Supporting resource 6: Approaches and tools for understanding nitrous oxide supply and use

This resource can be used independently or together with the 'Nitrous oxide toolkit: Reducing waste in NHS trusts'.

What

While comprehensive data collection can be beneficial, this document provides recommendations for minimum approaches that trusts can implement to start improving their nitrous oxide management. This resource also includes a list of data collection tools that may be useful if an in-depth understanding of nitrous oxide procurement, clinical use and waste volumes is desired.

Who

This resource is intended for project managers, medical gas committees, pharmacy, anaesthetics, and estates and facilities colleagues involved in nitrous oxide waste reduction initiatives.

When

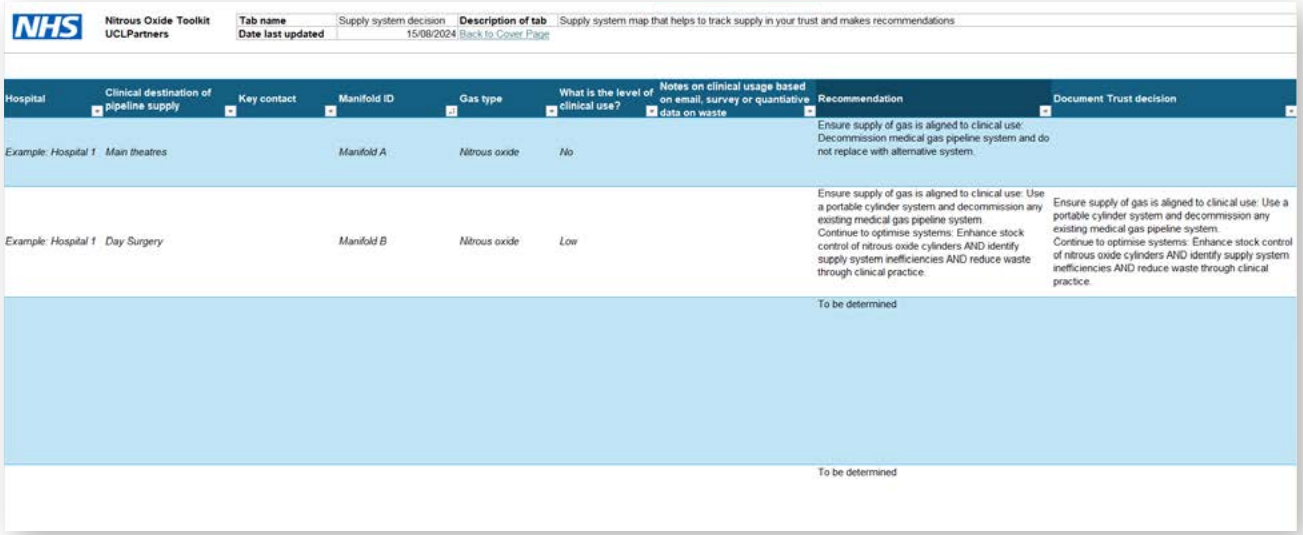
This document can be used at various stages of the nitrous oxide waste reduction process. Initially, it helps build a foundational understanding of nitrous oxide supply systems and clinical use. Later, it serves as a reference for implementing and refining measurement protocols, ensuring that nitrous oxide provision matches clinical needs.

Steps to assess nitrous oxide and nitrous/oxygen mixture supply and clinical use

To effectively measure nitrous oxide supply, measure clinical use and plan how to align these, NHS trusts need to:

1. Identify and contact departments that use nitrous oxide products and understand clinical use.
2. Understand their overall nitrous oxide volume patterns by reviewing the Greener NHS dashboard and/or requesting procurement data from the pharmacy procurement team.
3. Plan steps to align supply to clinical use.

More information can be found in the toolkit section 'Ensure supply of gas is aligned to clinical use' and 'Supporting resource 8: Supply system map and decision template' can support planning steps.



NHS Nitrous Oxide Toolkit UCLPartners | Tab name: Supply system decision | Description of tab: Supply system map that helps to track supply in your trust and makes recommendations | Date last updated: 15/08/2024 | Back to Cover Page

Hospital	Clinical destination of pipeline supply	Key contact	Manifold ID	Gas type	What is the level of clinical use?	Notes on clinical usage based on email, survey or quantitative data on waste	Recommendation	Document Trust decision
Example: Hospital 1	*Main theatres*		*Manifold A*	*Nitrous oxide*	*No*		Ensure supply of gas is aligned to clinical use: Decommission medical gas pipeline system and do not replace with alternative system.	
Example: Hospital 1	*Day Surgery*		*Manifold B*	*Nitrous oxide*	*Low*		Ensure supply of gas is aligned to clinical use: Use a portable cylinder system and decommission any existing medical gas pipeline system. Continue to optimise systems: Enhance stock control of nitrous oxide cylinders AND identify supply system inefficiencies AND reduce waste through clinical practice.	Ensure supply of gas is aligned to clinical use: Use a portable cylinder system and decommission any existing medical gas pipeline system. Continue to optimise systems: Enhance stock control of nitrous oxide cylinders AND identify supply system inefficiencies AND reduce waste through clinical practice.
							To be determined	
							To be determined	

↑ Supporting resource 8: Supply system map and decision template

Identifying clinical use patterns

Progress can be achieved even in the absence of perfect data. The most important information to inform action is to understand the clinical use volume ('no', 'low' or 'high') in each clinical area that is supplied nitrous oxide or nitrous oxide/ oxygen mixture via a medical gas pipeline system.

Project teams should assess the current supply system of nitrous oxide products in clinical areas and identify key contacts in the clinical areas they are undertaking nitrous oxide waste reduction activities in.

Process steps

1. Use 'Supporting resource 8: Supply system map and decision template' to capture and update information on supply and clinical use.
2. List the hospitals that have piped nitrous oxide products supplied and the manifolds for each hospital. Request this information from the Estates and Facilities team or via the Medical Gas Committee.
3. List each area the piped supply provides gas to and identify contacts for each department or clinical lead.
4. Request information on the clinical use. Either of the following two options can be used, depending on acceptability of the waste reduction project/s in your trust:
   - Option 1: email departmental leads using the email in the 'Supporting resource 5: Project communication templates' to quickly ascertain the baseline need for nitrous oxide across various clinical areas, gain a rapid overview of specific requirements and to identify immediate areas of concern that may require further investigation.
   - Option 2: survey clinicians using the draft in the 'Supporting resource 5: Project communication templates' to collect detailed insights on current practices and clinician attitudes towards nitrous oxide usage, which can support tailoring supply strategies and educational initiatives across departments.
5. Document the response of each department to inform the actions required using 'Supporting resource 8: Supply system map and decision template'.

Benefits of surveying clinicians to understand use:

- Relatively simple data collection compared to other methods of clinical use data collection
- Ensures alignment of gas supply with clinical use
- Identifies potential areas for system improvement or decommissioning
- Enables identification of clinicians who use nitrous oxide more frequently and may require support to use different a different supply system

Challenges of surveying clinicians to understand use:

- May be difficult to identify all stakeholders
- Requires detailed data collection and analysis
- Potential for poor response rates from clinicians

Using the Greener NHS dashboards

Medical gas committees (MGC), project managers and sustainability leads in NHS trusts can use the nitrous oxide pages in the Greener NHS Dashboard for broad monitoring while seeking more detailed and timely data for specific hospitals or specialties. It is recommended to include a regular review of the Greener NHS dashboards in medical gas committee meetings.

Access guidance for NHS organisations:

1. Access the dashboard via an OKTA account. To register for one, follow this link https://apps.Model.Nhs.Uk/register, or alternatively log in.
2. Click NHS England applications.
3. Search for Greener NHS dashboard, click the link if you already have access or request access if you do not have access.
4. Within the dashboard, locate the 'Nitrous oxide' and 'Nitrous oxide and oxygen' tabs to explore volume and emissions data at trust, ICS and region level.

Queries about the pages should be directed to greener.nhs@nhs.net

Benefits of using the Greener NHS dashboard:

- Can help to identify nitrous oxide purchasing patterns over time
- Can be used to demonstrate the trust's progress in reducing nitrous oxide use against sustainability objectives
- Helps support comparison with other trusts to identify best practices and areas for improvement

Challenges of using the greener NHS dashboard:

- Volume/emissions data are based on number of returned cylinders, which may not provide the whole picture of procurement patterns
- While data updates are done monthly, there can be a lag in data availability, which may delay decision-making
- Does not offer a drill-down to a hospital-level, providing an overall trust-level view only

Requesting data from pharmacy teams

Project teams can request data from the trusts' pharmacy department to gain a more granular understanding of the amount of gas purchased per hospital.

Process:

1. Contact your pharmacy procurement team to request 12 months of procurement data across all hospitals.
2. Review each hospital's supply volumes and compare them to known clinical use patterns.
3. Utilise 'Supporting resource 7: Measure and calculate emissions and waste tool', see screenshot below:

Supporting resource 7: Measure and calculate emissions and waste tool

Benefits of requesting and using supplier data:

- Provides granular, hospital-specific data on nitrous oxide procurement
- Allows for identification of significant variations in waste between hospitals
- Strengthens the argument for targeted interventions
- Offers 'hard' data to support business cases and engage stakeholders
- Enables more accurate tracking of progress over time

Challenges of requesting and using supplier data:

- May require coordination between multiple departments to obtain the data
- Initial data interpretation may be time-consuming
- The supplier data does not reflect how much gas a trust is using, only how much it is procuring

Detailed data collection options

Trusts may use several options to collect more data depending on their needs, below are some examples of methodologies from other organisations.

Note: These have not undergone assurance by UCLPartners nor NHS England.

For a granular understanding of supply patterns and requirements	
Conduct a detailed survey of the manifold locations and review manifold logs/switchboard change over rates and calculate volume of gas supplied per month and year.	Protocols and templates are available: • Nitrous waste methodology.pdf (anaesthetists.org) - template available on page 5 • NO MORE GAS: Pan-London Perioperative Audit and Research Network (uk-plan.net) - manifold survey available in the study documents
Estimate frequency of portable cylinder exchanges for each clinical location.	Suggested consideration available: • Toolkits and Resources: Nitrous Oxide Toolkit Available at: http://www.providence.org/about/advocacy-and-social-responsibility/environmental-stewardship/toolkits-and-resources - guidance available on page 8
For details on clinical use	
Direct data analysis of anaesthetic machines or EPRs to identify exact clinical usage.	Suggested methodologies available: • Anaesthetic Machine Reported Nitrous Usage - Green Theatres Network • Anaesthetic gases calculator | Association of Anaesthetists • Decommissioning N20 Playbook - WORKING VERSION.docx (practicegreenhealth.org) - available on page 19 - 25

For detailed audits to confirm waste in nitrous oxide supply systems	
Several methods such as the cylinder weighing method, currently used in Australia to detect and reduce nitrous oxide leaks in healthcare facilities.	Suggested methodologies available: • Detecting and reducing leaks from nitrous oxide in healthcare facilities – A practical guide | Australian Government Department of Health and Aged Care
Calculate the total carbon dioxide attributable to this aspect of anaesthetic and analgesic practice.	• Annual Anaesthetic Departmental Calculator | The Royal College of Anaesthetists (rcoa.ac.uk) this has been replicated with permission in 'Supporting resource 7: Measure and calculate emissions and waste tool'
Assess potential waste in maternity settings by benchmarking purchasing data against average volume per birth.	Suggestion available at: • Evidence-Based Policy Report: Reducing Environmental Emissions attributed to Piped Nitrous Oxide Products within NHS Hospitals (scot.nhs.uk) - page 25