

American Society of Dentist Anesthesiologists: Parameters of Care

The American Society of Dentist Anesthesiologists' (ASDA) Parameters of Care describe the range of appropriate anesthetic practices by dentist anesthesiologists practicing in the United States.¹ Since anesthesiology is the practice of dentistry, these Parameters of Care include standards, guidelines, and management strategies to assist dentist anesthesiologists in maximizing the safety and comfort of patients while minimizing risk and discomfort. Individuals with expertise and broad, in-depth, clinical experience in the wide variety of anesthesia practice venues used in dentistry prepared these practice parameters. Conclusions were derived based on review of the scientific literature, various standards and guidelines, as well as parameters of care of other major anesthesia provider organizations. The ASDA believes these parameters help broaden the range of practices to include the professional judgment of the practitioner. Given the dynamic nature of anesthesia practice within dentistry, these Parameters of Care will be updated as needed to reflect advancements in the art and science of anesthesia.

While these Parameters of Care are designed to assist the dentist anesthesiologist in determining the most appropriate anesthetic care options, the ultimate decision regarding treatment of an individual patient lies with the provider based on the specific clinical circumstances. Furthermore, adherence to these Parameters does not guarantee a successful clinical outcome. When circumstances require a deviation from these Parameters, the provider is advised to indicate in the clinical record the circumstances and rationale for the deviation.

THE CONTINUUM OF SEDATION AND ANESTHESIA

Sedation and anesthesia comprise a continuum of peripheral and central nervous system depression ranging from local anesthesia through various levels of sedation to general anesthesia. The ASDA Parameters of Care support the definitions of local anesthesia, minimal sedation, moderate sedation, deep sedation, and general anesthesia as defined in the American Dental Association's (ADA) *Guidelines for the Use of Sedation and General Anesthesia by Dentists*.

Because dentist anesthesiologists are trained to competency, as outlined in their comprehensive residency accreditation standards, in all levels of sedation and general anesthesia for very young children through adulthood, dentist anesthesiologists intending to produce a given level of sedation can diagnose and manage the physiologic consequences for patients whose level of sedation becomes deeper than initially intended. If appropriate, dentist anesthesiologists may convert the level of sedation to either deep sedation or general anesthesia or otherwise alter the level of sedation or general anesthesia as needed based on patient and surgical needs.

DEFINITIONS²

Analgesia: The diminution or elimination of pain.

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

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.

Moderate sedation: A drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation. No interventions are required to maintain a patent airway, and spontaneous ventilation is adequate. Cardiovascular function is usually maintained. Further, a patient whose only response is reflex withdrawal from a painful stimulus is not considered to be in a state of moderate sedation.

Deep sedation: A drug-induced depression of consciousness during which patients cannot be easily aroused but respond purposefully following repeated or painful stimulation. The ability to independently maintain ventilatory function may be impaired. Patients may require assistance in maintaining a patent airway,

¹ Any variation from this document related to dentist anesthesiologists practicing in Canada will be deferred to the published Canadian provincial standards of practice.

² The definitions are excerpts from the ADA's *Guidelines for the Use of Sedation and General Anesthesia by Dentists*.

and spontaneous ventilation may be inadequate. Cardiovascular function is usually maintained.

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

Standards: Clinical practices that are to be applied in all cases. Deviation from standards would be difficult to justify. A standard of care indicates that measurable criteria are present, and these criteria shall be used to arrive at a given level of outcome.

Guidelines: Clinical practices that should be followed in most cases, with the realization that treatment may be tailored to fit individual needs, depending on the patient, setting, and other factors. Deviations from guidelines may be justified by differences in individual circumstances.

Protocols: Descriptions of the process of care for individual patients.

Must/shall: Indicates an imperative need and/or duty; an essential or indispensable item; mandatory.

Should: Indicates the recommended manner to obtain the standard; highly desirable.

May: Indicates freedom or liberty to follow a reasonable alternative.

Dentist anesthesiologist: A dentist who has successfully completed an accredited postdoctoral anesthesiology residency training program for dentists in accord with Commission on Dental Accreditation (CODA) Standards for Dental Anesthesiology Residency Programs, qualifying them to administer all levels of the continuum of sedation and anesthesia care within the scope of their dental license.³

VENUES FOR ANESTHESIA DELIVERY

Sedation and general anesthesia can be safely delivered in a variety of venues. Hospital operating rooms, ambulatory surgery centers, and dental offices vary widely in size and complexity, but all anesthetic practices, whether fixed in one or more locations or

mobile and transferred to multiple venues, must provide adequate anesthetic equipment, monitors, and medications for the safe conduct of the anesthetic plan and for successful management of emergencies that might arise. The ASDA endorses the ADA's *Guidelines for Sedation and General Anesthesia by Dentists* as minimum standards for determining the adequacy of any office venue as an anesthetizing location, whether fixed in only one office, in several satellite offices, or in the multiple offices that mobile dentist anesthesiologists transform into a fully equipped anesthetizing facility.

The ASDA does not object if state boards determine it is necessary to evaluate the sedation and general anesthesia practitioner practice systems and competence in providing sedation and/or general anesthesia at initial licensure and periodically as required. The actual evaluation by a dental board or a recognized national accrediting organization can be at either the fixed office location of a dentist anesthesiologist's practice or, in the case of a mobile anesthesia practice, at any one location where the mobile dentist anesthesiologist provides services. It is the quality of the mobile anesthesia practitioner and practice systems that should be evaluated for patient safety, irrespective of the actual physical location. The dentist anesthesiologist must ensure that all facilities where sedation and/or general anesthesia is provided, whether at the primary location, a satellite location or at multiple locations, are held to the same standard of excellence, are comparably equipped with anesthetic emergency drugs and equipment, and that the operating dentist and/or auxiliary staff are adequately trained to assist the dentist anesthesiologist with basic life support resuscitation if needed so the dentist anesthesiologist can administer advanced resuscitation. For dentist anesthesiologists who have a mobile anesthetic practice, state inspection or national accreditation of the facility must take place only when the dentist anesthesiologist is present. So long as the mobile dentist anesthesiologist has all the necessary drugs, monitors, and anesthesia equipment in a facility at the time of patient treatment, there is no need to have these drugs present or permanently installed monitors and anesthesia equipment at that facility when the dentist anesthesiologist is not in attendance. Once a dentist anesthesiologist has undergone a successful evaluation of their anesthesia practice system within their mobile anesthesia facility in one location, there is no need to undergo subsequent evaluations of that same anesthesia practice system within the same mobile facility in other offices or facilities where the dentist anesthesiologist intends to provide services. When the dentist anesthesiologist is in the office of another practitioner to provide the anesthesia, monitor the patient, and manage emergencies, the operating dentist/surgeon and the dental/surgical assistant must be trained

³ Dentists who completed an anesthesiology residency prior to CODA accreditation of their program, but in accordance with CODA standards or the previous standards of the American Dental Association's *Guidelines for Teaching the Comprehensive Control of Pain and Anxiety in Dentistry, Part II*, in effect at the beginning of their program, are also qualified as dentist anesthesiologists if they met the eligibility requirements for examination by the American Dental Board of Anesthesiology.

and currently certified in Basic Life Support for the Health Care Provider in order to assist, as needed, the dentist anesthesiologist in providing basic life support and calling for emergency medical services. Within this context, and with comprehensive training dedicated to the delivery of anesthesia care in dental practice, the dentist anesthesiologist is thoroughly capable of independently managing all aspects of emergency care within their fixed or mobile anesthesia facility without the need for dental assistants to be trained in monitoring or pharmacology.

PERSONNEL

The dentist anesthesiologist must maintain current completion of an Advanced Cardiac Life Support (ACLS) course. In addition, the dentist anesthesiologist must ensure that the operating dentist/surgeon and dental/surgical assistant are current in Basic Life Support for the Health Care Provider.

Further, the dentist anesthesiologist must maintain current completion of a Pediatric Advanced Life Support (PALS) course when treating children less than 13 years of age.

The responsibilities of the dentist anesthesiologist include conducting an appropriate preanesthetic history and physical evaluation and continually monitoring, evaluating, and managing the patient's vital signs as well as the adequacy of ventilation/oxygenation, cardiovascular status, other homeostatic processes, and the level of sedation/general anesthesia. The dentist anesthesiologist is responsible for the administration of sedative and general anesthetic medications, capable of diagnosing and managing emergencies related to the medical and anesthetic care of the patient, and overseeing the recovery process until the patient is awake, can independently and continuously maintain their airway, and is otherwise in stable condition.

When deep sedation or general anesthesia is employed in a dental setting, a minimum of 3 individuals must be present: the operating dentist/surgeon, the dentist anesthesiologist, and a dental/surgical assistant (and/or another staff member who is involved in minor, interruptible tasks) who can aid in resuscitative efforts.^{4,5} The dentist anesthesiologist provider must

⁴ Note that dental assistants, dental sedation assistants, and so forth, even if legally allowed to perform some functions listed by a state dental board, are not autonomously licensed nor educationally qualified to provide ACLS or PALS support.

⁵ When the dentist anesthesiologist is supervising residents or others rotating on the dental anesthesiology service, graduate medical education and institutional rules shall govern appropriate supervision of residents and responsibilities of the dentist anesthesiologist.

not be simultaneously involved in the conduct of the dental procedure or surgery, unless another licensed anesthesia provider is present.

When moderate sedation is employed in a dental setting, the dentist anesthesiologist, when simultaneously involved in the conduct of the dental procedure or surgery, must have at least 1 appropriately trained support staff whose responsibility is to monitor appropriate physiologic parameters and to assist in any supportive or resuscitation measures, if required. The individual(s) may also be responsible for assisting with interruptible patient-related tasks of short duration.⁵

PROTOCOLS FOR THE DELIVERY OF ANESTHESIA FOR DENTAL PROCEDURES

Patient Evaluation and Preparation

1. Prior to undergoing sedation or anesthesia, a patient must be evaluated with an appropriate medical history that includes a review of major organ systems, medications, allergies, previous surgeries and illnesses, previous anesthetic history, level of physical activity, tobacco and recreational drug use, history of sleep apnea, and other relevant history. A focused physical examination, including determination of the height, weight, body mass index, and other vital signs, as well as assessment of the heart, lungs, and airway must be performed and documented. When indicated, appropriate laboratory, cardiovascular, and pulmonary assessments and preoperative consultations should be obtained. Pertinent results should be documented along with a physical status assessment (eg, the American Society of Anesthesiologists [ASA] Physical Status Classification).
2. The dentist anesthesiologist shall devise an anesthetic plan that is appropriate for the physical status of the patient, the pain and anxiety control needs of the patient, the nature of planned surgical procedure, the skill of the surgeon, and the treatment venue. The choice of an appropriate anesthetic delivery mode will be made in consideration of the depth and duration of anesthesia; the complexity of the procedure; the training, experience, and immediate availability of support staff throughout the entire procedure; and the anticipated degree of postanesthesia care.
3. The risks, benefits, expected outcomes, and possible anesthetic alternatives must be reviewed with the patient or the patient's legal guardian, and written informed consent must be obtained for the anesthetic plan, except in circumstances in which the patient's legal guardian is not able to be at the appointment and instructions were provided and appropriate

informed consent was obtained or if a third party is involved with providing legal informed consent.

Appropriate preoperative fasting instructions, in accord with ASA guidelines, must be applied and met prior to the start of anesthesia.

The dentist anesthesiologist is responsible for determining the adequacy of the clinical environment, support staff, and emergency preparedness prior to the start of anesthesia. This includes, but is not limited to, ensuring the immediate availability of the following:

- A. Appropriate, functioning suction device and light sources, including backup devices in the event of a power outage.
- B. Adequate oxygen supply, positive pressure oxygen delivery system, and anesthetic gas scavenging as indicated.
- C. Airway adjuncts and equipment to secure the patient's airway, along with equipment and monitors needed for airway management.
- D. Equipment and supplies necessary to establish and maintain an intravenous infusion. When intravenous access is indicated, an indwelling catheter must be used and connected to an intravenous administration set with appropriate intravenous fluid.
- E. Monitoring throughout the case and in the event of a power outage, sufficient to provide standard, continuous assessment of oxygenation, end-tidal carbon dioxide, ventilation, circulation, and cardiac rhythm for all patients as well as availability of monitoring and equipment for determining body temperature and neuromuscular function for appropriate patients and anesthetic plans.
- F. Inspired oxygen analyzer, with low oxygen concentration alarm, when a general anesthesia machine is used (unless it has the capacity to deliver only 100% oxygen). When dental nitrous oxide/oxygen delivery devices are used, flow-safe/fail-safe devices must be present and functional.
- G. Drugs and appropriate-sized equipment sufficient to carry out resuscitation and the management of common anesthetic complications and emergencies. This should include drugs, equipment, and staff needed to assist with advanced cardiac life support, including defibrillation, until the patient is transferred to an acute care facility.
- H. When triggering agents for malignant hyperthermia are to be administered, dantrolene and other appropriate drugs, supplies, and equipment must be immediately available.
- I. Patient transport to an acute care facility capable of managing anesthetic emergencies that may arise.

Monitoring and Intraoperative Management

The dentist anesthesiologist shall be responsible for establishing continuous monitoring of the patient's physiologic condition, as appropriate for the patient's needs and the level of anesthesia planned. For moderate sedation, deep sedation, and general anesthesia, this includes, but is not limited to, the following:

1. Monitoring of oxygenation and ventilation.
 - A. Continuous monitoring or oxygenation via pulse oximetry.
 - B. Continuous monitoring of end-tidal carbon dioxide is required. In situations where end-tidal carbon dioxide monitoring is precluded or invalidated by the nature of the patient, procedure, or equipment, monitoring with a precordial or pretracheal stethoscope must be used continuously.
 - C. Observation of chest excursions and other clinical signs as appropriate.
2. Monitoring of cardiovascular function.
 - A. Continuous monitoring of pulse rate.
 - B. Continuous electrocardiographic and heart rate monitoring.
 - C. Continual monitoring of arterial blood pressure.
3. Monitoring of body temperature when indicated.
 - A. When triggering agents for malignant hyperthermia are used, continuous body temperature monitoring must be provided.
4. Monitoring of neuromuscular function when indicated.
5. Monitoring of other physiologic parameters as indicated (eg, blood glucose).
6. Monitoring of inspired oxygen concentration with an oxygen analyzer when gases other than 100% oxygen are administered with an anesthesia machine. When a dental nitrous oxide-oxygen delivery system is used, fail-safe and flow-safe mechanisms must be functional.
7. Continuous monitoring of inspired and expired volatile anesthetic gas concentrations should be performed when used.

In addition, during intraoperative management of the patient, the dentist anesthesiologist's responsibilities include the following:

- A. Maintaining a time-oriented anesthetic record, including monitored physiological parameters, anesthetic interventions, and the names, doses, and times of all drugs and fluids administered, including local anesthetics. The recorded physiological parameters must include pulse oximetry, heart rate and rhythm, blood pressure, respira-

tory rate, end-tidal carbon dioxide (presence of a CO₂ wave form or actual number), and other indicated monitor values, recorded at appropriate intervals.

- B. Managing the administration of anesthetic drugs and adjusting the anesthetic treatment plan according to the changes in the patient's physiologic status.
- C. Maintaining patient homeostasis during the perioperative period.
- D. Positioning and protecting the patient to help avoid injury to the patient, himself/herself, or others during the period of anesthesia. Extremities should be secured and padded when indicated to avoid peripheral nerve injury. Appropriate eye protection should be provided for the patient during times of potential vulnerability. Oxidizers, ignition sources, and fuels should be closely monitored to prevent surgical site fires.

Recovery and Discharge

1. Suction equipment and oxygen (deliverable by both supplemental and positive-pressure delivery devices) must be immediately available in the recovery location if a separate recovery area is used. Oxygenation, pulse rate, and level of consciousness must be monitored until fitness for discharge is achieved. Blood pressure should be monitored as needed.
2. Adequate control of postoperative pain and nausea/vomiting should be achieved.
3. Postoperative verbal and written instructions must be given to the patient and parent, escort, guardian, or caregiver.
4. The dentist anesthesiologist working in the office setting may use appropriately trained support staff to recover the patient once the patient is easily arousable and can independently and continuously maintain their airway. The dentist anesthesiologist or another independent licensed general anesthesia provider must be continuously present and immediately available in the office during the postoperative period until the patient is safe for discharge.
5. The dentist anesthesiologist or another independent licensed general anesthesia provider is responsible for determining and documenting when the criteria for discharge have been met and to which responsible adult the patient is discharged.

Emergency Management

The dentist anesthesiologist is responsible for the diagnosis and treatment of emergencies related to the administration of anesthesia and ensuring the immediate

availability of all necessary emergency equipment, drugs, and supplies for patient rescue. In addition, the dentist anesthesiologist is responsible for stabilizing, if possible, the vital signs and other physiological parameters of the patient during surgical urgencies and emergencies that affect the patient's vital functions.

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