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## Administration of Nitrous Oxide in Labor: Expanding the Options for Women

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### Introduction

Nitrous oxide is an odorless, tasteless gas, which is administered by inhalation. A review of studies on the use of nitrous oxide in labor found it to be effective analgesia for many women while also being safe for the mothers, babies, and health care providers.<sup>1</sup> How it actually works for analgesia is not well understood. Not all laboring women who try it find it useful. Those who do either report reduced pain or acknowledge they are still in pain but care less about it.

For labor analgesia 50% nitrous oxide and 50% oxygen are blended by a regulator apparatus known by the name Nitronox (Matrx Medical Inc., Orchard Park, NY) and delivered either from a hospital pipeline supply through the walls into the labor rooms or from two separate portable cylinders. (In other countries, the same concentrations, known by the name Entonox [BOC Medical, Manchester, UK], are premixed in one cylinder.) The gas is self-administered by the laboring woman through a mask or mouthpiece that only she holds. The flow of gas into the mask is initiated by the negative pressure of inhalation, which opens a demand valve. This same demand valve prevents the flow of gas when inhalation ceases, and the Nitronox apparatus allows the exhaled gas to be scavenged so it is not released into the air, minimizing the exposure to others in the room.

The advantages of nitrous oxide include the rapidity of the onset of effect (1 minute or less) and the rapidity of reversal of effect on discontinuing its use. This allows it to be used throughout the second stage without fear of effects on the newborn. The self-administration of nitrous oxide is a safety measure, ensuring the mask will fall away if the woman becomes too drowsy, but this feature also gives women a sense of control over managing their pain.<sup>2</sup>

Disadvantages include the difficulty of timing the inhalation of the gas to the timing of the contractions in order to achieve maximum effective pain relief. Some women find a mask makes them feel claustrophobic or they do not like the slightly euphoric or dysphoric way the gas makes them feel. A small number of women experience dizziness and nausea. However, one of the main limitations of nitrous oxide use in labor is its relative lack of availability for obstetric purposes in the United States.<sup>3</sup>

It has been noted that laboring women in the United States have fewer options for pain relief than in other parts of the developed world.<sup>4</sup> Nitrous oxide for labor analgesia is a common choice in the United Kingdom, Canada, and Scandinavia. In the United States, it is rarely available as an option. At the University of California San Francisco, our Obstetrical Anesthesia Division has ensured the availability of nitrous oxide for labor analgesia for more than 30 years.

Recently, our client's access to nitrous oxide has been further facilitated by adding the administration of nitrous oxide protocol to the midwifery practice guidelines. Previously, the anesthesiologist was the only person who could set up the equipment and instruct the woman on the use of nitrous oxide. This expansion of our scope of practice alleviates the delays that sometimes occurred when the anesthesiologist was occupied in the operating room or placing an epidural for another patient. The standardized procedure that was accepted by our Interdisciplinary Practice Committee follows here.

# UCSF Standardized Procedure for the Administration of Nitrous Oxide in Labor by Nurse-Midwives

## Definition

Nitrous oxide inhalation is one form of labor analgesia. The administration of nitrous oxide for labor analgesia requires attaching the apparatus/equipment to gas outlets (mounted on the wall of every labor delivery room in the UCSF Birthing Center) and instructing women how to use the device for self-administration of inhalation analgesia.

## I. Background Information

A. Setting UCSF Birthing Center, 15th Floor, Long Hospital

B. Supervision Following a period of training and supervision to establish competency, no ongoing direct supervision would be required. However, an anesthesiologist will be readily available for consultation or assistance.

C. Indications Women in painful labor or undergoing painful perineal repair after vaginal delivery in the UCSF Birthing Center requesting nitrous oxide analgesia.

D. Precautions/Contraindications Patients who:

1. Cannot hold a facemask
2. Have impairment of consciousness or intoxication
3. Have received excessive amounts of intravenous opioids
4. Are receiving vitamin B12/with vitamin B12 deficiency
5. Have impaired oxygenation
6. Have hemodynamic instability
7. Have a compromised fetus

## II. Materials Nitronox machine

## III. Set-up and Administration of Nitrous Oxide for Women in Labor

A. Pre-treatment evaluation Assessment of patient suitability (mother and fetus) and absence of contraindications. Vital signs including blood pressure, heart rate, oxygen saturation, and fetal heart rate monitoring.

B.Set-up (if applicable)Ensure equipment is properly connected and operating.

C.Patient Preparation

1.Inform patient of potential side effects: Nausea, vomiting, and dizziness.

2.Instruct patient on self-administration: Placement of mask to create seal; timing of breathing for maximum analgesic effect; only patient allowed to hold mask.

D.ProcedurePatient holds mask over nose and mouth creating a sufficient seal to activate a second-stage regulator to open flow of nitrous oxide (50%) in oxygen (50%).Labor nurse is instructed and orders written that no additional opioid administration is allowed without direct anesthesiologist supervision if patient continues using nitrous oxide analgesia.

E.Termination of TreatmentUse of nitrous oxide is discontinued whenever patient wishes or when need for analgesia is no longer present.

IV.DocumentationMidwives will document in the patient's chart, as part of her progress, that nitrous oxide was administered, its efficacy, and any side effects or complications.

V.Competency Assessment

A.Initial Competence

1.Midwives will attend a nitrous oxide training session provided by an obstetrical anesthesiologist and will demonstrate:

a.Understanding of equipment

b.Ability to set-up equipment properly

c.Understanding of indications and contraindications

d.Knowledge of potential side effects

e.Ability to provide informed consent and instruction to patients requesting this method of analgesia

2.In addition, midwives will each be observed setting up and administering nitrous oxide to a patient three times by a member of the anesthesia team before being deemed competent.

B.Continued ProficiencyMidwives will receive updates in the use of nitrous oxide from the obstetrical anesthesia team and will be re-evaluated on a yearly basis to ensure continued competence.

## References

- [1.](#) Rosen MA. Nitrous oxide for relief of labor pain: A systematic review. Am J Obstet Gynecol. 2002;186(Suppl 5):S131–S159. [Abstract](#) | [Full Text](#) | [Full-Text PDF \(168 KB\)](#) | [CrossRef](#)
- [2.](#) Camann W, Alexander K. Easy labor. New York: Ballantine Books; 2006;.
- [3.](#) Leeman L, Fontaine P, King V, Klein MC, Ratcliffe S. The nature and management of labor pain: Part II (Pharmacologic pain relief). Am Fam Physician. 2003;68:1115–1120. [MEDLINE](#)
- [4.](#) Marmor TR, Krol DM. Labor pain management in the United States: Understanding patterns and the issue of choice. Am J Obstet Gynecol. 2002;186(Suppl 5):S173–S180. [Abstract](#) | [Full Text](#) | [Full-Text PDF \(65 KB\)](#) | [CrossRef](#)

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