

GUIDELINES TO THE PRACTICE OF ANESTHESIA

Revised Edition 2007

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GUIDE D'EXERCICE DE L'ANESTHÉSIE

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Since the 2005 edition of the *Guidelines to the Practice of Anesthesia*, the Canadian Anesthesiologists' Society has stopped publishing its membership list to comply with privacy legislation. A secure, Web-based, member-to-member intranet communications system will be made available to CAS members in the near future. In the meantime, members may contact the CAS office at anesthesia@cas.ca or 416-480-0602 ext 10 and ask the administrative assistant to pass along their request that a fellow member get in touch with them.

Depuis l'édition de 2005 du *Guide d'exercice de l'anesthésie*, la Société canadienne des anesthésiologistes a cessé de publier sa liste de membres dans ce guide, afin de se conformer aux lois sur la protection des renseignements personnels. Un système sécurisé de communications en ligne entre membres (Intranet) sera bientôt disponible pour les membres de la SCA. Les membres peuvent contacter le bureau de la SCA à anesthesia@cas.ca, ou au 416-480-0602, poste 10, afin de demander à l'adjointe administrative de transmettre leur demande à un collègue membre.

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Guidelines to the Practice of Anesthesia as recommended by the Canadian Anesthesiologists' Society

Revised edition, 2007

These guidelines were prepared by the Canadian Anesthesiologists' Society (CAS), which reserves the right to determine their publication and distribution. Because they are subject to revision, they are published annually and are available in reprint format from the society's head office.

Although the CAS encourages Canadian anesthesiologists to adhere to its practice guidelines to ensure high-quality patient care, the society cannot guarantee any specific patient outcome. Each anesthesiologist should exercise his or her own professional judgement in determining the proper course of action for any patient's circumstances. The CAS assumes no responsibility or liability for any error or omission arising from the use of any information contained in its *Guidelines to the Practice of Anesthesia*.

All changes are clearly indicated.

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Preamble

Anesthesia is a dynamic specialty of medicine. Continuous progress is being made to improve standards of anesthetic care for patients undergoing surgical and obstetric procedures in Canada. To reflect this progress in the delivery of anesthetic services, this document is reviewed annually and revised periodically.

The following recommendations are aimed at providing basic guidelines to anesthetic practice. They are intended to provide a framework for a reasonable and acceptable standard of patient care and should be so interpreted, allowing for some degree of flexibility in different circumstances. Each section of these guidelines is subject to revision as warranted by the evolution of technology and practice.

Basic Principles

In this document, the term **anesthesiologist** is used to designate all licensed medical practitioners with privileges to administer **anesthetics**. An anesthetic is any procedure that is deliberately performed to render a patient temporarily insensitive to pain or the external environment, so that a diagnostic or therapeutic procedure can be performed.

The independent practice of anesthesia is a specialized field of medicine. As such, it should be practised by physicians with appropriate training in anesthesia. The only route to specialist recognition in anesthesia in Canada is through the Royal College of Physicians and Surgeons of Canada's certification process. The Canadian Anesthesiologists' Society (CAS) acknowledges the fact that remote communities often lack the population base to support a specialist anesthetic practice. In these communities, appropriately trained family physicians may be required to provide anesthesia services. All anesthesiologists are encouraged to continue their education in all aspects of the practice of anesthesia and resuscitation.

These guidelines are intended to apply to all anesthesiologists in Canada.

Organization of Hospital Anesthetic Services

The department of anesthesia should be properly organized, directed and integrated with other departments in the hospital.

The department of anesthesia should include all hospital staff members who provide anesthetic services to patients for surgical, obstetric, diagnostic and therapeutic purposes.

The department should be staffed appropriately, bearing in mind the scope and nature of the services provided, and should strive to ensure that these services are available as required by the health care facility.

The chief of the department should be a physician who has obtained certification or appropriate training in anesthesia. This individual should be appointed in the same manner as other chiefs of clinical departments and should be a member of the medical advisory body for the hospital.

Responsibilities of the Chief of Anesthesia

1. To be aware of the current *CAS Guidelines to the Practice of Anesthesia*, the requirements of the Canadian Council on Health Services Accreditation and the requirements of the provincial licensing authority as they relate to anesthesia.
2. To ensure that written policies with respect to the practice of anesthesia are established and enforced.
3. To evaluate the qualifications and abilities of the physicians providing anesthetic care and of other health professionals providing ancillary care. This includes (but is not restricted to) the recommendations of clinical privileges for physicians with anesthetic responsibilities and annual review of these privileges.
4. To monitor systematically the quality of anesthetic care provided throughout the health care facility. This should include chart reviews and internal audits or more detailed reviews when indicated.
5. To ensure that records are kept for all anesthetic procedures. These records should allow for evaluation of all anesthetic care in the hospital.
6. To carry out such other duties as the governing body of the hospital may delegate to ensure safe anesthetic care.
7. To promote institutional compliance with applicable CSA Standards (Appendix 1).

Privileges in Anesthesia

All physicians applying for privileges in anesthesia should demonstrate satisfactory completion of postgraduate training in a department of anesthesia that has a residency program approved by the Royal College of Physicians and Surgeons of Canada.

Physicians with anesthetic privileges should possess the knowledge and technical skills necessary for the practice of anesthesia.

These include the ability

1. To provide pre-anesthetic evaluation of the patient and determine appropriate anesthetic management
2. To render the patient insensible to pain for the performance of surgical operations and obstetric procedures
3. To monitor and support the vital organ systems during the peri-operative period
4. To provide immediate post-anesthetic management of the patient
5. To provide resuscitation and intensive care when indicated
6. To provide relief of acute and chronic pain.

Residents

Residents in anesthesia are registered medical practitioners who, as part of their training, participate in the provision of anesthesia services both inside and outside of the operating room. All resident activities must be supervised by the responsible attending staff anesthesiologist, as required by the Royal College of Physicians and Surgeons of Canada, and the provincial and local regulatory authorities. The degree of this supervision must take into account the condition of each patient, the nature of the anesthesia service, and the experience and capabilities of the resident (increasing professional responsibility). At the discretion of the supervising staff anesthesiologist, residents may provide a range of anesthesia care with minimal supervision. In all cases, the supervising attending anesthesiologist must remain readily available to give advice or assist the resident with urgent or routine patient care. Whether supervision is direct or indirect, close communication between the resident and the responsible supervising staff anesthesiologist is essential for safe patient care. Each anesthesia department teaching anesthesia residents should have policies regarding their activities and supervision.

Ancillary Help

The health care facility must ensure that ancillary personnel are available where appropriate as determined by the department of anesthesia. Qualified allied health professionals (herein called anesthesia assistants) may, with the approval of the governing body of the hospital, render certain ancillary assistance in providing anesthetic, resuscitative and intensive care services. These individuals must be properly trained and must have received accreditation by the appropriate authority where applicable. The tasks that they may perform must be clearly defined. An anesthesiologist must only delegate, or assign, to such personnel tasks for which they have approval or accreditation.

The Canadian Anesthesiologists' Society recognizes the formal job designation "Anesthesia Assistant". Anesthesia assistants must have undergone specific training in anesthesia assistance. The scope of practice for anesthesia assistants working in a specific institution must also be approved by the department of anesthesia, the local hospital administration and/or the Medical Advisory Committee (Council of Physicians). Furthermore, anesthesia assistants, like other hospital employed health professionals, must be covered by the hospital liability insurance. Duties and tasks delegated to anesthesia assistants must be consistent with existing governmental regulations, the policies and guidelines established by professional regulatory agencies, and the local hospital policies.

Anesthetic Equipment and Anesthetising Location

An anesthetic must be given in an appropriate facility. All necessary equipment, drugs and other supplies must be readily available. Emergency equipment for resuscitation and life support must also be available.

The health care facility is responsible for the design and maintenance of the anesthetising location and for the purchase, maintenance and inspection of anesthetic and ancillary equipment. The Canadian Standards Association (CSA) has published standards pertaining to anesthetic facilities and to the selection, installation and maintenance of most anesthetic and ancillary equipment (Appendix 1). When purchasing new equipment or designing new installations, these standards, as well as specific recommendations arising from provincial legislation, shall be obtained and followed. The advice of the department of anesthesia should also be sought.

The health care facility must ensure that

1. The operating room conforms to the electrical code and meets the standards for safety in anesthetising locations and excess anesthetic gas scavenging systems.
2. There is compliance with all regulations to minimize hazards from fire, explosion and electrocution and all electrical equipment in the operating room conforms to the standards described in the CSA's current publications.
3. Medical gas pipeline systems, including low-pressure connecting assemblies, pressure regulators and terminal units, meet standards for identification, construction and installation. The piping systems must be certified by a CSA-approved testing agency. Oxygen concentrators may be an acceptable substitute for bulk oxygen, provided that installation and maintenance conform to all applicable CSA standards (Appendix 1). When such concentrators are installed, users must be aware that

- The fraction of inspired oxygen (FiO₂) delivered by the hospital medical oxygen supply may vary between 0.93 and 0.99
 - Oxygen analyzers must be calibrated against O₂ United States Pharmacopeia (USP) (FiO₂ 0.99) and room air or equivalent (FiO₂ 0.21)
 - Use of low-flow (less than 1 L total fresh gas flow) anesthetic techniques may result in the accumulation of inert gas (argon) and the dilution of nitrous oxide and oxygen in the circuit.
4. There is compliance with all safety regulations with respect to the preparation, storage, identification and use of medical gases, anesthetic drugs and related materials.
 5. The anesthetic machine conforms to CSA standards. The machine must be equipped with an oxygen analyzer, vaporizers fitted with keyed filling devices, a ventilator with a low-pressure alarm, a dedicated exhaust gas scavenging system and a high-vacuum tracheal suction system.
 6. The equipment, supplies and assistance necessary for the safe performance of invasive procedures are available. Diagnostic equipment such as nerve stimulators, ultrasound, fluoroscopy, and X-ray should be available to the anesthesiologist as required.
 7. A resuscitator, a defibrillator with synchronized electrocardiograph and drugs and equipment to manage emergencies (including malignant hyperthermia, difficult airways and failed endotracheal intubation) are immediately available. Facilities that care for children should have specialized pediatric equipment. Wherever obstetric anesthesia is performed, a separate area for newborn assessment and resuscitation, including designated oxygen, suction apparatus, electrical outlets and source of radiant heat, and equipment for neonatal airway management and resuscitation, shall be provided.
 8. Anesthesia providers ensure that potentially infectious materials or agents are not transferred from one patient to another. Special attention in this regard should be given to syringes, infusion pump administration sets and multidose drug vials.

The health care facility must also ensure that all anesthetic and ancillary equipment undergoes regular inspection and maintenance by qualified personnel. Records indicating conformity to regulations and inspection and maintenance must be retained by the hospital administration and the department of anesthesia.

Before the introduction of new anesthesia equipment, members of an anesthetic department should receive training sessions on this equipment under the guidance of the chief of the department. These training sessions should be repeated as necessary for new or established department members.

Recommendations for reducing occupational exposure to waste anesthetic gases:

1. Dilution ventilation at the rate of 20 changes/hour should be provided in all operating rooms.
2. Recirculation of exhaust air shall not be permitted during the hours when operations may be in progress and is not recommended at any other time.
3. Wherever an anesthetic delivery system is used, a scavenger shall be provided to capture anesthetic gases that might be released from the anesthetic circuit or ventilator.
4. A maintenance program shall be established in each health care facility to detect and repair leakage from the anesthetic delivery system and to maintain the effectiveness of the scavenging unit.
5. The health care facility shall be responsible for conducting regular monitoring of exposure to waste anesthetic gases. The monitoring protocol should include individuals and the air flow patterns of the rooms being assessed. When N₂O is used in the operating room, N₂O monitoring is a suitable representation for the assessment of adequacy of scavenging.

The Pre-anesthetic Period

Policies regarding pre-anesthetic assessment should be established by the department of anesthesia.

The primary goal of pre-anesthetic assessment is to obtain the information required to plan anesthetic management. Accordingly, all aspects of the patient's medical and surgical history, findings on physical examination and laboratory investigations that are relevant to anesthetic management should be documented by a physician who is knowledgeable about anesthetic management for the proposed diagnostic or therapeutic procedure. The history should include past and current medical problems, current and recent drug therapy, unusual reactions or responses to drugs and any problems or complications associated with previous anesthetics. A family history of adverse reactions associated with anesthesia should also be obtained. Information about the anesthetic that the patient considers relevant should also be documented. An American Society of Anesthesiologists' physical status classification (Appendix 2) should be recorded for each patient.

The surgeon may request consultation with an anesthesiologist. Medical consultations should be obtained when indicated.

Preoperative anesthetic assessment or consultation may take place in an outpatient clinic before admission for the operative procedure. Indications for preadmission assessment include the presence of significant medical problems (comorbidities), the nature of the proposed diagnostic or therapeutic procedure and patient request. All patients should

be informed that, if they wish to discuss anesthetic management with an anesthesiologist before admission to hospital, this will be arranged. The preoperative assessment clinic should also allow for assessment of the patient by nursing and other health care personnel. The attending anesthesiologist is responsible for performing a final pre-anesthetic assessment in the immediate preoperative period.

Laboratory investigations should be ordered only when indicated by the patient’s medical status, drug therapy or the nature of the proposed procedure. Investigations should not be ordered on a routine basis.

Suggested indications for specific tests

Test	Indications
Complete blood count	<ul style="list-style-type: none"> Major surgery requiring group and screen or group and match Chronic cardiovascular, pulmonary, renal or hepatic disease Malignancy Known or suspected anemia, bleeding diathesis or myelo-suppression Patient less than 1 year of age
Sickle cell screen	<ul style="list-style-type: none"> Genetically predisposed patient (hemoglobin electrophoresis if screen is positive)
International normalized ratio (INR), activated partial thromboplastin time	<ul style="list-style-type: none"> Anticoagulant therapy Bleeding diathesis Liver disease
Electrolytes and creatinine levels	<ul style="list-style-type: none"> Hypertension Renal disease Diabetes Pituitary or adrenal disease Digoxin or diuretic therapy, or other drug therapies affecting electrolytes
Fasting glucose level	<ul style="list-style-type: none"> Diabetes (should be repeated on day of surgery)
Pregnancy (β-HCG)	<ul style="list-style-type: none"> Woman who may be pregnant
Electro-cardiograph	<ul style="list-style-type: none"> Heart disease, hypertension, diabetes Other risk factors for cardiac disease (may include age) Subarachnoid or intracranial hemorrhage, cerebrovascular accident, head trauma

- Chest radiograph
- Cardiac or pulmonary disease
 - Malignancy

Fasting policies should vary to take into account age and pre-existing medical conditions and should apply to all forms of anesthesia, including monitored anesthesia care. Emergent or urgent procedures should be undertaken after considering the risk of delaying surgery versus the risk of aspiration of gastric contents. The type and amount of food ingested should be considered in determining the duration of fasting. Before elective procedures, the minimum duration of fasting should be

- 8 hours after a meal that includes meat, fried or fatty foods
- 6 hours after a light meal (such as toast and a clear fluid), or after ingestion of infant formula or nonhuman milk
- 4 hours after ingestion of breast milk
- 2 hours after clear fluids.

Premedication, when indicated, should be ordered by the anesthesiologist. Orders should be specific as to dose, time and route of administration.

Additional regulations governing the conduct of anesthesia may be dictated by provincial legislation or hospital by-laws.

The Anesthetic Period

Before beginning an anesthetic, the anesthesiologist must ensure that

1. An explanation of the planned anesthetic procedure has been provided.
2. An adequate review of the patient’s condition has been performed.
3. All equipment that is expected to be required is available and in working order.
4. A reserve source of oxygen under pressure is available.
5. All drugs and agents that are expected to be required are correctly identified. User-applied drug labels should conform to the CSA Standard CAN/CSA-Z264.3-98 (R2005) (Appendix 1)
6. Until a specific connection system is devised for neuraxial use, both sides of all Luer connections are labeled.
7. The manufacturers’ recommendations concerning the use, handling and disposal of anesthetic equipment and supplies have been considered.

The anesthesiologist’s primary responsibility is to the patient receiving care. The anesthesiologist or an anesthesia assistant supervised by the anesthesiologist shall remain with the patient at all times throughout the conduct of all general, major

regional and monitored intravenous anesthetics until the patient has been transferred to the care of personnel in the post-anesthesia care unit (PACU) or intensive care unit (ICU).

If the attending anesthesiologist leaves the operating room temporarily, he must delegate care of the patient to another anesthesiologist, to a resident in anesthesia, or to an anesthesia assistant. When the attending anesthesiologist delegates care to a resident in anesthesia or an anesthesia assistant, the attending anesthesiologist remains responsible for the anesthetic management of the patient. Before delegating care of the patient to an anesthesia assistant, the anesthesiologist must ensure that the anesthesia assistant is familiar with the operative procedure, the operating room environment and equipment, and that the patient's condition is stable. When care is delegated to an anesthesia assistant, the attending anesthesiologist must remain immediately available.

Only under the most exceptional circumstances, for example to provide life-saving emergency care to another patient, may an anesthesiologist briefly delegate routine care of a stable patient to a competent person who is not an anesthesia assistant, and that person's only responsibility is to monitor that patient during the anesthesiologist's absence and to keep the anesthesiologist informed until they return. In this situation the anesthesiologist remains responsible for the care of the patient and must inform the surgeon.

Simultaneous administration of general, spinal, epidural or other major regional anesthesia by one anesthesiologist for concurrent diagnostic or therapeutic procedures on more than one patient is unacceptable. However, in an obstetric unit, it is acceptable to supervise more than one patient receiving regional analgesia for labour. Due care must be taken to ensure that each patient is adequately observed by a suitably trained person following an established protocol. When an anesthesiologist is providing anesthetic care for an obstetric delivery, a second appropriately trained person should be available to provide neonatal resuscitation.

Simultaneous administration of an anesthetic and performance of a diagnostic or therapeutic procedure by a single physician is unacceptable, except for procedures done with only infiltration of local anesthetic.

Records

All monitored physiologic variables should be charted at intervals appropriate to the clinical circumstances. Heart rate and blood pressure should be recorded at least every 5 minutes. Oxygen saturation should be continuously monitored and recorded at frequent intervals. For every patient receiving inhalational, major regional or monitored intravenous anesthesia, oxygen saturation and, if the trachea is intubated, end-tidal carbon dioxide concentration should be monitored

continuously. Reasons for deviation from these charting guidelines should be documented in the anesthetic record. Monitors, equipment and techniques, as well as time, dose and route of all drugs and fluids should be recorded. Intraoperative care should be recorded.

The anesthesia record should include patient's level of consciousness, heart rate, blood pressure, oxygen saturation and respiratory rate as first determined in the PACU.

Patient Monitoring

The only indispensable monitor is the presence, at all times, of a physician or an anesthesia assistant, under the immediate supervision of an anesthesiologist, with appropriate training and experience. Mechanical and electronic monitors are, at best, aids to vigilance. Such devices assist the anesthesiologist to ensure the integrity of the vital organs and, in particular, the adequacy of tissue perfusion and oxygenation.

The health care facility is responsible for the provision and maintenance of monitoring equipment that meets current published equipment standards.

The chief of anesthesia is responsible for advising the health care facility on the procurement of monitoring equipment and for establishing policies for monitoring to help ensure patient safety.

The anesthesiologist is responsible for monitoring the patient receiving care and must ensure that appropriate monitoring equipment is available and working correctly. **A pre-anesthetic checklist (Appendix 3 or equivalent) shall be completed prior to initiation of anesthesia.**

Monitoring guidelines for standard patient care apply to all patients receiving general anesthesia, regional anesthesia or intravenous sedation.

Monitoring equipment is classified as one of the following

- **Required:** These monitors must be in continuous use throughout the administration of all anesthetics.
- **Exclusively available for each patient:** These monitors must be available at each anesthetic work station, so that they can be applied without any delay.
- **Immediately available:** These monitors must be available so that they can be applied without undue delay.

The following are required:

- Pulse oximeter
- Apparatus to measure blood pressure, either directly or noninvasively
- Electrocardiography
- Capnography, when endotracheal tubes or laryngeal masks are inserted.
- Agent-specific anesthetic gas monitor, when inhalation anesthetic agents are used.

The following shall be exclusively available for each patient:

- Apparatus to measure temperature
- Peripheral nerve stimulator, when neuromuscular blocking drugs are used
- Stethoscope — either precordial, esophageal or paratracheal
- Appropriate lighting to visualize an exposed portion of the patient.

The following shall be immediately available:

- Spirometer for measurement of tidal volume.

It is recognized that brief interruptions of continuous monitoring may be unavoidable. Furthermore, there are certain circumstances in which a monitor may fail and, therefore, continuous vigilance by the anesthesiologist is essential.

Audible and visual alarms for oximetry and capnography should not be indefinitely disabled during the conduct of an anesthetic except during unusual circumstances. The variable pitch pulse tone and the low-threshold alarm of the pulse oximeter and the capnograph apnea alarm must give an audible and visual alarms.

The Post-anesthetic Period

Recovery Facility

In any hospital providing anesthetic services, a post-anesthesia care unit (PACU) must be available. Administrative policies in accordance with hospital by-laws shall be enforced to coordinate medical and nursing care responsibilities.

The department of anesthesia should have overall medical administrative responsibility for the PACU. There should be a policy manual for the PACU, which has been approved by medical, nursing and administrative authorities.

The anesthesiologist should accompany the patient to the PACU, communicate necessary information and write appropriate orders. If clinically indicated, supplemental oxygen and appropriate monitoring devices should be applied

during transport. Care should not be delegated to the PACU nurse until the anesthesiologist is assured that the patient may be safely observed and cared for by the nursing staff. The anesthesiologist or designated alternate is responsible for providing anesthetic-related care in the PACU. Discharge from the PACU is the responsibility of the anesthesiologist. This responsibility may be delegated in accordance with hospital policy.

Supplemental oxygen and suction must be available for every patient in the PACU. Emergency equipment for resuscitation and life support must be available in the PACU. The monitoring used in the PACU should be appropriate to the patient's condition and a full range of monitoring devices should be available. The use of pulse oximetry in the initial phase of recovery is required.

An accurate record of the immediate recovery period shall be maintained. This must include a record of vital signs together with other aspects of treatment and observation. It shall form a part of the permanent medical record. Any complications that bear any relation to the anesthetic should be recorded, either on the recovery record or on the progress notes on the patient's chart.

Discharge of Patients after Day Surgery

The patient must be discharged from the facility under the care of a responsible adult only when fully conscious and ambulatory. The patient should be advised not to drive an automobile or to operate hazardous machinery for at least 24 hours. The patient should also be advised about the additive effects of alcoholic beverages and sedative drugs.

Guidelines for Obstetric Regional Analgesia

Anesthesia services to parturients include obstetric analgesia for labour and for both uncomplicated and complicated or operative deliveries. All guidelines regarding provision of anesthesia for other diagnostic or therapeutic procedures also apply to provision of obstetric anesthesia. The guidelines in this section pertain to epidural and spinal analgesia during labour. The term "regional analgesia" includes epidural, spinal, and combined spinal-epidural analgesia.

These guidelines will be reviewed annually by the Section of Obstetric Anesthesia and updated as indicated. Each hospital may wish to develop additional guidelines or policies for specific situations in which obstetric regional analgesia is provided.

Under the direction of an anesthesiologist, some aspects of monitoring and management of obstetric regional analgesia

may be delegated to other health care personnel. Each hospital should ensure that these personnel receive the same training, certification, continuing education and recertification in obstetric regional analgesia.

Initiation of Obstetric Regional Analgesia

1. Before introducing obstetric regional analgesia, hospitals should have appropriate monitoring protocols in place. These protocols should outline the types of monitoring required and the frequency of monitoring. In addition, they should clearly state how to manage common problems and emergencies and indicate who to contact if assistance is required.
2. Obstetric regional analgesia should only be provided by physicians with training, hospital privileges and license to provide these services. This includes trainees with appropriate supervision.
3. Regional analgesia should only be initiated and maintained in locations in which appropriate resuscitation equipment and drugs are immediately available.
4. Informed consent should be obtained and documented in the medical record.
5. Intravenous access must be established before initiating regional analgesia. The intravenous access should be maintained as long as regional analgesia is administered.
6. The anesthesiologist should be immediately available until analgesia is established and the patient's vital signs are stable.

Maintenance of Regional Analgesia during Labour

Continuous infusions of low-dose (diluted) epidural local anesthetics, with or without other adjuncts, are associated with a very low incidence of significant complications. Consequently, it is not necessary for an anesthesiologist to remain present or immediately available during maintenance of continuous epidural infusion analgesia provided that

- There are appropriate protocols for management of patients receiving epidural analgesia.
- The anesthesiologist can be contacted for the purpose of obtaining advice and direction.

The safety of patient-controlled epidural analgesia (PCEA) using low-dose (diluted) local anesthetics, with or without other adjuncts, is comparable to low-dose continuous infusion epidural analgesia. Consequently, it is not necessary for an anesthesiologist to remain present or immediately available during maintenance of PCEA provided that

- There are appropriate protocols for management of patients receiving PCEA.

- The anesthesiologist can be contacted for the purpose of obtaining advice and direction.

A bolus dose of local anesthetic through the epidural catheter or through a catheter or needle presumed to be in the epidural space can cause immediate, life-threatening complications. For this reason, when a bolus dose of local anesthetic is injected through the epidural catheter (except PCEA), an anesthesiologist must be available to intervene appropriately should any complications occur. The intent of the phrase "available to intervene appropriately" is that individual departments of anesthesiology establish their own policies regarding the availability of an anesthesiologist to manage any complications of regional analgesia. In developing these policies, each department should consider the possible risk of bolus injection of local anesthetics and the methods of dealing with emergency situations.

Oral Intake during Labour

Gastric emptying of solids is delayed during labour. Opioid analgesics may further delay gastric emptying. Therefore, parturients should not eat solid foods once they are in established labour. In contrast to solid food, clear liquids are relatively rapidly emptied from the stomach and absorbed in the proximal small bowel, including during labour. Therefore, individual hospitals should develop protocols regarding the intake of clear liquids by women in established labour.

Guidelines for Acute Pain Management using Neuraxial Analgesia

When neuraxial analgesia is managed by anesthesiologists, the incidence of side effects is no higher than when alternative techniques of pain management are used. Accordingly, when its use is appropriate, neuraxial analgesia should be managed by anesthesiologists.

For the purposes of these guidelines, neuraxial analgesia is defined as intrathecal or epidural administration of opioids and/or local anesthetics for treatment of postoperative pain or other acute pain problems. The purpose of these guidelines is to provide principles of management for anesthesiologists, so that neuraxial analgesia is provided in a fashion that maximizes its benefit–risk ratio.

Administrative and Educational Policies

The department of anesthesia should establish an acute pain service that is responsible for

1. **Developing policies and procedures for neuraxial analgesia.** Participation of other departments, such as nursing, pharmacy, surgery and materials management should be sought as needed.
2. **Liaison with the surgical departments.** Surgeons need to understand the criteria for patient selection, the effects of neuraxial analgesia on the normal postoperative course and on presentation of postoperative complications, and the implications of other therapies (such as prophylactic anticoagulation) on neuraxial analgesia.
3. **Education and certification of nurses.** A standardized educational program should be established for initial training and certification of nurses caring for patients receiving neuraxial analgesia and for maintenance of competence. Nursing personnel should understand
 - The risk of respiratory depression, including delayed respiratory depression when hydrophilic opioids are used
 - Assessment and management of respiratory depression
 - Assessment of motor and sensory blockade
 - Assessment and management of hypotension in patients receiving neuraxial analgesia
 - Signs and symptoms of the rare, but catastrophic, complications of epidural hematoma or abscess.

Policies for Drug Administration

Each hospital should use a limited number of standard solutions. Preprinted order sheets listing the standard solutions are strongly recommended. Before dispensing any solution that is not standard in the hospital, the anesthesiologist should verify the order with nursing and pharmacy personnel and discuss its indications and all concerns related to its use with the nurses responsible for administering the drug and monitoring the patient.

The risk of errors due to incorrect route of drug injection must be minimized. For continuous infusions or patient-controlled epidural analgesia (PCEA), the use of unique, tamper-proof pumps that are distinct from the pumps used for intravenous fluid or drug administration is strongly recommended. The tubing between neuraxial analgesia infusion pumps and catheters should not have any ports that could permit unintentional injection of intravenous drugs.

Preparation of solutions should follow a standardized procedure. All analgesic drug solutions should be labeled with the composition of the solution (opioid, local anesthetic, or both) and its intended route of administration (epidural or intravenous).

Optimal placement of epidural catheters is important when infusions of local anesthetics and opioids are used. When possible, the catheter should be no lower than the dermatome innervating the middle of the incision. The level of catheter placement is less important when hydrophilic opioids are used. Ideally, proper function of epidural catheters placed for treatment of postoperative pain should be verified before general anesthesia is induced.

Patient Monitoring and Management of Adverse Events

Patients receiving neuraxial analgesia should be in a room equipped with oxygen and suction. Resuscitation drugs and equipment must be immediately available. Intravenous access must be secured before initiation of neuraxial analgesia and maintained for the expected duration of drug effects after discontinuing neuraxial analgesia.

Epidural catheter dressings should permit examination for catheter movement and daily inspection of the catheter entry site for any signs of infection.

Standardized policies for patient management should be established. The parameters to be assessed, frequency of assessments, documentation and procedures for management of complications should be specified. Adequate nursing personnel must be available to assess and manage patients receiving neuraxial analgesia. Monitoring should continue after discontinuation of neuraxial analgesia until its effects have dissipated. Factors that should be considered in estimating the duration of action are the lipid solubility of the opioid, the total dose and the duration of administration.

An anesthesiologist must be readily available to advise nursing personnel on such issues as dose titration and management of adverse effects. Each hospital with an acute pain service should ensure that an anesthesiologist is available to attend directly to patients receiving neuraxial analgesia, within an appropriate time, depending on the clinical situation. Each hospital should also specify procedures for emergent management of any life-threatening complications.

Other drugs, particularly benzodiazepines or parenteral opioids, may cause severe respiratory depression in patients receiving neuraxial analgesia. For this reason, other physicians should not order sedatives or analgesics for any patient receiving neuraxial analgesia. The acute pain service should direct analgesic and sedative therapy until the effects of neuraxial analgesia have dissipated.

Patients with epidural catheters may receive prophylactic low-dose anticoagulant therapy if appropriate precautions are taken.

- To minimize the risk of epidural hematoma, catheter insertion and removal and the timing of anticoagulant

administration must be coordinated so that no clinically significant anticoagulant effect is present at these times.

- Use of nonsteroidal anti-inflammatory drugs in patients receiving neuraxial analgesia is appropriate, but concurrent administration of these drugs or other antiplatelet medication and an anticoagulant may increase the risk of epidural hematoma.
- Lower extremity motor blockade should be avoided in patients receiving neuraxial analgesia. Nursing staff should be aware of the signs and symptoms of epidural hematoma. Any change in neurologic status or new-onset back pain must be investigated immediately.

If full anticoagulation is indicated in a patient with an epidural catheter, the anesthesiologist should be consulted so that catheter removal and initiation of alternative analgesic management are accomplished before anticoagulation.

Guidelines for the Practice of Anesthesia outside a Hospital

The basic principles, training requirements, techniques, equipment and drugs used for the practice of anesthesia are noted in other sections of these guidelines. The following are guidelines for certain aspects particular to anesthetic practice outside a hospital.

Patient Selection

Patients should be classified as to physical status in a manner similar to that in use by the American Society of Anesthesiologists (see Appendix 2). Usually, only patients in ASA classifications I and II should be considered for an anesthetic outside a hospital. Patients in classification III may be accepted under certain circumstances.

Preoperative Considerations

The patient must have had a recent, recorded history, physical examination and appropriate laboratory investigations. These may be carried out by another physician or anesthesiologist. The duration of fasting before anesthesia should conform to the previously stated guidelines. The patient should be given an information sheet with instructions for pre- and post-anesthetic periods.

Conduct of Anesthesia

The anesthetic and recovery facilities shall conform to hospital standards published by the CSA as defined in other sections. The standards of care and monitoring shall be the same in all anesthetizing locations.

Appendix 1:

Canadian Standards Association Standards for Equipment

Legend

Example: C22.2 NO. 0.1-FM85 (C1999)

- F Indicates the standard is written in French.
M Indicates that the standard uses metric measurements.
85 Denotes the year of publication — in this case, 1985.
R or C The standard has been “reaffirmed” or “confirmed” — no changes have been made to the standard since the date of publication.

Anesthesia, Respiratory and Critical Care

CAN/CSA-Z168.5.6-96 (R2006)

Expired-Air Pulmonary Resuscitators

CAN/CSA-Z305.6-92 (R2007)

Medical Oxygen Concentrator Central Supply System for Use
With Nonflammable Medical Gas Piping

CAN/CSA-Z305.8-03

Medical Supply Units

Z305.12-06

Safe Storage, Handling, and Use of Portable Oxygen Systems in
Residential Buildings and Health Care

CAN/CSA-Z5360-94 (R2003)

Anaesthetic Vaporizers — Agent-Specific Filling Systems

CAN/CSA-Z5361-03

Anaesthetic and Respiratory Equipment — Tracheal Tubes and
Connectors

Z7396.1-06

Medical Gas Pipeline Systems — Part 1: Pipelines for Medical
Gases and Vacuum

CAN/CSA-Z7396.2-02 (R2007)

Medical Gas Pipeline Systems — Part 2: Anaesthetic Gas
Scavenging Disposal Systems

CAN/CSA-Z8382-94 (R2004)

Resuscitators Intended for Use With Humans

CAN/CSA-Z8835-2-01 (R2006)

Inhalational Anaesthesia Systems — Part 2: Anaesthetic
Breathing Systems for Adults

CAN/CSA-Z8835-3-00 (R2005)

Inhalational Anaesthesia Systems — Part 3: Anaesthetic Gas
Scavenging Systems — Transfer and Receiving Systems

CAN/CSA-Z8835-4-06

Inhalational Anaesthesia Systems — Part 4: Anaesthetic Vapour
Delivery Devices

CAN/CSA-Z8835-5-06

Inhalational Anaesthesia Systems — Part 5: Anaesthetic Ventilators

CAN/CSA-Z8836-01 (R2006)

Suction Catheters for Use in the Respiratory Tract

CAN/CSA-Z9170-1-00 (R2005)

Terminal Units for Medical Gas Pipeline Systems — Part 1: Terminal
Units for Use with Compressed Medical Gases and Vacuum

CAN/CSA-Z9170-2-00 (R2005)

Terminal Units for Medical Gas Pipeline Systems — Part 2:
Terminal Units for Anaesthetic Gas Scavenging Systems

CAN/CSA-Z9918-94 (R2004)

Capnometers for Use With Humans – Requirements

CAN/CSA-Z9919-07

Medical Electrical Equipment — Particular Requirements for the
Basic Safety and Essential Performance of Pulse Oximeter
Equipment for Medical Use

CAN/CSA-Z10079-1-03

Medical Suction Equipment — Part 1: Electrically Powered
Suction Equipment — Safety Requirements

CAN/CSA-Z10079-2-03

Medical Suction Equipment — Part 2: Manually Powered
Suction Equipment

CAN/CSA-Z10079-3-03

Medical Suction Equipment — Part 3: Suction Equipment
Powered from a Vacuum or Pressure Source

CAN/CSA-Z10524-02 (R2007)

Pressure Regulators and Pressure Regulators with Flow-Metering
Devices for Medical Gas Systems

CAN/CSA-Z10651-2-06

Lung Ventilators for Medical Use — Particular Requirements for
Basic Safety and Essential Performance — Part 2: Home Care
Ventilators for Ventilator-Dependent Patients

CAN/CSA-Z10651-3-98 (R2003)

Lung Ventilators for Medical Use — Part 3: Particular
Requirements for Emergency and Transport Ventilators

CAN/CSA-Z10651-6-06

Lung Ventilators for Medical Use — Particular Requirements for
Basic Safety and Essential Performance — Part 6: Home-Care
Ventilatory Support Devices

CAN/CSA-Z15002-02 (R2007)

Flow-Metering Devices for Connection to Terminal Units of
Medical Gas Pipeline Systems

CAN/CSA-Z17510-1-03

Sleep Apnoea Breathing Therapy — Part 1: Sleep Apnoea
Breathing Therapy Devices

CAN/CSA-Z17510-2-03

Sleep Apnoea Breathing Therapy — Part 2: Masks and
Application Accessories

CAN/CSA-Z23328-1-04

Breathing System Filters for Anaesthetic and Respiratory Use —
Part 1: Salt Test Method to Assess Filtration Performance

CAN/CSA-Z23328-2-03

Breathing System Filters for Anaesthetic and Respiratory Use —
Part 2: Non-Filtration Aspects

Applications of Electricity in Health Care

CAN/CSA-C22.2 NO. 114-M90 (R2005)

Diagnostic Imaging and Radiation Therapy Equipment

C22.2 NO. 125-M1984 (R2004)

Electromedical Equipment

CAN/CSA-C22.2 NO. 601.1B-90 (R2006)

Amendment 2 to CAN/CSA-C22.2 No. 601.1-M90, Medical
Electrical Equipment — Part 1: General Requirements for Safety

CAN/CSA-C22.2 NO. 60601-1-1-02 (R06)

Medical Electrical Equipment — Part 1-1: General
Requirements for Safety — Collateral Standard: Safety
Requirements for Medical Electrical Systems

CAN/CSA-C22.2 NO. 60601-1-2-03

Medical Electrical Equipment — Part 1-2: General
Requirements for Safety — Collateral Standard: Electromagnetic
Compatibility — Requirements and Tests

CAN/CSA-C22.2 NO. 60601-1-2A-03

Amendment 1:2006 to CAN/CSA-C22.2 NO. 60601-1-2-03,
Medical Electrical Equipment — Part 1-2: General
Requirements for Safety — Collateral Standard: Electromagnetic
Compatibility — Requirements and Tests

CAN/CSA-C22.2 NO. 60601-1-4-02 (R06)

Medical Electrical Equipment — Part 1-4: General
Requirements for Safety — Collateral Standard: Programmable
Electrical Medical Systems

CAN/CSA-C22.2 NO. 60601-1-6-05

Medical Electrical Equipment — Part 1-6: General
Requirements for Safety — Collateral Standard: Usability

CAN/CSA-C22.2 NO. 60601-1-8-05

Medical Electrical Equipment — Part 1-8: General
Requirements for Safety — Collateral Standard: General
Requirements, Tests and Guidance for Alarm Systems in Medical
Electrical Equipment and Medical Electrical Systems

CAN/CSA-C22.2 NO. 60601-2-1A-01(R07)

Amendment 1:2003 to CAN/CSA-C22.2 NO. 60601-2-1-01,
Medical Electrical Equipment — Part 2-1: Particular
Requirements for the Safety of Electron Accelerators in the
Range 1 MeV to 50 MeV

CAN/CSA-C22.2 NO. 60601-2-2-01

Medical Electrical Equipment — Part 2-2: Particular
Requirements for the Safety of High Frequency Surgical
Equipment

CAN/CSA-C22.2 NO. 60601-2-4-04

Medical Electrical Equipment — Part 2-4: Particular
Requirements for the Safety of Cardiac Defibrillators

CAN/CSA-C22.2 NO. 60601-2-5-02

Medical Electrical Equipment — Part 2-5: Particular
Requirements for the Safety of Ultrasonic Physiotherapy
Equipment

CAN/CSA-C22.2 NO. 60601-2-7-01 (R05)

Medical Electrical Equipment — Part 2-7: Particular
Requirements for the Safety of High-Voltage Generators of
Diagnostic X-Ray Generators

CAN/CSA-C22.2 NO. 60601-2-8-01

Medical Electrical Equipment — Part 2-8: Particular
Requirements for the Safety of Therapeutic X-Ray Equipment
Operating in the Range 10kV to 1MV

CAN/CSA-C22.2 NO. 60601-2-9-01 (R05)

Medical Electrical Equipment — Part 2: Particular Requirements
for the Safety of Patient Contact Dosimeters Used in
Radiotherapy with Electrically Connected Radiation Detectors

CAN/CSA-C22.2 NO. 60601-2-11-01 (R05)

Medical Electrical Equipment — Part 2-11: Particular
Requirements for the Safety of Gamma Beam Therapy Equipment

CAN/CSA-C22.2 NO. 60601-2-11A-01

Amendment 1:2005 to CAN/CSA-C22.2 No. 60601-2-11-01,
Medical Electrical Equipment — Part 2-11: Particular
Requirements for the Safety of Gamma Beam Therapy
Equipment

CAN/CSA-C22.2 NO. 60601-2-12-03(R07),

Medical Electrical Equipment — Part 2-12: Particular Requirements
for the Safety of Lung Ventilators — Critical Care Ventilators

CAN/CSA-C22.2 NO. 60601-2-13-07

Medical Electrical Equipment — Part 2-13: Particular
Requirements for the Safety and Essential Performance of
Anaesthetic Systems

CAN/CSA-C22.2 NO. 60601-2-16-01 (R05)

Medical Electrical Equipment — Part 2-16: Particular
Requirements for the Safety of Haemodialysis,
Haemodiafiltration and Haemofiltration Equipment

CAN/CSA-C22.2 NO. 60601-2-17-04

Medical Electrical Equipment — Part 2-17: Particular
Requirements for the Safety of Automatically-Controlled
Brachytherapy Afterloading Equipment

CAN/CSA-C22.2 NO. 60601-2-18A-01

Amendment 1:2002 to CAN/CSA-C22.2 NO. 60601-2-18-01,
Medical Electrical Equipment — Part 2-18: Particular
Requirements for the Safety of Endoscopic Equipment

CAN/CSA-C22.2 NO. 60601-2-22-01 (R05)

Medical Electrical Equipment — Part 2: Particular Requirements
for the Safety of Diagnostic and Therapeutic Laser Equipment

CAN/CSA-C22.2 NO. 60601-2-23-02

Medical Electrical Equipment — Part 2-23: Particular
Requirements for the Safety, Including Essential Performance, of
Transcutaneous Partial Pressure Monitoring Equipment

CAN/CSA-C22.2 NO. 60601-2-24-01 (R05)

Medical Electrical Equipment — Part 2-24: Particular Requirements for the Safety of Infusion Pumps and Controllers

CAN/CSA-C22.2 NO. 60601-2-26-04

Medical Electrical Equipment — Part 2-26: Particular Requirements for the Safety of Electroencephalographs

CAN/CSA-C22.2 NO. 60601-2-29-02(R07)

Medical Electrical Equipment — Part 2-29: Particular Requirements for the Safety of Radiotherapy Simulators

CAN/CSA-C22.2 NO. 60601-2-30-02 (R2006)

Medical Electrical Equipment — Part 2-30: Particular Requirements for the Safety, Including Essential Performance, of Automatic Cycling Non-Invasive Blood Pressure Monitoring Equipment

CAN/CSA-C22.2 NO. 60601-2-33-04

Medical Electrical Equipment — Part 2-33: Particular Requirements for the Safety of Magnetic Resonance Equipment for Medical Diagnosis

CAN/CSA-C22.2 NO. 60601-2-34-02(R06)

Medical Electrical Equipment — Part 2-34: Particular Requirements for the Safety, Including Essential Performance, of Invasive Blood Pressure Monitoring Equipment

CAN/CSA-C22.2 NO. 60601-2-37-03(R07)

Medical Electrical Equipment . Part 2-37: Particular Requirements for the Safety of Ultrasonic Medical Diagnostic and Monitoring Equipment

CAN/CSA-C22.2 NO. 60601-2-37A-03

Amendment 1:2005 to CAN/CSA-C22.2 No. 60601-2-37-03, Medical Electrical Equipment — Part 2-37: Particular Requirements for the Safety of Ultrasonic Medical Diagnostic and Monitoring Equipment

CAN/CSA-C22.2 NO. 60601-2-38-03(R07)

Medical Electrical Equipment — Part 2: Particular Requirements for the Safety of Electrically Operated Hospital Beds

CAN/CSA-C22.2 NO. 60601-2-39-02(R07)

Medical Electrical Equipment — Part 2-39: Particular Requirements for the Safety of Peritoneal Dialysis Equipment

CAN/CSA-C22.2 NO. 60601-2-40-01 (R05)

Medical Electrical Equipment — Part 2-40: Particular Requirements for the Safety of Electromyographs and Evoked Response Equipment

CAN/CSA-C22.2 NO. 60601-2-41-02(R07)

Medical Electrical Equipment — Part 2-41: Particular Requirements for the Safety of Surgical Luminaires and Luminaires for Diagnosis

CAN/CSA-C22.2 NO. 60601-2-43-03(R07)

Medical Electrical Equipment — Part 2-43: Particular Requirements for the Safety of X-Ray Equipment for Interventional Procedures

CAN/CSA-C22.2 NO. 60601-2-44-03(R07)

Medical Electrical Equipment — Part 2-44: Particular Requirements for the Safety of X-Ray Equipment for Computed Tomography

CAN/CSA-C22.2 NO. 60601-2-44A-04

Amendment 1:2004 to CAN/CSA-C22.2 No. 60601-2-44-03, Medical Electrical Equipment — Part 2-44: Particular Requirements for the Safety of X-Ray Equipment for Computed Tomography

CAN/CSA-C22.2 NO. 60601-2-45-02(R07)

Medical Electrical Equipment — Part 2-45: Particular Requirements for the Safety of Mammographic X-Ray Equipment and Mammographic Stereotactic Devices

CAN/CSA-C22.2 NO. 60601-2-46-01 (R05)

Medical Electrical Equipment — Part 2-46: Particular Requirements for the Safety of Operating Tables

CAN/CSA-C22.2 NO. 60601-2-47-03(R07)

Medical Electrical Equipment — Part 2-47: Particular Requirements for the Safety, Including Essential Performance, of Ambulatory Electrocardiographic Systems

CAN/CSA-C22.2 NO. 60601-2-49-04

Medical Electrical Equipment — Part 2-49: Particular Requirements for the Safety of Multifunction Patient Monitoring Equipment

CAN/CSA-C22.2 NO. 60601-2-50-03(R07)

Medical Electrical Equipment — Part 2-50: Particular Requirements for the Safety of Infant Phototherapy Equipment

CAN/CSA-C22.2 NO. 60601-2-51-04

Medical Electrical Equipment — Part 2-51: Particular Requirements for Safety, Including Essential Performance, of Recording and Analysing Single Channel and Multichannel Electrocardiographs

CAN/CSA-CEI/IEC 1258-98 (R2007)

Guidelines for the Development and Use of Medical Electrical Equipment Educational Materials

CAN/CSA-CEI/IEC 1288-1-98 (R2007)

Cardiac Defibrillators — Cardiac Defibrillators-Monitors — Part 1: Operation

CAN/CSA-CEI/IEC 1288-2-98 (R2007)

Cardiac Defibrillators — Cardiac Defibrillators-Monitors — Part 2: Maintenance

CAN/CSA-CEI/IEC 1289-1-98 (R2007)

High-Frequency Surgical Equipment — Part 1: Operation

CAN/CSA-CEI/IEC 1289-2-98 (R2007)

High-Frequency Surgical Equipment — Part 2: Maintenance

CAN/CSA-ISO 14971-07

Medical Devices — Application of Risk Management to Medical Devices

CAN/CSA-ISO 10993-10-98 (R2003)

Biological Evaluation of Medical Devices — Part 10: Tests for Irritation and Sensitization

CAN/CSA-ISO 10993.12-98 (R2002)

Biological Evaluation of Medical Devices — Part 12: Sample Preparation and Reference Materials

Blood and Blood Components

CAN/CSA-Z902-04

Blood and Blood Components

Child-Resistant Packaging

Z76.1-06

Reclosable Child-Resistant Packages

CAN/CSA-Z76.2-00 (R2005)

Nonreclosable Child-Resistant Packages

Drug Labeling and Delivery

CAN/CSA-Z264.1-02

Spacers and Holding Chambers for Use with Metered-Dose Inhalers

CAN/CSA-Z264.2-99 (R2004)

Labelling of Drug Ampoules, Vials and Prefilled Syringes

CAN/CSA-Z264.3-98 (R2005)

Standard for User-Applied Drug Labels in Anaesthesia and Critical Care

Extra Corporeal Circulation Technology

CAN/CSA-Z364.1.1/Z364.1.2-94 (R2006)

Haemodialysers, Haemofilters and Haemoconcentrators/
Extracorporeal Blood Circuit for Haemodialysers, Haemofilters
and Haemoconcentrators

CAN/CSA-Z364.1.3-98 (R2004)

Reuse of Haemodialysers

Z364.2.1-94 (R2006)

Fluid Supply and Monitoring Systems for Haemodialysis

Z364.2.2-03

Water Treatment Equipment and Water Quality Requirements
for Hemodialysis

Health Care Facility Engineering

PLUS 317 (1st ed. pub 2000)

Guidelines for Elementary Assessments of Building Systems in
Health Care Projects

CAN/CSA-Z317.1-99 (R2002)

Special Requirements for Plumbing Installations in Health Care
Facilities

CAN/CSA-Z317.2-01 (R2006)

Special Requirements for Heating, Ventilation, and Air
Conditioning (HVAC) Systems in Health Care Facilities

Z317.5-98 (R2002)

Illumination Systems in Health Care Facilities

CAN/CSA-Z317.10-01 (R2006)

Handling of Waste Materials in Health Care Facilities and
Veterinary Health Care Facilities

CAN/CSA-Z317.11-02 (R2007)

Area Measurement for Health Care Facilities

CAN/CSA-Z317.13-03

Infection Control During Construction or Renovation of Health
Care Facilities

Z318.0-05 SMART CD-ROM, Z318.0-05

Commissioning of Health Care Facilities - Smart CD-ROM
consists of CSA-Z318.0-05 and over 250 commissioning check
sheet templates

Appendix 2:

**American Society of Anesthesiologists'
Classification of Physical Status**

- P1 A normal healthy patient
- P2 A patient with mild systemic disease
- P3 A patient with severe systemic disease
- P4 A patient with severe systemic disease that is a constant threat to life
- P5 A moribund patient who is not expected to survive without the operation
- P6 A declared brain-dead patient whose organs are being removed for donor purposes

Appendix 3: Pre-anesthetic Checklist

A. Gas pipelines

- Secure connections between terminal units (outlets) and anesthetic machine

B. Anesthetic machine

- Turn on machine master switch and all other necessary electrical equipment
 - Line oxygen (40–60 psi or 275–415 KPa)
 - Line nitrous oxide (40–60 psi or 275–415 KPa)
 - Adequate reserve cylinder oxygen pressure
 - Adequate reserve cylinder nitrous oxide content
 - Check for leaks and turn off cylinders
 - Flow meter function of oxygen and nitrous oxide over the working range
- Vaporizer filled
 - Filling ports pin-indexed and closed
 - Ensure “on/off” function and turn off
- Functioning oxygen bypass (flush)
- Functioning oxygen fail-safe device
- Oxygen analyzer calibrated and turned on functioning mixer (where available)
 - Attempt to create a hypoxic O₂/N₂O mixture and verify correct changes in flow and/or alarm
- Functioning common fresh gas outlet
- Ventilator function verified
- Backup ventilation equipment available and functioning

If an anesthesiologist uses the same machine in successive cases, departmental policy may permit performing an abbreviated checklist between cases.

C. Breathing circuit

- Correct assembly of circuit to be used
- Patient circuit connected to common fresh gas outlet
- Oxygen flow meter turned on
- Check for exit of fresh gas at face mask
 - Pressurize. Check for leaks, and integrity of circuit (eg, Pethick test for co-axial)
- Functioning high-pressure relief valve
- Unidirectional valves and soda lime
- Functioning adjustable pressure relief valve

D. Vacuum system

- Suction adequate

E. Scavenging system

- Correctly connected to patient circuit and functioning

F. Routine equipment

- Airway Management:
 - Functioning laryngoscope (back-up available)
 - Appropriate tracheal tubes: patency of lumen and integrity of cuff
 - Appropriate oropharyngeal airways
 - Stylet
 - Magill forceps
- Intravenous supplies
- Blood pressure cuff of appropriate size
- Stethoscope
- ECG monitor
- Pulse oximeter
- Capnograph
- Temperature monitor
- Functioning low- and high-pressure alarm

G. Drugs

- Adequate supply of frequently used drugs and intravenous solutions
- Appropriate doses of drugs in labeled syringes

H. Location of special equipment in each anesthetising location

- Defibrillator
- Emergency drugs
- Difficult intubation kit

Appendix 4: Guidelines, Standards and Other Official Statements Available on the Internet

This non-exhaustive list of websites is provided solely for the convenience of CAS members. The CAS is not responsible for the accuracy, currency, or reliability of the content. The CAS does not offer any guarantee in this regard and is not responsible for the information found through these links, nor does it necessarily endorse the sites or their content. This list contains sites that were functional in September 2007, and it will be updated periodically.

CAS partner anesthesia organizations

American Society of Anesthesiologists
www.asahq.org/publicationsAndServices/sgstoc.htm

Association of Anaesthetists of Great Britain and Ireland
www.aagbi.org/publications/guidelines.htm

Australian Society of Anaesthetists
www.asa.org.au

Other official anesthesia organizations

Australian and New Zealand College of Anaesthetists
www.anzca.edu.au/publications/profdocs/view.htm#ps

European Society of Anaesthesiology
www.euroanesthesia.org

Federation of the European Associations of Paediatric Anaesthesia
www.feapa.sm.pl

Royal College of Anaesthetists
www.rcoa.ac.uk

Société Française d'Anesthésie et de Réanimation
www.sfar.org

Society for Pediatric Anesthesia
www.pedsanesthesia.org

World Federation of Societies of Anaesthesiologists
www.anaesthesiologists.org

Other official organizations

Canadian Institute for Health Information
www.cihi.ca

Canadian Standards Association
www.csa.ca

Health Canada
www.hc-sc.gc.ca

International Electrotechnical Commission
www.iec.ch

International Organization for Standardization
www.iso.org

Public Health Agency of Canada
www.phac-aspc.gc.ca

Royal College of Physicians and Surgeons of Canada
www.rcpsc.medical.org

Patient safety organizations

Anesthesia Patient Safety Foundation
www.apsf.org

Australian Patient Safety Foundation
www.apsf.net.au

Canadian Patient Safety Institute
www.patientsafetyinstitute.ca

National Patient Safety Foundation (USA)
www.npsf.org

For a complete list of this section including direct links, please visit our web version of the *Guidelines to the Practice of Anesthesia* at www.cas.ca/members/sign_in/guidelines.

Appendix 5: Position Paper on Anesthesia Assistants: An Official Position Paper of the Canadian Anesthesiologists' Society

Background

Tremendous advances in the practice of anesthesiology have taken place over the past two decades as the result of developments in the education and training of anesthesiologists; an expanded knowledge base; and remarkable innovations in equipment, technology, and pharmacotherapeutics. More complex surgical procedures are now conducted on a patient population that is older and at higher risk, often with significant medical comorbidities. The increasing surgical load imposes severe strains on the ability of anesthesiologists to meet their clinical and academic obligations. The Canadian Anesthesiologists' Society (CAS) is searching for ways to improve the efficiency of anesthesiologists while maintaining or enhancing the quality of care. Given this background, the concept of anesthesia assistants (AAs) is endorsed by the CAS. As described in this paper, the CAS welcomes the addition of competent and well trained healthcare professionals to assist in the delivery of anesthetic care in the operating room. A model of an anesthesia care team (ACT) already exists in the province of Québec, where AAs practice under clearly defined legal status in the code of professions. Elsewhere, anesthesia care teams have been proposed, training programs established, and AAs hired without a standard definition of their scope of practice and curriculum for training. The CAS wishes to clarify its position on those issues.

Initial Premises

- Anesthesiology in Canada is practised by specially trained physicians.
- Anesthesia assistants are specially trained healthcare professionals who execute orders prescribed by anesthesiologists.
- Anesthesia assistants work under the direction and supervision of anesthesiologists.

Guiding Principles

The *CAS Guidelines to the Practice of Anesthesia* state that:

"The independent practice of anesthesia is a specialized field of medicine. As such, it should be practised by physicians with appropriate training in anesthesia."

- The CAS is of the firm view that ensuring patient safety and optimal delivery of patient care in the peri-operative setting requires that the practice of anesthesia remain physician-based. In this context, the CAS supports the role of AAs in providing technical support to improve the efficiency of anesthetic care delivery. The wider introduction of AAs in Canadian anesthesia departments should not be made with the remote objective of introducing non-physician independent practice of anesthesia.
- Canadian anesthesiologists are proud of their high standard of clinical care and their reputation for the provision of safe anesthesia. One of the determinants of safe administration of anesthesia is the physician-to-patient ratio. On that issue, the current CAS guidelines state:

"Simultaneous administration of general, spinal, epidural or other major regional anesthesia by one anesthesiologist for concurrent diagnostic or therapeutic procedures on more than one patient is unacceptable."

- Any modification in clinical practice in contradiction to the CAS guidelines must be introduced with caution and careful evaluation of the outcome to ensure that patient safety is not jeopardized. The CAS recognizes that the ACT concept, with the specific addition of competent AAs, should be considered as one of the potential solutions for improving Canadians' access to surgical services. As new cohorts of AA graduates become available to play a role in the delivery of anesthetic care, the CAS will evaluate, with the safety of patients and quality of care as the primary principles in mind, the pertinence of revisiting its guidelines.
- The introduction of AAs into the ACT and the extent of their clinical activities should be kept under the direct responsibility of anesthesiologists at the hospital, regional, and/or provincial levels.

Anesthesia Assistants: Training and Education

The CAS recognizes that many educational programs are currently emerging in Canada, and that professionals from various backgrounds are entitled to function as AAs. The educational background for becoming an AA must be clearly defined and standardized. The theoretical knowledge and course curriculum should cover pertinent areas of physiology, pharmacology, and technical aspects of anesthesia. A standard amount of clinical exposure during training should be defined. Existing organizations, such as the Canadian Society of Respiratory Therapists, l'Ordre Professionnel des Inhalothérapeutes du Québec, the Operating Room Nurses Association of Canada, the National Association of Perianesthesia Nurses of Canada, and the Canadian Nurses Association should be consulted to agree on the specific training needed.

Anesthesiologists must have major involvement in the curriculum design course content, teaching, and assessment of students. There should be direct links between the AA education programs, the CAS, and university anesthesia departments. Existing course content should be evaluated by the Allied Health Committee of the CAS and modified to ensure that the skills required are included. Such education programs constitute additional training and should be recognized by the award of a diploma.

Anesthesia Assistants: Scope of Practice

Anesthesiologists are involved in patient care pre-, intra- and postoperatively. During each phase of the peri-operative period, anesthesiologists are assisted by dedicated and highly trained healthcare professionals. Anesthesia assistants, as defined by the training and scope of practice outlined in this document, are specially trained professionals whose activity should focus upon assisting the anesthesiologist in the delivery of patient care during the intra-operative and immediate peri-operative period. The AAs scope of practice is as follows.

Technical Duties

The anesthesia assistant shall:

1. Set up, test, calibrate, and operate physiologic monitors, such as anesthesia workstations, intubation/airway devices, fibre-optic endoscopes, physiologic monitors, and infusion devices.
 - Perform equipment checks as indicated and maintain records of problems to ensure safety of equipment.
 - Replace and change anesthetic equipment supplies as per routine maintenance schedule.
 - Maintain a stock of drug supplies and equipment at anesthesia workstations.
2. Troubleshoot anesthetic equipment.
 - Correct problems discovered and/or follow up with biomedical engineering technicians or service representative.
3. Monitor trace gas pollution levels.
4. Maintain and stock pediatric, difficult intubation, hemodynamic, and malignant hyperthermia carts.
5. Participate in the operating room infection control program by performing duties such as maintaining cleanliness in anesthetic equipment in accordance with quality assurance programs. Maintain measures, according to established procedures, to minimize operating room pollution.

Clinical Duties

The anesthesia assistant shall:

1. Assist in the preparation of the patient for surgery and perform preoperative assessments as requested by the anesthesiologist.
2. Assist with or perform the insertion of devices such as nasogastric tubes and intravenous and intra-arterial catheters.
3. Assist with the insertion of Swan Ganz catheters and central venous catheters.
4. Assist with regional anesthesia procedures.
5. Assist with or perform airway management, including insertion of laryngeal masks, tracheal intubation, and mask ventilation.
6. Assist in the positioning of the patient under the direction of the anesthesiologist.
7. Adjust therapies (e.g., ventilation, temperature control devices, etc.) as directed by the anesthesiologist.
8. Administer prescribed pharmacological agents to the patient under the direction of the attending anesthesiologist, observing for side effects and efficacy of treatment during anesthesia to ensure the patient responds appropriately.
9. Assess the patient's physiological status during anesthesia by performing duties such as monitoring vital signs and anesthetic gases and advising the anesthesiologist of the patient's status.
10. Assist at emergence from anesthesia by performing duties such as aspirating secretions from the trachea and pharynx, removing laryngeal mask airways, and tracheal extubation of the patient. Remove monitoring equipment after surgery.
11. Assist with the transfer of ventilated and/or anesthetized patients between areas of the hospital as required.
12. Transfer postoperative patients to the post-anesthesia care unit under the direction of the anesthesiologist.

13. Monitor patient progress in the post-anesthesia care unit, update anesthesia monitoring records, and report patient status to the anesthesiologist, as requested.
14. Provide diagnostic data for the anesthesiologist by performing duties such as blood sampling and analysis, pulmonary functioning testing, end tidal CO₂ monitoring, pulse oximetry, and transcutaneous monitoring.
15. Prepare fibre-optic bronchoscopes and other equipment as required, and assist the anesthesiologist during bronchoscopy with equipment setup, preparation of and instillation of medication, and sample procurement.
16. Assist the anesthesiologist with difficult intubations.
17. Assist the anesthesiologist with cases in locations outside of the operating room.
18. Respond to cardiac arrests in the operating room, post-anesthetic care unit, or other locations, according to hospital procedures and policies.

Administrative Duties

The anesthesia assistant shall:

1. Establish and conduct a preventive maintenance program.
2. In conjunction with the anesthesiology and biomedical engineering departments, maintain a variety of anesthetic equipment by performing duties such as receiving and assessing equipment, testing and identifying malfunctions, and determining whether repairs should be made on site or equipment returned to the vendor. Carry out minor maintenance following manufacturer's and Canadian Standards Association guidelines and verify vendor repairs to ensure equipment is operating in a safe and effective manner.
3. Where appropriate, meet with medical equipment and pharmacological sales representatives to organize trials and evaluations of new equipment and drugs according to hospital protocols. Gather and collate feedback and participate in purchase decisions.
4. Arrange and coordinate servicing and repair of equipment.
5. Communicate with and act as a liaison with supply companies.
6. Remain current with available supplies and equipment and make recommendations for changes/improvements.
7. Maintain supply inventory.
8. Source out supplies and equipment.
9. Assist the department of anesthesia with capital equipment budget by conducting equipment needs assessments and research.
10. Assist in quality assurance activities.

Education and Orientation

The anesthesia assistant shall:

1. Participate in the orientation of new operating room and post-anesthetic care unit staff and students.
2. Participate in teaching of students.
3. Participate in in-service sessions for nursing staff and physicians on new equipment and supplies.
4. Attend training programs as required.

