CLINICAL GUIDELINE

Entonox, ® (adult/ surgical) Queen Elizabeth University Hospital

A guideline is intended to assist healthcare professionals in the choice of disease-specific treatments.

Clinical judgement should be exercised on the applicability of any guideline, influenced by individual patient characteristics. Clinicians should be mindful of the potential for harmful polypharmacy and increased susceptibility to adverse drug reactions in patients with multiple morbidities or frailty.

If, after discussion with the patient or carer, there are good reasons for not following a guideline, it is good practice to record these and communicate them to others involved in the care of the patient.

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Important Note:

The online version of this document is the only version that is maintained.
Any printed copies should therefore be viewed as 'Uncontrolled' and as such, may not necessarily contain the latest updates and amendments.

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		Effective From	March 2023
	Acute Pain Service Guidelines (Adult / Surgical) **Entonox ®**	Review Date	Nov 2027
		Version	3
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Entonox is the 50:50 mixture of Nitrous Oxide and Oxygen and is a gaseous analgesic agent. It is self administered by the patient using a demand valve system, inhaled via a mouthpiece or facemask. The demand valve is opened when the patient breathes in and closes when the patient breathes out.

It provides swift analgesia (maximising within 2 minutes) and has a rapid offset (5 minutes) with minimal side effects such as dizziness, mild nausea, tingling, euphoria, drowsiness and dry mouth. It may be used to provide pain relief during short painful procedures such as wound dressings / debridement, removal of drains / sutures or manipulating a fracture. The gas has minimal effects on respiratory or cardiovascular function and is easy to use.

However prolonged or frequent use may result in megaloblastic anaemia or myeloneuropathy due to interference of the action of Vitamin B^{12}. Therefore it should NOT be given continuously for > 24 hours or more frequently than every 4 days without haematological monitoring.

If it is to be used repeatedly for painful short procedures, it may be reasonable to:

- exclude patients with a known vitamin B12 deficiency;
- screen patients at risk of vitamin B12 deficiency and limit exposure to the briefest possible time monitoring for signs and symptoms of neuropathy on a regular basis.

Entonox cylinders are colour coded having blue / white-quartered shoulders.

To ensure gas is ready for immediate use Entonox should be kept at room temperature above 10°C for 24 hours.

Staff should have clean hands, free from any oils / grease and be sure all alcohol has evaporated if using an alcohol hand gel.

It is used only for medicinal purposes in a well ventilated clinical area and NEVER used near a naked flame.

Contraindications

Maxillofacial injuries	Risk of further damage / aspiration. May be difficult to get adequate seal around mask / mouthpiece.
Impaired consciousness:- • head injury patients • following air encephelography • heavily sedated patients • intoxication	Risk of excessive drowsiness with potential for aspiration. May lead to rise in intracranial pressure if intracranial air present. Reduced ability to follow direction and instruction.
Air entrapment within body cavity:- • pneumothorax • gross abdominal distension • bowel obstruction • severe bullous emphysema • middle ear problems	Risk of increasing pressure / rupture. Nitrous oxide rapidly diffuses into gas containing spaces within the body thereby increasing size.
Recent eye surgery	Case reports: visual loss in patients following retinal surgery due to expansion of intraocular gas bubbles.
Recent dive or decompression illness	Risk of air embolism.

An assembled Entonox cylinder with the demand valve system ready for use is kept in the MEDICAL GAS STORE within Critical Care unit 2 & 6, floor 1.

PLEASE RETURN AFTER USE.

Healthcare Professional

A registered nurse should undertake responsibility for the administration of Entonox only after reading guideline and being confident in its administration.

- contact CNS Pain Management on ☎ **83726** for instruction / support if required.

Administration

• Risk assess your patient for any contraindications.	
• Ensure prescribed in the "as required" section of HEPMA.	
• The drug prescribed as "Entonox", route as "inhaled" and indication as "painful procedure".	
• Check the cylinder's batch label to ensure that it contains nitrous oxide 50% / oxygen 50% and is within its expiry date.	
• The cylinder valve will be in the off position. Turn the valve anticlockwise direction to turn it on. Press flush button briefly to ensure availability of gas.	
• Check cylinder gauge content to ensure enough Entonox for procedure.	**NB** Cylinder size "F" when gauge content at 25%, there is an estimated usage time of 1.5 hours.
• Ensure new Entonox mouthpiece with HME filter is fitted to demand valve.	
• Explain / demonstrate procedure with the patient to obtain verbal informed consent and aid compliance.	
• Position patient comfortably either in bed or in a chair with safety rails.	
• Encourage to hold mouthpiece between teeth with lips sealed, inhaling the gas by breathing normally, for at least two minutes before starting procedure.	
• Keep verbal contact and observe patient throughout procedure for changes in conscious level.	
• If any concern for patient, STOP, and record observations.	
• End of procedure: observe patient and advise against getting up / mobilising until the effects have worn off (approx 5 minutes). Evaluate effectiveness with patient.	
• Turn off the cylinder; press flush button until the gauge reads zero / empty.	
• Discard mouthpiece and HME filter: These are single use items.	
• Clean demand valve / hose with warm soapy water. Should cylinder require changing (≤ 25% gauge content) contact the pharmacy porter on page 17048.	

RETURN to floor 1, Critical Care unit 2 or 6 MEDICAL GAS STORE AFTER USE.

REFERENCES for QEUH ENTONOX

British Medical Association and Royal Pharmaceutical Society of Great Britain (2020). British National Formulary ; Pharmaceutical Press, England.
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Macintyre P, Ready LB (2015) Acute Pain Management – a practical guide. 4th Edition WB Saunders, Edinburgh. (Pages 85-86).

Pediani, R. (2003) Patient-administered inhalation of nitrous oxide and oxygen gas for procedural pain relief.
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