

Starting a nitrous oxide sedation program

This white paper includes the basic steps for a hospital or clinic starting a nitrous oxide sedation program. Additional information, including sample policies and procedures may be found at www.ziergroup.com.

Step 1: Identify the problem to solve

Step 2: Plan to solve the problem

Step 3: Involve your stakeholders

Step 4: Assess your facility

Step 5: Develop policies, procedures

Step 6: Get education

Step 7: Purchase equipment

Step 8: Get started!

Step 9: Keep it safe

Step 10: Why bother?

Starting a program from scratch can be a daunting experience.

There are steps required for program development at every institution. Keep in mind, though, that each hospital or clinic has unique policies and procedures. There may be additional steps needed to complete the program at your site.

Step 1: Identify the problem you want to solve

Do you have a group of patients that are not well served with your current sedation practices? You know these patients, the kids undergoing distress-filled procedures with no sedation. Or kids having short procedures with the currently available sedation that just seems like overkill - too deep or lasting much longer than the procedure. Determining the patients/ procedures you wish to improve will help guide the type of nitrous oxide program you develop.

Step 2: Create a plan to solve the problem

Who administers the nitrous, appropriate monitoring, updates to policies and procedures are all guided by the patients/procedures you wish to serve with nitrous. Nitrous oxide given as a single agent results in minimal sedation, particularly when given at <50% concentration, so administration by nursing staff may be appropriate. The combination of nitrous with other potentially sedating medications may be more appropriately administered by physician or advanced practice nursing staff.

Nitrous oxide as a single agent

For procedures which are

Distressing but not very painful - like bladder catheterization

Mildly painful - like IV starts

A bit more painful but controllable with a topical anesthetic (e.g., EMLA) - like lumbar puncture

Nitrous oxide combined with oral/nasal/IV narcotics

For procedures which are painful, e.g.,

Fracture reduction

Incision and drainage of abscesses

Step 3: Involve your stakeholders

A nitrous oxide sedation program involves many departments of a medical facility. Although the list may be slightly different in your situation, here is a list of stakeholders to involve in the planning and implementation of your nitrous oxide program:

Physicians, advanced practice nurses – order and administer the nitrous oxide or oversee its administration

Registered nurses – in some situations nurses will administer nitrous oxide sedation. In most circumstances, nurses will be responsible for monitoring sedated patients.

Hospital administration – approve and support program development

Biomedical department – responsible for maintenance of nitrous oxide delivery equipment, including periodic testing per manufacturer’s recommendations.

Facility department – assess suitability of the area where nitrous is administered

Purchasing – acquire nitrous delivery equipment and disposable goods

Occupational health and safety – ensure that program continues to meet nitrous oxide exposure standards

Patients! – your most important stakeholders!

Step 4: Assess your facility

The area chosen for nitrous administration must have the capability to remove exhaled nitrous oxide via an active vacuum system. Your building’s facilities management can help you determine if you have a vacuum system suitable for removal of nitrous oxide. Your institution may also have a policy for air exchanges in rooms where nitrous is administered.

Of course, the area should also be set up with equipment needed to safely monitor and care for sedated children. If you need more information on the minimal equipment needed in a pediatric sedation area, you can always refer to the American Academy of Pediatric guidelines* for monitoring and management of sedated pediatric patients.

*<http://pediatrics.aappublications.org/content/118/6/2587.long>.

Step 5: Develop policies, procedures, and credentials

If you work in a hospital, you probably know who has authority over pediatric procedural sedation in your institution. CMS requires that anesthesia services provides the ultimate oversight in a hospital situation, but you may also have additional layers like a sedation committee that report to anesthesia services.

If you are adding nitrous oxide to an existing sedation practice, you already have policies and procedures in place to address pediatric procedural sedation. Nitrous oxide sedation may already fit into these policies or they may need to be expanded to include nitrous. You may need to create new policies which are specific to nitrous sedation.

If you are starting a program in an area, like an outpatient clinic, where sedation is not part of the current practice, you will need to have the appropriate sedation policies in place for patient pre-assessment, monitoring, documentation, and discharge. Information about these aspects of pediatric sedation can be found in the American Academy of Pediatric guidelines* for monitoring and management of sedated pediatric patients.

Your hospital may also require specific credentialing and set training standards for institutional privileges for ordering and/or administering nitrous oxide sedation.

*<http://pediatrics.aappublications.org/content/118/6/2587.long>

Step 6: Get education

Although nitrous oxide sedation is a regular part of the dental school curriculum, the use of nitrous oxide for medical procedural sedation is relatively new. Options for education include courses offered by dental schools either on-site or on-line, but these are geared toward sedation of the average, anxious dental patient.

On-line training in the use of nitrous oxide for pediatric procedural sedation is also offered at <https://learn.ziergroup.com>. This course is designed to encourage safe sedation of children with nitrous oxide in a medically complex environment.

Step 7: Purchase equipment

Much of the currently available equipment is “dental” but adaptable for pediatric medical sedation. Equipment representatives can help you decide what’s best for your situation.

Regardless of the equipment you choose, you will need to include the following:

Oxygen and nitrous oxide sources – may be piped in from a central source or stored in tanks

Flowmeter / blender – mixes nitrous oxide with oxygen before it is delivered to the patient. These are available in digital and traditional formats.

Scavenging system – removes exhaled nitrous oxide from the room to minimize environmental exposure

Whatever equipment you choose, have your biomedical department check it out and maintain it as recommended by the manufacturer.

Step 8: Get started

You have to jump in sometime! Of course you will fumble a bit with the flowmeter controls, but like any other learned skill, you'll get smoother with practice.

Remember that attitude is everything.

Kid's aren't asleep with nitrous, only mildly sedated. Although nitrous is useful for very young children, the best place to start is with kids old enough to be easily distracted and plan for that distraction before you get started. As you get more comfortable with the process, you can expand your patient population to younger and more challenging patients.

Step 9: Keep it safe

Nitrous oxide has a long track record of safe sedation in the dental world, but that doesn't mean you can just let your guard down.

These aren't dental patients

Children undergoing sedation for medical procedures are increasingly complex. Screening for contraindications to nitrous oxide sedation, appropriate patient monitoring during sedation, and adequate recovery all play a role in ensuring patient safety.

Staff safety is important, too

Proper administration technique, gas scavenging, and equipment maintenance are essential to minimize occupational exposure to nitrous oxide.

Step 10: Why bother?

The American Academy of Pediatrics knows how important adequate pain management can be in the life of a child:

“There is a growing recognition of how even minor painful procedures, such as needle sticks, can affect a child’s longer-term emotional well-being.” *Fein, et al, Pediatrics 2012;130:e1391*

Why *not* use something so simple, safe, and effective?

Listen to what Ryan’s mother has to say about her 4 year old’s experience with nitrous oxide:

“It has definitely helped me keep my anxiety levels low, because I know that he’s not feeling the actual IV start. And I know that long term, every time we come to the hospital I’m not going to have to try to get him into the back seat, fighting and miserable – or afraid of even his preventative appointment with his regular well child checkup, because something that was really scary, isn’t anymore.”