

Information Sheet

Nitrous Oxide

Date: 29/3/2016
Version: 1.3



Classification: Dissociative anaesthetic.

Chemical name: N₂O. Nitrous oxide. Nitrous oxide is an oxide of nitrogen¹.



Background: Nitrous oxide has a number of industrial uses from an additive in drag racing engines to a propellant gas in the food industry. When mixed 50/50 with air (known as gas and air) it is used in surgery for its mild anaesthetic and analgesic effects. It is one of the safest inhalants/anaesthetics because it has little effect on critical body functions, which is why it is used to help relieve pain and anxiety for women giving birth² and in dentistry.

Commonly known as 'laughing gas', nitrous oxide demonstrations were a popular form of entertainment in Victorian Britain. Its popularity waned but nitrous oxide re-emerged in the new millennium as one of the most commonly used 'legal highs'. (See *Legal Status on page 3*)

CSEW³ shows past year use by 7.6% of 16-24 year olds - the highest level after cannabis, while, the Global Drug Survey⁴ shows nitrous oxide was used by 20% of UK respondents in the past year. With the exception of 2010, when nitrous oxide was mentioned 5 times, there have been either 1 or zero drug-related deaths per year where nitrous oxide was mentioned (England and Wales 1993 to 2012).⁵

Street/brand names: Laughing gas, Nos, whippets, hippy crack, N₂O.

Appearance: At room temperature nitrous oxide is a colourless, non-flammable gas that is slightly sweet smelling and tasting.^{1,6} Recreational users often get it from whipped cream chargers, sometimes called 'whippets', which are single-use, finger-length steel cartridges usually containing 8g of highly pressurised nitrous oxide (image 1), although 16g cartridges are also available. Nitrous oxide is also found in supermarket cans of whipped cream and full sized gas cylinders, intended for medical or industrial use.



Image 1. Whippet
Image BBC



Image 2. Cracker with balloon attached
Image Erowid



Image 3. Whipped cream dispenser
Image M.Linnell

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Route of administration: In order to produce its dissociative effects nitrous oxide is inhaled, usually by mouth. In the case of 'whippets', they have to be fitted into and released from a small canister into a whipped cream dispenser or a smaller gadget called a cracker. This has a balloon/bag fitted to the release valve so that when the lever is pressed the balloon fills with gas which can then be inhaled^{6,7,8,9,10} (image 2 and 3). Serious damage could be done to the lungs if the gas was inhaled directly from capsules or cylinders, **it must always be inhaled from a balloon.**

Cost: Refills of pure nitrous oxide (whippets) for whipped cream dispensers (sold online and from catering shops in multiples) work out at around 50 for £15-£20 and are usually sold individually for between £1 and £1.50, although this can be higher in some places. Balloons already filled with gas cost upwards of £1.50.

Prices quoted are retail prices before the advent of the Psychoactive Substances Act 2016 (see Legal Status on page 3).

Whippets: Both whippets and crackers can be obtained from online suppliers for 'legitimate use' (See *Legal Status* page 3). Some whippets imported from china have been seen to leave an oily residue inside the dispenser, suggesting that they contain impurities. Gas at pressure is dangerous, so care must be taken when filling balloons. Used whippets should be disposed of considerately and should never be thrown into fires as they may explode.

Crackers: Some crackers are of poor quality and do not fully pierce the cannister, which has led to some users discarding them thinking they are 'duds' before getting a fright and a freeze burn when they unscrew the canister and the gas suddenly goes off.

Dosage: A single inhalation of a balloon filled with an 8g cartridge of nitrous oxide is the normal dose, although some heavier users may 'double fill' a balloon and inhale. Because the effects of nitrous oxide are pleasurable but brief, people often take it repeatedly over a short space of time; users often take many 'hits' of nitrous oxide over a few hours.

Dosage information should not be taken as recommendations.

Brain chemistry: Nitrous oxide has a range of effects on the brain which are not fully understood, but its dissociative effects are probably caused by preventing the normal action of the NMDA receptor.⁶

Onset, duration and after effects: A single inhalation will result in effects starting almost immediately, peaking about 10-30 seconds after inhalation and then rapidly diminishing. If the dose is repeated effects reach a plateau about 30-60 seconds after the first breath. Whilst the user often feels back to normal within about 2 minutes after the last inhalation some users report that effects, such as a sense of well-being, can be felt for up to 30 minutes after last use.^{6,7,8,9,10}

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Typical effects and side effects:.	
Dizziness	Dissociation
Euphoria	Blurred vision
Giggling and laughing	Loss of balance
Sound distortions	Nausea
Hallucinogenic effects- Closed eye and mild open eye visuals e.g. Visual patterning	Tight chest after heavy use or for those with conditions such as asthma
Deep 'silly' voice	Headache

Patterns of use: Nitrous oxide is normally used occasionally in a social setting, however like all drugs it has the potential for psychological dependency, although this is rare.

Combinations with nitrous oxide: Nitrous oxide is commonly used with drugs such as cannabis and alcohol and is used to enhance/alter the effects of other drugs, particularly hallucinogenic drugs such as LSD, mushrooms and ketamine, where the effects can be intense. It is reported that nitrous oxide can alter the experience even after the user comes down from the nitrous oxide.⁷

Long term effects/known harms: Regular use can lead to red blood cell problems that could result in anaemia. There is a risk of vitamin D deficiency and a link with mood swings and depression. There is also a risk of vitamin B12 deficiency^{10,11} with continued regular use. Vitamin B12 deficiency can potentially cause severe and irreversible damage, especially to the brain and nervous system. Although official figures are not collected for deaths related to nitrous oxide there have been a number of deaths linked to its use, primarily due to oxygen deprivation.

Legal status: Nitrous oxide is not covered under the *Misuse of Drugs Act*. However, nitrous oxide is covered by the Psychoactive Substances Act 2016 (PSA).¹² Possession of nitrous oxide under the PSA is not an offence except in a 'custodial institution' (prison, young offender centre, removal centre etc.). Possession with intent to supply, offer to supply, importing or exporting psychoactive substances including nitrous oxide are offences **if** it is likely to be used for its psychoactive effects.

Nitrous oxide is still legal to sell or supply as a propellant for whipped cream or for any other industrial purpose. The PSA is likely to come into force in the spring of 2016.

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Harm reduction:

- Do not inhale directly from the canister, it's so cold that it could seriously damage the throat and lungs (like butane). Asphyxiation will occur if the gas is inhaled continuously with no air breathed.
- Do not use nitrous oxide with a bag over your head, even if mixed with air, or with a mask attached to cylinders of pure nitrous oxide. This will deprive the body of oxygen and several deaths have been associated with these methods of use.
- Use in a safe location (e.g. on sofa or floor) so that any lack of coordination or temporary unconsciousness does not result in falling or other accidents.
- Do not smoke or hold drinks or anything sharp when inhaling nitrous oxide.
- Dispose of empty containers responsibly. Whippets can be recycled.
- People with heart conditions or abnormal blood pressure may be at higher risk as the drop in oxygen levels caused by inhaling nitrous oxide raises the heart rate, which could cause problems in these individuals.
- Avoid mixing nitrous oxide with other drugs, especially stimulants, as effects on blood pressure and heart rate could be unpredictable.
- If pregnant or breast-feeding then you should avoid nitrous oxide.
- Because they are both gases used to fill balloons, nitrous oxide is sometimes confused with helium. Helium causes a high 'silly' voice, where as nitrous oxide causes a deep 'silly' voice. The two gases are not related.
- Nitrous oxide is not the same as nitric oxide. Nitric oxide is a poisonous gas.
- If there are serious adverse effects call 999 and tell emergency services what has been taken.
- Seek medical attention if experiencing any negative side effects.
- Always place an unconscious person in the recovery position (see illustration on next page).

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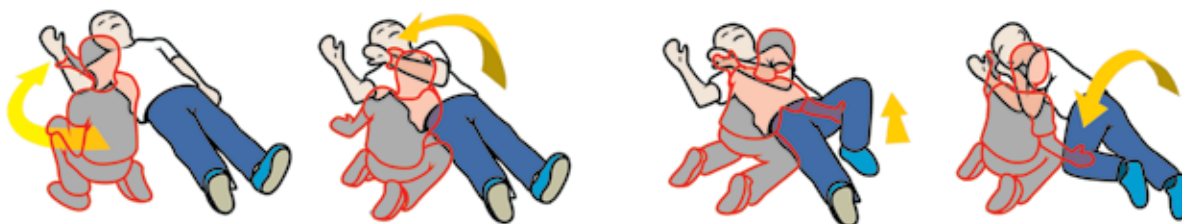
The recovery position: If a user becomes unconscious place them in the recovery position to prevent choking, then call an ambulance.

1. Put the right hand by the head (as if they were waving)

2. Put the left arm across the chest, so that the back of the hand rests against the cheek

3. Hold the hand in place and lift up the left knee

4. Turn them on their side by pushing down on the knee



Where to get help: We would advise anyone experiencing issues from nitrous oxide or other substances to seek medical support via their GP or the NHS. There are a wide range of local drug services throughout the UK, to find out what is available in your area please use the links below:

England: <http://www.talktofrank.com/need-support>

Scotland: <http://www.scottishdrugservices.com/sdd/homepage.htm>

Wales: <http://dan247.org.uk>

Northern Ireland: <http://www.publichealth.hscni.net/publications/drug-and-alcohol-directories-services>

DrugWatch is currently an informal association of charities, organisations and individuals who share an interest in establishing a robust early warning system in the UK for all types of drugs. A list of current members, and a selection of drug briefings can be found at: <http://www.drugscope.org.uk/partnersandprojects/DrugWatch.htm>.

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