

## POSITION STATEMENT

### Nitrous Oxide for Labor and Birth Analgesia

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

- Birthing people should have access to a variety of options, both pharmacologic and nonpharmacologic, to assist them in coping with labor. Among these should be nitrous oxide (N<sub>2</sub>O) analgesia, which is commonly used in maternity care worldwide.
- Certified nurse-midwives (CNMs) and certified midwives (CMs) should be aware of racial biases that affect the provision of modalities to cope with labor, such as N<sub>2</sub>O. As an example, ACNM rejects the stereotype that Black women experience less pain than do white women during labor.<sup>1</sup>
- Research supports the efficacy, safety, and unique and beneficial qualities of N<sub>2</sub>O 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 N<sub>2</sub>O, which is congruent with administration practices worldwide.<sup>2</sup> CNMs and CMs as well as physicians and other health care providers, as deemed appropriate, should also be trained to administer and oversee the safe use of N<sub>2</sub>O analgesia during labor.<sup>3</sup>
- Birthing people and their families should be educated about the use of N<sub>2</sub>O as an option for pain relief during labor in both the prenatal and intrapartum periods.
- Research and evaluation of the use of N<sub>2</sub>O analgesia should continue in all obstetric/anesthesia departments throughout the United States to facilitate the inclusion of N<sub>2</sub>O among the safe and effective options for coping with labor pain.

#### Background

The experience of pain during labor and birth differs among birthing people, and the response to pain is highly individualized.<sup>4</sup> Birthing people should have access to a variety of modalities to promote comfort and reduce pain throughout labor, and individuals are often interested in noninvasive options.<sup>5</sup> In the United States, epidural administration of local anesthetic agents and systemic (intravenous or intramuscular) administration of opioids (narcotics) are the 2 most frequently employed pharmacologic methods used to cope with labor.<sup>6</sup>

Nitrous oxide, a blend of inhaled N<sub>2</sub>O 50% and oxygen 50%, is frequently provided via a patient's self-administered face mask for labor analgesia in countries with high standards for safe and effective maternity care.<sup>7</sup> Since 2011, N<sub>2</sub>O has gained popularity for use in the United States and is available for labor analgesia in more than 500 hospital-based labor and delivery units and birthing centers.<sup>8</sup> This renaissance in the provision of N<sub>2</sub>O to birthing people has occurred in part because of midwives' advocacy for ensuring choice during labor and birth.<sup>9-12</sup>

Nitrous oxide is an inhaled analgesia with reported high rates of satisfaction, despite variable rates of patient-reported pain relief.<sup>6,7</sup> It is believed to affect a variety of mechanisms that reduce pain sensitivity, reduce anxiety, and provide analgesia, although its mechanism of action is not fully understood.<sup>13,14</sup> Inhaled N<sub>2</sub>O has been found to be more effective than is placebo at reducing pain intensity and providing relief for labor pain.<sup>5</sup> Nitrous oxide provides additional benefits that set it apart from other pain management options, including increased relaxation, distraction, and focus on breathing, and can be congruent with an individual's birth plans.<sup>8</sup> Birthing people experiencing induction of labor, oxytocin augmentation, or labor after cesarean are more likely to convert to another method for coping with labor, most frequently neuraxial anesthesia.<sup>7</sup>

Nitrous oxide has the following unique attributes:

- Despite the widespread and extensive use of N<sub>2</sub>O for labor analgesia in many countries since the early 1900s, no studies or published observations have identified significant adverse effects of N<sub>2</sub>O on the neonate.<sup>12</sup>
- Nitrous oxide analgesia can be administered quickly and has a very rapid onset and offset of action. Nitrous oxide is quickly eliminated from the body, as are its effects, which is a desirable quality for administration during birth.<sup>12</sup>
- Nitrous oxide analgesia has not been shown to adversely affect either labor progress or the rate of spontaneous vaginal birth.
- Nitrous oxide is administered through a mask that the birthing person holds to their own face, which allows them to determine when and how much they use it. This element of control over analgesia administration contributes to user satisfaction and an overall feeling of empowerment.<sup>8</sup>
- Nitrous oxide may be used during labor, birth, and the postpartum period for coping with labor or during invasive procedures such as external cephalic version, cervical examination, laceration repair, and removal of a retained placenta.<sup>12</sup>
- Nitrous oxide can continue to be offered as labor analgesia during the COVID-19 pandemic. Guidelines vary on the use of N<sub>2</sub>O with confirmed COVID-19 infection, including recommendations for suspension of its use<sup>15</sup> or continued administration with a viral filter.<sup>16</sup>

Nitrous oxide use during labor is contraindicated only in rare instances of vitamin B<sub>12</sub> deficiency, recent inner ear surgery, active pneumothorax, or recent vitreoretinal surgery.<sup>14</sup> Nitrous oxide may produce adverse effects—most frequently, nausea and dizziness—although these have not been found to be associated with conversion to other forms of pain control.<sup>7,12,13</sup> It is an inexpensive, simple, safe, and effective analgesic. ACNM recognizes the crucial role of midwives in educating pregnant people, both prenatally as well as in the intrapartum period, regarding both nonpharmacologic and pharmacologic options of pain relief. ACNM’s philosophy maintains that optimal health care for birthing people includes individualized options guided by the best evidence available. ACNM supports the availability of N<sub>2</sub>O for birthing people 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 N<sub>2</sub>O analgesia and its role during labor and birth, including its contraindications and potential adverse effects.

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*Note.* The terms *midwifery* and *midwives* as used throughout this document refer to the education and practice of certified nurse-midwives (CNMs) and certified midwives (CMs) who have been certified by the American Midwifery Certification Board (AMCB).

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