

ADA American Dental Association®

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Council on Dental Education and Licensure

Proposed Revisions:

*ADA Guidelines for the Use of Sedation and General Anesthesia by Dentists
and
ADA Guidelines for Teaching Pain Control and Sedation to Dentists and Dental Students*

The ADA Council on Dental Education and Licensure is considering proposed revisions to the appended *ADA Guidelines for the Use of Sedation and General Anesthesia by Dentists* and the *Guidelines for Teaching Pain Control and Sedation to Dentists and Dental Students* and seeks comment from the communities of interest. The proposed amendment to both documents addresses the use of capnography during moderate sedation in an open airway system as well as the need for continual observation of qualitative clinical signs by monitoring for the presence of exhaled carbon dioxide (unless precluded or invalidated by the nature of the patient, procedure or equipment).

The Council will consider comments received by July 31, 2014 and determine whether to pursue revisions.

The deadline for comments is July 31, 2014.

Comments should reference the line number(s) and be specific.
Comments should be addressed to:

Dr. Teresa Dolan, Chair
Council on Dental Education and Licensure
American Dental Association
211 East Chicago Avenue
Chicago, IL 60611

Comments may be sent via ground delivery or e-mailed to JasekJ@ada.org.

Guidelines for the Use of Sedation and General Anesthesia by Dentists

As adopted by the October 2012 ADA House of Delegates

Proposed Revisions See page 8

~~Strikethrough~~ indicates proposed deletions; Underscore indicates proposed additions

I. Introduction

The administration of local anesthesia, sedation and general anesthesia is an integral part of dental practice. The American Dental Association is committed to the safe and effective use of these modalities by appropriately educated and trained dentists. The purpose of these guidelines is to assist dentists in the delivery of safe and effective sedation and anesthesia.

Dentists providing sedation and anesthesia in compliance with their state rules and/or regulations prior to adoption of this document are not subject to *Section III. Educational Requirements*.

II. Definitions

Methods of Anxiety and Pain Control

analgesia - the diminution or elimination of pain.

conscious sedation¹ - a minimally depressed level of consciousness that retains the patient's ability to independently and continuously maintain an airway and respond appropriately to physical stimulation or verbal command and that is produced by a pharmacological or non-pharmacological method or a combination thereof.

In accord with this particular definition, the drugs and/or techniques used should carry a margin of safety wide enough to render unintended loss of consciousness unlikely. Further, patients whose only response is reflex withdrawal from repeated painful stimuli would not be considered to be in a state of conscious sedation.

combination inhalation–enteral conscious sedation (combined conscious sedation) - conscious sedation using inhalation and enteral agents.

When the intent is anxiolysis only, and the appropriate dosage of agents is administered, then the definition of enteral and/or combination inhalation-enteral conscious sedation (combined conscious sedation) does not apply.

local anesthesia - the elimination of sensation, especially pain, in one part of the body by the topical application or regional injection of a drug.

Note: Although the use of local anesthetics is the foundation of pain control in dentistry and has a long record of safety, dentists must be aware of the maximum, safe dosage limits for each patient. Large doses of local anesthetics in themselves may result in central nervous system depression, especially in combination with sedative agents.

minimal sedation - a minimally depressed level of consciousness, produced by a pharmacological method, that retains the patient's ability to independently and continuously maintain an airway and respond *normally* to tactile stimulation and verbal command. Although cognitive function and coordination may be modestly impaired, ventilatory and cardiovascular functions are unaffected.²

¹ Parenteral conscious sedation may be achieved with the administration of a single agent or by the administration of more than one agent.

² Portions excerpted from *Continuum of Depth of Sedation: Definition of General Anesthesia and Levels of Sedation/Analgesia, 2004*, of the American Society of Anesthesiologists (ASA). A copy of the full text can be obtained from ASA, 520 N. Northwest Highway, Park Ridge, IL 60068-2573.

48
49 *Note:* In accord with this particular definition, the drug(s) and/or techniques used should carry a margin of
50 safety wide enough never to render unintended loss of consciousness. Further, patients whose only response
51 is reflex withdrawal from repeated painful stimuli would not be considered to be in a state of minimal sedation.
52

53 **When the intent is minimal sedation for adults, the appropriate initial dosing of a single enteral drug is**
54 **no more than the maximum recommended dose (MRD) of a drug that can be prescribed for**
55 **unmonitored home use.**

56

57 **The use of preoperative sedatives for children (aged 12 and under) prior to arrival in the dental office,**
58 **except in extraordinary situations, must be avoided due to the risk of unobserved respiratory**
59 **obstruction during transport by untrained individuals.**

60

61 **Children (aged 12 and under) can become moderately sedated despite the intended level of minimal**
62 **sedation; should this occur, the guidelines for moderate sedation apply.**

63

64 **For children 12 years of age and under, the American Dental Association supports the use of the**
65 **American Academy of Pediatrics/American Academy of Pediatric Dentistry *Guidelines for Monitoring***
66 ***and Management of Pediatric Patients During and After Sedation for Diagnostic and Therapeutic***
67 ***Procedures.***

68

69 Nitrous oxide/oxygen may be used in combination with a single enteral drug in minimal sedation.
70

71 **Nitrous oxide/oxygen when used in combination with sedative agent(s) may produce minimal,**
72 **moderate, deep sedation or general anesthesia.**

73

74 The following definitions apply to administration of minimal sedation:
75 *maximum recommended (MRD)* - maximum FDA-recommended dose of a drug, as printed in FDA-approved
76 labeling for unmonitored home use.
77

78 *incremental dosing* - administration of multiple doses of a drug until a desired effect is reached, but not to
79 exceed the maximum recommended dose (MRD).
80

81 *supplemental dosing* - during minimal sedation, supplemental dosing is a single additional dose of the initial
82 dose of the initial drug that may be necessary for prolonged procedures. The supplemental dose should not
83 exceed one-half of the initial dose and should not be administered until the dentist has determined the clinical
84 half-life of the initial dosing has passed. The total aggregate dose must not exceed 1.5x the MRD on the day
85 of treatment.
86

87 **moderate sedation** - a drug-induced depression of consciousness during which patients respond
88 *purposefully* to verbal commands, either alone or accompanied by light tactile stimulation. No interventions
89 are required to maintain a patent airway, and spontaneous ventilation is adequate. Cardiovascular function is
90 usually maintained.³

91
92 *Note:* In accord with this particular definition, the drugs and/or techniques used should carry a margin
93 of safety wide enough to render unintended loss of consciousness unlikely. Repeated dosing of an
94 agent before the effects of previous dosing can be fully appreciated may result in a greater alteration
95 of the state of consciousness than is the intent of the dentist. Further, a patient whose only response
96 is reflex withdrawal from a painful stimulus is not considered to be in a state of moderate sedation.
97

98 The following definition applies to the administration of moderate or greater sedation:
99

100 *titration*-administration of incremental doses of a drug until a desired effect is reached. Knowledge of
101 each drug's time of onset, peak response and duration of action is essential to avoid over sedation.
102 Although the concept of titration of a drug to effect is critical for patient safety, when the intent is
103 moderate sedation one must know whether the previous dose has taken full effect before
104 administering an additional drug increment.
105

106 **deep sedation** - a drug-induced depression of consciousness during which patients cannot be easily aroused
107 but respond purposefully following repeated or painful stimulation. The ability to independently maintain
108 ventilatory function may be impaired. Patients may require assistance in maintaining a patent airway, and
109 spontaneous ventilation may be inadequate. Cardiovascular function is usually maintained.³
110

111 **general anesthesia** - a drug-induced loss of consciousness during which patients are not arousable, even by
112 painful stimulation. The ability to independently maintain ventilatory function is often impaired. Patients often
113 require assistance in maintaining a patent airway, and positive pressure ventilation may be required because
114 of depressed spontaneous ventilation or drug-induced depression of neuromuscular function. Cardiovascular
115 function may be impaired.
116

117 **Because sedation and general anesthesia are a continuum, it is not always possible to predict how an**
118 **individual patient will respond. Hence, practitioners intending to produce a given level of sedation**
119 **should be able to diagnose and manage the physiologic consequences (rescue) for patients whose**
120 **level of sedation becomes deeper than initially intended.**³
121

122 **For all levels of sedation, the practitioner must have the training, skills, drugs and equipment to**
123 **identify and manage such an occurrence until either assistance arrives (emergency medical service)**
124 **or the patient returns to the intended level of sedation without airway or cardiovascular**
125 **complications.**
126

127 **Routes of Administration**

128
129 *enteral* - any technique of administration in which the agent is absorbed through the gastrointestinal (GI)
130 tract or oral mucosa [i.e., oral, rectal, sublingual].
131

132 *parenteral* - a technique of administration in which the drug bypasses the gastrointestinal (GI) tract [i.e.,
133 intramuscular (IM), intravenous (IV), intranasal (IN), submucosal (SM), subcutaneous (SC), intraosseous
134 (IO)].
135

136 *transdermal* - a technique of administration in which the drug is administered by patch or iontophoresis
137 through skin.

³ Excerpted from *Continuum of Depth of Sedation: Definition of General Anesthesia and Levels of Sedation/Analgesia, 2004, of the American Society of Anesthesiologists (ASA). A copy of the full text can be obtained from ASA, 520 N. Northwest Highway, Park Ridge, IL 60068-2573.*

138
139 *transmucosal* - a technique of administration in which the drug is administered across mucosa such as
140 intranasal, sublingual, or rectal.
141
142 *inhalation* - a technique of administration in which a gaseous or volatile agent is introduced into the lungs
143 and whose primary effect is due to absorption through the gas/blood interface.
144

145 **Terms**

146
147 *qualified dentist* - meets the educational requirements for the appropriate level of sedation in accordance
148 with Section III of these *Guidelines*, or a dentist providing sedation and anesthesia in compliance with
149 their state rules and/or regulations prior to adoption of this document.
150
151 *must/shall* - indicates an imperative need and/or duty; an essential or indispensable item; mandatory.
152
153 *should* - indicates the recommended manner to obtain the standard; highly desirable.
154
155 *may* - indicates freedom or liberty to follow a reasonable alternative.
156
157 *continual* - repeated regularly and frequently in a steady succession.
158
159 *continuous* - prolonged without any interruption at any time.
160
161 *time-oriented anesthesia record* - documentation at appropriate time intervals of drugs, doses
162 and physiologic data obtained during patient monitoring.
163
164 *immediately available* – on site in the facility and available for immediate use.
165

166 **American Society of Anesthesiologists (ASA) Patient Physical Status Classification⁴**

167
168 **ASA I** - A normal healthy patient.
169 **ASA II** - A patient with mild systemic disease.
170 **ASA III** - A patient with severe systemic disease.
171 **ASA IV** - A patient with severe systemic disease that is a constant threat to life.
172 **ASA V** - A moribund patient who is not expected to survive without the operation.
173 **ASA VI** - A declared brain-dead patient whose organs are being removed for donor purposes.
174 **E** - Emergency operation of any variety (used to modify one of the above classifications, i.e., ASA III-E).
175

176 **III. Educational Requirements**

177 **A. Minimal Sedation**

178
179 1. To administer minimal sedation the dentist must have successfully completed:
180
181 a. training to the level of competency in minimal sedation consistent with that prescribed in the ADA
182 *Guidelines for Teaching Pain Control and Sedation to Dentists and Dental Students*, or a comprehensive
183 training program in moderate sedation that satisfies the requirements described in the Moderate Sedation
184 section of the *ADA Guidelines for Teaching Pain Control and Sedation to Dentists and Dental Students* at the
185 time training was commenced,
186
187 **or**
188 b. an advanced education program accredited by the ADA Commission on Dental Accreditation that affords
189 comprehensive and appropriate training necessary to administer and manage minimal sedation
commensurate with these guidelines;

⁴ *ASA Physical Status Classification System is reprinted with permission of the American Society of Anesthesiologists, 520 N. Northwest Highway, Park Ridge, IL 60068-2573.*

190 and
191 c. a current certification in Basic Life Support for Healthcare Providers.

192
193 2. Administration of minimal sedation by another qualified dentist or independently practicing qualified
194 anesthesia healthcare provider requires the operating dentist and his/her clinical staff to maintain current
195 certification in Basic Life Support for Healthcare Providers.

196
197 **B. Moderate Sedation**

198
199 1. To administer moderate sedation, the dentist must have successfully completed:

200
201 a. a comprehensive training program in moderate sedation that satisfies the requirements described in the
202 Moderate Sedation section of the ADA *Guidelines for Teaching Pain Control and Sedation to Dentists and*
203 *Dental Students* at the time training was commenced,

204 or

205 b. an advanced education program accredited by the ADA Commission on Dental Accreditation that affords
206 comprehensive and appropriate training necessary to administer and manage moderate sedation
207 commensurate with these guidelines;

208 and

209 c. 1) a current certification in Basic Life Support for Healthcare Providers and 2) either current certification in
210 Advanced Cardiac Life Support (ACLS) or completion of an appropriate dental sedation/anesthesia
211 emergency management course on the same recertification cycle that is required for ACLS.

212
213 2. Administration of moderate sedation by another qualified dentist or independently practicing qualified
214 anesthesia healthcare provider requires the operating dentist and his/her clinical staff to maintain current
215 certification in Basic Life Support for Healthcare Providers.

216
217 **C. Deep Sedation or General Anesthesia**

218
219 1. To administer deep sedation or general anesthesia, the dentist must have completed:

220 a. an advanced education program accredited by the ADA Commission on Dental Accreditation that affords
221 comprehensive and appropriate training necessary to administer and manage deep sedation or general
222 anesthesia, commensurate with Part IV.C of these guidelines;

223 and

224 b. 1) a current certification in Basic Life Support for Healthcare Providers and 2) either current certification in
225 Advanced Cardiac Life Support (ACLS) or completion of an appropriate dental sedation/anesthesia
226 emergency management course on the same re-certification cycle that is required for ACLS.

227
228 2. Administration of deep sedation or general anesthesia by another qualified dentist or independently
229 practicing qualified anesthesia healthcare provider requires the operating dentist and his/her clinical staff to
230 maintain current certification in Basic Life Support (BLS) Course for the Healthcare Provider.

231
232 **For all levels of sedation and anesthesia, dentists, who are currently providing sedation and**
233 **anesthesia in compliance with their state rules and/or regulations prior to adoption of this document,**
234 **are not subject to these educational requirements. However, all dentists providing sedation and**
235 **general anesthesia in their offices or the offices of other dentists should comply with the Clinical**
236 **Guidelines in this document.**

237
238 **IV. Clinical Guidelines**

239 **A. Minimal sedation**

240
241 1. Patient Evaluation

242
243 Patients considered for minimal sedation must be suitably evaluated prior to the start of any sedative
244 procedure. In healthy or medically stable individuals (ASA I, II) this may consist of a review of their

245 current medical history and medication use. However, patients with significant medical
246 considerations (ASA III, IV) may require consultation with their primary care physician or consulting
247 medical specialist.

248 2. Pre-Operative Preparation

- 251 • The patient, parent, guardian or care giver must be advised regarding the procedure associated
252 with the delivery of any sedative agents and informed consent for the proposed sedation must be
253 obtained.
- 254 • Determination of adequate oxygen supply and equipment necessary to deliver oxygen under
255 positive pressure must be completed.
- 256 • Baseline vital signs must be obtained unless the patient's behavior prohibits such determination.
- 257 • A focused physical evaluation must be performed as deemed appropriate.
- 258 • Preoperative dietary restrictions must be considered based on the sedative technique prescribed.
- 259 • Pre-operative verbal and written instructions must be given to the patient, parent, escort, guardian
260 or care giver.

261 3. Personnel and Equipment Requirements

262 Personnel:

- 263 • At least one additional person trained in Basic Life Support for Healthcare Providers must be
264 present in addition to the dentist.

265 Equipment:

- 266 • A positive-pressure oxygen delivery system suitable for the patient being treated must be
267 immediately available.
- 268 • When inhalation equipment is used, it must have a fail-safe system that is appropriately checked
269 and calibrated. The equipment must also have either (1) a functioning device that prohibits the
270 delivery of less than 30% oxygen or (2) an appropriately calibrated and functioning in-line oxygen
271 analyzer with audible alarm.
- 272 • An appropriate scavenging system must be available if gases other than oxygen or air are used.

273 4. Monitoring and Documentation

274 Monitoring: A dentist, or at the dentist's direction, an appropriately trained individual, must remain in
275 the operatory during active dental treatment to monitor the patient continuously until the patient meets
276 the criteria for discharge to the recovery area. The appropriately trained individual must be familiar
277 with monitoring techniques and equipment. Monitoring must include

278 Oxygenation:

- 279 • Color of mucosa, skin or blood must be evaluated continually.
- 280 • Oxygen saturation by pulse oximetry may be clinically useful and should be considered.

281 Ventilation:

- 282 • The dentist and/or appropriately trained individual must observe chest excursions continually.
- 283 • The dentist and/or appropriately trained individual must verify respirations continually.

284 Circulation:

- 285 • Blood pressure and heart rate should be evaluated pre-operatively, post-operatively and
286 intraoperatively as necessary (unless the patient is unable to tolerate such monitoring).

298 Documentation: An appropriate sedative record must be maintained, including the names of all drugs
299 administered, including local anesthetics, dosages, and monitored physiological parameters.

300
301 5. Recovery and Discharge
302

- 303 • Oxygen and suction equipment must be immediately available if a separate recovery area is
304 utilized.
- 305 • The qualified dentist or appropriately trained clinical staff must monitor the patient during recovery
306 until the patient is ready for discharge by the dentist.
- 307 • The qualified dentist must determine and document that level of consciousness, oxygenation,
308 ventilation and circulation are satisfactory prior to discharge.
- 309
- 310 • Post-operative verbal and written instructions must be given to the patient, parent, escort,
311 guardian or care giver.
- 312

313 6. Emergency Management
314

- 315 • If a patient enters a deeper level of sedation than the dentist is qualified to provide, the dentist
316 must stop the dental procedure until the patient returns to the intended level of sedation.
- 317 • The qualified dentist is responsible for the sedative management, adequacy of the facility and
318 staff, diagnosis and treatment of emergencies related to the administration of minimal sedation
319 and providing the equipment and protocols for patient rescue.
- 320

321 7. Management of Children
322

323 For children 12 years of age and under, the American Dental Association supports the use of the
324 American Academy of Pediatrics/American Academy of Pediatric Dentistry *Guidelines for*
325 *Monitoring and Management of Pediatric Patients During and After Sedation for Diagnostic and*
326 *Therapeutic Procedures.*

327
328 **B. Moderate Sedation**

329 1. Patient Evaluation
330

331 Patients considered for moderate sedation must be suitably evaluated prior to the start of any
332 sedative procedure. In healthy or medically stable individuals (ASA I, II) this should consist of at least
333 a review of their current medical history and medication use. However, patients with significant
334 medical considerations (e.g., ASA III, IV) may require consultation with their primary care physician or
335 consulting medical specialist.
336

337 2. Pre-operative Preparation
338

- 339 • The patient, parent, guardian or care giver must be advised regarding the procedure associated
340 with the delivery of any sedative agents and informed consent for the proposed sedation must be
341 obtained.
- 342 • Determination of adequate oxygen supply and equipment necessary to deliver oxygen under
343 positive pressure must be completed.
- 344 • Baseline vital signs must be obtained unless the patient's behavior prohibits such determination.
- 345 • A focused physical evaluation must be performed as deemed appropriate.
- 346 • Preoperative dietary restrictions must be considered based on the sedative technique prescribed.
- 347 • Pre-operative verbal or written instructions must be given to the patient, parent, escort, guardian
348 or care giver.
- 349

350 3. Personnel and Equipment Requirements
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Personnel:

- At least one additional person trained in Basic Life Support for Healthcare Providers must be present in addition to the dentist.

Equipment:

- A positive-pressure oxygen delivery system suitable for the patient being treated must be immediately available.
- When inhalation equipment is used, it must have a fail-safe system that is appropriately checked and calibrated. The equipment must also have either (1) a functioning device that prohibits the delivery of less than 30% oxygen or (2) an appropriately calibrated and functioning in-line oxygen analyzer with audible alarm.
- A capnograph must be used to monitor exhaled carbon dioxide unless precluded or invalidated by the nature of the patient, procedure or equipment.
- An appropriate scavenging system must be available if gases other than oxygen or air are used.
- The equipment necessary to establish intravenous access must be available.

4. Monitoring and Documentation

Monitoring: A qualified dentist administering moderate sedation must remain in the operatory room to monitor the patient continuously until the patient meets the criteria for recovery. When active treatment concludes and the patient recovers to a minimally sedated level a qualified auxiliary may be directed by the dentist to remain with the patient and continue to monitor them as explained in the guidelines until they are discharged from the facility. The dentist must not leave the facility until the patient meets the criteria for discharge and is discharged from the facility. Monitoring must include:

Consciousness:

- Level of consciousness (e.g., responsiveness to verbal command) must be continually assessed.

Oxygenation:

- Color of mucosa, skin or blood must be evaluated continually.
- Oxygen saturation must be evaluated by pulse oximetry continuously.

Ventilation:

- The dentist must observe chest excursions continually.
- The dentist must monitor ventilation. The adequacy of ventilation must be evaluated by continual observation of qualitative clinical signs and monitoring for the presence of exhaled carbon dioxide unless precluded or invalidated by the nature of the patient, procedure or equipment. This can be accomplished by auscultation of breath sounds, monitoring end-tidal CO₂ or by verbal communication with the patient.

Circulation:

- The dentist must continually evaluate blood pressure and heart rate (unless the patient is unable to tolerate and this is noted in the time-oriented anesthesia record).
- Continuous ECG monitoring of patients with significant cardiovascular disease should be considered.

Documentation:

- Appropriate time-oriented anesthetic record must be maintained, including the names of all drugs, dosages and their administration times, including local anesthetics, dosages and monitored physiological parameters. (See Additional Sources of Information for sample of a time-oriented anesthetic record).

- 406 • Pulse oximetry, heart rate, respiratory rate, blood pressure and level of consciousness must be
407 recorded continually.
408
409 5. Recovery and Discharge
410
411 • Oxygen and suction equipment must be immediately available if a separate recovery area is
412 utilized.
413 • The qualified dentist or appropriately trained clinical staff must continually monitor the patient's
414 blood pressure, heart rate, oxygenation and level of consciousness.
415 • The qualified dentist must determine and document that level of consciousness; oxygenation,
416 ventilation and circulation are satisfactory for discharge.
417 • Post-operative verbal and written instructions must be given to the patient, parent, escort,
418 guardian or care giver.
419 • If a pharmacological reversal agent is administered before discharge criteria have been met, the
420 patient must be monitored for a longer period than usual before discharge, since re-sedation may
421 occur once the effects of the reversal agent have waned.
422

423 6. Emergency Management 424

- 425 • If a patient enters a deeper level of sedation than the dentist is qualified to provide, the dentist
426 must stop the dental procedure until the patient returns to the intended level of sedation.
- 427 • The qualified dentist is responsible for the sedative management, adequacy of the facility and
428 staff, diagnosis and treatment of emergencies related to the administration of moderate sedation
429 and providing the equipment, drugs and protocol for patient rescue.

430 7. Management of Children 431

432
433 For children 12 years of age and under, the American Dental Association supports the use of the
434 American Academy of Pediatrics/American Academy of Pediatric Dentistry *Guidelines for*
435 *Monitoring and Management of Pediatric Patients During and After Sedation for Diagnostic and*
436 *Therapeutic Procedures.*
437

438 **C. Deep Sedation or General Anesthesia** 439

440 1. Patient Evaluation 441

442 Patients considered for deep sedation or general anesthesia must be suitably evaluated prior to the
443 start of any sedative procedure. In healthy or medically stable individuals (ASA I, II) this must
444 consist of at least a review of their current medical history and medication use and NPO status.
445 However, patients with significant medical considerations (e.g., ASA III, IV) may require
446 consultation with their primary care physician or consulting medical specialist.
447

448 2. Pre-operative Preparation 449

- 450 • The patient, parent, guardian or care giver must be advised regarding the procedure associated
451 with the delivery of any sedative or anesthetic agents and informed consent for the proposed
452 sedation/anesthesia must be obtained.
- 453 • Determination of adequate oxygen supply and equipment necessary to deliver oxygen under
454 positive pressure must be completed.
- 455 • Baseline vital signs must be obtained unless the patient's behavior prohibits such determination.
- 456 • A focused physical evaluation must be performed as deemed appropriate.
- 457 • Preoperative dietary restrictions must be considered based on the sedative/anesthetic technique
458 prescribed.
- 459 • Pre-operative verbal and written instructions must be given to the patient, parent, escort, guardian
460 or care giver.

- 461 • An intravenous line, which is secured throughout the procedure, must be established except as
462 provided in part IV. C.6. Pediatric and Special Needs Patients.

463
464 3. Personnel and Equipment Requirements

465
466 Personnel: A minimum of three (3) individuals must be present.

- 467
468 • A dentist qualified in accordance with part III. C. of these Guidelines to administer the deep
469 sedation or general anesthesia.
470 • Two additional individuals who have current certification of successfully completing a Basic Life
471 Support (BLS) Course for the Healthcare Provider.
472 • When the same individual administering the deep sedation or general anesthesia is performing
473 the dental procedure, one of the additional appropriately trained team members must be
474 designated for patient monitoring.

475
476 Equipment:

- 477
478 • A positive-pressure oxygen delivery system suitable for the patient being treated must be
479 immediately available.
480 • When inhalation equipment is used, it must have a fail-safe system that is appropriately checked
481 and calibrated. The equipment must also have either (1) a functioning device that prohibits the
482 delivery of less than 30% oxygen or (2) an appropriately calibrated and functioning in-line oxygen
483 analyzer with audible alarm.
484 • An appropriate scavenging system must be available if gases other than oxygen or air are used.
485 • The equipment necessary to establish intravenous access must be available.
486 • Equipment and drugs necessary to provide advanced airway management, and advanced
487 cardiac life support must be immediately available.
488 • If volatile anesthetic agents are utilized, a capnograph must be utilized and an inspired agent
489 analysis monitor should be considered.
490 • Resuscitation medications and an appropriate defibrillator must be immediately available.

491
492 4. Monitoring and Documentation

493
494 Monitoring: A qualified dentist administering deep sedation or general anesthesia must remain in the
495 operatory room to monitor the patient continuously until the patient meets the criteria for recovery.
496 The dentist must not leave the facility until the patient meets the criteria for discharge and is
497 discharged from the facility. Monitoring must include:

498 Oxygenation:

- 499 • Color of mucosa, skin or blood must be continually evaluated.
500 • Oxygenation saturation must be evaluated continuously by pulse oximetry.

501 Ventilation:

- 502 • Intubated patient: End-tidal CO₂ must be continuously monitored and evaluated.
503 • Non-intubated patient: Breath sounds via auscultation and/or end-tidal CO₂ must be continually
504 monitored and evaluated.
505 • Respiration rate must be continually monitored and evaluated.

506 Circulation:

- 507 • The dentist must continuously evaluate heart rate and rhythm via ECG throughout the procedure,
508 as well as pulse rate via pulse oximetry.
509 • The dentist must continually evaluate blood pressure.

510 Temperature:

- 511 • A device capable of measuring body temperature must be readily available during the
512 administration of deep sedation or general anesthesia.
513 • The equipment to continuously monitor body temperature should be available and must be
514 performed whenever triggering agents associated with malignant hyperthermia are administered.
515

516 Documentation:

- 517 • Appropriate time-oriented anesthetic record must be maintained, including the names of all drugs,
518 dosages and their administration times, including local anesthetics and monitored physiological
519 parameters. (See Additional Sources of Information for sample of a time-oriented anesthetic
520 record)
521 • Pulse oximetry and end-tidal CO₂ measurements (if taken), heart rate, respiratory rate and blood
522 pressure must be recorded continually.
523

524 5. Recovery and Discharge
525

- 526 • Oxygen and suction equipment must be immediately available if a separate recovery area is
527 utilized.
528 • The dentist or clinical staff must continually monitor the patient's blood pressure, heart rate,
529 oxygenation and level of consciousness.
530 • The dentist must determine and document that level of consciousness; oxygenation, ventilation
531 and circulation are satisfactory for discharge.
532 • Post-operative verbal and written instructions must be given to the patient, parent, escort,
533 guardian or care giver.
534

535 6. Pediatric Patients and Those with Special Needs
536

537 Because many dental patients undergoing deep sedation or general anesthesia are mentally and/or
538 physically challenged, it is not always possible to have a comprehensive physical examination or
539 appropriate laboratory tests prior to administering care. When these situations occur, the dentist
540 responsible for administering the deep sedation or general anesthesia should document the
541 reasons preventing the recommended preoperative management.
542

543 In selected circumstances, deep sedation or general anesthesia may be utilized without
544 establishing an indwelling intravenous line. These selected circumstances may include very brief
545 procedures or periods of time, which, for example, may occur in some pediatric patients; or the
546 establishment of intravenous access after deep sedation or general anesthesia has been induced
547 because of poor patient cooperation.
548

549 7. Emergency Management
550

551 The qualified dentist is responsible for sedative/anesthetic management, adequacy of the facility
552 and staff, diagnosis and treatment of emergencies related to the administration of deep sedation or
553 general anesthesia and providing the equipment, drugs and protocols for patient rescue.
554

555 *****

556 **V. Additional Sources of Information**
557

558 American Dental Association. Example of a time oriented anesthesia record at www.ada.org.
559

560 American Academy of Pediatric Dentistry (AAPD). *Monitoring and Management of Pediatric Patients During*
561 *and After Sedation for Diagnostic and Therapeutic Procedures: An Update*. Developed through a collaborative
562 effort between the American Academy of Pediatrics and the AAPD. Available at <http://www.aapd.org/policies>.

563 ~~American Academy of Periodontology (AAP). *Guidelines: In-Office Use of Conscious Sedation in*~~
564 ~~*Periodontics*. Available at http://www.perio.org/resources_products/posppr3-1.html~~—The AAP rescinded this
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1
2
3 **Guidelines for Teaching Pain Control and Sedation to Dentists and Dental Students**

4 *As adopted by the October 2012 ADA House of Delegates*

5 **Proposed Revisions - See pages 12 and 13**

6 ~~Strikethrough~~ indicates proposed deletions; Underscore indicates proposed additions

7
8
9 **I. Introduction**

10
11 The administration of local anesthesia, sedation and general anesthesia is an integral part of the practice of
12 dentistry. The American Dental Association is committed to the safe and effective use of these modalities by
13 appropriately educated and trained dentists.

14
15 Anxiety and pain control can be defined as the application of various physical, chemical and psychological
16 modalities to the prevention and treatment of preoperative, operative and postoperative patient anxiety and
17 pain to allow dental treatment to occur in a safe and effective manner. It involves all disciplines of dentistry
18 and, as such, is one of the most important aspects of dental education. The intent of these *Guidelines* is to
19 provide direction for the teaching of pain control and sedation to dentists and can be applied at all levels of
20 dental education from predoctoral through continuing education. They are designed to teach initial
21 competency in pain control and minimal and moderate sedation techniques.

22
23 These *Guidelines* recognize that many dentists have acquired a high degree of competency in the use of
24 anxiety and pain control techniques through a combination of instruction and experience. It is assumed that
25 this has enabled these teachers and practitioners to meet the educational criteria described in this document.

26
27 It is not the intent of the *Guidelines* to fit every program into the same rigid educational mold. This is neither
28 possible nor desirable. There must always be room for innovation and improvement. They do, however,
29 provide a reasonable measure of program acceptability, applicable to all institutions and agencies engaged in
30 predoctoral and continuing education.

31
32 The curriculum in anxiety and pain control is a continuum of educational experiences that will extend over
33 several years of the predoctoral program. It should provide the dental student with the knowledge and skills
34 necessary to provide minimal sedation to alleviate anxiety and control pain without inducing detrimental
35 physiological or psychological side effects. Dental schools whose goal is to have predoctoral students achieve
36 competency in techniques such as local anesthesia and nitrous oxide inhalation and minimal sedation must
37 meet all of the goals, prerequisites, didactic content, clinical experiences, faculty and facilities, as described in
38 these *Guidelines*.

39
40 Techniques for the control of anxiety and pain in dentistry should include both psychological and
41 pharmacological modalities. Psychological strategies should include simple relaxation techniques for the
42 anxious patient and more comprehensive behavioral techniques to control pain. Pharmacological strategies
43 should include not only local anesthetics but also sedatives, analgesics and other useful agents. Dentists
44 should learn indications and techniques for administering these drugs enterally, parenterally and by inhalation
45 as supplements to local anesthesia.

46
47 The predoctoral curriculum should provide instruction, exposure and/or experience in anxiety and pain
48 control, including minimal and moderate sedation. The predoctoral program must also provide the knowledge
49 and skill to enable students to recognize and manage any emergencies that might arise as a consequence of
50 treatment. Predoctoral dental students must complete a course in Basic Life Support for the Healthcare
51 Provider. Though Basic Life Support courses are available online, any course taken online should be followed
52 up with a hands-on component and be approved by the American Heart Association or the American Red
53 Cross.

54 Local anesthesia is the foundation of pain control in dentistry. Although the use of local anesthetics in
55 dentistry has a long record of safety, dentists must be aware of the maximum safe dosage limit for each
56 patient, since large doses of local anesthetics may increase the level of central nervous system depression
57 with sedation. The use of minimal and moderate sedation requires an understanding of local anesthesia and
58 the physiologic and pharmacologic implications of the local anesthetic agents when combined with the
59 sedative agents

60
61 The knowledge, skill and clinical experience required for the safe administration of deep sedation and/or
62 general anesthesia are beyond the scope of predoctoral and continuing education programs. Advanced
63 education programs that teach deep sedation and/or general anesthesia to competency have specific
64 teaching requirements described in the Commission on Dental Accreditation requirements for those advanced
65 programs and represent the educational and clinical requirements for teaching deep sedation and/or general
66 anesthesia in dentistry.

67
68 The objective of educating dentists to utilize pain control, sedation and general anesthesia is to enhance their
69 ability to provide oral health care. The American Dental Association urges dentists to participate regularly in
70 continuing education update courses in these modalities in order to remain current.

71
72 All areas in which local anesthesia and sedation are being used must be properly equipped
73 with suction, physiologic monitoring equipment, a positive pressure oxygen delivery system suitable for the
74 patient being treated and emergency drugs. Protocols for the management of emergencies must be
75 developed and training programs held at frequent intervals.

76 77 **II. Definitions**

78 79 **Methods of Anxiety and Pain Control**

80
81 **analgesia** - the diminution or elimination of pain.

82
83 **conscious sedation**¹ - a minimally depressed level of consciousness that retains the patient's ability to
84 independently and continuously maintain an airway and respond appropriately to physical stimulation or
85 verbal command and that is produced by a pharmacological or non-pharmacological method or a combination
86 thereof.

87
88 In accord with this particular definition, the drugs and/or techniques used should carry a margin of safety wide
89 enough to render unintended loss of consciousness unlikely. Further, patients whose only response is reflex
90 withdrawal from repeated painful stimuli would not be considered to be in a state of conscious sedation.

91
92 **combination inhalation–enteral conscious sedation** (combined conscious sedation) - conscious sedation
93 using inhalation and enteral agents.

94
95 When the intent is anxiolysis only, and the appropriate dosage of agents is administered, then the definition of
96 enteral and/or combination inhalation-enteral conscious sedation (combined conscious sedation) does not
97 apply.

98
99 **local anesthesia** - the elimination of sensation, especially pain, in one part of the body by the topical
100 application or regional injection of a drug.

101
102 *Note:* Although the use of local anesthetics is the foundation of pain control in dentistry and has a long record
103 of safety, dentists must always be aware of the maximum, safe dosage limits for each patient. Large doses of
104 local anesthetics in themselves may result in central nervous system depression especially in combination
105 with sedative agents.

¹ Parenteral conscious sedation may be achieved with the administration of a single agent or by the administration of more than one agent.

106
107 **minimal sedation** - a minimally depressed level of consciousness, produced by a
108 pharmacological method, that retains the patient's ability to independently and continuously maintain an
109 airway and respond *normally* to tactile stimulation and verbal command. Although cognitive function and
110 coordination may be modestly impaired, ventilatory and cardiovascular functions are unaffected.²
111
112 *Note:* In accord with this particular definition, the drug(s) and/or techniques used should carry a margin of
113 safety wide enough never to render unintended loss of consciousness. Further, patients whose only response
114 is reflex withdrawal from repeated painful stimuli would not be considered to be in a state of minimal sedation.
115
116 **When the intent is minimal sedation for adults, the appropriate initial dosing of a single enteral drug is**
117 **no more than the maximum recommended dose (MRD) of a drug that can be prescribed for**
118 **unmonitored home use.**

119 **The use of preoperative sedatives for children (aged 12 and under) prior to arrival in the dental office,**
120 **except in extraordinary situations, must be avoided due to the risk of unobserved respiratory**
121 **obstruction during transport by untrained individuals.**

122 **Children (aged 12 and under) can become moderately sedated despite the intended level of minimal**
123 **sedation; should this occur, the guidelines for moderate sedation apply.**

124 **For children 12 years of age and under, the American Dental Association supports the use of the**
125 **American Academy of Pediatrics/American Academy of Pediatric Dentistry *Guidelines for Monitoring***
126 ***and Management of Pediatric Patients During and After Sedation for Diagnostic and Therapeutic***
127 ***Procedures.***

128
129 Nitrous oxide/oxygen may be used in combination with a single enteral drug in minimal sedation.
130
131 **Nitrous oxide/oxygen when used in combination with sedative agent(s) may produce minimal,**
132 **moderate, deep sedation or general anesthesia.**
133
134 The following definitions apply to administration of minimal sedation:
135
136 *maximum recommended dose (MRD)* - maximum FDA-recommended dose of a drug as printed
137 in FDA-approved labeling for unmonitored home use.
138
139 *incremental dosing* - administration of multiple doses of a drug until a desired effect is reached,
140 but not to exceed the maximum recommended dose (MRD).
141
142 *supplemental dosing* - during minimal sedation, supplemental dosing is a single additional dose of
143 the initial dose of the initial drug that may be necessary for prolonged procedures. The
144 supplemental dose should not exceed one-half of the initial total dose and should not be
145 administered until the dentist has determined the clinical half-life of the initial dosing has passed.
146 The total aggregate dose must not exceed 1.5x the MRD on the day of treatment.
147

² Portions excerpted from *Continuum of Depth of Sedation: Definition of General Anesthesia and Levels of Sedation/Analgesia, 2004*, of the American Society of Anesthesiologists (ASA). A copy of the full text can be obtained from ASA, 520 N. Northwest Highway, Park Ridge, IL 60068-2573.

148 **moderate sedation** - a drug-induced depression of consciousness during which patients respond
149 *purposefully* to verbal commands, either alone or accompanied by light tactile stimulation. No interventions
150 are required to maintain a patent airway, and spontaneous ventilation is adequate. Cardiovascular function is
151 usually maintained.³

152
153 *Note:* In accord with this particular definition, the drugs and/or techniques used should carry a margin
154 of safety wide enough to render unintended loss of consciousness unlikely. Repeated dosing of an
155 agent before the effects of previous dosing can be fully appreciated may result in a greater alteration
156 of the state of consciousness than is the intent of the dentist. Further, a patient whose only response
157 is reflex withdrawal from a painful stimulus is not considered to be in a state of moderate sedation.
158

159 The following definition applies to administration of moderate and deeper levels of sedation:
160

161 *titration* - administration of incremental doses of a drug until a desired effect is reached.
162 Knowledge of each drug's time of onset, peak response and duration of action is essential to
163 avoid over sedation. Although the concept of titration of a drug to effect is critical for patient
164 safety, when the intent is moderate sedation one must know whether the previous dose has
165 taken full effect before administering an additional drug increment.
166

167 **deep sedation** - a drug-induced depression of consciousness during which patients cannot be easily aroused
168 but respond purposefully following repeated or painful stimulation. The ability to independently maintain
169 ventilatory function may be impaired. Patients may require assistance in maintaining a patent airway, and
170 spontaneous ventilation may be inadequate. Cardiovascular function is usually maintained.³

171
172 **general anesthesia** – a drug-induced loss of consciousness during which patients are not arousable, even by
173 painful stimulation. The ability to independently maintain ventilatory function is often impaired. Patients often
174 require assistance in maintaining a patent airway, and positive pressure ventilation may be required because
175 of depressed spontaneous ventilation or drug-induced depression of neuromuscular function. Cardiovascular
176 function may be impaired.³

177
178 **Because sedation and general anesthesia are a continuum, it is not always possible to predict how an**
179 **individual patient will respond. Hence, practitioners intending to produce a given level of sedation**
180 **should be able to diagnose and manage the physiologic consequences (rescue) for patients whose**
181 **level of sedation becomes deeper than initially intended.**³
182

183 **For all levels of sedation, the practitioner must have the training, skills, drugs and equipment to**
184 **identify and manage such an occurrence until either assistance arrives (emergency medical service)**
185 **or the patient returns to the intended level of sedation without airway or cardiovascular**
186 **complications.**

187 188 **Routes of Administration**

189
190 *enteral* - any technique of administration in which the agent is absorbed through the gastrointestinal (GI)
191 tract or oral mucosa [i.e., oral, rectal, sublingual].

192
193 *parenteral* - a technique of administration in which the drug bypasses the gastrointestinal (GI) tract [i.e.,
194 intramuscular (IM), intravenous (IV), intranasal (IN), submucosal (SM), subcutaneous (SC), intraosseous
195 (IO)].

196
197 *transdermal* - a technique of administration in which the drug is administered by patch or iontophoresis
198 through skin.

³ Excerpted from *Continuum of Depth of Sedation: Definition of General Anesthesia and Levels of Sedation/Analgesia, 2004, of the American Society of Anesthesiologists (ASA). A copy of the full text can be obtained from ASA, 520 N. Northwest Highway, Park Ridge, IL 60068-2573.*

199
200 *transmucosal* – a technique of administration in which the drug is administered across mucosa such as
201 intranasal, sublingual, or rectal.
202

203 *inhalation* - a technique of administration in which a gaseous or volatile agent is introduced into the lungs
204 and whose primary effect is due to absorption through the gas/blood interface.
205

206
207

208 **Terms**

209
210 *qualified dentist* – meets the educational requirements for the appropriate level of sedation in accordance
211 with Section III of these *Guidelines*, or a dentist providing sedation and anesthesia in compliance with
212 their state rules and/or regulations prior to adoption of this document.
213

214 *must/shall* - indicates an imperative need and/or duty; an essential or indispensable item; mandatory.
215

216 *should* - indicates the recommended manner to obtain the standard; highly desirable.
217

218 *may* - indicates freedom or liberty to follow a reasonable alternative.
219 continual - repeated regularly and frequently in a steady succession.
220

221 *continuous* - prolonged without any interruption at any time.
222

223 *time-oriented anesthesia record* - documentation at appropriate time intervals of drugs, doses and
224 physiologic data obtained during patient monitoring.
225

226 *immediately available* – on site in the facility and available for immediate use.
227

228 **Levels of Knowledge**

229
230 *familiarity* - a simplified knowledge for the purpose of orientation and recognition of general principles.
231

232 *in-depth* - a thorough knowledge of concepts and theories for the purpose of critical analysis and the
233 synthesis of more complete understanding (highest level of knowledge).
234

235 **Levels of Skill**

236
237 *exposed* - the level of skill attained by observation of or participation in a particular activity.
238

239 *competent* - displaying special skill or knowledge derived from training and experience.
240

241 *proficient* - the level of skill attained when a particular activity is accomplished with repeated quality and a
242 more efficient utilization of time (highest level of skill).
243

244

245 **American Society of Anesthesiologists (ASA) Patient Physical Status Classification⁴**

246

247 **ASA I** - A normal healthy patient.

248

249 **ASA II** - A patient with mild systemic disease.
250

⁴ ASA Physical Status Classification System is reprinted with permission of the American Society of Anesthesiologists, 520 N. Northwest Highway, Park Ridge, IL 60068-2573.

- 251 **ASA III** - A patient with severe systemic disease.
252
253 **ASA IV** - A patient with severe systemic disease that is a constant threat to life.
254
255 **ASA V** - A moribund patient who is not expected to survive without the operation.
256
257 **ASA VI** - A declared brain-dead patient whose organs are being removed for donor purposes.
258
259 **E** - Emergency operation of any variety (used to modify one of the above classifications, i.e., ASA III-E).
260

261 **Education Courses**

262
263 Education may be offered at different levels (competency, update, survey courses and advanced education
264 programs). A description of these different levels follows:
265

266 **1. Competency Courses** are designed to meet the needs of dentists who wish to become knowledgeable
267 and proficient in the safe and effective administration of local anesthesia, minimal and moderate sedation.
268 They consist of lectures, demonstrations and sufficient clinical participation to assure the faculty that the
269 dentist understands the procedures taught and can safely and effectively apply them so that mastery of the
270 subject is achieved. Faculty must assess and document the dentist's competency upon successful completion
271 of such training. To maintain competency, periodic update courses must be completed.
272

273 **2. Update Courses** are designed for persons with previous training. They are intended to provide a review of
274 the subject and an introduction to recent advances in the field. They should be designed didactically and
275 clinically to meet the specific needs of the participants. Participants must have completed previous
276 competency training (equivalent, at a minimum, to the competency course described in this document) and
277 have current experience to be eligible for enrollment in an update course.
278

279 **3. Survey Courses** are designed to provide general information about subjects related to pain control and
280 sedation. Such courses should be didactic and not clinical in nature, since they are not intended to develop
281 clinical competency.
282

283 **4. Advanced Education Courses** are a component of an advanced dental education program, accredited by
284 the ADA Commission on Dental Accreditation in accord with the *Accreditation Standards* for advanced dental
285 education programs. These courses are designed to prepare the graduate dentist or postdoctoral student in
286 the most comprehensive manner to be knowledgeable and proficient in the safe and effective administration
287 of minimal, moderate and deep sedation and general anesthesia.
288

289 290 **III. Teaching Pain Control**

291
292 These *Guidelines* present a basic overview of the recommendations for teaching pain control.
293

294 **A. General Objectives:** Upon completion of a predoctoral curriculum in pain control the dentist must:
295

- 296 1. have an in-depth knowledge of those aspects of anatomy, physiology, pharmacology and psychology
297 involved in the use of various anxiety and pain control methods;
- 298 2. be competent in evaluating the psychological and physical status of the patient, as well as the
299 magnitude of the operative procedure, in order to select the proper regimen;
- 300 3. be competent in monitoring vital functions;
- 301 4. be competent in prevention, recognition and management of related complications;
- 302 5. be familiar with the appropriateness of and the indications for medical consultation or referral;

303 6. be competent in the maintenance of proper records with accurate chart entries recording medical
304 history, physical examination, vital signs, drugs administered and patient response.
305

306 **B. Pain Control Curriculum Content:**
307

308 1. Philosophy of anxiety and pain control and patient management, including the nature and
309 purpose of pain

310 2. Review of physiologic and psychologic aspects of anxiety and pain

311 3. Review of airway anatomy and physiology

312 4. Physiologic monitoring

313 a. Observation

314 (1) Central nervous system

315 (2) Respiratory system

316 a. Oxygenation

317 b. Ventilation

318 (3) Cardiovascular system

319 b. Monitoring equipment

320 5. Pharmacologic aspects of anxiety and pain control

321 a. Routes of drug administration

322 b. Sedatives and anxiolytics

323 c. Local anesthetics

324 d. Analgesics and antagonists

325 e. Adverse side effects

326 f. Drug interactions

327 g. Drug abuse

328 6. Control of preoperative and operative anxiety and pain

329 a. Patient evaluation

330 (1) Psychological status

331 (2) ASA physical status

332 (3) Type and extent of operative procedure

333 b. Nonpharmacologic methods

334 (1) Psychological and behavioral methods

335 (a) Anxiety management

336 (b) Relaxation techniques

337 (c) Systematic desensitization

338 (2) Interpersonal strategies of patient management

339 (3) Hypnosis

340 (4) Electronic dental anesthesia

341 (5) Acupuncture/Acupressure

342 (6) Other

343 c. Local anesthesia

344 (1) Review of related anatomy, and physiology

345 (2) Pharmacology

346 (i) Dosing

347 (ii) Toxicity

348 (iii) Selection of agents

349 (3) Techniques of administration

350 (i) Topical

351 (ii) Infiltration (supraperiosteal)

352 (iii) Nerve block – maxilla-to include:

353 (aa) Posterior superior alveolar

354 (bb) Infraorbital

355 (cc) Nasopalatine

- 356 (dd) Greater palatine
- 357 (ee) Maxillary (2nd division)
- 358 (ff) Other blocks
- 359 (iv) Nerve block – mandible-to include:
- 360 (aa) Inferior alveolar-lingual
- 361 (bb) Mental-incisive
- 362 (cc) Buccal
- 363 (dd) Gow-Gates
- 364 (ee) Closed mouth
- 365 (v) Alternative injections-to include:
- 366 (aa) Periodontal ligament
- 367 (bb) Intraosseous
- 368 d. Prevention, recognition and management of complications and emergencies
- 369

370 **C. Sequence of Pain Control Didactic and Clinical Instruction:** Beyond the basic didactic instruction in
 371 local anesthesia, additional time should be provided for demonstrations and clinical practice of the injection
 372 techniques. The teaching of other methods of anxiety and pain control, such as the use of analgesics and
 373 enteral, inhalation and parenteral sedation, should be coordinated with a course in pharmacology. By this time
 374 the student also will have developed a better understanding of patient evaluation and the problems related to
 375 prior patient care. As part of this instruction, the student should be taught the techniques of venipuncture and
 376 physiologic monitoring. Time should be included for demonstration of minimal and moderate sedation
 377 techniques.

378 Following didactic instruction in minimal and moderate sedation, the student must receive sufficient clinical
 379 experience to demonstrate competency in those techniques in which the student is to be certified. It is
 380 understood that not all institutions may be able to provide instruction to the level of clinical competence in
 381 pharmacologic sedation modalities to all students. The amount of clinical experience required to achieve
 382 competency will vary according to student ability, teaching methods and the anxiety and pain control modality
 383 taught.

384 Clinical experience in minimal and moderate sedation techniques should be related to various disciplines of
 385 dentistry and not solely limited to surgical cases. Typically, such experience will be provided in managing
 386 healthy adult patients. The sedative care of pediatric patients and those with special needs requires advanced
 387 didactic and clinical training.

388 Throughout both didactic and clinical instruction in anxiety and pain control, psychological management of the
 389 patient should also be stressed. Instruction should emphasize that the need for sedative techniques is directly
 390 related to the patient's level of anxiety, cooperation, medical condition and the planned procedures.

391
 392 **D. Faculty:** Instruction must be provided by qualified faculty for whom anxiety and pain control are areas of
 393 major proficiency, interest and concern.

394
 395 **E. Facilities:** Competency courses must be presented where adequate facilities are available for proper
 396 patient care, including drugs and equipment for the management of emergencies.

397
 398

399 **IV. Teaching Administration of Minimal Sedation**

400
 401 The faculty responsible for curriculum in minimal sedation techniques must be familiar with the ADA Policy
 402 Statement: *Guidelines for the Use of Sedation and General Anesthesia by Dentists*, and the Commission on
 403 Dental Accreditation's *Accreditation Standards* for dental education programs.

404
 405 These *Guidelines* present a basic overview of the recommendations for teaching minimal sedation. These
 406 include courses in nitrous oxide/oxygen sedation, enteral sedation, and combined inhalation/enteral
 407 techniques.

408

409 **General Objectives:** Upon completion of a competency course in minimal sedation, the dentist must be able
410 to:

- 411 1. Describe the adult and pediatric anatomy and physiology of the respiratory, cardiovascular and
412 central nervous systems, as they relate to the above techniques.
- 413 2. Describe the pharmacological effects of drugs.
- 414 3. Describe the methods of obtaining a medical history and conduct an appropriate physical
415 examination.
- 416 4. Apply these methods clinically in order to obtain an accurate evaluation.
- 417 5. Use this information clinically for ASA classification and risk assessment.
- 418 6. Choose the most appropriate technique for the individual patient.
- 419 7. Use appropriate physiologic monitoring equipment.
- 420 8. Describe the physiologic responses that are consistent with minimal sedation.
- 421 9. Understand the sedation/general anesthesia continuum.

422 **Inhalation Sedation (Nitrous Oxide/Oxygen)**

423
424 **A. Inhalation Sedation Course Objectives:** Upon completion of a competency course in inhalation sedation
425 techniques, the dentist must be able to:

- 426 1. Describe the basic components of inhalation sedation equipment.
- 427 2. Discuss the function of each of these components.
- 428 3. List and discuss the advantages and disadvantages of inhalation sedation.
- 429 4. List and discuss the indications and contraindications of inhalation sedation.
- 430 5. List the complications associated with inhalation sedation.
- 431 6. Discuss the prevention, recognition and management of these complications.
- 432 7. Administer inhalation sedation to patients in a clinical setting in a safe and effective manner.
- 433 8. Discuss the abuse potential, occupational hazards and other untoward effects of inhalation agents.

434 435 **B. Inhalation Sedation Course Content:**

- 436 1. Historical, philosophical and psychological aspects of anxiety and pain control.
- 437 2. Patient evaluation and selection through review of medical history taking, physical diagnosis and
438 psychological considerations.
- 439 3. Definitions and descriptions of physiological and psychological aspects of anxiety and pain.
- 440 4. Description of the stages of drug-induced central nervous system depression through all levels of
441 consciousness and unconsciousness, with special emphasis on the distinction between the
442 conscious and the unconscious state.
- 443 5. Review of pediatric and adult respiratory and circulatory physiology and related anatomy.
- 444 6. Pharmacology of agents used in inhalation sedation, including drug interactions and
445 incompatibilities.
- 446 7. Indications and contraindications for use of inhalation sedation.
- 447 8. Review of dental procedures possible under inhalation sedation.
- 448 9. Patient monitoring using observation and monitoring equipment, with particular attention to vital
449 signs and reflexes related to pharmacology of nitrous oxide.
- 450 10. Importance of maintaining proper records with accurate chart entries recording medical history,
451 physical examination, vital signs, drugs and doses administered and patient response.
- 452 11. Prevention, recognition and management of complications and life-threatening situations.
- 453 12. Administration of local anesthesia in conjunction with inhalation sedation techniques.
- 454 13. Description and use of inhalation sedation equipment.
- 455 14. Introduction to potential health hazards of trace anesthetics and proposed techniques for limiting
456 occupational exposure.
- 457 15. Discussion of abuse potential.

458
459
460 **C. Inhalation Sedation Course Duration:** While length of a course is only one of the many factors to be
461 considered in determining the quality of an educational program, the course should be a minimum of *14*
462 *hours*, including a clinical component during which competency in inhalation sedation technique is achieved.

463 The inhalation sedation course most often is completed as a part of the predoctoral dental education program.
464 However, the course may be completed in a postdoctoral continuing education competency course.
465

466 **D. Participant Evaluation and Documentation of Inhalation Sedation Instruction:** Competency courses
467 in inhalation sedation techniques must afford participants with sufficient clinical experience to enable them to
468 achieve competency. This experience must be provided under the supervision of qualified faculty and must be
469 evaluated. The course director must certify the competency of participants upon satisfactory completion of
470 training. Records of the didactic instruction and clinical experience, including the number of patients treated
471 by each participant must be maintained and available.
472

473 **E. Faculty:** The course should be directed by a dentist or physician qualified by experience and training. This
474 individual should have had at least three years of experience, including the individual's formal postdoctoral
475 training in anxiety and pain control. In addition, the participation of highly qualified individuals in related fields,
476 such as anesthesiologists, pharmacologists, internists, and cardiologists and psychologists, should be
477 encouraged.
478

479 A participant-faculty ratio of not more than ten-to-one when inhalation sedation is being used allows for
480 adequate supervision during the clinical phase of instruction; a one-to-one ratio is recommended during the
481 early state of participation.
482

483 The faculty should provide a mechanism whereby the participant can evaluate the performance of those
484 individuals who present the course material.
485

486 **F. Facilities:** Competency courses must be presented where adequate facilities are available for proper
487 patient care, including drugs and equipment for the management of emergencies.

488 **Enteral and/or Combination Inhalation-Enteral Minimal Sedation**

489 **A. Enteral and/or Combination Inhalation-Enteral Minimal Sedation Course Objectives: Upon**
490 completion of a competency course in enteral and/or combination inhalation-enteral minimal sedation
491 techniques, the dentist must be able to:
492

- 493 1. Describe the basic components of inhalation sedation equipment.
- 494 2. Discuss the function of each of these components.
- 495 3. List and discuss the advantages and disadvantages of enteral and/or combination inhalation-enteral
496 minimal sedation (combined minimal sedation).
- 497 4. List and discuss the indications and contraindications for the use of enteral and/or combination
498 inhalation-enteral minimal sedation (combined minimal sedation).
- 499 5. List the complications associated with enteral and/or combination inhalation-enteral minimal sedation
500 (combined minimal sedation).
- 501 6. Discuss the prevention, recognition and management of these complications.
- 502 7. Administer enteral and/or combination inhalation-enteral minimal sedation (combined minimal
503 sedation) to patients in a clinical setting in a safe and effective manner.
- 504 8. Discuss the abuse potential, occupational hazards and other effects of enteral and inhalation agents.
- 505 9. Discuss the pharmacology of the enteral and inhalation drugs selected for administration.
- 506 10. Discuss the precautions, contraindications and adverse reactions associated with the enteral and
507 inhalation drugs selected.
- 508 11. Describe a protocol for management of emergencies in the dental office and list and discuss the
509 emergency drugs and equipment required for management of life-threatening situations.
- 510 12. Demonstrate the ability to manage life-threatening emergency situations, including current
511 certification in Basic Life Support for Healthcare Providers.
- 512 13. Discuss the pharmacological effects of combined drug therapy, their implications and their
513 management. Nitrous oxide/oxygen when used in combination with sedative agent(s) may produce
514 minimal, moderate, deep sedation or general anesthesia.
515

516 **B. Enteral and/or Combination Inhalation-Enteral Minimal Sedation Course Content:**
517

- 518 1. Historical, philosophical and psychological aspects of anxiety and pain control.
- 519 2. Patient evaluation and selection through review of medical history taking, physical diagnosis and
- 520 psychological profiling.
- 521 3. Definitions and descriptions of physiological and psychological aspects of anxiety and pain.
- 522 4. Description of the stages of drug-induced central nervous system depression through all levels of
- 523 consciousness and unconsciousness, with special emphasis on the distinction between the conscious
- 524 and the unconscious state.
- 525 5. Review of pediatric and adult respiratory and circulatory physiology and related anatomy.
- 526 6. Pharmacology of agents used in enteral and/or combination inhalation-enteral minimal sedation,
- 527 including drug interactions and incompatibilities.
- 528 7. Indications and contraindications for use of enteral and/or combination inhalation-enteral minimal
- 529 sedation (combined minimal sedation).
- 530 8. Review of dental procedures possible under enteral and/or combination inhalation-enteral minimal
- 531 sedation).
- 532 9. Patient monitoring using observation, monitoring equipment, with particular attention to vital signs and
- 533 reflexes related to consciousness.
- 534 10. Maintaining proper records with accurate chart entries recording medical history, physical
- 535 examination, informed consent, time-oriented anesthesia record, including the names of all drugs
- 536 administered including local anesthetics, doses, and monitored physiological parameters.
- 537 11. Prevention, recognition and management of complications and life-threatening situations.
- 538 12. Administration of local anesthesia in conjunction with enteral and/or combination inhalation-enteral
- 539 minimal sedation techniques.
- 540 13. Description and use of inhalation sedation equipment.
- 541 14. Introduction to potential health hazards of trace anesthetics and proposed techniques for limiting
- 542 occupational exposure.
- 543 15. Discussion of abuse potential.
- 544

545 **C. Enteral and/or Combination Inhalation-Enteral Minimal Sedation Course Duration:** Participants must
546 be able to document current certification in Basic Life Support for Healthcare Providers and have completed a
547 nitrous oxide competency course to be eligible for enrollment in this course. While length of a course is only
548 one of the many factors to be considered in determining the quality of an educational program, the course
549 should include a minimum of *16 hours*, plus clinically-oriented experiences during which competency in
550 enteral and/or combined inhalation-enteral minimal sedation techniques is demonstrated. Clinically-oriented
551 experiences may include group observations on patients undergoing enteral and/or combination inhalation-
552 enteral minimal sedation. Clinical experience in managing a compromised airway is critical to the prevention
553 of life-threatening emergencies. The faculty should schedule participants to return for additional clinical
554 experience if competency has not been achieved in the time allotted. The educational course may be
555 completed in a predoctoral dental education curriculum or a postdoctoral continuing education competency
556 course.

557
558 **These *Guidelines* are not intended for the management of enteral and/or combination inhalation-**
559 **enteral minimal sedation in children, which requires additional course content and clinical learning**
560 **experience.**

561
562 **D. Participant Evaluation and Documentation of Instruction:** Competency courses in combination
563 inhalation-enteral minimal sedation techniques must afford participants with sufficient clinical understanding to
564 enable them to achieve competency. The course director must certify the competency of participants upon
565 satisfactory completion of the course. Records of the course instruction must be maintained and available.

566
567 **E. Faculty:** The course should be directed by a dentist or physician qualified by experience and training. This
568 individual should have had at least three years of experience, including the individual's formal postdoctoral
569 training in anxiety and pain control. Dental faculty with broad clinical experience in the particular aspect of the
570 subject under consideration should participate. In addition, the participation of highly qualified individuals in
571 related fields, such as anesthesiologists, pharmacologists, internists, and cardiologists and psychologists,

572 should be encouraged. The faculty should provide a mechanism whereby the participant can evaluate the
573 performance of those individuals who present the course material.

574
575 **F. Facilities:** Competency courses must be presented where adequate facilities are available for proper
576 patient care, including drugs and equipment for the management of emergencies.
577

578 **V. Teaching Administration of Moderate Sedation**

579
580 These *Guidelines* present a basic overview of the requirements for a competency course in moderate
581 sedation. These include courses in enteral moderate sedation and parenteral moderate sedation. The
582 teaching guidelines contained in this section on moderate sedation differ slightly from documents in medicine
583 to reflect the differences in delivery methodologies and practice environment in dentistry. For this reason,
584 separate teaching guidelines have been developed for moderate enteral and moderate parenteral sedation.
585

586 **A. Course Objectives:** Upon completion of a course in moderate sedation, the dentist must be able to:

- 587 1. List and discuss the advantages and disadvantages of moderate sedation.
- 588 2. Discuss the prevention, recognition and management of complications associated with moderate
589 sedation.
- 590 3. Administer moderate sedation to patients in a clinical setting in a safe and effective manner.
- 591 4. Discuss the abuse potential, occupational hazards and other untoward effects of the agents
592 utilized to achieve moderate sedation.
- 593 5. Describe and demonstrate the technique of intravenous access, intramuscular injection and other
594 parenteral techniques.
- 595 6. Discuss the pharmacology of the drug(s) selected for administration.
- 596 7. Discuss the precautions, indications, contraindications and adverse reactions associated with the
597 drug(s) selected.
- 598 8. Administer the selected drug(s) to dental patients in a clinical setting in a safe and effective
599 manner.
- 600 9. List the complications associated with techniques of moderate sedation.
- 601 10. Describe a protocol for management of emergencies in the dental office and list and discuss the
602 emergency drugs and equipment required for the prevention and management of emergency
603 situations.
- 604 11. Demonstrate how to evaluate the adequacy of ventilation by continual observation of qualitative
605 clinical signs and by monitoring for the presence of exhaled carbon dioxide, unless precluded or
606 invalidated by the nature of the patient, procedure or equipment.
- 607 12. Discuss principles of advanced cardiac life support or an appropriate dental sedation/anesthesia
608 emergency course equivalent.
- 609 13. Demonstrate the ability to manage emergency situations.
- 610

611
612 **B. Moderate Sedation Course Content:**

- 613 1. Historical, philosophical and psychological aspects of anxiety and pain control.
- 614 2. Patient evaluation and selection through review of medical history taking, physical diagnosis and
615 psychological considerations.
- 616 3. Definitions and descriptions of physiological and psychological aspects of anxiety and pain.
- 617 4. Description of the sedation anesthesia continuum, with special emphasis on the distinction between
618 the conscious and the unconscious state.
- 619 5. Review of pediatric and adult respiratory and circulatory physiology and related anatomy.
- 620 6. Pharmacology of local anesthetics and agents used in moderate sedation, including drug interactions
621 and contraindications.
- 622 7. Indications and contraindications for use of moderate sedation.
- 623 8. Review of dental procedures possible under moderate sedation.
- 624 9. Patient monitoring using observation and monitoring equipment, with particular attention to vital signs
625 and reflexes related to consciousness.
626

- 627 10. Maintaining proper records with accurate chart entries recording medical history, physical
628 examination, informed consent, time-oriented anesthesia record, including the names of all drugs
629 administered including local anesthetics, doses, and monitored physiological parameters.
630 11. Prevention, recognition and management of complications and emergencies.
631 12. Evaluation of the adequacy of ventilation by continual monitoring of exhaled carbon dioxide using a
632 capnograph, including discussion of situations which may preclude or invalidate capnograph use,
633 e.g., by the nature of the patient, procedure or equipment.
634 13. Description and use of moderate sedation monitors and equipment.
635 14. Discussion of abuse potential.
636 15. Intravenous access: anatomy, equipment and technique.
637 16. Prevention, recognition and management of complications of venipuncture and other parenteral
638 techniques.
639 17. Description and rationale for the technique to be employed.
640 18. Prevention, recognition and management of systemic complications of moderate sedation, with
641 particular attention to airway maintenance and support of the respiratory and cardiovascular systems.
642

643 **C. Moderate Enteral Sedation Course Duration:** A minimum of *24 hours* of instruction, plus management of
644 *at least 10 adult case experiences* by the enteral and/or enteral-nitrous oxide/oxygen route are required to
645 achieve competency. These ten cases must include at least three live clinical dental experiences managed by
646 participants in groups no larger than five. The remaining cases may include simulations and/or video
647 presentations, but must include one experience in returning (rescuing) a patient from deep to moderate
648 sedation. Participants combining enteral moderate sedation with nitrous oxide-oxygen must have first
649 completed a nitrous oxide competency course.
650

651 Participants should be provided supervised opportunities for clinical experience to demonstrate competence
652 in airway management. Clinical experience will be provided in managing healthy adult patients; **this course**
653 **in moderate enteral sedation is not designed for the management of children (aged 12 and under).**
654 Additional supervised clinical experience is necessary to prepare participants to manage medically
655 compromised adults and special needs patients. This course in moderate enteral sedation does not result in
656 competency in moderate parenteral sedation. The faculty should schedule participants to return for additional
657 didactic or clinical exposure if competency has not been achieved in the time allotted.
658

659 **Moderate Parenteral Sedation Course Duration:** A minimum of *60 hours* of instruction, plus management
660 of *at least 20 patients* by the intravenous route per participant, is required to achieve competency in moderate
661 sedation techniques. Participants combining parenteral moderate sedation with nitrous oxide-oxygen must
662 have first completed a nitrous oxide competency course.
663

664 Clinical experience in managing a compromised airway is critical to the prevention of emergencies.
665 Participants should be provided supervised opportunities for clinical experience to demonstrate competence
666 in management of the airway. Typically, clinical experience will be provided in managing healthy adult
667 patients. **Additional supervised clinical experience is necessary to prepare participants to manage**
668 **children (aged 12 and under) and medically compromised adults.** Successful completion of this course
669 does result in clinical competency in moderate parenteral sedation. The faculty should schedule participants
670 to return for additional clinical experience if competency has not been achieved in the time allotted.
671

672 **D. Participant Evaluation and Documentation of Instruction: Competency courses in moderate**
673 **sedation techniques must afford participants with sufficient clinical experience to enable them to achieve**
674 **competency. This experience must be provided under the supervision of qualified faculty and must be**
675 **evaluated. The course director must certify the competency of participants upon satisfactory completion of**
676 **training in each moderate sedation technique, including instruction, clinical experience and airway**
677 **management. Records of the didactic instruction and clinical experience, including the number of patients**
678 **managed by each participant in each anxiety and pain control modality must be maintained and available for**
679 **review.**
680

681 **E. Faculty:** The course should be directed by a dentist or physician qualified by experience and training. This
682 individual should have had at least three years of experience, including formal postdoctoral training in anxiety
683 and pain control. Dental faculty with broad clinical experience in the particular aspect of the subject under
684 consideration should participate. In addition, the participation of highly qualified individuals in related fields,
685 such as anesthesiologists, pharmacologists, internists, cardiologists and psychologists, should be
686 encouraged.

687
688 A participant-faculty ratio of not more than five-to-one when moderate enteral sedation is being taught allows
689 for adequate supervision during the clinical phase of instruction. A participant-faculty ratio of not more than
690 three-to-one when moderate parenteral sedation is being taught allows for adequate supervision during the
691 clinical phase of instruction; a one-to-one ratio is recommended during the early stage of participation.

692
693 The faculty should provide a mechanism whereby the participant can evaluate the performance of those
694 individuals who present the course material.

695
696 **F. Facilities:** Competency courses in moderate sedation must be presented where adequate facilities are
697 available for proper patient care, including drugs and equipment for the management of emergencies. These
698 facilities may include dental and medical schools/offices, hospitals and surgical centers.

699
700 *****

701 VI. Additional Sources of Information

702
703 American Dental Association. Example of a time oriented anesthesia record at www.ada.org.
704
705 American Academy of Pediatric Dentistry (AAPD). *Guidelines for Monitoring and Management of Pediatric*
706 *Patients During and After Sedation for Diagnostic and Therapeutic Procedures: An Update*. Developed
707 through a collaborative effort between the American Academy of Pediatrics and the AAPD. Available
708 at <http://www.aapd.org/policies>
709
710 ~~American Academy of Periodontology (AAP). *Guidelines: In-Office Use of Conscious Sedation in*~~
711 ~~*Periodontics*. Available at http://www.perio.org/resources_products/posppr3-1.html~~ The AAP rescinded this
712 ~~policy in 2008.~~
713
714 American Association of Oral and Maxillofacial Surgeons (AAOMS). *Parameters and Pathways: Clinical*
715 *Practice Guidelines for Oral and Maxillofacial Surgery (AAOMS ParPath 01) Anesthesia in Outpatient*
716 *Facilities*. Contact AAOMS at 1-847-678-6200 or visit <http://www.aaoms.org/index.php>
717
718 American Association of Oral and Maxillofacial Surgeons (AAOMS). *Office Anesthesia Evaluation Manual 7th*
719 *Edition*. Contact AAOMS at 1-847-678-6200 or visit <http://www.aaoms.org/index.php>
720
721 American Society of Anesthesiologists (ASA). *Practice Guidelines for Preoperative Fasting and the Use of*
722 *Pharmacological Agents to Reduce the Risk of Pulmonary Aspiration: Application to Healthy Patients*
723 *Undergoing Elective Procedures*. Available at [https://ecommerce.asahq.org/p-178-practice-guidelines-for-](https://ecommerce.asahq.org/p-178-practice-guidelines-for-preoperative-fasting.aspx)
724 [preoperative-fasting.aspx](https://ecommerce.asahq.org/p-178-practice-guidelines-for-preoperative-fasting.aspx)
725
726 American Society of Anesthesiologists (ASA). *Practice Guidelines for Sedation and Analgesia by Non-*
727 *Anesthesiologists*. Available at [http://www.asahq.org/Home/For-Members/Practice-Management/Practice-](http://www.asahq.org/Home/For-Members/Practice-Management/Practice-Parameters#sedation)
728 [Parameters#sedation](http://www.asahq.org/Home/For-Members/Practice-Management/Practice-Parameters#sedation)
729 The ASA has other anesthesia resources that might be of interest to dentists. For more information, go
730 to <http://www.asahq.org/publicationsAndServices/sgstoc.htm>
731
732 Commission on Dental Accreditation (CODA). *Accreditation Standards for Predoctoral and Advanced Dental*
733 *Education Programs*. Available at <http://www.ada.org/en/coda/current-accreditation-standards/>.
734

735 National Institute for Occupational Safety and Health (NIOSH). *Controlling Exposures to Nitrous Oxide During*
736 *Anesthetic Administration* (NIOSH Alert: 1994 Publication No. 94-100). Available
737 at <http://www.cdc.gov/niosh/docs/94-100/>
738
739 Dionne, Raymond A.; Yagiela, John A., et al. Balancing efficacy and safety in the use of oral sedation in
740 dental outpatients. *JADA* 2006;137(4):502-13. ADA members can access this article online
741 at <http://jada.ada.org/cgi/content/full/137/4/502>