

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

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Purpose

The American Academy of Pediatric Dentistry (AAPD) recognizes that there are pediatric dental patients for whom routine dental care using nonpharmacologic 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

This guideline was originally 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 2012. The revision of this guideline is based upon a review of 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. The search returned 69 articles; the reviewers agreed upon the inclusion of 12 articles that met the defined criteria. 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.² Access to hospital-based anesthesia services may be limited for a variety of reasons, including restriction of coverage of by third-party payors.^{2,3} 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 use of licensed anesthesia providers to administer deep sedation/general anesthesia in the pediatric dental population is an accepted treatment modality.⁴⁻⁸ 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

ABBREVIATIONS

AA: Anesthesia assistant. **AAPD:** American Academy of Pediatric Dentistry. **ASA:** American Society of Anesthesiologists. **CO₂:** Carbon dioxide. **CRNA:** Certified registered nurse anesthetist.

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.^{1,3,4} 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 at least three individuals:

- Independently practicing and currently licensed anesthesia provider.
- Operating dentist.
- Support personnel.

The anesthesia care provider's responsibilities are to administer drugs or direct their administration and to continuously monitor the patient's vital signs, airway patency, cardiovascular and neurological status, and adequacy of ventilation. Both the surgical and anesthesia teams are responsible for maintaining optimal patient positioning, such as keeping the head and neck aligned and supported while padding all pressure points. Additional attention should be placed on moving extremities during long procedures so as to avoid the possibility of complications secondary to prolonged immobility (e.g., peripheral neuropathy).

It is the exclusive responsibility of treating practitioners, 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 anesthesia care 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 anesthesia assistant (AA) 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 AA would not simultaneously be providing dental treatment. The CRNA or AA 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: Update 2016⁴ or other appropriate guideline(s) of the American Dental Association, 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.

Advanced training in recognition and management of pediatric emergencies is critical in providing safe sedation and anesthetic care. During deep sedation/general anesthesia, there must be one person whose only responsibilities are to continuously monitor the patient's vital signs, airway patency, and adequacy of ventilation and to either administer drugs or direct their administration.⁴ An independent anesthesiologist often assumes this role. However, if this individual is not an anesthesiologist but is functioning under the supervision of a licensed and legally-permitted practitioner, then this individual, at a minimum, must be trained in advanced pediatric life support (e.g., PALS) and capable of assisting with any emergency event. The supervisor must be physically present during the intraoperative period, free from surgical responsibilities,

trained in and capable of providing advanced pediatric life support, and skilled to rescue a child with apnea, laryngospasm, and/or airway obstruction. This provider must have the skills and the ability to open the airway, suction secretions, provide continuous positive airway pressure (CPAP), insert supraglottic devices (oral airway, nasal trumpet, laryngeal mask airway [LMA]), and perform successful bag-valve-mask ventilation, tracheal intubation, and cardiopulmonary resuscitation.⁴ Furthermore, at least one practitioner skilled in obtaining vascular access in children must be immediately available.⁴ 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.⁴ The supervising anesthesia provider, not the operating dentist, shall determine when the patient exhibits respiratory and cardiovascular stability and appropriate discharge criteria⁴ have been met. The operating dentist 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 In addition, it is highly recommended that the operating dentist be trained in advanced resuscitative techniques. Contact numbers for local emergency medical and ambulance services must be readily available, and a protocol for immediate access to backup emergency services must be clearly outlined.⁴ 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.⁴ 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.

Expeditious 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: Update 2016⁴ 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.⁴ When adequacy of ventilation is difficult to observe using capnography, use of an amplified, audible precordial stethoscope (e.g., Bluetooth technology) is encouraged.⁴ In addition, an electrocardiographic monitor and a defibrillator capable of delivering an attenuated pediatric dose are required for deep sedation/general anesthesia.⁴ 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.^{4,5} 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.⁴

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.⁴ 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 Procedures:

Table 1. CONSIDERATIONS IN FREQUENCY OF CONDUCTING EMERGENCY EXERCISES⁹

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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Update 2016⁴ 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.⁴
- 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.⁴ When anesthetic gases are administered, inspired concentration and duration of inhalation agents and oxygen shall be documented.⁴
- 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.⁴

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.^{4,6} High-risk patients should be treated in a facility properly equipped to provide and staffed for their care.^{4,6} The dentist and anesthesia care provider must communicate during treatment to share concerns about the airway or other details of patient safety. Furthermore, 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.^{4,5}

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