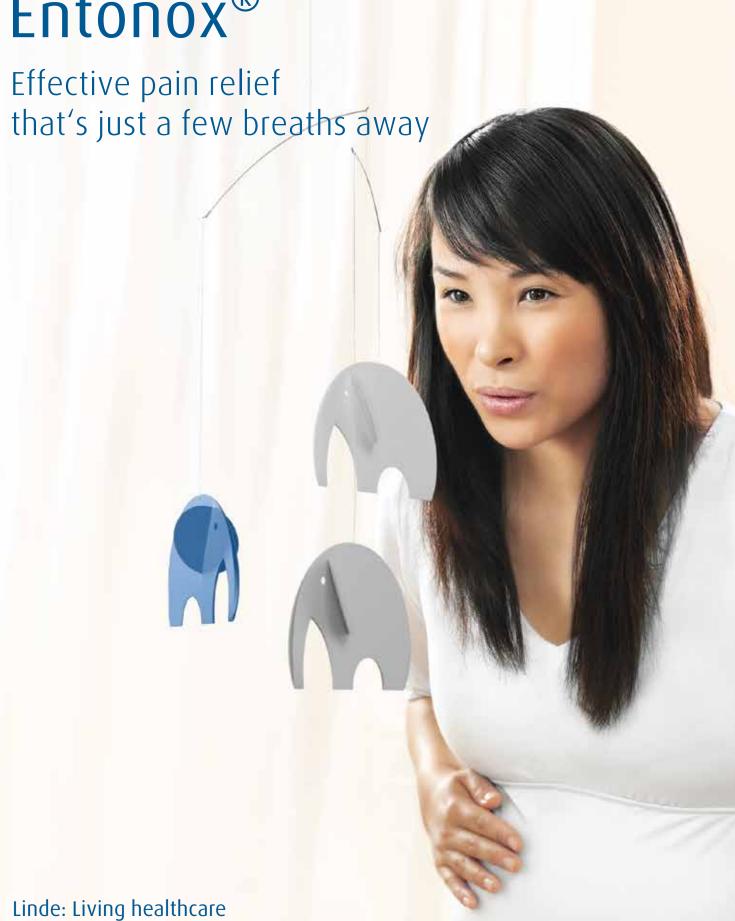
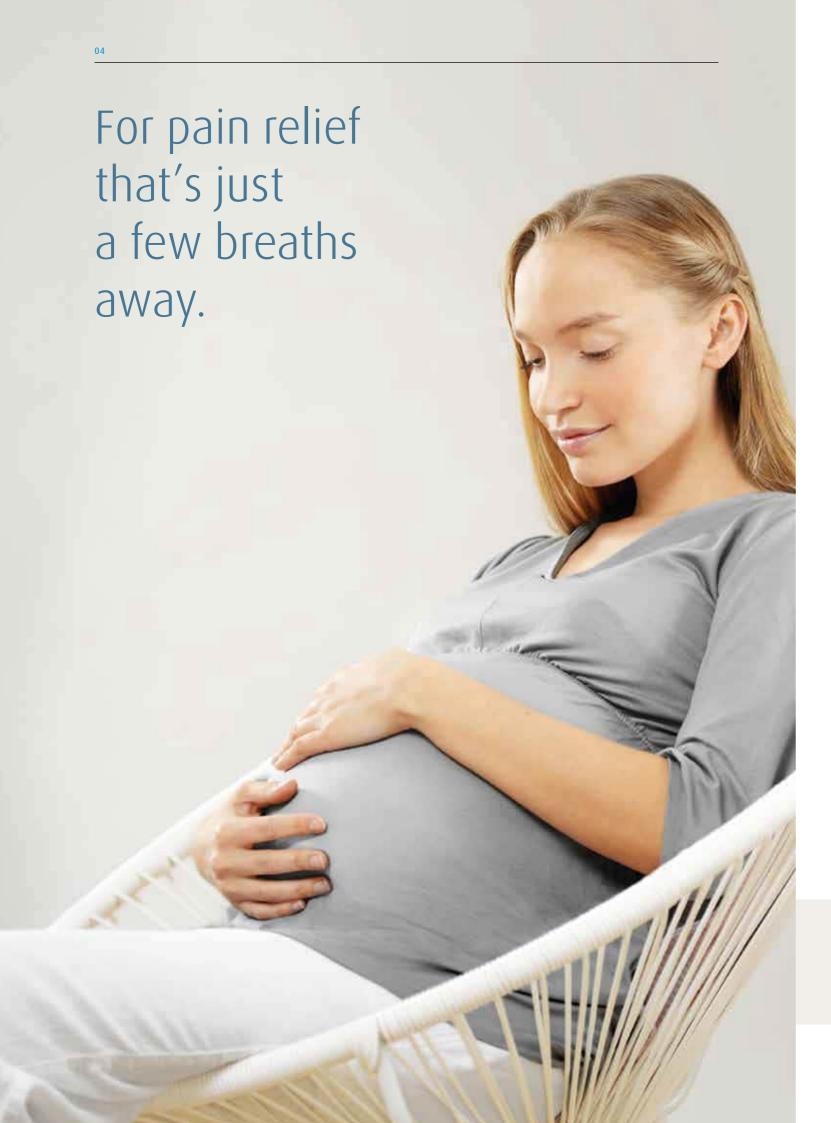


Entonox®



Rapid and controlled pain relief during childbirth.

Entonox, your natural choice.



Entonox – a ready-to-use medical gas mixture of 50% N_2O and 50% O_2 :

- easily self administered on demand during childbirth¹
- combined analgesic, sedative and relaxing efficacy^{2,3}
- non-invasive yet provides rapid onset/offset of action^{1,4}
- no anaesthesiologist or specialist needed for administration⁵
- suitable for both hospital and home delivery

Entonox for fast, effective and self regulated pain relief.

Entonox pharmacology and mode of action.

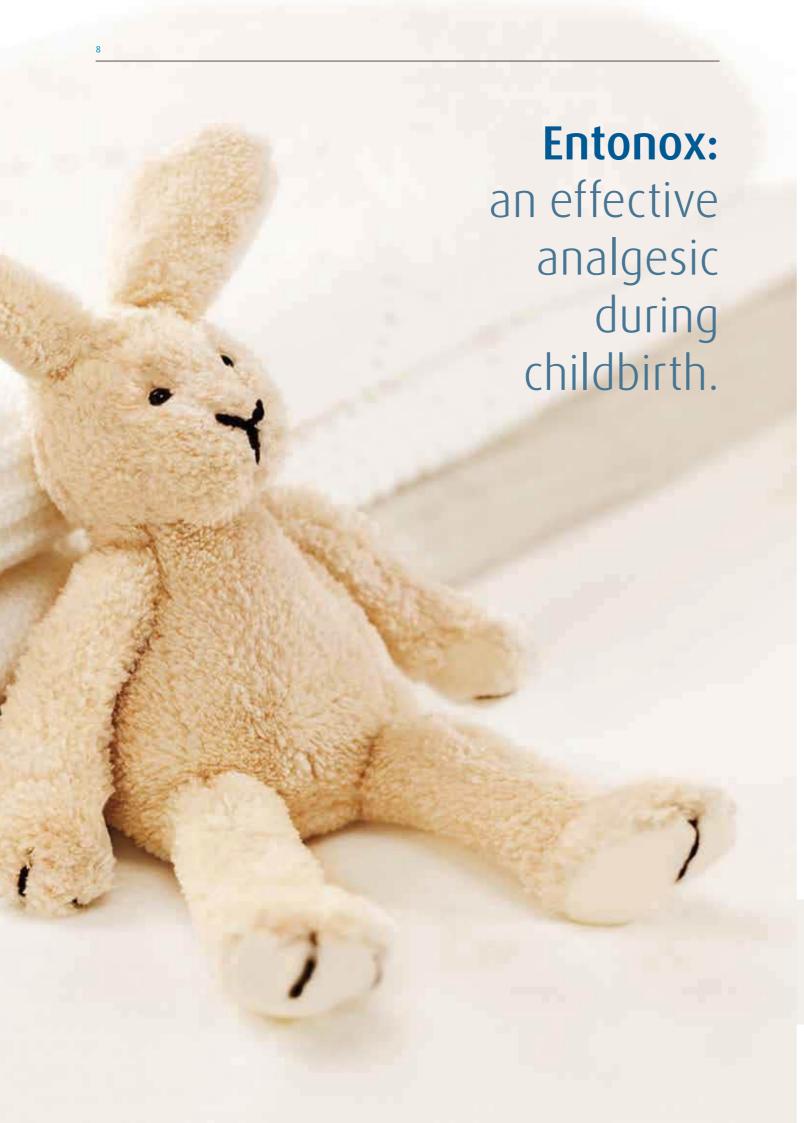
50% N_2O – NITROUS oxide^{2,6,7}

- · acts on pain centres in the brain and spinal cord
- rapidly absorbed/eliminated via the lungs
- provides an anxiolytic effect

$50\% O_2 - OXYGEN^*$

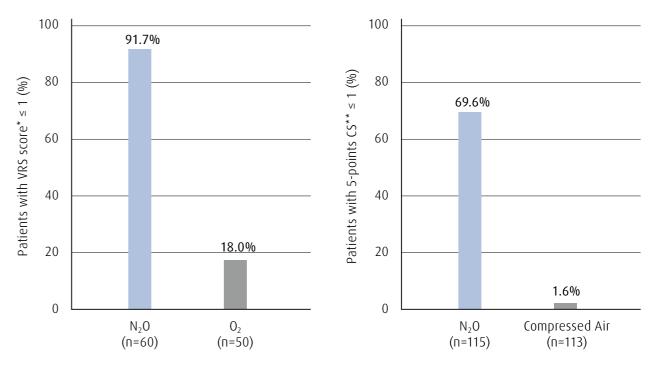
 may boost blood oxygen levels to deliver the benefits of improved oxygenation

Entonox – balanced N_2O/O_2 ratio provides good oxygenation and minimal risk of over-sedation.



Taking the edge off painful contractions⁸⁻¹⁰

- helps make painful contractions manageable while reducing feelings of anxiety
- analgesic effect is equivalent to 15 mg of morphine administered s.c. or 100 mg of pethidine

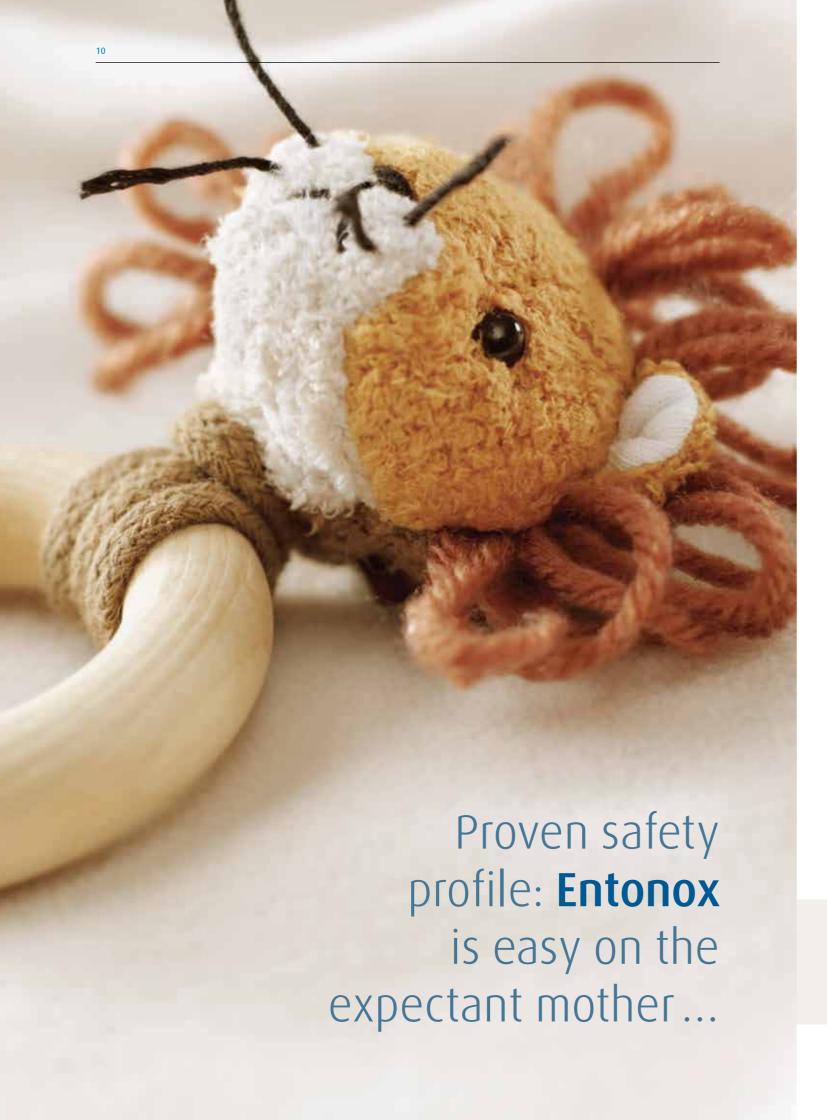


Two independent studies reported effective analgesia with N₂O during childbirth using a five-category patient rating scale

Entonox eases the pain and anxiety of childbirth.

^{*} VRS = Verbal rating scale: 0 = no pain; 1 = very little; 2 = moderate; 3 = severe; 4 = extreme

^{** 5-}point CS = 5-point category scale: 0 = no pain; 4 = severe, unable to bear



As part of Entonox, nitrous oxide:⁷

- has no adverse effects on the course of labour and delivery
- · does not prolong duration or affect spontaneous vaginal birth
- has no known effects on breathing, circulation, ability to push and other vital functions
- has no association with increased risk of maternal complications
- does not require more intensive or invasive monitoring
- can have minor side effects such as drowsiness and nausea that wear off quickly after cessation of administration

Entonox is safe for both mother-to-be and baby.

... and baby.

As part of **Entonox**, nitrous oxide:⁷

- has no known significant side effects on the neonate
- provides a lower risk for depressing the newborn compared to systemic opioids¹¹
- has no association with increased risk of foetal complications
- does not require intensive or invasive monitoring
- allows babies to maintain their PO₂ before birth¹²
- has no effect on Apgar score
- · causes no movement restriction for the women in labour
- has no effect on maternal bonding and early breast-feeding

Entonox is safe for both mother-to-be and baby.

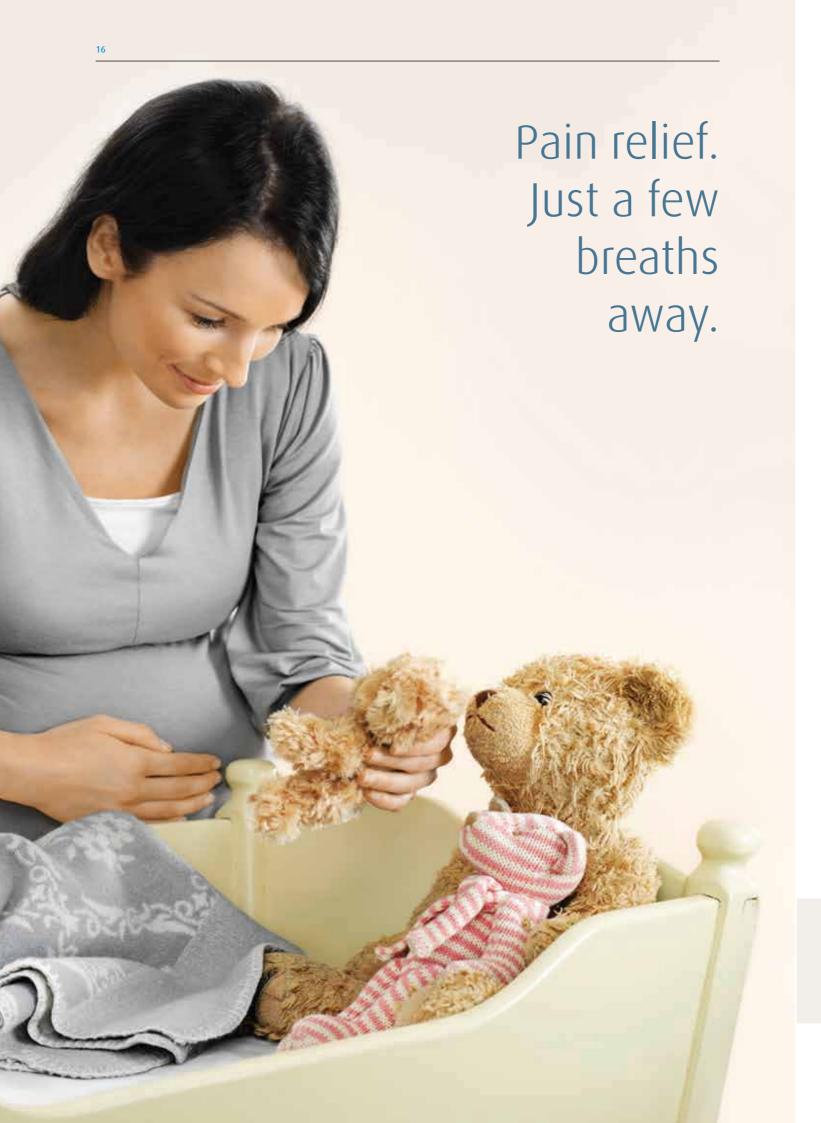
Entonox is easy on the patient: proven safety profile.

Nitrous oxide as part of **Entonox** shows: 13-17

- virtually no metabolism (no burden for lung, liver, kidneys)
- no accumulation in blood or tissues
- · little potential for drug interactions
- no cognitive impairment after use
- · no limiting effects with extended use
- no decrease in efficacy
- · no dose adjustments are required
- extensive experience in UK

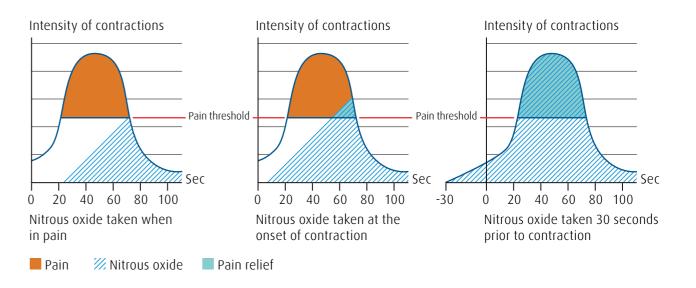
Entonox should not be used in any condition where gas is entrapped within the body. For further information on the undesirable effects and contraindications associated with Entonox, please read the safety information.

Entonox is safe across a wide variety of clinical situations.



Maximising pain relief with **Entonox** during childbirth: 18

- best to use during end of stage-one labour
- start breathing Entonox as soon as contraction starts, taking into account that stronger contractions lead to increased pain
- temporary cessation of **Entonox** during stage two is possible
- self administration by patient



Entonox keeps mother-to-be active, gives her control over her body.

The reassurance of simplicity: easy handling before and during treatment.

→ before

- inform her of potential side effects such as nausea,
 vomiting or dizziness
- instruct on how to hold the mask or tube and on timing of administration
- only the mother-to-be should hold the mask self-administration allows personal pain control, avoiding over-sedation

→ during

- inhalation starts 30 seconds before a contraction begins*
- exhaling into the mask only facilitates scavenging
- patient should hold the mask or mouthpiece

Precaution: ensure that there are no contraindications such as inability to hold face mask or impaired oxygenation.

Entonox – a simple solution for rapid and controlled analgesia during childbirth.

Entonox

- · rapid onset/offset of action^{1,4}
- · short-term, moderate sedation with relaxing properties^{2,3}
- · takes the edge off painful contractions⁸⁻¹⁰
- · safe for the mother and the baby⁵
- · can be administered without specialists⁵

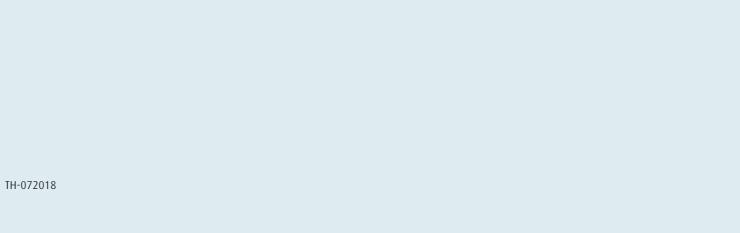
Entonox. As simple as breathing. As comforting as possible.



22

References

- 1. Rooks JP. Nitrous oxide for pain in labor why not in the United States? Birth 2007 March; 34(1):3–5.
- 2. Saunders RD, Weimann J, Maze M. Biologic effects of nitrous oxide: a mechanistic and toxicologic review. Anesthesiology. 2008; 109(4):707–722.
- 3. Emmanouil DE, Quock RM. Advances in understanding the actions of nitrous oxide. Anesth Prog. 2007; 54(1):9–18.
- 4. Nitrous Oxide for Labor Analgesia.
 American College of Nurse-Midwives. 2010.
- 5. LIVOPAN SPC.
- 6. Georgiev SK et al. Nitrous oxide and the inhibitory synaptic transmission in rat dorsal horn neurons. Eur J Pain 2010; 14(1):17–22.
- 7. Rooks JP. Safety and Risks of Nitrous Oxide Labor Analgesia: A Review. J Midwifery Womens Health 2011; 56(6):557–565.
- 8. Kronenberg JE, Thompson DEA. Is nitrous oxide an effective analgesic for labor? A qualitative systematic review. In: Evidence-based obstetric anesthesia. Halpern, Stephen H., Douglas, M. Joanne. Blackwell Publishing Ltd. 2005.
- 9. Gillman MA, Lichtigfeld FJ. A comparison of the effects of morphine sulphate and nitrous oxide analgesia on chronic pain states in man. J Neurol Sci 1981; 49(1):41–45.
- 10. Dundee JW, Moore J. Alterations in response to somatic pain associated with anaesthesia. IV. The effect of subanaesthetic concentrations of inhalation agents. Br J Anaesth 1960; 32:453–459.
- 11. Reynolds F. The effects of maternal labour analgesia on the fetus. Best Pract Res Clin Obstet Gynaecol 2010; 24(3):289–302.
- 12. Phillips TJ, MacDonald RR. Comparative effect of pethidine, trichloroethylene, and Entonox on fetal and neonatal acid-base and PO₂.
 - Br Med J 1971; 3(5774):558-560.
- 13. Kanagasundaram SA et al. Arch Dis Child 2001; 84(6):492–495.
- 14. Eger El II (1985). Nitrous Oxide/N2O. London, Edward Arnold. 369p.
- 15. Lienhart A (1986). Pharmacologie du protoxyde d'azote. Anesthésie par inhalation. Paris, Arnette. 119–184.
- 16. Lienhart A (1990). Protoxyde d'azote Edition Techniques Encycl Méd Chir (Paris, France) 36279 A10, 6-1990:13p.
- 17. Lienhart A, Deriaz H (1987). Pharmacocinétique des agents anesthésiques par inhalation. Anesthésie et Réanimation, Conférences d'actualisation. Paris, SFAR. 15–44.
- 18. Sidebottom P, Yentis S. Nitrous oxide in obstetric and gynaecological practice. Best Pract Res Clin Anaesthesiol 2007; 15(3):447–457.



Linde (Thailand) Public Company Limited
15th Floor, Bangna Tower A, 2/3 Moo 14, Bangna-Trad KM.6.5,
Bangkaew, Bangplee, Samutprakarn 10540
Phone +662 338 6100
Fax +662 312 0126
Emergency contact number 1384
www.linde.co.th