



Pediatric Oral Sedation
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At the time of this writing, January 2011, a total of six patients have died during the past 14 months in the United States during the course of routine dental care. All were children or adolescents. All had received some form of sedation, ranging from oral medications to general anesthesia.

It is beyond question that some children need some form of sedation for some dental appointments. However, based on morbidity and mortality, sedation of children is the most challenging procedure performed in dentistry. There are two reasons for this phenomenon.

First, in an effort to make the administration of medication as easy as possible for the child, many practitioners rely on the oral route of administration. Proper dosing for oral medications is, at best, a guess of the patient's needs based on weight. Because it is impossible to assess how much and at what rate the drug is absorbed in the GI tract, it is impossible to determine when the drug has reached optimum effect. Therefore, the dentist has no way of knowing if (1) the effect of the drug will continue to increase, (2) the drug is now at its peak effect, or (3) if the drug is actually wearing off.

The second challenge of pediatric sedation lies in the anatomical differences between children and adults. Children are not small adults. They are different.

When an adult stops breathing about 2½ liters of air remains in the lungs after the patient's last exhalation. This is called the functional residual capacity (FRC). Being made of room air, about 20% (0.5 liter) of the FRC is oxygen. Presuming the heart is still beating, this oxygen can sustain life 3-4 minutes.

However, the FRC in a child is disproportionately small in children. Consequently, the total volume of gas left in the lungs is minute. In small children the brain can become deficient of oxygen in as little as 90 seconds. To further complicate the matter, small children have "short necks." Establishing an airway is anatomically more difficult than

on an adult. These differences place extraordinary pressures on the dentist to identify and successfully respond to the apneic condition quickly.

The focus of this article is to consider how to accomplish the needed level of anxiety and behavior control with minimal risk to the patient. The following six items are considerations that any dentist should consider before sedating a patient, but in particular a child.

1) Is the office prepared for an emergency? Far too many dental offices are not. The Raven Maria Blanco Foundation is a non-profit patient advocacy group focused on improving medical emergency preparedness in dental offices. (The foundation is named after the 8 year-old Virginia girl who died in 2007 during a routine check-up and cleaning.) In concert with the Institute of Medical Emergency Preparedness, they have adopted a 6-point protocol that all dental offices should follow called, The Six Links of Survival™. A copy of the Reference Guide that fully describes each link can be downloaded, without cost, from their website at www.rmbfinc.org.

2) Consider Nitrous Oxide. Within dentistry, a recent trend is to rely on oral sedation for the care of both children and adults. However, nitrous oxide sedation still remains a highly safe, effective, and affordable option. Nitrous oxide offers three specific options over oral sedation. (i) It is titratable. The level of sedation can be increased or decreased by simply adjusting the concentration. (ii) It is easily reversed. Slight oversedation can be reversed quickly and easily before the patient becomes fully apneic. (iii) The patient is being oxygenated during the procedure. Even at a maximum delivery of 70%, the patient is receiving 30% oxygen via the nasal hood, 10% more than room air.

3) Consider an Oral – Nitrous Combination. For those cases where nitrous oxide alone is not sufficient, consider mixing it with an oral sedative. Typically, dentists give a large bolus of oral medication and hope that the effect will be normal. Of course, an equal dose of medication will impact one patient differently than another. The oral/nitrous combination relies on providing a very modest dosage of oral medication (far less than the normal dosage), then supplementing it with nitrous oxide to the desired level of relaxation. This strategy preserves the ability to titrate the sedative agent while preserving the added benefit of the underlying oral medication. It is important to note that this technique is one which dentists should engage in formal training to master.

4) Consider a Reversible Sedative. In contrast to chloral hydrate, consider a benzodiazapene (BNZ) as an oral sedative. With the advent of Romazicon™, a BNZ-antagonist, an overly sedated patient can be “reversed.” A dentist should be schooled in this technique, as it is an “off-label” application of the medication. Furthermore, introducing excessive Romazicon™ lowers the patient’s seizure threshold.

5) Fully Understand the Oximeter. While pulse oximetry has revolutionized anesthesia care, the device does have limitations. Unfortunately, when the patient receives supplemental oxygen, it is easy to be led into a false sense of security. It is incumbent that both the dentist and the staff understand how to fully interpret the information the machine is providing.

6) Consider Outside Assistance. Especially when doing extensive dental work within the small confines of a young child's mouth, it may be beyond one doctor's ability to both monitor the sedation and perform the dental care. Increasingly, the availability of dental anesthesiologists makes this option more attractive.

Sedating children during dental care remains a necessity under selected circumstances. At the same time, it remains the responsibility of each dentist (and the profession as a whole) to assure that these procedures are done in a safe manner.

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