The Gerard W. Ostheimer Lecture: What’s New in Obstetric Anesthesia?

Introduction: Lawrence C. Tsen, MD

Speaker: Brenda A. Bucklin, MD

Saturday, May 7
8:15 - 9:15 am

Following this session, the learner will be able to:

1. Identify published contributions from the 2004 calendar year relevant to obstetric anesthesia.

2. Critically evaluate the implications of these contributions on the provision of clinical anesthetic care or the conduct of research for the obstetric patient.

Gerard W. Ostheimer, MD
1940-1995
The Gerard W. Ostheimer Lecture:
What’s New in Obstetric Anesthesia?

Introduction: Lawrence C. Tsen, MD

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Denver, Colorado
"If physicians would read two articles per day out of the six million medical articles published annually, in one year, they would fall 82 centuries behind in their reading." Miser WF. Critical appraisal of the literature. J Am Board Fam Pract 1999;12(4):315-33.

This review covers a wide range of topics from the obstetric anesthesia, obstetrics, and neonatology literature published in 2004. It was produced by a combination of search techniques including hand searches of the table of contents of journals listed below, as well as key word electronic searches of Pub Med, LEXIS/NEXIS, Cochrane Database, and Science Citation index. Although this syllabus is not meant to be exhaustive nor does it represent even a small proportion (<10%) of the references published in 2004, it is intended to provide a nidus for individual research and furthering clinical care.

Journals

Acta Anaesthesiologica Belgica
Acta Anaesthesiologica Scandinavica
Acta Obstetrica et Gynecologica Scandinavica
American Journal of Obstetrics and Gynecology
Anaesthesia
Anaesthesia and Intensive Care
Anesthesia and Analgesia
Anesthesiology
Anesthesiology Clinics of North America
ASA Newsletter
British Journal of Anaesthesia
British Journal of Obstetrics and Gynecology
British Medical Journal
Canadian Journal of Anaesthesia
Clinical Obstetrics and Gynecology
European Journal of Anaesthesiology
European Journal of Obstetrics & Gynecology

Fertility and Sterility
International Journal of Obstetric Anesthesia
JAMA
Journal of Clinical Anesthesia
Journal of Pediatrics
Lancet
Nature
New England Journal of Medicine
Obstetrics and Gynecology
Obstetrics and Gynecologic Survey
Obstetric Anesthesia Digest
Pediatrics
Regional Anesthesia and Pain Medicine

Key points follow many of the headings and subheadings and are listed after the references.
Assisted Reproductive Technologies


6. Wadyka S: For women worried about fertility, egg bank is a new option. NY Times; Sept 21, 2004


- There is convincing evidence that ART is associated with a number of adverse neonatal outcomes (e.g. low birth weight, preterm delivery).

Pregnant Patient, Fetus, and Newborn

Coexisting Disease

Aging


- Advanced maternal age is associated with intercurrent illness, pregnancy complications, perinatal mortality, intrauterine fetal death, and neonatal death.

Allergy/Local Anesthetic Allergy


Autoimmune


Autonomic Dysfunction


Cardiac


- The incidence of congenital heart disease in pregnant patients is increasing because more of these women are reaching childbearing age due to improved medical and surgical therapies.

Connective Tissue/Glycogen Storage


Endocrine


65. Hampton T: Maternal diabetes and obesity may have lifelong impact on health of offspring. JAMA 2004; 292: 789-90

**Gastrointestinal**


**Hepatic**


**Hematologic**


81. Moeller-Bertram T, Kuczkowski KM, Benumof JL: Uneventful epidural labor analgesia in a parturient with immune thrombocytopenic purpura and platelet count of 26,000/mm3 which was unknown preoperatively. J Clin Anesth 2004; 16: 51-3


Hypertension


Immunologic


Infection


117. Goldberg D, Anderson E: Hepatitis C: who is at risk and how do we identify them? J Viral Hepat 2004; 11 Suppl 1: 12-8


105


- ACOG published updated guidelines for the antenatal and intrapartum treatment of pregnant women with HIV.
- HIV positive patients are at risk for neuropathies, local infections, or clotting abnormalities, which, on rare occasions preclude the use of regional anesthesia.

Metabolic


Musculoskeletal


Neoplasm


Neurologic


Obesity


156. In the delivery room, a woman's weight may impact clinical choices. Hosp Health Netw 2004; 78: 60

- Morbid obesity in early pregnancy is associated with pregnancy complications (e.g. preeclampsia, antepartum stillbirth, cesarean delivery) and perinatal conditions (e.g. meconium aspiration, fetal distress, early neonatal death), as is excessive weight gain during pregnancy (i.e. increased BMI).

Orthopedic


Pain


Psychiatric


Pulmonary


Renal


Substance Abuse


• There is evidence to suggest that illicit and licit drug use during pregnancy alters placental function and adversely affects fetal outcome.

Transplant


Trauma


**Vascular**


**Complementary and Alternative Medicine**


**Fetus**

**Fetal Monitoring**

208. ACOG Committee Opinion #303: Inappropriate use of the terms fetal distress and birth asphyxia. Obstet Gynecol 2004; 104: 903


• When used with electronic fetal monitoring, fetal pulse oximetry may provide additional information to more accurately assess fetal oxygenation during labor and reduce cesarean delivery rate.

• ST segment analysis has been introduced to improve observer consistency in both decision-making and timing of obstetric decisions.

Fetal Surgery


- Advances in fetal surgery are represented by the progress to: 1) physiologic manipulation; 2) fetoscopic techniques; 3) randomized controlled trials.

Maternal Fever and Neonatal Sepsis Evaluation


Newborn Behavior


Breast Feeding


Cerebral Palsy


- In collaboration with the American Academy of Pediatrics, ACOG published an executive summary outlining the criteria necessary for defining an acute intrapartum event sufficient to cause cerebral palsy.
- Major abnormalities were evident in 80% of preterm infants who underwent cranial ultrasound and subsequently developed cerebral palsy.

Low Birth Weight/Preterm Delivery


• *In very low birth weight infants without sepsis, the diagnosis of meningitis is missed in nearly one-third.*

**Meconium Aspiration**


  • Infants with meconium-stained amniotic fluid who received no intrapartum suctioning had no difference in the need for or duration of mechanical ventilation, oxygen therapy, or length of hospital stay when compared with those who received suctioning before delivery of the shoulders.

Morbidity


266. Hampton T: Fetal environment may have profound long-term consequences for health. JAMA 2004; 292: 1285-6


Mortality


• Women with prior fetal death (~16-18 weeks gestation) are at high risk for subsequent pregnancy loss and recurrent fetal death, with fewer than 25% of pregnancies resulting in surviving infants.

Respiratory Distress


279. Stevens TP, Blennow M, Soll RF: Early surfactant administration with brief ventilation vs selective surfactant and continued mechanical ventilation for preterm infants with or at risk for respiratory distress syndrome. Cochrane Database Syst Rev 2004: CD003063


- ATP-binding cassette transporter A3 (ABCA3) is critical for the proper formation of lamellar bodies and surfactant function. Its absence causes fatal surfactant deficiency in newborns.

Resuscitation/Evaluation


- For term and near-term infants, air should be used initially followed by oxygen administration if initial resuscitation fails.
- Polyethylene occlusive skin wrap from the neck down prevents rather than delays heat loss at delivery in very preterm infants.

**Umbilical Cord Issues**


**Non-Obstetric Surgery During Pregnancy**


300. Uemura K, McClaine RJ, de la Fuente SG, Manson RJ, Campbell KA, McClaine DJ, White WD, Stamler JS, Eubanks WS, Reynolds JD: Maternal insufflation during the second trimester equivalent produces hypercapnia, acidosis, and prolonged hypoxia in fetal sheep. Anesthesiology 2004; 101: 1332-8


308. Martin F, Viviani X, Desbriere R, Bouli L, Martin C: [Do we have to monitor foetal heart rate during general anesthesia?]. Ann Fr Anesth Reanim 2004; 23: 1179-81

- Carbon dioxide insufflation during 2nd trimester produces insufflation-induced hypercapnia and respiratory acidosis accompanied by fetal hypoxia and cardiovascular depression in the sheep model.

Pharmacologic Alterations in Pregnancy


Physiologic Alterations in Pregnancy


• Echocardiography during pregnancy reveals substantial increases in cardiac output during the 3rd trimester due to increased heart rate and stroke volume. Blood pressure remained normal because of decreased SVR.

Uterine Blood Flow/Placental Abnormalities


Obstetrics

Complications

Abdominal/Interstitial Pregnancy


Amniocentesis


Amniotic Fluid Embolism


- **Transesophageal echocardiography may be useful as a diagnostic tool in the obstetric suite when catastrophic events require diagnosis.**

**Chorioamnionitis/Infection**


**Grand Multiparity**


**Hemorrhage**


- Pharmacologic (e.g. misoprostol by several routes) and mechanical methods (e.g. uterine artery ligation, uterine artery embolization, non-inflatable anti-shock garment, B-Lynch technique) are used to treat postpartum hemorrhage.
- There are several reports in the literature of the use of Recombinant Factor VIIa for intractable postpartum hemorrhage

Hyperemesis Gravidarum


Macrosomia


**Maternal Morbidity**


**Maternal Mortality**


374. Brettingham M: Depression and obesity are major causes of maternal death in Britain. BMJ 2004; 329: 1205


- In the US, a case control study of pregnancy-related deaths, near-miss morbidity, and severe morbidity revealed that 41% of the deaths and 46% of the near-misses were preventable. Provider issues contributed to 90% of the cases.

- Confidential Enquiries into Maternal Deaths (2000-2002) revealed six deaths attributed to general anesthesia (a similar rate to the 1982-84 report) and an additional 20 maternal deaths in which poor anesthetic care contributed.

**Multiple Gestation**


388. Leung TY, Lok IH, Tam WH, Leung TN, Lau TK: Deterioration in cord blood gas status during the second stage of labour is more rapid in the second twin than in the first twin. BJOG 2004; 111: 546-9


393. Walker MC, Murphy KE, Pan S, Yang Q, Wen SW: Adverse maternal outcomes in multifetal pregnancies. BJOG 2004; 111: 1294-6


- Multiple gestation pregnancies are associated with increases in cardiac and hematologic morbidity, amniotic fluid embolism, preeclampsia, gestational diabetes, postpartum hemorrhage, need for obstetric intervention, hysterectomy and blood transfusion.

**Obstetric Trauma/Injury/Lacerations**


399. Howden NL, Weber AM, Meyn LA: Episiotomy use among residents and faculty compared with private practitioners. Obstet Gynecol 2004; 103: 114-8


- Mediolateral episiotomy is associated with reduced pelvic floor muscle strength compared with spontaneous perineal lacerations.

Ovarian Hyperstimulation Syndrome


Pain


- Postpartum perineal pain is common among all women but perineal pain is more frequent and severe for women with increased perineal trauma (e.g. following operative vaginal delivery).

Placenta Previa/Accreta


• Several diagnostic modalities (ultrasound, color Doppler, and MRI) may be helpful in preoperative diagnosis and planning of perinatal procedures.

Placental Abruption


Post-term Pregnancy


Preeclampsia


448. Thapa L, He CM, Chen HP: Study on the expression of angiotensin II (ANG II) receptor subtype 1 (AT1R) in the placenta of pregnancy-induced hypertension. Placenta 2004; 25: 637-41


- There is a better understanding of the contribution of angiogenic proteins, inflammatory system activation and cell adhesion in the development of preeclampsia.
- In cases of mild preeclampsia, the risk-benefit ratio of magnesium administration is not favorable.
- In some women with eclamptic seizures and without neurologic deficits, persistent areas of infarction will be identified on MRI.

Preterm labor/delivery


- A recent study determined that there was no difference between oral rofecoxib and intravenous magnesium sulfate in arresting preterm labor.
- Weekly courses of antenatal steroids did not improve neonatal outcomes compared with single-course therapy, and were associated with an increased risk of chorioamnionitis.

**Pulmonary Embolism**


- Embolism (thrombotic, air, and AFE) is the leading cause of maternal death.

**Retained Placenta**


**Umbilical Cord Problems**


• Term infants with a short umbilical cord had a 2-fold increased risk of death, suggesting closer postpartum monitoring of these infants is needed.

Uterine Inversion


Uterine Rupture


• Labor induction using a transcervical Foley catheter has not been associated with an increased risk of uterine rupture.
• A study of fetal heart rate characteristics in patients with uterine rupture revealed episodes of fetal bradycardia during both the 1st and 2nd stages of labor.

Critical Care for Obstetric Patients


• Preeclampsia/eclampsia and obstetric hemorrhage are leading causes of admission to the intensive care unit.
Obstetric Management

Alternative Management


• Water birth may be associated with potential complications that are not seen with land-based birth. Rates of complications are likely low but not well defined.

Antepartum Care


• Compared to hospitalization, antenatal "day-care" resulted in greater patient satisfaction and shorter stay. There were no differences in interventions or cost.

Birth Centers


Breech


501. Leung TY, Sahota DS, Fok WY, Chan LW, Lau TK: External cephalic version induced fetal cerebral and umbilical blood flow changes are related to the amount of pressure exerted. BJOG 2004; 111: 430-5


- *It is unclear whether anesthetic administration increases the external cephalic version success rate enough to justify its routine use.*
- *Comparison of nitroglycerin versus terbutaline for external cephalic version revealed a greater rate of success for terbutaline, but more maternal symptoms.*
- *When greater force is applied during external cephalic version, there is a greater reduction in pulsatility indices of middle cerebral and umbilical arteries.*

**Cerclage Placement**


- Insertion of a Shirodkar cerclage in women with a short cervix does not substantially reduce the risk of early preterm delivery.

**Cesarean Delivery**


517. Juntunen K, Makarainen L, Kirkinen P: Outcome after a high number (4-10) of repeated caesarean sections. BJOG 2004; 111: 561-3


520. Diniz SG, Chacham AS: "The cut above" and "the cut below": the abuse of caesareans and episiotomy in Sao Paulo, Brazil. Reprod Health Matters 2004; 12: 100-10


524. Rashid M, Rashid RS: Higher order repeat caesarean sections: how safe are five or more? BJOG 2004; 111: 1090-4

525. Johnson R: C-Sections and the real crime, NY Times, April 12, 2004

526. Grady D: Moms fuming as more hospitals mandate repeat C-sections, The Denver Post, Nov 29, 2004

• Intrapartum elective cesarean delivery (i.e. cesarean delivery offered by the obstetrician or requested by the patient before being medically indicated), a previously unrecognized clinical entity was defined in 2004.

• Cesarean delivery is associated with increased risks of endometritis, the need for transfusion, and pneumonia; however, rates are lower than previously reported.

• A dose-finding study determined that the ED90 for an oxytocin bolus to achieve satisfactory uterine contractions was 0.35U and the ED100 was 0.5U.

Induction of Labor


532. ACOG Committee Opinion Number 228: Induction of labor with misoprostol. Reaffirmation in 2004

- *Extra-amniotic saline infusion may be associated with a greater risk of chorioamnionitis when compared with other methods of labor induction.*
- *A single outpatient intravaginal dose of misoprostol is effective in decreasing the interval to delivery in women with unfavorable cervices at term.*

**Instrumental Delivery**


**Intrapartum Care**


551. Joint Commission on Accreditation of Healthcare Organizations: Sentinel Event Alert #30, Joint Commission on Accreditation of Healthcare Organizations, July 21, 2004

- Myometrial lactic acidosis may be a factor contributing to dysfunctional labor.
- Epidural analgesia results in great clinician force applied to the fetus for vaginal delivery (25/27 spontaneous vaginal deliveries) in multiparas, but without perineal trauma.

**Oral Intake during Labor**

553. Scheepers HC, de Jong PA, Essed GG, Kanhai HH: Carbohydrate solution intake during labour just before the start of the second stage: a double-blind study on metabolic effects and clinical outcome. BJOG 2004; 111: 1382-7

- Carbohydrate intake prior to the second stage does not reduce instrumental delivery rate.

Postpartum Care


Termination of Pregnancy


568. Bush signs new law on harming fetuses, NY Times, April 2, 2004

569. Paracervical block with psychological support is comparable to pain control using psychological support alone; neither pain management regimen provides sufficient pain control.

Vaginal Birth after Cesarean Delivery


576. Dodd JM, Crowther CA, Huertas E, Guise JM, Horey D: Planned elective repeat caesarean section versus planned vaginal birth for women with a previous caesarean birth. Cochrane Database Syst Rev 2004: CD004224


- ACOG revised its Practice Bulletin stating that women with 2 or more previous cesarean deliveries are not candidates for trial of labor.
- Perinatal risk is greater with trial of labor after prior cesarean delivery compared with elective repeated cesarean delivery without labor, but the absolute risks are low (~1:586).

**Obstetric Anesthesia**

**Labor Analgesia**

**Alternative Techniques**


- Evidence for acupuncture as an adjunct to conventional pain control during labor is promising but not convincing.
- Well-designed trials are needed to confirm the effects of hypnosis on childbirth.

**Ambulation**


- Ambulation for women with epidural analgesia provides no benefit for delivery outcomes or maternal satisfaction but reduces epidural bupivacaine and oxytocin requirements.

**Anatomy**


- Epidural catheter passage is unlikely in the presence of intact dura or after uncomplicated CSE. Inadvertent subarachnoid passage suggests dural damage with the epidural needle.
- When using a midline approach during epidural placement, the ligamentum flavum may be absent in some areas.
**Benefit of Labor Analgesia**


**Breastfeeding**


- A retrospective questionnaire concerning breast-feeding practices determined that patients who had received epidural analgesia reported the problem of "not having enough milk" compared to patients receiving other methods of pain control.

**CSE Analgesia/Technique**


604. Arya VK, Malhotra SK: "Oily" streak formation on aspiration of cerebrospinal fluid into local anesthetic solution: its significance in the combined spinal-epidural technique. Anesthesiology 2004; 101: 1049-50


- Real-time ultrasonic scanning of the lumbar spine provides the accurate location of the needle tip by surveying the location of interspinal and flaval ligaments.

**Epidural Analgesia/Technique**


612. Lindow SW, Dhillon AR, Husain SW, Russell IF: A randomised double-blind comparison of epidural fentanyl versus fentanyl and bupivacaine for pain relief in the second stage of labour. BJOG 2004; 111: 1075-80


- Continuous intermittent bolus technique (5 mL boluses hourly, with the first bolus 30 min postinduction) is a good alternative to continuous epidural infusions for maintenance of epidural analgesia after CSE.
- Race and ethnicity continue to be significant predictors of use of epidural analgesia after controlling for age, rural-urban residence, and availability of anesthesiologists.

Equipment


- Small-bore spinal catheters with higher-strength characteristics may reduce the risk of catheter breakage.
- Incidence of failure and postdural puncture headache appears to be similar when comparing a newly designed Ballpen needle with the Sprotte needle.
- There is no difference with regard to spread of local anesthetic or contrast medium when an epidural bolus injection is administered by a Tuohy needle or catheter.

Fetal Effects


- Fetal heart rate changes (bradycardia or late decelerations) are more frequent after CSE using 7.5 mcg of intrathecal sufentanil as compared with lower doses or other forms of neuraxial sufentanil.
- Intrathecal clonidine prolongs spinal analgesia with ropivacaine and sufentanil at the expense of maternal hypotension, new onset fetal heart rate abnormalities and neonatal umbilical artery pH.

Fluid Preloading


- Rapid crystalloid administration after, rather than over 20 minutes before the induction of spinal anesthesia may be advantageous in managing maternal blood pressure prior to delivery.
Maternal Education


Maternal Position

629. Lewis NL, Ritchie EL, Downer JP, Nel MR: Left lateral vs. supine, wedged position for development of block after combined spinal-epidural anesthesia for Caesarean section. Anaesthesia 2004; 59: 894-8


- Left lateral position is associated with relatively slower block onset, but produces a spinal block with similar characteristics to that obtained in the supine wedged position.
- In obese parturients, the lateral recumbent head-down position for epidural placement reduces the incidence of lumbar epidural venous.
- Hip-flexed postures do not influence local anesthetic spread or symmetry of thermo-algesic blockade after induction of epidural analgesia.

Maternal Satisfaction


636. ACOG Committee Opinion #295: pain relief during labor. Obstet Gynecol 2004; 104: 213

638. Punger D: Importance of continuous doula support during labor. Am Fam Physician 2004; 70: 448


- Compared to patient-controlled IV opioid analgesia, PCEA: 1) provides "superior" analgesia; 2) produces less maternal and neonatal sedation; 3) does not increase risk for obstetrical interventions.
- Childbirth education and effective analgesia are less effective than support and listening in improving the woman's birth experience.

Obstetric Management


- Further studies are needed to assess pelvic floor morbidity and risk of 2nd stage cesarean delivery in patients with delayed pushing during epidural analgesia.

Parenteral Technique


**PCEA Analgesia/ Technique**

650. Purdie NL, McGrady EM: Comparison of patient-controlled epidural bolus administration of 0.1% ropivacaine and 0.1% levobupivacaine, both with 0.0002% fentanyl, for analgesia during labour. Anaesthesia 2004; 59: 133-7

651. Boselli E, Debon R, Cimino Y, Rimmele T, Allaouchiche B, Chassard D: Background infusion is not beneficial during labor patient-controlled analgesia with 0.1% ropivacaine plus 0.5 microg/ml sufentanil. Anesthesiology 2004; 100: 968-72


• Use of a background infusion with PCEA leads to a greater consumption of anesthetic solution without improving patient comfort or satisfaction.

**Pharmacology**


671. Lacassie HJ, Lacassie HP, Muir HA: Is the minimum local analgesic concentration method robust enough? Anesthesiology 2004; 101: 550; author reply 550-1


- Compared to racemic mixtures, the effects of $S(+)$-ketamine on uterine perfusion and maternal/fetal hemodynamics are similar in chronically instrumented pregnant sheep. There is a decreased effect of $S(+)$-ketamine on maternal and fetal PCO2 levels, making it potentially attractive as a labor analgesic.
- Duration of intrathecal sufentanil labor analgesia exhibits a temporal pattern with 30% variations throughout the day.
- Intrathecal midazolam increases the analgesic effects of fentanyl without increasing maternal or fetal adverse effects.

**Physiology**


686. Takahashi Y, Yamaguchi S, Tezuka M, Kimura Y, Nagao M, Yamazaki H, Hamaguchi S: Comparison of 0.2% ropivacaine, 0.125% bupivacaine, and 0.25% bupivacaine for duration and magnitude of action in peripheral arterial blood flow induced by sympathetic block in dogs. Reg Anesth Pain Med 2004; 29: 441-5


- Labor epidural analgesia significantly improves respiratory function.
- Wavelet transform may be used to detect changes in autonomic activity that may predict hemodynamic compromise after neuraxial blockade.

Progress of Labor/Outcome


691. Liu EH, Sia AT: Rates of caesarean section and instrumental vaginal delivery in nulliparous women after low concentration epidural infusions or opioid analgesia: systematic review. BMJ 2004; 328: 1410


- Epidural analgesia compared to IV meperidine analgesia during labor does not increase the number of cesarean deliveries.
- There is no major outcome advantage or difference in mode of delivery comparing continuous epidural infusion of ropivacaine 0.1% with fentanyl over bupivacaine 0.1% with fentanyl.

Spinal Analgesia/Technique


- Spinal bony landmarks and radiological characteristics of lumbar vertebrae are independent predictors of difficulty during spinal anesthesia. Level of training does not affect difficulty score.
- The tenth rib line may be a new landmark of the lumbar vertebral level and can prevent spinal puncture from being performed above L1.

Termination of Pregnancy


- Compared with paracervical block alone, addition of 1% intrauterine lidocaine infusion results in no improvement in pain perception during 1st trimester termination of pregnancy.

Test Dose


- Plain ropivacaine (25 mg) solution is unsuitable for use as an IV test dose during regional anesthesia because CNS symptoms are inadequate.
- Use of a low concentration (e.g. 9 ml of 0.1% ropivacaine) test dose has not been shown to be a reliable indicator of intrathecal catheter placement.

Anesthesia for Cesarean Delivery

General Anesthesia

703. Chin KJ, Yeo SW: Bispectral index values at sevoflurane concentrations of 1% and 1.5% in lower segment cesarean delivery. Anesth Analg 2004; 98: 1140-4


710. Harle CC, McKendrick R: Fresh frozen plasma for succinylcholine apnoea. Anaesthesia 2004; 59: 89; author reply 89-90


713. Smiley R: Partners should be allowed to stay in the operating theatre during caesarean section under general anaesthesia. Int J Obstet Anesth 2004; 13: 253-6


- Based on BIS data, sevoflurane should be administered to patients having uncomplicated Caesarean section at concentrations of at least 1.2-1.3% to minimize risk of awareness and recall.
- Short-lived neonatal rigidity and respiratory depression may occur following remifentanil administration during cesarean delivery.
- The decision on whether to permit the father or other partner to be present during any part of the birth process should be based on an assessment of benefits and risks to mother and fetus.

Oxygenation


- Supplemental oxygen administration does not increase fetal oxygenation when the uterine incision to delivery interval is prolonged.
- There are no differences in umbilical cord venous or arterial blood gases when patients receive room air or supplemental oxygen during cesarean delivery.

Preoperative Evaluation

Postoperative Hypothermia/Shivering


• Study results suggest that spinal meperidine decreases the incidence and intensity of shivering associated with spinal anesthesia for cesarean delivery.

Postoperative Nausea and Vomiting


• In parturients who received spinal anesthesia for elective cesarean delivery, the combination of subhypnotic-doses of propofol and dexamethasone was more effective than propofol alone in reducing emetic symptoms.

• The safest or least expensive antiemetic should be administered first because these medications are similarly effective and act independently.

Postoperative Pain Management


• Chronic pain after Caesarean delivery seems to be a significant problem in at least 6% of patients.
• In a study where all patients received subarachnoid bupivacaine and fentanyl with 1) morphine and clonidine; 2) morphine; or 3) clonidine, the addition of morphine plus clonidine improved pain relief compared with bupivacaine, fentanyl and morphine or clonidine, but increased intraoperative sedation and possibly perioperative vomiting.
• Encapsulated epidural morphine shows promise for postoperative pain control after cesarean delivery.

Pruritus


• Celecoxib is ineffective in reducing intrathecal morphine-induced pruritus in patients undergoing cesarean delivery.

Regional Anesthesia


• When doses of intrathecal bupivacaine less than the ED95 (11mg), especially near the ED50, are administered, doses should be administered as part of a catheter-based technique.
• When compared with single-shot spinal anesthesia, epidural volume extension (i.e. epidural top-up with saline) after small-dose spinal block (55% of dose) provides satisfactory anesthesia for cesarean delivery and is associated with more rapid motor recovery of the lower extremities.
• Sedation during epidural anaesthesia depends on sensory block level and is associated with detectable block-dependent alterations in brainstem auditory evoked responses.

Timing of Delivery


767. Thomas J, Paranjothy S, James D: National cross sectional survey to determine whether the decision to delivery interval is critical in emergency caesarean section. BMJ 2004; 328: 665


Vasopressors


- Leg wrapping with elastic bandages prevents maternal hypotension after epidural anesthesia.
- Compared to ephedrine, phenylephrine administration results in more favorable effects on uterine and placental circulations without significant differences in fetal acid-base status or lactate concentrations.
- There is evidence to suggest that IV phenylephrine decreases rostral spread of spinal anesthesia in pregnancy, compared with IV ephedrine.
Anesthesia for Postpartum Tubal Ligation

Anesthetic Complications

Airway


782. Hilditch WG, Kopka A, Crawford JM, Asbury AJ: Interobserver reliability between a nurse and anaesthetist of tests used for predicting difficult tracheal intubation. Anaesthesia 2004; 59: 881-4


787. Vadodaria BS, Gandhi SD, McIndoe AK: Comparison of four different emergency airway access equipment sets on a human patient simulator. Anaesthesia 2004; 59: 73-9


• Several case reports document the use of laryngeal mask airway for airway maintenance during emergency cesarean delivery after failed intubation.
• Difficult airway letters may have significant utility even if patients do not obtain MedicAlert bracelets.

**Allergy**


• Patients without a history of latex allergy, but with a history suspicious for latex allergy can develop a life-threatening latex allergy at any time.

• Of five latex-free breathing bags tested, only the Intersurgical complete respiratory system provided an adequate safety mechanism (i.e. in-circuit pressures <45 cmH2O) and did not potentially compromise patient safety.

**Arrhythmias**


800. Kuczkowski KM: Myocardial ischemia induced by intramyometrial injection of methylergonovine maleate. Anesthesiology 2004; 100: 1043


**Aspiration Prophylaxis**


- When preoperative gastric pH and volume were compared in patients undergoing elective and emergent cesarean delivery, pH and volume were similar in both groups.
- A French acid prophylaxis survey comparing 1998 vs 1988 practice determined that there was a significant overall improvement regarding acid aspiration prophylaxis in obstetrics.

**Cardiac Arrest**


**Drug Error**

806. Hampton T: Bar codes mandated for hospital meds. JAMA 2004; 291: 1685-6


- Several case reports of drug errors in the labor suite are reminders of the need for continued vigilance.

**Drug Exposure**


**Equipment**


- Sudden, jerky movements during spinal placement can result in severely distorted spinal needles.

Hearing Impairment/Loss


- A recent report suggests that spinal anesthesia does not produce hearing loss.

High/Total Spinal


- Documented subdural block after intended subarachnoid anesthesia can produce extensive sensory block and respiratory compromise.

Hypotension

Inadequate Anesthesia


- When considering spinal anesthesia for cesarean section following inadequate labor epidural analgesia: 1) avoid epidural boluses immediately preceding spinal injection; 2) use a lower spinal dose; 3) delay supine positioning following spinal injection.

- A large retrospective review determined that the overall failure rate for labor epidural catheters was 12%. Spinal anesthesia for cesarean delivery had a lower failure rate of 2.7%, with 1.2% of the patients requiring general anesthesia.

Infection


- Although spinal-epidural abscess is a rare complication, case reports are reminders for strict attention to sterile technique when performing epidural catheterization.
- Modern innovations in hand washing procedures and products can improve opportunities for anesthesiologists to employ safe hand hygiene.
- Local anesthetics suppress HLA-DR expression on the surface of human monocytes, which may have some importance in the immunocompromised.

Intravenous Toxicity


843. Weinberg GL, Hertz PH, Newman J: Local anesthetic cardiac toxicity can present as late-onset hypotension, bradycardia, and asystole. Anesthesiology 2004; 101: 553


- In a porcine model of bupivacaine-induced cardiac arrest, CPR with a combination of vasopressin and epinephrine resulted in significantly better survival rates than placebo, epinephrine, or vasopressin alone.
- Atypical cases of local anesthetic toxicity may go unrecognized and underreported because there are no arrhythmias and the time course varies from the classic presentation.
Nausea/Vomiting


Neurologic Injury


856. Lambert DH, Lambert LA, Strichartz GR: Questioning the mechanism of nerve injury. Anesthesiology 2004; 101: 1249; author reply 1249-50


862. Todd MM: Anesthetic neurotoxicity: the collision between laboratory neuroscience and clinical medicine. Anesthesiology 2004; 101: 272-3


864. Lambert DH, Strichartz GR: In defense of in vitro findings. Anesthesiology 2004; 101: 1246-7; author reply 1247-8


• Unlike non-obstetric claims, obstetric claims in the closed-claims analysis were predominately associated with minor injuries and were block-related in approximately 50% of cases.
• Neurologic complications occur significantly more often after epidural than after spinal blockade.
• Although anesthesiologists are frequently called to evaluate neurologic deficits, most postpartum nerve injuries are not directly related to neuraxial blockade.
• Highly concentrated local anesthetics cause nerve membrane disruption resulting in irreversible neural injury.

Other Injury


878. von Knobelsdorff G, Paris A: [Intracerebral hemorrhage after cesarean section under spinal anesthesia. Coincidence or causality?]. Anaesthesist 2004; 53: 41-4


- The cause of spontaneous spinal epidural hematoma in a pregnant patient is likely multifactorial, resulting from pregnancy-induced structural changes in arterial walls and hemodynamic changes.
- Postpartum cerebral angiopathy is an important cause of ischemic or hemorrhagic stroke in the postpartum period.

Postdural Puncture Headache/Dural Puncture


- There is no advantage of using Synacthen Depot (containing first 24 amino acids occurring in natural ACTH) 1 mg for the treatment of postdural puncture headache.
- Prophylactic epidural blood patch shortens the duration of PDPH symptoms but does not decrease the incidence of PDPH or need for therapeutic blood patch.
• Anesthetists need to include intracerebral hemorrhage in the differential diagnosis of postdural puncture headache.

Pruritis


• Ondansetron 4 or 8 mg IV is ineffective in reducing the incidence or severity of intrathecal fentanyl-induced pruritus during labor.

Respiratory


Respiratory Depression


Urinary Incontinence/Retention


• Intrathecal opioids decrease bladder function by causing dose-dependent suppression of detrusor contractility and decreased sensation of urge.

Consent


- Studies are needed to determine socioeconomic and demographic factors that affect consent rates for clinical studies.

**Economics and Staffing**


911. Abouleish AE, Prough DS, Vadhera RB: Influence of the type of anesthesia provider on costs of labor analgesia to the Texas Medicaid program. Anesthesiology 2004; 101: 991-8


• Despite lower per-unit reimbursement of CRNAs, costs of labor analgesia billed to Texas Medicaid were 19% to 26% less per patient when provided by anesthesiologists than by CRNAs.
• The recycling of glass is good for the environment but only results in a small savings to the hospital.

Pharmacology


923. Awad IT, Chan V: Developing yet another spinal analgesic drug? Can J Anaesth 2004; 51: 871-4


937. Chassard D, Bruguerolle B: Chronobiology and anesthesia. Anesthesiology 2004; 100: 413-27


- The efficacy and toxicity of local anesthetics depend on time of administration.
- CSF density and volume (calculations were based on measurements by axial MRI of low-thoracic, lumbar and sacral spine) influence spread of spinal anesthesia (i.e. lower CSF volume and higher CSF density means higher peak sensory level) with plain bupivacaine. CSF volume also influences duration (i.e. the higher the level of the spinal block, the more time is required for regression).

Miscellaneous

Economics


Ethics


950. Vastag B: Merits of embryo screening debated. JAMA 2004; 291: 927-9


**Genetics**


**History**


**Labor Support**


**Medicolegal Issues**


967. Davies JM: Obstetric anesthesia closed claims- trends over the last three decades. ASA Newsletter 2004; 68: 12-3

968. Davis R: Group targets anesthesia errors, USA Today, October 6, 2004


**Obituaries**


**Professionalism**


**Research**


978. Myles PS: The pain visual analog scale: linear or nonlinear? Anesthesiology 2004; 100: 744; author reply 745


Websites/Books/Leaflets/Announcements/Abstracts


983. Wissler RN: Another busy year for SOAP. ASA Newsletter 2004; 68: 32


