



Pain relief using Entonox®

This information sheet explains about the use of Entonox®. It explains how Entonox® works, when it is most suitable and what to expect when your child uses Entonox® at Great Ormond Street Hospital (GOSH). For more general information about pain relief, please ask for a copy of *Pain relief after surgery* information sheet.

What is Entonox®?

Entonox® is a gas – a mixture of half oxygen and half nitrous oxide that is used for pain relief. Entonox® can also be called 'gas and air' or 'laughing gas'. It is particularly useful for children and young people having short procedures that are quite painful. It works very quickly providing fast acting pain relief. Entonox® also produces feelings of relaxation, which can help reduce your child's anxiety about the procedure.

When is Entonox® used?

Entonox® is used for short-term pain relief and calming of anxiety during a range of painful procedures. It is used most commonly at GOSH for procedures such as chest drain removal, dressing changes, lumbar punctures, pin site cleaning, joint injections or Botulinum toxin injections. It is not used for blood tests or insertion of cannulae (thin, plastic tubes) into a vein.

Can any child have Entonox®?

The age at which a child is suitable to use Entonox® varies from child to child and also depends on the procedure. Usually, children over the age of five years will be able to use Entonox® but we will assess them beforehand to make sure. As a rule, children will be assessed as suitable to use Entonox® if they can understand and follow simple instructions and hold the mask or mouthpiece while breathing in the Entonox® gas, without any help.

Entonox® is not suitable for every child, even if they are assessed as capable of using it. We will not suggest Entonox® if your child:

- Is unable to understand how to breathe in the gas or cannot hold the mask or mouthpiece without help
- Has had a recent head injury
- Has or has recently had an ear infection or middle ear surgery
- Has been underwater diving in the past 48 hours
- Has a bowel obstruction



- Has a lung condition called 'pneumothorax' or any major problems with their airway or breathing

If you have any queries or concerns about whether your child is suitable to use Entonox®, please discuss these with us. There are alternative methods of pain relief that we can use or sedation may be more suitable for your child.

If you are in the first three months of pregnancy or think you could be, please let us know before we give your child Entonox®. There is a risk that the gas could harm your unborn baby, so we advise you not to stay in the room while your child is having Entonox®. If your daughter is 12 years old or older, we will ask her about her periods and any possibility that she could be pregnant.

How does my child get ready for having Entonox®?

There is no specific preparation for having Entonox®, although we request that children do not eat or drink anything for at least an hour before breathing in the gas. This reduces the chance of nausea and vomiting while using Entonox®. Avoiding heavy meals that day will also help.

How is the Entonox® gas given?

Entonox® is breathed into the lungs through a mask or a mouthpiece. The mask or mouthpiece is attached to a handset, which in turn is connected to

the gas cylinder by tubing. The handset contains a valve, which only opens when your child is breathing in, so they can control the amount of gas they receive.

- If your child chooses to use a mask, they should put it over their nose and mouth, creating an airtight seal, and then breathe in normally.
- If your child chooses to use a mouthpiece, they should hold it between their teeth and close their lips around it to make an airtight seal. They should then breathe in and out only through their mouth.

Whether they use a mask or mouthpiece, we will ask your child to concentrate on breathing slowly and deeply. If your child has not used Entonox® before, we will have a practice before the procedure starts.

The effects of the Entonox® usually start within a few breaths, although this can vary from child to child. Your child will need to carry on breathing the gas slowly and deeply throughout the procedure for the Entonox® to have the most benefit.

A qualified nurse who has had extra training in giving Entonox® will supervise your child throughout the procedure. They will check for any side effects, assess pain levels and make sure that your child is using the Entonox® effectively. Children who have breathing or heart conditions may also have a 'pulse oximeter' attached to a finger or toe. This is a sticky light probe which measures the level of oxygen in the blood. It is used to provide additional monitoring and will not hurt.



How long does it take to recover after using Entonox®?

Entonox® is very short acting and the effects on the body clear within a few minutes. Some children feel a little light-headed or dizzy afterwards so your child should not walk unaided or eat and drink until any dizziness or disorientation has gone. We recommend that children should rest for 30 minutes after the procedure to ensure the effects have completely worn off.

Are there any alternatives to using Entonox®?

We usually ask your child to have a practice breathing in Entonox® before the procedure starts to see if they are able to use it effectively and are happy to use it during the procedure. If they do not like the Entonox® or prefer not to use it, please tell the supervising nurse before the procedure starts so we can offer alternative forms of pain relief. These alternative forms of pain relief may take some time to work and so we might have to delay your child's procedure slightly.

Are there any side effects?

Possible side effects of Entonox® include:

- Dry mouth – this is a common side effect on Entonox® but is not usually troublesome. Your child should have a drink after the procedure has finished.
- Earache – if your child complains of earache while using Entonox®, we will stop using it and use an alternative form of pain relief instead.
- Dizziness or disorientation – this can sometimes happen if your child is breathing too quickly (hyperventilation). The effect of Entonox® wears off very quickly so they should stop breathing the gas until the feeling passes and then start again, more slowly and deeply.
- Nausea and vomiting – your child will not be allowed to eat or drink anything for at least one hour before using Entonox® and should not have had a heavy meal in the hours before this. This will reduce feelings of nausea and vomiting. If your child starts to feel sick during the procedure, we suggest that they stop using the gas until the feeling passes and then start again when they feel more comfortable.
- Tingling sensation – children occasionally report a tingling sensation around their lips, hands or feet or sometimes a 'floating' feeling. This is an effect of the Entonox® and wears off as soon as they stop breathing in the gas.
- Becoming too sleepy – if your child uses Entonox® for 45 minutes or longer in one session, they may become sleepy.



Usually, if this happens, they will let go of the mask or mouthpiece so that they are no longer breathing in the gas. This allows the effects of the gas to wear off before they start breathing it in again. The nurse supervising will also be monitoring your child and will remove the handset if they become too sleepy.

If you are at all worried about any of these side effects, please talk to the nurse monitoring your child.

Can my child use other pain relief at the same time as Entonox®?

Your child can use certain other types of pain relief at the same time as Entonox® if necessary. It can be helpful for your child to have some pain medicine a little while beforehand so it has had chance to work by the time the procedure starts.

Can my child have too much Entonox®?

When Entonox® is used appropriately there is no risk of overdose. Some children may become light-headed or sleepy and a few may experience feelings of extreme happiness (euphoria) or see/hear things that are not there (hallucinate). Any unwanted effects stop quickly once they stop breathing in the gas. We will monitor your child closely while they are using Entonox® and will remove the handset if needed.

Are there any long term effects of using Entonox®?

We know that using Entonox® often or for a long time can affect how vitamin B12 is absorbed. Reduced vitamin B12 levels can lead to damage to nerves and/or red blood cells. To avoid this, we advise that Entonox® is not used more often than every four days without close supervision or monitoring.

While Entonox® is not physically addictive we know that with repeated use people can develop a psychological dependency, which means a desire to use it for its effects other than pain relief. This is why we do not recommend Entonox® for procedures such as cannulation or blood tests as these are better managed with distraction techniques or topical anaesthetics, such as cold spray or local anaesthetic cream.

How often can my child use Entonox®?

Some children may need to have repeated painful procedures on different occasions and it is possible to use Entonox® each time. However, we do not advise using Entonox® more often than every four days without close supervision and monitoring of changes in their vitamin B12 levels.



I am not sure if I should let my child use the Entonox[®], what should I do?

**If you have any questions,
please talk to your doctor or nurse**

The supervising nurse can discuss the benefits and potential side-effects/risks of Entonox[®] with you and your child to help you make your decision. We will always ask your permission to use the Entonox[®] as both you and your child will need to be happy to use the Entonox[®] gas before we will proceed. You will need to verbally give your consent for us to proceed with using the Entonox[®].

Notes

Compiled by the Pain Control Service in collaboration with the Child and Family Information Group

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