What's new in anesthetic management for OB-GYN patients

CRISTINA WOOD, MD MS
ASSOCIATE PROFESSOR, UNIVERSITY OF COLORADO SCHOOL OF MEDICINE
SECTION CHIEF ANESTHESIA OB/GYN
PROGRAM DIRECTOR OBSTETRIC ANESTHESIOLOGY FELLOWSHIP
MEDICAL DIRECTOR ANESTHESIOLOGY, COLORADO FETAL CARE CENTER

Disclosures

I have no commercial interests or other financial disclosures

Learning Objectives

- Evaluate the benefits and drawbacks of labor epidurals
- Understand various pain management techniques for cesarean delivery
- Analyze current perioperative pregnancy testing and breastfeeding recommendations after anesthesia exposure
- Review recent anesthetic management recommendations for second trimester abortions

Epidural Analgesia for Labor: Benefits and Drawbacks

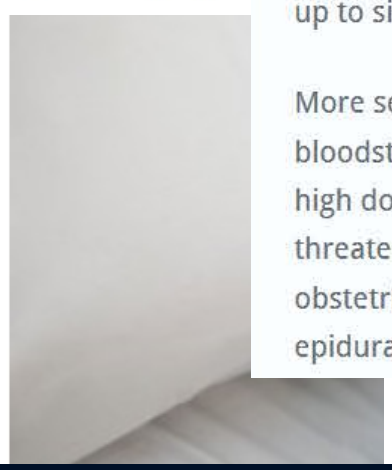
decrease in PGF2

7.8 hours

One of the mo
woman in 8 w
given through
much of her b
baby.

An epidural w
oxytocin drip
a three times
affected; choc

Some epidural
causative. Th
tion or CPD) th
pelvic anomali



Opiate drugs, especially administered as spinals, can sometimes cause unexpected breathing difficulties for the mother, which may come on hours after birth and may progress to have serious effects. One author comments, "Respiratory depression remains one of the most feared and least predictable complications of . . . intrathecal [spinal] opioids."[47]

Many observational studies have found an association between epidural use and bleeding after birth (postpartum hemorrhage).[48–53] For example, a large UK study found that women were twice as likely to experience postpartum hemorrhaging when they used an epidural in labor.[54] This may be related to the increase in instrumental births and perineal trauma (causing bleeding), or may reflect some of the hormonal disruptions mentioned above, including increased risks of exposure to synthetic oxytocin.

An epidural gives inadequate pain relief for 10 to 15 percent of women,[55] and the epidural catheter needs to be reinserted in about 5 percent.[56] For around 1 percent of women, the epidural needle punctures the dura (dural tap); this usually causes a severe headache that can last up to six weeks, but can usually be treated by an injection into the epidural space.[57, 58]

More serious side effects are rare. If the epidural drugs are inadvertently injected into the bloodstream, local anesthetics can cause toxic effects such as slurred speech, drowsiness, and, at high doses, convulsions. This occurs in around one in 2,800 epidural insertions.[59] Overall, life-threatening reactions occur for around one in 4,000 women.[60–63] Death associated with an obstetric epidural is very rare,[64] but can be caused by cardiac or respiratory arrest, or by an epidural abscess that develops days or weeks afterward.

cts

ring

in).

OP, face

9 studies

idural

ery.

orce

as not in

place. This is significant because instrumental deliveries can increase the short-term risks of bruising, facial injuries, displacement of skull bones and

And TikTok?

POPSUGAR 7/17/23: What exactly is an epidural?

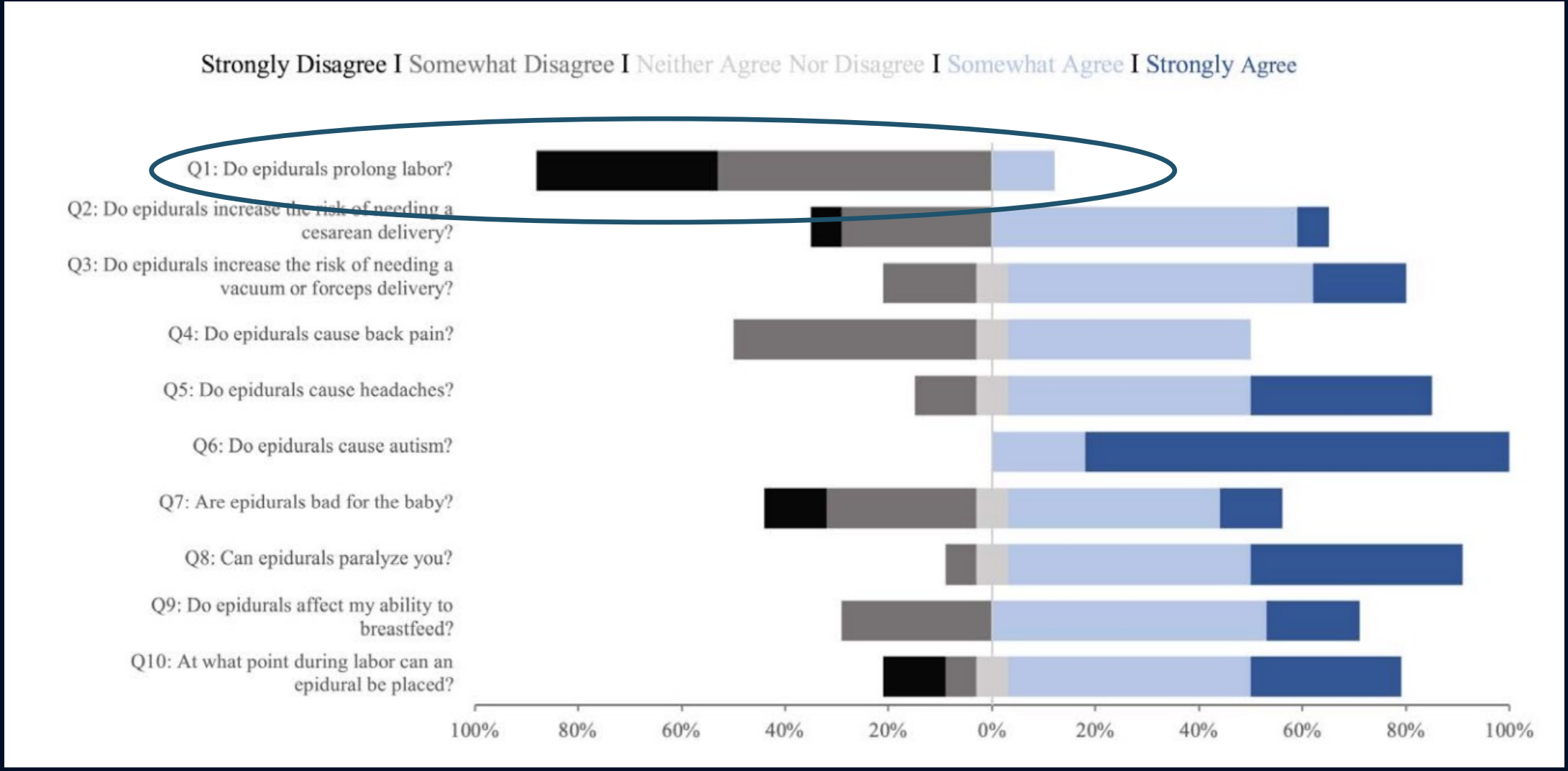
TikTok recently went viral for a post in which she expresses her shock at learning what's actually involved in an epidural.

'Finding out that the epidural isn't a shot, it's a tube that stays in your back for your entire labor' she wrote over video of her mouth hanging open. 'I have no words'….

"They really don't tell us anything on purpose" one person wrote.

"Wait, I thought it was a pill" someone else said.

What does ChatGPT say?



Mootz A Survey-Based Study. Anesth Analg. 2024 Jan 5.

Received: 30 September 2022 | Accepted: 15 March 2023
DOI: 10.1111/jog.15640

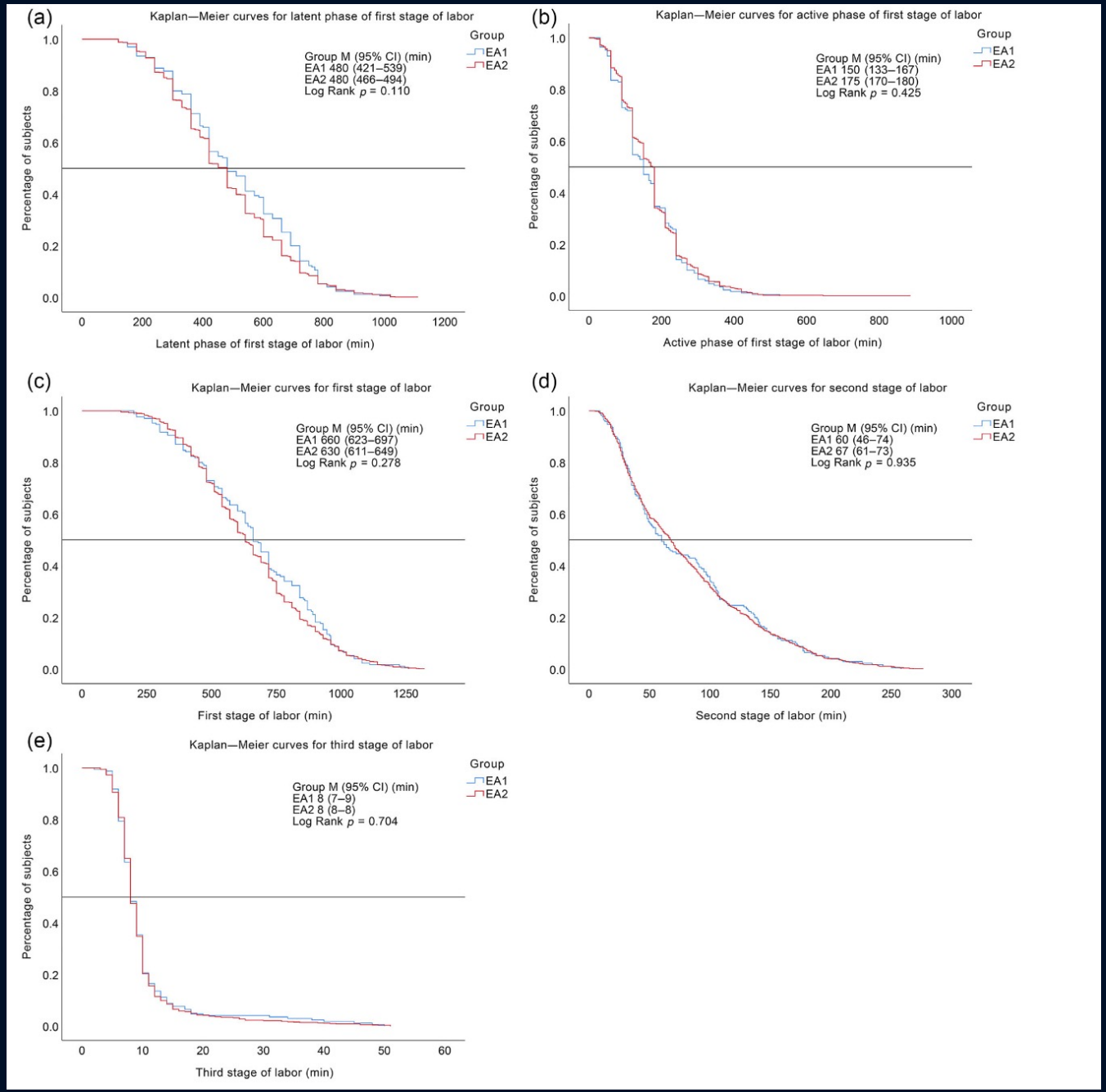
ORIGINAL ARTICLE

Effects of epidural analgesia at 1 cm cervical dilatation on labor interventions in full-term primigravida: A retrospective cohort study

Shunbin Chen | Siping Ye | Chenhua Wu | Xiufeng Jia | Sangsang Li | Xiaomei Zeng

1000 term Nulliparous patients:

- Divided into early (1cm) or late (greater than 1cm).
- There were no significant differences in the median time to latent phase of labor, active phase of labor, second, and third stages of labor (p> 0.05).
- There were no significant differences in maternal and neonatal outcomes.



- 2015-2016: 51,000 patients, multicenter
- Neuraxial analgesia resulted in:
  - Reduced cesarean deliveries: OR 0.68
    - Maternal request for intrapartum cesarean without medical indication decreased from 11.6% to 3.3% with the use of neuraxial analgesia ($p < .0001$)
  - $3^{rd}/4^{th}$ degree lacerations: OR 0.36
  - 5-minute Apgar: OR 0.15

Xi Meng, Anesth Analg 2023

Expert Review ajog.org

Modern labor epidural analgesia: implications for labor outcomes and maternal-fetal health

Elliott C. Callahan, MD; Won Lee, MD; Pedram Aleshi, MD; Ronald B. George, MD, FRCPC

MAY 2023 American Journal of Obstetrics & Gynecology

- Clinically negligible prolongation of labor
- No increased risk of assisted vaginal or cesarean delivery.
- Transient hypotension on initiation is not associated with adverse outcomes if treated with fluids and/or pressors.
- Infants have a better acid-base status at delivery compared with systemic opioid analgesia.
- There is ↑ incidence of non-infectious fever that has not been shown to affect neonates; its cause is unknown.

Epidural-related maternal fever: incidence, pathophysiology, outcomes, and management

Selina Patel, BMBS, FRCA; Sarah Ciechanowicz, BMBCh, MRes, FRCA; Yair J. Blumenfeld, MD; Pervez Sultan, MBChB, FRCA, MD (Res)

- 20% of OB patients who receive neuraxial analgesia will have fever regardless of the medication concentration or rate.
- Etiology is unknown but it is non-infectious.
- It may be caused by:
  - Sterile inflammation involving reduced activation of caspase-1.
  - Thermoregulatory mechanisms due to neuraxial local anesthetic may contribute.

FIGURE 1
Proposed mechanisms of sterile inflammation resulting in epidural-related maternal fever

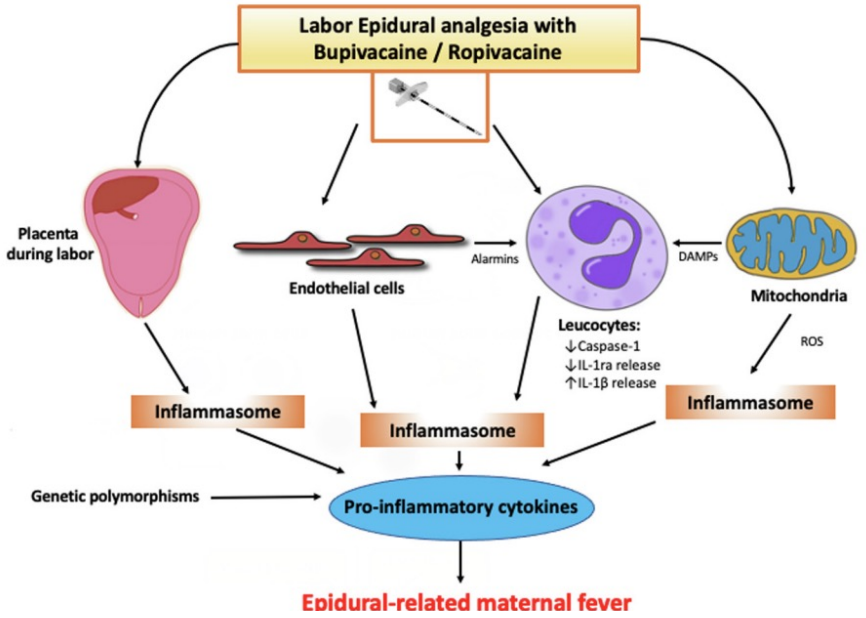
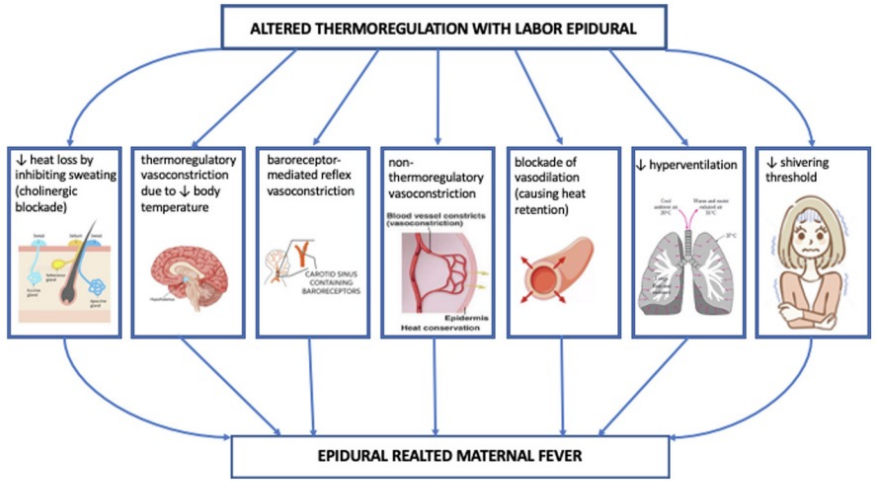


FIGURE 2
Proposed mechanisms of epidural-related maternal fever secondary to altered thermoregulation



Patel. Epidural-related maternal fever narrative review. Am J Obstet Gynecol 2023.

ANESTHESIOLOGY

Association of Labor Neuraxial Analgesia with Maternal Blood Transfusion

Jean Guglielminotti, M.D., Ph.D., Ruth Landau, M.D., Jamie Daw, Ph.D., Alexander M. Friedman, M.D., M.P.H., Guohua Li, M.D., Dr.P.H.

ANESTHESIOLOGY 2023; 139:734–45

https://www.blood.ca/sites

- 12,503,042 U.S. deliveries from 2015-2018
  - 9,479,291 (75.82%) were with neuraxial analgesia
  - 42,485 (0.34%) involved maternal blood transfusion
  - Propensity matching with 2,589,493 patients in each group
- All deliveries: OR 0.87
- Cesarean deliveries: OR 0.55
- Vaginal deliveries: OR 0.93

TO EAT or NOT TO EAT…

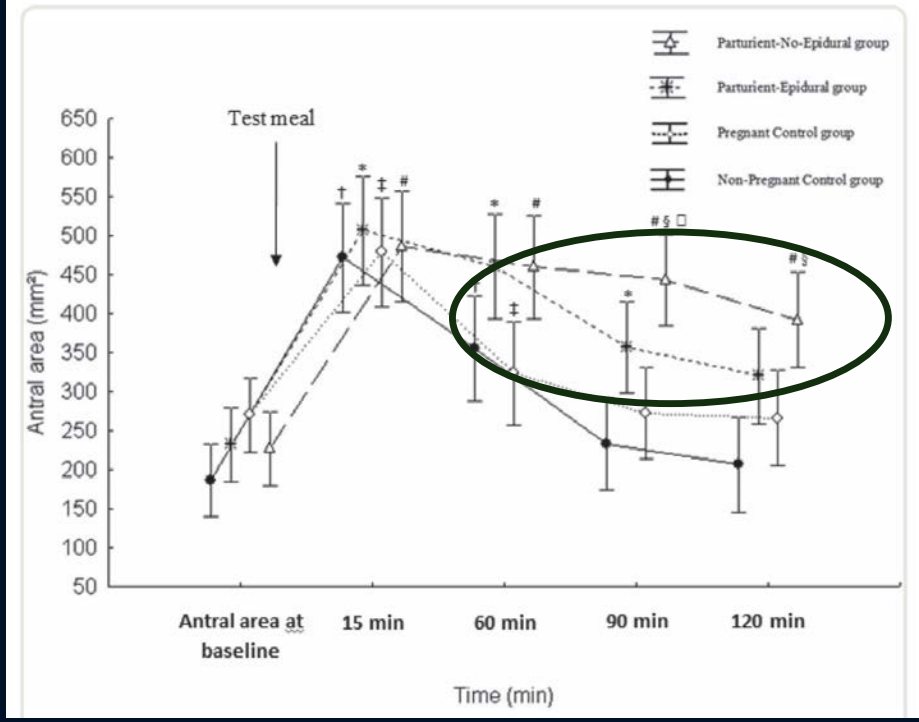
ANESTHESIOLOGY

Pregnancy and Labor Epidural Effects on Gastric Emptying: A Prospective Comparative Study

Lionel Bouvet, M.D., Ph.D., Thomas Schulz, M.D., Federica Piana, M.D., François-Pierrick Desgranges, M.D., Ph.D., Dominique Chassard, M.D., Ph.D.

ANESTHESIOLOGY 2022; 136:542–50

"Gastric emptying in parturients after a light meal was delayed, and labor epidural analgesia seems not to worsen but facilitates gastric emptying."



Ultrasound evaluation of gastric emptying of high-energy semifluid solid beverage in parturients during labor at term: a randomized controlled trial

Xiu Ni[1] · Jiang Li[1] · Qi-Wei Wu[1] · Shuang-qiong Zhou[1] · Zhen-Dong Xu[1] · Zhi-Qiang Liu[1]

Received: 29 September 2022 / Accepted: 29 September 2023 / Published online: 26 October 2023

- *40 parturients*
- *Semi-solid carbohydrate drink*
- *Clears*
- *No difference in gastric emptying at 2 hours*

OBSTETRICS

Labor epidural analgesia and subsequent risk of offspring autism spectrum disorder and attention-deficit/hyperactivity disorder: a cross-national cohort study of 4.5 million individuals and their siblings

- 24% were exposed to epidural analgesia during labor, 1.2% were diagnosed with ASD and 4% with ADHD.
- On a population level there was a significant association with epidural, but when controlling for maternal anxiety or depression & using siblings not exposed to epidural as the control group, there was no significant association.
- Conclusion:

"In this large cross-national study, we found no support for the hypothesis that exposure to labor epidural analgesia causes either offspring autism spectrum disorder or attention-deficit/hyperactivity disorder."

Am J Obstet Gynecol 2023;228:233

OBSTETRICS

Fentanyl in the labor epidural impacts the results of intrapartum and postpartum maternal and neonatal toxicology tests

- Prospective cohort study used urine samples before and after initiation of neuraxial analgesia plus at intervals during labor and up to 4 times postpartum + a neonatal urine sample.
- 33 maternal-infant dyads yielded a total of 178 urine specimens.
- No specimens were + before neuraxial.
- Intrapartum 77% had + mass spec and 40% had + immunoassay.
- Postpartum 91% had + mass spec and 62% had + immunoassay.
- Neonatal samples were + in 77%.

Am J Obstet Gynecol 2023;228:741

Multimodal analgesic approach for cesarean delivery

Anaesthesia
Peri-operative medicine, critical care and pain
Association of Anaesthetists

Correspondence | Free Access

PROSPECT guideline for elective caesarean section: an update

E. Roofthooft, G. P. Joshi, N. Rawal, M. Van de Velde, on behalf of
the PROSPECT Working Group of the European Society of Regional Anaesthesia and Pain Therapy

CURRENT OPINION

Analgesia after cesarean section – what is new?

Heidrun Lewald[a,b,c] and Thierry Girard[d]

Multi-modal regimens are underused and should be standard.

- Neuraxial morphine should be utilized if possible (150mcg spinal or 3mg epidural).
- NSAIDs and acetaminophen should be scheduled and given <u>together</u>.
- Intravenous dexamethasone 8-10 mg is opioid-sparing.
- Truncal blocks or local infiltration helpful if neuraxial morphine not utilized.

ORIGINAL CLINICAL RESEARCH REPORT

Outpatient Treatment With Gabapentin in Women With Severe Acute Pain After Cesarean Delivery Is Ineffective: A Randomized, Double-Blind, Placebo-Controlled Trial

Cedar Fowler, MD, PhD, Amy W. Chu, MD, Nan Guo, PhD, Jessica R. Ansari, MD, Steven L. Shafer, MD, and Pamela D. Flood, MD

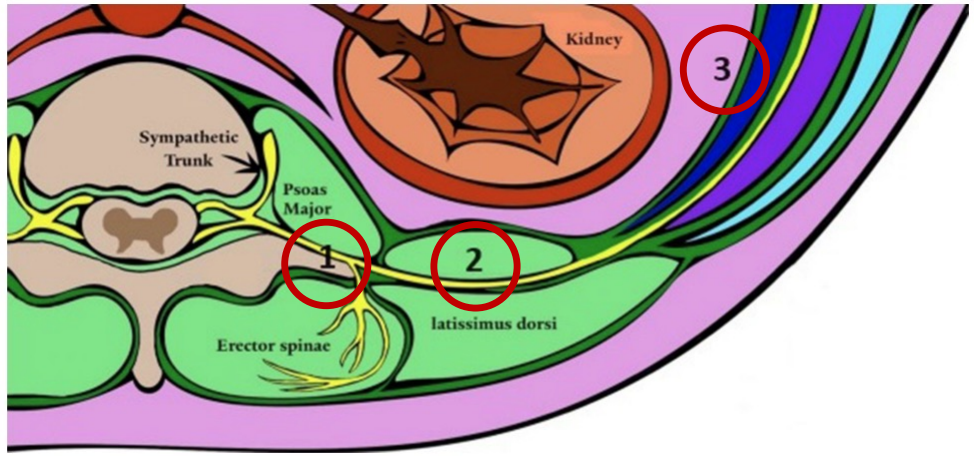
- Avoid gabapentin; limited analgesia and excess side effects.

Open Access Full Text Article

REVIEW

Regional Analgesia for Cesarean Delivery: A Narrative Review Toward Enhancing Outcomes in Parturients

Matthew Silverman[1], Nicholas Zwolinski[1], Ethan Wang[2], Nishita Lockwood[1], Michael Ancuta[1], Evan Jin[1], Jinlei Li[1]



1. Erector Spinae Plane block (ESP)
2. Quadratus Lumborum block (QL)
3. Transversus abdominal plane block (TAP)

- Neuraxial morphine continues to be the gold standard.
- If neuraxial morphine cannot/is not provided: overwhelming evidence that regional anesthetic techniques improve post-cesarean section analgesia and decrease post-operative opioid use.
- All provide analgesic benefit.
- More data is accumulating that QL and ESP blocks may provide improved analgesia.

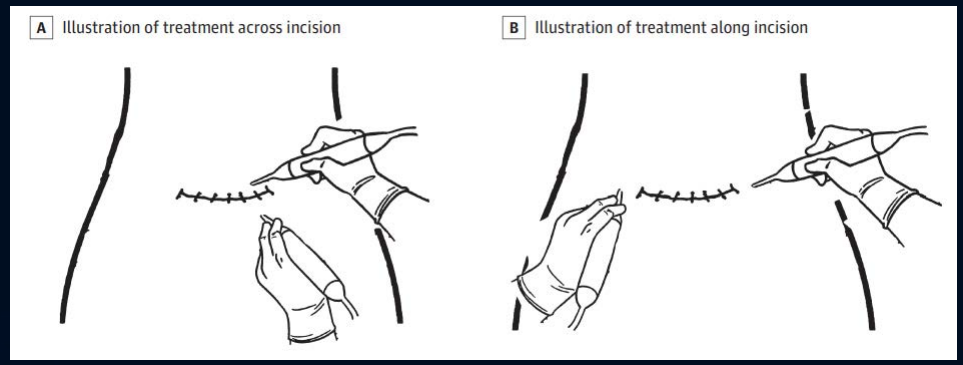
JAMA Network | Open

Original Investigation | Obstetrics and Gynecology

Noninvasive Bioelectronic Treatment of Postcesarean Pain
A Randomized Clinical Trial

Jennifer L. Grasch, MD; Maged M. Costantine, MD; Devra D. Doan Mast, BSN; Baylee Klopfenstein, BSN; Jessica R. Russo, RDMS; Taryn L. Summerfield, MS; Kara M. Rood, MD

- Blinded comparison of a functional or sham TENS device
- Each group received 3 treatments (real or sham) at the incision site:
  - Within 2 hours postop
  - 12 hours after first application
  - 12 hours after second application
- 47% less opioid while inpatient
- Prescribed less at discharge (MME 82.5mg v 90mg, p<0.001)
- No opiates at discharge (10% v 25%, p=0.03)



Research article

Effect of chamomile aromatherapy with and without oxygen on pain of women in post cesarean section with spinal anesthesia: A randomized clinical trial

Hajar Zamani Habibabad [a], Ardashir Afrasiabifar [b], Afshin Mansourian [c], Mahboubeh Mansourian [d], Nazafarin Hosseini [e,*]

- Decrease in pain scores at 6h (9 vs 8), not clinically significant
- Decrease in pain scores at 12 h (8.5 vs 6) and 18h (7.5 vs. 4.5) postoperatively ($p < 0.001$)

Chamomile Essential Oil Benefits & Uses in Treatment | Seema

Perioperative pregnancy testing and breastfeeding after anesthesia

Ethical Principles Do Not Support Mandatory Preanesthesia Pregnancy Screening Tests: A Narrative Review

Stephen Jackson, MD,* James Hunter, MD,† and Gail A. Van Norman, MD‡

- Mandatory routine non-consented preop pregnancy testing does not respect patient autonomy.
- It can be coercive, e.g. if canceling surgery is the option.
- It can cause harm socially, medically (by delaying needed treatments), and financially (insurance implications).
- Not performing a test does not have medicolegal issues for anesthesiologists.

Anesth Analg 2023

American Society of Anesthesiologists

Pregnancy Testing Prior to Anesthesia and Surgery

Developed By: Committee on Quality Management and Departmental Administration
Last Amended: October 13, 2021 (original approval: October 26, 2016)

- Informed consent or assent of the risks, benefits, and alternatives related to preoperative pregnancy testing.
- Shared decision-making between patients and providers.
- Preanesthetic educational materials should include information about false positives and negatives of pregnancy testing and effects of anesthesia.
- Pregnancy testing may be offered to female sex patients of childbearing age and for whom the result would alter the patient's management, **but testing should not be mandatory.**

INTERIM UPDATE

The American College of Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS

American Society of Anesthesiologists™

ACOG COMMITTEE OPINION SUMMARY

Number 775

(Replaces Committee Opinion No. 696, April 2017)

For a comprehensive overview of these recommendations, the full-text version of this Committee Opinion is available at http://dx.doi.org/10.1097/AOG.0000000000003174.

Scan this QR code with your smartphone to view the full-text version of this Committee Opinion.

Committee on Obstetric Practice
American Society of Anesthesiologists

This Committee Opinion was developed by the American College of Obstetricians and Gynecologists' Committee on Obstetric Practice and the American Society of Anesthesiologists.

INTERIM UPDATE: The content on nonobstetric surgery in this Committee Opinion has been updated to reflect a limited, focused change in the language regarding sedative drugs, medically necessary surgery, antenatal corticosteroids, and venous thromboembolism. For complete details on these updates, please see the full-text version.

Nonobstetric Surgery During Pregnancy

"No currently used anesthetic agents have been shown to have any teratogenic effects in humans when using standard concentrations at any gestational age."

Anaesthesia 2023, 78, 159–169 doi:10.1111/anae.15884

Original Article

Neurodevelopmental outcomes after prenatal exposure to anaesthesia for maternal surgery: a propensity-score weighted bidirectional cohort study

T. Bleeser,[1] S. Devroe,[2] N. Lucas,[3] T. Debels,[4] M. Van de Velde,[5] J. Lemiere,[6] J. Deprest[7] and S. Rex[5]

A cohort study of children who had received prenatal anesthesia during maternal surgery (N=129) vs unexposed.

- Single exposure, short duration
- Excluded fetal surgery
- No difference in the global executive composite of the behavior rating inventory of executive function score.
- No difference in problems from the child behavior checklist, psychiatric diagnoses or learning disorders.

Breastfeeding after Anesthesia

- Relative infant dose (RID)
- Accounts for maternal and infant weight + concentration of drug in breastmilk
- RID levels less than 10% are generally considered safe
- Codeine or tramadol
  - CYP2D6 metabolism
  - “ultra-metabolizer” patient breastfeeds a “slow metabolizer” neonate

Relative Infant Dose for Common Anesthesia Medications

Table. Relative Infant Dose (RID) of Anesthesia Medications and Recommendations

Medication Class (Drug)	Mean RID (%)*
Anticholinergics (atropine, glycopyrrolate)	Unknown: generally considered safe with single systemic or ophthalmic dosing
Anticholinesterases (neostigmine, pyridostigmine)	0.1
Antiemetics (metoclopramide, ondansetron)	Unknown: considered safe due to lack of sedating side effects
Benzodiazepines (diazepam, lorazepam, midazolam)	0.3
Intravenous Anesthetics	
Etomidate	0.1
Ketamine	Unknown: recommended only if medically necessary
Propofol	0.1
Local Anesthetics (bupivacaine, lidocaine, ropivacaine)	0.1
Narcotics	
Fentanyl	1
Hydrocodone	3
Hydromorphone	3
Morphine	9
Oxycodone	3 (maximum daily dose 30mg§)
Remifentanil	Unknown: considered safe secondary to short half-life
Codeine/Tramadol	Avoid: FDA warning against use in women with a CYP2D6 mutation
Non-narcotic Analgesics	
Acetaminophen	4 (maximum daily dose < 3gm¥)
Ibuprofen	0.5
Ketorolac	0.3
Miscellaneous	
Gabapentin	3
Dexamethasone	Unknown: considered safe (may cause temporary loss of milk secondary to ↓ prolactin levels)
Diphenhydramine	Unknown: generally considered safe
Volatile Gases	Unknown: considered safe secondary to rapid excretion, poor bioavailability and OR scavenging of gases

* Mean RID is an estimated average from multiple sources reviewed.

§ LactMed. Toxicology Data Network. US National Library of Medicine. NIH. HMS. Bethesda, MD. Accessed at: https://toxnet.nlm.nih.gov/cgi-bin/sis/search2.

American Society of Anesthesiologists

Statement on Resuming Breastfeeding after Anesthesia

Developed by: Committee on Obstetric Anesthesia

Approved: October 23, 2019

- Patients should resume breastfeeding as soon as possible after surgery because anesthetic drugs appear in such low levels in breastmilk.
- Because pain interferes with successful breastfeeding, pregnant patients should not avoid pain medicines after surgery.
- Pain meds such as oxycodone can and should be given in PACU as needed and should not delay breast-feeding.
- **It is not recommended that patients "pump and dump."**

Anesthesia for Second Trimester Abortions

Anesthetic Considerations for Second-Trimester Surgical Abortions

Elizabeth Ozery, MD,* Jessica Ansari, MD,* Simranvir Kaur, MD,† Kate A. Shaw, MD, MS,† and Andrea Henkel, MD, MS†

- Abortion is safer than carrying a pregnancy to term: the estimated fatality rate is 0.41 deaths per 100,0003vs 17.4 per 100,000 in term birth resulting in a 42-fold increase in risk of death for pregnancy compared to abortion. (Obstet Gynecol. 2021;137:763–771)
- 5579 pregnant people receiving abortion care in an outpatient setting (31% in second trimester) with IV moderate or deep sedation without endotracheal intubation.
  - There were no incidents of pulmonary complications or anesthesia-related adverse events with BMI up to 40.
- Deep sedation or monitored anesthesia care should routinely be considered as the default anesthetic modality for patients undergoing D&E.

Anesth Analg. 2023 Aug 1;137(2):345-353.

Summary

- Many misconceptions about labor epidurals
- Labor epidurals
  - Do NOT slow down labor progression
  - Reduce patient requested cesarean
  - Reduce 3rd and 4th degree lacerations
  - Reduce blood transfusions, esp in CD
  - Improve gastric emptying
  - Increase incidence of noninfectious fevers
  - Neuraxial opiates found in maternal urine and neonatal meconium
- Cesarean analgesia
  - ERAC protocols
  - Truncal blocks if no neuraxial morphine
  - Consider non-pharmacologic options (TENS, aromatherapy)
- Perioperative Pregnancy Testing: Offered but not mandatory
- Breastfeeding After Anesthesia: No Pump and Dump
- Anesthesia for Second Trimester Abortions: Sedation is a safe option

Thank you!


University of Colorado
Anschutz Medical Campus


Colorado Fetal
Care Center