

# MEDICAL OFFICERS OF SCHOOLS ASSOCIATION

## Guideline for the use of Entonox in Schools

**Entonox** (“gas and air”) is a mixture of 50% Nitrous Oxide (N<sub>2</sub>O) and 50% Oxygen (O<sub>2</sub>), supplied in a blue cylinder with a white shoulder.

Each cylinder contains 440 litres Entonox (sufficient for 2-3 hours continuous use) pressurised to 137bar.

### Advantages

- Entonox is a powerful analgesic (comparable to 5-10mg Morphine) which acts quickly (within 30 seconds) and wears off rapidly, so does not mask potentially diagnostic symptoms or signs.
- It has few side-effects or contra-indications and can be safely administered by personnel with minimal training.

MOSA recommends that schools consider making Entonox available for use by staff with medical, nursing or first-aid responsibilities. Suitable training could be sought from the local Ambulance Trust, hospital anaesthetic department or Resuscitation Training Officer.

### Potential uses in a school setting include:

- Fractures and dislocations: for splinting, immobilisation or simple reductions e.g. shoulder or finger dislocation
- Moving an injured casualty in pain e.g. for transfer to an ambulance
- Changing large painful dressings

### Contraindications:

- Chest injury, especially if a pneumothorax is suspected (may increase the pneumothorax)
- Maxillo-facial injuries when it is difficult to obtain an airtight seal using the mask. Using a mouthpiece rather than a mask may help.
- SCUBA diving injuries or decompression sickness. N<sub>2</sub>O is more soluble than O<sub>2</sub> or Nitrogen (N<sub>2</sub>) so increases the risk of bubble formation in the blood stream and tissues as the pressure falls and can thus precipitate or worsen the “bends”.
- Suspected bowel obstruction or perforation
- Patients for whom 50% O<sub>2</sub> might be hazardous e.g. severe bullous emphysema - unlikely in a school setting
- Patient unable to understand or carry out instructions safely, e.g.
  - Too young
  - Head injury with reduced awareness or loss of consciousness
  - Previous administration of sedating drugs
  - Patient who is violent or disturbed
  - Alcohol intoxication or illicit drug use

### How to use Entonox:

- Explain the use of the equipment and ensure the patient has understood.
- The patient holds the mask over their nose and mouth to form an airtight seal and inhales to deliver gas. Gas only flows when they inhale, and stops automatically if, for example, they become unconscious and drop the mask. The patient is in control of administration. Equipment with a disposable mouthpiece is also available.

### Cautions:

Do not use Entonox at temperatures below -4° C; Under these conditions, O<sub>2</sub> and N<sub>2</sub>O separate so the patient could receive hypoxic gas. In cold temperatures but above -4°C, ensure an even mixture of gases by inverting the cylinder several times before use.

### Side effects

Prolonged exposure (e.g. operating theatre staff) can rarely cause leucopaenia or megaloblastic anaemia.

**Technical Data and Storage:** The trademark “Entonox” is owned by BOC Medical. Manufacturer’s instructions regarding use and storage can be obtained from BOC Medical, Priestly Road, Worsley, Manchester M28 2UT  
Tel 0800 111 333 Website: [www.bocmedical.co.uk](http://www.bocmedical.co.uk)