

Patient Safety Tip of the Week

November 28, 2017

More on Dental Sedation/Anesthesia Safety

Lee and colleagues recently asked why we aren't doing more to avoid tragedies related to dental sedation/anesthesia ([Lee 2017](#)). They described a case where a young patient with dental caries was sedated with Versed and nitrous oxide for dental work because he had behavioral issues. More Versed was required during the procedure and after the procedure was done the dentist left the child in recovery with a dental assistant. But when he returned with the boy's mother, the child was cyanotic. Rescue efforts failed and the boy was dead upon arrival at the hospital. Lee and colleagues call for more data and more research on the reasons for pediatric sedation deaths during dental procedures.

Actually, a considerable amount of data collection and analysis has been done recently, as noted in our March 28, 2017 Patient Safety Tip of the Week "[More Issues with Dental Sedation/Anesthesia](#)", which we'll reiterate later.

But very timely is an article from the California Dental Association ([CDA 2017](#)) in which Dr. Steven Yun, a board-certified M.D. anesthesiologist who specializes in dental office anesthesia, is interviewed about safe dental sedation in the office.

Dr. Yun notes 2 important trends in improving dental sedation safety: "There is now an emphasis on the team model, meaning that as an anesthesiologist I must recruit and activate each member of the treatment team to take an active role in patient safety. Dentists, dental assistants and the front-office staff must be recognized as important and valuable members of the care team when it comes to anesthesia patient safety." He describes how he introduces himself to each member of the team and talks about their role(s), in a manner that promotes a culture in which team members feel empowered to speak up. He also reviews basic emergency procedures with the office, checks backup emergency equipment and completes a pre-anesthesia checklist before every procedure.

The second important trend is the use of checklists. Dr. Yun uses a [Safety Checklist for Office-Based Procedural Sedation/Anesthesia](#) downloaded from the American Dental Society of Anesthesiology. That checklist is similar to the Safe Surgery Checklist we've so often discussed and is customizable.

Another important point is that he provides his patients and their parents access to a variety of information about safety on his website and emphasizes the need to do this well in advance.

And then he provides several very practical recommendations:

- Don't take shortcuts.
- When a patient develops distress, call 911 first!
- Follow sedation/anesthesia guidelines promulgated by specialty societies.
- Practice, practice, practice... for emergencies.
- Be prepared for failures of things like equipment, including emergency equipment.

The point about calling 911 first is very important. Dr. Yun emphasizes that one of the most common mistakes is **waiting too long to seek emergency assistance**. That was one of the root causes identified by the Texas Blue Ribbon Panel that we discussed in our March 28, 2017 Patient Safety Tip of the Week "[More Issues with Dental Sedation/Anesthesia](#)".

We've also emphasized over and over that the only way to be prepared for rare emergencies, whether they are events related to dental sedation or hospital events like surgical fires, is to **practice for them**. Every member of the team needs to understand their role in such events. We also like the way he stresses that **everyone, including front office staff, are critical to successfully handling sedation emergencies**.

Periodic inspection (with a log) of all emergency equipment should be done regularly.

Of course, Dr. Yun is an anesthesiologist. We doubt that most dental practices are using an anesthesiologist. Much more often the dentist, who is also doing the dental work, is the one certified in dental sedation/anesthesia. That dual role is obviously problematic, regardless of how well we think we can multi-task.

Proper procedures and guidelines for pediatric sedation ([Coté 2016](#)) were discussed in our August 2016 What's New in the Patient Safety World column "[Guideline Update for Pediatric Sedation](#)".

Our March 28, 2017 Patient Safety Tip of the Week "[More Issues with Dental Sedation/Anesthesia](#)" discussed the Texas blue ribbon panel ([Texas SBDE 2017](#)) recommendations that were made after analyzing multiple Texas cases with adverse events and reviewing the scientific literature, the above mentioned guidelines, and regulations in place in other states.

The panel's review of incidents that had occurred in Texas included some of the following root causes and contributing factors:

- Emergency drugs were available but given in the wrong dose
- Emergency ventilation equipment was available but used ineffectively
- Emergency ventilation equipment was not available
- Supplemental oxygen was available but not administered when indicated
- The provider was slow to activate the emergency medical system (EMS)

The latter factor (long delays in calling 911 or otherwise activating the EMS) was the most common contributing factor identified, though it was not universal. The panel identified several root causes for such delays, including fear that such might lead to a regulatory investigation, considering the need for EMS as a personal failure, and lack of practice in crisis management.

One other factor suspected, but which was difficult to prove, was that in some cases the sedation provider may have left the dental operator for a period of time, leaving the patient unobserved. Current rules in Texas require continuous presence of the sedation provider until the patient has reached a defined level of recovery.

The panel found that at least 2 major failures had occurred in all 6 major events and that no sedation related event would likely have occurred if all rules currently in place had been closely followed and failures avoided.

The Texas blue ribbon panel made several recommendations, including the following:

- Dentists should have in place written emergency protocols and be required to document that these protocols are practiced with office staff using drills or similar exercises.
- At least one support staff member assisting with a sedation procedure must receive training in recognition and management of sedation/anesthesia related emergencies.
- Age-specific sedation training (for moderate/deep/general anesthesia) must be documented for those dentists providing services to children under the age of 8 and also for other “high risk” patients (eg. BMI \geq 30, ASA class 3 or 4, age 75 or older).
- Basic ventilation equipment must be onsite at all sites, including offices where portable providers practice.
- Capnography and a precordial stethoscope are mandated for procedures using moderate/deep/general anesthesia.

Other suggestions included encouraging or mandating a preoperative sedation checklist, clarifying what should be included in the preoperative evaluation, and what constitutes an acceptable sedation/anesthesia record.

They also had multiple administrative recommendations and suggestions that you can read in our prior column.

Texas already had a rule/regulation that at least one member of the assistant staff be present during nitrous oxide/oxygen inhalation sedation. The dental provider may delegate monitoring of nitrous oxide/oxygen inhalation sedation (once pharmacologic and vital sign stability has been established) to an assistant who is certified by the State Board of Dental Examiners (SBDE) to do so. Assisting staff must also be certified in BLS (Basic Life Support).

The updated American Academy of Pediatrics (AAP)/American Academy of Pediatric Dentistry (AAPD) “Guideline for Monitoring and Management of Pediatric Patients During and After Sedation for Diagnostic and Therapeutic Procedures” ([Coté 2016](#)) emphasizes the **role of capnography** in appropriate physiologic monitoring and **continuous observation by personnel not directly involved with the procedure** to facilitate accurate and rapid diagnosis of complications and initiation of appropriate rescue interventions. We were glad to see the Texas blue ribbon panel recommendation for use of capnography.

The updated AAP/AAPD guideline has specific recommendations for when the intended level of sedation is minimal, moderate, deep or general sedation. One critical point that should be of particular concern for dental practices, is that use of moderate or deeper sedation shall include the provision of **a person, in addition to the practitioner, whose responsibility is to monitor appropriate physiologic parameters** and to assist in any supportive or resuscitation measures. While that individual might also be responsible for assisting with interruptible patient-related tasks of short duration, such as holding an instrument or troubleshooting equipment, the **primary role of that individual is monitoring the patient**. For deep sedation the sole role of the support individual is to monitor the patient. In either case that individual should be trained in and capable of providing advanced airway skills (eg, PALS) and shall have specific assignments in the event of an emergency and current knowledge of the emergency cart/kit inventory.

Monitoring is critical and should include the level of patient’s ability to communicate (where assessable), heart rate, respiratory rate, blood pressure, oxygen saturation, and expired carbon dioxide values (via **capnography**) should be recorded, at minimum, every 10 minutes in a time-based record. The guideline stresses use of capnography but acknowledges that it may not be able to be used in some procedures around the face, including many dental procedures.

The guideline also discusses selection of drugs and the importance of knowledge about the duration of action of the drugs used. It also discusses the needs for the emergency cart/kit and backup emergency services access and availability. There is also a good section on discharge issues, including what should be monitored by families after discharge.

One important item we could not find in either Texas’ current regulations or the recommendations made by the panel is a statement about patient restraints or immobilization devices. You’ll recall that several of the events we described in our March 15, 2016 Patient Safety Tip of the Week “[Dental Patient Safety](#)” involved use of a pediatric restraint called a “papoose” that may have contributed to the adverse outcomes. The updated AAP/AAPD guideline has a good discussion about the use of immobilization devices, such as the “papoose” boards. Such must be applied in such a way as to avoid airway obstruction or chest restriction and the child’s head position and respiratory excursions should be checked frequently to ensure airway patency. If an immobilization device is used, a hand or foot should be kept exposed, and the child should never be left unattended.

We do like the [Safety Checklist for Office-Based Procedural Sedation/Anesthesia](#) downloaded from the American Dental Society of Anesthesiology. It has sections for room setup, pre-procedure issues, postop recovery, and record keeping. But we also wonder how often dental practices do pre-procedure huddles (briefings) and post-procedure debriefings. Those offer the opportunity to both plan for contingencies and analyze things that might have been done better.

We certainly concur with Lee and colleagues that deaths and other adverse events related to dental sedation/anesthesia should be avoidable. There are already some excellent guidelines and recommendations available. The question is how often dental practices comply with those guidelines and recommendations.

Sedation/anesthesia probably allows dental and oral surgery procedures needed by many young children. But it is not something that dental practices or parents of young children should approach cavalierly. Guidelines like those outlined today need to be adhered to closely and a high level of vigilance incorporated into such dental practices.

Some of our previous columns on dental patient safety issues:

March 15, 2016 “[Dental Patient Safety](#)”

August 2016 “[Guideline Update for Pediatric Sedation](#)”

March 28, 2017 “[More Issues with Dental Sedation/Anesthesia](#)”

August 8, 2017 “[Sedation for Pediatric MRI Rising](#)”

References:

Lee H, Milgrom P, Huebner CE, et al. Ethics Rounds: Death After Pediatric Dental Anesthesia: An Avoidable Tragedy? *Pediatrics* 2017, e20172370
http://pediatrics.aappublications.org/content/early/2017/11/03/peds.2017-2370?sso=1&sso_redirect_count=1&nfstatus=401&nftoken=00000000-0000-0000-0000-000000000000&nfstatusdescription=ERROR%3a+No+local+token

CDA (California Dental Association). Dental anesthesia safety: Say something if you see something. *CDA News/Events* 11/09/2017
<https://www.cda.org/NewsEvents/Details/tabid/146/ArticleID/4067/Dental-anesthesia-safety-Say-something-if-you-see-something.aspx>

ADSA (American Dental Society of Anesthesiology). Safety Checklist for Office-Based Procedural Sedation/Anesthesia.

<https://irp-cdn.multiscreensite.com/f37fe5b3/files/uploaded/ADSAChecklistFINAL%20copy.pdf>

Coté CJ, Wilson S, American Academy of Pediatrics, American Academy of Pediatric Dentistry. Guidelines for Monitoring and Management of Pediatric Patients Before, During, and After Sedation for Diagnostic and Therapeutic Procedures: Update 2016. Pediatrics 2016; 138(1): e2016121

<http://pediatrics.aappublications.org/content/138/1/e2016121>

State Board of Dental Examiners (Texas). Report to the Texas Sunset Advisory Commission by the Blue Ribbon Panel on Dental Anesthesia/Sedation Safety. January 4, 2017

<https://lintvkxan.files.wordpress.com/2017/01/anesthesia-recommendations-final-report.pdf>



The
Truax
Group
Healthcare Consulting
www.patientsafetysolutions.com

<http://www.patientsafetysolutions.com/>

[Home](#)

[Tip of the Week Archive](#)

[What's New in the Patient Safety World Archive](#)