



**Galway
University
Hospitals**

Ospidéal na h-Ollscoile Gaillimh
UNIVERSITY HOSPITAL GALWAY
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Auditing CO2 equivalent (CO2e) emissions related to anaesthetic gases from a large Irish University Hospital

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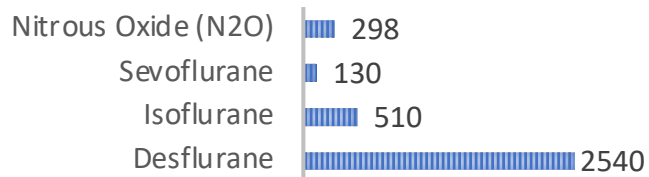


Background: Anaesthetic gases are potent greenhouse gases, producing a disproportionate amount of CO2e as compared with other healthcare emissions. [1]

Aim: We sought to establish a framework that would allow hospitals to audit and subsequently improve upon anaesthetic gas usage.

Methods: The anaesthetic gas use was recorded over one year (2019) at University Hospital Galway (UHG). CO2e (tonnes) was calculated using 100-year Global Warming Potential (GWP100). [2]

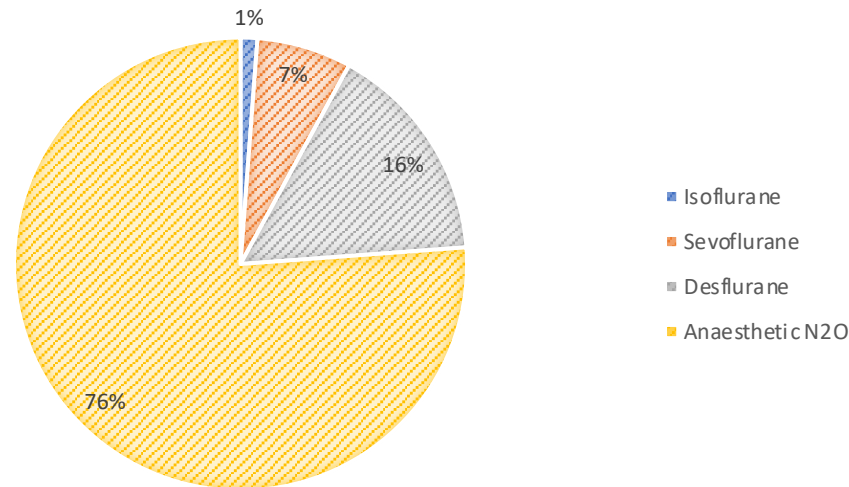
100-YEAR GLOBAL WARMING POTENTIAL (GWP100)



Results: In one year (2019), the UHG anaesthetic department produced 922 tonnes CO2e from anaesthetic gases alone, equating to 54 tonnes per anaesthetic machine (n=17).

Desflurane 144 tonnes CO2e (~16%), N2O 685 tonnes CO2e (~76%) were related to ~91% of emissions.

PERCENTAGE OF TOTAL CO2E (TONNES)



Conclusion: The CO2e emissions related to anaesthetic gases from a large Irish University Hospital are significant; equivalent to the combined emissions from 200 passenger vehicles a year; and would require 185 hectares of Irish forest to sequester.

Awareness of the contribution of anaesthesia is crucial if we are to make meaningful changes to anaesthetic practice in Ireland in terms of carbon footprint.

References

- [1] Ryan SM, Nielsen CJ. Global warming potential of inhaled anesthetics: application to clinical use. *Anesthesia & Analgesia*. 2010 Jul 1;111(1):92-8.
- [2] Andersen MP, Nielsen OJ, Wallington TJ, Karpichev B, Sander SP. Assessing the impact on global climate from general anesthetic gases. *Anesthesia & Analgesia*. 2012 May 1;114(5):1081-5