

**American Society of Dentist Anesthesiologists
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Introduction

The American Society of Dentist Anesthesiologists' (ASDA) Parameters of Care describe the range of appropriate anesthetic practices by dentist anesthesiologists for patients undergoing dental, oral, maxillofacial and adjunctive surgical procedures within the scope of dental practice. These Parameters of Care include standards, guidelines and management strategies in an effort to assist dentist anesthesiologists in maximizing the safety and comfort of their dental patients while minimizing risks and discomfort. Individuals with expertise and broad, in-depth clinical experience in the wide variety of anesthesia practice venues and models used in dentistry prepared these practice parameters. Their conclusions were derived on the basis of 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 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, in light of 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 the circumstances and rationale for the deviation in the clinical record.

The ASDA strongly supports these Parameters of Care for practicing dentist anesthesiologists, while also supporting the right of other professional dental organizations to determine their own parameters of care for the practice of sedation and general anesthesia utilizing their own educational guidelines within state licensure requirements to ensure the comfort and safety of their dental patients. At the same time, the ASDA supports the American Dental Association's (ADA's) *Guidelines for the Use of Sedation and General Anesthesia by Dentists*, and the associated *Guidelines for Teaching Pain Control and Sedation to Dentists and Dental Students*, as minimum guidelines that should be followed by all dentists providing any form of sedation or general anesthesia.

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 ADA's Guidelines for the Use of Sedation and General Anesthesia by Dentists. Because dentist anesthesiologists are trained to proficiency in all levels of sedation and general anesthesia for dentistry, dentist anesthesiologists intending to produce a given level of sedation are able to diagnose and manage the physiologic consequences (rescue) for patients whose level of sedation becomes deeper than initially intended or, if appropriate, convert the level of sedation to either deep sedation or general anesthesia or otherwise alter the sedation or general anesthesia as needed based on patient and surgical needs.

Definitions*

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, 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.

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

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 in order 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.

dentist anesthesiologist - a dentist who has successfully completed an accredited postdoctoral anesthesiology residency training program for dentists of a minimum two years duration, in accord with Commission on Dental Accreditation's 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.[†]

Deep Sedation and General Anesthesia Delivery Models

In the history of dentistry, two distinct models of deep sedation and general anesthesia delivery evolved. Horace Wells, the dentist who discovered nitrous oxide general anesthesia in 1844, assumed the roles of both dental surgeon and anesthetist in his own dental practice. This "Wells Model" of anesthesia delivery, more generally termed the *Operator-Anesthetist Model*, subsequently evolved into a broader *Anesthesia Team Model* consisting of the dentist supported by an appropriately trained individual dedicated to monitoring the patient in addition to a dental/surgical assistant and became the predominant model of anesthesia delivery in dentistry, especially in oral and maxillofacial surgery. The "Morton Model" was initiated by William T.G. Morton, the dentist who first successfully demonstrated ether general anesthesia at the Massachusetts General Hospital in 1846. He provided in his practice only anesthesia for operating dental and medical surgeons, especially during the American Civil War. This mode of anesthesia delivery became the *Independent Anesthesia Provider Model* of anesthesia delivery and helped create anesthesiology as a separate specialty of medicine. Most dentist anesthesiologists utilize the Independent Anesthesia Provider Model.

Oral and maxillofacial surgeons receive general anesthesia training in their accredited training programs and are licensed by state dental boards to provide all levels of

[†]Prior to 2012, dentists who completed an anesthesiology residency prior to CODA accreditation 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 completion of their program, are also qualified as dentist anesthesiologists if they met the eligibility requirements for examination by the American Dental Board of Anesthesiology.

sedation and general anesthesia in their offices. Oral and maxillofacial surgeons utilize the “Anesthesia Team Model” in their offices to deliver moderate sedation for varied patients and surgical procedures or deep sedation/general anesthesia for appropriate patients and surgical procedures. In this practice model, the operating surgeon is responsible for the sedation or general anesthetic by directing office team members in monitoring the patient and assisting in maintaining a patent airway.

In medicine, surgeons do not receive general anesthesia training, and therefore they provide only the surgery while a separate anesthesia-trained and independently licensed healthcare practitioner provides only the anesthetic. This Independent Anesthesia Provider Model remains the primary delivery system for general anesthesia in medicine, although the Anesthesia Team Model has become increasingly popular among non-anesthesiologist physicians for the delivery of different levels of sedation.

Dentist anesthesiologists may provide deep sedation and general anesthesia using either model for their dental patients. Although the Independent Anesthesia Provider Model for delivery of deep sedation and general anesthesia is used by a vast majority of dentist anesthesiologists, both modes of anesthesia delivery are acceptable in dentistry for any general anesthesia-trained and licensed dentist, provided that appropriately trained support staff are continuously present in the office operatory during anesthesia and until the patient regains consciousness and is stable.

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 location 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 when they are there.

The ASDA endorses state dental board evaluation of sedation and general anesthesia practitioner practice 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 of the practice for that particular day. 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. For dentist anesthesiologists who have a mobile anesthetic practice, state inspection or national accreditation of the facility must only take place when the dentist anesthesiologist is actually present at that particular facility. 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. 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 and currently certified in basic life support for the health care provider to assist the dentist anesthesiologist in providing basic life support and calling for emergency medical services.

Protocols for the Delivery of Anesthesia for Dental Procedures

Patient Evaluation and Preparation

Prior to undergoing sedation or anesthesia, a patient must¹ 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, and other relevant history. A focused physical examination, including determination of the height, weight and vital signs, as well as assessment of the heart, lungs and airway, should be performed and documented. When indicated, appropriate laboratory assessment and preoperative consultations should be obtained. Pertinent results should be documented along with a physical status assessment (e.g., The American Society of Anesthesiologists (ASA) Physical Status Classification).

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 post-anesthesia care.

The risks, benefits, expected outcomes and possible anesthetic alternatives must be reviewed with the patient or the patient's legal guardian, and informed consent must be obtained for the anesthetic plan.

Appropriate pre-operative 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:

- Appropriate, functioning suction device and light sources, including backup devices in the event of power outage.
- Adequate oxygen supply, positive pressure oxygen delivery system, and anesthetic gas scavenging as needed.

¹ Please refer to the ADA's *Guidelines for Sedation and General Anesthesia by Dentists*' definitions of "must/shall," "should," and "may."

- Airway adjuncts and equipment to secure the patient's airway, along with equipment and monitors needed for airway management.
- Equipment and supplies necessary to establish and maintain an intravenous infusion.
 - o When IV access is indicated, an indwelling catheter must be used.
- Monitoring sufficient to provide standard, continuous assessment of oxygenation, ventilation, circulation and cardiac rhythm for all patients as well as monitoring and equipment for determining body temperature, end-tidal carbon dioxide and neuromuscular function for appropriate patients and anesthetic plans, throughout the case and in the event of power outage.
- Inspired oxygen analyzer, with low oxygen concentration alarm, when a general anesthesia machine is used. When dental nitrous oxide/oxygen delivery devices are used, flow safe/fail safe devices must be present and functional.
- Drugs and equipment in appropriate sizes 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.
 - o When triggering agents for malignant hyperthermia are part of the planned anesthetic, dantrolene and other appropriate drugs, supplies and equipment must be immediately available.
- Patient transport to an acute care facility capable of managing anesthetic emergencies that may arise.

The dentist anesthesiologist should maintain current completion of an Advanced Cardiac Life Support course and, when treating children under 13 years of age, a Pediatric Advanced Life Support course. In addition, the dentist anesthesiologist should ensure that the operating dentist/surgeon and dental/surgical assistant are current in Basic Life Support for the Health Care Provider.

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. This includes, but is not limited to:

- Continuous monitoring of ventilation

- a. When an endotracheal tube or laryngeal mask is inserted and/or malignant hyperthermia triggering agents are part of the planned anesthetic, end-tidal carbon dioxide must be continuously monitored.
- b. When an endotracheal tube or laryngeal mask is not inserted for general anesthesia or when deep sedation is provided:
 - i. A precordial or pretracheal stethoscope may be used to continuously monitor ventilation as an alternative to end-tidal carbon dioxide monitoring.
 - ii. For patients undergoing prolonged procedures or with significant cardio-pulmonary compromise, continuous end-tidal carbon dioxide monitoring is strongly encouraged.
 - iii. In case an emergent insertion of an endotracheal tube or laryngeal mask is needed, a disposable end-tidal carbon dioxide detector or an end-tidal carbon dioxide monitor must be used.
- c. For moderate sedation, continuous use of a precordial or pretracheal stethoscope, continuous monitoring of end-tidal carbon dioxide or continual verbal communication with the patient as well as observation of chest excursions, as appropriate, is required.
- Continuous monitoring of oxygenation via pulse oximetry
- Monitoring of cardiovascular function
 - d. Continual monitoring of arterial blood pressure at least every 5 minutes and continuous monitoring of heart rate.
 - e. Continuous electrocardiographic monitoring is required for deep sedation or general anesthesia.
 - f. Continuous electrocardiographic monitoring is required for patients with significant cardiovascular disease, and for other patients where it may be indicated, undergoing moderate sedation.
- Monitoring of body temperature when indicated
 - o When triggering agents for malignant hyperthermia are part of the planned anesthetic, continuous body temperature monitoring must be provided.
- Monitoring of neuromuscular function when indicated

A time-oriented anesthetic record must be maintained, including monitored physiological parameters, anesthetic interventions, and the names, doses and times of all drugs administered, including local anesthetics. The recorded physiological parameters will include pulse oximetry, heart rate and rhythm, blood pressure, respiratory rate, and other indicated monitor values, recorded at appropriate intervals.

The dentist anesthesiologist is responsible for managing the administration of anesthetic drugs and adjusting the anesthetic treatment plan according to the changes in the patient's physiologic status.

The dentist anesthesiologist is responsible for maintaining patient homeostasis during the perioperative period.

The dentist anesthesiologist is responsible for positioning and protecting the patient to help avoid injury to 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 to the eyes.

Recovery and Discharge

Suction equipment and oxygen must be immediately available in the recovery location.

Blood pressure, level of oxygenation, pulse rate and level of conscious must be monitored until fitness for discharge is achieved.

Adequate postoperative pain control and control of postoperative nausea and vomiting should be achieved.

Postoperative verbal and written instructions must be given to the patient, parent, escort, guardian or caregiver.

The dentist anesthesiologist 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 impact the patient's vital functions.

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