

CANADIAN ACADEMY OF DENTAL ANAESTHESIA PARAMETERS OF CARE

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Introduction

The Canadian Academy of Dental Anaesthesia (CADA) assembled an Ad Hoc Committee of volunteer dental anaesthesiologists from across Canada to review all published Canadian standards and guidelines pertaining to sedation and anaesthesia practices.(1–19) This landmark document titled the CADA’s Parameters of Care presents eight evidence-informed, consensus expert statements that identify essential principles for the dentistry profession to adhere to when it provides sedation and anaesthesia for patient care.

History of Dental Anaesthesia

The practice of anaesthesia has its foundations in dentistry. From the earliest uses and demonstration of nitrous oxide in the mid-1800s by Dr. Horace Wells and Dr. T.G. Morton, both American dentists, pain control and sedation has been important to modern dental care.

Dental Anaesthesia is a recognized dental specialty in Japan, the United States, and in the Province of Ontario, Canada. The only training program for Dental Anaesthesia in Canada is located at the University of Toronto, Faculty of Dentistry. Founded in 1960, the mission of this program is to prepare dentists to provide the full range of sedation and anaesthesia services for dental patients, with the focus on deep sedation and general anaesthesia; the program also prepares dentists for teaching and research in anaesthesia in dentistry. Several equivalent training programs located in the United States share a similar mission.

Currently, dentists licensed to provide deep sedation and general anaesthesia in Canada provide a wide range of services to both pediatric and adult patients requiring sedation care. In this way, anaesthesia providers continue their decades-long service to the public by providing vital access to pain control and comfort for dental procedures.

Rationale

The primary aim of the POC document is to improve patient safety and to eliminate substandard anaesthesia practices. The CADA respects the variation in anaesthesia practices found in different provinces of Canada and thus, have collaborated with its members from different regions. The POC also strives to provide structured flexibility whilst remaining respectful of the clinical judgements of practitioners.

Methods

A sequential process of research; writing; internal editing by co-authors; external editing by volunteer peer dental anaesthesiologists; consultation with the Executive Board of the CADA; revision and review by the General Assembly of the CADA produced this document.

Statement 1: Qualification, licensure, and continuous training are essential.

Qualification through formal training and subsequent licensure forms a foundation for the practice of sedation/anaesthesia in dentistry. Sedation- or anaesthesia-related knowledge and skills may be further developed through cumulative didactic instruction, clinical experiences, and simulation training, but are limited by a practitioner's scope of practice and licensure class.

A prudent practitioner continuously aims to maintain proficiency relevant to their modalities of sedation/anaesthesia practice. Participation in expert peer communities through continuing education offers practitioners opportunities to refresh fundamental knowledge, add new knowledge, and keep abreast of best practices as techniques evolve. Practitioners are expected to complete continuing education as specified by the presiding provincial regulatory body and should strongly consider simulation exercises offered by reputable institutions and organizations.

All sedation/anaesthesia providers must be registered, licensed professionals in their provinces and are to be held to their provincial regulatory standards.

Statement 2: Professional judgment, expertise, and adherence to regulatory standards are paramount in case selection and risk mitigation.

Practitioners must use their professional judgment to assess and identify potentially negative outcomes preoperatively. Information gathered at consultation, including, but not limited to past and present medical history, health assessment, review of functional capacity, and airway assessment, is essential. This information will contribute to the risk assessment for each individual patient. From this assessment, appropriate decisions can be made for the depth and modality of sedation/anaesthesia. Additionally, providers must have knowledge and appreciation of the anatomic and physiologic differences between adults and children.

Providers are to be held to their provincial regulatory standards.

Statement 3: Vigilance and diligence in monitoring all phases of anaesthesia care is essential.

Adequate patient monitoring is a core element of safety during sedation/anaesthesia. Patients require continual observation and monitoring that includes both physiologic monitors (e.g. cardiac, pulse oximetry, respiratory, blood pressure) and interactive monitoring (e.g. patient appearance, airway patency, auscultation). Monitoring must be accomplished by an appropriate sedation/anaesthesia team during all stages of care and must be appropriate for the level of sedation administered.

Sedation/anaesthetic records must be appropriate for the level of sedation provided and must meet provincial regulatory standards.

Statement 4: Facilities and equipment are properly maintained.

Facilities must adhere to municipal, provincial, and regulatory specifications including, but not limited to building, fire, and accessibility codes. All facilities should be registered with the presiding provincial regulatory body.

All anaesthesia equipment should be calibrated and serviced as per the manufacturer's instructions for use. Such equipment includes but is not limited to: patient monitors including gas analysis modules, anaesthetic gas delivery machines, infusion pumps, oxygen/nitrous oxide delivery systems, emergency suction, and defibrillators. This service must be performed and documented by certified biomedical personnel at regular intervals as recommended.

Statement 5: Prudent anaesthesia practitioners commit to current best practices for patient safety in anaesthesia.

Prudent anaesthesia practitioners routinely aim to prevent patient harm and provide the utmost quality in patient care. In clinical practice, awareness of common sources of error in clinical care should be maintained. Employment of systematic safety mechanisms, such as cognitive aids (e.g. standardized checklists for normal, atypical, and emergency situations), and intentional redundancy (e.g. in training, team roles, and armamentarium) are highly recommended.

Strategies to prepare for both routine practice and anaesthesia emergencies may include:

1) customization of content and design of armamentarium, devices and settings, medication management, and emergency response resources to the clinician's local practice; 2) training of team members with a combination of self-study, seminar, demonstration and/or simulation on a specific retraining schedule; 3) planning for easy access to information and clearly defined team roles during clinical care. Anaesthesia practitioners should promote a culture of care which includes event anticipation and monitoring of practice by both routine pre-briefing and debriefing in patient care, and mandatory post-event debriefing should a near-miss or critical event occur.

Evidence of such self-monitoring practices should be readily available in the form of team meeting notes, standard protocols, and emergency algorithms.

Statement 6: Standby drug supplies and equipment for rare medical emergencies and resuscitations are always adequate and currently serviced.

Every dentist anaesthesiologist must be prepared to act as a first responder, taking into consideration patient demographics and the care environment when selecting most appropriate drugs and equipment. The provision of safe and effective sedation and anaesthetic services depends on preparedness for urgent and emergent anaesthetic events. This includes a supply of drugs and equipment that anticipates situations that fall outside of routine sedation/anaesthetic management.

In order to provide safe and adequate patient care, the provision of drugs and equipment should be consistent with what is practical and rational for prehospital environments, while meeting provincial regulatory standards. All ambulatory clinics must be prepared to manage sedation/anaesthesia complications and emergencies, factoring in remoteness and accessibility to hospital services.

To be prepared for rare situations, the anaesthesiologist should maintain a supply of medications to manage emergencies corresponding to the depth and modality of sedation/anaesthesia. The current versions of the Advanced Cardiovascular Life Support and Pediatric Advanced Life Support manuals provide good guidance for drugs and supplies to be maintained. The emergency equipment should include a variety of airway management tools as well as a defibrillator as specified by the presiding provincial regulatory body. All equipment should be safety-checked annually with a written record of service maintained by the practitioner.

Statement 7: Anaesthesia practitioners comply with jurisdictional standards for infection prevention and controls.(20)

The CADA respects evidence-based infection prevention and control standards. Anaesthesia practitioners must comply with the Infection control protocols as specified by the presiding provincial regulatory body.

Statement 8: Anaesthesia practitioners comply with jurisdictional Standards of Care.

The CADA acknowledges two models of anaesthesia care that have each demonstrated efficacy in the dental environment: in-hospital (operating room) and out-of-hospital (community-based) settings. Both models of care share the common foundation of required specialty knowledge in anatomy, physiology, and pharmacology. When choosing a model of anaesthesia care, a dentist anaesthesiologist should adhere to the practices and principles of the chosen model and conduct themselves in a manner that meets the scrutiny of their peers. Dentist anaesthesiologists have the flexibility to employ either model to best meet the needs of their individual patients as permitted by their regulatory authority. Dentist anaesthesiologists should always consider risk mitigation, case complexity, team composition and environment.

Procedural Team Anaesthesia Model

This model combines the role of the proceduralist and the anaesthesiologist. This individual executes the dental procedure but retains the role as the most responsible person in the delivery of non-intubated anaesthesia care. This model requires the addition of a trained anaesthesia assistant to provide redundancy in patient monitoring and anaesthesia care during the procedure. The anaesthesia assistant focuses exclusively on the anaesthesia with limited responsibility in the conduct of the procedure. The anaesthesia assistant must be an independently credentialed regulated health care professional, such as a registered nurse (RN) or respiratory therapist (RT), who has experience in relevant domains such as emergency medicine, critical care, or anaesthesia. This team-based model

called “Procedural Team Anaesthesia” (PTA) has a documented record of safety when performed by experts in well-defined regulatory contexts.

Sole Anaesthesiologist Monitor Model

This model separates the role of the proceduralist and the anaesthesiologist. The proceduralist focuses on the procedure exclusively with limited responsibility in the anaesthesia care. The anaesthesiologist primarily focuses on the anaesthesia and has limited involvement in the conduct of the procedure.

Discussion

The CADA Parameters of Care document, inspired by the *American Society of Dentist Anesthesiologists Parameters of Care* document,(21) focuses primarily on the guiding principles that conscientious anaesthesia providers practice in Canada. The written descriptions that support the Standards are intentionally general to allow adaptation of these common concepts to various Canadian regions where practice patterns and regulations may vary. Nonetheless, the primary objective of all anaesthesia providers in all regions across Canada is patient safety.

Safety of Anaesthesia in Dentistry

The safety of patients cannot be emphasized enough when providing anaesthesia. The practice of anaesthesia in dentistry has a demonstrated safety record for the past forty years.(22,23) From 1973 to 1995 Ontario data, the mortality rate was estimated to be 1.4 deaths per 1 million cases of deep sedation or general anaesthesia.(22) A recent study that looked at data from 1996 to 2015 determined the estimated mortality rate to be 0.8 deaths per 1 million cases of office-based deep sedation or general anaesthesia.(23) The cumulative mortality rate over 40 years of office-based anaesthesia was determined to be 1.1 deaths per 1 million cases.(23) To provide context, the mortality rate for healthy patients undergoing general elective general anaesthesia procedures in the hospital environment is 1 death in 200,000 cases.(24) The prevalence of serious morbidity was determined to be 0.25 per 1 million cases.(23) Comparing these two Ontario studies, the reduction in mortality in the past twenty years may be attributable to estimation error; increasing training (i.e., simulation); education and training improvements; technological advancements (i.e., pulse oximetry, capnography); advances in medications; and greater office anaesthesia regulatory requirements.(23)

Quality improvement in Anaesthesia Practice

The CADA continues to advocate for quality improvement of anaesthesia care in dental environments. There is an expectation that clinicians perform iterative evaluations of their anaesthesia practices to reduce the risk of mortality and morbidity and to improve overall patient safety and outcomes. For every anaesthetic procedure, the benefits of anaesthesia must be weighed against the risks. When the risks outweigh the benefits, safer modalities or options must be brought to the forefront and clinical decisions must address patients’ needs and safety.

Future directions

The *CADA Parameters of Care* is a dynamic document that will be updated as advancements in the field of anaesthesia arise. Furthering the knowledge and research of the risk of anaesthesia will better inform future documents and understandings. It is the hope that clinicians and regulators collaborate to establish a patient safety surveillance system to better understand the statistical risk of anaesthesia procedures in the dental environments. Sessional reviews on morbidity, mortality, and near-misses would offer great value to clinicians who could learn about and avoid these rare adverse events. Ultimately, a common goal of the patient, anaesthesia provider, and regulator remains to be patient safety.

Conclusion

This landmark document represents a major milestone for the dental anaesthesia profession and intends to be a working document for clinical practice. The standards for the provision of anaesthetic care in the dentistry profession are presented in this evidence-informed Parameters of Care document. It strives to provide structured flexibility and respect clinical judgments of conscientious providers of anaesthesia.

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