Practice Guidelines for Obstetric Anesthesia

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PRACTICE PARAMETERS

Practice Guidelines for Obstetric Anesthesia

*An Updated Report by the American Society of Anesthesiologists Task Force on Obstetric Anesthesia and the Society for Obstetric Anesthesia and Perinatology**

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Practice guidelines developed by the ASA are not intended as standards or absolute requirements, and their use cannot guarantee any specific outcome.
They provide basic recommendations that are supported by a synthesis and analysis of the current literature, expert and practitioner opinion, open-forum commentary, and clinical feasibility data.

proof of global warming

Category A.

Randomized controlled trials. Statistically significant (P< 0.01).
Outcomes are designated as either beneficial (B) or harmful (H) for the patient;
Statistically nonsignificant findings are designated as equivocal (E).

Level 1:
The literature contains a sufficient number of RCTs to conduct meta-analysis

Level 2:
The literature contains multiple RCTs, but the number of RCTs is not sufficient to conduct a viable meta-analysis

Level 3:
The literature contains a single RCT, and findings are reported as evidence.

Category B.

Observational studies or RCTs without pertinent comparison groups may permit inference of beneficial or harmful relations among clinical interventions and clinical outcomes.

Level 1:
The literature contains observational comparisons (e.g., cohort and case-control research designs) with comparative statistics.

Level 2:
The literature contains noncomparative observational studies with associative statistics.

Level 3:
The literature contains noncomparative observational studies with descriptive statistics.

Level 4:
The literature contains case reports.

Perianesthetic Evaluation and Preparation

1.A focused history and a physical examination
2.An intrapartum platelet count
3.A blood type and screen
4.Perianesthetic recording of fetal heart rate patterns.

Literature is insufficient to give recommendation of category A or B. Guidelines are based on survey.

Conduct a focused history and physical examination before providing anesthesia care.

1.Maternal health and anesthetic history
2.A relevant obstetric history, a baseline blood pressure measurement
3.An airway, heart, and lung examination, consistent with the ASA "Practice Advisory for Preanesthesia Evaluation."
4.When a neuraxial anesthetic is planned, examine the patient's back.
5.Recognition of significant anesthetic or obstetric risk factors should encourage consultation between the obstetrician and the anesthesiologist

Intrapartum Platelet Count.

1. The anesthesiologist's decision to order or require a platelet count should be individualized and based on a patient's history (e.g., preeclampsia), physical examination, and clinical signs.
2. A routine platelet count is not necessary in the healthy parturient

Blood Type and Screen.

1.A routine blood cross-match is not necessary for healthy and uncomplicated parturients for vaginal or operative delivery.
2.It may be recommended basing on anticipated hemorrhagic complications
3.Local institutional policies.

Perianesthetic Recording of Fetal Heart Rate Patterns.

1.FHR patterns should be monitored by a qualified individual before and after administration of neuraxial analgesia for labor.
2.Continuous electronic recording FHR patterns may not be necessary in every clinical setting and may not be possible during placement of a neuraxial catheter.*

*American College of Obstetricians and Gynecologists: ACOG Practice Bulletin No. 106: Intrapartum fetal heart rate monitoring: Nomenclature, interpretation, and general management principles. Obstet Gynecol 2009; 114:192–202.

Aspiration Prevention

1.Clear liquids
2.Solids
3.antacids, H2-receptor antagonists, and metoclopramide

Clear Liquids.

1.The oral intake of moderate amounts of clear liquids may be allowed for uncomplicated laboring patients.
2.The uncomplicated patient undergoing elective surgery may have clear liquids up to 2 h before induction of anesthesia (water, fruit juices without pulp, carbonated beverages, clear tea, black coffee, and sports drinks).
3.The volume of liquid ingested is less important
4.Laboring patients with additional risk factors for aspiration may have further restrictions of oral intake, determined on a case-by-case basis

Solids.

1.Solid foods should be avoided in laboring patients.
2.The patient undergoing elective surgery should fast for solids of 6 - 8 h depending on the type of food ingested (e.g., fat content).

Antacids, H2-receptor Antagonists, and Metoclopramide.

1. Before surgical procedures (e.g., cesarean delivery or postpartum tubal ligation), consider the timely administration of nonparticulate antacids, H2 -receptor antagonists, and/or metoclopramide for aspiration prophylaxis.

Anesthetic Care for Labor and Vaginal Delivery

1.Timing of neuraxial analgesia and outcome of labor
2.Neuraxial analgesia and trial of labor after prior cesarean delivery
3.Anesthetic/analgesic techniques.
A. Early insertion of a neuraxial (i.e., spinal or epidural) catheter for complicated parturients
B. Epidural local anesthetics combined with opioids
C. Higher vs lower concentrations of local anesthetics
D. Pencil-point spinal needles
E. CSE analgesia
F. Patient-controlled epidural analgesia (PCEA).

Timing of Neuraxial Analgesia and Outcome of Labor

There are equivocal findings for spontaneous, instrumented, and cesarean delivery when comparing early administration (i.e., cervical dilations <4 cm) with late administration (i.e., cervical dilations >5 cm) of epidural analgesia (Category A1 evidence)

An RCT comparing cervical dilations of less than 2 cm with greater than or equal to 2 cm also reports equivocal findings (Category A3)

RCTs comparing early vs. late combined spinal–epidural analgesia administration report equivocal findings for cesarean, instrumented, and spontaneous delivery (Category A2)

Recommendations:

1. Provide patients in early labor the option of neuraxial analgesia
2. Offer neuraxial analgesia on an individualized basis **regardless of cervical dilation**.

Neuraxial Analgesia and Trial of Labor after Prior Cesarean Delivery

1.Literature is equivocal regarding mode of delivery, duration of labor, and adverse outcomes when epidural analgesia is used in a trial of labor for previous cesarean delivery patients (Category B1).

2.It is recommended to offer neuraxial techniques to patients attempting vaginal birth after previous cesarean delivery.

3.Consider early placement of a neuraxial catheter that can be used later for labor analgesia or for anesthesia in the event of CS.

Analgesic Concentrations.

Analgesic quality is improved comparing LA + opioids vs. equal concentrations of LA without opioids (Category A1).
Findings were equivocal for frequency of spontaneous delivery, hypotension, pruritus, and 1-min Apgar scores (Category A1).

RCT are equivocal for analgesic efficacy and duration of labor when continuous epidural infusion of low concentrations of LA with opioids are compared with higher concentrations of LA without opioids (Category A2)

A lower frequency of motor block was found for lower concentrations of LA (Category A1).

Recommendations:

1.An IV infusion should be established before the initiation of neuraxial analgesia and maintained throughout the duration of the neuraxial analgesic .

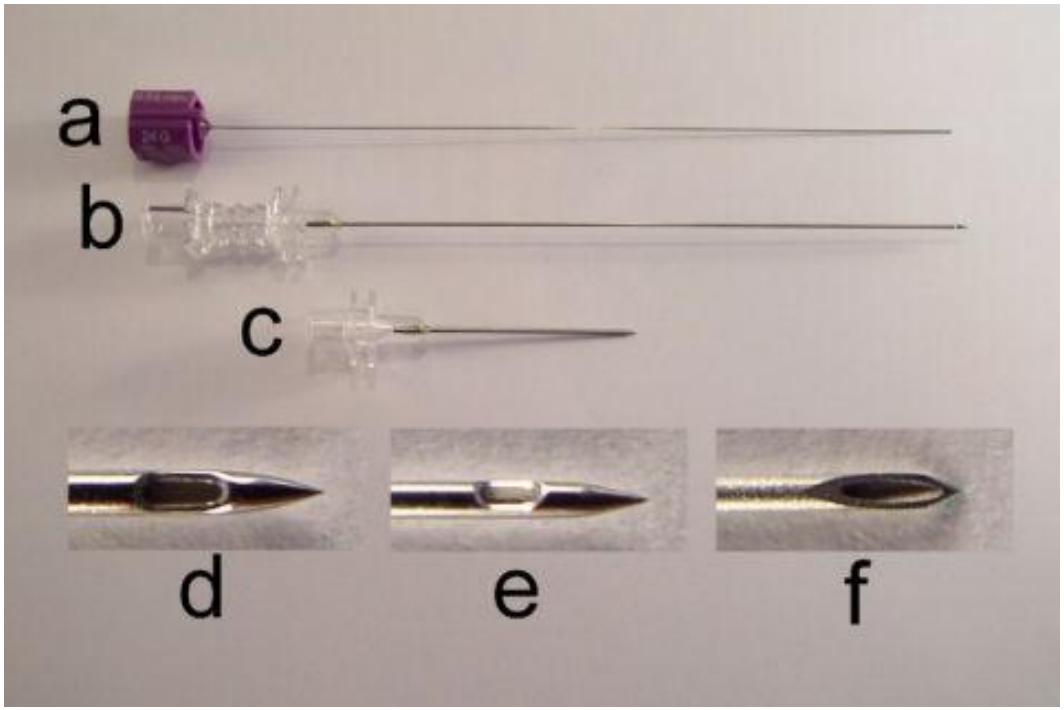
2.However, administration of a fixed volume of IV fluid is not required before neuraxial analgesia is initiated.

3.Use dilute concentrations of LA with opioids to produce as little motor block as possible.

Pencil-point Spinal Needles

Recommendation:

Use pencil-point spinal needles instead of cutting-bevel spinal needles to minimize the risk of PDPH



CSE Analgesia:

1.CSE techniques may be used to provide effective and rapid onset of analgesia for labor.

2.RCTs report improved analgesia and a faster onset time when CSE LA ± opioids are compared with epidural LA ± opioids . (Category A2-B)

Patient-controlled Epidural Analgesia.

Literature reports reduced analgesic consumption when PCEA is compared with CIE (Category A1) .

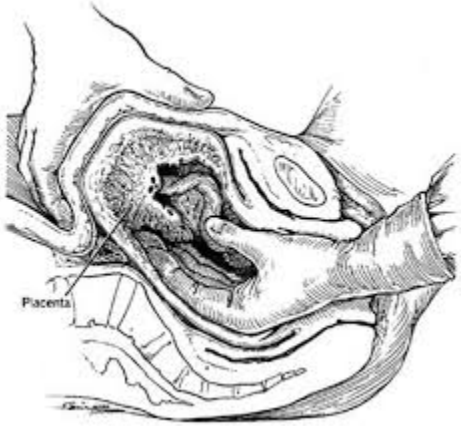
Duration of labor, mode of delivery, motor block, and 1- and 5-min Apgar scores is equivocal when PCEA is compared with CIE (Category A1).

Analgesic efficacy for PCEA with a background infusion is more efficient compared with PCEA without a background infusion and is equivocal regarding mode of delivery and frequency of motor block (Category A1).

Recommendations:

1. The use of PCEA may be preferable to fixed-rate CIE.
2. PCEA may be used with or without a background infusion.

Removal of Retained Placenta- Anesthetic Techniques



The literature is insufficient to assess whether a particular anesthetic technique is more effective than another for removal of retained placenta.

Recommendations:

1.There is no preferred anesthetic technique for removal of retained placenta.
2.If an epidural catheter is in place and the patient is hemodynamically stable, consider providing epidural anesthesia.
3.Assess hemodynamic status before administering neuraxial anesthesia.
4.Consider aspiration prophylaxis.
5.Titrate sedation/analgesia carefully due to the potential risks of respiratory depression and pulmonary aspiration during the immediate postpartum period.
6.In cases involving major maternal hemorrhage with hemodynamic instability, GA with an endotracheal tube may be considered in preference to neuraxial anesthesia

Removal of Retained Placenta- Nitroglycerin for Uterine Relaxation

RCTs comparing IV or sublingual nitroglycerin with placebo for the purpose of uterine relaxation report inconsistent findings for the successful removal of retained placenta (Category A2)

Observational studies and case reports indicate successful uterine relaxation and successful placental removal after IV or sublingual nitroglycerin administration (Category B3)

The ASA consultants strongly agree that nitroglycerin may be used as an alternative to terbutaline or GA with halogenated agents for uterine relaxation during removal of retained placental tissue.

Recommendations:

1.Nitroglycerin may be used as an alternative to terbutaline sulfate or GA with halogenated agents for uterine relaxation during removal of retained placental tissue.

2.Initiating treatment with incremental doses of IV or sublingual (i.e., tablet or metered dose spray) nitroglycerin may be done to sufficiently relax the uterus.

Anesthetic Care for Cesarean Delivery

1.equipment, facilities, and support personnel
2.general, epidural, spinal, or CSE anesthesia;
3.IV fluid preloading or coloading;
4.ephedrine or phenylephrine;
5.neuraxial opioids for postoperative analgesia after neuraxial anesthesia.

General, Epidural, Spinal, or CSE Anesthesia.

Literature Findings:

1.RCTs report higher Apgar scores at 1 and 5 min for epidural anesthesia when compared with GA and equivocal findings for umbilical artery pH values (Category A2)

2.When spinal anesthesia is compared with GA, RCTs report equivocal findings for 1- and 5-min Apgar scores and umbilical artery pH values (Category A1).

3.RCTs also are equivocal regarding total time in the operating room when epidural or spinal anesthesia is compared with GA (Category A2)

4.When SA is compared with EA, RCTs are equivocal regarding induction-to-delivery times, hypotension, umbilical pH values, and Apgar scores (Category A2)

5.RCTs report equivocal findings for the frequency of hypotension and for 1-min Apgar scores, delivery times when CSE is compared with EA and SA (Category A2)

Recommendations:

1.The decision to use a particular anesthetic technique for CS should be individualized, based on anesthetic, obstetric, or fetal risk factors (e.g., elective vs.emergency), the preferences of the patient, and the judgment of the anesthesiologist.

2.Left uterine displacement should be maintained until delivery regardless of the anesthetic technique used.

3.Consider selecting neuraxial techniques in preference to GA for most CS.

4.For urgent cesarean delivery, an indwelling epidural catheter may be used as an alternative to initiation of spinal or GA.

5.GA may be the most appropriate choice in some circumstances (e.g., profound fetal bradycardia, ruptured uterus, severe hemorrhage, and severe placental abruption).

IV Fluid Preloading or Coloading.

Literature Findings:

1.RCT findings are inconsistent regarding the frequency of maternal hypotension when IV crystalloids or colloids for spinal anesthesia is compared with no fluids (Category A2).
2.Data is equivocal for maternal hypotension when IV cristalloids preloading is compared with colloids (Category A2)

Recommendations:

1.IV crystalloids or colloids may be used to reduce the frequency of maternal hypotension after spinal anesthesia for cesarean delivery.
2.Do not delay the initiation of spinal anesthesia in order to administer a fixed volume of IV fluid

Ephedrine or Phenylephrine.

Literature Findings:

1.Evidence of reduced maternal hypotension during SA for CS when IV ephedrine is administered compared with placebo (Category A1)

2.RCTs comparing high doses of phenylephrine with placebo report a lower frequency of hypotension and equivocal findings when lower dosages are administered (Category A2)

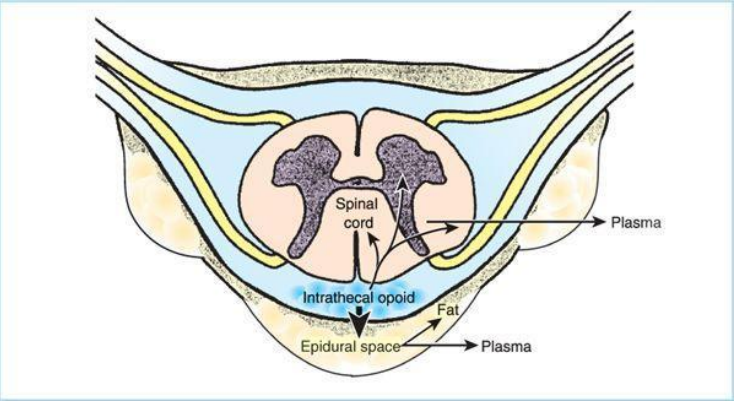
3.Infusions of phenylephrine was associated with higher maternal ABP and higher umbilical artery pH values than with ephedrine (Category A1)

Recommendations:

1.Either IV ephedrine or phenylephrine may be used for treating hypotension during neuraxial anesthesia.

2.In the absence of maternal bradycardia, consider selecting phenylephrine because of improved fetal acid–base status.

Neuraxial Opioids for Postoperative Analgesia



Literature Findings:

1.RCTs comparing epidural opioids with intermittent IV opioids report improved postoperative analgesia for epidural opioids after cesarean delivery and equivocal findings for nausea, vomiting, and pruritus (Category A1)
2.RCTs report improved postoperative analgesia when PCEA is compared with IV PCA with equivocal findings for nausea, vomiting, pruritus, and sedation (Category A2)

Recommendations:

For postoperative analgesia after neuraxial anesthesia for CS, consider selecting neuraxial opioids rather than intermittent injections of parenteral opioids.

Resources for Management of Hemorrhagic Emergencies

Recommendation:
Institutions providing obstetric care should have resources available to manage hemorrhagic emergencies.

Table 1. Suggested Resources for Obstetric Hemorrhagic Emergencies

Large-bore IV catheters
Fluid warmer
Forced-air body warmer
Availability of blood bank resources
Massive transfusion protocol
Equipment for infusing IV fluids and blood products rapidly. Examples include, but are not limited to, hand-squeezed fluid chambers, hand-inflated pressure bags, and automatic infusion devices.

Equipment for Management of Airway Emergencies.

Recommendation:
labor and delivery units should have personnel and equipment readily available to manage airway emergencies consistent with the ASA Practice Guidelines .

Table 3. Suggested Contents of a Portable Storage Unit for Difficult Airway Management for Cesarean Section Rooms

Rigid laryngoscope blades of alternate design and size
Videolaryngoscopic devices
Endotracheal tubes of assorted size
Endotracheal tube guides. Examples include (but are not limited to) semirigid stylets, light wands, and forceps designed to manipulate the distal portion of the endotracheal tube.
At least one device suitable for emergency nonsurgical airway ventilation consisting of a face mask or supraglottic airway device (*e.g.*, laryngeal mask airway, intubating laryngeal mask airway, and laryngeal tube).
Equipment suitable for emergency surgical airway access (*e.g.*, cricothyrotomy)

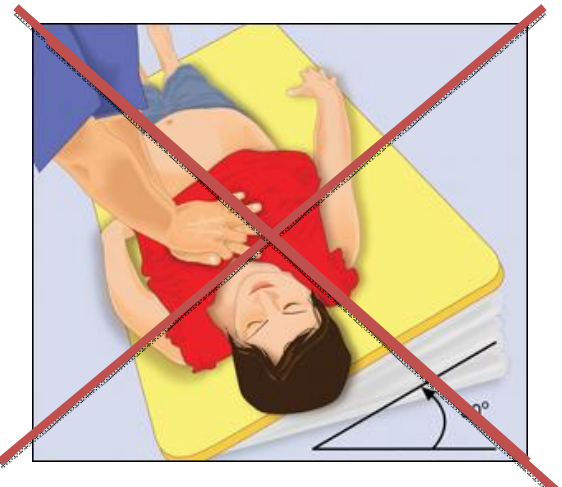
Cardiopulmonary Resuscitation.

Literature Findings:

The literature is insufficient to evaluate the efficacy of CPR in the obstetric patient during labor and delivery.

Recommendations:

1.ACLS equipment should be immediately available in the operative area of labor and delivery units.
2.If cardiac arrest occurs, initiate standard CPR.
3.Left uterine displacement should be maintained.
4.If maternal circulation is not restored within 4 min, CS should be performed by the obstetrics team.



Properly performed CPR in pregnant patients.

Thank you for your attention