

Use of Anesthesia Providers in the Administration of Office-based Deep Sedation/General Anesthesia to the Pediatric Dental Patient

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ABBREVIATIONS

AAPD: American Academy of Pediatric Dentistry. **APLS:** Advanced pediatric life support. **ASA:** American Society of Anesthesiologists. **CAA:** Certified anesthesiologist assistant. **CO₂:** Carbon dioxide. **CRNA:** Certified registered nurse anesthetist. **PALS:** Pediatric advanced life support.

Purpose

The American Academy of Pediatric Dentistry (AAPD) recognizes that there are pediatric dental patients for whom routine dental care using non-pharmacologic behavior guidance techniques is not a viable approach.¹ The AAPD intends this guideline to assist the dental practitioner who elects to use a licensed anesthesia provider for the administration of deep sedation/general anesthesia for pediatric dental patients in a dental office or other facility outside of an accredited hospital or ambulatory surgical center. This document discusses personnel, facilities, documentation, and quality assurance mechanisms necessary to provide optimal and responsible patient care.

Methods

Recommendations on the use of anesthesia providers in the administration of office-based deep sedation/general anesthesia were developed by the Clinical Affairs Committee – Sedation and General Anesthesia Subcommittee and adopted in 2001. This document is a revision of the previous version, last revised in 2018. This revision is limited to the section on personnel, with changes based upon a review of the recently revised *Guidelines for Monitoring and Management of Pediatric Patients Before, During, and After Sedation for Diagnostic and Therapeutic Procedures*², a joint publication of the AAPD and the American Academy of Pediatrics. The last full revision utilized current dental and medical literature pertaining to deep sedation/general anesthesia of dental patients, including a search of the PubMed®/MEDLINE database using the terms: office-based general anesthesia, pediatric sedation, deep sedation, sleep dentistry, and

dental sedation; fields: all; limits: humans, all children from birth through age 18, English, clinical trials, and literature reviews. When data did not appear sufficient or were inconclusive, recommendations were based upon expert and/or consensus opinion by experienced researchers and clinicians.

Background

Pediatric dentists seek to provide oral health care to infants, children, adolescents, and persons with special health care needs in a manner that promotes excellence in quality of care and concurrently induces a positive attitude in the patient toward dental treatment. Behavior guidance techniques have allowed most pediatric dental patients to receive treatment in the dental office with minimal discomfort and without expressed fear. Minimal or moderate sedation has allowed others who are less compliant to receive treatment. Some children and individuals with special care needs who have extensive oral healthcare needs, acute situational anxiety, uncooperative age-appropriate behavior, immature cognitive functioning, disabilities, or medical conditions require deep sedation/general anesthesia to receive dental treatment in a safe and humane fashion.³ Access to hospital-based anesthesia services may be limited for a variety of reasons, including restriction of coverage of by third-party payors.^{3,4} Pediatric dentists and others who treat children can provide for the administration of deep sedation/general anesthesia by utilizing properly trained and currently licensed anesthesia providers in their offices or other facilities outside of the traditional surgical setting.

Office-based deep sedation/general anesthesia can provide benefits for the patient and the dental team. Such benefits may include:

- improved access to care;
- improved ease and efficiency of scheduling;
- decreased administrative procedures and facility fees when compared to a surgical center or hospital;
- minimized likelihood of patient's recall of procedures;
- decreased patient movement which may optimize quality of care; and
- use of traditional dental delivery systems with access to a full complement of dental equipment, instrumentation, supplies, and auxiliary personnel.

* The 2019 revision was limited to section on personnel.

The use of licensed anesthesia providers to administer deep sedation/general anesthesia in the pediatric dental population is an accepted treatment modality.^{2,5-8} Caution must be used in patients younger than two years of age. Practitioners must always be mindful of the increased risk associated with office-based deep sedation/general anesthesia in the infant and toddler populations. This level of pharmacologic behavioral modification should only be used when the risk of orofacial disease outweighs the benefits of monitoring, interim therapeutic restoration, or arresting medicaments to slow or stop the progression of caries. The AAPD supports the provision of deep sedation/general anesthesia when clinical indications have been met and additional properly-trained and credentialed personnel and appropriate facilities are used.¹⁻³ In many cases, the patient may be treated in an appropriate outpatient facility (including the dental office) because the extensive medical resources of a hospital may not be deemed necessary for delivering routine health care.

Recommendations

Clinicians may consider using deep sedation or general anesthesia in the office to facilitate the provision of oral health care. Practitioners choosing to use these modalities must be trained in rescue emergency procedures and be familiar with their patient's medical history, as well as the regulatory and professional liability insurance requirements needed to provide this level of pharmacologic behavior management. This guideline does not supersede, nor is it to be used in deference to, federal, state, and local credentialing and licensure laws, regulations, and codes.

Personnel

Deep sedation/general anesthesia techniques in the dental office require the presence of the following individuals throughout the procedure²:

- licensed anesthesia provider who is independent of performing or assisting with the dental procedure; and
- operating dentist.

It is the exclusive responsibility of the operating dentist, when employing anesthesia providers to administer deep sedation/general anesthesia, to verify and carefully review their credentials and experience. Significant pediatric training, including anesthesia care of the very young, and experience in a dental setting are important considerations, especially when caring for young pediatric and special needs populations.

In order to provide anesthesia services in an office-based setting:

- the licensed anesthesia provider must be a licensed dental and/or medical practitioner with current state certification to independently administer deep sedation/general anesthesia in a dental office. He/She must be in compliance with state and local laws regarding anesthesia practices. Laws vary from state to state and may supersede any portion of this document.
- if state law permits a certified registered nurse anesthetist (**CRNA**) or certified anesthesiologist assistant (**CAA**) to function under the direct supervision of a dentist, the dentist is required to have completed training in deep sedation/general anesthesia and be licensed or permitted for that level of pharmacologic management, appropriate to state law. Furthermore, to maximize patient safety, the dentist supervising the CRNA or CAA would not simultaneously be providing dental treatment. The CRNA or CAA must be licensed with current state certification to administer deep sedation/general anesthesia in a dental office. He/She must be in compliance with state and local laws regarding anesthesia practices. Laws vary from state to state and may supersede any portion of this document.

The dentist and anesthesia care provider must be compliant with the American Academy of Pediatrics/AAPD's *Guideline on Monitoring and Management of Pediatric Patients Before, During, and After Sedation for Diagnostic and Therapeutic Procedures*² or other appropriate guideline(s) of the American Dental Association, American Society of Dental Anesthesiologists (ASDA), American Society of Anesthesiologists (**ASA**), and other organizations with recognized professional expertise and stature. The recommendations in this document may be exceeded at any time if the change involves improved safety and/or is superseded by state law.

The dentist and licensed anesthesia provider must collaborate to enhance patient safety. Continuous and effective perioperative communication and appropriately timed interventions are essential in mitigating adverse events or outcomes. The dentist introduces the concept of deep sedation/general anesthesia to the parent, justifies its necessity, and provides appropriate preoperative instructions and informational materials. The dentist or his/her designee coordinates medical consultations when necessary and conveys pertinent information to the anesthesia care provider. The anesthesia care provider explains potential risks and obtains informed consent for sedation/anesthesia. Office staff should understand their additional roles and responsibilities and special considerations (e.g., loss of protective reflexes) associated with office-based deep sedation/general anesthesia.

Both the licensed anesthesia provider and the operating dentist must, at a minimum, have appropriate training and up-to-date certification in patient rescue, including drug administration and pediatric advanced life support (**PALS**) or advanced pediatric life support (**APLS**).² The licensed anesthesia provider's sole responsibility is to administer drugs and constantly monitor and record the patient's vital signs, depth of sedation, airway patency, and adequacy of ventilation.² The anesthesia provider must be skilled to establish intravenous access and draw up and administer rescue medications. He must have the training and skills to rescue a child with apnea, laryngospasm, airway obstruction, hypotension, anaphylaxis, or cardiopulmonary arrest, including the ability to open the airway, suction secretions, provide constant positive airway pressure (CPAP), insert supraglottic devices (oral airway, nasal trumpet, or laryngeal mask

airway), and perform successful bag-valve-mask ventilation, tracheal intubation, and cardiopulmonary resuscitation.² As permitted by state regulation, the anesthesia provider may be one of the following:

- dentist or physician anesthesiologist;
- certified registered nurse anesthetist; or
- an oral and maxillofacial surgeon.

The anesthesia provider would assume the lead during the management of any perioperative emergencies. The dentist must be capable of providing skilled assistance with the rescue of a child experiencing any of the adverse events described above.² It is the responsibility of the anesthesia provider to ensure that the operating dentist and supportive staff are capable of providing skilled support and have an established emergency and transport protocol in the event of an adverse incident.

Personnel experienced in post anesthetic recovery care and trained in advanced resuscitative techniques (e.g., PALS) must be in attendance and provide continuous respiratory and cardiovascular monitoring during the recovery period.² The supervising anesthesia provider, not the operating dentist, shall determine when the patient exhibits respiratory and cardiovascular stability and appropriate discharge criteria² have been met. The operating dentist must have up-to-date certification in PALS or APLS, and his/her clinical staff must be well-versed in emergency recognition, rescue, and emergency protocols including maintaining cardiopulmonary resuscitation certification for healthcare providers.⁶ Contact numbers for local emergency medical and ambulance services must be readily available, and a protocol for immediate access to back-up emergency services must be clearly outlined.² Emergency preparedness must be updated and practiced on a regular (e.g., semi-annual) basis [see Table 1], so as to keep all staff members up to date on established protocols.⁹

Facilities

A continuum exists that extends from wakefulness across all levels of sedation. Often these levels are not easily differentiated, and patients may drift among them.¹⁰ When anesthesia care providers are utilized for office-based administration of deep sedation or general anesthesia, the facilities in which the dentist practices must meet the guidelines and appropriate local, state, and federal codes for administration of the deepest possible level of sedation/anesthesia. Facilities must be in compliance with applicable laws, codes, and regulations pertaining to controlled drug storage, fire prevention, building construction and occupancy, accommodations for the disabled, occupational safety and health, and disposal of medical waste and hazardous waste.² The treatment room must accommodate the dentist and auxiliaries, the patient, the anesthesia care provider, the dental equipment, and all necessary anesthesia delivery equipment along with appropriate monitors and emergency equipment. Expedient access to the patient, anesthesia machine (if present), and monitoring equipment should be available at all times.

It is beyond the scope of this document to dictate equipment necessary for the provision of deep sedation/general anesthesia, but equipment must be appropriate for the technique used and consistent with the guidelines for anesthesia providers, in accordance with governmental rules and regulations. Because laws and codes vary from state to state, *Guidelines for Monitoring and Management of Pediatric Patients Before, During, and After Sedation for Diagnostic and Therapeutic Procedures*² should be followed as the minimum requirements.

For deep sedation/general anesthesia, there must be continuous monitoring of the patient's level of consciousness and responsiveness, heart rate, blood pressure, respiratory rate, expired carbon dioxide (CO₂) values, and oxygen saturation.² When adequacy of ventilation is difficult to observe using capnography, use of an amplified, audible precordial stethoscope (e.g., Bluetooth technology) is encouraged.² In addition, an electrocardiographic monitor and a defibrillator capable of delivering an attenuated pediatric dose are required for deep sedation/general anesthesia.² Emergency equipment must be readily accessible and should include Yankauer suction, drugs necessary for rescue and resuscitation (including 100 percent oxygen capable of being delivered by positive pressure at appropriate flow rates for up to one hour), and age-/size-appropriate equipment to resuscitate and rescue a non-breathing and/or unconscious pediatric dental patient and provide continuous support while the patient is being transported to a medical facility.^{2,5} The licensed practitioners are responsible for ensuring that medications, equipment, and protocols are available to treat malignant hyperthermia when triggering agents are used.¹¹ Recovery facilities must be available and suitably equipped. Backup power sufficient to ensure patient safety should be available in case of emergency power outage.²

Table 1. CONSIDERATIONS IN FREQUENCY OF CONDUCTING EMERGENCY EXERCISES ⁹	
Changes in plans	Changes in the emergency response plan need to be disseminated and practiced.
Changes in personnel	New staff members need training in their emergency response roles. Emergency roles left by former staff members need to be filled.
Changes in property	Infrastructure changes can affect how the plan is implemented. New equipment may require training for their use.
Foreseen problems	Protocols for newly identified problems must be established, practiced and implemented.

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Available at: "http://www.wpro.who.int/publications/PUB_9789290614791/en/". Accessed August 24, 2018.

Documentation

Prior to delivery of deep sedation/general anesthesia, patient safety requires that appropriate documentation shall address rationale for sedation/general anesthesia, anesthesia and procedural informed consent, instructions to parent, dietary precautions, preoperative health evaluation, and any prescriptions along with the instructions given for their use.² Because laws and codes vary from state to state, *Guidelines on Monitoring and Management of Pediatric Patients Before, During, and After Sedation for Diagnostic and Therapeutic Procedure*² should be followed as minimum requirements for a time-based anesthesia record.

- Vital signs: Pulse and respiratory rates, blood pressure, heart rhythm, oxygen saturation, and expired CO₂ must be continuously monitored and recorded on a time-based record throughout the procedure, initially every five minutes and then, as the patient awakens, at 10-15 minute intervals until the patient has met documented discharge criteria.²
- Drugs: Name, dose, route, site, time of administration, and patient effects (e.g., level of consciousness, patient responsiveness) of all drugs, including local anesthesia, must be documented.² When anesthetic gases are administered, inspired concentration and duration of inhalation agents and oxygen shall be documented.²
- Recovery: The condition of the patient, that discharge criteria have been met, time of discharge, and into whose care the discharge occurred must be documented. Requiring the signature of the responsible adult to whom the child has been discharged, verifying that he/she has received and understands the post-operative instructions, is encouraged.²

Various business/legal arrangements may exist between the treating dentist and the anesthesia provider. Regardless, because services were provided in the dental facility, the dental staff must maintain all patient records, including time-based anesthesia records, so that they may be readily available for emergency or other needs. The dentist must assure that the anesthesia provider also maintains patient records and that they are readily available.

Risk management and quality assurance

Dentists who utilize office-based anesthesia care providers must take all necessary measures to minimize risk to patients. The dentist must be familiar with the ASA physical status classification.¹² Knowledge, preparation, and communication between professionals are essential. Prior to subjecting a patient to deep sedation/general anesthesia, the patient must undergo a pre-operative health evaluation by an appropriate and currently licensed medical or anesthesia provider.^{2,6} High-risk patients should be treated in a facility properly equipped and staffed to provide for their care.^{2,6} The dentist and anesthesia care provider must communicate during treatment to share concerns about the airway or other details of patient safety. Further-more, they must work together to develop and document mechanisms of quality assurance.

Untoward and unexpected outcomes must be documented and reviewed to monitor the quality of services provided. This will decrease risk, allow for open and frank discussions, document risk analysis and intervention, and improve the quality of care for the pediatric dental patient.^{2,5}

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