Nitronox™ Inhalation Analgesia System | Physician FAQ

HOLOGIC® The Science of Sure

Will this put people to sleep?

No, when using Nitronox, the device always administers 50% nitrous oxide AND 50% oxygen ensuring that patients are getting the appropriate amount of nitrous oxide needed for pain or anxiety relief. This ratio is not strong enough to provide anesthesia.

Is nitrous oxide safe?

Nitrous oxide and oxygen have been used for over 100 years[1] and have a long-standing safety record. When the Nitronox device is used – patients are awake (conscious), responsive, and breathing on their own.

What safety mechanisms does the Nitronox device have?

- Oxygen fail-safe preventing flow of nitrous oxide without oxygen (will not work without oxygen)
- Diameter indexed gas line connections (can't cross connect hoses)
- Pin-Indexed cylinder regulators (can't cross connect regulators to cylinders)
- Visual pressure gauges for real time visual confirmation of gas and mixture supply
- Audible alarm for mixture pressure failure
- Dual seal diaphragm block reduces risk for leak or failure
- Nitrous oxide regulator check valve (when removing N_2O regulator to change cylinders, check valve prevents flow back out into the room from the hose and device)
- Oxygen enrichment feature increases O_2% if repetitive pattern of shallow breathing (unlikely in a patient self-administered protocol)
- Patient-self administered
- No settings or adjustments (fixed 50/50 nitrous oxide and oxygen)
- Ability to secure / lock out the system

1. Nitrous Oxide for the Management of Labor Analgesia. AANA Journal, February 2018, Vol. 86, No. 1

Is nitrous oxide flammable?

No, neither N_2O or O_2 are flammable. However, they are both oxidizers which support combustion. If you have a fuel source, heat source and add an oxidizer – there is potential for hazard. For customers utilizing lasers for medical aesthetic procedures - an open firing laser should not be fired at the same time as when Nitronox is being used.

Are there risks?

Nitrous oxide is a “drug” with contraindications for use. There are also occupational concerns and risks to be aware of. Contraindications are very well documented and easy to assess. Occupational risks can be monitored and managed effectively. Additional risks could include combining N_2O / O_2 with other drugs and medications.

What are the typical side effects that one might see?

Side effects are usually minimal. With a self-administered protocol the patient is in control, which minimizes side effects. Dizziness, nausea – if left unmanaged may result in vomiting. During patient self-administered application – if the patient does not like how they are feeling – they stop, breathe room air, which should quickly reverse any negative effects.

Who can administer?

Typically, you will not find a specific regulation saying who can administer nitrous oxide and oxygen. It is the treating clinician’s responsibility to ensure that the use of nitrous oxide and oxygen are within their scope of practice. You should review guidelines from your governing body or state medical board. What you would want to look for – is it within your scope of practice to administer pain management medications, minimal conscious sedation, anxiolysis, analgesia, etc. If the answer is yes – N_2O / O_2 is no different. For the most part, use of nitrous oxide and oxygen fall under the same umbrella as administering a local anesthetic.

Does this effect malpractice?

In most cases the answer is no – as you are already covered for pain management, minimal sedation, analgesia, etc. That said – the treating clinician may wish to notify your malpractice carrier if you have concerns.

Are there regulations for use?

Typically, you will not see a regulation specific to the use of nitrous oxide and oxygen for physicians or nurses. This falls under the same umbrella as utilizing pain medications, local anesthetics, analgesia, minimal sedation.

Are there patient monitoring requirements?

With just nitrous oxide and oxygen – typically the answer is no. You should follow any guidelines set forth within your scope of practice that may define what is required when administering pain management medications, analgesia, minimal sedation etc.

Do I need to be in the room with the patient?

This is related to the standard of care within your practice. The prudent answer would be that a patient shouldn't be left alone in a room if they are medicated.

Risks of patient falling during use of nitrous oxide?

For safety, it is always a good idea to be sure the patient is sitting or lying down for the procedure if using Nitronox. As with the use of any pain medication there is risk that a patient may be unsteady, light-headed or dizzy which could be a fall risk. You and your staff should evaluate potential risks prior to treatment and make sure the patient is not in a position where there is potential for falling / injury.

Is there an insurance code?

Outside of dental and anesthesia – there are no codes for nitrous oxide used as an analgesic. Some physicians will choose to charge an out of pocket fee - It is not uncommon to see cash fees range from $50 to $150. Conversely, physicians may also consider using Nitronox as a marketing tool to help assist with attracting patients and choose to offer it at no charge.

How fast does nitrous oxide take effect and last?

For most patients they will feel the effects of nitrous oxide within a minute or two. As with any medication the effects may vary from patient to patient. For some it will work great and for others it may either not be enough or they will not like how it is making them feel. Once the patient stops inhaling the gas mixture it will be completely out of their system within 5-10 minutes[1]. They will start feeling back to normal almost immediately.

Does nitrous oxide eliminate pain?

No. Nitrous oxide and oxygen do not eliminate pain. This is important for educating patients and setting expectations. This will also not replace a local anesthetic (if required). Nitrous oxide is intended to take the edge off, help the patient relax, make them more comfortable, distract them, reduce anxiety. This is not something you would use for extremely painful procedures or procedures where you need the patient to not be able to move.

What does it feel like?

Most will say it makes them feel relaxed, arms and legs feel light, tingling in extremities (hands / feet), floating feeling, sinking into a chair feeling, etc.

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Do patients use nitrous oxide for the duration of the procedure – or just for a minute or two before the procedure?

The effects of nitrous oxide wear off very quickly, so the patient will need to utilize nitrous oxide and oxygen to maintain comfort during the procedure. If using nitrous oxide as an adjunct to local anesthesia, the patient may use the nitrous oxide until the effects of the local anesthetic are felt and stop using the nitrous oxide. If your patient is using the nitrous oxide during a laser procedure it is very important to remember to only allow the patient to use the nitrous oxide when the laser is not firing. A good practice to adopt is replace the laser handpiece to the unit and allow the patient to use the Nitronox, replace the breathing circuit to the cart and resume treatment.

Can patients drive home after using nitrous oxide?

This is dependent on the procedure performed, other medications administered etc. The effects of nitrous oxide and oxygen are completely out of the patient's system within a few minutes. It is reasonable (assuming all other discharge criteria is met) that a patient can safely go home about 10 minutes after ceasing use of nitrous oxide and oxygen.

Are there safety concerns for me or my staff?

Nitrous oxide is a medical gas, and OSHA has guidelines for workplace safety. The main concern is for chronic (frequent) and long-term exposure to high levels of nitrous oxide. Depending on duration of use and frequency of use this may or may not be an area of concern for you and your staff. You should be educated and aware of potential risks and how to manage them. You can easily monitor exposure by periodically wearing nitrous oxide dosimeter testing badges that will verify the parts per million (PPM) of exposure.

Do you need to scavenge waste gas?

Scavenging is the term for removal of waste / exhaled gas and venting it directly to the outside. Nitrous oxide is not metabolized in the body. Basically, the amount the patient inhales is nearly the same amount they exhale. There is no law or regulation on the use of scavenger systems. OSHA has standards of care with regard to use of medical gas – and recommend providing workplace environments below 50ppm over an 8-hour time weighted average (TWA) – per American Conference of Government Industrial Hygienists (ACGIH). Aside from scavenging you can lower exposure levels by having good room air circulation, fans, open windows, not using in confined spaces, avoiding direct contact, etc.

Where do I get the gas – and how much do I need to order?

The gas itself is available from most medical gas suppliers. There are large national suppliers like Praxair® (www.praxair.com) and Airgas® (www.airgas.com) – and smaller regional / local ones. If you have a supplier for oxygen – more than likely you will have access to nitrous oxide. You should shop around as suppliers will have various fees and charges added on. You will need to source size "E" cylinders with a "standard post valve" (not cylinders with integrated regulators). You should order enough gas so that you have 1 of each gas for use as well as a few spare cylinders of each gas on hand. You will go

through more O_2 vs. N_2O as there is more N_2O in one cylinder. O_2 = 625 Liters, N_2O = 1500 Liters. A good question to ask the gas supplier – how long will it take for delivery after you order? If it is a longer period of time, factor that in as you may want to hold additional reserve cylinders.

How long does a cylinder of O_2 and N_2O last?

A full O_2 cylinder will last approximately 2 hours of continual use. A full N_2O cylinder will last about 6 hours of continual use.

How much does a cylinder of O_2 and N_2O cost?

One cylinder of O_2 typically costs around $25 whereas one cylinder of N_2O typically costs anywhere from $35-$40. Prices will vary depending on the supplier.

When looking at the regulator gauges – why doesn't the N_2O gauge move as the gas is being used?

O_2 is a true gas and as it is used you will see the gauge move. A full O_2 cylinder is 2000 psi, half full = 1000 psi, etc. N_2O is in the cylinder as a liquid, and as it is released turns into a gas. Because of this, it maintains the same amount of pressure in the cylinder right up until it is just about empty (similar to a propane cylinder for a gas grill). A full cylinder of N_2O is 750 psi, a half full cylinder of N_2O is 750 psi, and a quarter full cylinder of N_2O is 750 psi. You can't look at the gauge and tell how much is left. This is why you should keep an estimate / track of use and have a spare(s) reserve on hand. The only way to know how much is in an N_2O cylinder is to weigh it before and after use (which is not practical). Remember that you will get about 6 hours of use – so it should last for quite a few patients. Cylinders can be swapped out quickly and takes less than 2 minutes to complete.

How do you handle staff abuse concerns?

Just like any drug or controlled substance in an office – you have a zero-tolerance policy. This is no different. With the Nitronox system there is a convenient "lock out" mechanism. You can detach the demand valve from the Nitronox system and secure the demand valve. Without the demand valve the system cannot be used. Spare cylinders should be secured appropriately.

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