



Nitrous Oxide Policy

1. Purpose

To define responsibilities and the minimum requirements for people (WACHS staff and non-WACHS staff) involved in managing nitrous oxide across WA Country Health Service (WACHS). This policy supports people to comply with the WA Health MP 139/20 - [Medicines Handling Policy](#).

- Nitrous oxide, when referred to in this policy, is for therapeutic use as a medical gas (Schedule 4 (S4) prescription only medicine) and is not applicable to TGA registered medical devices that use / contain nitrous oxide.
- The term nitrous oxide will be used throughout this policy to include both nitrous oxide >99.5%, and nitrous oxide mixed with oxygen (e.g. Entonox®).

2. Policy

2.1 Summary of Mandatory Requirements

Individual sites and regions can apply specific processes if they comply with this policy. Appendices have been included as examples detailing minimum requirements.

- Prescribers / midwives must write a nitrous oxide medication order and document use.
- Regional Chief Pharmacists (RCPs), as the *Health Service Medicines and Poisons Act* permit holder, will identify, approve and document units / positions delegated to purchase nitrous oxide (e.g. [Appendix A](#)).
- Purchasers must oversee purchasing patterns via the gas suppliers online portal (e.g. [BOC online registration portal](#)).
- Nitrous oxide handling / access is limited to approved positions and must also comply with the WACHS [Storage and Handling of Gas in Cylinders Procedure](#).
- Intra / inter-site movement of cylinders must be recorded (e.g. [Appendix B](#)) and kept for 2 years. Managers / positions in charge (or delegates) of gas storage areas are responsible for record keeping and escalating non-compliance to the Regional Managers of Infrastructure and Support Services (RMISS) / Operations Manager (OM) as determined by the Regional Executive Director (ED), and the RCP.
- Nitrous oxide cylinder storage must be safe, secured, with restricted access, and must comply with relevant standards¹, legislation, and policy. Storage areas must be approved by the RMISS / OM (as determined by the Regional ED) (e.g. [Appendix C](#)).
- The RMISS / OM (as determined by the Regional ED) must maintain a list of current areas approved to store nitrous oxide cylinders (including the strength of nitrous oxide, cylinder sizes and minimum/safe agreed quantities kept) and areas with reticulated nitrous oxide outlets (e.g. maternity, theatre) (e.g. [Appendix D](#)).
- Administration sets must be secured to prevent nitrous oxide misuse.
- Clinical area managers must restrict and secure access to reticulated nitrous oxide in their area to minimise risk of misuse.
- The RMISS / OM (as determined by the Regional ED) is responsible for the maintenance and integrity (e.g. identification of leaks) of the medical gas system and ensures compliance with relevant standards (e.g. [AS 2896:2021 Medical gas systems](#)

– [Installation and testing of non-flammable medical gas pipeline systems](#)²⁾. They must determine who is responsible for connection of nitrous oxide cylinders to the manifold for reticulated supply, and subsequent reticulated gas system tests.

- The RMISS / OM (as determined by the Regional ED) must determine who performs the bi-annual gas cylinder audits with the gas supplier (see section [2.13](#) and [Appendix E](#)) and reconcile results with the nitrous oxide cylinder movement records.
- The RMISS / OM (as determined by the Regional ED) and RCP must review consumption trends quarterly and the reconciled cylinder audits / movement records bi-annually, and report results to the regional Medicines and Therapeutics Committee (MTC).
- All parties involved must investigate and report any suspected loss to the RMISS / OM (as determined by the Regional ED) and the RCP.

2.2 Risks and hazards

Nitrous oxide presents different risks to most other S4 medicines due to:



- the inherent hazards of compressed gas in cylinders e.g. may explode if heated
- the dangers due to chemical characteristics and oxidising nature
- risk of diversion and misuse with inhalation resulting in euphoria and relaxation
- environmental, financial and safety risks from undetected leaks in the medical gas reticulation system (pipeline).

The risks apply to all forms of nitrous oxide, i.e. stored cylinders, cylinders attached to anaesthetic machines and reticulated supply.

Risk minimisation strategies are required to ensure the safe storage and handling of nitrous oxide, to reduce inappropriate access, potential misuse, and subsequent harm. Optimised management also has environmental and cost benefits.

2.3 Availability

Nitrous oxide is stored in compressed gas cylinders as a liquid under pressure. Contact the gas supplier for more information e.g. BOC medical gas cylinders [BOC AUS Gases Cylinder ID Poster Nov 2016.pdf \(boc-healthcare.com.au\)](#)

<p>Nitrous oxide 50% with oxygen 50% gas cylinders (e.g. Entonox®)</p>	<p>A medical gas mixture of 50% nitrous oxide and 50% oxygen. The cylinder shoulder colours are white and ultramarine (blue). Available in sizes C, D, E, G.</p>	
<p>Nitrous oxide > 99.5% gas cylinders</p>	<p>Medical gas nitrous oxide > 99.5%. To be mixed with oxygen to provide various nitrous oxide to oxygen concentrations. The cylinder shoulder colour is ultramarine (blue). Available in sizes C, D, E, G and F8. Sizes G and F8 are large and heavy and are usually connected to manifolds for reticulated supply.</p>	

2.4 Indications

Approved indications for initiation are listed on the [State-wide Medicines Formulary](#).

For clinical guidance see the following:

- Intrapartum:

- Use per the WACHS [Structured Administration and Supply Arrangement \(SASA\) – Intrapartum Nitrous Oxide](#) and the Women’s and Newborn Health Service (WNHS) [Pain Management \(including labour non-pharmacological\) Clinical Practice Guideline](#) (endorsed for use in WACHS).
- Paediatrics:
 - Refer to the Perth Children’s Hospital (PCH) guidelines (all are endorsed for use in WACHS). There are several PCH emergency guidelines that mention nitrous oxide (e.g. [Fractures - Elbow](#), [Lumbar Puncture](#) etc). Search the [PCH Emergency Department Guidelines internet page](#) for relevant indication, and
 - See the PCH medication management guideline [Nitrous Oxide / Oxygen \(50:50\): Self Demand Guideline](#).
- Other patient cohorts – refer to the product information³⁻⁴.

2.5 Minimum Prescribing and Administration Requirements

Minimum prescribing and administration requirements are as follows:

- All nitrous oxide must be prescribed on the WA Hospital Medication Chart (WA HMC) or on any other WACHS endorsed medication chart (e.g. anaesthetic record).
 - includes midwife initiated and all presentations (cylinders and reticulated).
- In addition to the usual prescription requirements, the medication order must include:
 - the dose (concentration of nitrous oxide with oxygen as the balance)
 - a frequency (e.g. as required, continuous)
 - a maximum concentration if applicable (e.g. up to 70% nitrous oxide : 30% oxygen)
 - the duration (e.g. continuous for 30 min, or for duration of procedure)
 - and a maximum use per 24 hours, if applicable.
- Nitrous oxide should be administered where there is satisfactory scavenging or ventilation to keep air levels at a minimum and below the Australian occupational exposure limits.¹⁻⁵
- For patients who are self-administering, document as “patient self-administering, see patient healthcare record for details” in the administration section of the medication chart (or equivalent) (every inhalation does not require documentation).
- In the patient healthcare record, document the:
 - time of initiation
 - any changes in nitrous oxide : oxygen concentration
 - effect of therapy (including level of sedation and pain score)
 - the time ceased.
- Refer to the clinical guidelines mentioned in [section 2.4](#) or the product information for directions on how to use, administer and monitor nitrous oxide therapy.
- After administration, return the nitrous oxide cylinder to the designated storage area and secure per the below storage requirements.

2.6 Purchasing

Authority to purchase scheduled medicines resides with the Health Service Medicines and Poisons Act Permit holder, i.e. the Regional Chief Pharmacist (RCP). Due to specialised storage and handling requirements for compressed gas cylinders the purchase of nitrous oxide will be managed by another unit of the public health service (i.e. not be directly managed by the Pharmacy Department). The RCP will be responsible for identifying, approving and documenting units / positions delegated to manage purchasing.

- For consistency, purchasing of nitrous oxide will be delegated to the Supply Department or to the position already ordering medical gas for the site, or as part of a contracted service.
- Approval to purchase must be documented by the RCP prior to purchasing.
- Records will be reviewed and updated annually ([Appendix A](#)).
- Sites must register for an online account with the gas supplier (e.g. [BOC online registration portal](#)) to oversee purchasing patterns, current cylinder holdings and ordering. Online access will support prompt review and reconciliation.
 - The purchaser will set up the account and provide access details to the RMISS/ Operations Manager, Facilities Management, Regional Supply Manager and RCP.
- RMISS and/or OM approval is required prior to ordering stock for new storage areas to ensure the area is safe and appropriate (see "[Additional Nitrous Oxide Storage Requirements](#)").

2.7 Receival from the Gas Supplier

- Cylinder deliveries must be received by people approved to handle medications (see "[Handling and Access](#)") and immediately secured within the main gas store area, or suitable minor gas store (e.g. secured medicines room).
- The cylinders must be recorded into the gas store area upon receipt. Record receival details, e.g. [Appendix B](#).
- See "Movement records for nitrous oxide" for more information.

2.8 Handling and Access

- The following people are approved to handle (or access) nitrous oxide:
 - an authorised health professional permitted to handle medications per the WA Medicines and Poisons Regulations 2016, e.g. medical practitioner, nurse, midwife, pharmacist, paramedic, medic, anaesthetic technician, or Aboriginal & Torres Strait Islander health practitioners; or
 - an unregulated health care worker where their JDF includes the transport of supplies; or
 - an unregulated health care worker under the direct supervision of an authorised health professional permitted to handle medicines, e.g. cleaners being escorted by a nurse.
- Further restriction to the above list is at the discretion of the position in charge of the gas storage area, e.g. Nurse Unit Manager, anaesthetists (anaesthetic machines), Facilities Management.
- Gas cylinders are a significant manual handling risk. They are unstable and prone to toppling, which increases the physical hazard risk. Handling and use must comply with training requirements and safety measures outlined in the WACHS [Storage and Handling of Gas in Cylinders Procedure](#) and the WACHS [Manual Tasks Policy](#).

2.9 Movement Records of Nitrous Oxide

- Sites must record movement of nitrous oxide cylinders (and people involved) to aid reconciliation and minimise diversion risk.
- This includes movement within a site (e.g. main gas store to clinical area) and between sites (e.g. via ambulance services with nurse or medical practitioner escort).

- If there is a need to transport nitrous oxide cylinders by vehicle, refer to the additional transport requirements in the WACHS [Storage and Handling of Gas in Cylinders Procedure](#).
- Areas storing nitrous oxide cylinders, including cylinders attached to back of anaesthetic machines, require a movement record - see sample in [Appendix B: WACHS Nitrous Oxide Cylinder Movement Records](#).
 - Keep the movement record near the designated storage space (e.g. hang above trolley).
 - If a cylinder is moved from a storage area to a clinical area for use and returned to the storage area immediately after, it only needs to be recorded out and in of the approved storage area.
- The person moving the cylinder is responsible for completing the record. The unique bar code on the gas cylinder, date, time, location received from / sent to and the name and position of the person must be recorded at a minimum.
- Movement records must be kept for a minimum of two years and are to be reviewed with the bi-annual cylinder audit.
- Managers of storage areas are responsible for implementation, record keeping and escalation of non-compliance with movement record requirements to the RMISS/OM (as determined by the Regional ED) and the RCP.

2.10 Cylinder storage requirements

Storage of nitrous oxide in cylinders must meet Australian Standard [AS 4332-2004 – The Storage and Handling of Gases in Cylinders](#). These requirements are detailed in: WACHS [Storage and Handling of Gas in Cylinders Procedure](#). These documents detail classifications and requirements for:

- **Minor storage of gas** - small quantities of gas cylinders present little risk or add to a building's fire load, but there are still storage and handling requirements applicable to each site / storage area under the Standard. Most clinical areas storing nitrous oxide will meet the classification for indoor minor storage.¹
- **Main gas stores / storage that exceeds minor storage limits** – the full Standard 4332-2004 applies to these storage areas. Main gas stores generally exceed the limits for minor storage.¹
- **Storage of gas cylinders to minimise hazard risks** - all cylinders must be stored to minimise hazard risks, i.e. chemical (e.g. spontaneous combustion, asphyxiation) and physical hazards (e.g. frostbite from liquified gas release, increased intensity of fire, cylinder impact resulting in shrapnel release, a direct stream of high-pressure gas causing damage to the ears or eyes, shearing of valve which can 'rocket' cylinder into the air, musculoskeletal injury).¹

Additional Nitrous Oxide Storage Requirements

Nitrous oxide cylinder storage must also comply with the WA Health MP 139/20 - [Medicines Handling Policy](#); [Risk based requirements for medicines handling](#). When determining storage requirements for scheduled medicines / compressed gas cylinders, access to allow timely patient care, the risk of diversion and the safe storage of a dangerous good must be considered.

- Maintain a list of areas approved to store nitrous oxide cylinders and areas with reticulated nitrous oxide on site. Document the type of nitrous oxide available i.e. cylinders, reticulated (e.g. theatre, maternity), strength (> 99.5% or mixture such as Entonox®), the minimum/safe agreed quantities kept, and size of cylinders kept in

each area. This will reduce risk of diversion and aid reconciliation. The RMISS / OM (as determined by the Regional ED) is responsible for maintaining a current list ([Appendix D](#)).

- Areas that wish to start storing nitrous oxide must first obtain RMISS / OM approval to ensure the area meets requirements and to record the reason for storing, the storage location, and the quantity / size of cylinder(s) to be kept (e.g. [Appendix C](#)).
- Nitrous oxide cylinders must be secured, kept in a designated position, with access restricted to people approved to handle nitrous oxide. This applies to cylinders attached to anaesthetic machines, connected to manifolds, or stored on F8 pallets:
 - Secured examples: a locked gas cage, a locked room deemed suitable as a minor gas store or a locked wall bracket with measures to prevent inappropriate access.
 - In the main gas store nitrous oxide must be additionally secured with a locking mechanism, with access to the mechanism restricted.
 - Cages are available for purchase from the gas supplier and can be installed inside the gas storage area if required.
- Administration sets must be secured to prevent misuse.
- People approved to handle nitrous oxide must be able to observe the entry to the storage area when the area is in operation.

Facilities Management and the gas supplier can be contacted for advice when determining storage, handling, inspection, and maintenance requirements.

If any storage requirement(s) cannot be met, this must be reviewed by the RMISS / OM (as determined by the Regional ED) in consultation with the RCP. If necessary, a risk-based assessment should be submitted to the Regional Executive via the regional Medicines and Therapeutics Committee (MTC).

2.11 Reticulated (Piped) Nitrous Oxide

The RMISS / OM (as determined by the Regional ED) is responsible for the maintenance and integrity (e.g. identifying leaks) of the medical gas system and ensures compliance with relevant standards (e.g. [AS 2896:2021 Medical gas systems – Installation and testing of non-flammable medical gas pipeline systems²](#)).

Connection to the manifold

- Cylinders for reticulated nitrous oxide (usually the large size E, G or F8 pallet) are stored in the main gas store.
- The RMISS / OM (as determined by the Regional ED) must decide who is responsible for connection of nitrous oxide to the manifold for reticulated supply, and subsequent reticulated gas system tests.

Access to reticulated (piped) nitrous oxide in clinical areas and minimising misuse

- Areas that use “on demand triggered system administration sets” to access reticulated nitrous oxide (e.g. maternity) must keep the sets secured to prevent misuse.
- Access to devices / machines (e.g. anaesthetic machines) that deliver continuous nitrous oxide must be restricted and steps taken to prevent misuse, e.g. securing electronic access to the machine or locking the room and restricting access.
- If steps to secure and restrict access cannot be put in place, the Nurse Unit Manager must escalate the issue to the OM in consultation with the RCP. If necessary, a risk-

based assessment should be submitted to the regional Executive Director via the regional MTC.

2.12 Inspection and Maintenance of Nitrous Oxide Equipment and Systems

Regular inspection and maintenance of nitrous oxide equipment and systems must be in place.^{1,2} Gas storage area managers can contact the RMISS / Facilities Management (or delegate) for requirements.

2.13 Audits and Reports to Detect Loss

Biannual Cylinder Audit with Cylinder Movement Records

In accordance with the WA Health Financial Management Manual, sites must perform a stocktake of nitrous oxide on site biannually. The RMISS / OM (as determined by the Regional ED) (or their delegate) will perform an annual audit of this process as follows:

- RMISS/OM (or their delegates) is responsible for organising and performing the bi-annual gas cylinder audit with the gas supplier per the common use agreements (CUA) e.g. [BOC CUA](#), [Appendix E](#). This audit includes nitrous oxide and is to be reconciled with the nitrous oxide movement records in each storage location.
- RMISS/OM (or their delegates) will advise the gas supplier of the preferred cylinder audit option prior to the 30th of April each year.
- The cylinder audit will provide the following at a minimum (see Image 1 below):
 - stock agreement list (sent to the customer prior to audit day) which confirms the rented cylinder holdings at each site, enables a site count by unique cylinder barcode
 - missing assets, cylinders confirmed “not held” by the customer (investigation and replacement costs occur)
 - extra cylinders found on site audit day
 - swappers report – assets returned by another organisation.
- The completed cylinder audit and reconciled nitrous oxide cylinder movement records will be reviewed by the RMISS / OM (as determined by the Regional ED) and RCP, and reported to the regional MTC.


		<h3 style="border: 1px solid black; padding: 5px;">DASHBOARD</h3>		
DASHBOARD DECLARATION STOCK AGREEMENT SITE COUNT MISSING ASSETS & RC EXTRA CYL FOUND SWAPPERS REPORT	TERMINOLOGY		DESCRIPTION	
	DASHBOARD		AUDIT SUMMARY	
	DECLARATION		SIGNED DECLARATION FORM	
	STOCK AGREEMENT		STOCK AGREEMENT BEFORE AUDIT	
	SITE COUNT		STOCK AGREEMENT COMPLETED ON AUDIT DAY	
	MISSING ASSETS & RC		ASSETS CONFIRMED NOT HELD & REPLACEMENT COSTS	
	EXTRA CYL FOUND		EXTRA CYLINDER FOUND ON AUDIT DAY	
	SWAPPERS REPORT		CYLINDERS RETURNED BY OTHER ORGANIZATIONS	
	CUSTOMER INFORMATION			
	ACCOUNT NUMBER			
ACCOUNT NAME				
AUDIT DAY				
AUDIT SUMMARY				
DESCRIPTION	ASSET QTY	VALUE + GST	COMMENTS	
STOCK AGREEMENT	155			
SITE COUNT - HELD	143			
SITE COUNT - EXTRA CYL	22			
MISSING ASSETS	3	\$643.65	Excluded 065E2 from replacement fees	

Image 1. BOC cylinder audit report

Nitrous Oxide Consumption Trends

The gas supplier will provide consumption trends (purchases) quarterly to the RCP and RMISS / OM (as determined by the Regional ED) to review and investigate any increased or unexpected usage. The report will include the previous 5 year purchasing history of nitrous oxide across all WACHS sites and will be reported to the regional MTC.

2.14 Reporting Suspected Loss

All parties must investigate and report any suspected loss to the RMISS/OM (as determined by the Regional ED) and RCP. Any unresolved loss must be reported to the Regional MTC via the RCP.

3. Roles and Responsibilities

Regional Executive Directors are responsible for:

- overall governance and accountability of nitrous oxide systems
- determining responsibilities where outlined in this policy.

Regional Operations Managers, in addition to responsibilities detailed in this policy (if determined by the regional ED), are responsible for:

- delegation of responsibilities relating to nitrous oxide management within their service
- identifying relevant breaches to this policy and escalating to the RCP for a risk-based assessment.

Regional Managers Infrastructure and Support Services, in addition to responsibilities detailed in this policy (if determined by the regional ED), are responsible for:

- delegation of responsibilities relating to nitrous oxide management within their service
- identifying relevant breaches to this policy and escalating to the RCP for a risk-based assessment
- inspection, maintenance and repairs of nitrous oxide equipment and gas systems
- ensuring facility / room is suitable for storage of medical gas
- updating Dangerous Goods Manifest dependent on quantity of gas stored.

The **Regional Chief Pharmacist** (Health Service Medicines and Poisons Act Permit Holder), in addition to responsibilities detailed in this policy, is responsible for:

- ensuring legislative / WA Health policy compliance related to medicines and support medicines stewardship
- reporting any suspected loss to the Regional MTC and if appropriate, WACHS Integrity Unit
- undertaking risk-based assessments when requested by the RMISS / OM.

Managers (or nominated delegates) of nitrous oxide storage areas (including minor stores and areas with reticulated outlets), in addition to responsibilities detailed in this policy are responsible for:

- ensuring their gas storage area is compliant with all requirements
- ensuring appropriate approvals are sought and in place for new storage areas
- monitoring stock and requesting replacement with the purchaser, to ensure supply continuity
- investigating and reporting any suspected nitrous oxide loss to the RMISS / OM (as determined by the Regional ED) and the RCP.

Units/positions with delegated authority to purchase nitrous oxide, in addition to responsibilities detailed in this policy, are responsible for:

- monitoring stock on hand with the gas storage area managers and place purchase orders via the gas agent
- ensuring RMISS / OM (as determined by the Regional ED) approval of new gas storage area is in place prior to ordering stock for new storage areas.

Facilities Management/Engineering, in addition to responsibilities detailed in this policy, are responsible for:

- ensuring that main gas stores meet the relevant standards/requirements and is responsible for the overall maintenance of each sites gas stores areas (including minor storage areas) storing nitrous oxide
- ensuring compliance with the WACHS [Storage and Handling of Gas in Cylinders Procedure](#) within the main gas store and providing advice to clinical areas with minor stores of nitrous oxide.
- Contractors are responsible for: servicing cylinders, gas equipment and reticulated systems
- transporting cylinders
- complying with this policy and ensuring stock movement is recorded where applicable e.g. stock transferred between sites is logged out of the storage area at point of origin and into the storage area of the new WACHS site (destination).

The **Gas supplier** is responsible for:

- providing cylinder audits per the CUA (e.g. BOC provide bi-annual cylinder holdings and conduct annual cylinder reconciliation audits when requested)
- providing safety advice regarding storage
- providing information regarding online portal access and use.

Prescribers, in addition to handling responsibilities detailed in this policy, are responsible for:

- the appropriate clinical use, administration and prescribing of nitrous oxide, including requirements outlined under the prescribing and administration section of this policy, and working within scope of practice
- upon completion of a case, anaesthetists are responsible for securing and restricting access to anaesthetic machines delivering nitrous oxide.

Nurses, in addition to handling and storage responsibilities detailed in this policy, are responsible for:

- appropriate clinical use and administration of nitrous oxide (as per [section 2.4](#) and [2.5](#)), working within scope of practice
- ensuring appropriate medication order in place prior to administration.

Midwives, in addition to handling and storage responsibilities detailed in this policy, are responsible for:

- ensuring administration of intrapartum nitrous oxide complies with both the WACHS SASA and policy guidelines (refer to [section 2.4](#) and [2.5](#)) if working within WACHS Maternity and Obstetric units
- ensuring midwife initiated nitrous oxide via the SASA is documented on the WA HMC (per the prescribing and administration instructions) and use is documented in the patient healthcare record
- working within scope of practice.

The **Regional Medicines and Therapeutics Committees** are responsible for escalating unresolved loss to Regional EDs, the WACHS Medicines and Therapeutics Committee and, when required to the WACHS Integrity Unit e.g. where there is potential diversion.

The **Regional Work Health Safety Committees** are responsible for addressing / escalating known work health safety issues relating to nitrous oxide.

All staff are required to work within policies and guidelines to make sure that WACHS is a safe, equitable and positive place to be.

4. Monitoring and Evaluation

Monitoring

Managers of storage areas, RMISS, Operations Managers, Regional Executive Directors and Regional Chief Pharmacists are responsible for monitoring compliance with various aspects of this policy e.g. prescribing, purchasing, handling, storage, access, movement records etc.

Evaluation

Regional Medicines and Therapeutics Committees and/or Medication Safety Committees are responsible for evaluation of this policy. The following means or tools are to be used:

- biannual cylinder audit reviewed with cylinder movement records
- annual medication storage audit (included as part of the WACHS [Medication Handling and Accountability Policy](#))
- quarterly consumption report review.

5. Compliance

This policy is a mandatory requirement under the *Medicines and Poisons Act 2014* (WA).

Failure to comply with this policy may constitute a breach of the WA Health Code of Conduct (Code). The Code is part of the [Integrity Policy Framework](#) issued pursuant to Section 26 of the [Health Services Act 2016](#) and is binding on all WACHS staff which for this purpose includes trainees, students, volunteers, researchers, contractors for service (including all visiting health professionals and agency staff) and persons delivering training or education within WACHS.

WACHS staff are reminded that compliance with all policies and procedures is mandatory.

6. References

- Standards Australia. AS 4332-2004 The storage and handling of gases in cylinders. Sydney, NSW: Standards Australia. 2004 In SAI Global i2i. Available from: <https://au.i2.saiglobal.com/management/display/index/4/250283/-/67d657d18cf3020c1bfa93ff7f9c965b> [accessed 2023 Jun 30].
- Standards Australia. AS 2896: 2021 Medical gas systems - Installation and testing of non-flammable medical gas pipeline systems.. Sydney, NSW (AU): Standards Australia. 2021 In SAI Global i2i. Available from: <https://au.i2.saiglobal.com/management/display/index/0/178784/-/fd250b8fa8af83a26815f2583373abb1> [accessed 2023 Jun 30].
- MIMS online [Internet]. Crows Nest (NSW): MIMS Australia; 2023. BOC Gases Nitrous Oxide; [updated 2019 May; cited 2023 May 10]. Available from: https://www-mimsonline-com-au.wachslibresources.health.wa.gov.au/Search/FullPI.aspx?ModuleName=Product%20Info&searchKeyword=nitrous+oxide&PreviousPage=~/Search/QuickSearch.aspx&SearchType=&ID=129340001_2
- MIMS online [Internet]. Crows Nest (NSW): MIMS Australia; 2023. BOC Gases Entonox; [updated 2019 Jun; cited 2023 May 10]. Available from: https://www-mimsonline-com-au.wachslibresources.health.wa.gov.au/Search/FullPI.aspx?ModuleName=Product%20Info&searchKeyword=nitrous+oxide&PreviousPage=~/Search/QuickSearch.aspx&SearchType=&ID=129450001_2
- Safe Work Australia [Internet]. Nitrous Oxide. Hazardous Chemical Information System (HCIS). Exposure Standard Documentation. Commonwealth of Australia. [cited 2023 June 30]. Available from: <https://hcis.safeworkaustralia.gov.au/ExposureStandards/Document?exposureStandardID=453>

7. Definitions

Term	Definition
Medical gas pipeline system	The Standard AS 2896:2021 defines the medical gas pipeline distribution system as: “Central supply of medical gases with control equipment and a distribution pipeline linking the source of supply to the terminal units. This includes: <ul style="list-style-type: none"> • pump suction and venturi ejector operated suction systems. • isolation valves, pressure relief valves, and any secondary pipeline pressure regulators.”
Manager of gas storage area	Position responsible or in charge of a room, area or facility that stores gases or has reticulated gas outlets.
Manifold	A manifold is a wide and/or bigger pipe, or channel, into which smaller pipes or channels lead. A pipe fitting or similar device that connects multiple inputs or outputs.
Purchaser	Unit or position with delegated approval (by the Regional Chief Pharmacist) to purchase nitrous oxide.
Reticulated nitrous oxide	Is the supply of nitrous oxide through a dedicated pipe network (e.g. the medical gas pipeline system).

8. Document Summary

Coverage	WACHS-wide
Audience	Infrastructure, operations, support services, medical, nursing, midwifery, pharmacy
Records Management	Non Clinical: Corporate Recordkeeping Compliance Policy Clinical: Health Record Management Policy
Related Legislation	Medicines and Poisons Act 2014 (WA) Medicines and Poisons Regulations 2016 (WA) Dangerous Goods Safety Act 2004 (WA) Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007 (WA) Health Practitioner Regulation National Law (WA) Act 2010
Related Mandatory Policies / Frameworks	<ul style="list-style-type: none"> • MP 0078/18 - Medication Chart Policy • MP 139/20 - Medicines Handling Policy • WA Health Risk based requirements for medicines handling • Clinical Governance, Safety and Quality Framework
Related WACHS Policy Documents	<ul style="list-style-type: none"> • Storage and Handling of Gases in Cylinders Procedure • Managing Risks of Hazardous Chemicals and Dangerous Goods Procedure • Medication Handling and Accountability Policy • Medication Prescribing and Administration Policy • Manual Tasks Policy • Provision of Domiciliary Oxygen for Travel in WA Guideline • Oxygen Therapy and Respiratory Devices - Adults Clinical Practice Standard
Other Related Documents	<ul style="list-style-type: none"> • PCH Clinical care of paediatric patients with COVID-19 • PCH Fractures - Elbow • PCH Lumbar puncture • PCH Ulnar nerve block • PCH Digital nerve block • PCH Penile zipper injury • PCH Median nerve block • PCH Fractures - Knee • PCH Lacerations • PCH Paraphimosis • PCH Posterior tibial nerve block • PCH Fractures - Forearm • PCH Nitrous Oxide / Oxygen (50:50): Self Demand Guideline • Structured Administration and Supply Arrangement (SASA) – Intrapartum Nitrous Oxide

	<ul style="list-style-type: none"> • WNHS Pain Management (including labour non-pharmacological) Clinical Practice Guideline
Related Forms	<ul style="list-style-type: none"> • Approved Nitrous Oxide Storage Areas - Inventory Form (editable version) • Nitrous Oxide Cylinder Movement Records (editable version) • Nitrous Oxide New Storage Area Request Form (editable version) • WACHS MR170A WA Hospital Medication Charts • Units / Positions Approved to Purchase Nitrous Oxide Record (editable version)
Related Training Packages	Work Health and Safety: Managers and Supervisors (WHSMS EL2) (via MyLearning)
Aboriginal Health Impact Statement Declaration (ISD)	ISD Record ID: 2549
National Safety and Quality Health Service (NSQHS) Standards	1.01,1.05,1.07, 1.10, 1.29, 4.01, 4.04, 4.14
Aged Care Quality Standards	Nil
Chief Psychiatrist's Standards for Clinical Care	Nil

9. Document Control

Version	Published date	Current from	Summary of changes
1.00	6 February 2024	6 February 2024	New policy
1.01	14 February 2024	6 February 2024	Minor amendment to fix error in roles and responsibilities for midwives.
1.02	11 March 2024	6 February 2024	Minor amendment to update hyperlinks to the Approved Nitrous Oxide Storage Areas - Inventory Form on pages 13 and 18.
1.03	16 Sept 2025	6 February 2024	Minor amendment to replace HealthPoint link to SASA with Internet link.

10. Approval

Policy Owner	Executive Director Clinical Excellence
Co-approver	Executive Director Infrastructure and Environment Executive Director Nursing and Midwifery
Contact	WACHS Chief Pharmacist
Business Unit	Clinical Excellence
EDRMS #	ED-CO-24-7079
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This document can be made available in alternative formats on request.

Appendix C: WACHS Nitrous Oxide New Storage Area Request Form Sample

Editable version available on the [Pharmacy SharePoint page](#) > [Nitrous Oxide New Storage Area Request Form](#)



Government of Western Australia
WA Country Health Service

WACHS - XXXXXXXXXX

Nitrous Oxide New Storage Area Request Form

Instructions: This form is to be completed by areas within a site that wish to store nitrous oxide. Prior to storage, approval must be obtained from the RMISS and/ or Operations Manager to ensure the area is safe and is appropriate for gas cylinders and scheduled medicines (refer to the regional Chief Pharmacist if unsure), and to record the reason for storing, the storage location, and the quantity/size of cylinder(s) to be kept.

Site: _____ Area Name: _____

Area manager/supervisor: _____ Phone Number: _____

Email: _____

Questions (<i>Examples</i>)	Area manager / supervisor to complete	RMISS / OM check
Reason / indication to commence storage		
Nitrous oxide product		
Size requested		
Minimum quantity kept		
How will nitrous oxide administration sets be secured?		
Proposed storage location e.g. locked medication room		
Does the area comply with storage / access requirements per the WACHS Storage and Handling of Gas in Cylinders Procedure and the WACHS Nitrous Oxide Policy? Detail how access will be restricted. (Seek Facilities Management or gas supplier advice for cylinder storage and the regional Chief Pharmacist for scheduled medicines advice if required)		

RMISS / Operation Manager Use Only

Approved / not approved	Date:	Name:
Approval sent to regional Chief Pharmacist for noting	Date:	Signature:

Appendix D: WACHS Approved Nitrous Oxide Storage Areas Inventory Record Sample

Editable version available on the [Pharmacy SharePoint page](#) > [Approved Nitrous Oxide Storage Areas Inventory Form](#)



Government of Western Australia
WA Country Health Service

WACHS - XXXXXXXXXX

Approved Nitrous Oxide Storage Areas - Inventory Records Sample

Instructions: This form is to be used to maintain a current list of approved nitrous oxide storage/ areas, along with the regular quantity and size of cylinders held in each area. Please update this form as necessary and ensure that it is readily accessible to appropriate staff.

Site and region : _____

Area	Nitrous kept (e.g. nitrous oxide cylinder, Entonox, reticulated supply)	Size	Quantity kept	Storage location
<i>(Examples to be removed prior to use) Maternity / Oct 2023</i>	<i>Reticulated, administered via triggered administration set</i>	-	-	<i>Birthing suites. Administration sets secured.</i>
<i>Maternity/ Oct 2023</i>	<i>Nitrous oxide cylinder</i>	<i>E</i>	<i>1</i>	<i>Locked storage room with restricted access.</i>
<i>Theatre 1/ Oct 2023</i>	<i>Nitrous oxide cylinders attached to anaesthetic machine</i>	<i>C</i>	<i>3</i>	<i>Theatre room 1.</i>
<i>Theatre 2 / Oct 2023</i>	<i>Reticulated nitrous oxide delivered via anaesthetic machine</i>	-	-	<i>Theatre, restricted access to machine.</i>
<i>ED / Oct 2023</i>	<i>Entonox cylinder</i>	<i>D</i>	<i>1</i>	<i>Locked medicines room.</i>

Appendix E: Cylinder Audit (BOC sample)

BOC A Member of The Linde Group		EXTRA CYLINDERS FOUND ON SITE AUDIT DAY				
		GAS TYPE	MATERIAL CODE	BARCODE	QTY	
N		OXYGEN INHALO CD SIZE	400CD	9204421158	1	return
N		MEDICAL DRY AIR C SIZE	470C	9204454133	1	t
N		ENTONOX D SIZE	570D	9204740400	1	t
N		ENTONOX D SIZE	570D	9204041975	1	t
N		ENTONOX D SIZE	570D	9203894803	1	t
N		OXYGEN MEDICAL C SIZE	400C	9204932577	1	t
N		OXYGEN INHALO CD SIZE	400CD	9204483629	1	t
N		OXYGEN INHALO CD SIZE	400CD	9204618382	1	t
N		OXYGEN INHALO CD SIZE	400CD	9204613316	1	t
N		OXYGEN INHALO CD SIZE	400CD	9204599888	1	t
N		CO2 MEDICAL G SIZE	530G	9204312066	1	t
N		CO2 MEDICAL G SIZE	530G	9203837205	1	t
N		CO2 MEDICAL G SIZE	530G	9204630026	1	t
N		ENTONOX D SIZE	570D	9200659484	1	t
N		N2O MEDICAL G SIZE	610G	9203128666	1	return
N		ENTONOX D SIZE	570D	9204740522	1	t
N		ENTONOX D SIZE	570D	9204214422	1	t
N		N2O MEDICAL G SIZE	610G	9200552616	1	t
N		N2O MEDICAL G SIZE	610G	9201879927	1	t
N		N2O MEDICAL G SIZE	610G	9203721784	1	t
N		N2O MEDICAL G SIZE	610G	9201242372	1	t
N		N2O MEDICAL G SIZE	610G	9204040007	1	t