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## Equanox® or Entonox®

<b>Legal status</b> (GSL, P or POM on exemption list, or PGD)	<ul style="list-style-type: none"> <li>▪ P - midwife may supply for the woman to administer</li> </ul>
<b>Patient group</b>	Women in labour or requiring perineal repair.
<b>Clinical indication</b>	Inhalation analgesia in labour or during perineal repair.
<b>Pharmacology</b> (Onset and duration of action where appropriate)	<p>It is an analgesic with weak anaesthetic and muscle relaxant properties. It has rapid onset (within 30 seconds after the start of administration) and offset (ie it is very fast-acting and wears off very quickly).</p> <p>It should therefore be used 30 seconds before a contraction becomes painful in labour.</p> <p>It is removed from the body unchanged via the lungs</p> <p>Nitrous oxide is more soluble than oxygen and nitrogen, so will tend to diffuse into any air spaces within the body.</p>
<b>Pharmaceutical form, strength, route of administration</b>	<p>Oxygen EP 50% / Nitrous oxide EP 50% gas (Equanox® or Entonox®) gas.</p> <p>Oral inhalation via facemask or mouthpiece.</p>
<b>Dose, frequency and maximum number of doses or period of time for administration or supply</b>	<p>Self-administration – on demand.</p> <p>As required to achieve effective control of the discomfort of uterine activity during labour.</p> <p>Dosage is self-limited by the facemask or mouthpiece falling away from the woman at the onset of drowsiness.</p> <p>Recovery is very rapid.</p> <p>Must not be used for more than 24 hours.</p>
<b>Contra-indications/exclusion criteria</b>	<ul style="list-style-type: none"> <li>▪ known hypersensitivity to any component of the medicine</li> <li>▪ any condition where air is entrapped within the body and where its expansion might be dangerous such as a chest injury, pneumothorax, gross abdominal distension, and emphysema</li> <li>▪ alcohol intoxication</li> <li>▪ impaired level of consciousness or head injury as can increase intracranial pressure</li> </ul> <p>Patients who have undergone recent eye surgery involving gas bubble insertion</p>
<b>Cautions and action that will be taken if a caution applies</b>	<ul style="list-style-type: none"> <li>▪ women with breathing difficulties, who are psychiatrically disturbed and mentally confused</li> <li>▪ women who have bowel obstruction</li> <li>▪ check for and document any allergies</li> <li>▪ check and document past medical and drug history and current medication to ascertain potential for overdose</li> <li>▪ if a caution applies consult with a doctor</li> <li>▪ document consultation in maternity record</li> </ul> <p>May cause fertility problems for healthcare professionals who are repeatedly exposed, so ensure adequate ventilation.</p>

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<p><b>Medicine interactions and action that will be taken if a patient is taking a medicine that may interact</b></p>	<ul style="list-style-type: none"> <li>▪ intense sedation resulting in effects on respiration, circulation and protective reflexes may occur when used in combination with other CNS depressants, including alcohol, opioids and benzodiazepines. May potentiate the side effects of methotrexate</li> <li>Increased risk of pulmonary toxicity with bleomycin, amiodarone and nitrofurantoin, so use cautiously at lowest rate possible in these patients.</li> <li>May cause hypotension in combination with other medications which can cause this.</li> <li>Avoid using oil-based creams due to the risk of combustion and ensure alcohol gel has evaporated before handling Entonox/Equanox equipment.</li> </ul> <ul style="list-style-type: none"> <li>▪ if there is a clinically significant drug interaction, consult with a doctor before administration or supply</li> <li>▪ document consultation in maternity record</li> <li>▪ refer to current BNF for latest information on interactions</li> </ul>
<p><b>Potential adverse reactions and side effects including actions to be taken if adverse drug reaction is suspected</b></p>	<ul style="list-style-type: none"> <li>▪ <i>May cause dizziness, , nausea, vomiting, cardiovascular depression, euphoria, disorientation, sedation, generalised tingling, and loss of co-ordination.</i></li> <li>▪ <i>Prolonged exposure for prolonged periods for more than 24 hours or more frequently than every 4 days, either by intermittent or continuous administration, may result in megaloblastic anaemia due to interference with the actions of vitamin B12 and depression of white cell formation. Prolonged use may also result in bowel distension, middle ear damage, and ear drum rupture.</i></li> </ul> <p><i>In undiagnosed subclinical vitamin B12 deficiency, neurological toxicity may occur after a single dose.</i></p> <p><i>Prolonged inhalation may result in dryness of the mouth and discomfort.</i></p> <p><i>Has addictive properties</i></p> <ul style="list-style-type: none"> <li>▪ <i>May depress neonatal respiration if used during delivery.</i></li> <li>▪ <i>Exceptionally heavy occupational exposure and addiction to nitrous oxide have resulted in myeloneuropathy and subacute combined degeneration. For these reasons, exposure of midwives and obstetric staff must be minimised by the use of scavenging equipment or good ventilation.</i></li> </ul> <ul style="list-style-type: none"> <li>▪ <i>on labour</i> Nil</li> <li>▪ <i>on the neonate</i> Breastfeeding can resume as soon as anaesthesia has worn off.</li> <li>▪ <i>on breast feeding</i> Nil</li> </ul> <p><b>Accidental Release Measures</b></p> <ul style="list-style-type: none"> <li>▪ evacuate area</li> <li>▪ ensure adequate ventilation</li> <li>▪ eliminate ignition source</li> <li>▪ if possible stop unintentional release of product, close gas cylinder valve</li> </ul> <ul style="list-style-type: none"> <li>▪ <i>if a serious adverse reaction is suspected please report to the MHRA Yellow Card Scheme. <a href="http://yellowcard.mhra.gov.uk/">http://yellowcard.mhra.gov.uk/</a></i></li> </ul>

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<b>Overdose</b>	<ul style="list-style-type: none"><li>▪ when used appropriately there is no concern about overdose</li><li>▪ excessive inhalation will ultimately result in unconsciousness progressing through stages of increasing light-headedness and intoxication</li><li>▪ remove woman to fresh air, provide mouth to mouth resuscitation and if necessary use an oxygen resuscitator</li><li>▪ immediate assessment/treatment is essential - refer to medical staff</li><li>▪ manage in accordance with established treatment guidelines</li><li>▪ for further advice contact National Poisons Centre 0344 892 0111</li></ul>
<b>Action if patient declines</b>	<ul style="list-style-type: none"><li>▪ refer to authorised prescriber or doctor</li><li>▪ document in maternity record</li></ul>
<b>Additional advice and information</b>	<ul style="list-style-type: none"><li>▪ an explanation on how to use the equipment, common side effects and duration of action</li><li>▪ supply the manufacturer's patient information leaflet if requested</li></ul>

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<b>Patient monitoring arrangements during and after treatment and follow-up required</b>	If response is inadequate consider alternative analgesics agreed with woman in her care plan or follow pain management during labour process for a practicing midwife. Report any untoward reactions to obstetric staff.
<b>Particular storage requirements</b>	<b>Specific Hazards</b> Equanox® or Entonox® should be treated as oxygen and although it is not flammable it strongly supports combustion. <ul style="list-style-type: none"><li>▪ highly dangerous when in contact with oils, grease, tarry substances and many plastics, even small amount of oil eg from crisps</li><li>▪ exposure to fire may cause containers to rupture/explode</li><li>▪ F sized cylinders and larger – store vertically, size D and smaller may be stored horizontally</li><li>▪ ensure cylinders are maintained at a temperature above 10°C for at least 24 hours before use to ensure the gases are mixed correctly - if this is not possible, D, EA and ED size cylinders may be used immediately if inverted three times before use to ensure mixing</li><li>▪ in event of fire all known fire extinguishers can be used</li><li>▪ transport arrangements should follow local and national guidelines</li></ul> Store cylinders under cover and keep dry and clean as per local policy for storing medical gases. Do not subject to extremes of hot and cold and store below 45°C. Ensure not stored near naked flames or areas where smoking may occur.
<b>References</b> <ol style="list-style-type: none"><li>1. Entonox. Last updated May 2016. Available at <a href="http://www.bochealthcare.co.uk/en/products-and-services/products-and-services-by-category/medical-gases/entonox/entonox.html">http://www.bochealthcare.co.uk/en/products-and-services/products-and-services-by-category/medical-gases/entonox/entonox.html</a> accessed 29/8/18</li><li>2. Medical Gas Data Sheet (MGDS) Entonox. Last updated 8.2018. Available at: <a href="http://www.bochealthcare.co.uk/">http://www.bochealthcare.co.uk/</a> Accessed 16.12.2019</li><li>3. <a href="http://www.bnf.org">http://www.bnf.org</a></li></ol>	