



POSITION STATEMENT

Nitrous Oxide for Labor and Birth Analgesia

The American College of Nurse-Midwives (ACNM) affirms the following:

- Women should have access to a variety of resources, both pharmacologic and non-pharmacologic, to assist them in coping with labor. Among these should be nitrous oxide (N₂O) analgesia, which is commonly used in many other countries during labor and birth.
- Research supports the efficacy, safety, and unique and beneficial qualities of N₂O as an analgesic for labor and its use as a widely accepted component of quality maternity care.
- Ideally, the bedside nurse should be the selected clinical person to administer N₂O, which is congruent with administration worldwide. Certified nurse-midwives (CNMs) and certified midwives (CMs) as well as physicians and other health care providers as deemed appropriate should also be trained to administer and oversee safe use of N₂O analgesia during labor.
- Women and families should be educated about the use of N₂O as an option for pain relief in labor in both the prenatal and intrapartum period.
- Research and evaluation of the use of N₂O analgesia should continue in all obstetric/anesthesia departments to facilitate the inclusion of N₂O among safe and effective options for women in labor throughout the United States.

Background

The experience of labor and birth pain differs among women, and the response to pain is highly individualized.¹ Women should have access to a variety of approaches to promote comfort and reduce pain throughout labor, but women in the United States often have fewer options than those in many other developed countries.²

A blend of inhaled N₂O 50% and oxygen 50% is used for analgesia in labor in many countries with high standards for safe and effective maternity care, including Australia, Canada, Finland, Sweden, and the United Kingdom.^{3,4} However, until recently N₂O has not been readily available during labor and birth in the United States.³ In the United States, epidural administration of local anesthetic agents and systemic (intravenous or intramuscular) administration of opioids (narcotics) are the two most frequently employed pharmacologic methods for labor analgesia.⁵

Nitrous oxide is a less potent analgesic than either epidural or other neuraxial anesthesia, but may be more effective than systemic opioids,⁴ with the exception of intravenously administered, short-acting, very potent synthetic opioids such as remifentanyl.⁶ Nitrous oxide works by increasing the release of endogenous opioid polypeptide compounds (endorphins), corticotropins, and dopamine that are produced in the mother's brain.⁷ The analgesic efficacy of inhaling a relatively low concentration of N₂O is limited, with a small minority of women reporting little or no benefit. However, N₂O is effective for the majority of women who try it, and most who have used it said they were satisfied.⁸

Nitrous oxide has the following unique attributes:

- Despite widespread and extensive use of N₂O for labor analgesia in many countries since the early 1900s, no studies or published observations have identified significant adverse effects on the neonate.⁸
- Nitrous oxide analgesia can be administered quickly and has a very rapid onset and offset of action, rendering it a modality that can be employed in situations in which methods of pain relief requiring greater time to initiate and become effective would be less appropriate. Nitrous oxide is quickly eliminated from the body as are its effects, which is a desirable quality for administration during birth.
- Nitrous oxide analgesia has not been shown to adversely affect either labor progress or rate of spontaneous vaginal birth rate.
- Nitrous oxide is self-administered through a mask that the woman holds to her own face, which allows her to determine when and how much she uses. This element of control over analgesia administration contributes to user satisfaction and an overall feeling of empowerment.

Nitrous oxide is not without side effects and will not be the most desired or appropriate modality for every woman in labor. However, it is an inexpensive, simple, reasonably safe, and effective analgesic. ACNM recognizes the crucial role of midwives in educating women, prenatally as well as in the intrapartum period, regarding both non-pharmacologic and pharmacologic options for pain relief. ACNM philosophy maintains that optimal health care for women includes individualized options guided by the best evidence available. ACNM supports N₂O availability for all women who are appropriate candidates and encourages institutions where birth occurs, both in and out of hospital, to include it as a modality. Midwives should be well versed on the utility of N₂O analgesia and its role during labor and birth including contraindications and potential adverse effects.

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