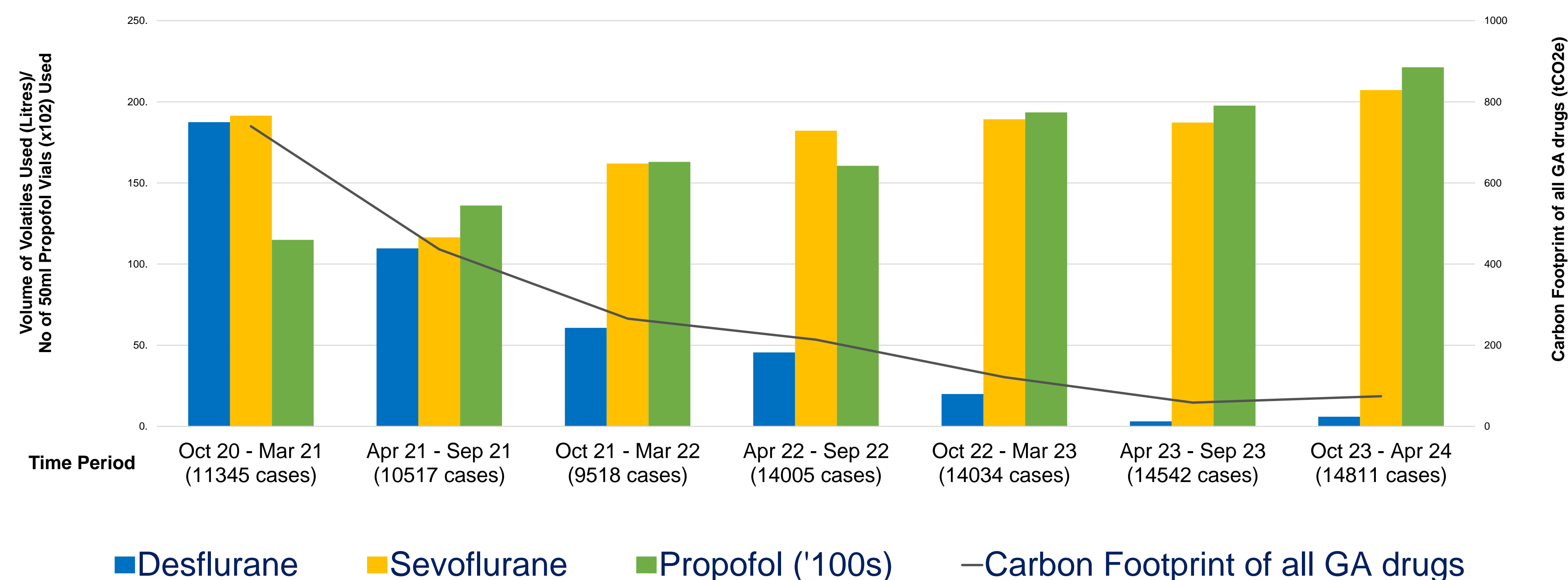
Make it part of our curriculum and exams

Have we asked patients what they want?

Importance of environmental sustainability to patients undergoing general anaesthesia
Pei Kee Poh, King Sin Ang, Will Ne-Hooi Loh
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75% of our patients preferred an anaesthetic that emitted **lower carbon emissions** in the knowledge they may take a slightly longer time to wake up (few mins).

Trends in anaesthetic agent use in NUH



Savings in NUH

- Financial: \$5341,900/year
- Environmental:
 - 1,303 tonnes CO₂e
 - 8.22 million passenger km
 - Removing 411 cars off the road

Through staff education, NUH and AH reduced their use of desflurane by over 95% and 100% respectively, saving both carbon and costs.

* Ang, K. S., BMJ Open Quality, 2023