



**This Issue:**

- Entonox and Pentrox – advanced pain relief
- Severe Allergies – Suggested guidelines for the outdoor industry

- Compiled by Drew Coleman - Horizons

As we move into another ski season we would like to remind all you ski patrollers, ski guides and SAR personnel about the administration and contraindications of a couple of advanced pain relief options. As Entonox and Methoxyflurane [brand name 'Pentrox'] become more commonly used it is important to be aware of when and when not to administer these drugs.

**Entonox – common name 'Nitrox'**

**Composition:**

- 50% Oxygen, 50% Nitrous Oxide.
- Nitrous oxide is a low potency anaesthetic & a high potency analgesic.

**Indications:**

- Moderate to severe pain in conscious patients.

**Contraindications:**

- Suspected pneumothorax
- Suspected bowel obstruction
- Has been SCUBA diving in last 24hrs or is suffering diving related emergency
- Is unable to obey commands

**Administration:**

- Self-administered via mouth piece through a demand valve system which allows the patient to self regulate.
- In cold environments invert the bottle 2-3 times as the nitrous oxide & oxygen will separate out.

**Special notes:**

- The Nitrous Oxide component of Entonox promotes gas expansion, hence contraindications listed above.
- Do not use around sources of ignition, and do not lubricate equipment with petrochemical oils or greases.
- If the patient has also been administered morphine, Entonox will increase sedation & consequently have effects on RR, HR & LOC.
- Repeated use is associated with psycho-dependence and neuro-disorders.

**References:**

New Zealand Medicines & Medical Devices Safety Authority: Medsafe Data Sheet  
BOC Healthcare: MSDS

For further pain relief options such as Paracetamol, Aspirin & Ibuprofen etc please view the August 2011 PHEC newsletter via this link  
<http://horizons.co.nz/documents/PHECNewsletterAutumn2011-MedicalDrugs.pdf>

**Methoxyflurane – brand name 'Pentrox®'**

**Composition:**

- 100% Methoxyflurane.
- Methoxyflurane is a volatile anaesthetic for inhalation.

**Indications:**

- Moderate to severe pain in conscious patients.

**Contraindications:**

- Has personal or family history of malignant hyperthermia.
- Has known renal impairment [liver disease].
- Has received Methoxyflurane within the last week.
- Is unable to obey commands.
- It is advisable not to administer Methoxyflurane for:
- Labour with complications.

**Administration:**

- Self-administered via plastic whistle/inhaler with charcoal filter.
- Administer 3mls at a time into the gauze wad at the top of the inhaler.
- Maximum of 6mls [2 x 3ml bottles/day]
- Encourage the patient to breathe out through the inhaler.
- The patient may place a finger over the dilution hole to increase dose.
- Do not add supplemental oxygen as this increases evaporation of Methoxyflurane.

**Special notes:**

- Possible reduced LOC, RR &/or HR.
- Place the inhaler in a snap/zip lock bag to be used at a later time by the same patient.
- Minimal doses for children are recommended.
- Store at <30°C. Flash point is 38.5°C.
- Preferred in patrol/SAR situations as the vial and inhaler are much smaller/lighter than Entonox.

Onset of effect: 2-5mins.

Duration: 2-5mins after stopping administration.

**Before administering ANY drug/pain relief**

**Ask yourself:**

- Is my patient able to obey commands and understand what I am telling them?
- Do they have a head injury or LOC.
- Have I missed anything?
- Have I asked them the following questions?

**Ask your patient:**

- Are you allergic to any drugs/medicines? Which ones?
- Have you had 'THIS' drug before? When / Why?
- Did you have any side effects? What were they?

**Entonox:**

- Have you been diving in the last 24-48hrs? [This may be relevant in our growing tourism market particularly with direct flights from Queensland to Queenstown].
- Have you been toileting normally over the last 2 days? [Re. Bowel obstruction].
- Do YOU suspect the patient has a pneumothorax?
- Methoxyflurane:
- Do you have renal failure?
- Do you have a family history of Malignant Hyperthermia? [If in doubt, do not administer].
- Have you had a Pentrox inhaler in the last week?

## Suggested protocols regarding severe allergies for New Zealand outdoor industry.

### Client medical information

Ask clients the following questions prior to trip:

Have you ever had a bee or wasp sting? Y/ N

Was the reaction either:

- A: Local swelling and itching which settled down after a few days.
- B: Local swelling and itching with hives all over.
- C: Above signs plus difficulty breathing.

If the form comes back with A then okay to go, if B or C then client should have a doctor's visit to gain better understanding of their allergy.

C's should have an allergy management plan including adrenaline.

Do you have any known food or drug allergies? Y/N

Is the reaction:

- A: Feeling sick in the stomach plus hives possibly vomiting?
- B: Above signs plus difficulty breathing, swelling round the mouth and tongue and dizziness.

If the form comes back with A then okay, but B will need their own management plan.

Prevention is the key management technique for severe allergies.

Wasps and bees:

- Wear closed footwear.
- Cover limbs – clothing avoid pastel and flowers! Best to wear white or dark colours.
- No strong perfumes.
- Don't drink or eat sweet drinks, jam or lollies in wasp areas.
- Use insect repellent.
- Avoid known hives – get them removed if possible. Avoid provoking wasps.

Food:

- Identify which foods cause a reaction – make sure all instructors/ guides know this prior to departure.
- Either avoid having these foods along on the trip (i.e. read all labels carefully)
- Or have the person bring their own food along.
- Discourage swapping of food.

### What is an epipen?

Adrenaline (epinephrine) is the body's natural reaction to stress - adrenaline is a hormone which has the effect of constricting the blood vessels and strengthening the heartbeat. By giving adrenaline as a first aid treatment to those having an anaphylactic reaction the body rapidly reverses the effects of the anaphylaxis by reducing the throat swelling, opening the airways and maintaining blood pressure. It is the only medication available for the immediate treatment of severe allergic reactions.

Adrenaline is available in auto-injectors. There are two brands available in Australia and New Zealand:

- EpiPen adrenaline autoinjectors (EpiPen or EpiPen Jr)
  - Anapen adrenaline autoinjectors (Anapen or Anapen Jr)
- Junior doses are for children over between 15 and 30 kilos.

Adrenaline should be injected into the muscle of the outer mid thigh – this way it is unlikely to damage the blood vessels or nerves or tendons.

### Key points

It is very rare for a person to have a life threatening severe anaphylactic reaction without first having had a prior reaction to the allergen involving localised swelling and itching, nausea plus respiratory or cardiovascular system difficulties. It is very difficult to predict whether a person will react; the same, better or worse with subsequent doses of the allergen.

People who are most at risk are those who have had a severe allergic reaction in the past, those who react to a tiny dose of the allergen, those who react with just skin contact, the elderly and those who have breathing difficulties. Adults are at a greater risk than children. Studies have shown that that co-existing asthma has a major part to play in deaths from anaphylaxis. People with a severe allergy should have an 'allergy action plan'.

It is important to recognise early symptoms of a severe allergic reaction i.e. itchy mouth, face swelling and hives. Patients with known severe allergies should consider these as warning signs and start treatment and get medical help immediately.

Symptoms of a severe allergy usually occur within half an hour of exposure – sometimes within five minutes. It is very rare for onset of symptoms to be delayed

### What is a severe allergy?

*Any allergic reaction, including the most extreme form, anaphylactic shock, occurs because the body's immune system reacts inappropriately in response to the presence of a substance that it wrongly perceives as a threat.*

*An anaphylactic reaction is caused by the sudden release of chemical substances, including histamine, from cells in the blood and tissues. These cells are mast cells and basophils.*

*The release is triggered by the reaction between the allergic antibody (IgE) with the substance (allergen) causing the anaphylactic reaction. The released chemicals act on blood vessels, resulting in dilatation (opening up) of the vessels.*

*The skin can become red and, with fluid leakage from the vessels, tissues may become swollen. This is common around the eyes and mouth. There may be a fall in blood pressure and, especially in asthmatics, there may be wheezing and narrowing of the airways. Not all anaphylaxis is caused by allergy (IgE) antibodies.*

*Some reactions are caused by direct effects on the mast cells/basophils, e.g. allergic reactions to aspirin and other anti-inflammatory drugs.*

*From: [www.allergy.org.nz](http://www.allergy.org.nz)*

*The potential risks of NOT giving adrenaline far outweigh the potential risks of giving adrenaline*

*Adrenaline is advised when you have evidence of a potentially life threatening allergic reaction, such as inability to breathe or a drop in blood pressure. When administered as directed, the risks of not giving adrenaline far outweigh any potential side effects of the medication. Common side effects from adrenaline are increased heart rate, an increase in blood pressure, thumping of the heart, shaking, nervousness or a transient headache. Of course needles may hurt, but you have to remember why you are using it.*

*From: [www.allergy.org.au](http://www.allergy.org.au)*