Pediatric Sedation



What is children's (pediatric) sedation and how does it work?

While most imaging exams are quick and painless, pediatric patients sometimes need sedation to remain still and follow instructions throughout an exam.

Anesthesia is a state of consciousness or sedation achieved through drugs and/or other methods to block feelings of pain. Sedation may also cause memory loss so that the patient may not remember what is going on.

Pediatric sedation helps relieve anxiety and to control pain and excessive movement. It may be achieved through general anesthesia or monitored anesthesia care.

• General anesthesia

Under general anesthesia, the patient is unaware and does not feel pain. It reduces the patient's ability to breathe without assistance and often requires the use of a breathing machine.

To deliver general anesthesia and maximize patient safety, a breathing tube or another airway device may be needed. General anesthesia can be achieved with a variety of drugs and methods.

The most common method to deliver general anesthesia is through breathing gas after an intravenous (IV) (http://www.radiologyinfo.org) injection. The patient breathes in anesthesia gases that are absorbed by the lungs and delivered via blood stream to the brain and spinal cord.

A patient who receives general anesthesia is usually under the care of an anesthesiologist (http://www.radiologyinfo.org) . This is a medical doctor who has completed four years of specialized training in anesthesia beyond medical school. A specially trained nurse called a nurse anesthetist may also administer general anesthesia. The nurse anesthetist is usually supervised by an anesthesiologist. The anesthesia provider stays with the patient and carefully monitors their heart rate, electrocardiogram (EKG), blood pressure and oxygen delivery.

Patients typically have no memory of what happened during general anesthesia. Only rarely do some patients remember events.

General anesthesia helps ensure your child will remain still for a successful exam. Sometimes, children with certain conditions cannot be given sedatives safely and require general anesthesia. Often this can only be determined after the child is evaluated in person by the anesthesiologist.

• Deep sedation/monitored anesthesia care

Sedatives are drugs that reduce a patient's ability to feel and/or remember pain. Sedatives are usually given by vein through an IV catheter. Deep sedation may be delivered by an anesthesiologist or anesthetist. In some cases, a qualified non-anesthesiologist may deliver sedatives. There are different levels of sedation. The level of sedation reflects the patient's ability to feel and respond to pain and verbal commands.

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Under deep sedation, a patient is normally able to breathe on their own without a breathing machine. Deep sedation relieves pain, reduces discomfort and/or reduces the likelihood of recalling a painful procedure.

• Minimal/Moderate Sedation

In minimal/moderate sedation, your child may be given sedatives to reduce anxiety. While under minimal or moderate sedation, patients will be able to respond to questions and follow instructions as needed. At this level of sedation, patients can breathe without assistance.

Which imaging exams may require anesthesia or sedation?

Pediatric imaging exams that may require sedation include:

- CT (http://www.radiologyinfo.org)
- MRI (http://www.radiologyinfo.org)
- Interventional radiology (http://www.radiologyinfo.org)
- Nuclear medicine (http://www.radiologyinfo.org)
- *Voiding cystourethrogram (https://www.radiologyinfo.org/en/info/voidcysto)* or contrast-enhanced voiding urosonography (https://www.radiologyinfo.org/en/info/contrast-enhanced-ultrasound)

How much sedation your child requires will vary according to the exam. It also depends on their age and developmental level, how much discomfort is expected, and the advice of your physician who ordered the test. For instance, moderate sedation can often be used with modern CT scanners that work very quickly. More complex exams like MRI that require a child to keep still for up to one hour may require deeper sedation.

MRI can be very scary for a child because it is noisy. It also involves lying still in an enclosed space. Some children cannot remain still for an MRI scan and need sedation to help them relax or sleep during the exam.

Are there alternatives to anesthesia and sedation?

Some hospitals employ certified child life specialists to provide children and families with emotional support in medical settings. These specialists have backgrounds in child development, psychology and counseling. They can prepare children for medical imaging procedures. This can help decrease the child's stress and anxiety and even reduce or eliminate the need for sedation.

Ask your doctor if child life specialists are available at your imaging facility.

Many facilities offer child-friendly imaging suites decorated with murals and lighting that can help entertain and calm pediatric patients. Silent MRI techniques and distraction devices like DVD goggles and music headphones may reduce or eliminate the need for sedation during MRI.

New and improved MRI approaches produce high-quality images and reduce the time children spend in the scanner. This may also eliminate the need for sedation.

Accessing a vein for an IV is often the most difficult part of the experience for the child. Other imaging approaches that do not use IV contrast material may be available for some conditions.

How should I prepare my child for an imaging test or treatment with anesthesia?

Tell your doctor about all the medications your child is taking, including herbal supplements and vitamins, and if they have any allergies to food, medications, or contrast materials. You should also inform your doctor if there is any family history of problems with anesthesia, medical conditions or recent illnesses. Your physician will want to know about any prior surgeries, as well as if

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your child has ever had any problems or reactions to anesthesia. Your physician may advise you to have your child stop taking aspirin, nonsteroidal anti-inflammatory drugs (NSAIDs) or other medications that they regularly take for a specified period before the procedure.

Prior to the procedure, your child's blood may be tested to assess their ability to form blood clots and to determine how their liver and kidneys are functioning.

A physical exam and other tests also may be performed.

Your child may be asked not to eat or drink anything for up eight hours or more before receiving sedation or anesthesia. This includes milk, formula, breast milk and orange juice. It is important that a child's stomach is empty to prevent vomiting that may occur with sedation drugs. The amount of time required for fasting may differ based on the procedure, your child's age and other factors.

Preventing a young child from eating can be a challenge. Unless otherwise instructed, you can help ease your child's feeling of an empty stomach with clear liquids up until two hours prior to the procedure. At some facilities, your child may be allowed to have a few sips of a drink prior to the exam.

Before the exam, try to keep your child away from others who are eating and make sure siblings do not share food with them.

A child can be given prescription drugs while they are still allowed to take clear liquids. Do not give a child medication with solid foods, including apple sauce and pudding. Medications that are to be taken later in the day may be given after the procedure and your child has recovered from the sedation.

Parents are strongly encouraged to eat and drink prior to arriving at the imaging facility. The entire process—from check-in to release—can be physically draining.

Inform your doctor if your child is sick or has cold or flu symptoms, such as a cough, runny nose or fever. Sedation may not be safe when a child is sick with these symptoms. The procedure may need to be rescheduled.

Your child may be asked to remove their clothing and wear a gown during the exam. They may also be asked to remove jewelry, eyeglasses, any metal objects or clothing that might interfere with the x-ray images.

How safe is anesthesia?

In general, anesthesia and sedation are safe for most patients.

Patients are closely monitored by an anesthesiologist or other trained healthcare professional, regardless of the level of sedation or anesthesia used.

Side effects and adverse allergic reactions

Serious side effects and allergic reactions resulting from anesthesia are rare.

After sedation or general anesthesia, some patients may have nausea, vomiting, dizziness, headache, sore throat, blood pressure changes or pain. These side effects are usually mild, brief and treatable.

Some children may not achieve adequate sedation and may require a procedure to be rescheduled with general anesthesia.

More serious complications from anesthesia are rare and are more likely to occur in patients with complex, serious medical conditions.

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What will my child experience during and after the procedure?

During the procedure

All patients who receive anesthesia are attached to special devices that monitor heart rate and other vital body functions. Children who receive general anesthesia will be unconscious for the entire procedure under the direct care of an anesthesia professional.

Sedatives are usually administered to children through a peripheral IV catheter. They may feel slight pressure or a sharp pinch when the catheter is inserted. Some children younger than two years old occasionally can be sedated with oral medications.

Children undergoing MRI will be watched on a camera in the MRI scanner. Imaging staff will report any movement to the anesthesia provider, in which case additional sedation may be needed.

After the procedure

Children who received minimal or moderate sedation should be able to go home shortly after the procedure. Those who receive deep sedation or general anesthesia may remain in the recovery room longer, until they are fully conscious.

Children respond differently to sedatives and anesthesia. Some children may become agitated, inconsolable or restless during or after sedation. Other children may continue to be sleepy and unsteady on their feet for the remainder of the day.

Most pediatric patients can resume their normal activity within six to eight hours. However, children should be monitored by a responsible adult for 12 to 24 hours after being sedated. Activities that require coordination and balance, such as swimming, climbing and riding a bike, should usually be delayed by 24 hours.

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