

Consensus Statement on the Removal of Pipeline Nitrous Oxide in the United Kingdom and Republic of Ireland

Background

Nitrous oxide has been commonly used in anaesthetic practice as both an anaesthetic and analgesic agent for over a century. In the theatre setting, nitrous oxide is usually supplied via a manifold of cylinders to enable a continuous, uninterrupted supply. Recent work has demonstrated that the majority of nitrous oxide manifolds in the United Kingdom have a significant leak, with a range of 83-100% of nitrous oxide leaking out to the atmosphere before reaching point of delivery¹⁻³. This has obvious financial implications, but there are also environmental consequences to consider

Nitrous oxide is an important, and abundant, long-lived greenhouse gas, with an atmospheric lifetime of over 100 years^{4,5}. This lifetime is important – since it is a centennial gas, emissions will accumulate in the atmosphere, resulting in increasing atmospheric concentrations and increasing potential effects on the climate. As it is a long-lived gas, any reductions in emissions associated with it are meaningful.

Many anaesthetists have moved away from routine nitrous oxide use in general anaesthesia, including in previous high-usage areas such as paediatric anaesthesia and general anaesthesia in obstetric anaesthesia.

Consensus recommendation

That nitrous oxide should no longer be considered an essential drug in modern anaesthetic practice, and that continuous supply of nitrous oxide to theatre suites via a pipelined supply is no longer essential. We recommend that Trusts and Health Boards decommission their nitrous oxide manifolds as soon as possible, switching to point-of-use cylinders where individual Trusts and Health Boards feel that access to nitrous oxide remains desirable. We recommend that this transition is completed by the end of the 2026/27 financial year in the United Kingdom and the Republic of Ireland.

We would advise that Trusts and Health Boards liaise at an early stage with their supplier of nitrous oxide so that a contemporaneous timeline can be devised, in order to ensure that the increased demand for point-of-use nitrous oxide cylinders can be met and maintained.

Please note that this guidance refers to pipelined pure nitrous oxide only, and does not refer to pipelined Entonox for use in non-theatre areas such as delivery suite.

References

1. Decommission of nitrous oxide manifolds – opportunity for change (2023). NHS Scotland Centre for Sustainable Delivery:
<https://www.nhscfsd.co.uk/media/jwtnthuz/ngtp-n20-manifolds-v20-sept-2023.pdf>
2. The Nitrous Oxide Project (2021). Centre for Sustainable Healthcare:
<https://sustainablehealthcare.org.uk/what-we-do/sustainable-specialties/anaesthetics/nitrous-oxide-project>
3. Reducing Waste Emissions from Piped Nitrous Oxide Products: A Toolkit for Acute NHS Hospitals. NHS England and NHS Improvement (currently being updated).
4. Chakera, A. et al. (2024). 'The Nitrous Oxide Project: Assessment of Advocacy and National Directives to Deliver Mitigation of Anaesthetic Nitrous Oxide.' *Anaesthesia*, 79(3), p270-277. DOI: <https://doi.org/10.1111/anae.16211>
5. Chakera A (2021). Evidence based policy report: reducing environmental emissions attributed to piped nitrous oxide products within NHS hospitals.
<https://www.sehd.scot.nhs.uk/publications/piped-nitrous-oxide-products.pdf>

Please note that for the purposes of this statement, 'decommissioning' refers to capping off the terminal units in theatre and removing the large nitrous oxide cylinders that supply the pipeline.

July 2024