

GUIDELINES TO THE PRACTICE OF ANESTHESIA

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Guidelines to the Practice of Anesthesia Revised Edition 2010

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Overview *The Guidelines to the Practice of Anesthesia Revised Edition 2010 (the guidelines) were prepared by the Canadian Anesthesiologists' Society (CAS), which reserves the right to determine their publication and distribution. Because the guidelines are subject to revision, updated versions are published annually. Whereas previous versions of the guidelines appeared as special supplements to the Canadian Journal of Anesthesia (the Journal), this edition of the guidelines is published within the Journal. This allows for improved archiving and online access to complement the printed version—a new offering for CAS members and Journal subscribers. The Guidelines to the Practice of Anesthesia Revised Edition 2010 supersedes all previously published versions of this document. 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.*

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Preamble

Anesthesia is a dynamic specialty of medicine. Continuous progress is being made to improve 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 reasonable and acceptable 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 certification process of the Royal College of Physicians and Surgeons of Canada. 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 should continue their education in the practice of anesthesia, pain management, perioperative care, and resuscitation. These guidelines are intended to apply to all anesthesiologists in Canada.

Organization of Anesthetic Services

The department of anesthesia should be properly organized, directed, and integrated with other departments in the organization or facility, and it should include all facility 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 it 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 senior medical administrative bodies for the facility.

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 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 facility;
6. To carry out such other duties as the governing body of the facility may delegate to ensure safe anesthetic care;
7. To promote institutional compliance with applicable Canadian Standards Association (CSA) Standards (Appendix 1); and

8. To coordinate liaison between the departments of anesthesiology, biomedical engineering, and information management services.

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 perioperative period;
4. To provide immediate post-anesthetic management of the patient;
5. To provide resuscitation and intensive care when indicated;
6. To provide relief from acute and chronic pain.

Residents

Residents in anesthesia are registered medical practitioners who participate in the provision of anesthesia services both inside and outside of the operating room as part of their training. 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. With the approval of the governing body of the facility, qualified allied health professionals (herein called anesthesia assistants) may render certain ancillary assistance in providing anesthetic, resuscitative, and intensive care services. These individuals must be properly trained and must have received accreditation from the appropriate authority where applicable. The tasks that the anesthesia assistants may perform must be clearly defined. An anesthesiologist must only delegate or assign to such personnel those tasks for which they have approval or accreditation.

The Canadian Anesthesiologists' Society recognizes the formal job designation, "Anesthesia Assistant". Anesthesia assistants must have completed 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 and the appropriate administrative bodies. Furthermore, anesthesia assistants, like other facility employed health professionals, must be covered by the facility 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 policies of the local facility.

Anesthetic Equipment and Anesthetizing 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 anesthetizing location and for the purchase, maintenance, and inspection of anesthetic and ancillary equipment. The 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 anesthetizing 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 facility medical oxygen supply may vary from 0.93 to 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, an airway pressure monitor, an alternative method of assisted ventilation, 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, 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 facility 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/hr 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 it 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 patient's 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 pre-admission assessment include the presence of significant medical problems (co-morbidities), the nature of the proposed diagnostic or therapeutic procedure, and patient request. All patients should be informed that arrangements will be made if they wish to discuss anesthetic management with an anesthesiologist before admission to the facility. 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 myelosuppression • 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)

continued

Test	Indications
International normalized ratio (INR), activated partial thrombo-plastin 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	<ul style="list-style-type: none"> • 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 *vs* 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 hr after a meal that includes meat, fried or fatty foods;
- 6 hr after a light meal (such as toast and a clear fluid) or after ingestion of infant formula or non-human milk;
- 4 hr after ingestion of breast milk;
- 2 hr 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 facility 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 labelled; and
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 is transferred to the care of personnel in an appropriate care unit.

If the attending anesthesiologist leaves the operating room temporarily, he/she must delegate care of the patient to another anesthesiologist, a resident in anesthesia, or 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 patient's condition is stable and that the anesthesia assistant is familiar with the operative procedure and the operating room environment and equipment. When care is delegated to an anesthesia assistant, the attending anesthesiologist must remain immediately available.

Only under the most exceptional circumstances, e.g., 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. That person's only responsibility would be to monitor the patient during the anesthesiologist's absence and to keep the anesthesiologist informed until he/she returns. In this situation, the anesthesiologist remains responsible for the care of the patient and must inform the operating team.

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 min. Oxygen saturation should be monitored continuously and recorded at frequent intervals. For every patient receiving inhalational, major regional, or monitored intravenous anesthesia, oxygen saturation should be monitored continuously, and end-tidal carbon dioxide concentration should be monitored continuously if the trachea is intubated. 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 the patient's level of consciousness, heart rate, blood pressure, oxygen saturation, and respiratory rate as first determined in the post-anesthesia care unit (PACU).

Patient Monitoring

The only indispensable monitor is the presence, at all times, of a physician or an anesthesia assistant who is under the immediate supervision of an anesthesiologist and has 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 ensuring 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 non-invasively;
- Electrocardiography;
- Capnography, when endotracheal tubes or laryngeal masks are inserted; and
- 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; and
- 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 low-threshold alarm of the pulse oximeter and the capnograph apnea alarm must give an audible and visual warning.

The Post-anesthetic Period

Recovery Facility

In any facility providing anesthetic services, a PACU must be available. Administrative policies in accordance with facility 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 facility 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. The recovery record 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.

In some circumstances, it may be considered acceptable to transfer a patient directly to other care units or to bypass the PACU if the appropriate level of care is available in another unit in the facility and the suitability of the patient for this transfer is documented on the anesthetic record.

Discharge of Patients After Day Surgery

Discharge of patients after day surgery must be through the application of a formal care plan approved by the institution and documented in the patient care notes. Specific written instructions should include management of pain, postoperative complications, and routine and emergency follow up. The patient should be advised regarding the

additive effects of alcohol and other sedative drugs, the danger of driving or the operation of other hazardous machinery during the postoperative period (most commonly 24 hr postoperatively), and the necessity for attention by a competent adult for the postoperative period (most commonly 24 hr postoperatively).

Guidelines for Obstetric Regional Analgesia

Anesthesia services to parturients include obstetric analgesia for labour, for both uncomplicated and complicated deliveries, or for 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 of the Canadian Anesthesiologists' Society and updated as indicated. Each facility 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 facility 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, the facility 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, facility privileges, and licence to provide these services. This includes trainees with appropriate supervision.
3. Regional analgesia should only be initiated and maintained in locations where 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 patient-controlled epidural analgesia (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, an anesthesiologist must be available to intervene appropriately should any complications occur when a bolus dose of local anesthetic is injected through the epidural catheter (except PCEA). The intent of the phrase “available to intervene appropriately” is that individual departments of anesthesiology should 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 facilities 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 the 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 that includes initial training, certification, and ongoing maintenance of competence should be established for nurses caring for patients receiving neuraxial analgesia. 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; and
 - Signs and symptoms of the rare but catastrophic complications of epidural hematoma or abscess.

Policies for Drug Administration

Each facility 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 facility, the anesthesiologist should verify the order with nursing and pharmacy personnel and discuss its indications and all

concerns relating 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 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 ports that could permit unintentional injection of intravenous drugs.

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

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. Before initiating neuraxial analgesia, intravenous access must be secured, and after discontinuing neuraxial analgesia, intravenous access must be maintained for the expected duration of drug effects.

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.

An anesthesiologist must be readily available to advise nursing personnel on such issues as dose titration and management of adverse effects. Each facility 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 facility 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.
- Where neuraxial analgesia is used for prolonged postoperative pain management, every effort should be made to avoid lower extremity motor blockade.
- 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 Facility

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 facility.

Patient Selection

Patients should be classified as to physical status in a manner similar to that in use by the American Society of Anesthesiologists (Appendix 2). Usually, only patients in ASA classifications I and II should be considered for an anesthetic outside a hospital facility. 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 facility 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 (available as Electronic Supplementary Material).

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

1. 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
2. Vaporizer filled
 - Filling ports pin-indexed and closed
 - Ensure “on/off” function and turn off
3. Functioning oxygen bypass (flush)
4. Functioning oxygen fail-safe device
5. 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
6. Functioning common fresh gas outlet
7. Ventilator function verified
8. 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

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

D. Vacuum system

- Suction adequate

E. Scavenging system

- Correctly connected to patient circuit and functioning

F. Routine equipment

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

G. Drugs

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

H. Location of special equipment in each anesthetizing location

- Defibrillator
- Emergency drugs
- Difficult intubation kit

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

Appendix 4 (available at: http://www.cas.ca/members/sign_in/guidelines) provides a non-exhaustive list of sites with official statements promulgated by other related medical organizations, Canadian and worldwide. This list 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 includes sites that were functional in October 2009, and it will be updated periodically.

Appendix 5

Position Paper on Anesthesia Assistants: An Official Position Paper of the Canadian Anesthesiologists' Society (available as Electronic Supplementary Material).