



MATERNAL CHILD

Policy and Procedure

Title:	Nitrous Oxide Administration in Labour and Delivery	Number:	MC-LD-040
Sponsor:	Senior Director, Women's & Children's Health	Page:	1 of 8
Approved by:	Vice President, Health Services & Quality System Performance	Approval Date:	Aug. 07, 2020
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Applies to:	Registered Nurses and Midwives working in Labour and Delivery		

Terms capitalized throughout this policy are defined in [Appendix A](#).

PURPOSE

The purpose of this policy is to outline a pain relief option for labouring patients at term or preterm gestations, in a manner that is safe for the patient and the Health Care Team. Nitrous oxide may be used in environments where epidural anesthesia is not readily available, when the patient does not prefer an epidural or narcotic analgesia, and/or when the labour or delivery is precipitous.

POLICY STATEMENTS

1. Registered Nurses (RNs) and Midwives who work with or around Nitrous Oxide must complete the [Nova Scotia Health Nitrous Oxide Administration for Labour Analgesia course and skills checklist](#) upon employment in the Labour and Delivery Unit.
2. RNs and midwives who have completed the [Nitrous Oxide Administration for Labour Analgesia Course](#) may assist laboring patients with self-administration of Nitrous Oxide upon request and supervise self-administration of Nitrous Oxide as per admission orders.

Safety Considerations

3. Nitrous oxide, used as labour analgesia, is self-administered by the patient.
 - 3.1. The RN is **NOT** responsible to administer the Nitrous Oxide.
 - 3.2. The RN is responsible to reinforce patient education provided by Health Care Team members, perform and document appropriate nursing assessments, patient relief, side effects response, and Guard Patient Safety.
4. Safe work practices for the self-administration of Nitrous Oxide must be followed.

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- 4.1. Nitrous Oxide for labour must be administered using a scavenger device that eliminates exhaust gases in well-ventilated rooms to minimize occupational exposure to Health Care Team Members. (Please refer to [Appendix B](#) for measures to undertake in order to maintain workplace safety.)
5. Nitrous Oxide systems must be checked by bio-medical engineering at a minimum of every 6 months for technical checks.

GUIDELINES

1. Nitrous Oxide, administered as Pro-NOX[®], Entonox[®], or Nitronox[®] (50:50 oxygen: Nitrous Oxide mixture), is self-administered by the patient via a face mask or mouthpiece.
 - 1.1. The inhaled self-administered blend of 50% Nitrous Oxide and 50% oxygen is a common form of labour analgesia and can be used during the first, second, and third stages of labour, as well as during post-delivery procedures such as laceration repair, manual removal of the placenta, and uterine curettage.

PROCEDURE

1. Gather the following equipment:
 - Nitrous Oxide administration unit (mobile stand unit) with inhalation analgesia circuit (filter with disposable mouthpiece or filter with face mask) and single patient use corrugated tubing
 - Electronic fetal monitor, doppler or fetoscope
 - Blood pressure monitoring equipment
 - Oxygen and suction equipment at bedside
 - Intravenous (IV) access supplies and pulse oximeter (may be required if there is increased patient sedation)
2. Prior to starting, ensure that:
 - An order is obtained for Nitrous Oxide
 - There are no contraindications to use (see [learning module](#)).
 - A new filter with mouthpiece or face mask is attached correctly to corrugated tubing.
 - Pre-administration checklist has been reviewed.
3. Explain the effects, risks, benefits, and restrictions of using Nitrous Oxide, as well as, the procedure to the patient and their support person.
4. Obtain verbal consent from patient.
5. Assess the following prior to initiation:
 - Patient oxygen saturation (SpO₂)
 - Vital signs
 - Level of consciousness

- Fetal heart rate
 - Uterine activity
6. Attach Nitrous Oxide mobile unit to appropriate gas source (oxygen and Nitrous Oxide) at patient bedside and set up circuit and tubing with mouthpiece/face mask.
 - Ensure all connections are firmly attached with no leaking.
 - Also attach tubing to scavenger system outlet on wall in patient room.
 7. Instruct the patient and support persons on the technique:
 - Nitrous Oxide is self-administered, therefore **only the patient should hold the mouthpiece or face mask.**
 - Insert mouthpiece into mouth or place face mask snugly on face.
 - At the onset of contraction breathe in and out deeply and fairly rapidly into the mouth piece/face mask. Approximately 30 seconds is needed before any pain relief is perceived and 45-60 seconds before maximal effect is achieved.
 - Continue to breathe deeply but less frequently throughout the remainder of the contraction.
 - Stop inhalation at the end of the contraction.
 - Remove the mouthpiece/face mask between contractions and breathe normally.
 - During second stage of labour, inhalations of Nitrous Oxide can be taken before each push, however collaboration between the patient and a member of the Health Care Team is necessary to ensure pushing techniques are optimized, the patient is alert to their surroundings, and is able to verbalize what is happening.
 8. Observe patient at least every 15 minutes when Nitrous Oxide is in use.
 9. Palpate the uterine activity to assist the patient in recognizing early onset of contractions.
 10. Monitor patient vital signs as per unit protocol and continuously assess the patient's levels of pain and consciousness.

Note: If Nitrous Oxide is used continuously (without taking a break between contractions) or in conjunction with IV or intramuscular narcotics, pulse oximetry should be used.

Use of a pulse oximeter may be required if there is increased patient sedation or drowsiness.

11. Monitor fetal health surveillance as per [Fundamentals of Fetal Health Surveillance \(FHS\)](#).
12. Discontinue Nitrous Oxide administration if:
 - Side effects are observed, (i.e., nausea and/or vomiting)
 - No longer required
 - Evidence of fetal/patient compromise

13. Document in the patient's permanent health record the following:

- Date and time of initiation
- Changes in respiratory effort and any alterations in respiratory status
- Patient vital signs as per labour routines
- Patient's subjective description of pain based on the numerical pain scale, zero being no pain and ten being the worst pain experienced (0-10 at rest and with contractions)
- Changes in level of sedation
- Evidence of side effects/complications and actions taken to manage those;
- Evaluation of patient response to interventions
- Communication with health care providers
- Patient teaching

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RELATED DOCUMENTS

Learning Module

[Nitrous Oxide Administration for Labour Analgesia Course](#)

Reproductive Care Program: [Clinical Practice Guidelines—Working with Pain in Labour: Systemic Medications](#)

Checklists

[Pre-Use Checklist for Porter Nitronox](#)

[Pre-Use Checklist for Pronox](#)

Skills Check List for Nitrous Oxide administration for Labour Analgesia

Appendices

[Appendix A: Definitions](#)

[Appendix B: Measures for Maintaining Workplace safety](#)

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Appendix A: Definitions

Guard Patient Safety	In an event of over exposure, the Health Care Team will ensure patient is safe.
Health Care Team	For the purpose of this policy, health care team includes Physicians, Registered Nurses, and Midwives
Nitrous Oxide	<p>Nitrous oxide for labor analgesia is 50% nitrous oxide in 50% oxygen and is known as Pro-NOX[®], Nitronox[®] or Entonox[®].</p> <p>It is a non-flammable, non-explosive gas. It is a sweet smelling, colourless, 50/50 gas mixture of nitrous oxide and oxygen, commonly self-administered by the patient through a demand-valve mask or mouthpiece and supervised by trained nurses or midwives. It is a safe, easy to use, inexpensive, and reasonably effective labour analgesic. The precise mechanism of nitrous oxide remains uncertain, but the evidence suggests that it works by increasing the release of endorphins, corticotropins and dopamine that are produced in the mother's brain.</p>

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Appendix B: Safe Practices when Working with Nitrous Oxide

In addition to in-place engineering controls such as effective scavenging systems and general room ventilation, workers can protect themselves from exposure to Nitrous Oxide by following appropriate safe work practices. The key procedure is to inspect the Nitrous Oxide delivery system and all connections prior to use. Ensure that all hoses, clamps and connections are in place prior to turning on the Nitrous Oxide.

Health Care Providers Can Reduce Their Exposure To Nitrous Oxide

- Safe handling procedures to decrease the risk of exposure include:
- Inspection of the Nitrous Oxide delivery system and the connections prior to each use, as per the pre-use checklist.
- Ensuring that the corrugated scavenging tubing is attached securely to the exhalation port of the patient valve.
- Assessing that the connection at the distal end of the magenta scavenging tubing is secured to the scavenging system. Ensure the active scavenging system is then connected to the wall suction securely.
- A Nitrous Oxide leak may have occurred if:
 - A sweet smelling odor is noted in the area of the Nitrous Oxide
 - You notice symptoms of acute exposure such as: dizziness, fatigue, headache, irritability, nausea
 - The monitoring system, if available, indicates higher than normal exposure thresholds.

If a Nitrous Oxide Leak Occurs:

1. Shut off the source of Nitrous Oxide
2. Evacuate area to allow for ventilation
3. Contact the Biomedical Engineering Department to have the leak addressed
4. In the event of a major leak, call your local code extension to activate the Code Brown: Emergency Response Procedure

First aid procedure to follow in the event of accidental/inadvertent inhalation of Nitrous Oxide?

1. Remove the exposed individual to fresh air
2. If the individual is not breathing, call local code extension to activate the Code Blue Emergency Response Procedure
3. Vomiting may occur as the exposed individual awakens. Place the exposed individual in the recovery position with their head slightly lower than their body to prevent aspiration. Consider oxygen therapy and provide prompt medical treatment.

Other safe work practices should include:

Ensure the scavenging tubing is connected to the wall scavenging connector. Check to see that the scavenging system is operational i.e. suction can be felt at the connector.

Do not start gas flow until all connections have been checked and the patient is ready to have gas applied.

Ensure gas supply is turned off when Nitrous Oxide administration is discontinued with the patient.

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District Health Authority/IWK Policies Being Replaced

Former CBDHA 13-70 Nitronox (not in OP3)

Version History

Major Revisions (e.g. Standard 4 year review)	Minor Revisions (e.g. spelling correction, wording changes, etc.)
New Aug. 07, 2020	

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