HEALTH HOLDING
HAFER ALBATIN HEALTH CLUSTER
MATERNITY AND CHILDREN HOSPITAL

Department:	Obstetrics and Gynecology		
Document:	Departmental Policy and Procedure		
Title:	Nitrous Oxide Use for Labour Analgesia in Delivery Room		
Applies To:	All Obstetrics and Gynecology Staff		
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1. PURPOSE:

1.1 To relax women during labor to relax and decreases their perception of labor pain.

2. DEFINITIONS:

2.1 **Nitrous Oxide** is a nonflammable, tasteless, odorless gas. N2O can be used for analgesia during the first, second, and third stages of labor, as well as during post delivery procedures. N2O is self-administered and has a rapid onset of 30 to 50 seconds, which correlates with volume and rate of inhalation. N2O administration is intermittent and delivered via face mask. The patient's inhalation triggers the opening of a negative pressure demand valve and is timed by the patient to coincide with uterine contractions. Anecdotal reports have noted patient report of greatest relief when the woman begins inhalation approximately 30 seconds prior to the start of her contraction.

3. POLICY:

3.1 Nitrous oxide can be used for women during labor and/or women undergoing perineal repair or postpartum procedures where local anesthesia may not meet the patient's analgesic needs.

4. PROCEDURE:

4.1 **Precautions:**
- 4.1.1 Determine no contraindications present.
- 4.1.2 Perform history and physical examination.
- 4.1.3 Obtain informed consent.
- 4.1.4 Use with caution if other sedating drugs are administered during use of nitrous oxide/oxygen.

4.2 **Preparation:**
- 4.2.1 Inform the woman of potential side effects of nausea, vomiting, and/or dizziness.
- 4.2.2 Instruct on how to hold the mask or tube so it creates a seal; instruct on timing of inhalation.
- 4.2.3 Review with the woman and any labor support persons that only the woman can hold the mask.
  - 4.2.3.1 Sedation from nitrogen is possible only if the woman continues to inhale the gas after she can no longer hold the mask tightly to her face or the tube tightly in her mouth. Nitrous oxide dissipates rapidly with exhalation, and the effects resolve very quickly.
  - 4.2.3.2 Self-administration gives the woman personal control of management of pain, and this control may potentiate the analgesic effect.

4.3 **Administration:**

Administration device with adequate scavenging system 50/50 nitrous oxide and oxygen (maximum concentration). No additional monitoring required (as this is classified by the ASA as anxiolytics/minimal sedation).

- 4.3.1 The woman holds the mask or tube in a manner that creates a seal.

4.3.2 She starts inhaling the gas 30 seconds before a contraction starts because the onset of action takes about 30 seconds; full analgesic effects occur in 50 seconds. It often takes 3 to 4 contractions to learn the best technique.

4.3.3 The woman should exhale into the mask to facilitate scavenging.

4.3.4 She should stop breathing through the mask when the contraction terminates.

4.3.5 Use may be continued between contractions as needed for anxiolytics or discomfort.

4.3.6 The administration of inhaled N2O requires the use of a device equipped with a proper scavenging system.

4.3.7 This minimizes exposure and risk to healthcare providers and others present.

4.3.8 A scavenging system is the only specialized equipment required. This system is composed of 3 key components; positive pressure relief, negative pressure relief, and a reservoir.

4.3.9 Positive pressure relief protects the equipment and patient from dangers (eg, barotrauma) that are possible in events such as occlusion. If the flow of gas is excessive, the gas mixture is diverted into the reservoir, thus preventing release into the surrounding environment. In instances in which the reservoir becomes full, an audible noise is heard as the positive pressure relief valve vents excess gas into the surrounding environment, preventing dangers associated with excessive pressures while simultaneously notifying the provider of the need to decrease the rate of flow.

4.3.10 Inactive systems, a negative pressure relief valve prevents the formation of a vacuum in instances where flow rate is too low (eg, sudden increase in patient minute ventilation).

4.3.11 The reservoir plays an important role in these negative pressure circumstances by providing a reserve of gas mixture until flows can be increased. The American Society of Anaesthesiologists classifies the manner in which N2O is administered for labor analgesia as anxiolytics/minimal sedation.

4.4 **Contraindication:**

4.4.1 Acute drug intoxication.

4.4.2 Reduced level of consciousness.

4.4.3 Inability to hold the N2O delivery device to one's face.

4.4.4 Recent trauma pneumothorax.

4.4.5 Emphysema .

4.4.6 Pulmonary hypertension.

4.4.7 Increased intracranial pressure.

4.4.8 Bowel Obstruction.

4.4.9 Vitreoretinal surgery within 30 days.

4.4.10 Women who have had recent ear surgery or who have conditions that predispose them to vitamin B12 deficiency should not use N2O during labor, unless it has been determined that their vitamin B12 levels are within normal limits.

5. MATERIAL AND EQUIPMENT:

5.1 Suction Device
5.2 Oxygen Source
5.3 Airway management equipment
5.4 Crash Cart with Emergency Drugs
5.5 Monitor including Pulse Oximetry

6. RESPONSIBILITIES:

6.1 Physician
6.2 Nurse
6.3 Midwife

7. APPENDICES:

N/A

8. REFERENCES:

8.1 American College of Nurse-Midwives 2010
8.2 American Society of Anesthesiology Guidelines 2015
8.3 American Association of Nurse Anesthetist Journal Course 2018

9. APPROVALS:

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