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# Best Practices on Use of Anesthesia Providers in the Administration of Office-based Deep Sedation/General Anesthesia to the Pediatric Dental Patient[1]

## Review Council

Council on Clinical Affairs

## Latest Revision

201~~7~~8*

*Revision limited to personnel section (line 129-154)

## Purpose

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

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[1] ABBREVIATIONS

**AA**: Anesthesia assistant. **AAPD**: American Academy of Pediatric Dentistry. **ASA**: American Society of Anesthesiologists. **$CO_2$**: Carbon dioxide. **CRNA**: Certified registered nurse anesthetist.

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29 or were inconclusive, recommendations were based upon expert and/or consensus opinion by experienced
30 researchers and clinicians.
31
32 ## Background
33 Pediatric dentists seek to provide oral health care to infants, children, adolescents, and persons with
34 special health care needs in a manner that promotes excellence in quality of care and concurrently induces
35 a positive attitude in the patient toward dental treatment. Behavior guidance techniques have allowed
36 most pediatric dental patients to receive treatment in the dental office with minimal discomfort and
37 without expressed fear. Minimal or moderate sedation has allowed others who are less compliant to
38 receive treatment. Some children and individuals with special care needs who have extensive oral
39 healthcare needs, acute situational anxiety, uncooperative age-appropriate behavior, immature cognitive
40 functioning, disabilities, or medical conditions require deep sedation/general anesthesia to receive dental
41 treatment in a safe and humane fashion.[2] Access to hospital-based anesthesia services may be limited for
42 a variety of reasons, including restriction of coverage of by third-party payors.[2,3] Pediatric dentists and
43 others who treat children can provide for the administration of deep sedation/general anesthesia by
44 utilizing properly trained and currently licensed anesthesia providers in their offices or other facilities
45 outside of the traditional surgical setting.
46
47 Office-based deep sedation/general anesthesia can provide benefits for the patient and the dental team.
48 Such benefits may include:
49 - Improved access to care;
50 - Improved ease and efficiency of scheduling;
51 - Decreased administrative procedures and facility fees when compared to a surgical center or
52 hospital;
53 - Minimized likelihood of patient's recall of procedures;
54 - Decreased patient movement which may optimize quality of care; and
55 - Use of traditional dental delivery systems with access to a full complement of dental equipment,
56 instrumentation, supplies, and auxiliary personnel.
57
58 The use of licensed anesthesia providers to administer deep sedation/general anesthesia in the pediatric
59 dental population is an accepted treatment modality.[4-8] Caution must be used in patients younger than two
60 years of age. Practitioners must always be mindful of the increased risk associated with office- based deep

61 sedation/general anesthesia in the infant and toddler populations. This level of pharmacologic behavioral
62 modification should only be used when the risk of orofacial disease outweighs the benefits of monitoring,
63 interim therapeutic restoration, or arresting medicaments to slow or stop the progression of caries. The
64 AAPD supports the provision of deep sedation/general anesthesia when clinical indications have been met
65 and additional properly-trained and credentialed personnel and appropriate facilities are used.[1,3,4] In many
66 cases, the patient may be treated in an appropriate outpatient facility (including the dental office) because
67 the extensive medical resources of a hospital may not be deemed necessary for delivering routine health
68 care.
69
70 ## Recommendations
71 Clinicians may consider using deep sedation or general anesthesia in the office to facilitate the provision
72 of oral health care. Practitioners choosing to use these modalities must be trained in rescue emergency
73 procedures and be familiar with their patient's medical history, as well as the regulatory and professional
74 liability insurance requirements needed to provide this level of pharmacologic behavior management.
75 This guideline does not supersede, nor is it to be used in deference to, federal, state, and local
76 credentialing and licensure laws, regulations, and codes.
77
78 **Personnel**
79 Deep sedation/general anesthesia techniques in the dental office require at least three individuals:
80 - Independently practicing and currently licensed anesthesia provider.
81 - Operating dentist.
82 - Support personnel.
83
84 The anesthesia care provider's responsibilities are to administer drugs or direct their administration and to
85 continuously monitor the patient's vital signs, airway patency, cardiovascular and neurological status, and
86 adequacy of ventilation. Both the surgical and anesthesia teams are responsible for maintaining optimal
87 patient positioning, such as keeping the head and neck aligned and supported while padding all pressure
88 points. Additional attention should be placed on moving extremities during long procedures so as to avoid
89 the possibility of complications secondary to prolonged immobility (e.g., peripheral neuropathy).
90
91 It is the exclusive responsibility of treating practitioners, when employing anesthesia providers to
92 administer deep sedation/general anesthesia, to verify and carefully review their credentials and

93 experience. Significant pediatric training, including anesthesia care of the very young, and experience in a
94 dental setting are important considerations, especially when caring for young pediatric and special needs
95 populations.
96
97 In order to provide anesthesia services in an office-based setting:

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

111
112 The dentist and anesthesia care provider must be compliant with the American Academy of
113 Pediatrics/AAPD's Guideline on Monitoring and Management of Pediatric Patients Before, During, and
114 After Sedation for Diagnostic and Therapeutic Procedures: Update 2016[4] or other appropriate guideline(s)
115 of the American Dental Association, American Society of Anesthesiologists (ASA), and other
116 organizations with recognized professional expertise and stature. The recommendations in this document
117 may be exceeded at any time if the change involves improved safety and/or is superseded by state law.
118
119 The dentist and licensed anesthesia provider must collaborate to enhance patient safety. Continuous and
120 effective perioperative communication and appropriately timed interventions are essential in mitigating
121 adverse events or outcomes. The dentist introduces the concept of deep sedation/general anesthesia to the
122 parent, justifies its necessity, and provides appropriate preoperative instructions and informational
123 materials. The dentist or his/her designee coordinates medical consultations when necessary and conveys
124 pertinent information to the anesthesia care provider. The anesthesia care provider explains potential risks

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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 in the dental setting, there must be at least two individuals present with the skills in patient rescue and pediatric advanced life support (PALS) .~~o~~One of the two must be an independent observer whose sole responsibility is to constantly ~~person whose only responsibilities are to continuously monitor~~ observe the patient's vital signs, levels of sedation, airway patency, and adequacy of ventilation. The independent observer must, at a minimum, be trained in PALS and capable of managing any emergency event.[4] ~~to either administer drugs or direct their administration.~~[4] The independent observer must be capable of recognizing the depth of sedation as well as be skilled to establish intravenous access, draw up and administer rescue medications, ~~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.~~ have management skills to rescue the non-breathing child, a child with air way obstruction, a child with hypotension, anaphylaxis, or cardiorespiratory arrest including ~~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] The independent observer must be one of the following: (1) a physician anesthesiologist, (2) a dental anesthesiologist, (3) a certified registered nurse anesthetist, (4) an oral and maxillofacial surgeon. ~~Furthermore, at least one practitioner skilled in obtaining vascular access in children must be immediately available.~~[4] The second individual who is responsible dental practitioner must be trained in and capable of providing pediatric advanced life support and skilled in assisting the independent observer with the rescue of a child with any of the adverse events described above.

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156 Personnel experienced in post anesthetic recovery care and trained in advanced resuscitative techniques
157 (e.g., PALS) must be in attendance and provide continuous respiratory and cardiovascular monitoring
158 during the recovery period.[4] The supervising anesthesia provider, not the operating dentist, shall
159 determine when the patient exhibits respiratory and cardiovascular stability and appropriate discharge
160 criteria[4] have been met. The operating dentist and his/her clinical staff must be well-versed in emergency
161 recognition, rescue, and emergency protocols including maintaining cardiopulmonary resuscitation
162 certification for healthcare providers.[6] In addition, it is highly recommended that the operating dentist be
163 trained in advanced resuscitative techniques. Contact numbers for local emergency medical and
164 ambulance services must be readily available, and a protocol for immediate access to back-up emergency
165 services must be clearly outlined.[4] Emergency preparedness must be updated and practiced on a regular
166 (e.g., semi-annual) basis [see Table 1], so as to keep all staff members up to date on established
167 protocols.[9]
168
169 **Facilities**
170 A continuum exists that extends from wakefulness across all levels of sedation. Often these levels are not
171 easily differentiated, and patients may drift among them.[10] When anesthesia care providers are utilized for
172 office-based administration of deep sedation or general anesthesia, the facilities in which the dentist
173 practices must meet the guidelines and appropriate local, state, and federal codes for administration of the
174 deepest possible level of sedation/anesthesia. Facilities must be in compliance with applicable laws,
175 codes, and regulations pertaining to controlled drug storage, fire prevention, building construction and
176 occupancy, accommodations for the disabled, occupational safety and health, and disposal of medical
177 waste and hazardous waste.[4] The treatment room must accommodate the dentist and auxiliaries, the
178 patient, the anesthesia care provider, the dental equipment, and all necessary anesthesia delivery
179 equipment along with appropriate monitors and emergency equipment. Expeditious access to the patient,
180 anesthesia machine (if present), and monitoring equipment should be available at all times.
181
182 It is beyond the scope of this document to dictate equipment necessary for the provision of deep
183 sedation/general anesthesia, but equipment must be appropriate for the technique used and consistent with
184 the guidelines for anesthesia providers, in accordance with governmental rules and regulations. Because
185 laws and codes vary from state to state, Guidelines for Monitoring and Management of Pediatric Patients
186 Before, During, and After Sedation for Diagnostic and Therapeutic Procedures: Update 2016[4] should be
187 followed as the minimum requirements.

188
189 For deep sedation/general anesthesia, there must be continuous monitoring of the patient's level of
190 consciousness and responsiveness, heart rate, blood pressure, respiratory rate, expired carbon dioxide
191 (**$CO_2$**) values, and oxygen saturation.[4] When adequacy of ventilation is difficult to observe using
192 capnography, use of an amplified, audible precordial stethoscope (e.g., Bluetooth technology) is
193 encouraged.[4] In addition, an electrocardiographic monitor and a defibrillator capable of delivering an
194 attenuated pediatric dose are required for deep sedation/general anesthesia.[4] Emergency equipment must
195 be readily accessible and should include Yankauer suction, drugs necessary for rescue and resuscitation
196 (including 100 percent oxygen capable of being delivered by positive pressure at appropriate flow rates
197 for up to one hour), and age-/size-appropriate equipment to resuscitate and rescue a non-breathing and/or
198 unconscious pediatric dental patient and provide continuous support while the patient is being transported
199 to a medical facility.[4,5] The licensed practitioners are responsible for ensuring that medications,
200 equipment, and protocols are available to treat malignant hyperthermia when triggering agents are used.[11]
201 Recovery facilities must be available and suitably equipped. Backup power sufficient to ensure patient
202 safety should be available in case of emergency power outage.[4]
203
204 **Documentation**
205 Prior to delivery of deep sedation/general anesthesia, patient safety requires that appropriate
206 documentation shall address rationale for sedation/general anesthesia, anesthesia and procedural informed
207 consent, instructions to parent, dietary precautions, preoperative health evaluation, and any prescriptions
208 along with the instructions given for their use.[4] Because laws and codes vary from state to state,
209 Guidelines on Monitoring and Management of Pediatric Patients Before, During, and After Sedation for
210 Diagnostic and Therapeutic Procedures: Update 2016[4] should be followed as minimum requirements for a
211 time-based anesthesia record.
212 • Vital signs: Pulse and respiratory rates, blood pressure, heart rhythm, oxygen saturation, and
213 expired $CO_2$ must be continuously monitored and recorded on a time-based record throughout the
214 procedure, initially every five minutes and then, as the patient awakens, at 10-15 minute intervals
215 until the patient has met documented discharge criteria.[4]
216 • Drugs: Name, dose, route, site, time of administration, and patient effects (e.g., level of
217 consciousness, patient responsiveness) of all drugs, including local anesthesia, must be
218 documented.[4] When anesthetic gases are administered, inspired concentration and duration of
219 inhalation agents and oxygen shall be documented.[4]

220 - Recovery: The condition of the patient, that discharge criteria have been met, time of discharge,
221 and into whose care the discharge occurred must be documented. Requiring the signature of the
222 responsible adult to whom the child has been discharged, verifying that he/she has received and
223 understands the post-operative instructions, is encouraged.[4]
224
225 Various business/legal arrangements may exist between the treating dentist and the anesthesia provider.
226 Regardless, because services were provided in the dental facility, the dental staff must maintain all patient
227 records, including time-based anesthesia records, so that they may be readily available for emergency or
228 other needs. The dentist must assure that the anesthesia provider also maintains patient records and that
229 they are readily available.
230
231 **Risk management and quality assurance**
232 Dentists who utilize office-based anesthesia care providers must take all necessary measures to minimize
233 risk to patients. The dentist must be familiar with the ASA physical status classification.[12] Knowledge,
234 preparation, and communication between professionals is essential. Prior to subjecting a patient to deep
235 sedation/general anesthesia, the patient must undergo a pre-operative health evaluation by an appropriate
236 and currently licensed medical or anesthesia provider.[4,6] High-risk patients should be treated in a facility
237 properly equipped to provide and staffed for their care.[4,6] The dentist and anesthesia care provider must
238 communicate during treatment to share concerns about the airway or other details of patient safety.
239 Furthermore, they must work together to develop and document mechanisms of quality assurance.
240
241 Untoward and unexpected outcomes must be documented and reviewed to monitor the quality of services
242 provided. This will decrease risk, allow for open and frank discussions, document risk analysis and
243 intervention, and improve the quality of care for the pediatric dental patient.[4,5]
244
245 ## References
246 1. American Academy of Pediatric Dentistry. Behavior guidance for the pediatric dental patient.
247 Pediatr Dent 2017;39(6):246-59.
248 2. Glassman P, Caputo A, Dougherty N, et al. Special Care Dentistry Association consensus
249 statement on sedation, anesthesia, and alternative techniques for people with special needs. Spec
250 Care Dentist 2009;29(1):2-8; quiz 67-8.
251 3. American Academy of Pediatric Dentistry. Policy on third- party reimbursement of medical fees

252 related to sedation/ general anesthesia for delivery of oral health care services. Pediatr Dent
253 2017;39(6):115-7.
254 4. Coté CJ, Wilson S. Guidelines for monitoring and management of pediatric patients before, during,
255 and after sedation for diagnosis and therapeutic procedures: Update 2016. American Academy of
256 Pediatric Dentistry, American Academy of Pediatrics. Pediatr Dent 2016;38 (special issue):216-45.
257 5. American Society of Anesthesiologists. Guidelines for office-based anesthesia. 2009. Reaffirmed
258 2014. Available at: "http://www.asahq.org/~/media/Sites/ASAHQ/Files/
259 Public/Resources/standards-guidelines/guidelines-for-office-based-anesthesia.pdf". Accessed
260 March 22, 2017. (Archived by WebCite® at "http://www.webcitation.org/6p9jMa4Aj")
261 6. American Dental Association. Guidelines for the use of sedation and general anesthesia by dentists.
262 2016. Available at:
263 "http://www.ada.org/en/~/media/ADA/Advocacy/Files/anesthesia_use_guidelines". Accessed
264 March 22, 2017. (Archived by WebCite® at "http://www.webcitation.org/6p9ddeDFJ")
265 7. Nick D, Thompson L, Anderson D, Trapp L. The use of general anesthesia to facilitate dental
266 treatment. Gen Dent 2003;51:464-8.
267 8. Wilson S. Pharmacologic behavior management for pediatric dental treatment. Pediatr Clinic North
268 Am 2000; 47(5):1159-73.
269 9. World Health Organization. Hospital and health facility emergency exercises. Guidance materials.
270 WHO Press, 2010. Available at:
271 "http://www.wpro.who.int/publications/PUB_9789290614791/en/". Accessed September 19, 2017.
272 (Archived by WebCite® at: "http://www.webcitation.org/6tb70x1pr")
273 10. Cravero JP, Beach ML, Blike GT, Gallagher SM, Hertzog JH, Pediatric Sedation Research
274 Consortium. The incidence and nature of adverse events during pediatric sedation/ anesthesia with
275 propofol for procedures outside the operating room; A report from the Pediatric Sedation Re-
276 search Consortium. Anesth Analg 2009;108(3):795-804.
277 11. Rosenberg, H. Succinylcholine dantrolene controversy: President's report. Malignant
278 Hyperthermia Association of the United States. Available at: "http://www.mhaus.
279 org/blog/post/a8177/succinylcholine-dantrolene-controversy". Accessed March 22, 2017.
280 (Archived by WebCite® at: "http://www.webcitation.org/6p9jqQ0WO").
281 12. American Society of Anesthesiologists. ASA physical status classification system. Available at:
282 "https://www. asahq.org/resources/clinical-information/asa-physical-status-classification-system".
283 Accessed March 22, 2017. (Archived by WebCite® at: "http://www.webcitation.org/6p9jx3iGg")

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286 **TABLE 1**

| **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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289 exercise basics, Page 4, Copyright © World Health Organization 2010.
290 Available at: “http://www.wpro.who.int/publications/PUB_9789290614791/en/”. Accessed September
291 19, 2017.