Nitrous Oxide

Midwife tip sheet

Association of Ontario Midwives
Delivering what matters.

What is nitrous oxide?

Nitrous oxide (N2O) is a colourless gas with **analgesic** and **anxiolytic** effects. This **inhalational** anaesthetic is **fast-acting**, **safe** and **effective** for intrapartum pain relief.

When would N2O benefit clients?

Study participants rated satisfaction with N2O and epidural equally

Client satisfaction linked to maintaining mobility, and control over administration of N2O

- Intrapartum **pain**, especially when **>5cm** dilated
- **Avoiding** epidural, or **awaiting** availability/onset of other pain relief
- **Anxiety** during labour
- To support **out-of-hospital** labour (if N2O available in community)

How does N2O work?

Several mechanisms of action involved

Analgesic effects

Increases the release of endogenous endorphins, dopamine and other opioids in the brain and spinal cord

Analgesic effects work like morphine

Anxiolytic effects

Increases prolactin and decreases cortisol, reducing the hormonal response to stress. Activates GABA-A, an inhibitory neurotransmitter.

Anxiolytic effects work like benzodiazepine

What are the benefits and risks of N2O?

Benefits

- Rapid onset (30-50 seconds)
- Rapid offset (1-2 breaths room air)
- Preserves client mobility
- No effect on uterine activity
- Non-invasive
- Cost-effective

Fetal effects

- No effect on fetal heart rate, umbilical cord gases, Apgar score
- Crosses placenta, but lack of lipid solubility prevents accumulation; any residual gas eliminated when neonate starts breathing

Adverse effects

- Nausea
- Dizziness/vertigo
- In mixtures of 50% N20/50% Oxygen, there is NO respiratory depression or diffusion hypoxia

Can N2O be used during the COVID-19 pandemic?

See the AOM FAQ for information about safely using N2O during COVID-19:
www.ontariomidwives.ca/covid-19-clinical-faq

How to administer N2O

1. Prepare equipment

Connect regulator, gas tubing, filter, mask/mouthpiece, and scavenging tube.* Check if tank is full enough.

* Equipment may vary by community/institution

2. Inform client

Instruct client to inhale and exhale fully into mask/mouthpiece during contractions, breathe room air between contractions.

3. Client to hold apparatus

Clarify that no other person should hold mask/mouthpiece for client. Do not use straps to hold mask in place.

4. Breathe deeply

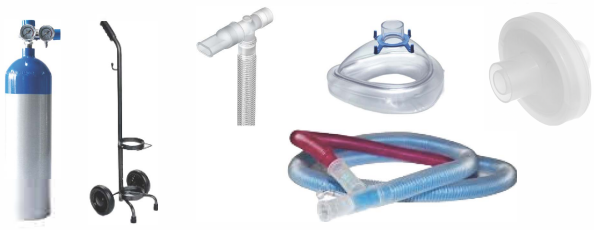
The client should breathe deeply during contractions. The N2O will only flow during inhalation.

5. Refill prn

Monitor gas level and replace tank as needed.

Supplies needed:

- Nitrous oxide tank
- Gas tank regulator (integrated from some suppliers)
- Mask/mouthpiece
- Filter (integrated from some suppliers)
- Gas tubing
- Scavenged gas tubing (scavenging recommended as COVID precaution)
- Cylinder cart carrier (optional)



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