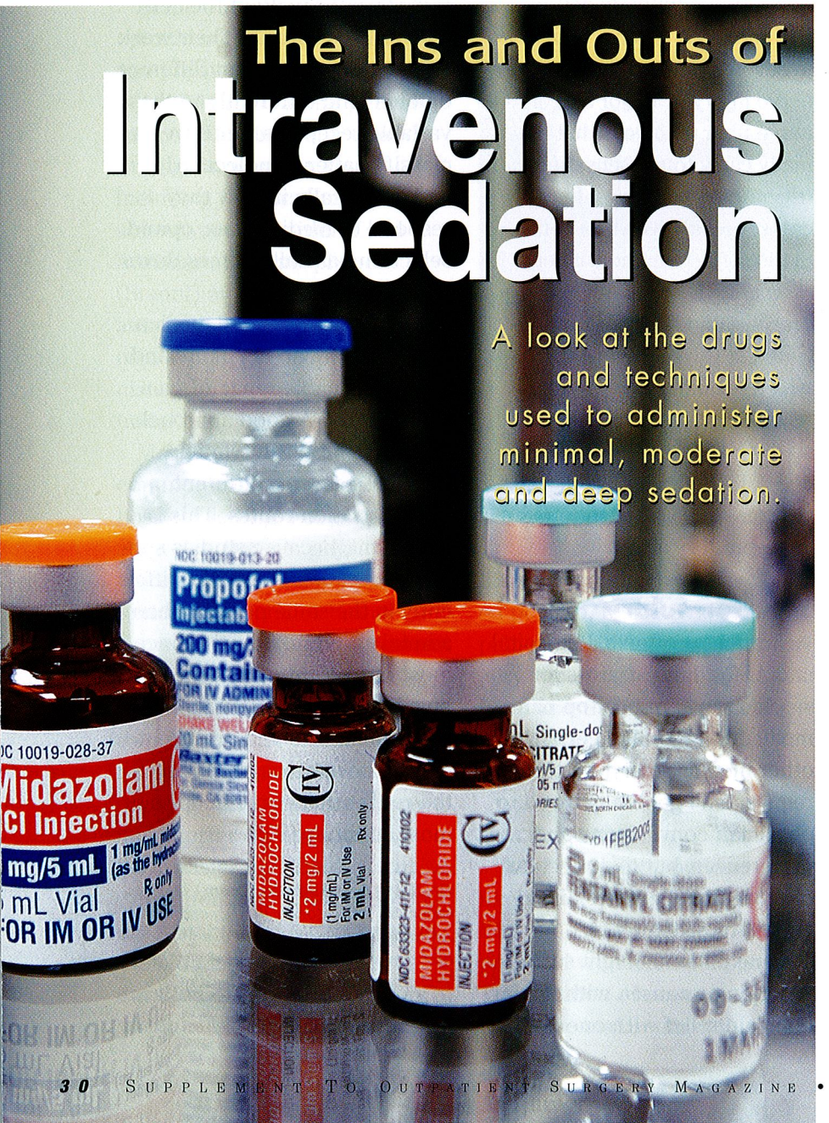
Since the late 1980s, conscious sedation has been the anesthetic technique of choice to decrease patient anxiety and relieve mild-to-moderate pain during diagnostic and minimally invasive surgical procedures that don't require general anesthesia. Examples include endoscopies, breast biopsies, colonoscopies, closed reductions, carpal tunnel release, angiograms, and D and Cs. Many physicians prefer conscious sedation — a depressed state of consciousness that's also known as moderate sedation — because patients are easily aroused, and it requires less medication and causes fewer side effects and complications than general anesthesia.



The Ins and Outs of Intravenous Sedation

A look at the drugs and techniques used to administer minimal, moderate and deep sedation.

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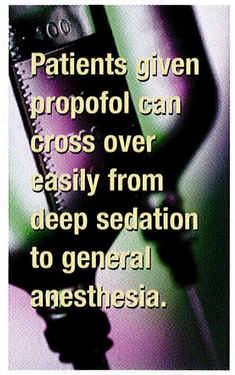
Levels of sedation

Let's review the levels of sedation along with the drugs and techniques commonly used to administer each one.

• **Minimal sedation.** Previously called light sedation, minimal sedation (anxiolysis) is a drug-induced state during which patients respond normally to verbal commands. Cognitive function and coordination may be impaired, but the ability to breathe is unaffected.

Typically, minimal sedation is administered with oral medications such as diazepam (Valium) or opioids with sedative effects such as Tylenol 3 with codeine, diazepam (Valium) or acetaminophen and oxycodone (Tylox) and acetaminophen and hydrocodone (Vicodin), the pill forms of the opioids morphine and meperidine (Demerol). Small doses of morphine and Demerol may be given intravenously or (rarely) via intramuscular injections.

• **Moderate sedation.** Moderate sedation (analgesia) is a drug-induced depression of consciousness. Patients are less alert, but they can respond purposefully to repeated or painful stimulation. Their ability to breathe independently may be impaired; they may require assistance in maintaining a patent airway, and spontaneous ventilation may be inadequate. Cardiovascular function is usually maintained. Like minimal sedation, patients respond to verbal commands either alone or accompanied by light tactile stimulation.



Sedatives most commonly used are benzodiazepines such as midazolam (Versed) and diazepam. Should a patient develop respiratory depression, a common complication, flumazenil (Romazicon) may reverse the harmful effects of the medication. Use flumazenil with caution for patients on long-term benzodiazepine therapy.

Opioids used for pain relief include morphine, meperidine, fentanyl (Alfenta), and the agonist-antagonists butorphanol (Stadol) and nalbuphine (Nubain). The reversal drug naloxone hydrochloride (Narcan) is given to patients who develop respiratory depression due to the opioids.

Sedatives and opioids should be titrated intravenously to control dosing. Instead of giving a patient 10mg of a particular drug combination at once, administer a small amount at a time until the patient reaches the desired effect. And he might reach it at 8mg. So you're giving patients just enough of the drug to decrease anxiety and control pain. You don't want to give them too much and risk respiratory depression or move them into deep sedation. Patients respond individually, so you can't predict how each one will respond to the same amount of medication. That's why titration is crucial.

• **Deep sedation.** Deep sedation (analgesia) is also a drug-induced depression of consciousness, but unlike moderate sedation, patients aren't as easily aroused and don't readily respond to verbal commands, though they react to repeated or painful stimulation. Their ability to breathe on their own may be impaired; they may require assistance in maintaining a patent airway, and spontaneous ventilation may be inadequate. Cardiovascular function, however, is generally maintained.

Drugs commonly used are midazolam, diazepam, morphine, fentanyl, meperidine and propofol (Diprivan), a non-barbiturate hypnotic. These medications are administered through an IV push, although you can give bolus propofol in a continuous IV drip.

Patients recover rapidly from short-acting propofol, function well post-operatively and discharge quickly. The problems: Propofol has no reversal drugs to counter harmful side effects, and its administration is unpredictable. Patients easily can cross over from moderate to deep sedation to general anesthesia, and their ventilatory and cardiovascular function can be compromised. If this occurs, you have to be ready to rescue the patient's ventilatory function by bagging, or oxygenating, him to keep the airway open. The American Society of Anesthesiologists mandates that you must be prepared to rescue any patient who crosses over to a deeper level of sedation than initially intended because of respiratory depression or other complications.

Monitoring patients

No matter what level of sedation you choose, it's important to continuously monitor the patient's respiratory rate, oxygen saturation, blood pressure, cardiac rate and rhythm and level of consciousness. You have to be prepared to deal with other complications as well such as severely slurred speech, unarousable sleep, hypotension, hypertension, agitation and apnea. And you should know dosage requirements for elderly and pediatric patients, who usually require less medication. **OSM**

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