



The QA and Technical Services Interest Group of the
Guild of Healthcare Pharmacists

Pharmaceutical Quality Assurance and Technical Services Symposium 2023

Thursday 28th and Friday 29th September 2023

International Convention Centre
Newport, Wales. NP18 1HQ



POSTER APPLICATION FORM

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Poster title	Reducing our medicines carbon footprint of at King's College Hospital by tackling nitrous oxide waste

Please submit details of abstract overleaf

Please note: all poster applications must be submitted by 18th August 2023

Please return your application to:

admin@pasg.co.uk

marking the subject as "Symposium Posters"

ABSTRACT

Title Reducing our medicines carbon footprint of at King’s College Hospital by tackling nitrous oxide waste.

There is now a focus on the NHS becoming greener which is underpinned by the NHS Green Plan and the move towards the NHS closing the gap to net zero. One of the biggest contributors to the NHS carbon footprint is medicines, accounting for 25% of the total footprint¹. Nitrous oxide confers the largest carbon footprint of the anaesthetic gases within the acute sector accounting for at least 75% of the total anaesthetic gas footprint².

It is crucial we work to reduce our carbon footprint as the climate crisis is a health crisis, and it is our duty as health care professionals to act to protect our patients and planet.

Introduction

At King’s College Hospital, as part of the trust’s Green Plan, our aim is to reduce our anaesthetic gas footprint. The project aimed to tackle the largest cause of these emissions, nitrous oxide. Volatile anaesthetic agents are known to be environmentally harmful, and NHS England announced in early 2023 that desflurane would be decommissioned in England by 2024³. However, Nitrous oxide is a much bigger problem due to frequency of use and reliance in dental and paediatric procedures. Our goal was to reduce our carbon footprint of nitrous oxide gases by tackling waste, through leaks in piped systems, theft and over-ordering of gas cylinders.

Method

We carried out a clinical audit across all clinical areas that are served by piped nitrous oxide, 1605 litres were used weekly on average (83,460 litres per year). As BOC provide supply and return data of nitrous oxide gases to all trusts in England, we were able to compare our clinical audit data with the total gas bought into the trust (915,000 litres per year). Figure 2 shows clinical use of 5%, and therefore 95% waste.

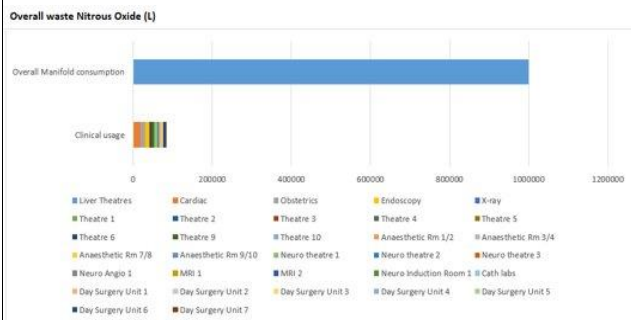


Figure 2: Overall clinical usage and manifold consumption of nitrous oxide at KCH in 2021/22

Our data collection revealed that wastage from piped manifold systems is a far more significant problem than that of persistent clinical usage.

Conclusions

From switching to a leaner supply of medical gases, we have saved over 250 tonnes of CO₂e since the beginning of our project, as well as over £20,000. The project continues with aims to reduce to less than 100 tonnes of CO₂ emissions per year from our nitrous oxide footprint.

Laura Stevenson, Associate Chief Pharmacist – Aseptic Services at King’s College Hospital

References

1. [Greener NHS » Areas of focus \(england.nhs.uk\)](https://www.nhs.uk/greener-nhs/areas-of-focus/)
2. [Nitrous oxide could be harming people as much as the planet - The Pharmaceutical Journal \(pharmaceutical-journal.com\)](https://www.pharmaceutical-journal.com/news-features/industry-news/nitrous-oxide-could-be-harming-people-as-much-as-the-planet)
3. [NHS England » Putting anaesthetic emissions to bed: commitment on desflurane](https://www.nhs.uk/greener-nhs/putting-anaesthetic-emissions-to-bed-commitment-on-desflurane)

All data referenced belongs to the King’s College Hospital anaesthetic gas waste reduction project working group.

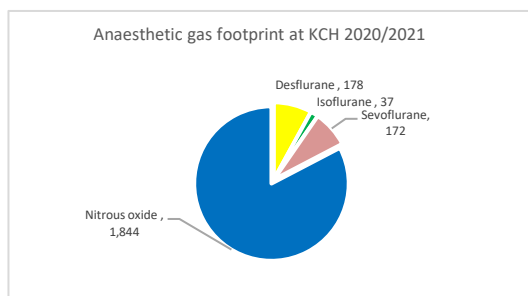


Figure 1: Tonnes of CO₂ produced per gas at KCH in 2020/21

Results

In establishing a solution to the problem we knew the main source of waste of nitrous oxide was from the piped supply. Therefore, our plan was to completely decommission areas that had zero clinical usage and **convert anaesthetic gas machines to take portable cylinders in all other areas**. Converting to smaller, portable cylinders we could provide a leaner supply with no change in patient care or experience. Figure 3 shows an overall reduction in our carbon footprint at KCH since removing piped supply and switching to smaller nitrous cylinders.

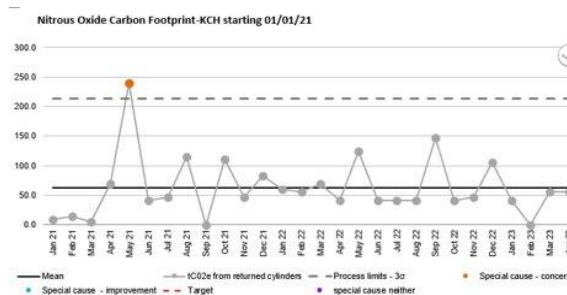


Figure 3: Nitrous oxide carbon footprint from 2021 to 2023