

# **EVIDENCE BASED PRACTICE: USE OF NITROUS OXIDE FOR PAIN MANAGEMENT DURING LABOR**

**Presented By : Hannah Young and Madison  
Smith**

**Murray State University | 2024**

# INTRODUCTION

**The implementation of nitrous oxide for pain management on the labor and delivery unit would give patients a new option that allows for movement during labor, little to no side effects, and can help patients stick to their goals set together by the mothers and the nurses. Not only is it effective for pain but also can help reduce anxiety, and is cost effective for both the hospital and the patient.**

# WHAT'S THE PROBLEM?

**Most hospitals in the area only have options of IV narcotics, epidurals, or spinals for labor pain. Side effects of these can range from respiratory failure in both mother and baby, hypotension, low oxygen saturation, and being confined to the bed. The implementation of nitrous oxide could change the way pain is managed on the labor unit. Side effects of nitrous oxide may include nausea, dizziness, vomiting, and drowsiness. The major benefits of this route of analgesia is that it gives mothers the freedom to move around during labor, effects of the medication stop as soon as use is withdrawn, and there are no major side effects on the baby.**

# **THEORETICAL FRAMEWORK**

**Theories of Nursing that coincide with implementation of nitrous oxide use during labor are:**

- Theory of Goal Attainment- it helps to meet patient goals set in birth plans such as different birthing positions, following with natural labor, and pain relief**
- Kolcaba's comfort theory- the key to this theory is that comfort is the number one priority which can be obtained through nitrous oxide because it relieves pain, has few side effects for both the mother and the baby, and has been shown to help reduce anxiety**

# EVIDENCE BASED PRACTICE

1. According to an article released by the maternal-fetal medicine “out of 126 participants we had 7 complaints of vomiting, 55 reported dizziness, 32 reported sleepiness, and 7 reported nausea.” (Pita et al., 2012)
2. According to the Pro-con debate: Nitrous oxide for labor analgesia, “By self-placing the mask, the patient can control her own level of pain relief by choosing when to put the mask on and take it off. This can increase the patients sense of perceived pain control which can reduce pain perception.” (Vallejo et al., 2019)
3. According to an article comparing meperidine and nitrous oxide, “Chantrasiri et al reports that the two agents have comparable effectiveness in a small trial...” (Zuarez-Easton et al., 2023)

# RECOMMENDATIONS FOR PROCEDURE

- **supplies needed for implementation are NO<sub>2</sub> tanks, negative pressure opening demand valve face mask, and a scavenging system**
- **the set rate should be 50% nitrous oxide %50 oxygen**
- **it should only be administered by the patient and should not be held on by straps or by family members**
- **staff should be educated on the policy and procedure, excluding criteria, and the set up and break down for administration**
- **exclusion criteria includes B12 deficiency, pernicious anemia, impaired level of consciousness, or inability to hold the face mask**



# RECOMMENDATION

## Recommendation for policy

**The guidelines for the policy for nitrous oxide would include:**

- **informed consent from the patient before administration**
- **patient education given by nurses**
- **nurses or anesthesia may set up and administer this medication**
- **monitor for the first 15 minutes of administration**
- **monitor for symptoms such as nausea, vomiting, dizziness, and drowsiness**

# CONCLUSION

**The use of nitrous oxide for managing pain during child birth can be beneficial in many ways for laboring mothers. It can take workload off of both the patient and the staff as well as being more cost effective for both parties. With proper education for the staff, it could improve patient satisfaction and is offering a service that is not widely used in the area attracting more clients to the hospital.**



# RESOURCES

- Houser, T., DeButy, K., & Beal, C. C. (2019). Implementation of an Evidence-Based Practice Change to Offer Nitrous Oxide During Labor. *Nursing for women's health*, 23(1), 11-20. [https://www.nwhjournal.org/article/S1751-4851\(18\)30240-X/fulltext](https://www.nwhjournal.org/article/S1751-4851(18)30240-X/fulltext)
- Pita, C. P., Pazmiño, S., Vallejo, M., Salazar-Pousada, D., Hidalgo, L., Pérez-López, F. R., & Chedraui, P. (2012). Inhaled intrapartum analgesia using a 50–50 % mixture of nitrous oxide–oxygen in a low-income hospital setting. *Archives of Gynecology and Obstetrics*, 286(3), 627–631.  
[https://www.researchgate.net/publication/224925636\\_Inhaled\\_intrapartum\\_analgesia\\_using\\_a\\_50-50\\_mixture\\_of\\_nitrous\\_oxide-oxygen\\_in\\_a\\_low-income\\_hospital\\_setting](https://www.researchgate.net/publication/224925636_Inhaled_intrapartum_analgesia_using_a_50-50_mixture_of_nitrous_oxide-oxygen_in_a_low-income_hospital_setting)
- Richardson MG, Raymond BL, Baysinger CL, Kook BT, Chestnut DH. A qualitative analysis of parturients' experiences using nitrous oxide for labor analgesia: It is not just about pain relief. *Birth*. 2019; 46: 97–104.  
<https://doi.org/10.1111/birt.12374>
- Vallejo, M. C., & Zakowski, M. I. (2019). Pro-con debate: Nitrous Oxide for labor analgesia. *BioMed Research International*, 2019, 1–12. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6720045/>
- Suarez-Easton, S., Zafran, N., Garmi, G., Dagilayske, D., Inbar, S., & Salim, R. (2023). Meperidine compared with nitrous oxide for intrapartum pain relief in multiparous patients: A randomized controlled trial. *Obstetrics and gynecology*, 141(1), 4–10. <https://doi.org/10.1097/AOG.0000000000005011>

**Murray State University | 2024**

**THANK YOU**

**Presented By : Hannah Young and Madison Smith**