
Help Make Boos Boos BeHer for Kids with Conscious Sedation

EDITOR'S NOTE) Because several errors were inadvertently incorporated into this article when edited and published in the October 2, 2000, issue, it is republished below in its entirety.

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What do you get when you mix Ketamine, Versed, or chloral hydrate with chocolate syrup? A tasty treat that's sure to fly young patients out of the pain zone and into never-never land. All kid-

ding aside, nurses know that getting some children to take oral medications can be difficult, if not altogether impossible. That challenge can be made all the more formidable when young patients are in pain or they shortly will be, courtesy of the torment some procedures bestow.

In the ED, where unknowing children are apt to find their painful parts poked, prodded, searched, or stitched, a little creativity goes a long way in sparing children pain. A chocolate concoction is just one way nurses have expanded their artistry of caring for children through conscious sedation. Born in the OR, conscious sedation has found a home away from home in the ED, where it's seeing great success, if used safely and with proper emergency precautions.

Pediatric sedation -both conscious and deep -is nothing to take lightly. Nurses who administer either sedatives or analgesics to children must be knowledgeable and vigilant. Last issue, we discussed the general hows and whys of conscious sedation (see "When in Doubt, Knock 'Em Out," September 18, 2000); here, we'll give you the ins and outs of the drugs themselves. But note: Our brief tour of the conscious sedation cabinet is just that -a short excursion only. For in-depth information on sedatives and analgesics, consult the *Physicians' Desk Reference* or other reliable medical sources, as well as your institution's policies and procedures. Established conscious sedation guidelines are available from the American Association of Nurse Anesthetists <www.aana.com>, the American College of Emergency Physicians <www.acep.org>, and the American Academy of Pediatrics <www.aap.org>.

Here's what we recommend or don't recommend for healthy children requiring conscious sedation and why:

Fentanyl (Sublimaze)

Onset: 2 to 3 minutes

Duration: 30 to 60 minutes

Reversed with: Narcan

Our favorite analgesic, fentanyl is also a good sedative. It's 100 times more powerful than morphine, but it's also the least hemodynamically-affecting opiate. The preferred analgesic for unstable patients, it can be given IV or as a "lollipop" (Yeah! No shot!) or transdermally as a patch for chronic pain. Whenever you administer fentanyl, watch for respiratory depression. Chest wall rigidity signals a problem with rapid IV administration. It can be managed with Narcan or chemical paralytics with intubation and ventilatory support.

Sufentanil (Sufenta)

Onset: Nasally, 5 to 15 minutes

Duration: 1 to 2 hours

Reversed with: Narcan

Sufentanil is another great analgesic, but it's five to seven times as potent as fentanyl. Not required, it's administered intranasally with or without Versed. Treat complications and reversal like fentanyl above.

Ketamine (Ketalar)

Onset: 1 minute IV, 5 to 6 minutes IM, a little longer orally or rectally

Duration: 10 to 30 minutes IV, 60 to 90 minutes IM

Reversed with: No reversal, except time

Ketamine gets a bad rap because it's a PCP derivative and an animal tranquilizer. Still, if it works for charging elephants, it'll likely work for a two-year-old. Ketamine provides analgesia, sedation, and amnesia, but it doesn't depress respirations—all in one drug. It can be administered orally, rectally, IM, or IV with rapid onset (even with the IM route). Patients will look as though they're awake with their eyes half open—like a trance—though they are asleep. As in sleep, they may have disconnected, random movements of their extremities.

This drug increases BP, HR, CO, and ICP, as well as airway secretions (it stimulates copious saliva production that can be treated with atropine or Robinul), but it avoids respiratory or airway reflex depression. The part of ketamine that concerns some professionals is the drug's association with emergence reactions or nightmares, but these are rare in children less than 10 years old and uncommon in the 10 to 15 age set. What's more, such reactions are typically not found with oral or rectal administration.

Versed (midazolam)

Onset: 2 to 3 minutes IV, 10 to 20 minutes IM, 10 to 15 minutes nasally, 10 to 30 minutes PO, 10 to 30 minutes rectally

Duration: 30 to 60 minutes IV, 1 to 2 hours IM, 45 to 60 minutes nasally, 60 to 90 minutes PO, 60 to 90 minutes PR

Reversed with: Romazicon (flumazenil)

Versed provides anxiolysis (decreases anxiety), sedation, and amnesia, but it does not act as an analgesic. If you're using Versed for a painful procedure, you'll need to couple it with an analgesic. It can be administered orally, rectally, or intranasally, as well as IM or IV.

Essentially, you can do anything with Versed in children short of baptizing them in it, and they will become sedated. Watch for respiratory depression, however, especially with concurrent analgesic administration.

Chloral hydrate

Onset: 15 to 60 minutes PO

Duration: 1 to 2+ hours (even longer in some patients)

Reversed with: No drug available

Chloral hydrate sedates only; it has no analgesic properties and, as such, is generally reserved for nonpainful procedures. It's poorly absorbed rectally, and it has a fairly high incidence of nausea and vomiting, as well as

respiratory depression. Chloral hydrate's biggest problem, however, is its long time of onset and potentially very long duration. It's not as popular a drug as it used to be, especially in the ED with its time constraints. No reversal agent is available, and practitioners have learned that better drugs are available with more predictable effects.

Demerol, Phenergan, and Thorazine (DPT)

Onset: 15 to 60 minutes

Duration: typically 1 to 3 hours, but sometimes as long as 19 hours

Reversed with: Narcan

DPT has been widely used because of its ease of IM administration and its reliable sedating effects, but it's also been used inappropriately to chemically immobilize children for nonpainful procedures. It's poorly titratable, and if children do not become sleepy enough under the drug or still experience pain, you'll need to give them another shot. DPT can cause seizures, respiratory depression, dystonic reactions, hypotension, and death, so it doesn't come highly recommended. A big shot (or two) is required, and better, more effective drugs than DPT are available in the ED.

Propofol (Diprivan)

Onset: 8 minutes

Reversed with: Time (within 8 minutes after bolus or infusion is discontinued)

Propofol looks like milk, but it's an IV sedative-hypnotic. Rapid onset and rapid recovery make this a great drug, but it provides no amnesic or analgesic effects. Respiratory depression and apnea are dose-related, but common. Propofol should not be used in children with allergies to eggs or lethicin.

Nitrous oxide

Onset: 3 to 5 minutes

Duration: 3 to 5 minutes after withdrawal and administration of 100% oxygen (use 50% O₂/50% nitrous mixture to prevent hypoxia)

This drug does it all; it provides sedation, amnesia, anxiolysis, and analgesia—all with no shot. It's particularly useful with poorly cooperative patients, such as children with mental impairments or developmentally delayed children, because it's noninvasive, requires minimal expertise and monitoring, and produces light sedation. It's safe for brief use, but it can accumulate in the middle ear or bowel, causing perforation. Also, when given with narcotics or sedatives, deep sedation or general anesthesia can result, requiring the need for appropriate monitoring.

Nitrous oxide is helpful because it's flow-dependent, meaning that when patients take deep breaths, they get more nitrous, but when they become too sleepy and don't breathe as deeply, they get less nitrous and quickly awaken. Older children can self-administer the medication by holding the mask. When they get sleepy, the mask will drop away from their face onto the cart. Newer innovations in nitrous oxide use include allowing children to pick their mask—red, blue, etc.—as well as the flavor they prefer. We put a few drops of different "scents," such as bubble gum or strawberry, into the mask. As children inhale, they smell the bubble gum, but they get the nitrous. When the procedure is complete, simply turn off the nitrous, and give 100% oxygen for a quick return to a baseline level of consciousness. Use lots of caution, however, with concurrent administration of IV sedation or

analgesics, which can cause respiratory depression.

In summary, when considering conscious sedation measures, think about how you would like your own children to be during a painful procedure—awake, pain free, and not

remembering anything. This can be accomplished through conscious sedation.

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