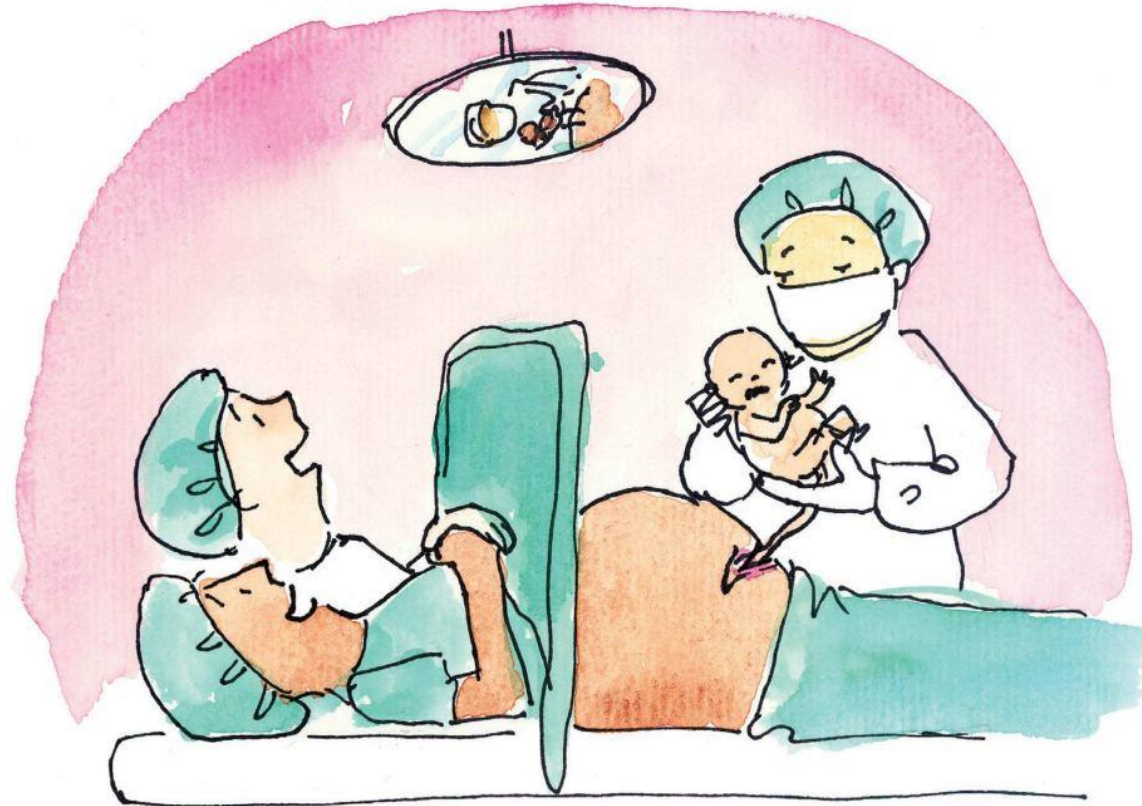
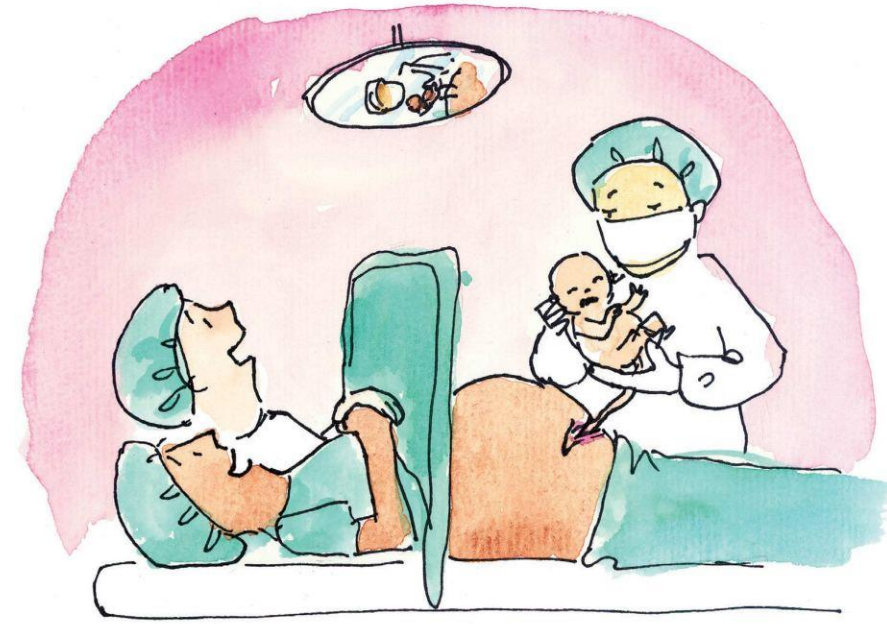


Anesthésie pour césarienne



Plan

- Généralités de la césarienne
- Considérations femme enceinte
- Préparation anesthésique
- Anesthésies neuraxiales
- Anesthésie générale
- Utérotoniques
- Analgésie post-césarienne
- ERAC





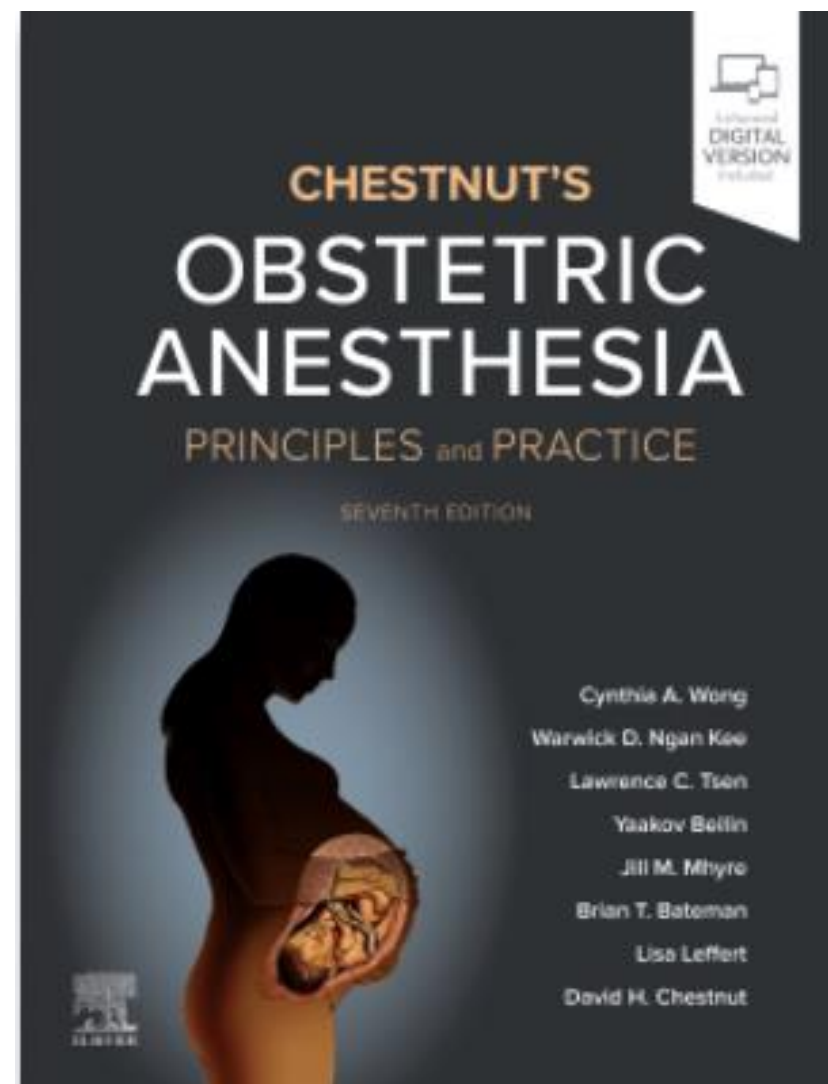
ROYAL COLLEGE
OF PHYSICIANS AND SURGEONS OF CANADA
COLLÈGE ROYAL
DES MÉDECINS ET CHIRURGIENS DU CANADA



26

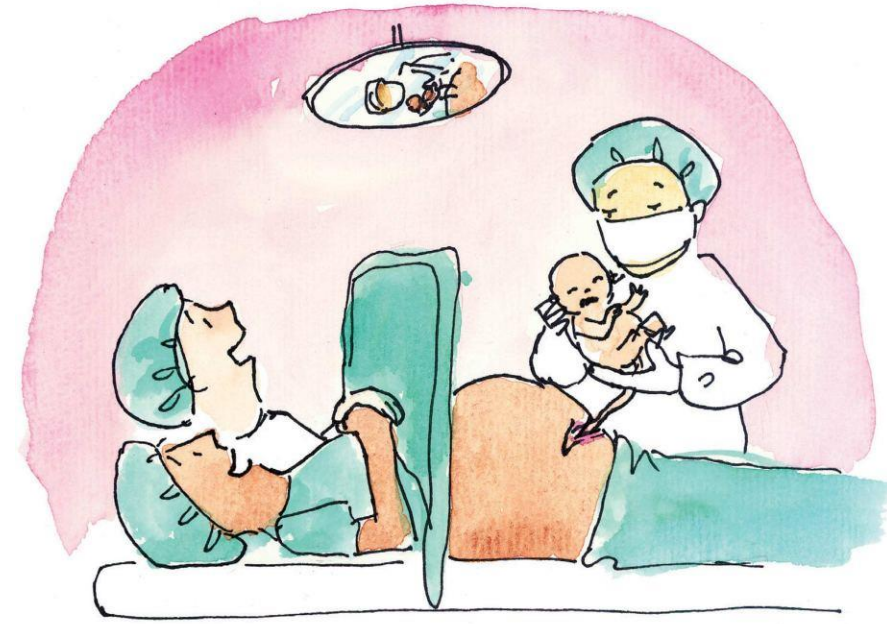
Anesthesia for Cesarean Delivery

Lawrence C. Tsen, MD, Brian T. Bateman, MD, MSc

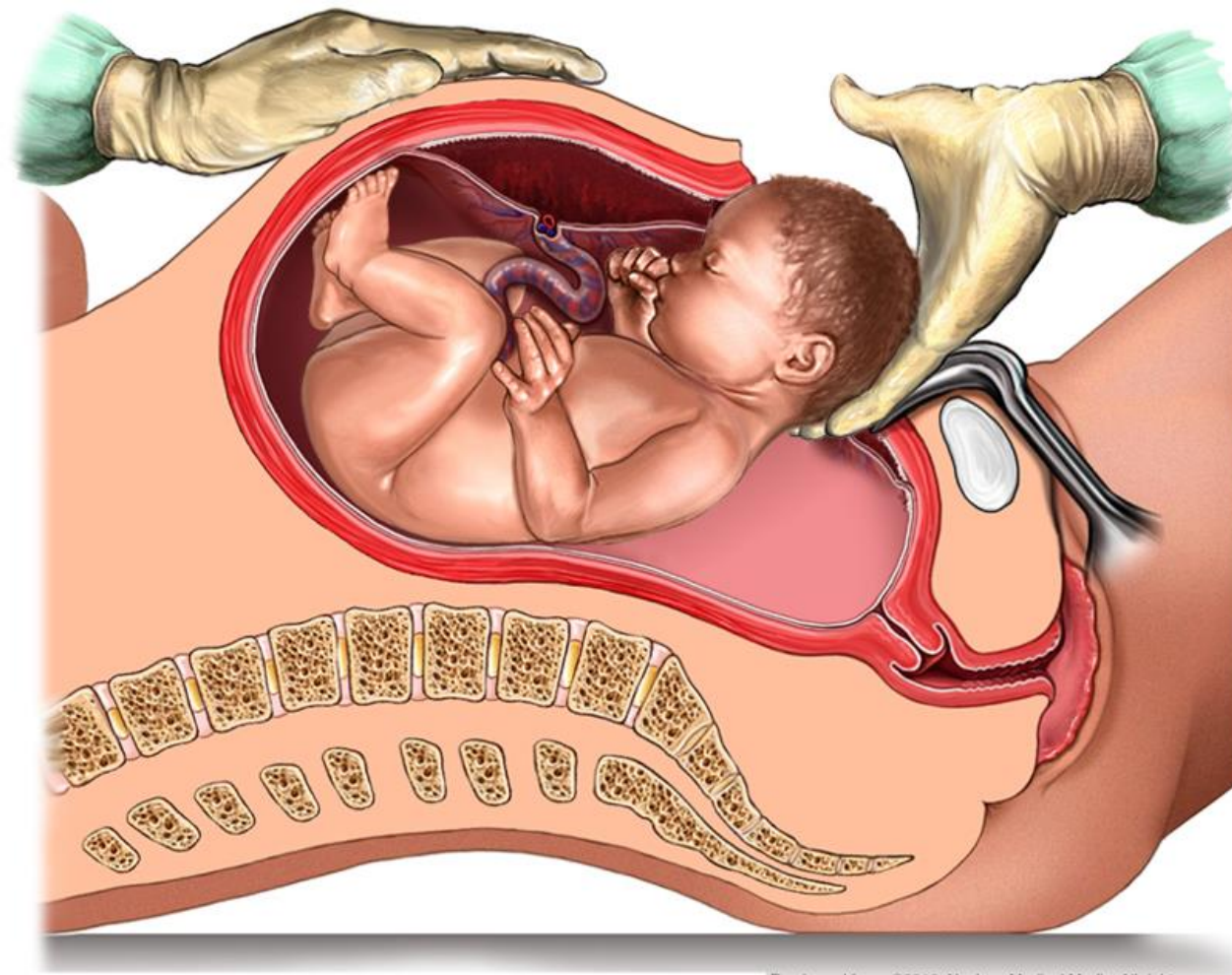


Plan

- **Généralités de la césarienne**
- Considérations femme enceinte
- Préparation anesthésique
- Anesthésies neuraxiales
- Anesthésie générale
- Utérotoniques
- Analgésie post-césarienne
- ERAC



Généralités de la césarienne



Question

1. Quel est le taux de césarienne au Canada?

- a) 33%
- b) 28%
- c) 22%
- d) 20%



Question

1. Quel est le taux de césarienne au Canada?

a) 33%

b) 28%

c) 22%

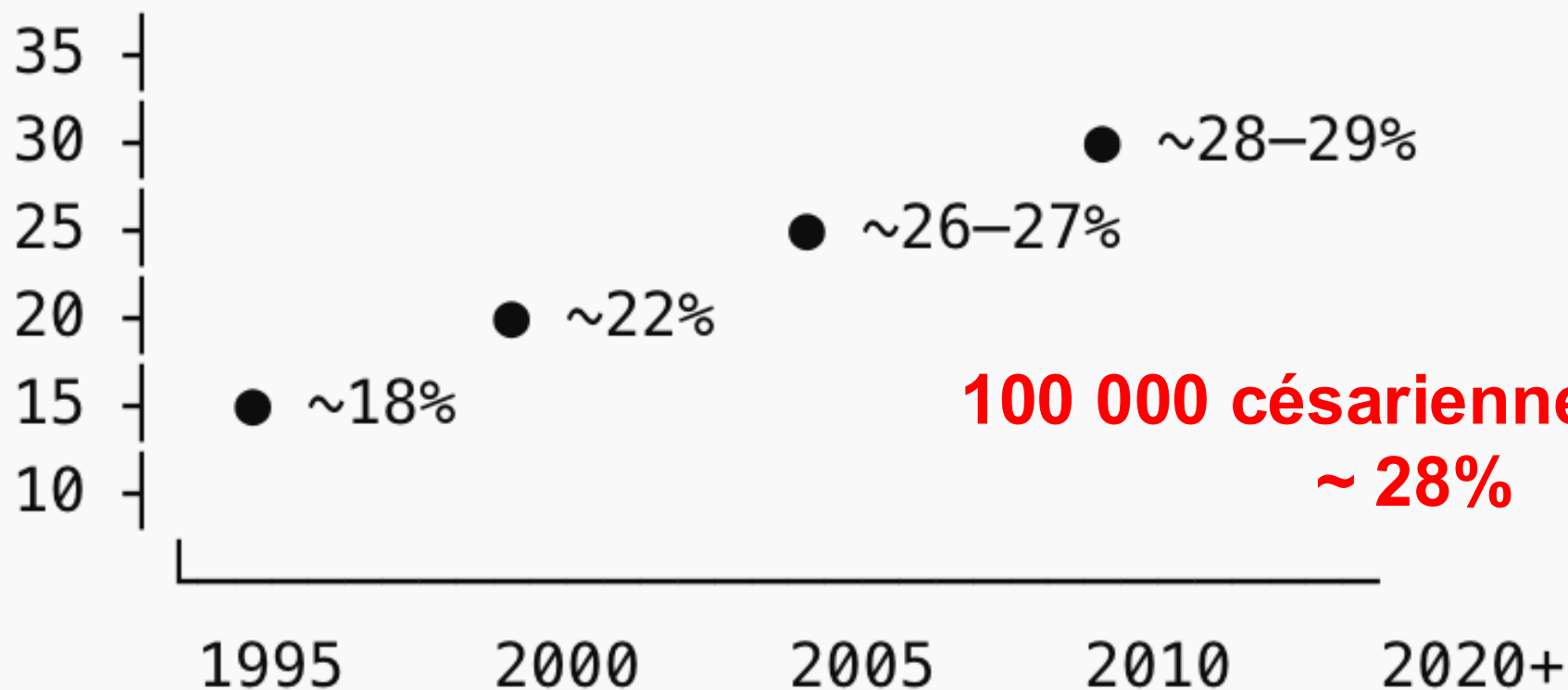
d) 20%



Taux de césarienne au Canada



% des naissances (360 000 naissances/ année)



La Césarienne

- La chirurgie la plus fréquente mondialement
- Taux :
 - États-Unis: 33%
 - Canada 28%
 - Québec 22-25%
- Taux idéal 19%

Question

2. Quelle est l'indication la plus fréquente de césarienne?

- a) Présentation en siège
- b) Tracé foetal anormal
- c) Arrêt de progression
- d) Demande de la patiente



Question

2. Quelle est l'indication la plus fréquente de césarienne?

- a) Présentation en siège
- b) Tracé foetal anormal
- c) Arrêt de progression**
- d) Demande de la patiente



BOX 26.2 Indications for Cesarean Delivery

Maternal

- Antepartum or intrapartum hemorrhage
- Arrest of labor 34%
- Breech presentation 17%
- Chorioamnionitis
- Deteriorating maternal condition (e.g., severe preeclampsia)
- Dystocia
- Failure of induction of labor
- Genital herpes (active lesions)
- High-order multiple gestation (or twin gestation in which twin A has a breech presentation)
- Maternal request
- Placenta previa
- Placental abruption
- Previous myomectomy
- Prior classic uterine incision
- Uterine rupture

Fetal

- Breech presentation or other malpresentation
- Fetal intolerance of labor
- Suspected macrosomia
- Nonreassuring fetal status 23%
- Prolapsed umbilical cord

Obstetrician

- Desire to avoid difficult forceps or vacuum delivery

BOX 26.2 Indications for Cesarean Delivery

Maternal

- Antepartum or intrapartum hemorrhage
- Arrest of labor
- Breech presentation
- Chorioamnionitis
- Deteriorating maternal condition (e.g., severe preeclampsia)
- Dystocia
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- Genital herpes (active lesions)
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- Previous myomectomy
- Prior classic uterine incision
- Uterine rupture

Fetal

- Breech presentation or other malpresentation
- Fetal intolerance of labor
- Suspected macrosomia
- Nonreassuring fetal status
- Prolapsed umbilical cord

Obstetrician

- Desire to avoid difficult forceps or vacuum delivery

~ 40% electives
~ 60% urgentes

Question



3. Lequel des suivants est le plus fortement associé avec un placenta accréta?

- a) Antécédent de laparotomie ou chirurgie intra-abdominale
- b) Nombre d'accouchements antérieurs
- c) Césarienne antérieure
- d) Antécédent de rupture utérine



Question



3. Lequel des suivants est le plus fortement associé avec un placenta accréta?

- a) Antécédent de laparotomie ou chirurgie intra-abdominale
- b) Nombre d'accouchements antérieurs
- c) **Césarienne antérieure**
- d) Antécédent de rupture utérine





TABLE 37.1 Risk for Placenta Accreta in Patients with Placenta Previa: Relationship to Number of Prior Cesarean Deliveries

Number of Prior Cesarean Deliveries	% of Patients with Placenta Accreta
0	3
1	11
2	40
3	61
4 or more	67

Modified from Silver RM, Landon MB, Rouse DJ, et al. Maternal morbidity associated with multiple repeat cesarean deliveries. *Obstet Gynecol.* 2006;107:1226–1232.

BOX 26.3 Complications of Cesarean Delivery

Intraoperative Complications

Hemorrhage

- Uterine atony
- Uterine lacerations
- Broad ligament hematoma

Infection

- Endometritis
- Wound infection

Postoperative Complications

- Cardiovascular: venous thromboembolism
- Gastrointestinal: ileus, adhesions, injury
- Genitourinary: bladder or ureteral injury
- Respiratory: atelectasis, aspiration pneumonia
- Chronic pain

Future Pregnancy Risks

- Placenta previa
- Placenta accreta
- Uterine rupture
- Obstetric hysterectomy

Risque de décès maternel*

La césarienne:

- > 3x vs accouchement vaginal
(OR 3.21; 95% CI, 2.80 to 3.61)
- > 5x vs accouchement vaginal, si 1^e C/S
(OR, 5.72; 95% CI, 4.92 to 6.51)

MMR 6.9 décès/100 000 accouchements

Classification

TABLE 26.4 Classification for Urgency of Cesarean Delivery

Grade	Label	Definition	Example
1	Emergency	Immediate threat to life of mother or fetus	Prolonged fetal bradycardia
2	Urgent	Maternal or fetal compromise that is not immediately life-threatening	Deep variable decelerations with cervical dilation of 3 cm
3	Scheduled	Needing early delivery but no maternal or fetal compromise	Ruptured membranes with previously undiagnosed breech presentation
4	Elective	At a time to suit the mother and delivery team	Elective repeat cesarean delivery

Modified from Lucas DN, Yentis SM, Kinsella SM, et al. Urgency of caesarean section: a new classification. *J R Soc Med.* 2000;93:346–350.

CÉSARIENNES URGENTES

CODIFICATION DE L'INTERVALLE DE TEMPS VISÉ ENTRE L'APPEL AU BLOC OPÉRATOIRE ET L'INCISION CUTANÉE

L'ANNONCE DE TOUTES LES CÉSARIENNES DOIT SE FAIRE: AU BLOC OPÉRATOIRE, POSTE 7342

*** DANS TOUS LES CAS, IL EST IMPORTANT QUE L'OBSTÉTRICIEN-NE ET L'ANESTHÉSIOLOGISTE SE PARLENT DIRECTEMENT ***

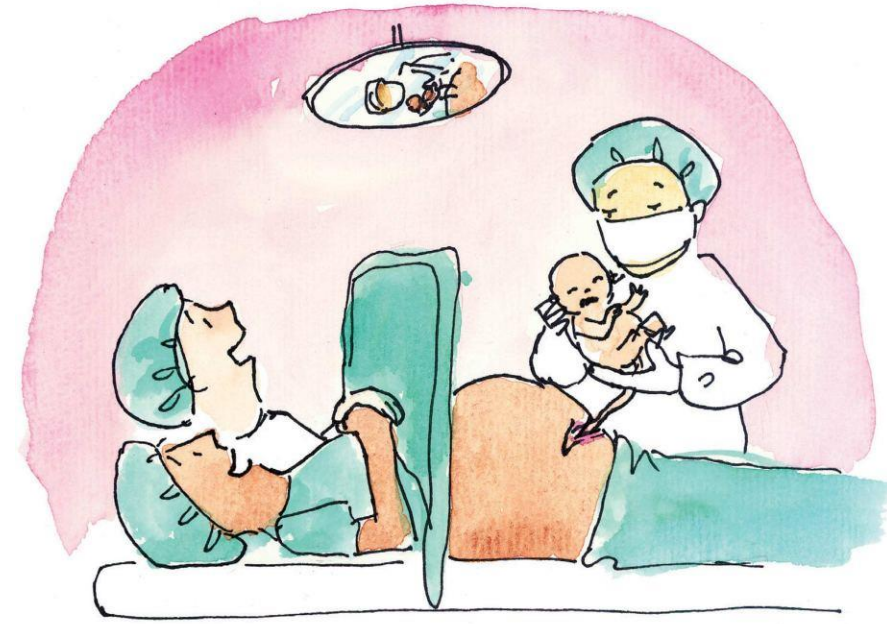
INFORMATIONS À TRANSMETTRE DU 7e AU BLOC:

- 1) COULEUR DE LA C/S
- 2) RAISON DE LA C/S
- 3) ÉPIDURALE FONCTIONNELLE?
- 4) NB DE SEMAINES
- 5) STATUT COVID
- 6) GÉMELLAIRE?

CODE	INTERVALLE APPEL- INCISION PEAU	TYPE D'ANESTHÉSIE	EXEMPLES D'INDICATIONS	PROCÉDURES À SUIVRE	
ROUGE STAT	LE PLUS RAPIDEMENT POSSIBLE	GÉNÉRALE	• BRADYCARDIE FŒTALE SÉVÈRE ET CONTINUE • HÉMORRAGIE MATERNELLE MASSIVE OU TOUTE CONDITION MATERNELLE URGENTE • PROCIDENCE DU CORDON AVEC BRADYCARDIE FŒTALE	UNITÉ DES NAISSANCES (INFIRMIÈRE OU COMMIS)	BLOC OPÉRATOIRE
				1) PAGETTES D'URGENCE C/S 2) ANNONCER CÉSARIENNE ROUGE AU BLOC OPÉRATOIRE, POSTE 7342 3) APPELER NÉONATOLOGIE STAT 4) RAPPORT AIC 7C À AIC BLOC 5) RAPPORT OBS À ANESTH (6666)	1) AVISER ANESTHÉSISTE POSTE 6666 OU 6576 (chambre de garde) 2) ASSEMBLER ÉQUIPE DE CÉSARIENNE STAT
ORANGE 15 MINUTES	• CÉSARIENNE DOIT ÊTRE FAITE SANS DÉLAI, MAIS PEUT ÊTRE RÉALISÉE SOUS ANESTHÉSIE NEURAXIALE. • CÉSARIENNE POUR LAQUELLE ON PEUT PRENDRE LE CF À L'ARRIVÉE EN SOP.	RACHIDIENNE PÉRIDURALE GÉNÉRALE	• PROCIDENCE DU CORDON SANS BRADYCARDIE FŒTALE • DECELERATIONS DU RCF DE TYPE TARDIF AVEC RÉCUPÉRATION/ COMPLIQUEES • ECHEC D'EXTRACTION INSTRUMENTALE AVEC DECELERATIONS COMPLIQUEES	UNITÉ DES NAISSANCES (INFIRMIÈRE OU COMMIS), ET MD	BLOC OPÉRATOIRE
				1) PAGETTES D'URGENCE SI PTE COVID+ (911-8) 2) ANNONCER CÉSARIENNE ORANGE AU BLOC OPÉRATOIRE, POSTE 7342 3) RAPPORT AIC 7C À AIC BLOC 4) APPELER NÉONATOLOGISTES AU BESOIN 5) OBS/AIC PARLE À NÉONAT	1) AVISER ANESTHÉSISTE POSTE 6666 OU 6576 2) ANESTH. PARLE À OBS 3) ASSEMBLER ÉQUIPE DE CÉSARIENNE RAPIDEMENT
JAUNE 45 MINUTES	CÉSARIENNE QUI PEUT ATTENDRE QUE L'ÉQUIPE DE GARDE À DOMICILE ARRIVE DANS L'ÉTABLISSEMENT (30 MINUTES)	RACHIDIENNE PÉRIDURALE GÉNÉRALE	• FIÈVRE MATERNELLE AVEC RÉPERCUSSIONS HÉMODYNAMIQUES OU FŒTALES • ARRÊT DE DESCENTE • ARRÊT DE PROGRESSION DU TRAVAIL AVEC DECELERATIONS NON COMPLIQUEES	UNITÉ DES NAISSANCES (INFIRMIÈRE OU COMMIS), ET MD	BLOC OPÉRATOIRE
				1) ANNONCER CÉSARIENNE JAUNE AU BLOC OPÉRATOIRE, POSTE 7342 2) RAPPORT OBS À ANESTH. 3) RAPPORT AIC 7C À AIC BLOC 4) APPELER NÉONATOLOGISTES AU BESOIN 5) OBS/AIC PARLE À NÉONAT	1) AVISER ANESTHÉSISTE POSTE 6666 OU 6576 2) ANESTH. PARLE À OBS 3) ASSEMBLER ÉQUIPE DE CÉSARIENNE RAPIDEMENT (ÉQUIPE DE GARDE PRN)
VERTE < 2 HEURES	CÉSARIENNE QUI PEUT ATTENDRE LA FIN DE LA CHIRURGIE EN COURS	RACHIDIENNE PÉRIDURALE GÉNÉRALE	• ARRÊT DE PROGRESSION • FIÈVRE MATERNELLE SANS RÉPERCUSSION HÉMODYNAMIQUE OU FŒTALE • CÉSARIENNE ELECTIVE PREVUE DANS LES JOURS A VENIR EN TRAVAIL ACTIF	UNITÉ DES NAISSANCES (INFIRMIÈRE OU COMMIS), ET MD	BLOC OPÉRATOIRE
				1) ANNONCER CÉSARIENNE VERTE AU BLOC OPÉRATOIRE, POSTE 7342 2) APPELER NÉONATOLOGISTES AU BESOIN	1) AVISER ANESTHÉSISTE POSTE 6666 OU 6576 2) ASSEMBLER ÉQUIPE AU MOMENT OPPORTUN
BLANCHE > 2 HEURES	CÉSARIENNE QUI PEUT ATTENDRE LA PROCHAINE PLACE DISPONIBLE EN SOP	RACHIDIENNE PÉRIDURALE GÉNÉRALE	• CÉSARIENNE ELECTIVE INITIALEMENT PREVUE DANS LES JOURS À VENIR, SANS TRAVAIL ACTIF	UNITÉ DES NAISSANCES (INFIRMIÈRE OU COMMIS), ET MD	BLOC OPÉRATOIRE
				1) ANNONCER CÉSARIENNE BLANCHE AU BLOC OPÉRATOIRE, POSTE 7342 2) APPELER NÉONATOLOGISTES AU BESOIN	1) AVISER ANESTHÉSISTE POSTE 6666 OU 6576 2) ASSEMBLER ÉQUIPE AU MOMENT OPPORTUN

Plan

- Généralités de la césarienne
- **Considérations femme enceinte**
- Préparation anesthésique
- Anesthésies neuraxiales
- Anesthésie générale
- Utérotoniques
- Analgésie post-césarienne
- ERAC



Cas

- Vient pour césarienne élektive
- 28 ans, G2P1, bonne santé, poids N
- À jeun
- AW facile
- Labos: Hb 118, Plts 118
- G1 = césarienne pour arrêt de progression
- N°/V° intra-op lors de sa 1^e césarienne



Cas

- Vient pour césarienne éleative
- 28 ans, G2P1, bonne santé, poids N
- À jeun
- AW facile
- Labos: Hb 118, Plts 118
- G1 = césarienne pour arrêt de progression
- N°/V° intra-op lors de sa 1^e césarienne

CONSIDERATIONS?



Considérations anesthésiques chez femme enceinte



- 2 patients
- À risque d'aspiration
- Compression aorto-cave
- ↓ CRF + ↑ métabolisme O₂
- AW potentiellement plus difficile

Considérations anesthésiques chez femme enceinte



- ~~2 patients~~
- ~~À risque d'aspiration~~
- Compression aorto-cave
- ~~↓ CRF + ↑ métabolisme O_2~~
- ~~AW potentiellement plus difficile~~

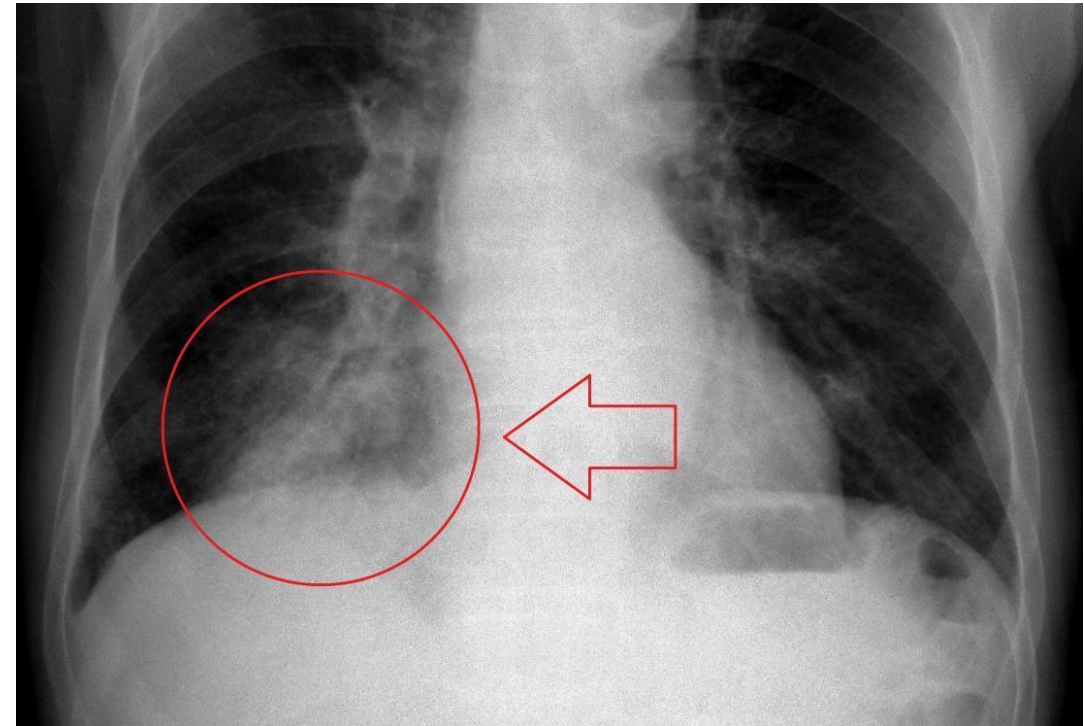


Question



4. L'augmentation du risque d'aspiration débute dans quelle semaine de gestation?

- a) 6
- b) 14
- c) 20
- d) 28

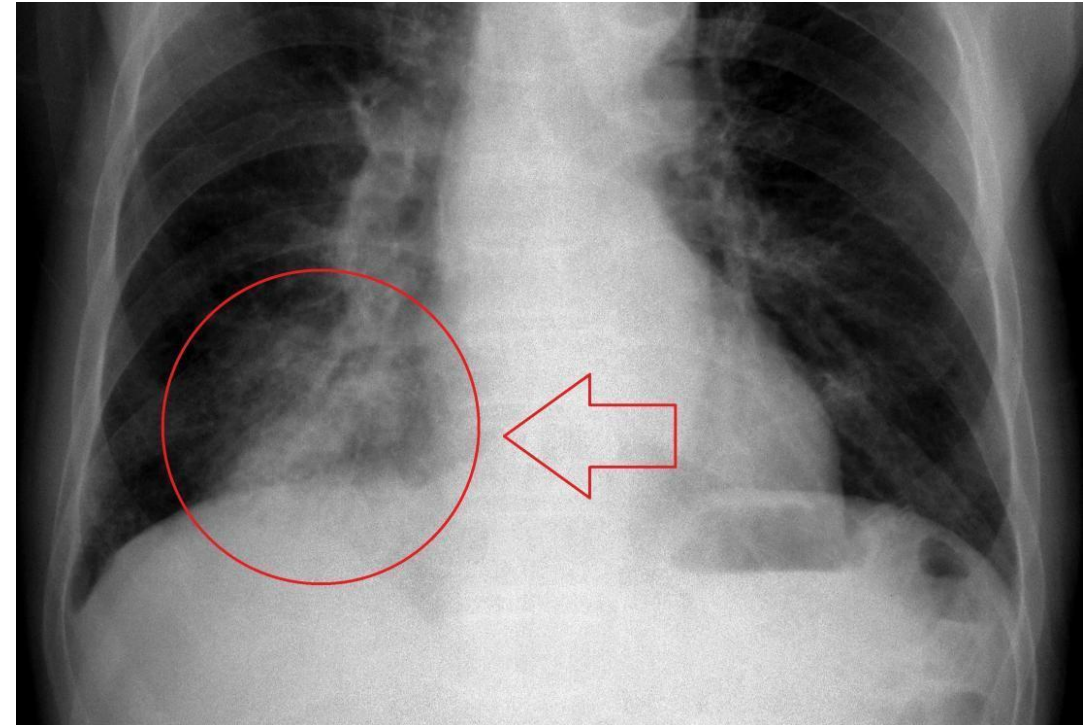


Question



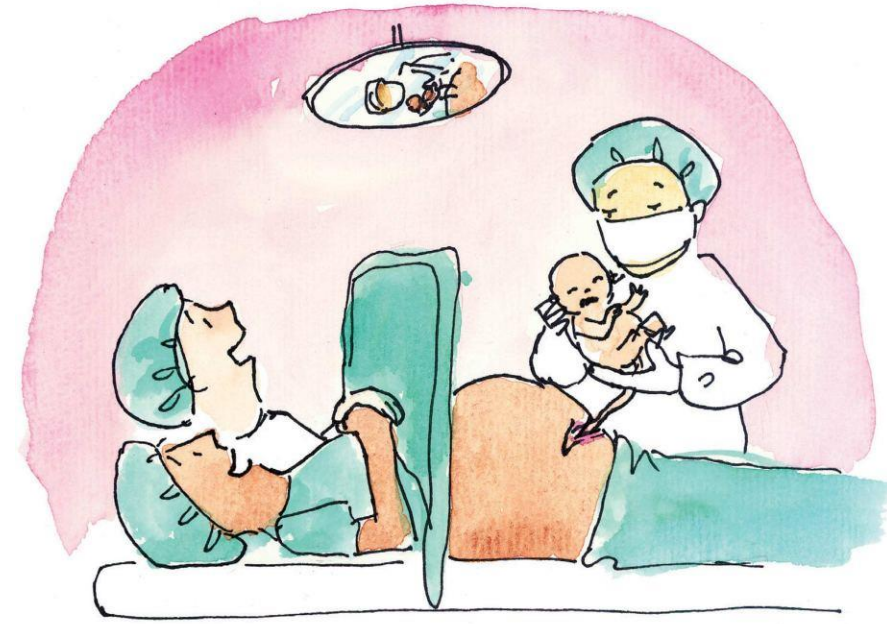
4. L'augmentation du risque d'aspiration débute dans quelle semaine de gestation?

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- d) 28



Plan

- Généralités de la césarienne
- Considérations femme enceinte
- **Préparation anesthésique**
- Anesthésies neuraxiales
- Anesthésie générale
- Utérotoniques
- Analgésie post-césarienne
- ERAC



A white rectangular card is suspended from a horizontal, light-brown twine string by a small wooden clothespin. The card is tilted at an angle, and the words "BE PREPARED" are printed on it in a bold, black, sans-serif font. The background is a dark, textured surface, possibly a piece of dark paper or fabric, which provides a high contrast for the white card and the light string. The lighting is soft, highlighting the textures of the twine, the wood of the clothespin, and the paper of the card.

BE PREPARED

Phase	Issues	Specific Concerns
Preparation	Preanesthetic evaluation	History and physical examination Indicated laboratory measurements Imaging studies
	Oral intake	No clear liquids and solid foods for 2 hours and 6–8 hours, respectively, before elective surgery (the presence of comorbid conditions may warrant a longer fasting interval)
	Communication with obstetric team	Indication(s) for cesarean delivery, including degree of urgency Anticipated surgical complications
	Informed consent	Threshold, information, and consent elements Informed refusal
	Blood products	Risk factors for hemorrhage Baseline hematocrit or hemoglobin measurement Blood type and screen or cross-match Equipment for rapid transfusion
	Monitoring	Pulse oximetry, electrocardiogram, blood pressure, fetal heart rate, urinary catheter Consider electroencephalographic (bispectral index) monitoring during general anesthesia (controversial) Invasive monitoring in selected patients
	Medication availability	Anesthetic (general and neuraxial anesthetic drugs, vasopressors) Obstetric (uterotonic agents) Emergency (advanced cardiac life support, malignant hyperthermia)
	Equipment availability	Anesthesia, airway management
	Aspiration prophylaxis	Fasting guidelines, nonparticulate antacid, H ₂ -receptor antagonist, metoclopramide
	Prophylactic antibiotics ^b	Within 60 minutes <i>before</i> incision
	Intravenous access and fluid management	Intravenous catheter: 16- or 18-gauge Fluid type, volume, and rate
	Supplemental medications	Consider anxiolysis for severe anxiety
	Positioning	Lateral or sitting position for neuraxial needle/catheter placement Left uterine displacement, slight head up for surgery “Sniffing” position if general anesthesia is planned
	Supplemental oxygen	Preoxygenation/denitrogenation required before general anesthesia Of unclear benefit during neuraxial anesthesia for elective delivery of a noncompromised fetus

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Questionnaire anesthésique

- Antécédents/ Habitudes de vie
- Médicaments/ Allergies
- Voies aériennes
- Labos



Questionnaire anesthésique

- Antécédents/ Habitudes de vie
- Médicaments/ Allergies
- Voies aériennes
- Labos
- Césarienne: Indication? Urgence?
- Évolution du travail: Durée? Oxytocine? Épidurale?
- Foetus: Position, bien-être, combien?
- Placenta: Insertion? Anomalie?

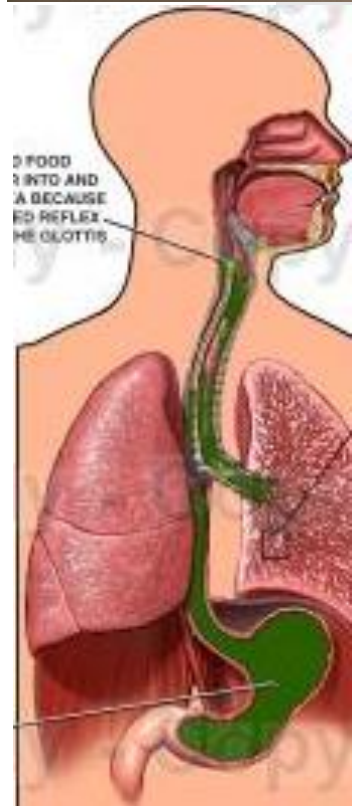
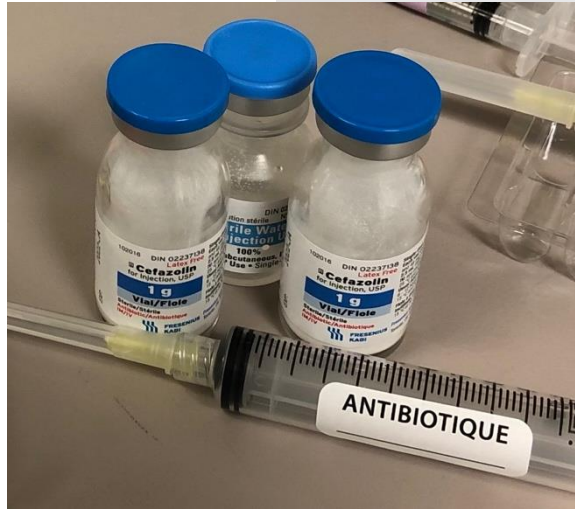


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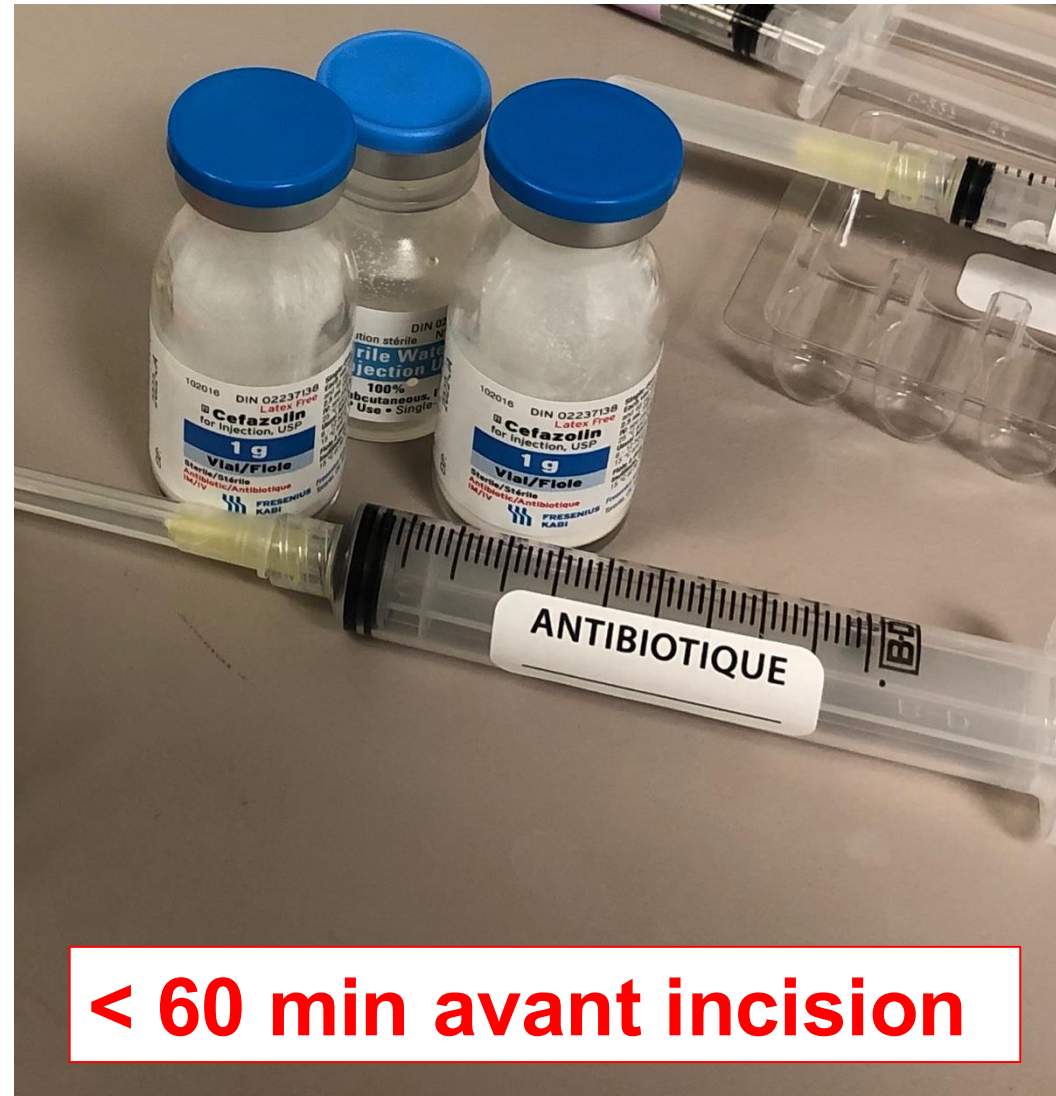
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Préparation





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< 60 min avant incision

Effects of Maternal Obesity on Tissue Concentrations of Prophylactic Cefazolin During Cesarean Delivery

Leo Pevzner, MD, Morgan Swank, MD, Candace Krepel, MS, Deborah A. Wing, MD, Kenneth Chan, MD, and Charles E. Edmiston Jr, PhD

Obstet Gynecol 2011;117:877–82,

> 120 kg = Céfazoline 3 g IV

Adoption of Adjunctive Azithromycin for Unscheduled Cesarean Delivery and Postpartum Infections

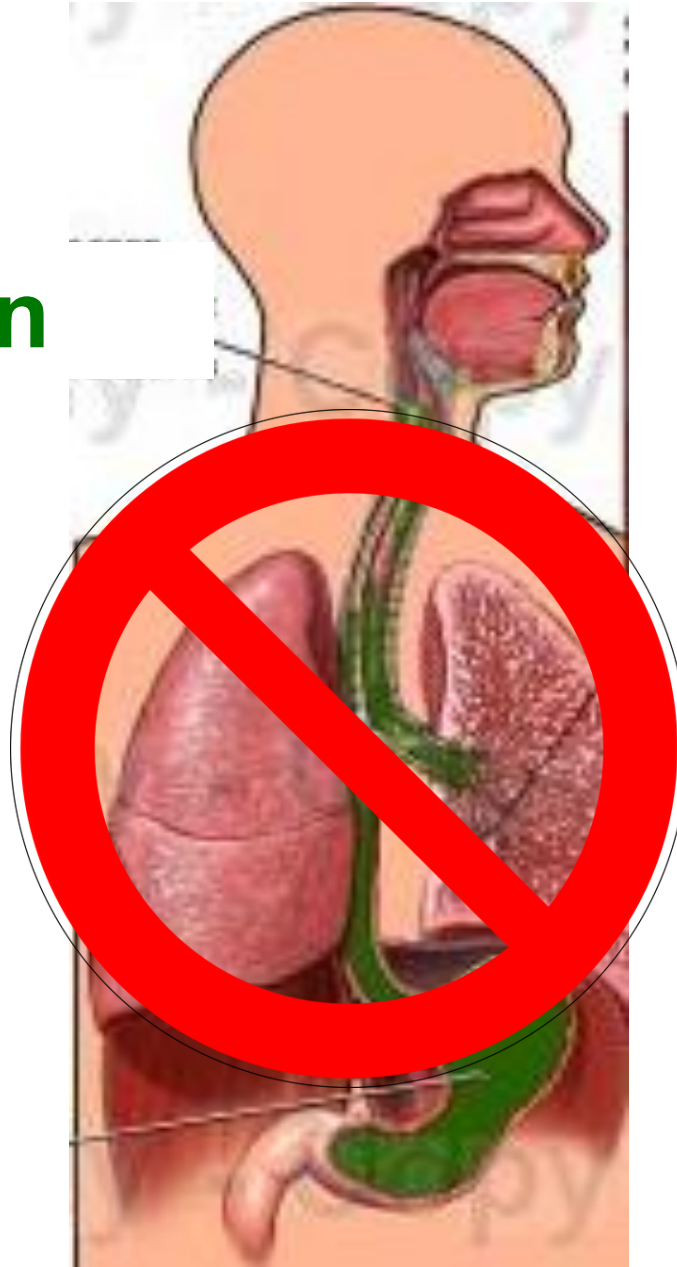
Taylor S. Freret, MD, EdM; Ethan Litman, MD; Timothy Wen, MD, MPH; Jeanne-Marie Guise, MD, MPH, MBA;
Sarah E. Little, MD, MPH; Mark A. Clapp, MD, MPH

JAMA. doi:[10.1001/jama.2026.15010](https://doi.org/10.1001/jama.2026.15010)

Published online September 14, 2026.

CONCLUSIONS AND RELEVANCE After publication of the trial evidence in 2016, azithromycin use for pregnant persons undergoing unscheduled cesarean delivery increased and postpartum infection rates decreased in the US.

Risque d'aspiration



Guidelines to the Practice of Anesthesia—Revised Edition 2026

Can J Anesth/J Can Anesth

Gregory R. Dobson, MD  · Alex Beomju Bak, MD · Anthony Chau, MD · Justine Denomme, MD ·
Giuseppe Fuda, MD · Conor Mc Donnell, MD · Robert Milkovich, MD · Andrew D. Milne, MD ·
John Murdoch, MD · Kathryn Sparrow, MD · Yamini Subramani, MD · Christopher Young, MD

An H₂ receptor antagonist (*po* or *iv*) is recommended for all women presenting for Cesarean delivery.



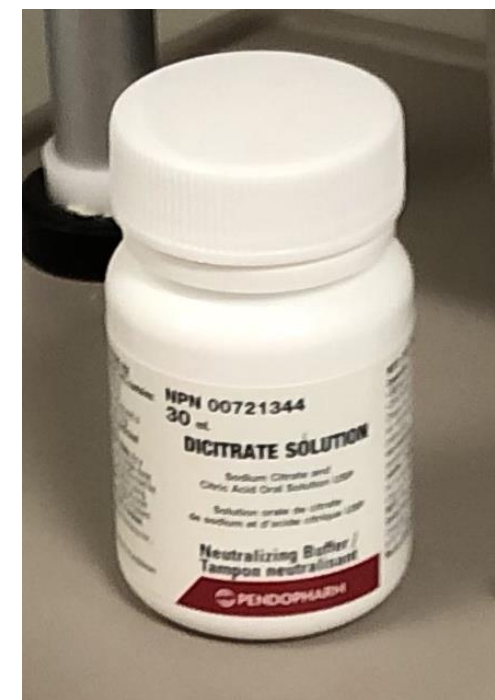
Guidelines to the Practice of Anesthesia—Revised Edition 2026

Can J Anesth/J Can Anesth

Gregory R. Dobson, MD  · Alex Beomju Bak, MD · Anthony Chau, MD · Justine Denomme, MD · Giuseppe Fuda, MD · Conor Mc Donnell, MD · Robert Milkovich, MD · Andrew D. Milne, MD · John Murdoch, MD · Kathryn Sparrow, MD · Yamini Subramani, MD · Christopher Young, MD

An H₂ receptor antagonist (*po* or *iv*) is recommended for all women presenting for Cesarean delivery.

We recommend 30 mL of oral sodium citrate (0.3 M) is recommended prior to an emergent Cesarean delivery if general anesthesia is planned.



Oral sodium citrate increases nausea amongst elective Cesarean delivery patients

[Le citrate de sodium oral augmente les nausées pendant la césarienne réglée]

Klaus Kjaer MD, Michele Comerford MD, Linda Kondilis BA, Lauren DiMaria BA, Sharon Abramovitz MD, Michael Kiselev MD, Jon Samuels MD, Farida Gadalla MD, Barbara L. Leighton MD

[Can J Anaesth. 2006 Aug;53\(8\):776-80.](#)

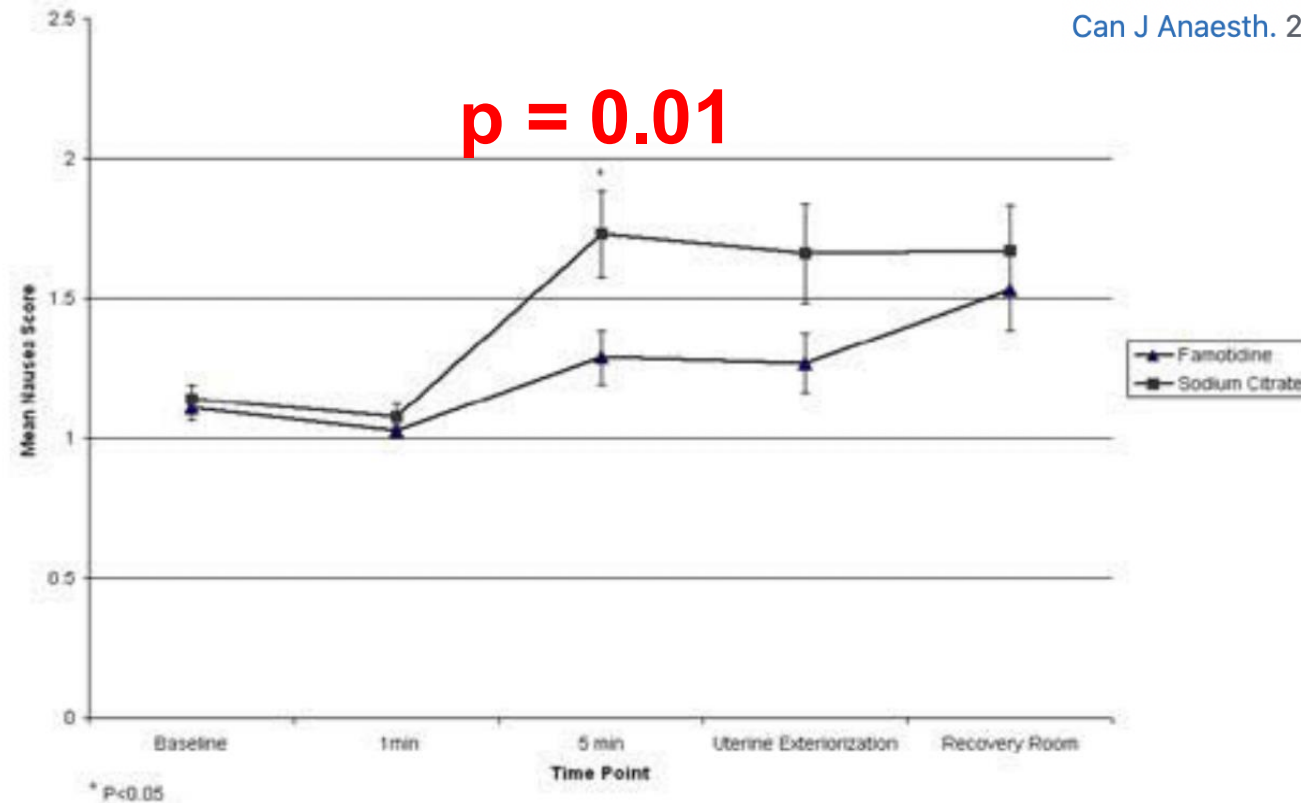


FIGURE 1 Average degree of nausea over time.



↑ **vidange gastrique**
↓ **risque d'aspiration**
↓ **N°/V°**

Vidange gastrique

A prospective, comparative study in 40 parturients and nonpregnant women

Hypothesis:

Gastric emptying is delayed in parturients (with or without epidural analgesia) compared to nonlaboring and nonpregnant controls



10 subjects per group:

- Nonpregnant control
- Nonlaboring pregnant control
- Parturient-No-Epidural
- Parturient-Epidural

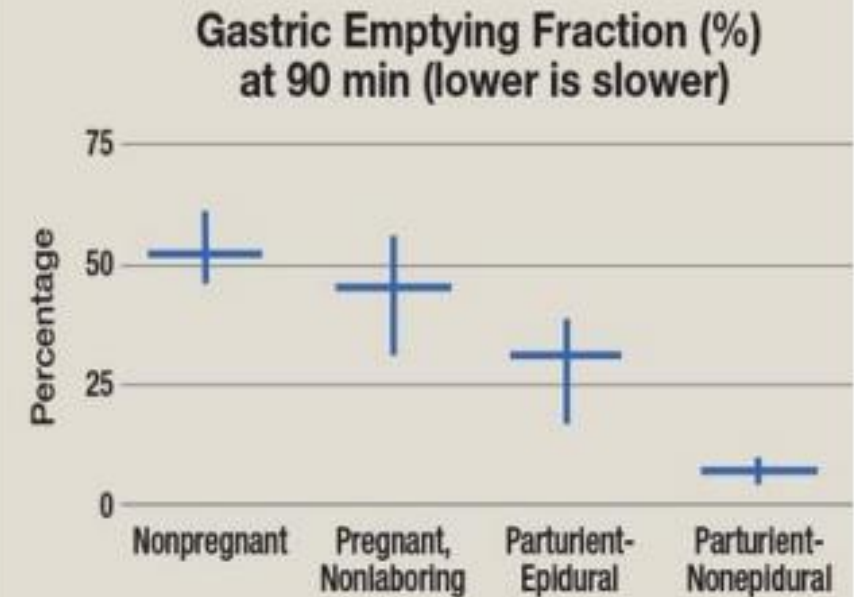
Study design:

- Baseline gastric ultrasound after fasting
- Ingestion of 125 g yogurt
- Serial ultrasound measurements of the antrum at 15, 60, 90, and 120 min



Primary outcome:

Antral cross-sectional area at 15 and 90 min after ingestion



Gastric emptying in parturients was delayed. Labor epidural analgesia appears to facilitate gastric emptying.

Vidange gastrique

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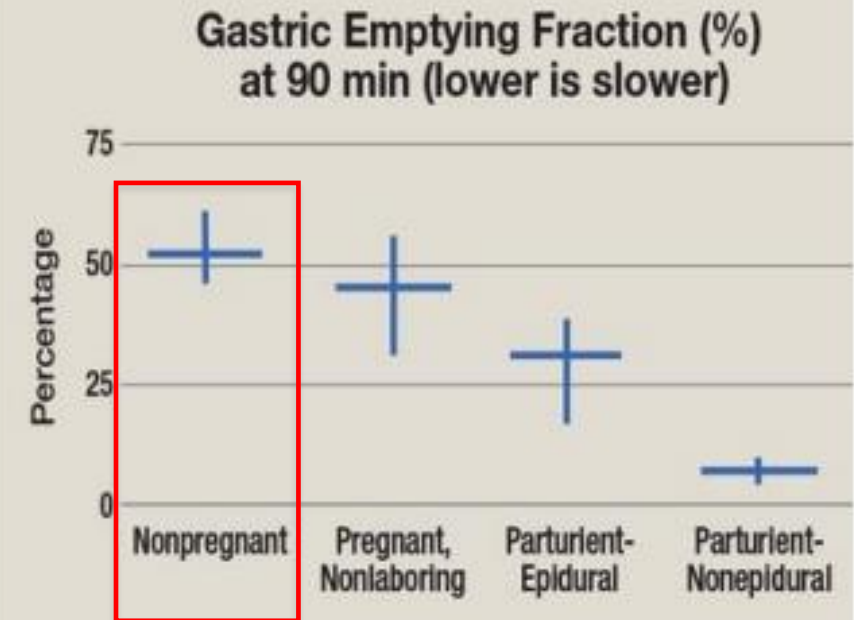
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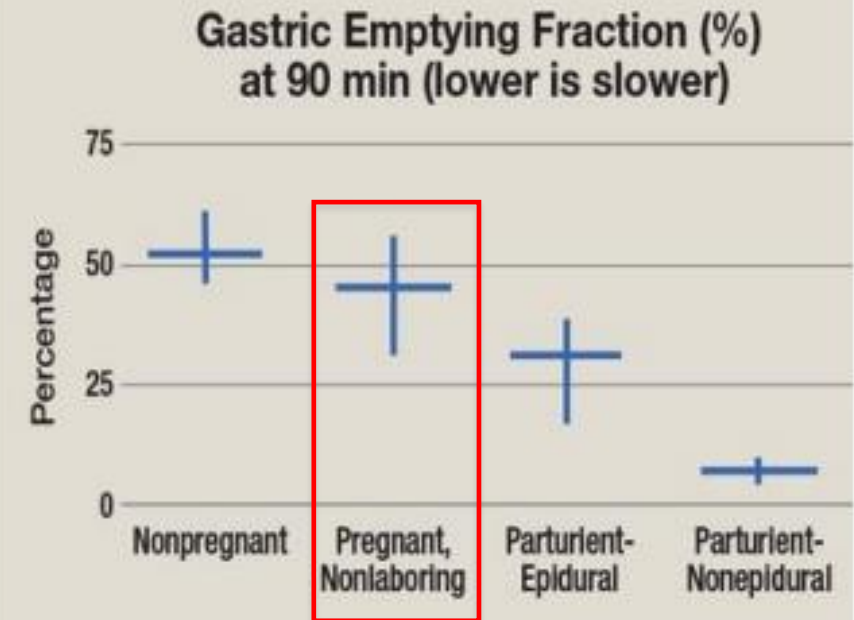
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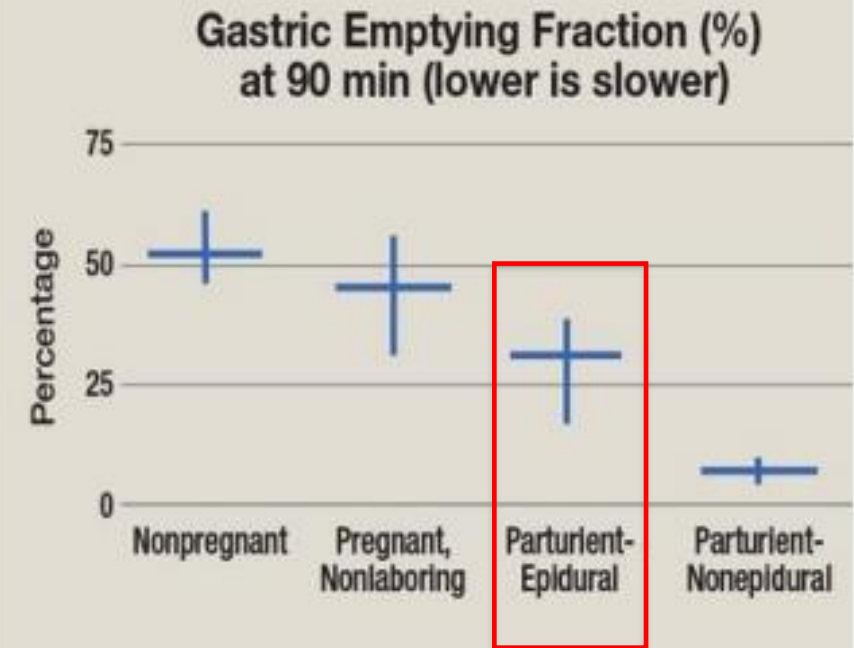
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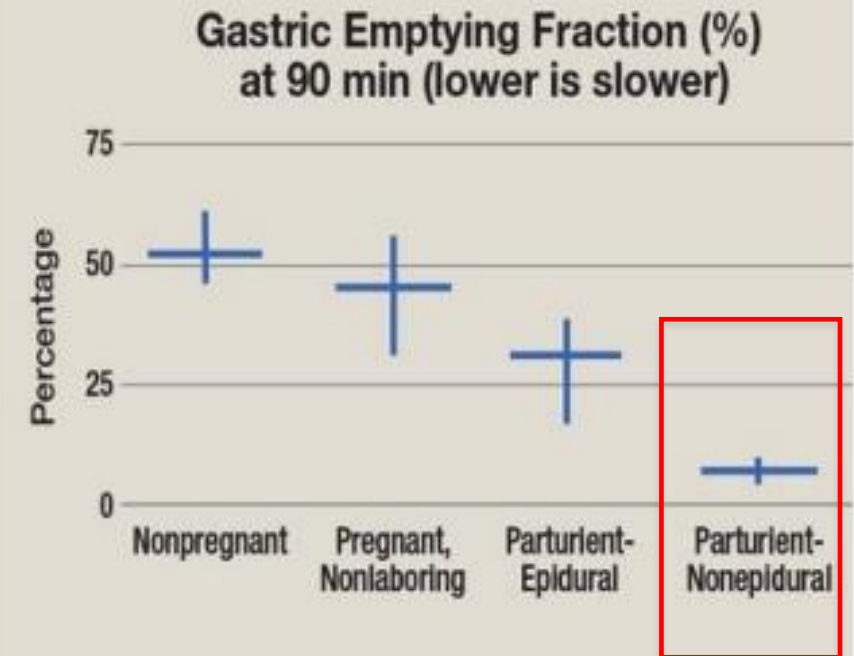
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Phase	Issues	Specific Concerns
Preparation	Preanesthetic evaluation	History and physical examination Indicated laboratory measurements Imaging studies
	Oral intake	No clear liquids and solid foods for 2 hours and 6–8 hours, respectively, before elective surgery (the presence of comorbid conditions may warrant a longer fasting interval)
	Communication with obstetric team	Indication(s) for cesarean delivery, including degree of urgency
	Informed consent	Anticipated surgical complications Threshold, information, and consent elements Informed refusal
	Blood products	Risk factors for hemorrhage Baseline hematocrit or hemoglobin measurement Blood type and screen or cross-match Equipment for rapid transfusion
	Monitoring	Pulse oximetry, electrocardiogram, blood pressure, fetal heart rate, urinary catheter Consider electroencephalographic (bispectral index) monitoring during general anesthesia (controversial) Invasive monitoring in selected patients
	Medication availability	Anesthetic (general and neuraxial anesthetic drugs, vasopressors) Obstetric (uterotonic agents) Emergency (advanced cardiac life support, malignant hyperthermia)
	Equipment availability	Anesthesia, airway management
	Aspiration prophylaxis	Fasting guidelines, nonparticulate antacid, H ₂ -receptor antagonist, metoclopramide
	Prophylactic antibiotics ^b	Within 60 minutes <i>before</i> incision
	Intravenous access and fluid management	Intravenous catheter: 16- or 18-gauge Fluid type, volume, and rate
	Supplemental medications	Consider anxiolysis for severe anxiety
	Positioning	Lateral or sitting position for neuraxial needle/catheter placement Left uterine displacement, slight head up for surgery “Sniffing” position if general anesthesia is planned
	Supplemental oxygen	Preoxygenation/denitrogenation required before general anesthesia Of unclear benefit during neuraxial anesthesia for elective delivery of a noncompromised fetus

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Supplemental oxygen for caesarean section during regional anaesthesia (Review)

Chatmongkolchart S, Prathep S

Cochrane Database of Systematic Reviews 2016, Issue 3. Art. No.: CD006161.

Overall, we found no convincing evidence that giving supplementary oxygen to healthy term pregnant women during elective caesarean section under regional anaesthesia is either beneficial or harmful for either the mother or the foetus' short-term clinical outcome as

JAMA Pediatrics | **Original Investigation**

JAMA Pediatr. 2021;175(4):368-376.

Maternal Oxygen Supplementation Compared With Room Air for Intrauterine Resuscitation A Systematic Review and Meta-analysis

Nandini Raghuraman, MD, MS; Lorene A. Temming, MD, MSCI; Michelle M. Doering, MLIS; Carolyn R. Stoll, MPH, MSW; Arvind Palanisamy, MD; Molly J. Stout, MD, MSCI; Graham A. Colditz, MD, DrPH; Alison G. Cahill, MD, MSCI; Methodius G. Tuuli, MD, MPH, MBA

Meaning This systematic review and meta-analysis found no association between maternal oxygen supplementation and a clinically relevant improvement in umbilical artery pH or other neonatal outcomes.



Cas

- Vient pour césarienne élektive
- 28 ans, G2P1, bonne santé, poids N
- À jeun
- AW facile
- Labos: Hb 118, Plts 118
- G1 = césarienne pour arrêt de progression
- N°/V° intra-op lors de sa 1^e césarienne



Question

5. Quelle est votre choix d'anesthésie pour cette patiente?

- a) Épidurale
- b) Rachi
- c) Rachi en continue
- d) Anesthésie générale



Question

5. Quelle est votre choix d'anesthésie pour cette patiente?

a) Épidurale

b) Rachi

c) Rachi en continue

d) Anesthésie générale



Plan

- Généralités de la césarienne
- Considérations femme enceinte
- Préparation anesthésique
- **Anesthésies neuraxiales**
- Anesthésie générale
- Utérotoniques
- Analgésie post-césarienne
- ERAC

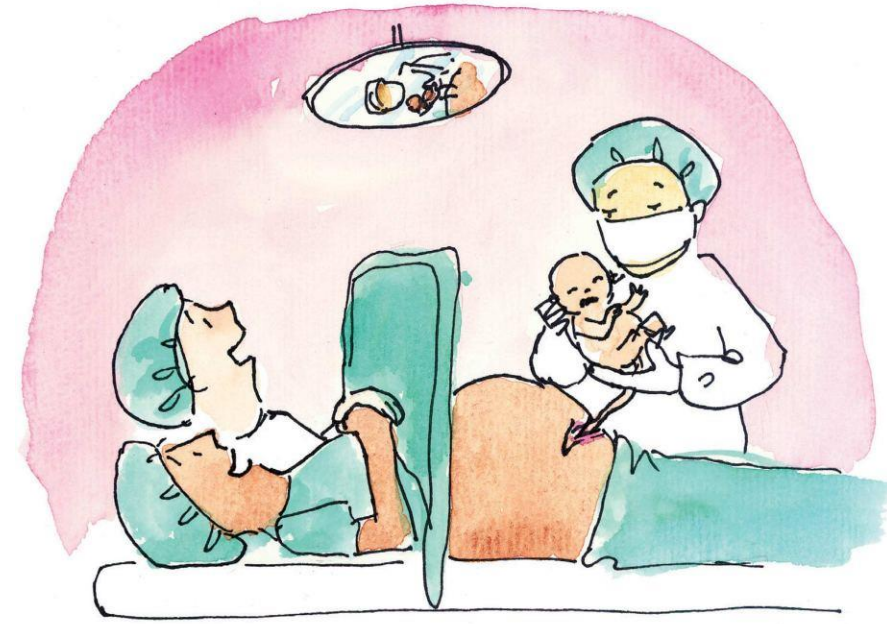


TABLE 26.5 Advantages and Disadvantages of Neuraxial Anesthetic Techniques for Cesarean Delivery

Neuraxial Technique	Advantages	Disadvantages
Single-shot spinal	Technically simple Low doses of local anesthetic and opioid Rapid onset of dense lumbosacral and thoracic anesthesia	Limited duration of anesthesia Limited ability to titrate extent of sensory blockade

Rachi

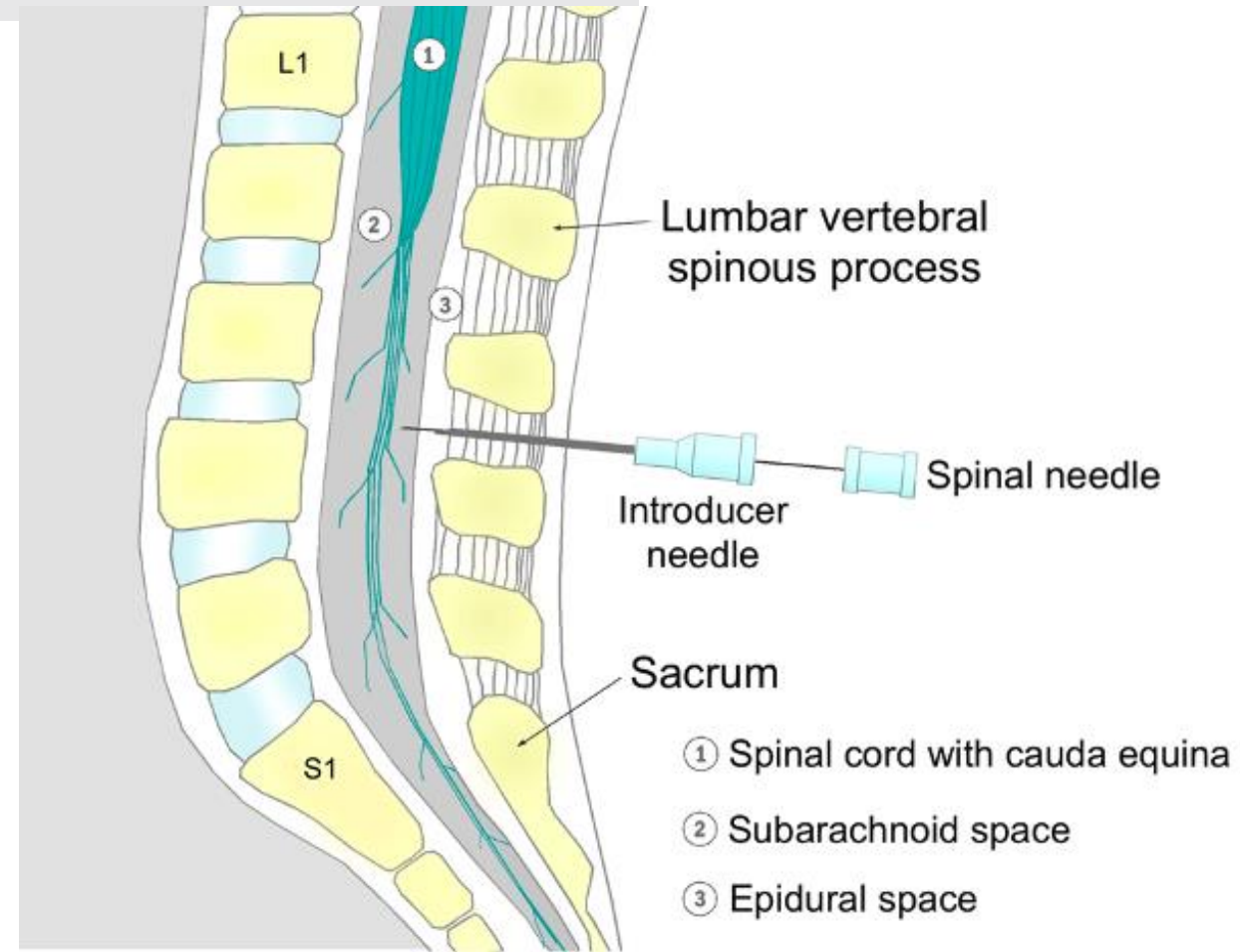


TABLE 26.5 Advantages and Disadvantages of Neuraxial Anesthetic Techniques for Cesarean Delivery

Neuraxial Technique	Advantages	Disadvantages
Epidural	No dural puncture required Can use <i>in situ</i> catheter placed for earlier administration of labor analgesia Ability to titrate extent of sensory blockade Continuous intraoperative anesthesia Continuous postoperative analgesia	Slow onset of anesthesia Larger drug doses required than for spinal techniques: • Greater risk for maternal local anesthetic systemic toxicity • Greater fetal drug exposure

Épidurale

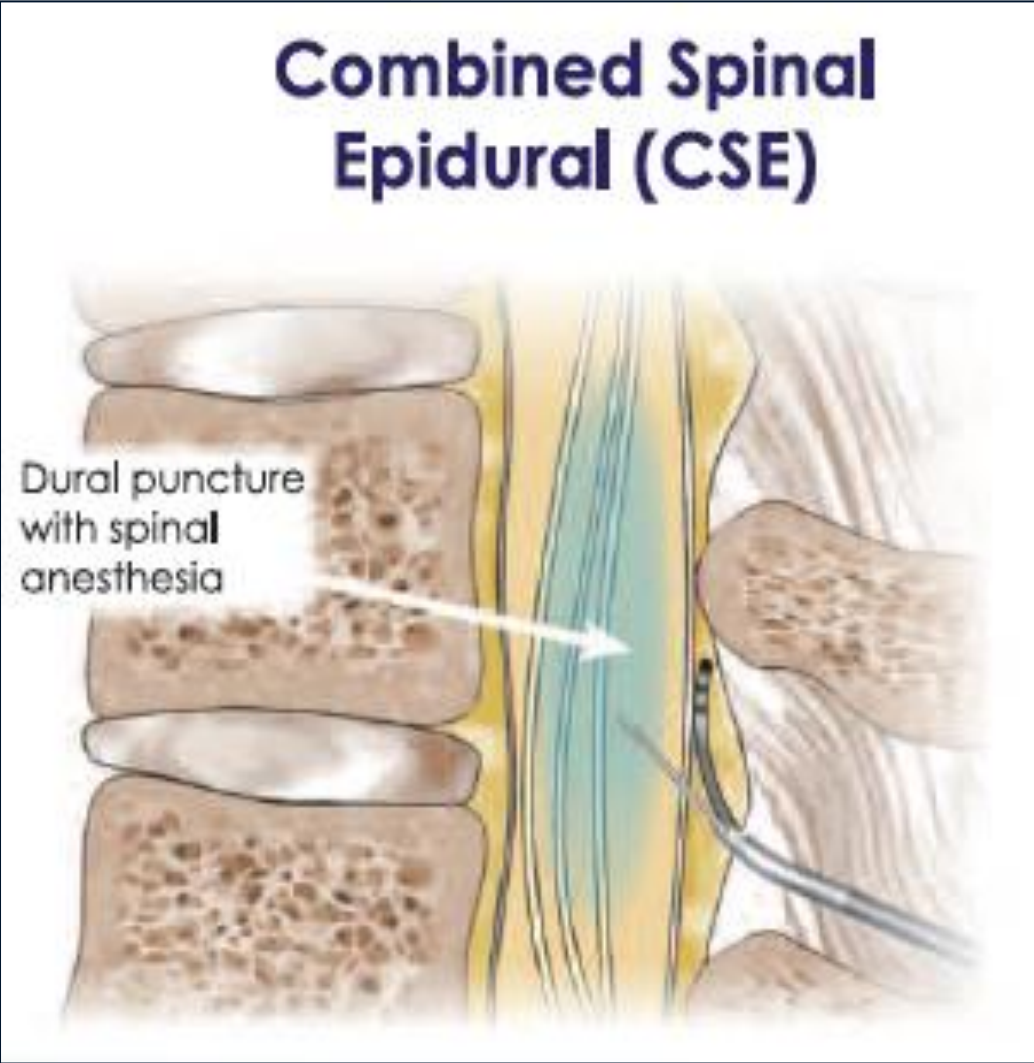
Epidural (EPL)



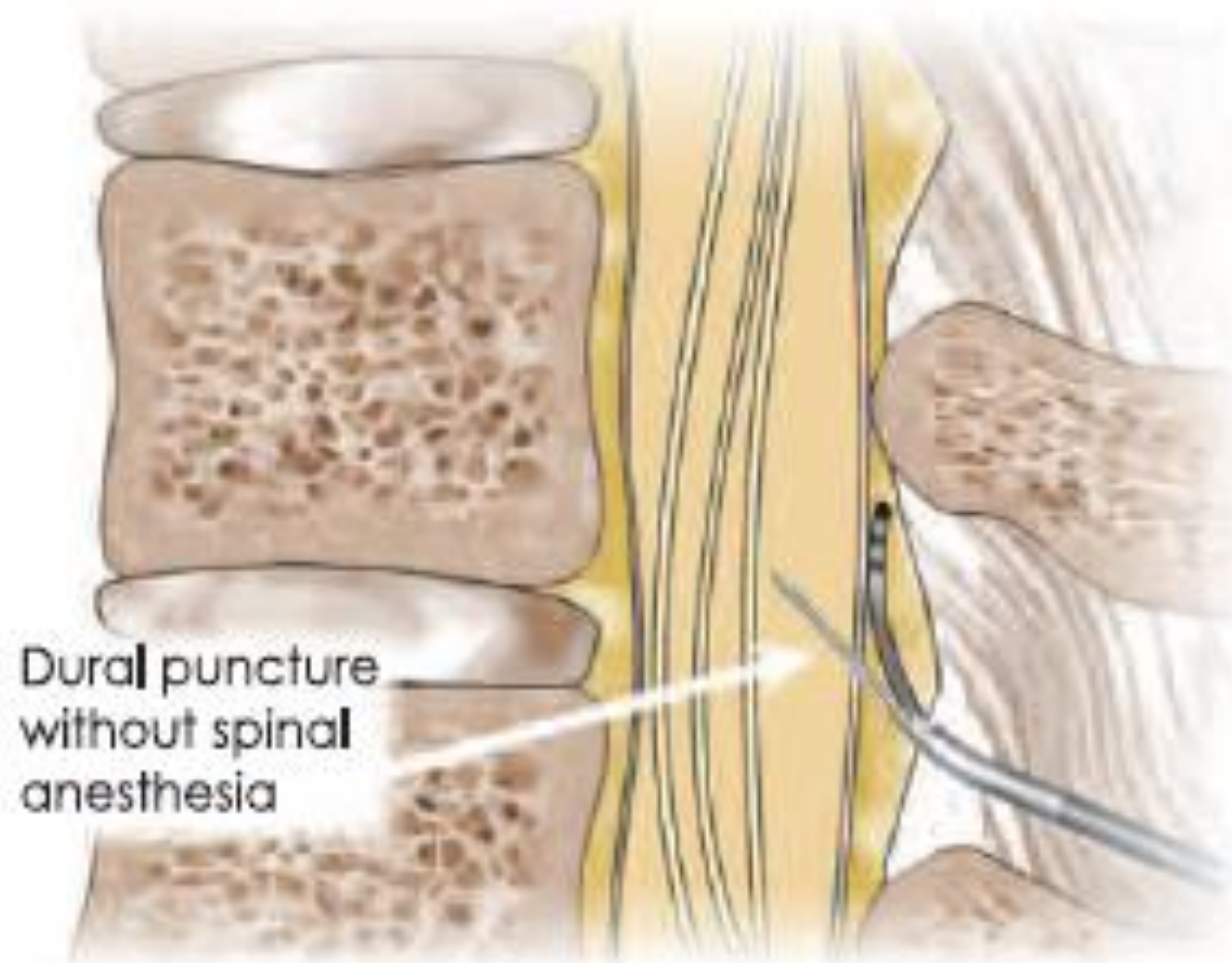
TABLE 26.5 Advantages and Disadvantages of Neuraxial Anesthetic Techniques for Cesarean Delivery

Neuraxial Technique	Advantages	Disadvantages
Combined spinal-epidural	May be technically easier than spinal anesthesia in obese patients Low doses of local anesthetic and opioid Rapid onset of dense lumbosacral and thoracic anesthesia Ability to titrate extent of sensory blockade Continuous intraoperative anesthesia Continuous postoperative analgesia	Delayed verification of functioning epidural catheter

Combinée



Dural Puncture Epidural (DPE)



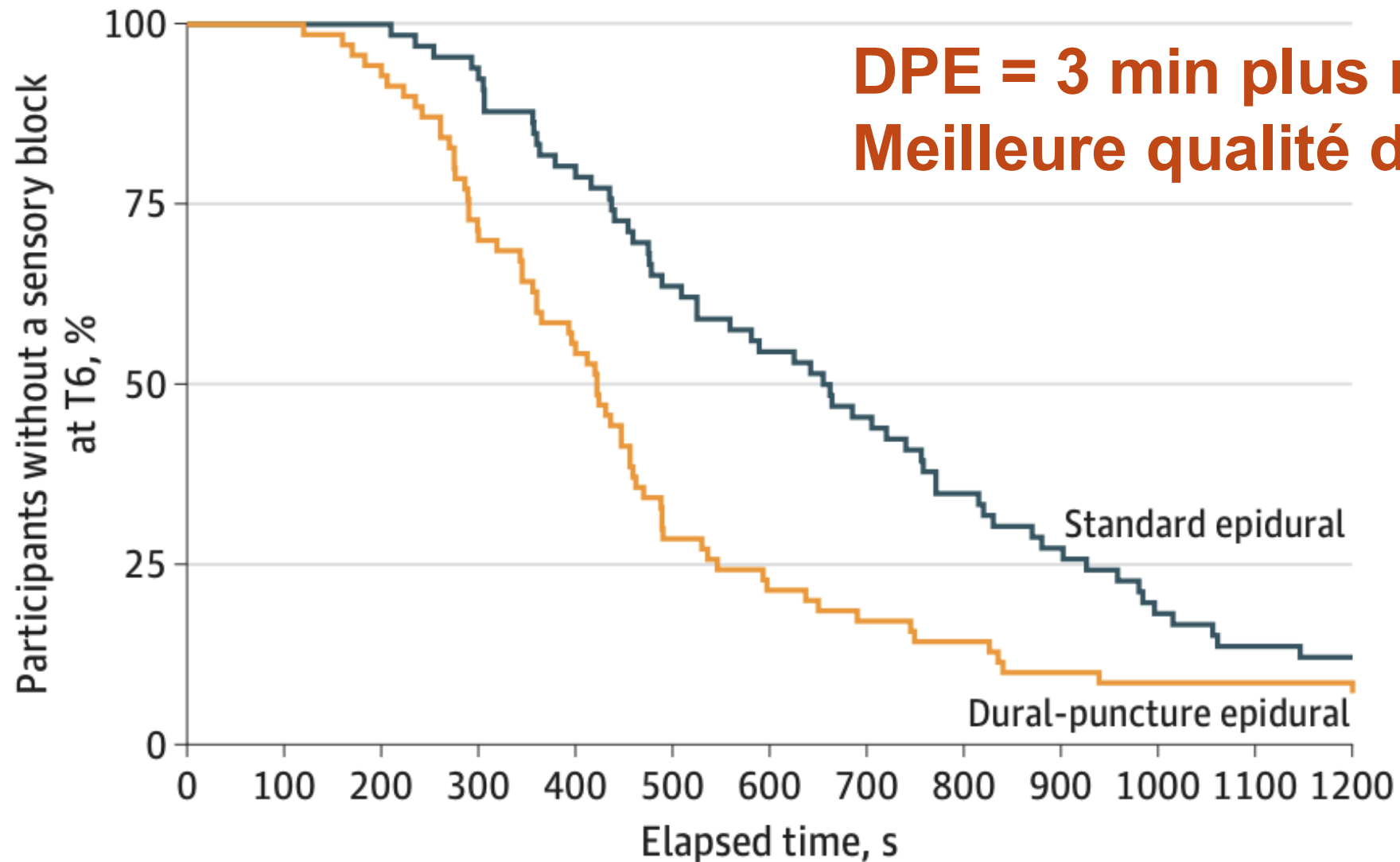
Effect of Dural-Puncture Epidural vs Standard Epidural for Epidural Extension on Onset Time of Surgical Anesthesia in Elective Cesarean Delivery

A Randomized Clinical Trial

JAMA Network Open. 2023;6(8):e2326710.

Nadir Sharawi, MBBS, MSc; Matthew Williams, MD; Waseem Athar, MD; Caroline Martinello, MD; Kyle Stoner, MD; Cameron Taylor, MD; Nan Guo, PhD; Pervez Sultan, MBChB, MD (Res); Jill M. Mhyre, MD

- 140 patients
- DPE ou EPL 1 heure avant la césarienne
- Initiation avec 20 ml de bupi 0,0625% pour $\geq$ T10
- Top-up césarienne avec 3% chloroprocaïne
- Outcome 1^e: temps pour atteindre anesthésie chirurgicale



No. at risk

Standard epidural	66	66	66	62	53	42	36	30	23	18	12	9	8
Dural-puncture epidural	70	70	66	50	39	20	15	12	10	7	6	6	6

Maternal Hemorrhage—Regional Versus General Anesthesia: Does It Really Matter?

ANESTHESIA & ANALGESIA

October 2018 • Volume 127 • Number 4

Yaakov Beilin, MD

Neuraxiale

- Éveillée pour voir la naissance du bébé
- Pas d'IET
- Pas d'aspiration
- Meilleurs outcomes NN
- Meilleure stabilité HD

Générale

- Éviter la sympathectomie de la neuraxiale en cas d'hypotension à cause d'une hémorragie massive

**Mode of Anesthesia for
Patients with Placenta
Accreta Spectrum
Undergoing Cesarean
Hysterectomy: A Report
from the Multicenter
Perioperative Outcomes
Group Database**

**~ 75% des patientes avec spectre
placenta accreta reçoivent AG!**

Andrew Padilla, M.D., Jessica Stockinger, M.D.,
Nicole C. Zanolli, M.D., Rachel Hurwitz, M.Sc.,
Holly B. Ende, M.D., Alexander J. Butwick, M.B.B.S.,
Christine M. Warrick, M.D., Philip E. Hess, M.D.,
Michael Mathis, M.D., Matthew Fuller, M.S.,
Ashraf S. Habib, M.B.B.Ch., M.Sc., M.H.Sc.,
for the Multicenter Perioperative Outcomes
Group Investigators

ANESTHESIOLOGY 2026; 144:535–45



**Severe maternal morbidity following Cesarean hysterectomy for
placenta accreta spectrum: a historical cohort study**

Alexandra Bickett, BS · Matthew Fuller, MS · Jennifer B. Gilner, MD, PhD · Luke A. Gatta, MD
Vijay Krishnamorthy, MD, PhD · Tetsu Ohnuma, MD, MPH · Karthik Raghunathan, MD ·
Ashraf S. Habib, MBBCh, MHSc, FRCA 

Severe maternal morbidity following Cesarean hysterectomy for placenta accreta spectrum: a historical cohort study

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Ashraf S. Habib, MBBCh, MHSc, FRCA 

Anesthésie neuraxiale associée avec:

↓ *Morbidité maternelle sévère*

(OR 0.64; 95% CI, 0.44 – 0.91)

↓ *Admissions aux SI*

(OR 0.43; 95% CI, 0.27 – 0.69)

Neuraxial anesthesia in patients with placenta accreta spectrum disorder: balancing clinical strategy with shared decision-making

Valerie Zaphiratos, MD, FRCPC · Ronald B. George, MD, FRCPC 

Can J Anesth/J Can Anesth (2026) 73:8–12

Neuraxial Anesthesia During Cesarean Delivery for Placenta Previa With Suspected Morbidly Adherent Placenta: A Retrospective Analysis

Anesth Analg 2018;127:930–8

John C. Markley, MD, PhD,* Michaela K. Farber, MD, MS,† Nicola C. Perlman, BA,‡
and Daniela A. Carusi, MD, MSc§

- L'usage systématique de l'AG pour le spectre de placenta accréta n'est pas nécessaire
- Réserver AG pour patientes avec complexités chirurgicales

TABLE 26.5 Advantages and Disadvantages of Neuraxial Anesthetic Techniques for Cesarean Delivery

Neuraxial Technique	Advantages	Disadvantages
Continuous spinal	Low doses of local anesthetic and opioid Rapid onset of dense anesthesia Ability to titrate extent of sensory blockade Continuous intraoperative anesthesia	Large dural puncture increases risk for post-dural puncture headache Possibility of overdose and total spinal anesthesia if the spinal catheter is mistaken for an epidural catheter

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Anesthetic management of super-morbidly obese parturients for cesarean delivery with a double neuraxial catheter technique: a case series

IMC > 50

C.M. Polin,^{*} B. Hale, A.A. Mauritz, A.S. Habib, C.A. Jones, Z.Y. Strouch,
J.E. Dominguez

Department of Anesthesiology, Duke University Medical Center, Durham, NC, USA

Neuraxiale contre-indications

- Coagulopathie (absolue)
- Neuropathie
- Infection
- Augmentation PIC
- Hypovolémie/Choc

Rachianesthésie



- Peu d'anesthésique local (AL) =
↓ risque toxicité pour mère et
foetus
- Ponction lombaire dessous L2
- Objectif = bloc à T4 bilatéral
- Femmes enceintes = ↓ dose d'AL
 - ↓ volume LCR en grossesse
 - Étendue céphalade d'AL hyperbare
en DD
 - ↑ sensibilité des fibres nerveuses
aux AL

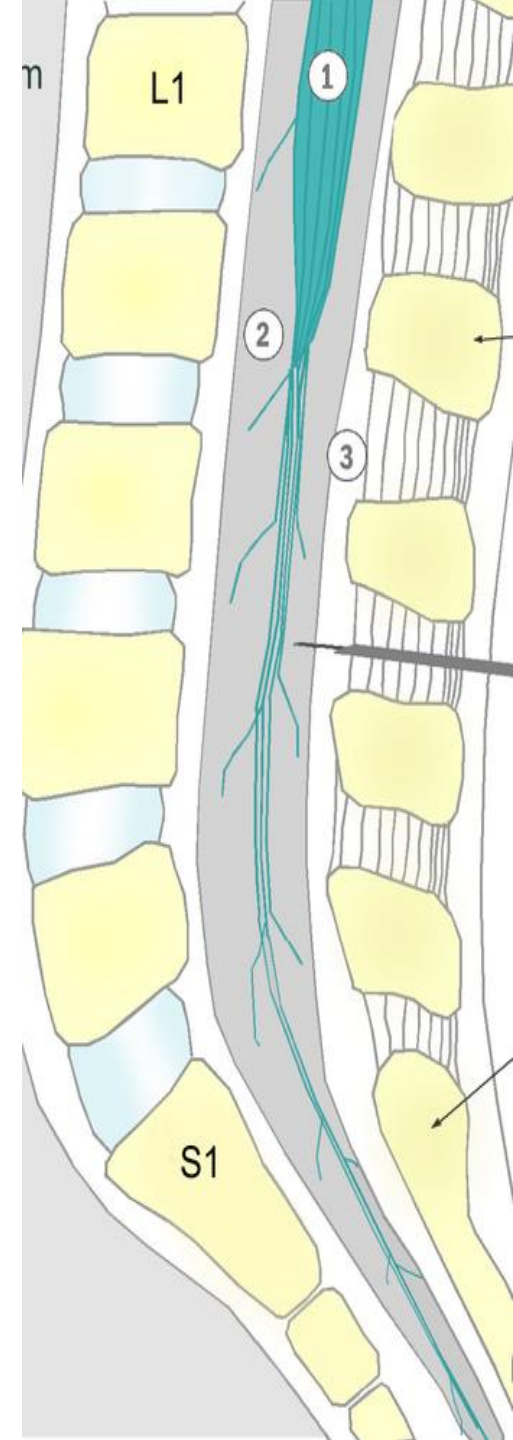


TABLE 26.6 Drugs Used for Spinal Anesthesia for Cesarean Delivery

Drug	Dose Range	Duration (min)^a
Local Anesthetics		
Lidocaine	60–80 mg	45–75
Bupivacaine	7.5–15 mg	60–120
Levobupivacaine	7.5–15 mg	60–120
Ropivacaine	15–25 mg	60–120
Opioids		
Fentanyl	10–25 µg	180–240
Sufentanil	2.5–5 µg	180–240
Morphine	100–200 µg (0.1–0.2 mg)	720–1440
Hydromorphone	60–75 µg (0.060– 0.075 mg)	720–875
Meperidine ^b	60–70 mg	60
Adjuvant Drugs		
Epinephrine ^c	100–200 µg (0.1–0.2 mg)	

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Sufentanil	2.5–5 µg	180–240
Morphine	100–200 µg (0.1–0.2 mg)	720–1440
Hydromorphone	60–75 µg (0.060– 0.075 mg)	720–875
Meperidine ^b	60–70 mg	60
Adjuvant Drugs		
Epinephrine ^c	100–200 µg (0.1–0.2 mg)	

Optimiser la dose selon la patiente

Grandeur

Poids

Âge gestationnel

Optimiser la dose selon la patiente

Grandeur

< 155 cm ou > 170 cm

Poids

Âge gestationnel

Optimiser la dose selon la patiente

Grandeur

< 155 cm ou > 170 cm

Poids

Dose inversement
proportionnelle

Âge gestationnel

Optimiser la dose selon la patiente

Grandeur

< 155 cm ou > 170 cm

Poids

Dose inversement
proportionnelle

Âge gestationnel

↑ dose (préterme ou RCIU)

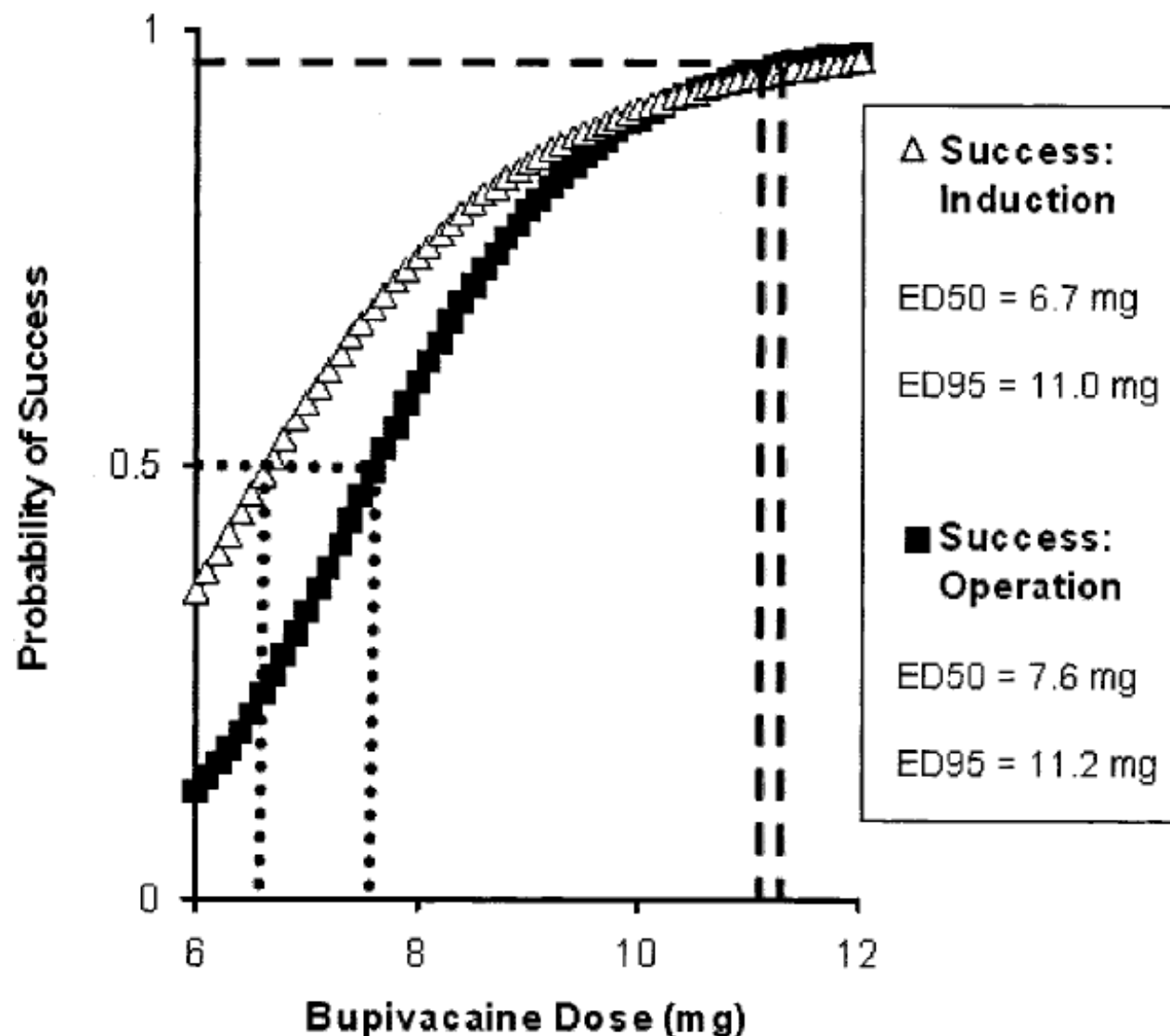
↓ dose (macrosomie ou gestation multiple)

ED₅₀ and ED₉₅ of Intrathecal Hyperbaric Bupivacaine Coadministered with Opioids for Cesarean Delivery

Yehuda Ginosar, B.Sc., M.B.B.S.,* Edward Mirikatani, M.D.,† David R. Drover, M.D.,‡

Sheila E. Cohen, M.B.Ch.B., F.R.C.A.,§ Edward T. Riley, M.D.||

Anesthesiology 2004; 100:676-82



12 mg

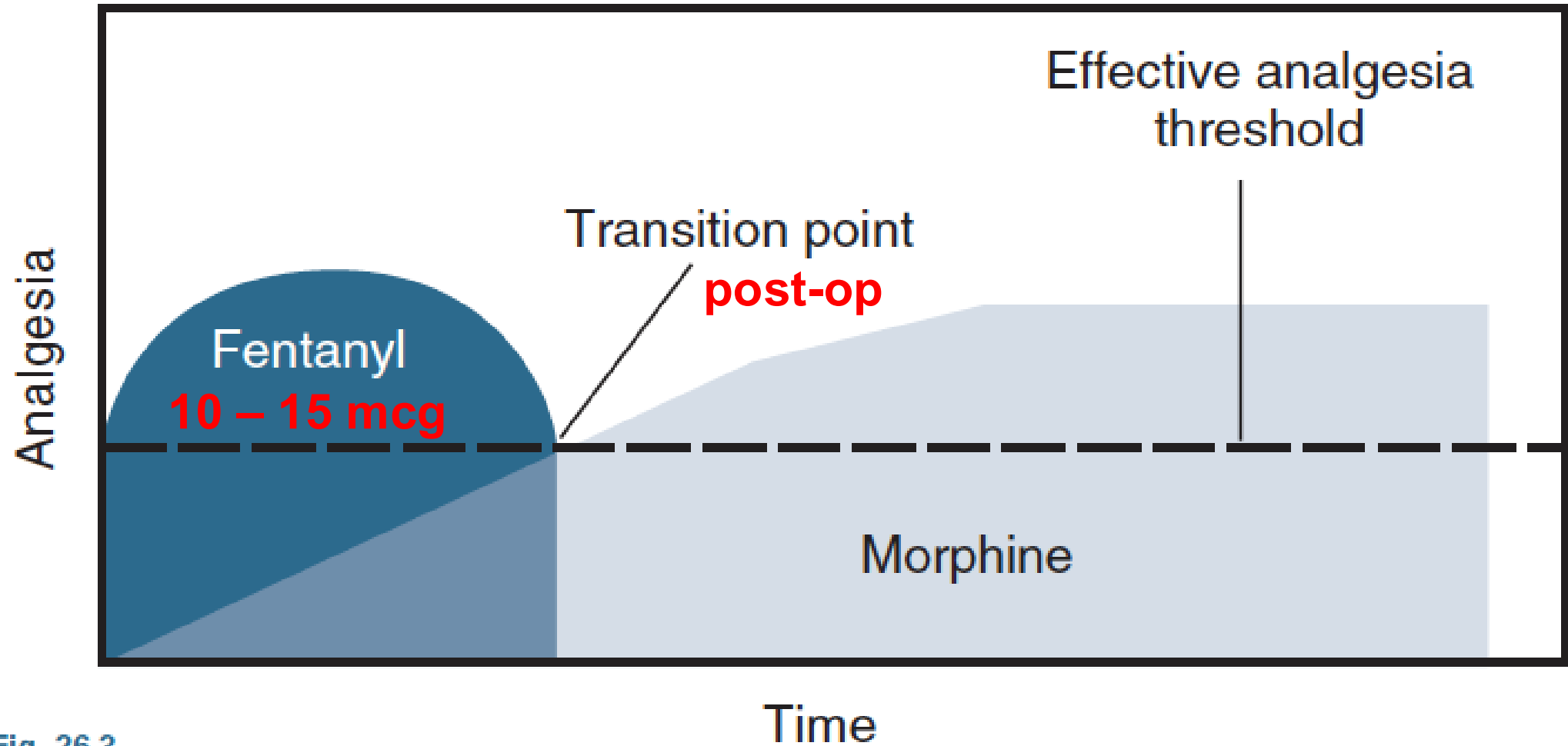


Fig. 26.3

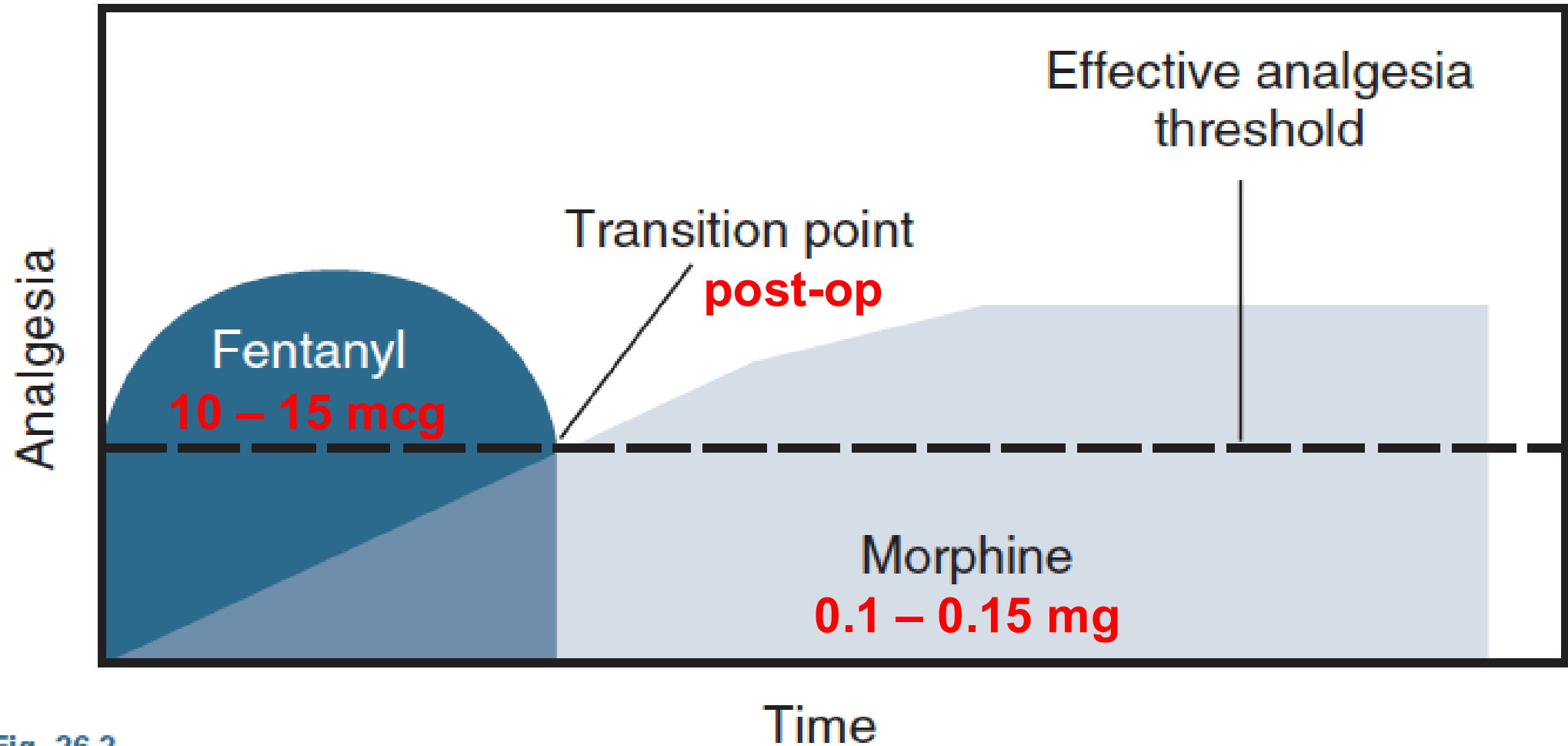
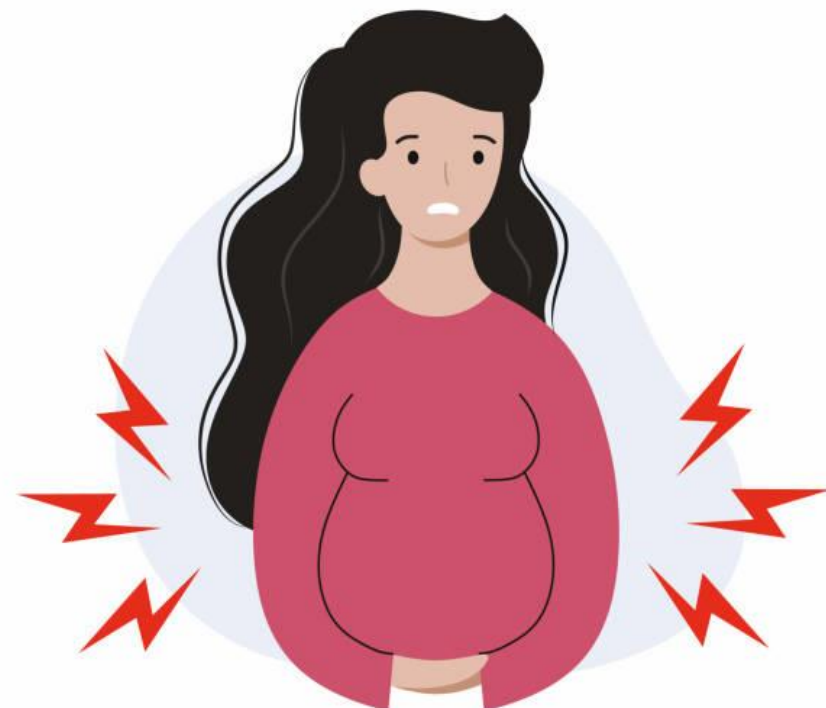


Fig. 26.3

Intraoperative Pain during Cesarean Delivery under Neuraxial Anesthesia: A Systematic Review and Meta-analysis

Elinor A. Charles, M.B.B.S., Hester Carter, Mb.Ch.B.,
Susanna Stanford, B.Sc., Lindsay Blake, Ed.D.,
Victoria Eley, Ph.D., Brendan Carvalho, M.B.Bc.H.,
Pervez Sultan, Mb.Ch.B., Justin Kua, M.B.B.S.,
James E. O'Carroll, M.B.B.S.

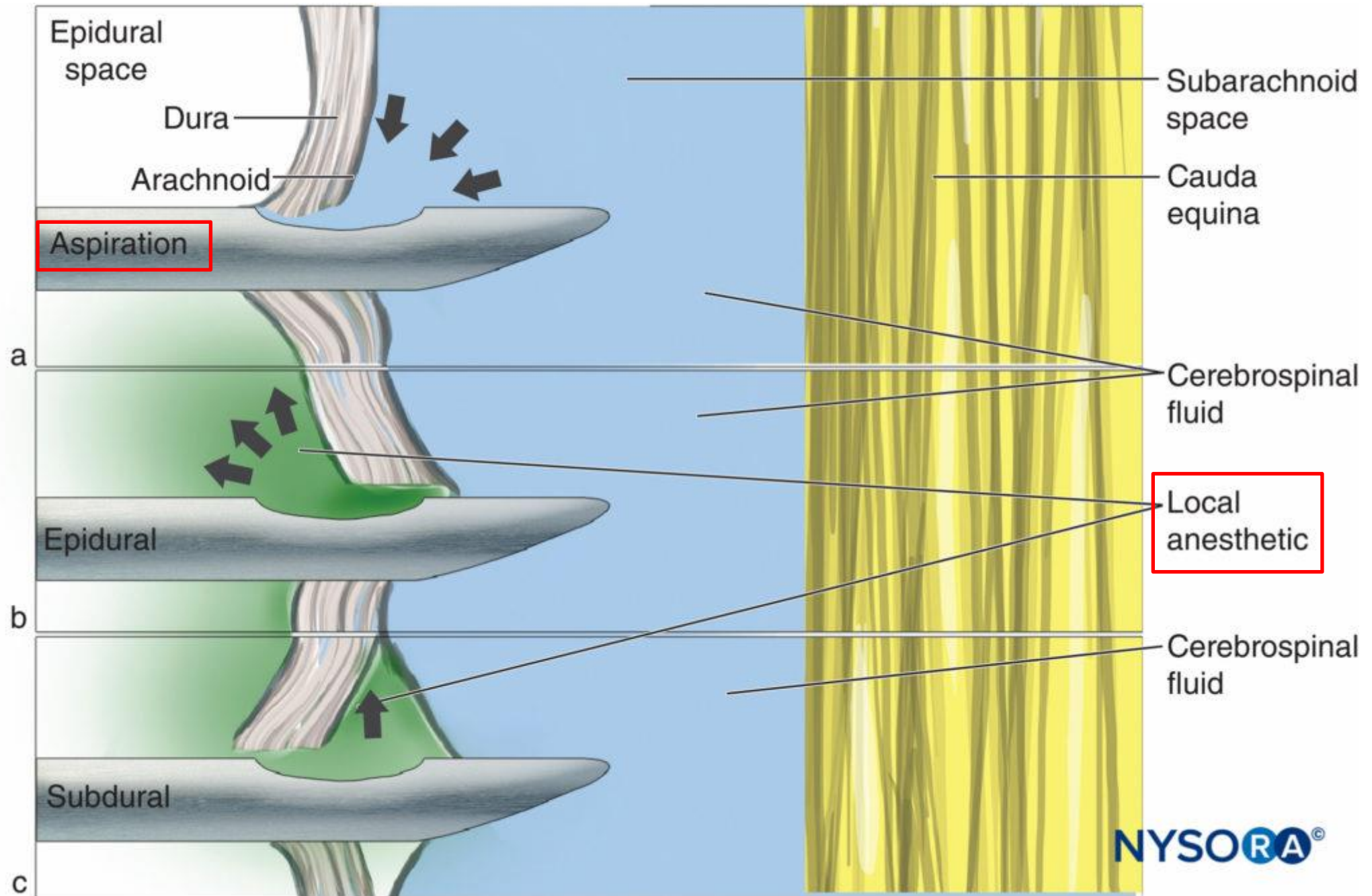
ANESTHESIOLOGY 2025; 143:156–67



Échec d'anesthésie neuraxiale pour césarienne

Incidence:

- Neuraxiale globale: **17%**
- Rachianesthésie: **14%**
- Anesthésie épidurale: **33%** - (**16%** après l'an 2000)
- Anesthésie combinée: **18%**
- Taux de conversion à l'AG: **1%**



INADEQUATE INTRATHECAL SPREAD

- Anatomical abnormalities
- Density of LA

Injection hyperbaric solution at L3-L4 level in supine position:

- LA disposition influenced by gravity “downward” along the curvature of the spine (**see figure**)
- Supine position promotes disposition of LA in the concavity of the thoracic curve, exposing neuraxial tissue to LA (**see figure**)



More caudal level of injection (e.g., L5/S1):

- Hyperbaric solution descends below lumbar lordosis and fails to spread more cephalad
- Block may affect only the sacral nerve roots

Prevention and management of intra-operative pain during caesarean section under neuraxial anaesthesia: a technical and interpersonal approach

**F. Plaat,¹ S. E. R. Stanford,² D. N. Lucas,³  J. Andrade,⁴ J. Careless,⁵ R. Russell,⁶ 
D. Bishop,⁷  Q. Lo⁸ and D. Bogod⁹**

Anaesthesia 2022, 77, 588-597

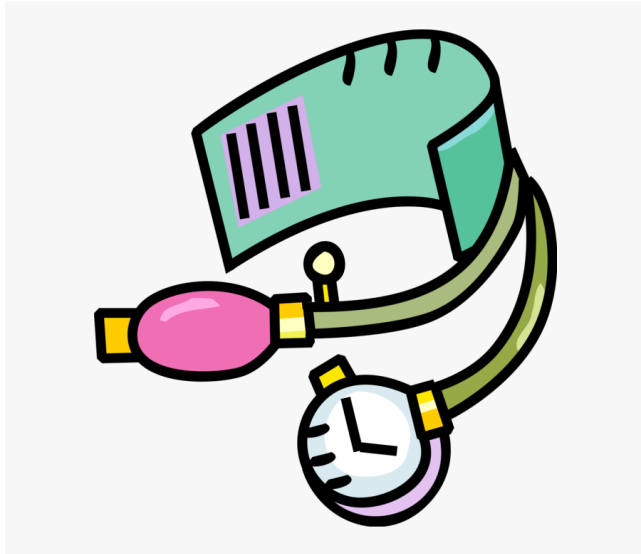
Summary

A woman who experiences pain during caesarean section under neuraxial anaesthesia is at risk of adverse psychological sequelae. Litigation arising from pain during caesarean section under neuraxial anaesthesia has replaced accidental awareness under general anaesthesia as the most common successful medicolegal claim against obstetric anaesthetists. Generic guidelines on caesarean section exist, but they do not provide specific recommendations for this area of anaesthetic practice. This guidance aims to offer pragmatic advice to support anaesthetists in caring for women during caesarean section. It emphasises the importance of non-technical skills, offers advice on best practice and aims to encourage standardisation. The guidance results from a collaborative effort by anaesthetists, psychologists and patients and has been developed to support clinicians and promote standardisation of practice in this area.

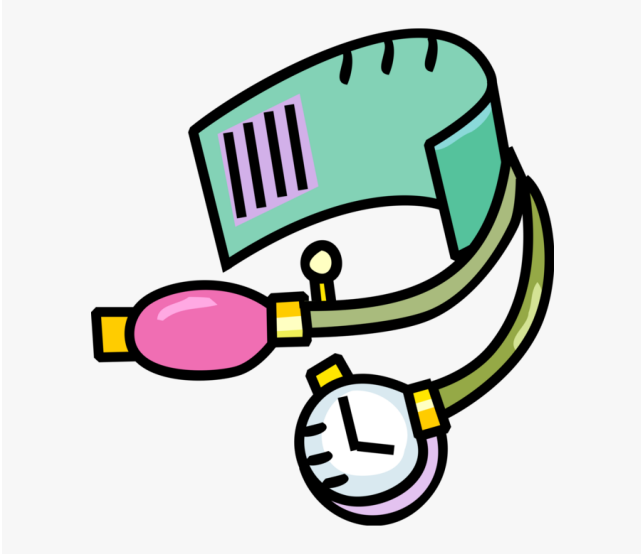
Box 1 Top tips for testing a neuraxial block [4, 36].

- Wait for evidence of motor block before testing the sensory block for the first time.
- Check the block at relatively fixed time intervals, thus gaining experience of what to expect at those intervals.
- If the block is denser on one side than the other (noted by more motor block), start the sensory testing on that side. The mother will then appreciate if there are differences, and this will help you determine subtle changes.
- Perform the first check early enough to allow positional changes before fixing of intrathecal local anaesthetic.
- Continue testing past the initial level of change to seek possible further change at a higher level. This is most commonly noted when testing with an ice cube. The mother will first register cool touching, followed by cold, then icy cold as the ice cube is moved cephalad.

Complications de la césarienne sous neuraxiale



Complications de la césarienne sous neuraxiale



Question



6. Lequel est le MOINS efficace pour prévenir l'hypotension maternelle suite à une rachi?

- a) Éviter la compression aorto-cave
- b) Administrer des liquides IV
- c) Monitoring fréquent de la pression artérielle
- d) Usage prophylactique d'éphedrine



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Changements hémodynamiques de la rachi

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↓ RVP → HypoTA → N/V

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- Débit cardiaque (CO): Ø changement *ou* ↑

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- Circulation utéro-placentaire: Ø d'autorégulation, en cas d'hypoTA, tx rapidement

Prévention de l'hypotension



Prévention de l'hypotension



Prévention de l'hypotension



Fluid and vasopressor management for Cesarean delivery under spinal anesthesia: Continuing Professional Development

Christian Loubert, MD

Can J Anesth/J Can Anesth (2012) 59:604–619

Prophylactic Phenylephrine Infusion for Preventing Hypotension During Spinal Anesthesia for Cesarean Delivery

Warwick D. Ngan Kee, MBChB, MD, FANZCA, Kim S. Khaw, MBBS, FRCA,
Floria F. Ng, RN, BASc, and Bee B. Lee, MBBS, FANZCA

Anesth Analg 2004;98:815–21

Prevention of Hypotension during Spinal Anesthesia for Cesarean Delivery

An Effective Technique Using Combination Phenylephrine Infusion and Crystalloid Cohydration

Warwick D. Ngan Kee, M.B.Ch.B., M.D., F.A.N.Z.C.A., F.H.K.A.M.,* Kim S. Khaw, M.B.B.S., F.R.C.A., F.H.K.A.M.,†
Floria F. Ng, R.N., B.A.Sc.‡

Anesthesiology 2005; 103:744–50

	Préremplissage administration de liquides avant la rachianesthésie	Comparaison	Coremplissage administration de liquides dès le début de la rachianesthésie
Cristalloïdes	Stratégie I Préremplissage Cristalloïdes	Stratégie III meilleure que stratégie I quant à : Réduction de l'hypotension Besoins en vasopresseurs (vol de 20 mL·kg ¹ seulement)	Stratégie III Coremplissage Cristalloïdes
Comparaison	Stratégie II meilleure que stratégie I quant à : Réduction de l'hypotension Besoins en vasopresseurs Maintien du débit cardiaque Réduction des nausées	Points d'aboutissement néonataux identiques	Stratégie IV identique à stratégie III quant à : Réduction de l'hypotension Besoins en vasopresseurs (perfusion de phényléphrine).
Colloïdes	Stratégie II Préremplissage Colloïdes	Stratégie IV identique à stratégie II quant à : Réduction de l'hypotension Besoins en vasopresseurs Stratégie IV meilleure que stratégie II quant à : Augmentation du débit cardiaque (vol de 15 mL·kg ⁻¹)	Stratégie IV Coremplissage Colloïdes

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A Quantitative, Systematic Review of Randomized Controlled Trials of Ephedrine Versus Phenylephrine for the Management of Hypotension During Spinal Anesthesia for Cesarean Delivery

Anesth Analg 2002;94:920–6

Anna Lee, MPH, PhD, Warwick D. Ngan Kee, MBChB, MD, FANZCA, and
Tony Gin, MBChB, MD, FANZCA, FRCA

Department of Anaesthesia and Intensive Care, The Chinese University of Hong Kong, Prince of Wales Hospital, China

. This systematic review does not
support the traditional idea that ephedrine is the pre-
ferred choice for the management of maternal hypoten-
sion during spinal anesthesia for elective cesarean deliv-
ery in healthy, nonlaboring women.

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Women given phenylephrine had neonates with higher umbilical arterial pH values than those given ephedrine (weighted mean difference of 0.03; 95% CI, 0.02–0.04).

Bolus?



Perfusion?

Prophylactic Phenylephrine Infusion for Preventing Hypotension During Spinal Anesthesia for Cesarean Delivery

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Can J Anesth/J Can Anesth (2012) 59:604–619

À l'instar de Ngan Kee *et coll.*,²⁴ nous sommes d'avis que l'efficacité de la perfusion de phényléphrine à prévenir l'hypotension artérielle et surtout à améliorer le confort de la mère en minimisant l'incidence de nausées et vomissements peuvent justifier son utilisation systématique en première intention. L'éphédrine demeure tout de même un vasopresseur de choix dans les cas d'hypotension maternelle accompagnée de bradycardie et devrait continuer à faire partie de l'arsenal thérapeutique facilement et rapidement disponible.

Randomized Double-blinded Comparison of Norepinephrine and Phenylephrine for Maintenance of Blood Pressure during Spinal Anesthesia for Cesarean Delivery

Warwick D. Ngan Kee, M.B.Ch.B., M.D., F.A.N.Z.C.A., F.H.K.A.M.,
Shara W. Y. Lee, B.Sc.(Hons.), M.Sc., Ph.D., Floria F. Ng, R.N., B.A.Sc.,
Perpetua E. Tan, B.Sc., M.Phil., Kim S. Khaw, M.B.B.S., M.D., F.R.C.A., F.H.K.A.M.

ANESTHESIOLOGY 2015; 122:736-45

Norepinephrine or phenylephrine during spinal anaesthesia for Caesarean delivery: a randomised double-blind pragmatic non-inferiority study of neonatal outcome

Warwick D. Ngan Kee^{1,2,*}, Shara W. Y. Lee³, Floria F. Ng¹ and Anna Lee¹

British Journal of Anaesthesia, 125 (4): 588–595 (2020)



Left Lateral Table Tilt for Elective Cesarean Delivery under Spinal Anesthesia Has No Effect on Neonatal Acid–Base Status

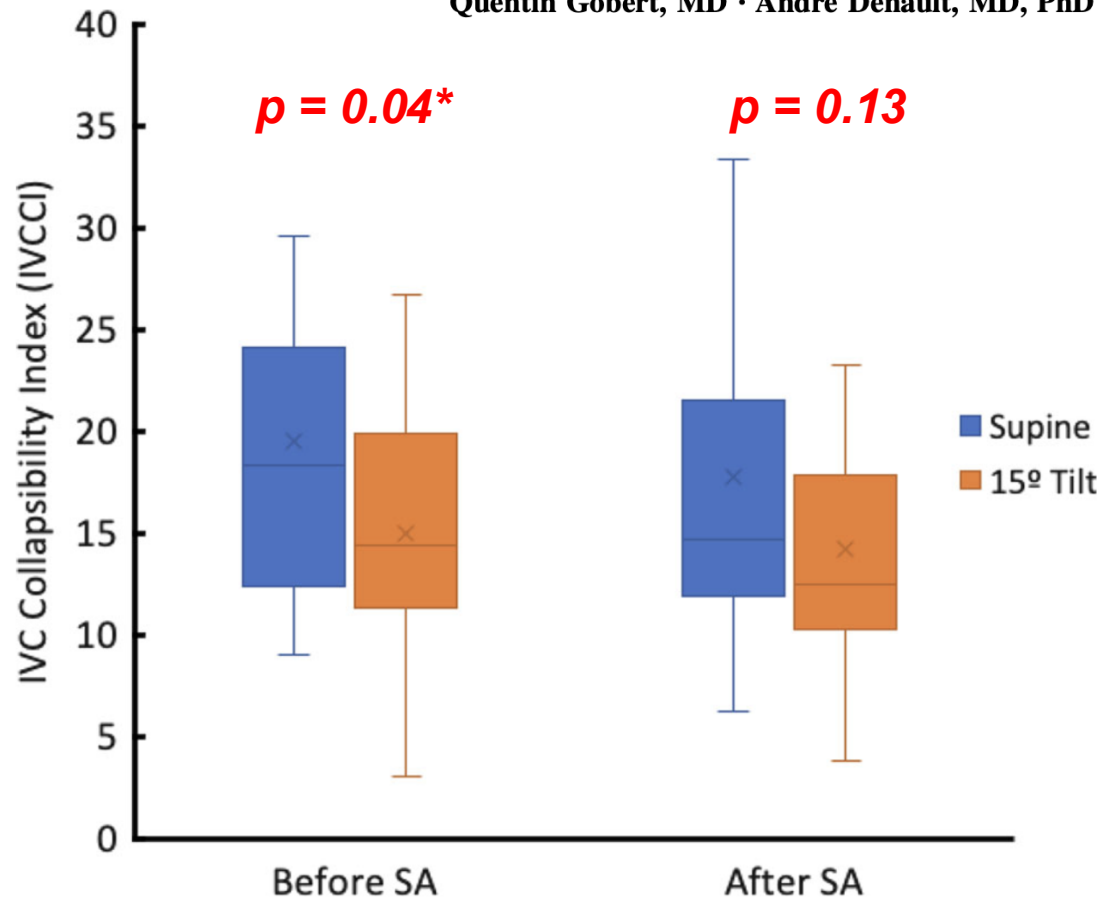
Allison J. Lee, M.D., Ruth Landau, M.D., James L. Mattingly, C.R.N.A., Margaret M. Meenan, C.R.N.A., Beatriz Corradini, M.Sc., Shuang Wang, Ph.D., Stephanie R. Goodman, M.D., Richard M. Smiley, M.D., Ph.D.

ANESTHESIOLOGY 2017; 127:241-9

- In healthy term pregnant women undergoing elective cesarean delivery after spinal anesthesia, with a crystalloid coload and prophylactic phenylephrine infusion, supine horizontal position or 15° left tilt of the surgical table (in a randomized protocol) had no effect on umbilical artery base excess
- When maternal systolic blood pressure was maintained with fluid and phenylephrine, there was no apparent benefit to left lateral uterine displacement during cesarean delivery

Évaluation échographique de la compression de la veine cave inférieure en position latérale et en décubitus dorsal chez les parturientes à terme

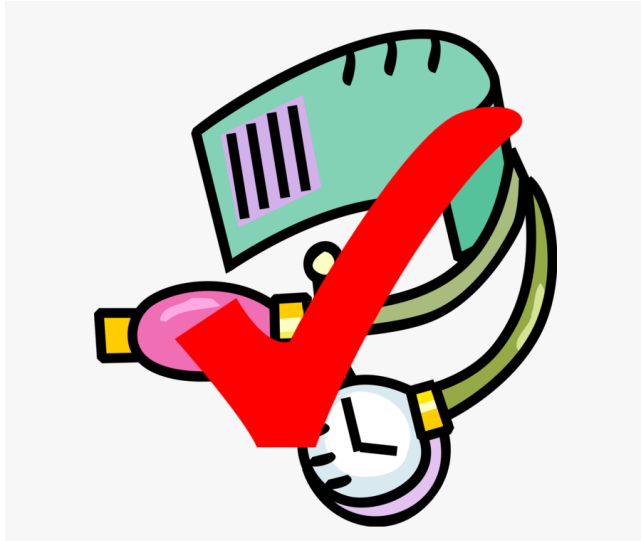
Marie-Pierre Gagné, MD · Philippe Richebé, MD, PhD · Christian Loubert, MD · Pierre Drolet, MD · Quentin Gobert, MD · André Denault, MD, PhD · Valerie Zaphiratos, MD, MSc 



SA = Spinal Anesthesia

Fig. 4 Plot and whisker diagram of main results. The IVC collapsibility index (%) (y axis) before and after spinal anesthesia in the supine and 15° tilted position (x axis). X = median, horizontal line = mean, top and bottom of the box = 75th and 25th interquartile range respectively, whiskers = minimum and maximum values. IVC = inferior vena cava.

Complications de la césarienne sous neuraxiale



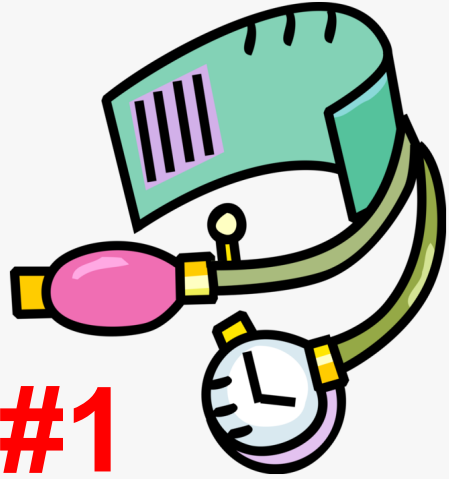
Co-load IV
Vasopresseurs
Tilt 15°?



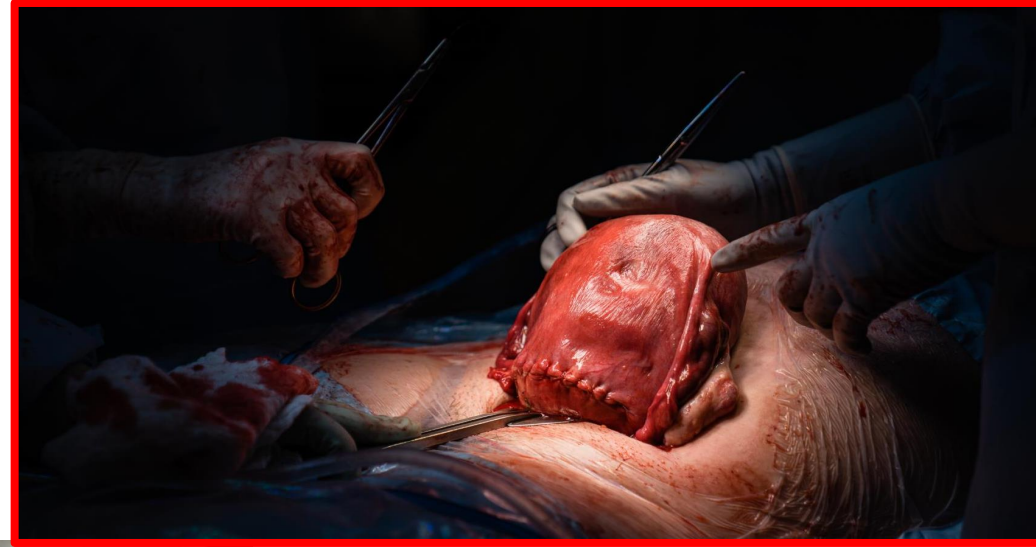
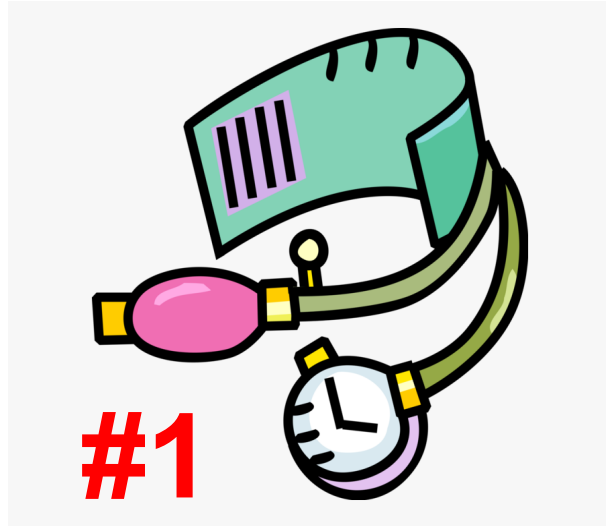
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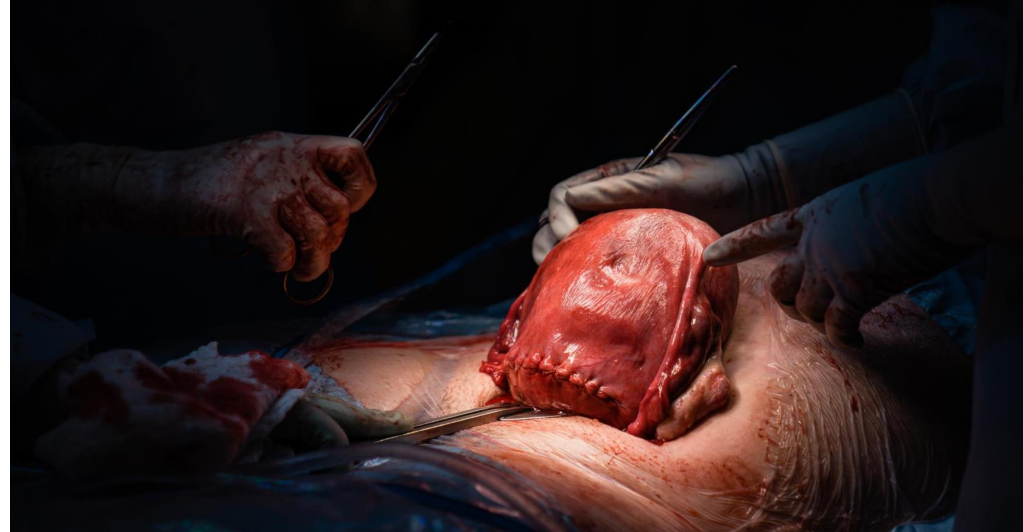
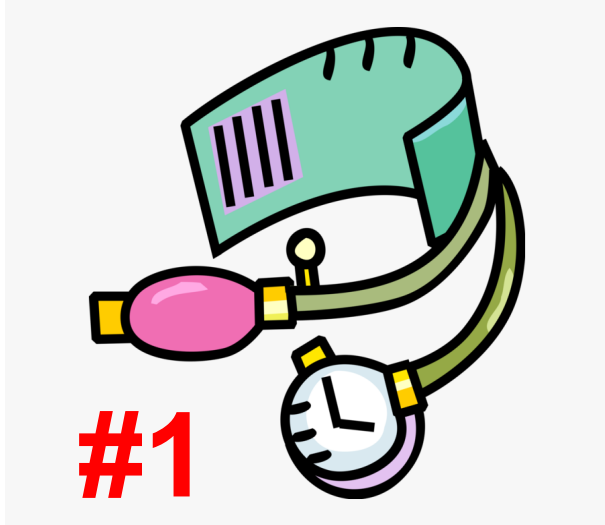
Prévention nausées/vomissements



Prévention nausées/vomissements



Prévention nausées/vomissements



Utérotoniques



Métoclopramide



Fourth Consensus Guidelines for the Management of Postoperative Nausea and Vomiting

Anesthesia & Analgesia 131(2):p 411-448, August 2020.

Metoclopramide. The antiemetic efficacy of a 10 mg dose of metoclopramide is uncertain.

Fourth Consensus Guidelines for the Management of Postoperative Nausea and Vomiting

Anesthesia & Analgesia 131(2):p 411-448, August 2020.

This consensus statement presents a comprehensive and evidence-based set of guidelines for the care of postoperative nausea and vomiting (PONV) in both adult and pediatric populations. The

Metoclopramide for nausea and vomiting prophylaxis during and after Caesarean delivery: a systematic review and meta-analysis

B. M. Mishriky and A. S. Habib* *British Journal of Anaesthesia* 108 (3): 374–83 (2012)

Interventions for preventing nausea and vomiting in women undergoing regional anaesthesia for caesarean section (Review)

Griffiths JD, Gyte GML, Paranjothy S, Brown HC, Broughton HK, Thomas J
Cochrane Database of Systematic Reviews 2012, Issue 9.

Antiemetics Added to Phenylephrine Infusion During Cesarean Delivery

A Randomized Controlled Trial

Ashraf S. Habib, MBBCh, FRCA, Ronald B. George, MD, FRCPC, Dolores M. McKeen, MD, MSc, William D. White, MPH, Unyime S. Ituk, MBBS, FCARCSI, Sohair A. Megalla, MBBCh, and Terrence K. Allen, MBBS, FRCA

(Obstet Gynecol 2013;121:615–23)

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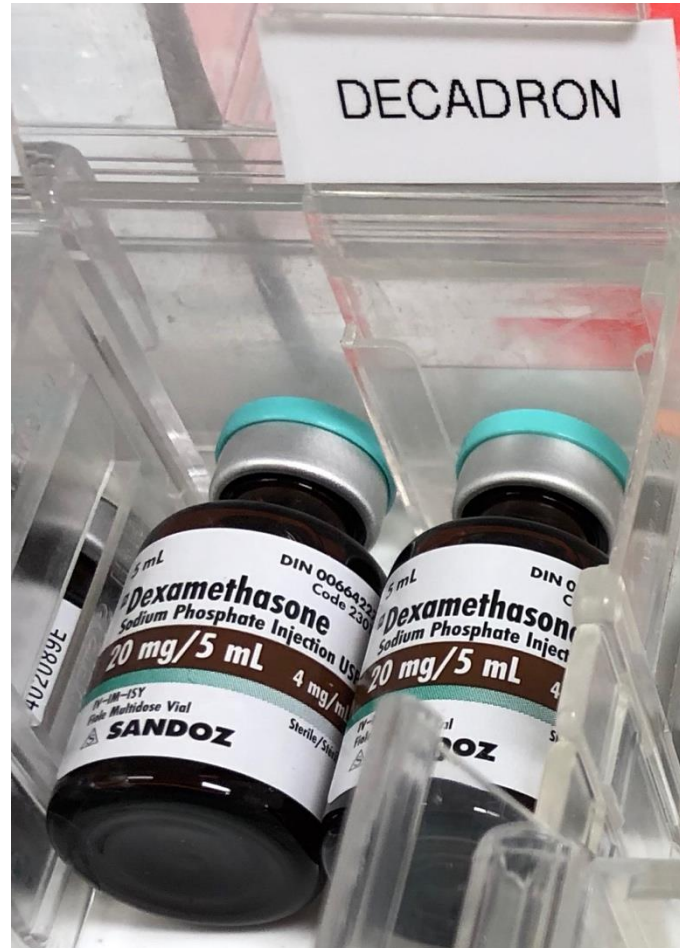
(Obstet Gynecol 2013;121:615–23)

CONCLUSION: Metoclopramide with ondansetron reduced intraoperative nausea and vomiting and early postoperative nausea and vomiting compared with placebo. Metoclopramide alone also decreased intraoperative but not postoperative nausea and vomiting.



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Dexamethasone



Effect of dexamethasone on prevention of postoperative nausea, vomiting and pain after caesarean section: a randomised, placebo-controlled, double-blind trial

Monica M.S. Cardoso, Alexandre O. Leite, Elisa A. Santos, Judymara L. Gozzani and Lígia A.S.T. Mathias

Eur J Anaesthesiol 2013; 30:102–105

Table 3 Incidence of nausea and vomiting in the post-anaesthesia care unit, ward and first 24 h in dexamthasone and control groups

	Nausea (n = 35)			Vomiting (n = 35)		
	Dexamethasone	Control	P	Dexamethasone	Control	P
PACU (0 to 3 h)	11	26	<0.001	11	23	<0.01
Ward (3 to 24 h)	1	6	NS	1	6	NS
Total (0 to 24 h)	12	32	<0.001	12	29	<0.001

PACU, postanesthesia care unit.

Conclusion Dexamethasone reduced the cumulative incidence of nausea and vomiting after caesarean section under spinal anaesthesia with morphine and lowered pain scores on the first postoperative day.

Perioperative dexamethasone with neuraxial anesthesia for scheduled cesarean delivery and neonatal hypoglycemia

Minhazur Sarker^{a,*}, Chelsea DeBolt^a, Chloe Getrajdman^a, Paige Rattner^a, Daniel Katz^b, Lauren Ferrara^{a,c}, Joanne Stone^a, Angela Bianco^a

European Journal of Obstetrics and Gynecology 278 (2022) 109–114

Table 6

Multivariate logistic regression of adverse neonatal outcomes associated with perioperative dexamethasone in pregnancies complicated by diabetes*.

	Unadjusted OR	Adjusted OR**
Neonatal Hypoglycemia	1.87 (1.23–2.84)	1.96 (1.28–3.00)
1-Min Apgar < 7	0.74 (0.26–2.13)	0.87 (0.30–2.55)
5-Min Apgar < 7	N/A	N/A
Umbilical Artery pH < 7.1	0.39 (0.14–1.10)	0.46 (0.16–1.33)
NICU Admission	0.79 (0.42–1.49)	0.85 (0.44–1.63)
Meconium-Stained Amniotic Fluid	0.55 (0.19–1.65)	0.62 (0.20–1.91)

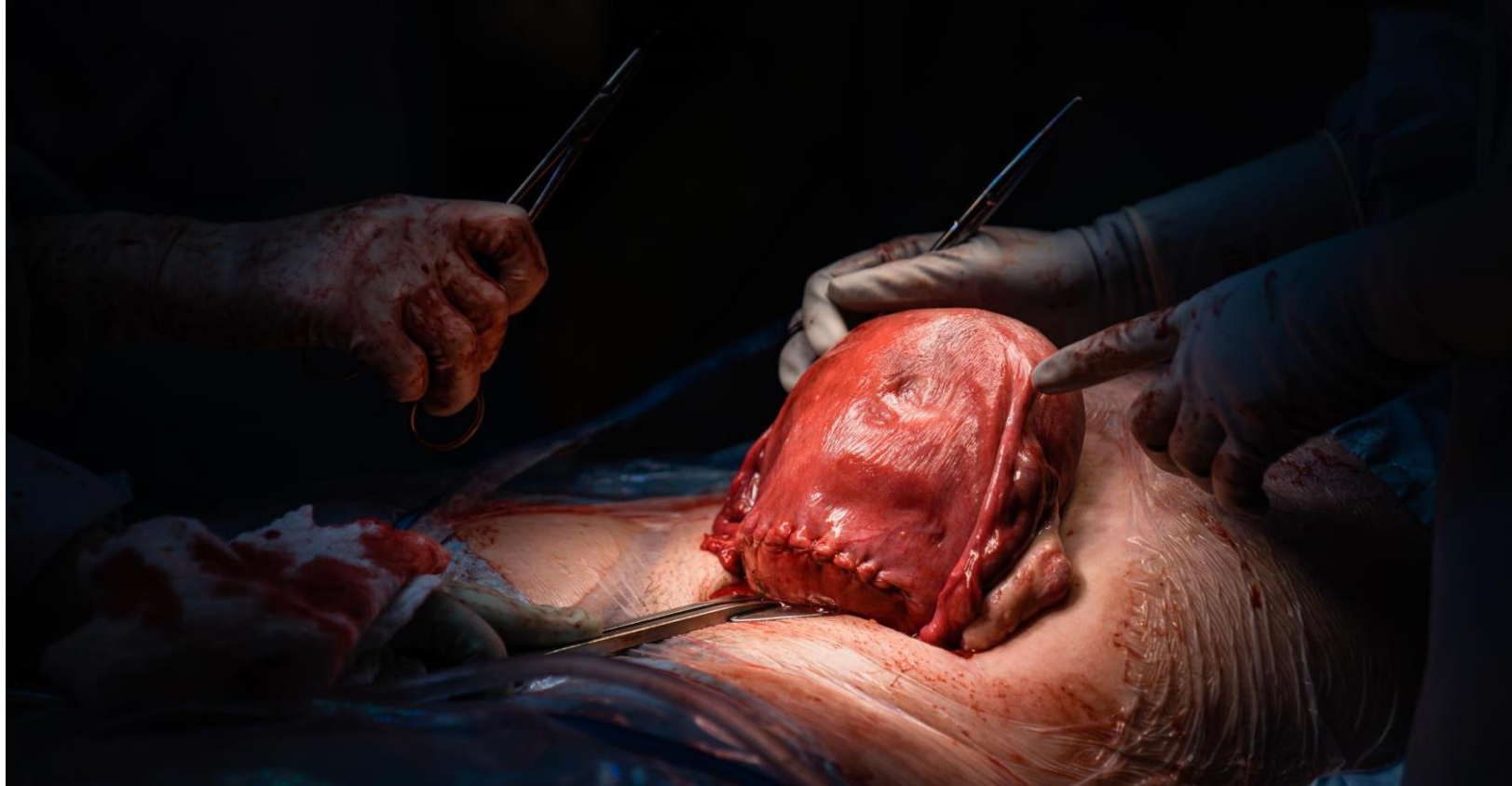
*Adjusted for maternal age, gestational age at delivery, BMI at time of delivery, and small and large for gestational age.

(5) IONV/PONV prophylaxis

- Prophylactic vasopressor infusion (see above) to decrease hypotension-associated IONV
- Address uterine exteriorization and abdominal saline irrigation with surgeon
- Combination of at least 2 prophylactic IV antiemetics with different mechanisms of action. Examples:
 - 5HT₃ antagonist (eg, ondansetron 4 mg)
 - Glucocorticoid (eg, dexamethasone 4 mg)
 - D2 receptors antagonist (eg, metoclopramide 10 mg)
- IONV/PONV is a major stressor for the mother and should be avoided, bearing in mind the different etiologies
- Limiting/avoid uterine exteriorization which is associated with IONV and delayed bowel function recovery
- Abdominal saline irrigation may worsen IONV and PONV
- Dexamethasone is effective for PONV and not IONV due to delayed onset of action
- Metoclopramide is effective for IONV but not PONV Anesth Analg 2021;132:1362–77



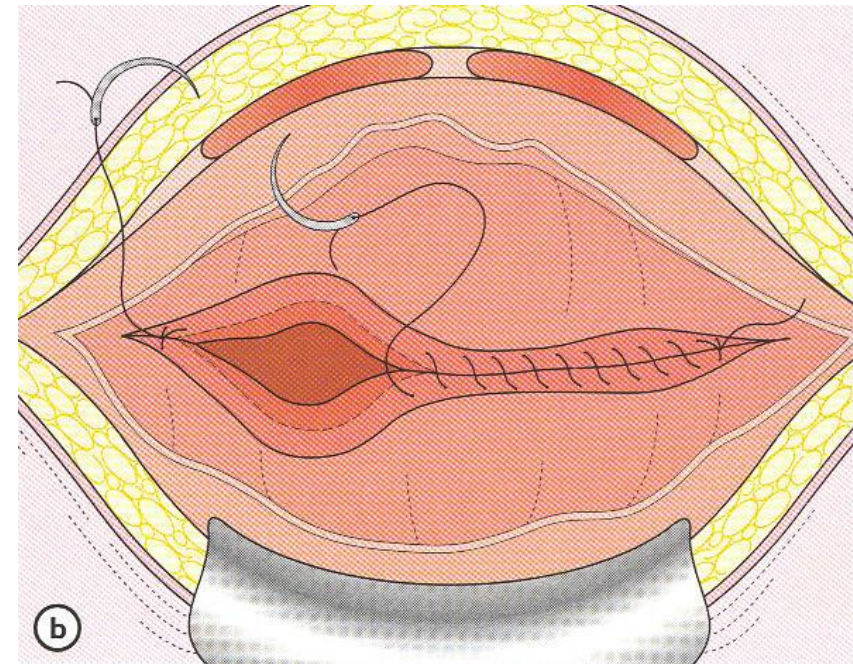
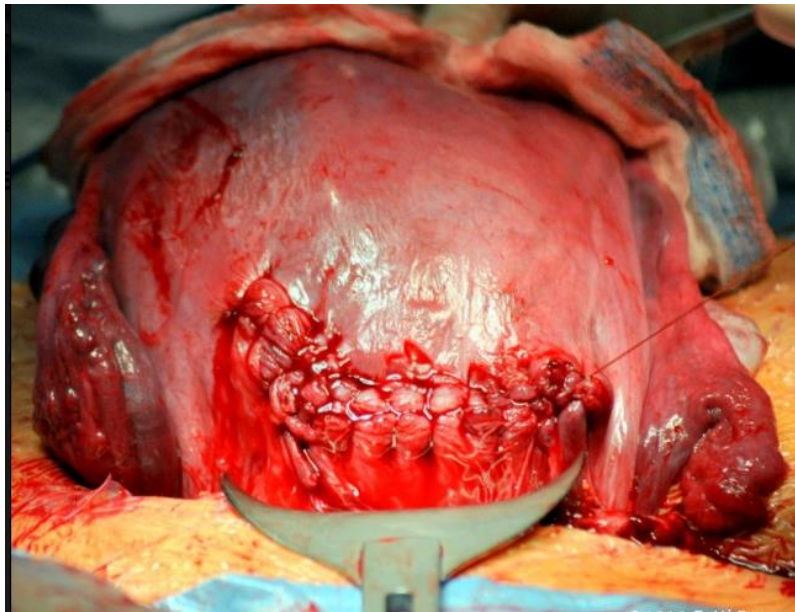
Technique chirurgicale



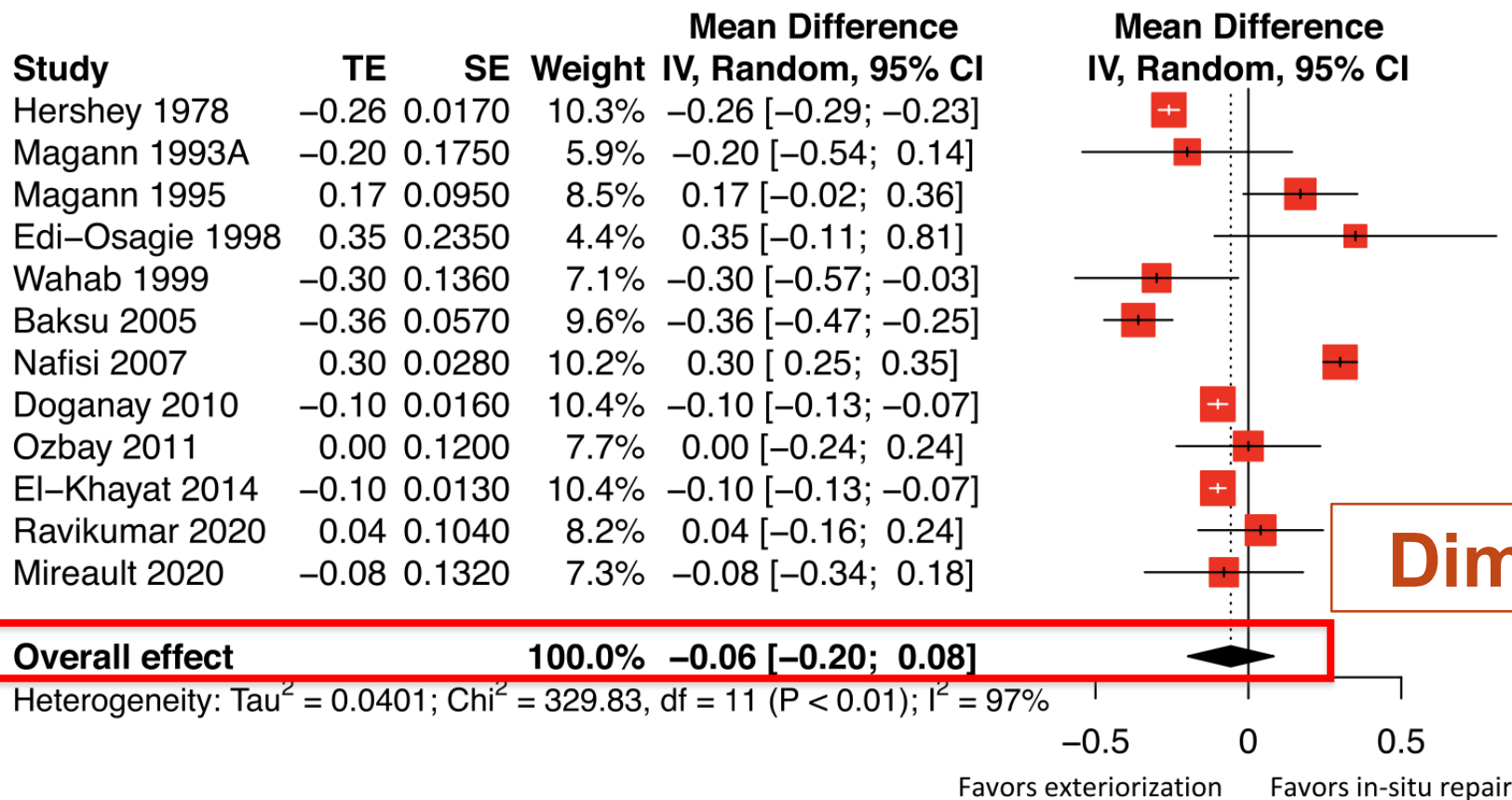
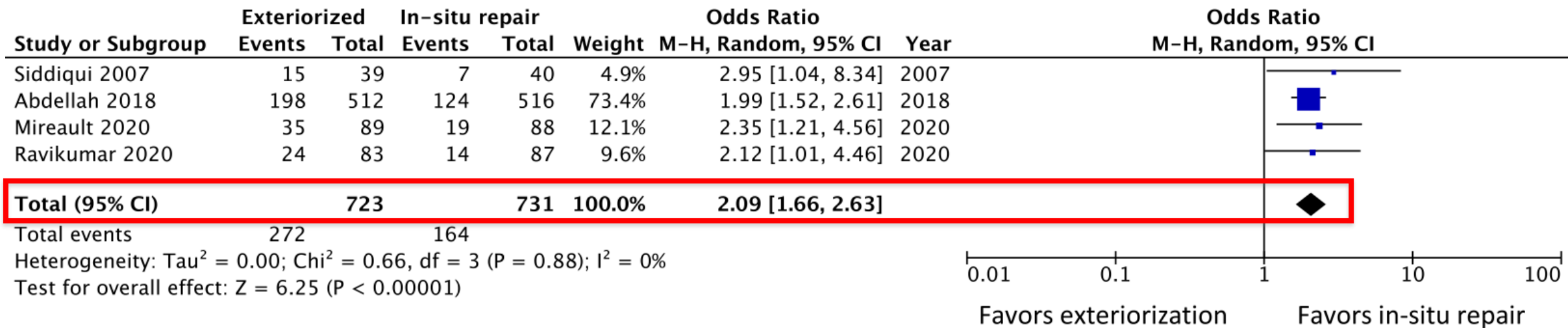
Uterine exteriorization *versus in situ* repair in Cesarean delivery: a systematic review and meta-analysis

Can J Anesth/J Can Anesth (2022) 69:216–233

Hon Sen Tan, MD, MMed, MHSc · Cameron R. Taylor, MD · Nadir Sharawi, MBBS, MSc, FRCA ·
Rehena Sultana, MSc · Karen D. Barton, MSLIS, AHIP · Ashraf S. Habib, MBBCh, MSc, MHSc, FRCA 

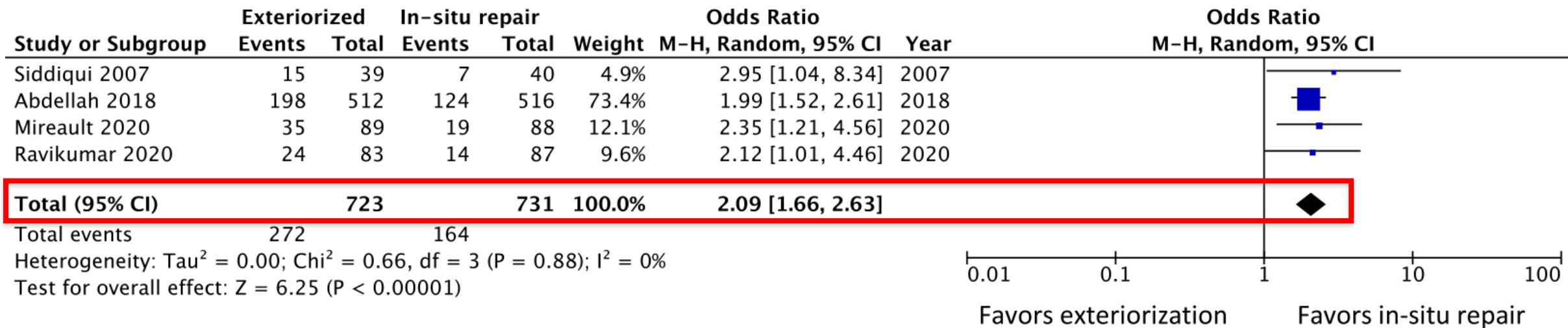


Can J Anesth/J Can Anesth (2015) 62:1209–1220



N/V intraop

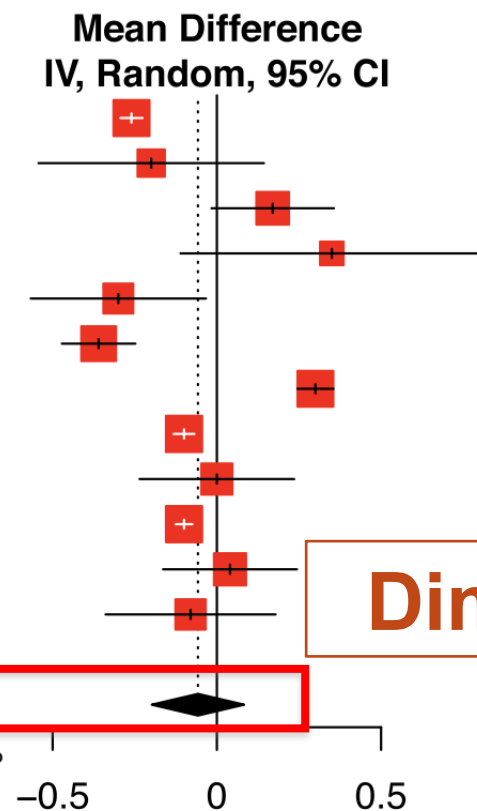
Diminution Hb post-op



Study	TE	SE	Weight	Mean Difference IV, Random, 95% CI
Hershey 1978	-0.26	0.0170	10.3%	-0.26 [-0.29; -0.23]
Magann 1993A	-0.20	0.1750	5.9%	-0.20 [-0.54; 0.14]
Magann 1995	0.17	0.0950	8.5%	0.17 [-0.02; 0.36]
Edi-Osagie 1998	0.35	0.2350	4.4%	0.35 [-0.11; 0.81]
Wahab 1999	-0.30	0.1360	7.1%	-0.30 [-0.57; -0.03]
Baksu 2005	-0.36	0.0570	9.6%	-0.36 [-0.47; -0.25]
Nafisi 2007	0.30	0.0280	10.2%	0.30 [0.25; 0.35]
Doganay 2010	-0.10	0.0160	10.4%	-0.10 [-0.13; -0.07]
Ozbay 2011	0.00	0.1200	7.7%	0.00 [-0.24; 0.24]
El-Khayat 2014	-0.10	0.0130	10.4%	-0.10 [-0.13; -0.07]
Ravikumar 2020	0.04	0.1040	8.2%	0.04 [-0.16; 0.24]
Mireault 2020	-0.08	0.1320	7.3%	-0.08 [-0.34; 0.18]

Overall effect 100.0% **-0.06 [-0.20; 0.08]**

Heterogeneity: $\tau^2 = 0.0401$; $\chi^2 = 329.83$, $df = 11$ ($P < 0.01$); $I^2 = 97\%$



N/V intraop

Douleur 6 h post-op
(OR, 1.64; 95% CI, 1.31 - 2.03)

Diminution Hb post-op

Intra-abdominal Irrigation at Cesarean Delivery

Reagan Viney, MD, Christine Isaacs, MD, and David Chelmow, MD

A Randomized Controlled Trial

Table 2. Intraoperative Outcomes

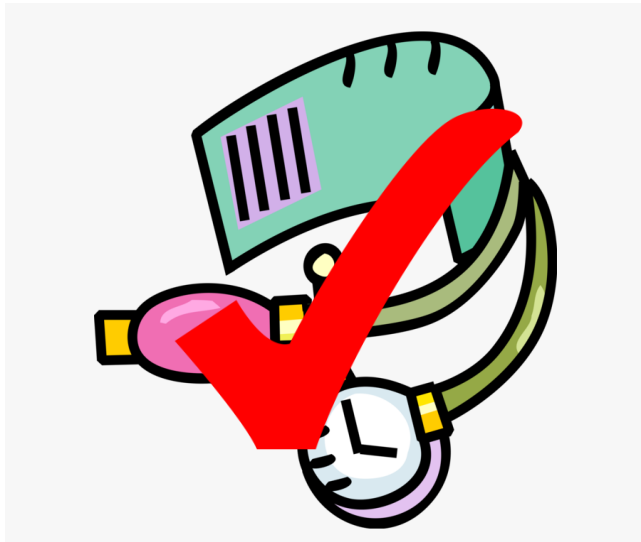
	No Irrigation (n=126)	Irrigation (n=110)	Relative Risk or Risk Difference	95% CI	P
Preoperative diagnosis of chorioamnionitis	10 (7.9)	8 (7.3)	0.92	0.37–2.24	1.00
Lysis of adhesions	28 (22.2)	22 (20.0)	0.90	0.55–1.48	.750
Bowel packed	6 (4.8)	4 (3.6)	0.76	0.22–2.64	.754
Uterus exteriorized	95 (75.4)	95 (86.4)	1.15	1.01–1.30	.047
Bilateral tubal ligation	31 (24.6)	36 (32.7)	1.23	.093–1.62	
Closure of rectus muscle	44 (34.9)	38 (34.5)	1.011	0.71–1.44	.952
Closure of peritoneum	16 (12.7)	12 (10.9)	1.164	0.58–2.35	.672
Closure of bladder flap	9 (7.1)	6 (5.5)	1.310	0.48–3.56	.596
Intraoperative nausea	36 (28.6)	51 (46.4)	1.62	1.15–2.28	.007
Intraoperative emesis	24 (19.0)	29 (26.4)	1.38	0.86–2.23	.212
Operative time (min)*	64.37±22.64	63.95±21.71	.428	–5.28 to 6.14	
Estimated blood loss (mL)	864.37±195.10	861.95±209.90	2.41	–49.55 to 54.38	

CI, confidence interval.

Continuous data are mean±standard deviation. Dichotomous data are n (%).

* Start of surgery to end of surgery.

Complications de la césarienne sous neuraxiale



Co-load IV
Vasopresseurs
Tilt 15°?



Prévenir hypoTA
Antiémétiques
Technique chx
Utérotoniques

Complications de la césarienne sous neuraxiale



Maintenance de la normothermie > 35.5°C

- Bénéfices:
 - ↓ Frissons
 - ↓ Infection plaie chirurgicale
 - ↓ Séjour hospitalier
 - ↑ pH artériel ombilicale et Apgar
- Méthodes:
 - Température ambiante 23°C
 - Réchauffe-soluté
 - Couverture chauffante intra-op
 - Réchauffement pré-op



Anesth Analg 2021;132:1362–77

 J Anaesth. 2015;115:500–510.

Frissons sous anesthésie neuraxiale

Incidence (50-55%):

40% anesthésie rachidienne

56% anesthésie epidurale

Conséquences:

2x O₂ consommation

↑ CO₂ production

Interfère avec monitoring (PNI)

↓ confort & satisfaction



Anesthesiology 1989;70:737-741.

Anaesthesia 1989;44:787-788.

Regional Anesthesia and Pain Medicine 1998; 23(4), 418–423.

Dexmedetomidine



α 2-agonist très sélectif

Plusieurs études pour les frissons sous anesthésie neuraxiale:

Prévention (bolus & perfusion)

Bozgeyik S, et al. *Saudi Journal of Anaesthesia* 2014; 8(2): 238–243.

Usta B, et al. *Clinics* 2011; 66(7): 1187–1191.

Traitement (bolus)

Mittal G, et al. *Indian Journal of Anaesthesia* 2014; 58(3), 257–262.

Easley RB, et al. *Paediatric Anaesthesia*, 2007; 17(4), 341–346.

Intravenous dexmedetomidine for the treatment of shivering during Cesarean delivery under neuraxial anesthesia: a randomized-controlled trial

Christina Lamontagne, MD, FRCP  · Sandra Lesage, MD, FRCP ·

Edith Villeneuve, MD, FRCP · Elsa Lidzborski, MD · Alex Derstenfeld, BSc, BCL, LLB

Chantal Crochetière, MD, FRCP

Can J Anesth/J Can Anesth (2019) 66:762–771

80 patientes sous anesthésie neuraxiale

Dexmedetomidine 30 mcg IV vs placebo

1^e outcome: Temps pour diminuer les frissons

Table 2 Parameters for shivering

Outcome	DEX <i>n</i> = 40	Control <i>n</i> = 40	<i>P</i> value	Effect size Difference in means (95% CI)
Time to decrease shivering after bolus administration (minutes), mean (SD)	2.6 (2.07)	17.9 (12.62)	< 0.001	-15.3 (-11.2 to -19.4)
				Relative risks (95% CI)
Number of patients without significant shivering at 5 min (%)	29 (72.5)	7 (17.5)	< 0.001	4.1 (2.1 to 8.3)
Number of patients without significant shivering at 10 min (%)	36 (90.0)	9 (22.5)	< 0.001	4.0 (2.2 to 7.2)
Number of patients without significant shivering at 15 min (%)	36 (90.0)	9 (22.5)	< 0.001	4.0 (2.2 to 7.2)

CI = confidence interval; SD = standard deviation. Relative risks are for the DEX group compared with the control group

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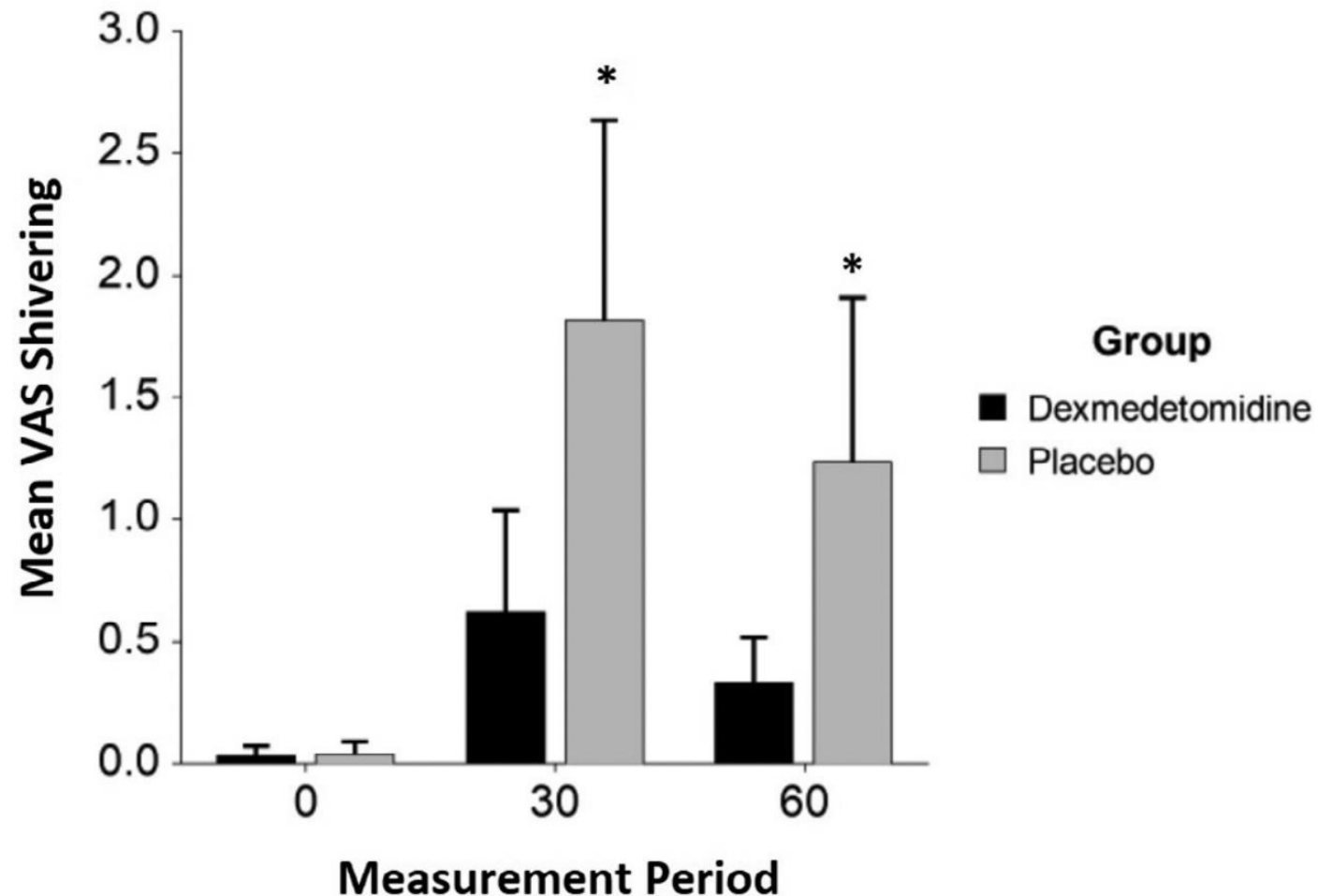
CI = confidence interval; SD = standard deviation. Relative risks are for the DEX group compared with the control group

Low-dose intravenous dexmedetomidine reduces shivering following cesarean delivery: a randomized controlled trial

L.K. Sween,^a S. Xu,^a C. Li,^b M.A. O'Donoghue,^c E.J. Ciampa,^a J.J. Kowalczyk,^a
Y. Li,^a P.E. Hess^a

International Journal of Obstetric Anesthesia (2021) 45, 49–55

PRÉVENTION



Shivering control							
Total Studies: 19	Total Participants: 1933						
Interventions	Relative effect* Odds ratio (95 % CrI)	Anticipated absolute effect**		Difference in number of patients with shivering control (95 % CrI)	Certainty in the evidence	Ranking*** (SUCRA)	Interpretation of Findings****
		<i>Shivering control without</i> intervention	<i>Shivering control with</i> intervention				
Dexmedetomidine	38.1 (14.2 to 111.5)	233 per 1000	917 per 1000	684 more per 1000 (575 more to 737 more)	⊕⊕⊕○ Moderate b,c,x	1st (0.87)	Definitely Superior
Tramadol	33.6 (15.1 to 81.8)	233 per 1000	908 per 1000	675 more per 1000 (587 more to 726 more)	⊕⊕○○ Low a,b,c	2nd (0.85)	Definitely Superior
Nalbuphine	26.2 (10.8 to 80.2)	233 per 1000	884 per 1000	651 more per 1000 (535 more to 724 more)	⊕⊕⊕○ Moderate b,c,x,y	3rd (0.74)	Definitely Superior
Meperidine	20.9 (6.2 to 73.1)	233 per 1000	855 per 1000	622 more per 1000 (415 more to 721 more)	⊕⊕○○ Low a,d	4th (0.66)	Definitely Superior
Ondansetron	6.6 (2.2 to 23.2)	233 per 1000	658 per 1000	425 more per 1000 (166 more to 636 more)	⊕⊕○○ Low a,c,d,	5th (0.41)	Probably superior
Clonidine	3.2 (0.6 to 14.9)	233 per 1000	418 per 1000	185 more per 1000 (81 fewer to 580 more)	⊕⊕○○ Low a,c,d	6th (0.3)	Probably superior
Control	Reference comparator			Reference comparator		7th (0.13)	Reference comparator
Amitriptyline	0.31 (0.02 to 3.64)	233 per 1000	81 per 1000	152 fewer per 1000 (228 fewer to 274 more)	⊕⊕○○ Low b,c,d	8th (0.03)	Probably inferior

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Intravenous Bolus of Dexmedetomidine for Treatment of Severe Shivering After Caesarean Delivery Under Combined Spinal-Epidural Anaesthesia: A Randomized Dose-Response Study

Meijuan Yang^{1,*}, ShuXi Li^{1,*}, Dan Drzymalski², Xinzhong Chen¹

Drug Design, Development and Therapy 2024;18 2393–2402

Intravenous Bolus of Dexmedetomidine for Treatment of Severe Shivering After Caesarean Delivery Under Combined Spinal-Epidural Anaesthesia: A Randomized Dose-Response Study

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Drug Design, Development and Therapy 2024;18 2393–2402

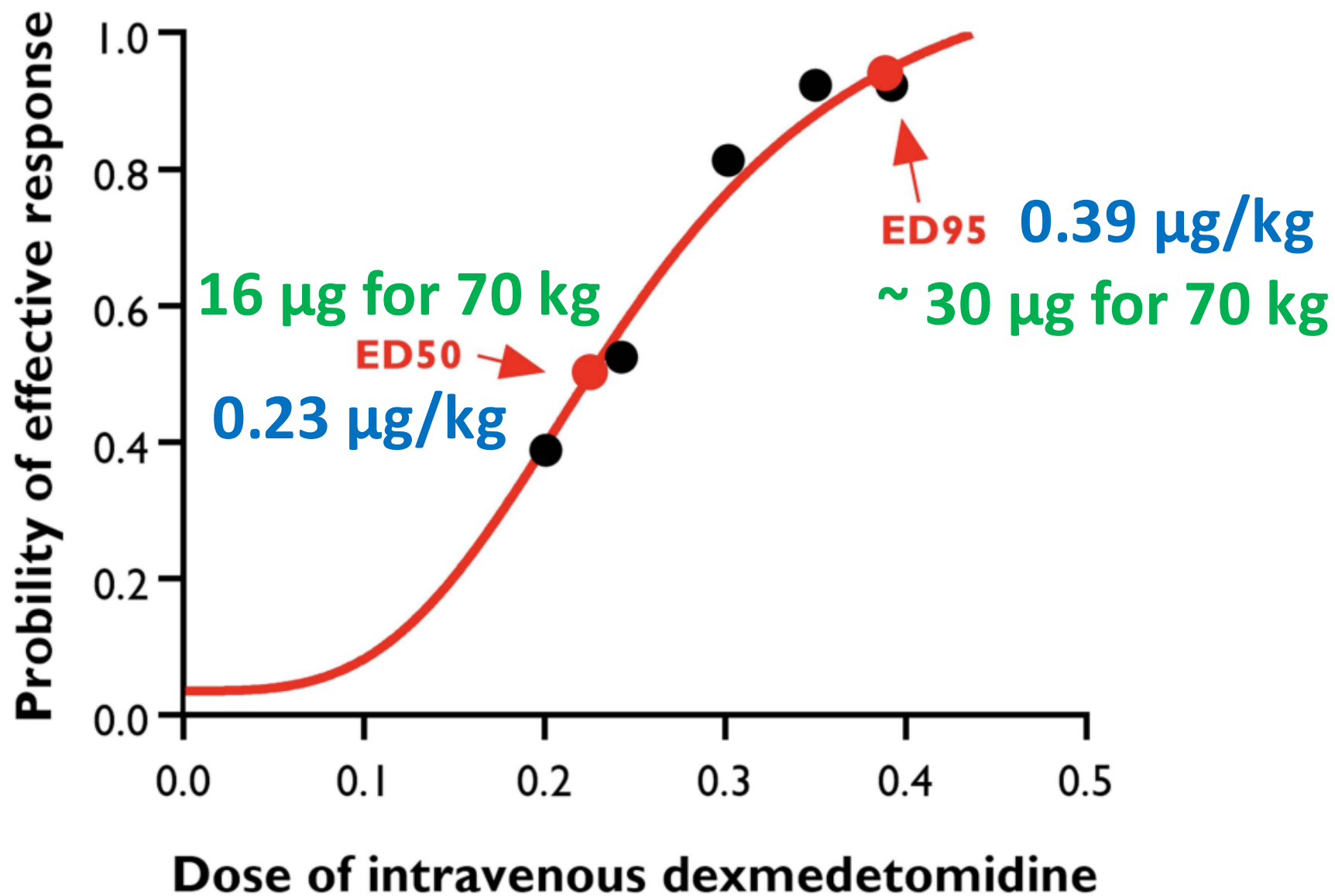
D1: 0.2 mcg/kg

D2: 0.25 mcg/kg

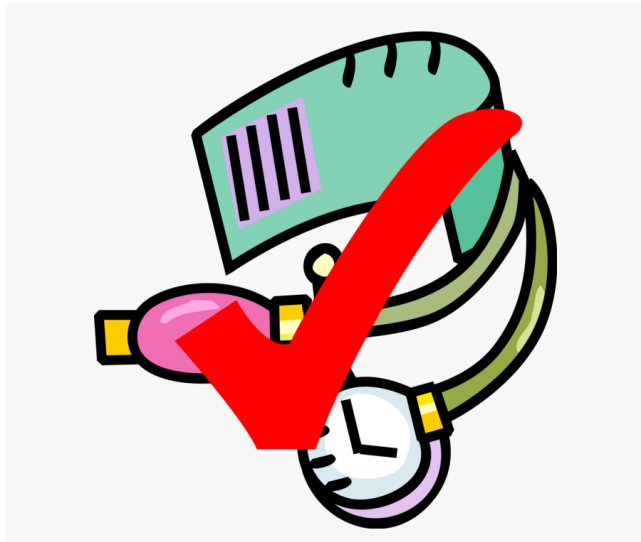
D3: 0.3 mcg/kg

D4: 0.35 mcg/kg

D5: 0.4 mcg/kg



Complications de la césarienne sous neuraxiale



Co-load IV
Vasopresseurs
Tilt 15°?

Normothermie
Dexmed PRN



Prévenir hypoTA
Antiémétiques
Technique chx
Utérotoniques

Anesthésie épidurale



- Utilisé surtout pour les césariennes urgentes avec cathéter en place
- Doses d'AL 5-10x ↑ qu'en rachidienne = risque de toxicité
- Bloc sympathique lent = hypotension plus rare qu'en rachidienne

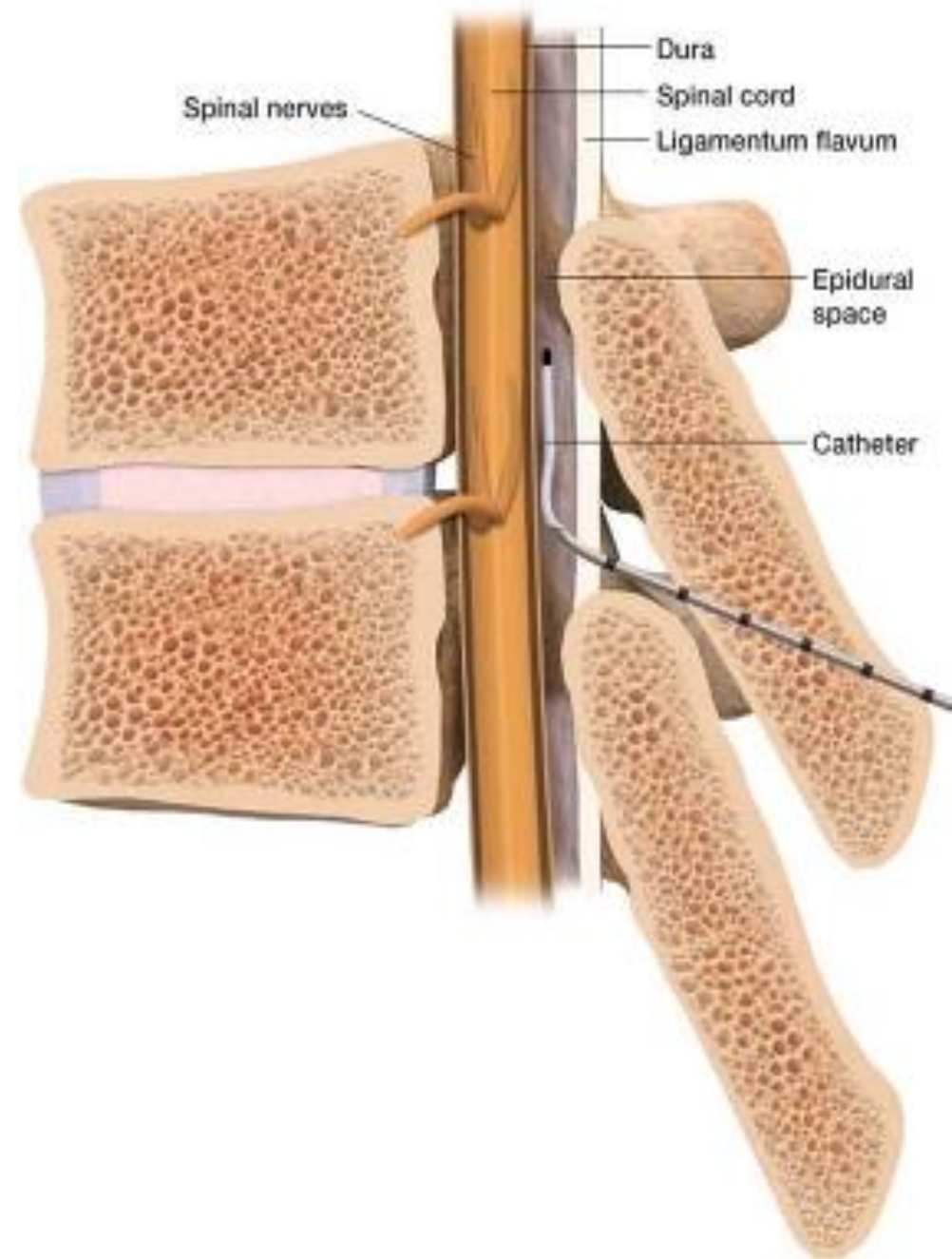


TABLE 26.7 Drugs Used for Epidural Anesthesia for Cesarean Delivery

Drug	Dose Range^a	Duration (min)^b
Local Anesthetics		
Lidocaine 2% with epinephrine 5 µg/mL	300–500 mg	75–100
2-Chloroprocaine 3%	450–750 mg	40–50
Bupivacaine 0.5%	75–125 mg	120–180
Ropivacaine 0.5%	75–125 mg	120–180
Opioids		
Fentanyl	50–100 µg	120–240
Sufentanil	10–20 µg	120–240
Morphine	3–4 mg	720–1440
Hydromorphone	0.6–1.5 mg	780–1090
Meperidine	50–75 mg	240–720

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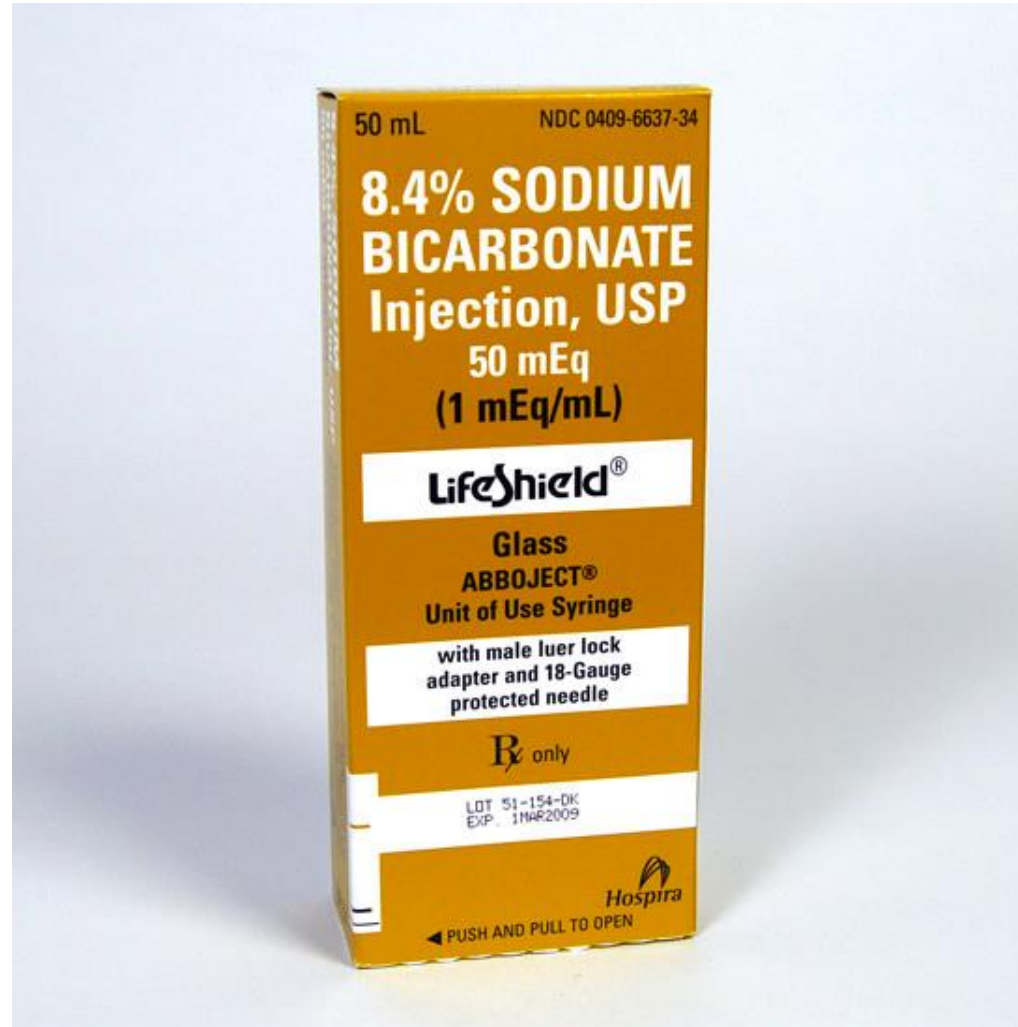
Risk factors for failed conversion of labor epidural analgesia to cesarean delivery anesthesia: a systematic review and meta-analysis of observational trials

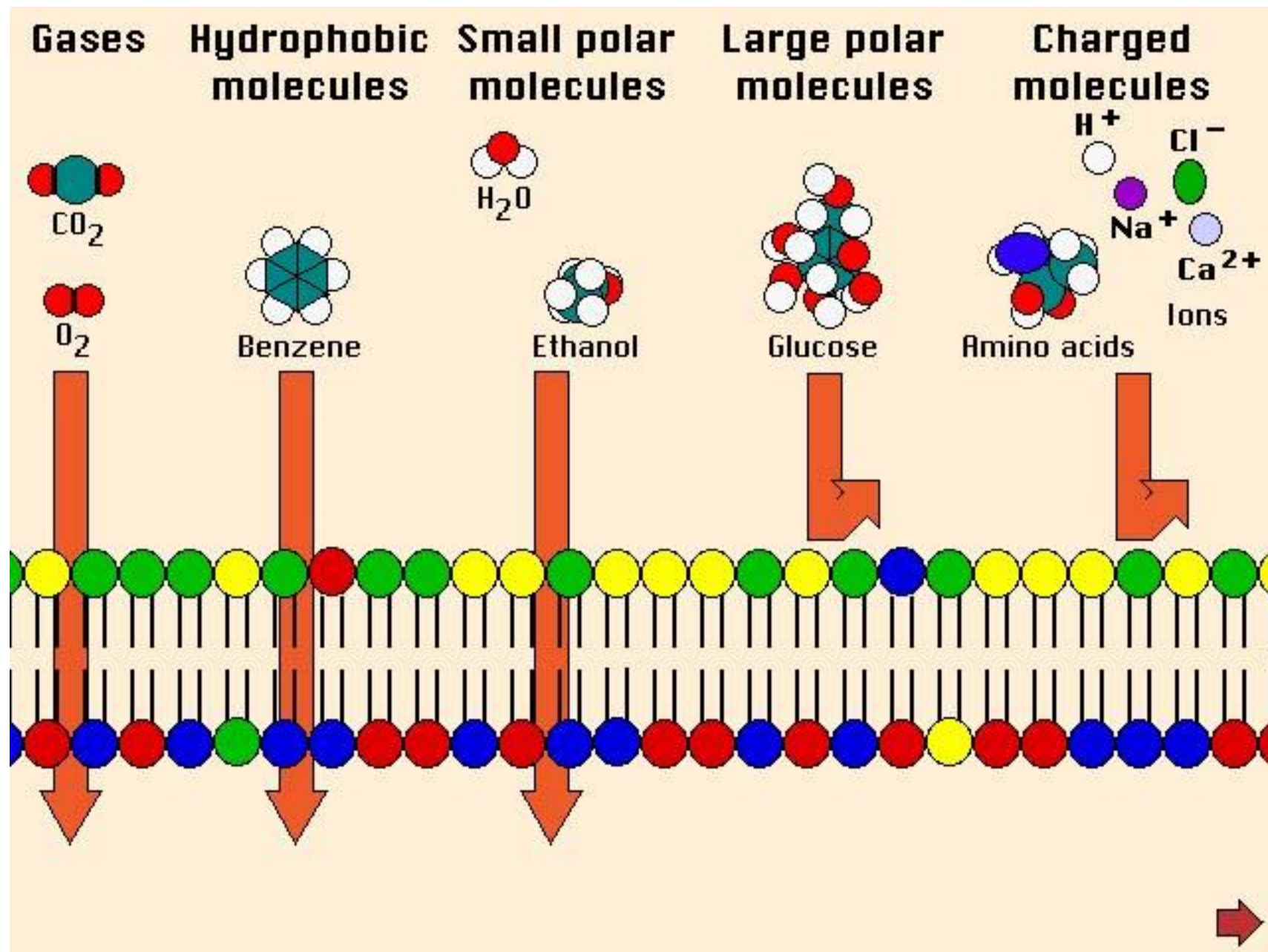
M.E. Bauer,^a J.A. Kountanis,^a L.C. Tsen,^b M.L. Greenfield,^a J.M. Mhyre^a

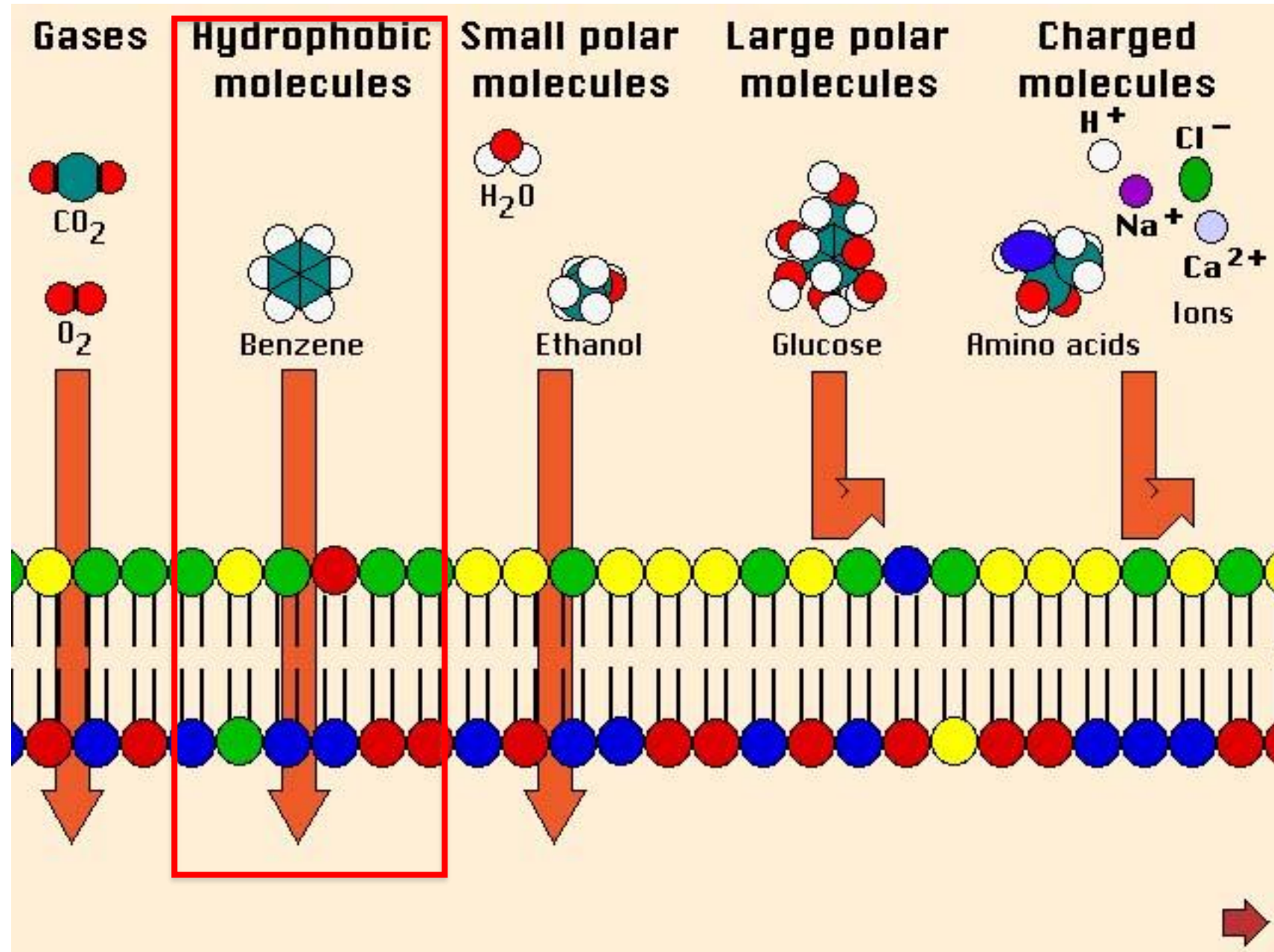
International Journal of Obstetric Anesthesia (2012) 21, 294–309

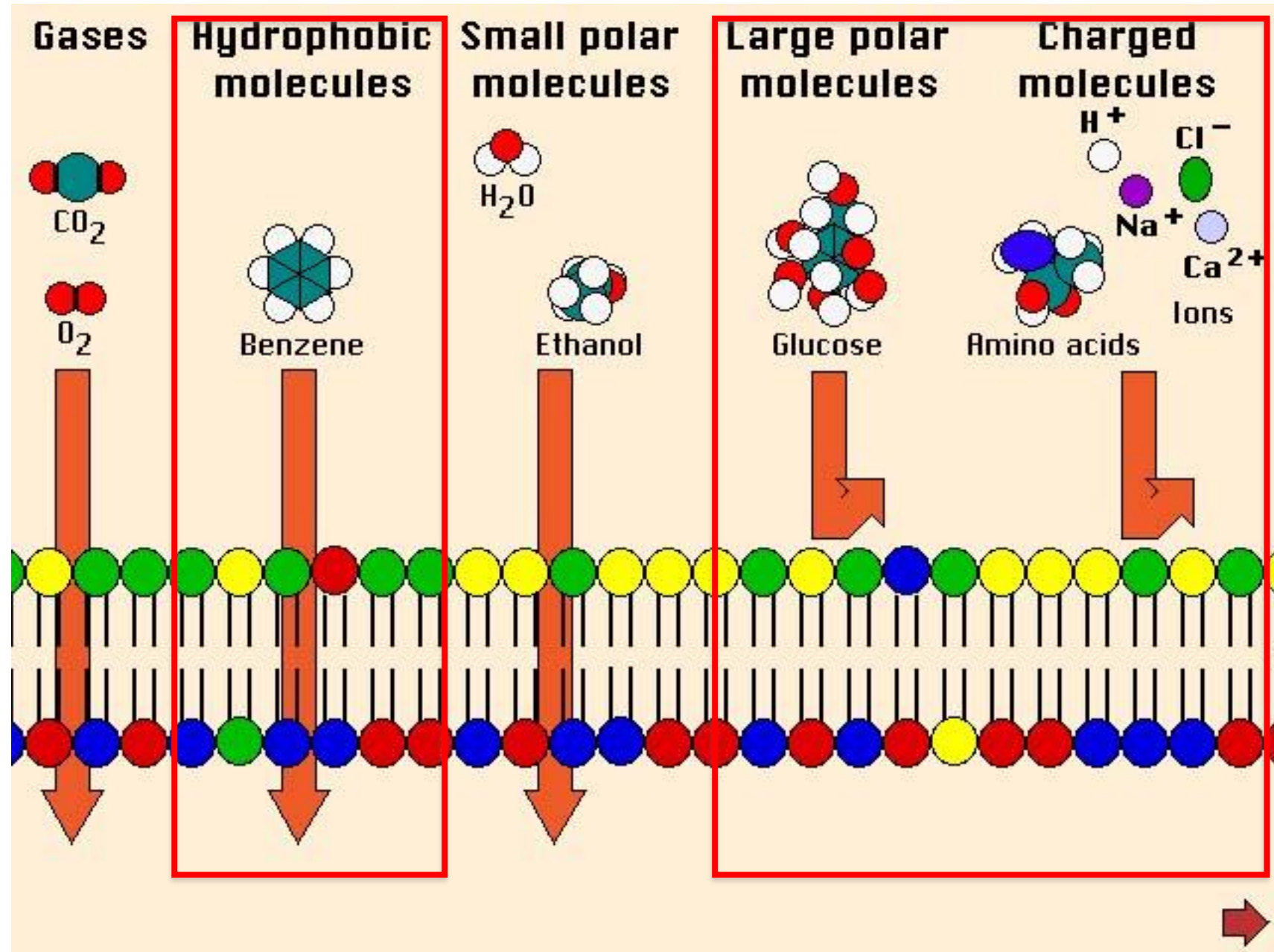
- Échec de conversion d'analgésie à anesthésie épidurale:
 - Augmentation des bolus clinicien (OR 3.17)
 - Extrême urgence de la césarienne (OR 40.43)
 - Anesthésiste non-obstétrical (OR 4.56)

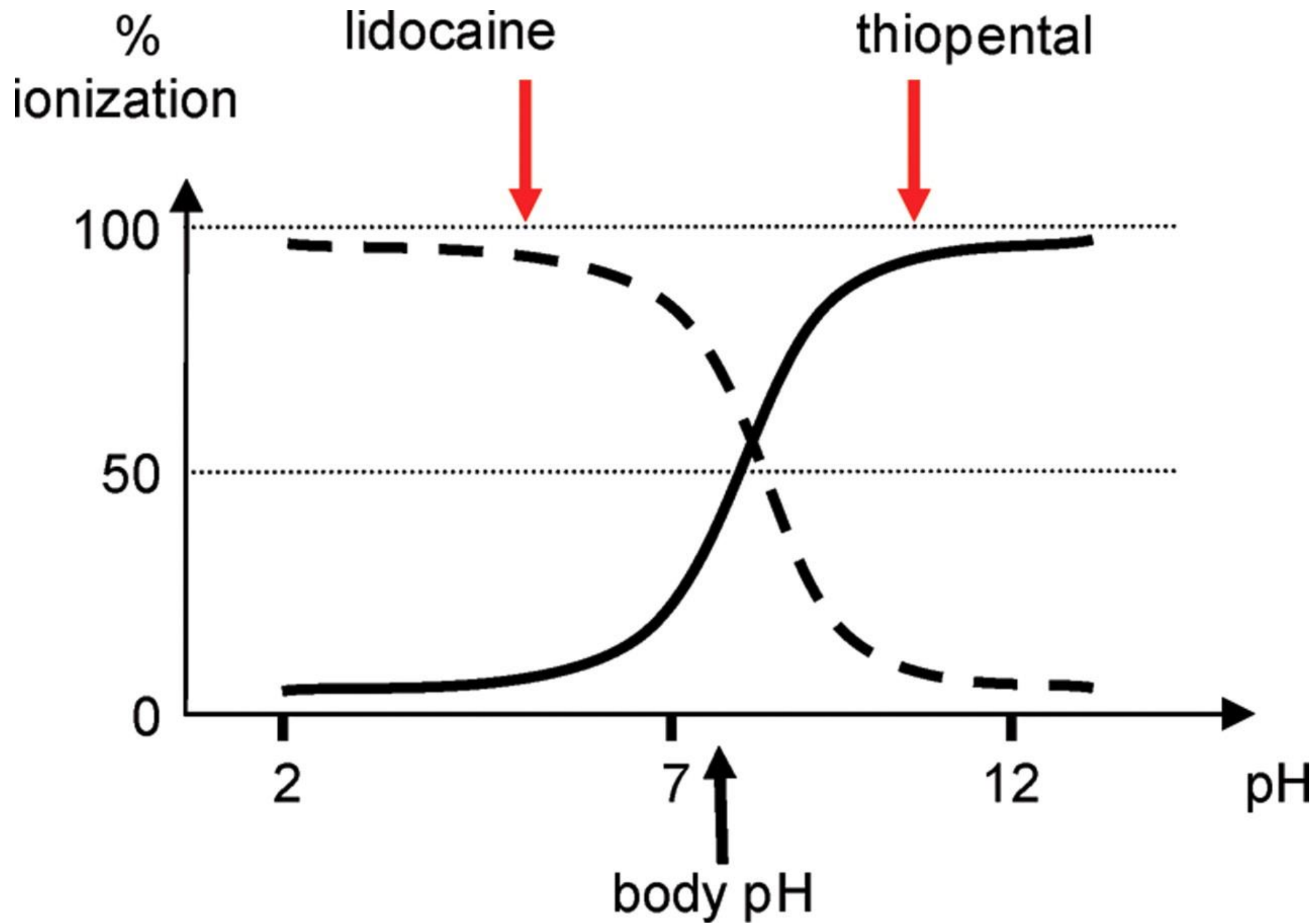
Bicarbonates











Lidocaïne

- Maintenu à un pH acide pour conserver la molécule (pH 6,2)
- Ajout d'épinephrine augmente l'acidité (pH 5,98)
- Fiole lidocaïne avec épinephrine encore plus acide (pH ~4.5)
- Bicarbonates neutralisent cette acidité (pH 7,2) + augmentent la forme non-ionisé de la molécule de lidocaïne
- Donc, augmente le passage intracellulaire de la molécule et son action!

Extension of epidural blockade in labour for emergency Caesarean section using 2% lidocaine with epinephrine and fentanyl, with or without alkanalisation★

Anaesthesia, 2001, **56**, pages 777–798

D. T. C. Lam,¹ W. D. Ngan Kee² and K. S. Khaw²

Table 2 Details of epidural analgesia and anaesthesia in mothers receiving alkalinised (bicarbonate group) or non-alkalinised (saline group) epidural lidocaine 2% with epinephrine 1 : 200 000 for emergency Caesarean section. Values are mean (SD [range]) or median (interquartile range [range]).

	Bicarbonate group <i>n</i> = 20	Saline group <i>n</i> = 20	<i>p</i> -value
Duration of epidural infusion; h	5.3 (3.9)	7.5 (5.5)	0.1
Block level (pinprick) before top-up for Caesarean section	T ₁₁ (T ₁₀ -T ₁₂ [T ₉ -T ₁₂])	T ₁₁ (T ₁₀ -T ₁₂ [T ₉ -T ₁₂])	0.9
Maximum block level (pinprick)	T ₄ (T ₄ -T ₄ [T ₄ -T ₆])	T ₄ (T ₄ -T ₆ [T ₄ -T ₆])	0.3
Bromage score before top-up for Caesarean section*	1 (1-1 [1-2])	1 (1-1 [1-2])	0.2
Bromage score at end of surgery	4 (3-4 [3-4])	4 (3-4 [3-4])	0.8
Time from end of top-up to surgical anaesthesia†	5.2 (1.5 [2-8])	9.7 (1.6 [6-12])	< 0.001
Duration of surgery; min	45 (40-60 [30-115])	45 (35-45 [30-90])	0.6

*0 = no motor block; 1 = unable to raise the extended leg but able to move the knee and foot; 2 = unable to raise the extended leg and to move the knee, but able to move the foot; 3 = complete motor block of the lower limb. †Loss of discrimination to pinprick at the T₆ dermatome.

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Bicarbonates

Combien?

- 1 meq pour chaque 10 ml de lidocaïne 2% + épinephrine 1: 200 000
- Donc, 2 ml pour un mélange de 20 ml de lido 2% + épinephrine 1:200 000



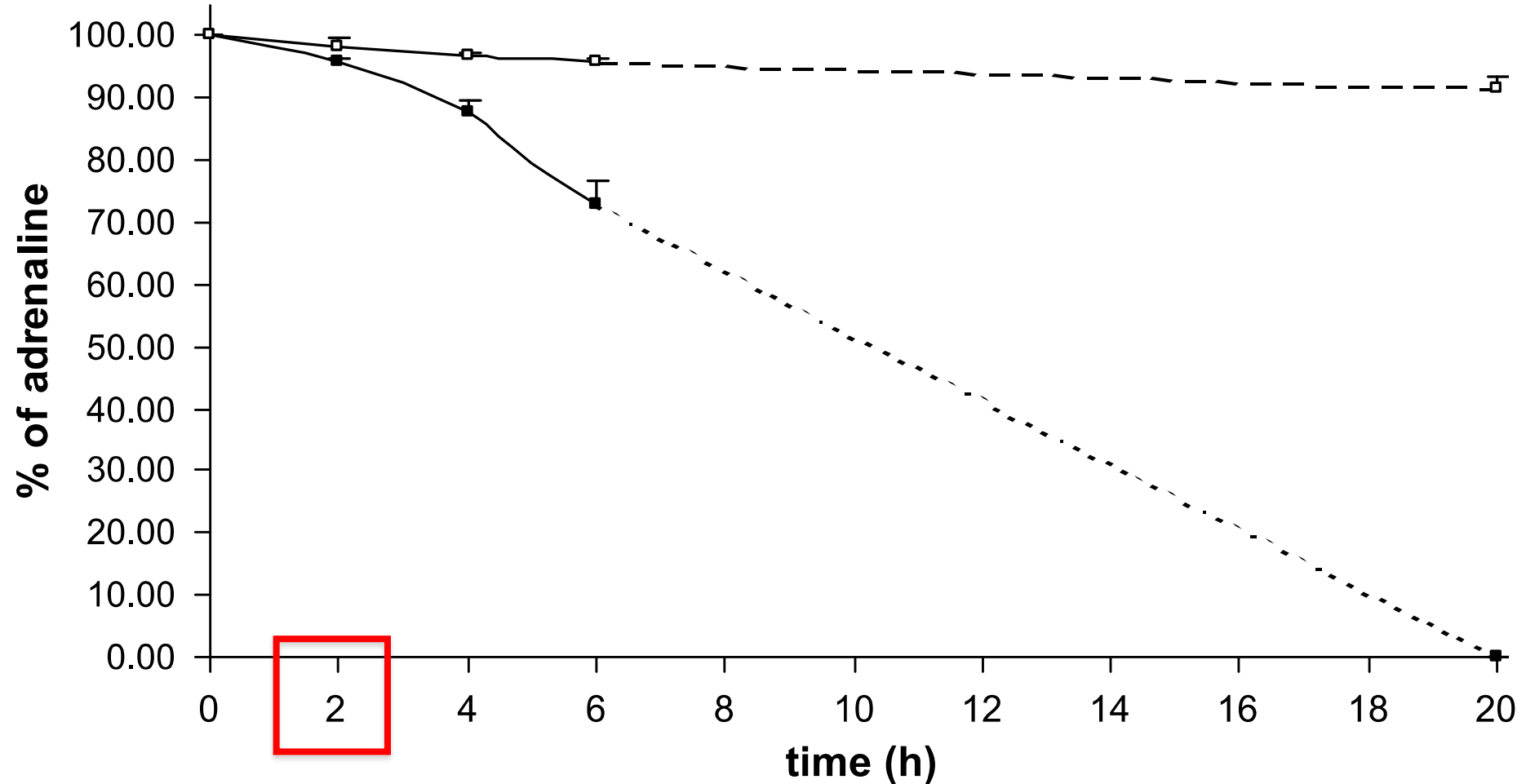


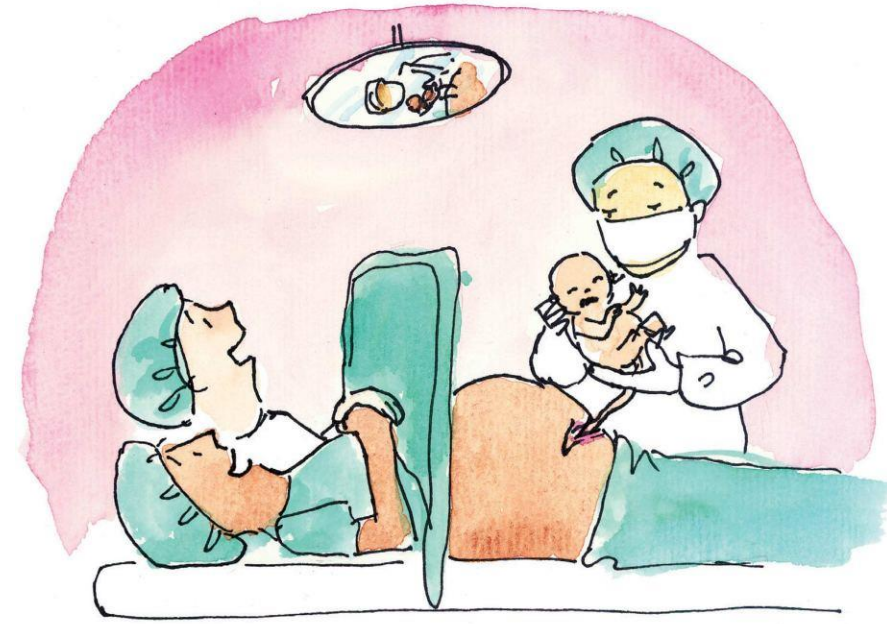
Figure 1 Chemical stability of adrenaline (proportion of starting concentration remaining $\pm$ SD) as a function of time in mixtures with bicarbonate at room temperature when exposed to light (-■-) and protected from light (-□-). $P < 0.0001$ for both curves compared with time zero. *NB: It is possible that the decay of adrenaline in the solutions exposed to light may have been complete earlier than 20 h.*

Et donc?

- Pour une C/S urgente sous épidurale, l'ajout de 2 meq de bicarbonates dans un mélange de 20 ml lido 2% + épinephrine 1:200 000 peut diminuer le temps moyen de 50% (5 min) pour obtenir un bloc chirurgical
- Débuté tôt (dès la salle d'accouchement), ce mélange peut éviter une anesthésie générale dans certains contextes

Plan

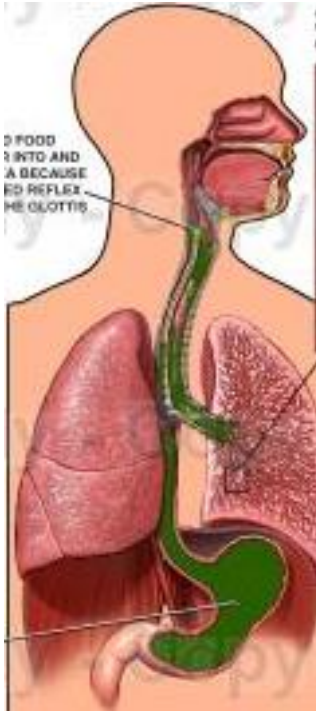
- Généralités de la césarienne
- Considérations femme enceinte
- Préparation anesthésique
- Anesthésies neuraxiales
- **Anesthésie générale**
- Utérotoniques
- Analgésie post-césarienne
- ERAC



Anesthésie générale



↑ Mortalité avec AG vs neuraxiale



Questionnaire anesthésique en urgence (AG)

- AMPLE
- Airway
- IV
- Monitoring (inhalo 1)
- Pré-oxygénation (inhalo 2)
- Positionnement (Ao-Cave)
- Cœur foetal (infirmière OB)
- Attend les champs . . .



Questionnaire anesthésique en urgence (AG)

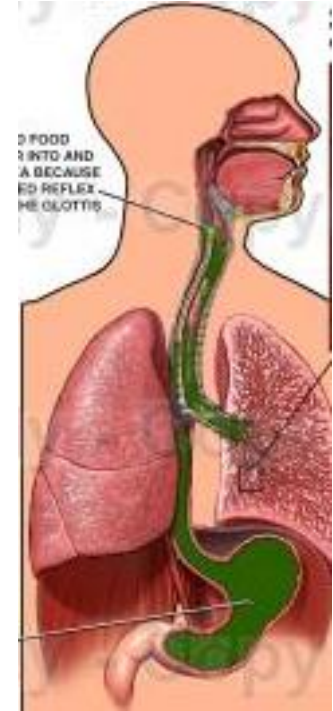
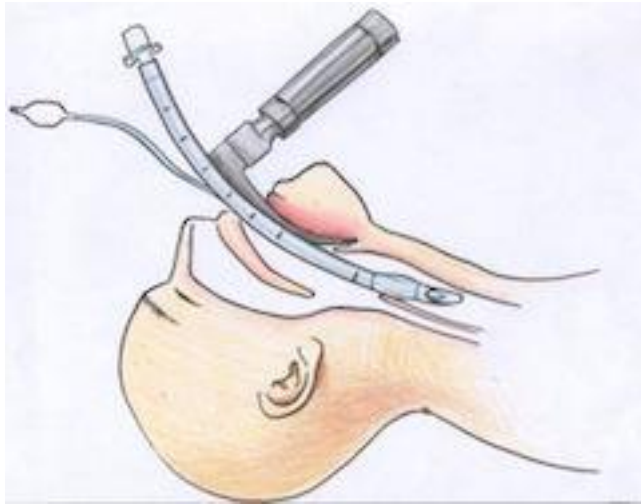
- AMPLE
- Airway
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- Pré-oxygénation (inhalo 2)
- Positionnement (Ao-Cave)
- Cœur foetal (infirmière OB)
- **Attend les champs . . .**



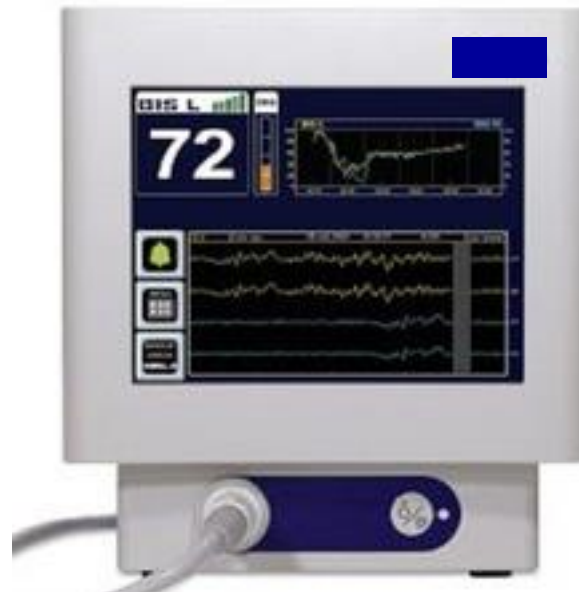
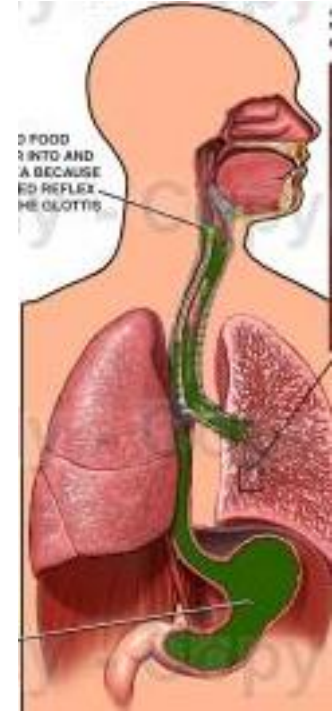
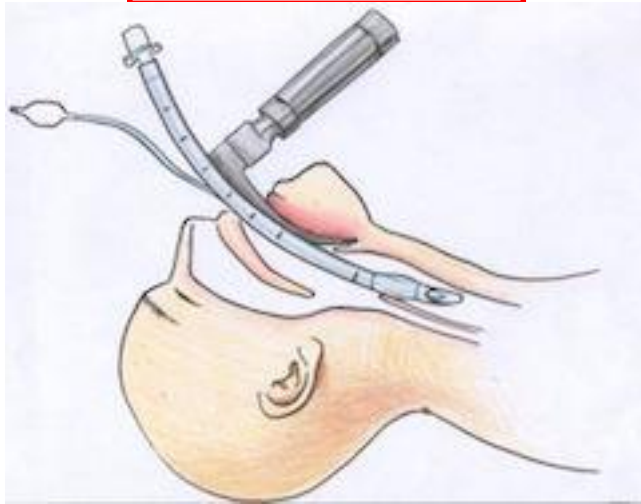
En attendant les champs avant AG . . .

- Anti-émétiques (ex: métoclopramide, ondansétron)
- Antiacides (ex: anti-H2 (famotidine))
- Antibiotiques (ex: céfazoline (lentement))
- Lidocaïne IV
- Rocuronium IV en pré-curarisation si désiré

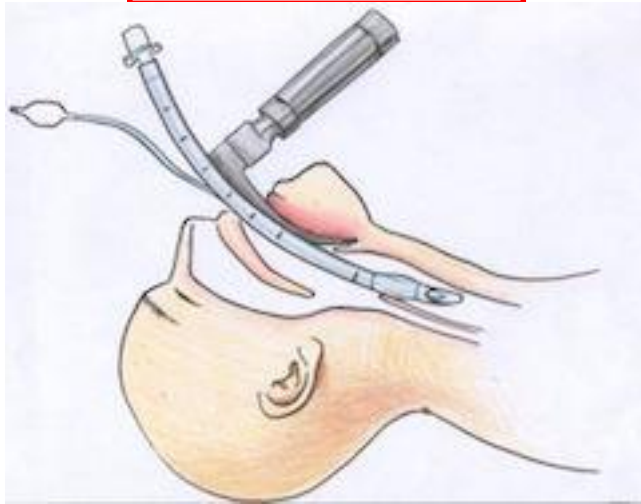




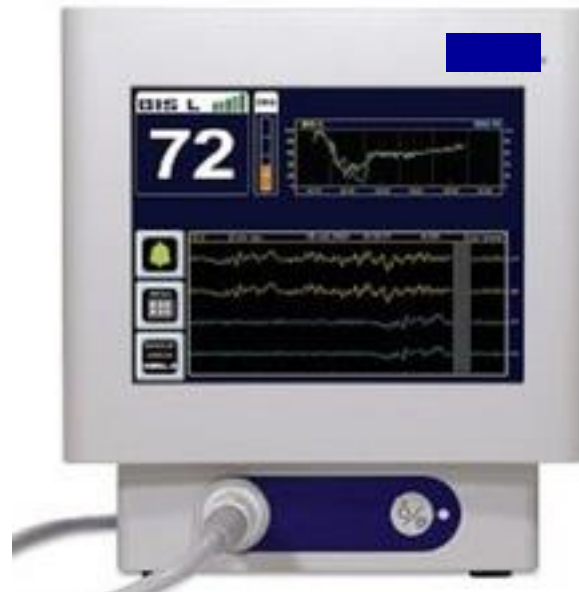
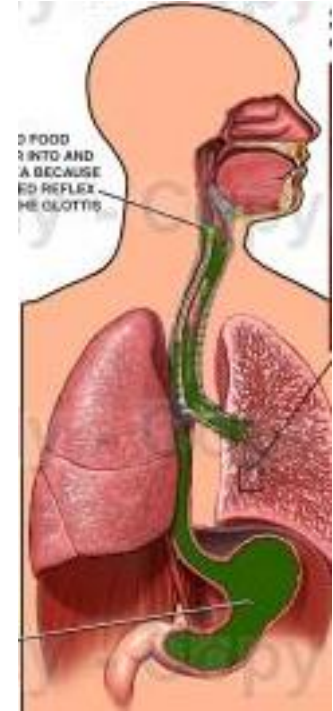
Airway



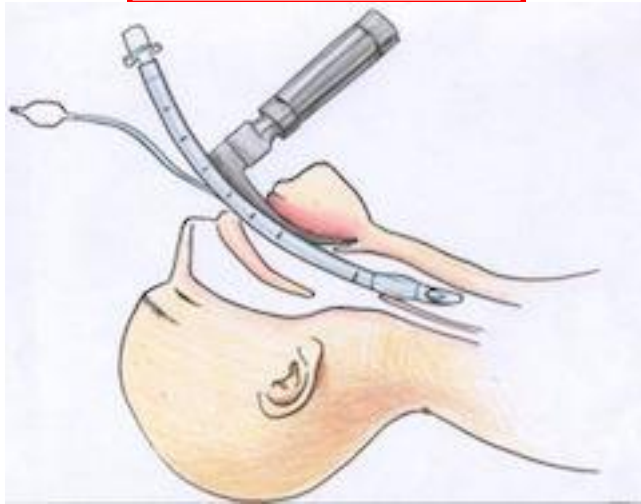
Airway



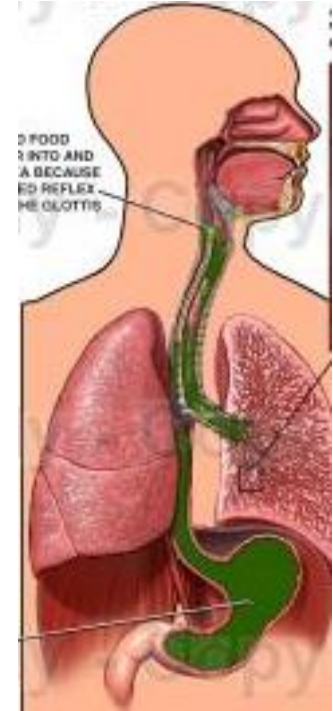
Aspiration



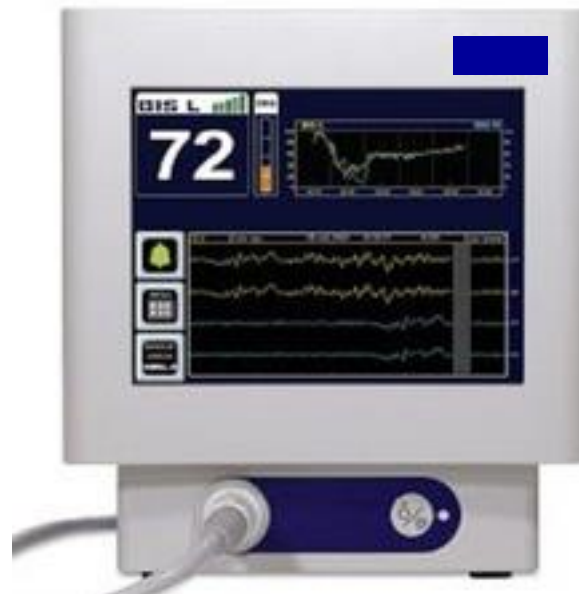
Airway



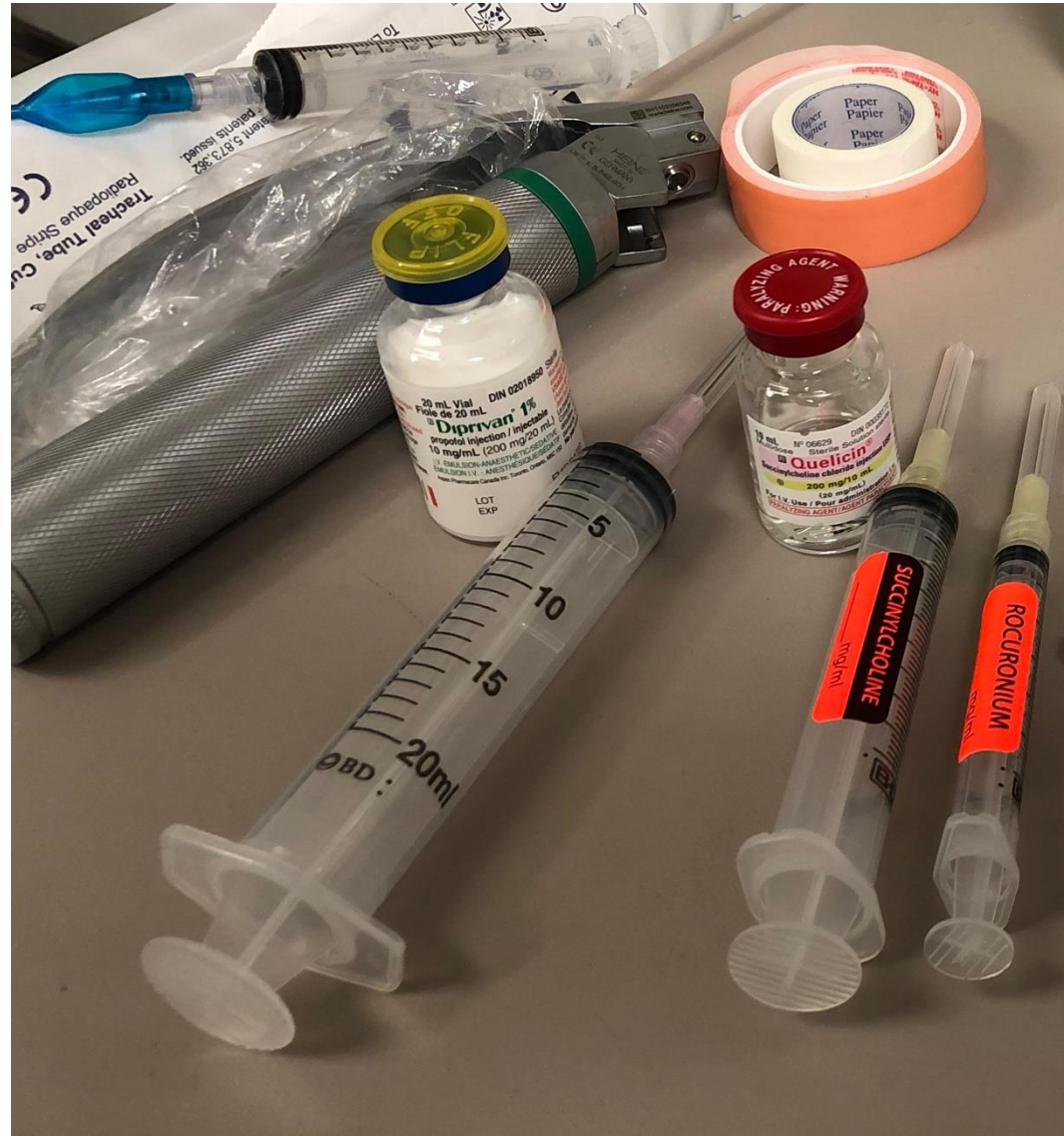
Aspiration



Awareness



Induction





Intubation conditions and neonatal outcomes with rocuronium versus suxamethonium in cesarean sections: A systematic review and meta-analysis

BMC Anesthesiology (2025) 25:476

Atef A. Hassan¹, Mohamed A. Khalafallah², Noha Rami Ismail³, Esraa Menshawy⁴, Abdulrhman Mady⁵, Moaz Abouelmagd⁶, Amr Menshawy⁷ and Ahmed Mensahwy^{7*}

- 6 études, 1122 patientes
- Rocuronium 1 mg/kg, sauf 1 étude 0.6 mg/kg
- Sch 1 mg/kg, sauf 1 étude 1.5 mg/kg

Induction au claspement du cordon

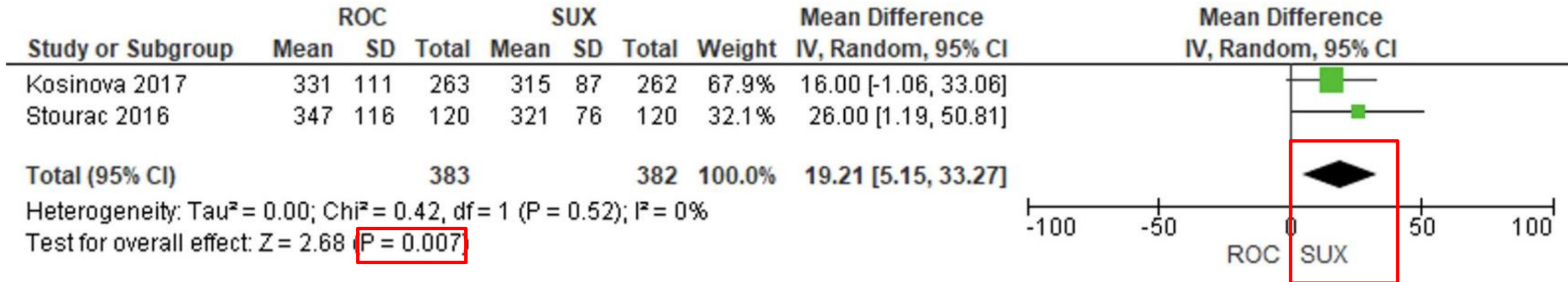


Fig. 2 Meta-analysis of time from induction to clamping the umbilical cord (s)



Avant le clampage

Avantages:

- Prévenir pic adrénérgique maternel
- Diminuer la douleur à l'intubation et l'incision
- Diminuer le risque d'éveil en potentialisant les agents d'induction



Après le clampage

Avantages:

- Éviter l'impact respiratoire sur le nouveau-né
- Éviter la gestion médicale invasive chez le nouveau-né



Best practice in obstetric general anaesthesia: an umbrella review of pharmacological strategies for induction of general anaesthesia

Anaesthesia 2026

Robert Craig,  Amelia Carnachan, Kay A. Mak, Olivia Beesley, Lauren Borg Xuereb, James E. O'Carroll,  Sohail Bampoe,  Nuala Lucas  and Peter M. Odor 

Best practice in obstetric general anaesthesia: an umbrella review of pharmacological strategies for induction of general anaesthesia

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Included

Studies included in umbrella review
(n = 50)

- RCTs (n = 26)
- Observational studies (n = 15)
- Meta-analyses (n = 7)
- Systematic review (n = 2)

- 127 études uniques
- 64% CS électives
- 4% CS urgentes
- 24% mélange électif + urgent
- 9% urgence inconnu

Table 1 Summary of findings for induction opioid medications. Effect sizes are mean difference or odds ratio.

Induction opioid	Type of evidence	Number of studies	Number of patients		Effect (95%CI)	Certainty of evidence
			Opioid	Control		
Alfentanil vs. control						
Mean 1 min Apgar	Meta-analysis	1 (4 RCTs)[8]	65	60	MD 0.05 (-0.12 to 0.21)	⊕⊕○○○ Low ^{A,D}
Mean 5 min Apgar	Meta-analysis	1 (4 RCTs)[8]	65	60	MD 0.14 (-0.08 to 0.36)	⊕⊕○○○ Low ^{A,D}
Remifentanil vs. control						
Mean 1 min Apgar	Meta-analysis	2 (5 RCTs)[8, 9];	218	217	MD -0.27 (-0.74 to 0.19)	⊕⊕⊕○○ Moderate ^{C,D}
	Systematic review	1 [10]	-	-	MD -0.84 (-1.52 to -0.15)	
Mean 5 min Apgar	Meta-analysis	2 (5 RCTs)[8]; (5 RCTs)[9]	218	217	MD -0.19 (-0.40 to 0.02)	⊕⊕⊕○○ Moderate ^{C,D}
	Systematic review	1 [10]	-	-	MD -0.30 (-0.570 to -0.021)	
1 min Apgar score < 7	Meta-analysis	1 (3 RCTs)[10]	61	61	OR 1.51 (0.75–3.02)	⊕○○○○ Very Low ^{A,D}
5 min Apgar score < 7	Meta-analysis	1 (3 RCTs)[10]	61	61	OR 1.52 (0.43–5.32)	⊕○○○○ Very Low ^{A,D}
	RCT	1 [11]	27	25	OR 0.66 (0.20–2.18)	
Fentanyl vs. control						
Mean 1 min Apgar score	Meta-analysis	1 (3 RCTs)[8]	105	105	MD -0.02 (-0.30–0.26)	⊕⊕○○○ Low ^{A,D}
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RCT, randomised controlled trial; MD, mean difference; OR, odds ratio.

A, downgraded for number of patients; B, downgraded for risk of bias (study quality); C, downgraded for heterogeneity; D, downgraded for risk of bias (review quality).

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RCT, randomised controlled trial; MD, mean difference; OR, odds ratio.

A, downgraded for number of patients; B, downgraded for risk of bias (study quality); C, downgraded for heterogeneity; D, downgraded for risk of bias (review quality).

Doses?



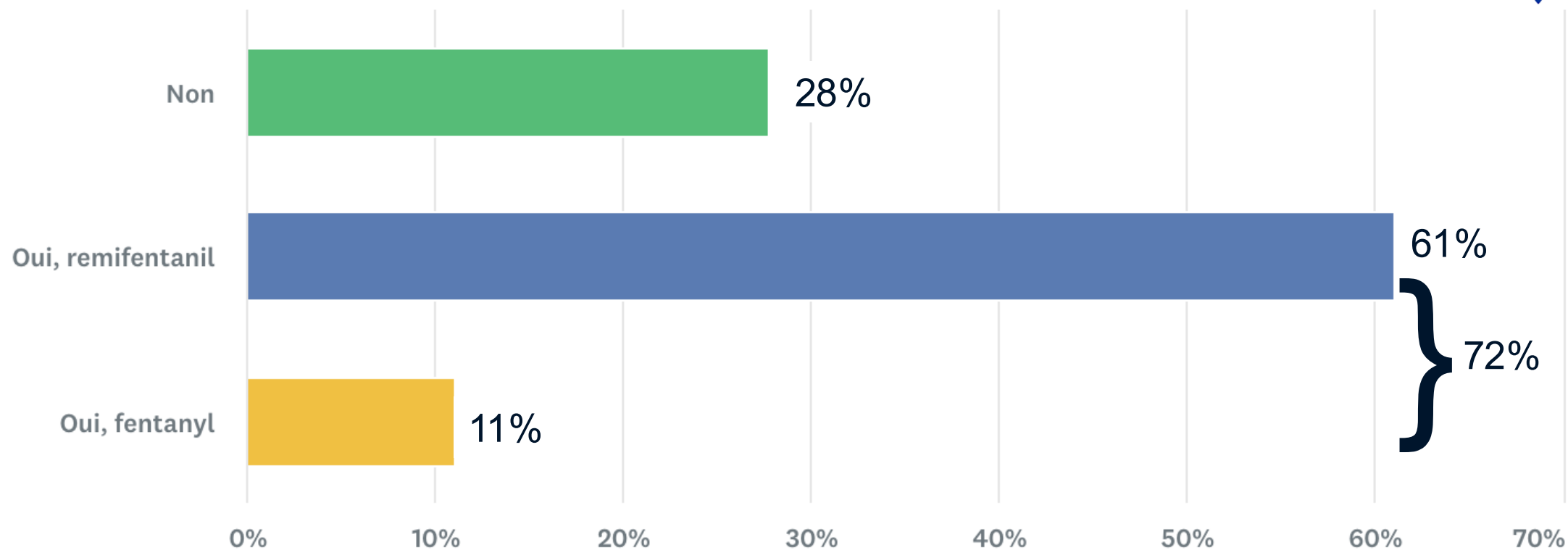
0.5 à 1 mcg/kg



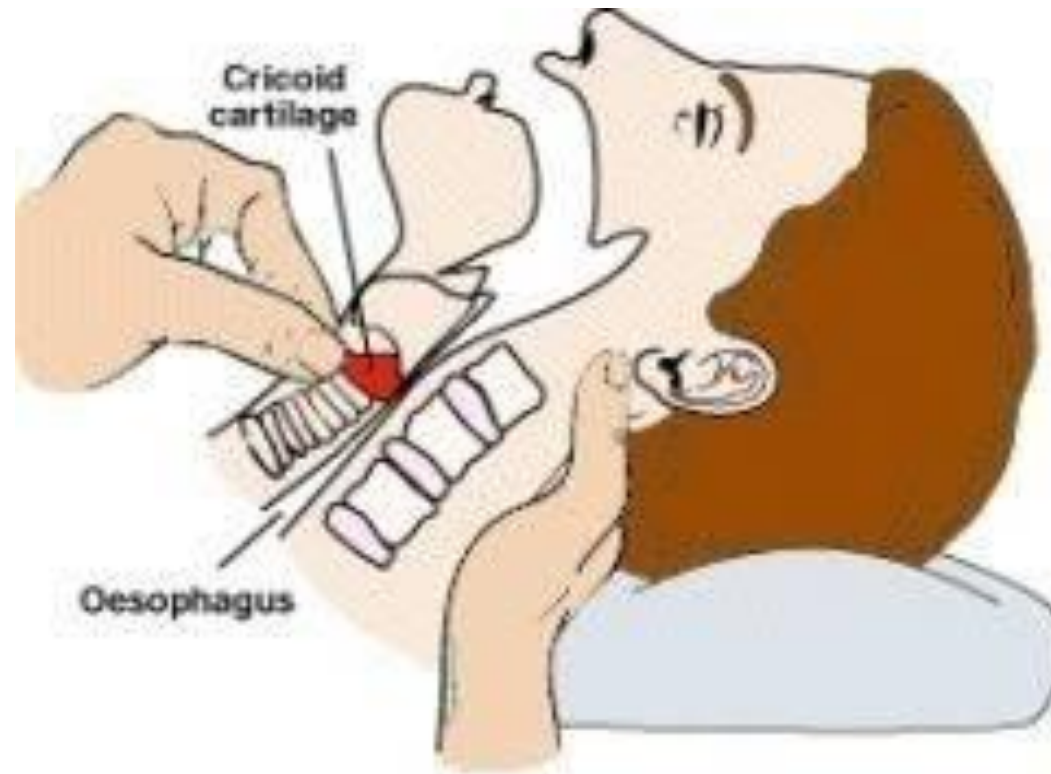
1 mcg/kg (50-100 mcg IV)

Utilisez-vous un opiacé lors de l'induction de l'AG pour césarienne?

18 responses



Pression cricoïdienne (Sellick)



Sellick

Avantages

- Occlusion mécanique, parfois incomplète, de l'œsophage supérieur
- Manœuvre réversible et peut être relâché si nuit à la visualisation

Désavantages

- Distorsion anatomie du AW
- Inefficace car œsophage peut glisser latéral
- Force de 30 N nécessaire

Mark J. Rice, MD*
Anthony A. Mancuso, MD†
Charles Gibbs, MD*
Timothy E. Morey, MD*
Nikolaus Gravenstein, MD*
Lori A. Deitte, MD†

Cricoid Pressure Results in Compression of the Postcricoid Hypopharynx: The Esophageal Position Is Irrelevant

Anesth Analg 2009;109:1546–52

The Effectiveness of Cricoid Pressure for Occluding the Esophageal Entrance in Anesthetized and Paralyzed Patients: An Experimental and Observational Glidescope Study

Anesth Analg 2014;118:580–6

Ahed M. Zeidan, MD,*† M. Ramez Salem, MD,‡§ Jean-Xavier Mazoit, MD, PhD,||¶
Mohamad Ali Abdullah, MD,*# Tharwat Ghattas, MD,* and George J. Crystal, PhD‡§

Intubation



Comparaison de la vidéolaryngoscopie et de la laryngoscopie directe pour l'intubation endotrachéale en obstétrique : une revue systématique de méthodes mixtes et une méta-analyse

Can J Anesth/J Can Anesth (2021) 68:546–565

Ryan Howle, MBChB, FRCA  · Desire Onwochei, MBBS, FRCA ·
Siew-Ling Harrison, MBBS, FRCA · Neel Desai, MBChB, FRCA

48 studies included in data
synthesis:
35 case reports and series
7 cross-sectional studies
1 cohort study
1 crossover study
4 randomised controlled
trials

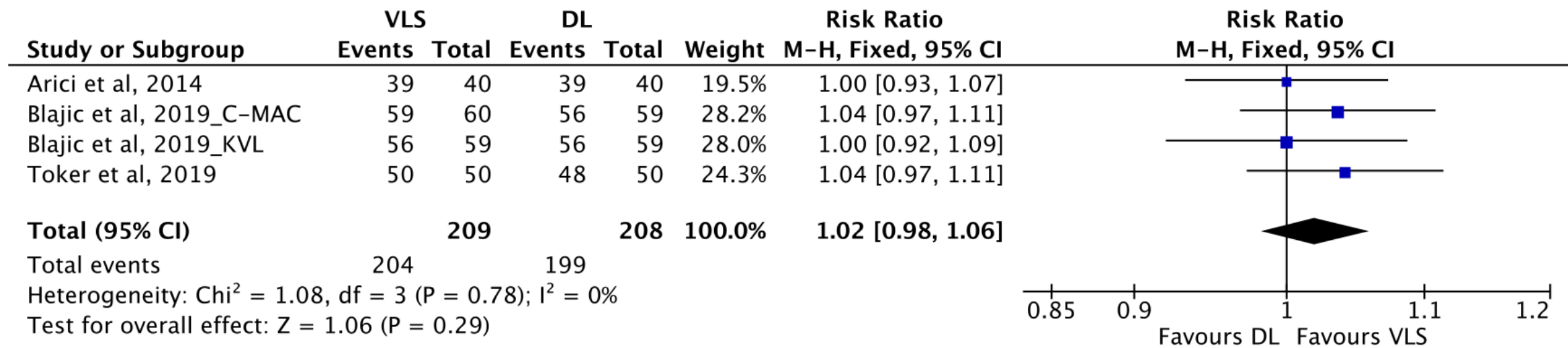


Fig. 3 Forest plot of the first-pass success rate at tracheal intubation. For each trial, the square depicts the risk ratio and the horizontal lines either side of it represent the 95% CI. The summary result is

presented as a diamond. CI = confidence interval; DL = direct laryngoscopy; SD = standard deviation; VLS = videolaryngoscope

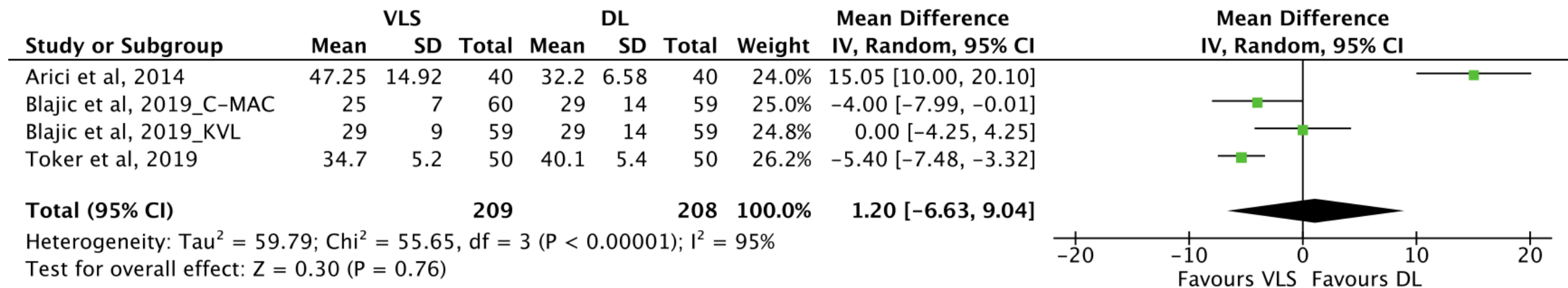


Fig. 4 Forest plot of the time to tracheal intubation. For each trial, the square depicts the mean difference and the horizontal lines either side of it represent the 95% CI. The summary result is presented as a

diamond. CI = confidence interval; DL = direct laryngoscopy; SD = standard deviation; VLS = videolaryngoscope

Comparaison de la vidéolaryngoscopie et de la laryngoscopie directe pour l'intubation endotrachéale en obstétrique : une revue systématique de méthodes mixtes et une méta-analyse

Can J Anesth/J Can Anesth (2021) 68:546–565

Ryan Howle, MBChB, FRCA  · Desire Onwochei, MBBS, FRCA ·
Siew-Ling Harrison, MBBS, FRCA · Neel Desai, MBChB, FRCA

We suggest that the lack of difference shown between direct laryngoscopy and videolaryngoscopy in our meta-analysis for patients not predicted to have a difficult airway and scheduled for elective surgery should encourage an overall increased adoption of videolaryngoscopy in obstetrics.

Maintien



Stratégie halogénés

- Halogénés 1 MAC avant naissance
- Diminue à 0.75 MAC après naissance car risque *d'atonie utérine*
- Ajout d'un/des adjuvant(s):
 - Protoxyde 50% avec O₂ (N°/V°)
 - Propofol ou TIVA
 - Midazolam
 - Opiacé
 - Dexmedetomidine



The Effects of Sevoflurane on Isolated Gravid Human Myometrium

Anaesth Intensive Care 2002; 30: 591-596

R. J. TURNER*, M. LAMBROS†, C. HOLMES‡, S. G. KATZ§, C. S. DOWNS**, D. W. COLLINS††, S. P. GATT‡‡

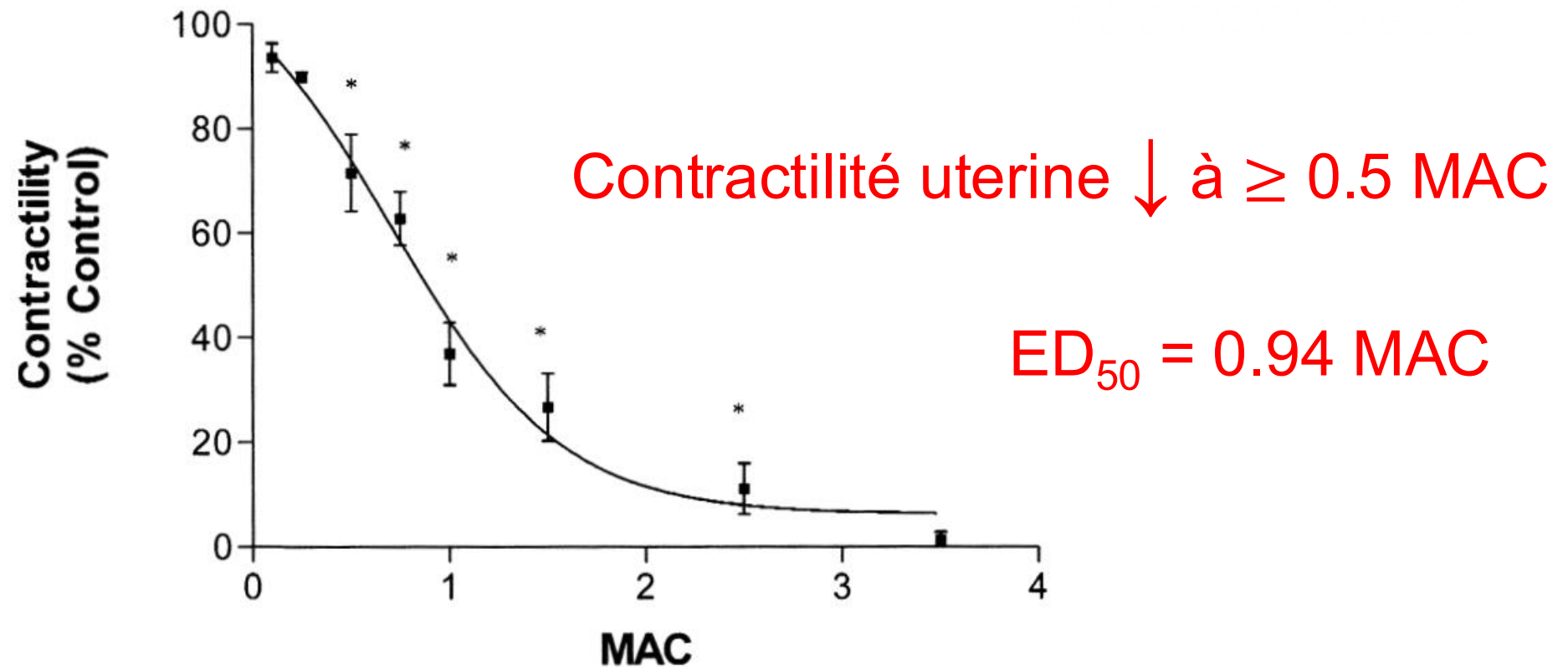


FIGURE 2: The effects of sevoflurane on uterine muscle contractility, defined as the area under the force-time curve (per cent of control $\pm$ SE). * $P < 0.05$.

Les avantages de la TIVA en césarienne

- Stabilité hémodynamique
- Diminution du risque d'hémorragie causé par atonie utérine
- Moins de N/V
- Bénéfices environnementales



Question



7. L'ajout d'une perfusion de remifentanyl 0.05 mcg/kg/min au sevoflurane 0.75 MAC va créer laquelle de ces situations:

- a) Dépression néonatale
- b) Augmentation saignement
- c) Diminution awareness maternelle
- d) Atonie utérine



Question



7. L'ajout d'une perfusion de remifentanyl 0.05 mcg/kg/min au sevoflurane 0.75 MAC va créer laquelle de ces situations:

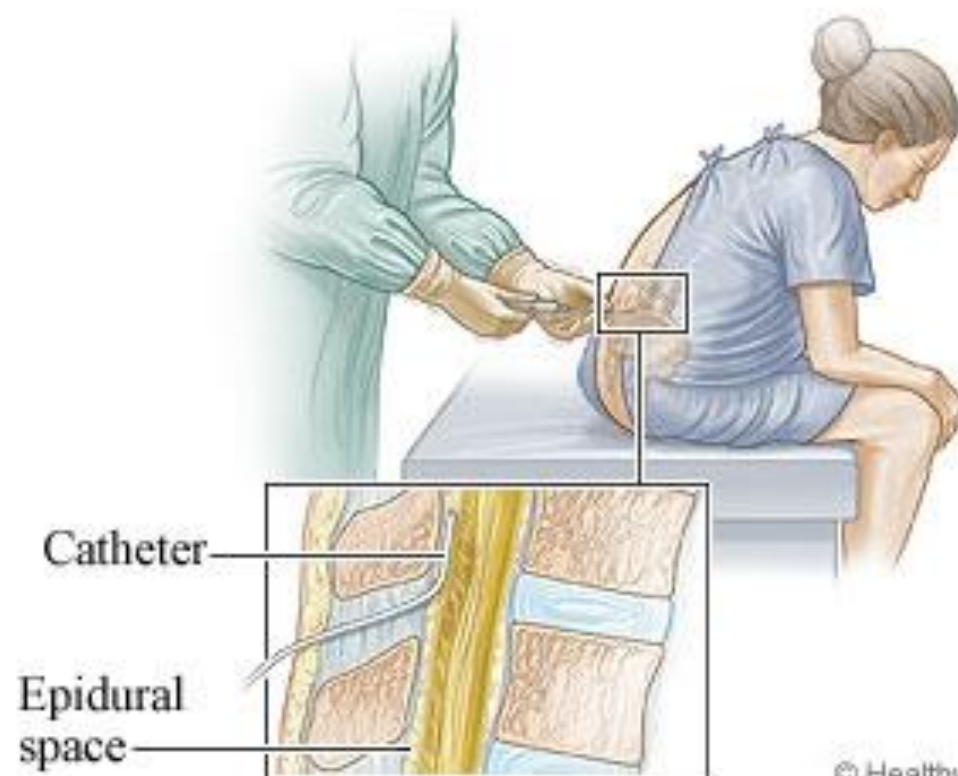
- a) Dépression néonatale
- b) Augmentation saignement
- c) **Diminution awareness maternelle**
- d) Atonie utérine





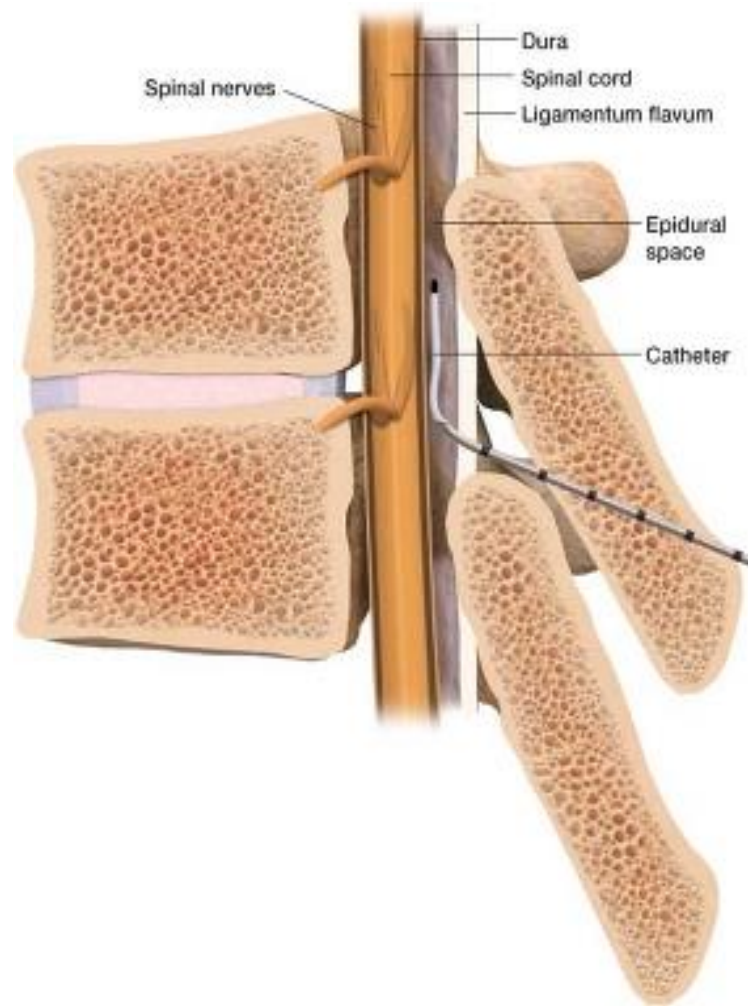
Risk factors for failed conversion of labor epidural analgesia to cesarean delivery anesthesia: a systematic review and meta-analysis of observational trials

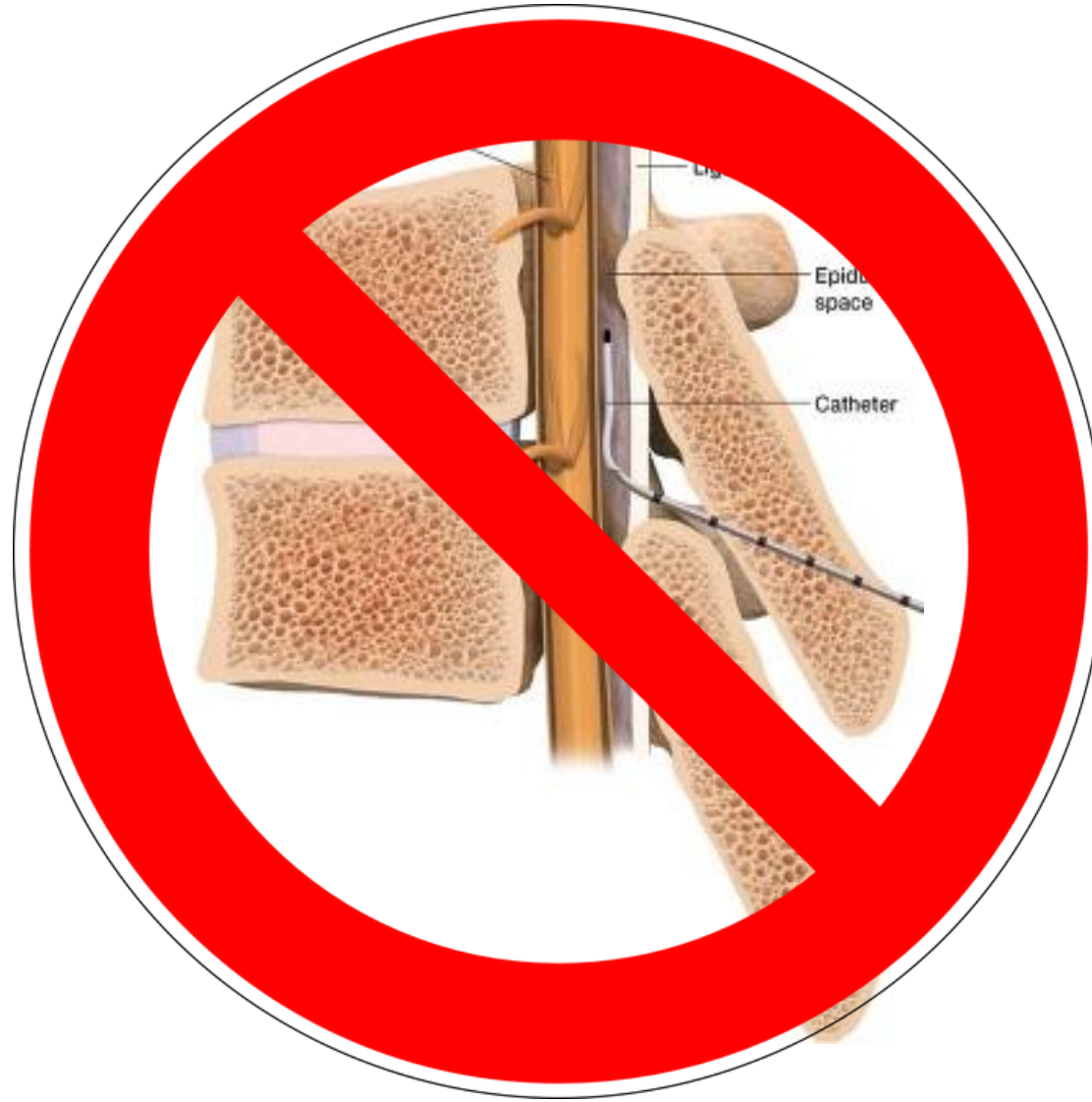
International Journal of Obstetric Anesthesia (2012) 21, 294–309



© Healthwise, Incorporated







CONTROVERSIES

Cord prolapse demands general anaesthesia

Proposer: V. Bythell

Opposer: Mark Scrutton



If there is no evidence of fetal distress,
there should be no absolute demand for general anaes-
thesia.

Often, the cord is still contained in the
warm, moist environment of the vagina where compro-
mise of the blood supply is unlikely if undisturbed.

Box 1. Technique for rapid sequence spinal

1. Have anaesthetic equipment prepared at all times.
2. Get someone else to set up i.v. infusion.
3. No-touch technique – sterile gloves only.
4. Make only one attempt at siting the spinal unless obvious correction can be made.
5. Resort to general anaesthesia early (unless contraindicated).

International Journal of Obstetric Anesthesia (2003) **12**, 287–292

Rapid sequence spinal anaesthesia for category-1 urgency caesarean section: a case series

Anaesthesia, 2010, **65**, pages 664–669

S. M. Kinsella,¹ K. Girgirah² and M. J. L. Scrutton¹

Question



8. Tous ces phénomènes sont associés avec une procidence du cordon, SAUF?

- a) Jumeaux
- b) Siège
- c) Macrosomie
- d) Pré maturité
- e) Partie présentatoire non engagée

Question

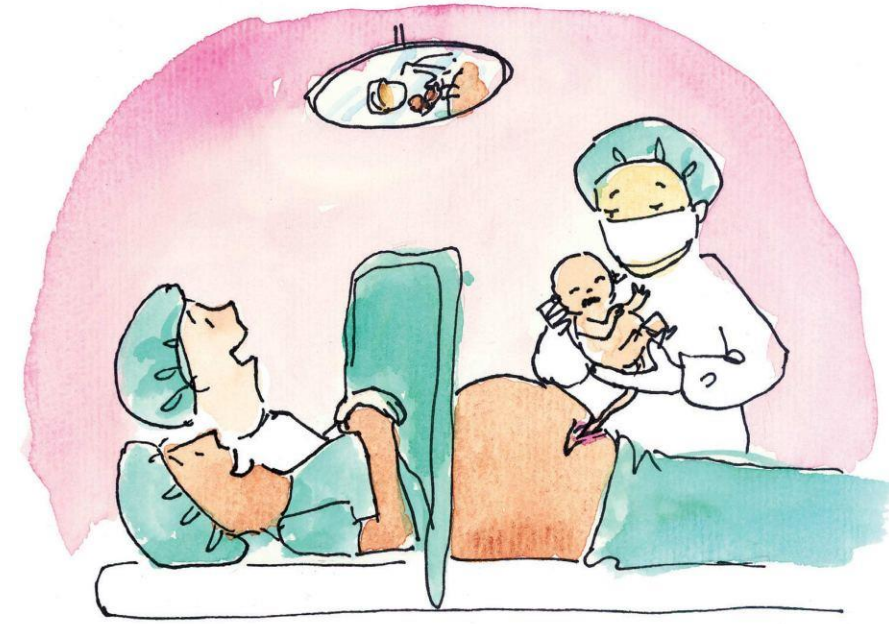


8. Tous ces phénomènes sont associés avec une procidence du cordon, SAUF?

- a) Jumeaux
- b) Siège
- c) **Macrosomie**
- d) Pré maturité
- e) Partie présentatoire non engagée

Plan

- Généralités de la césarienne
- Considérations femme enceinte
- Préparation anesthésique
- Anesthésies neuraxiales
- Anesthésie générale
- **Utérotoniques**
- Analgésie post-césarienne
- ERAC

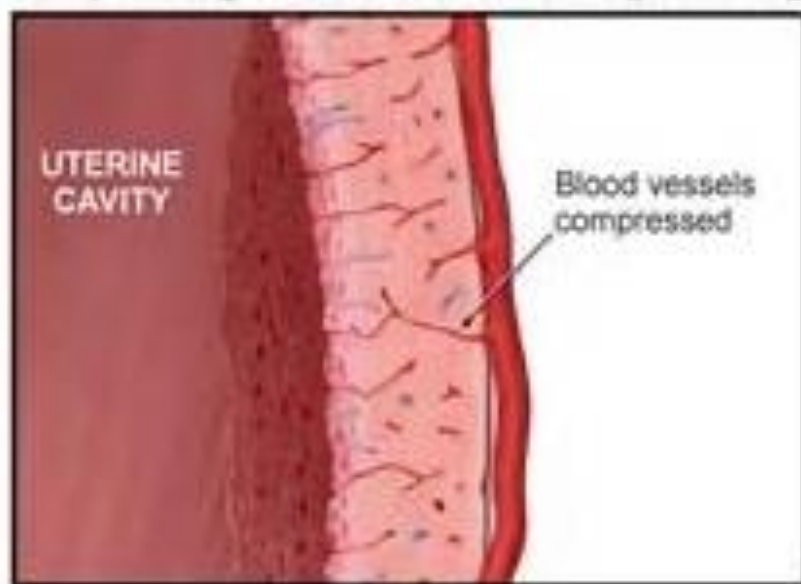


AVENGING
UTERUS: GO!

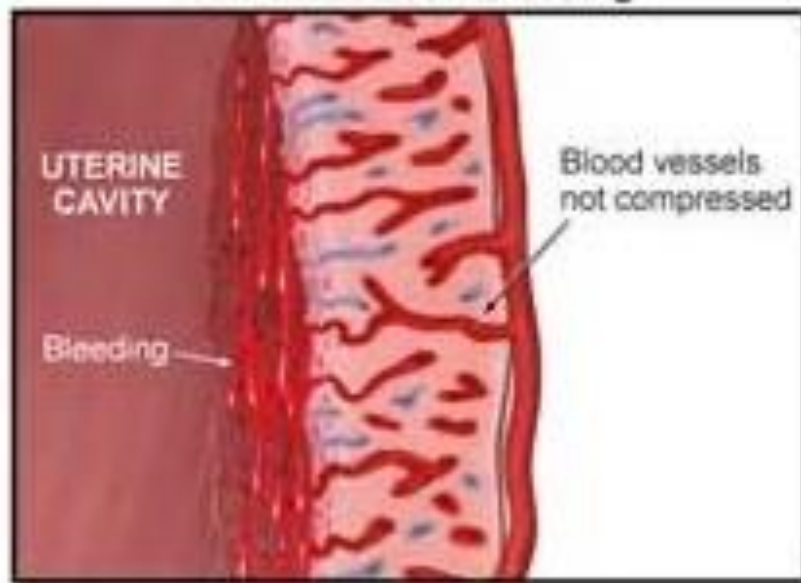
Utérotoniques



**Contraction of Uterine Muscles,
Compressing Vessels and Preventing Bleeding**



**Atony: Lack of Uterine Contraction
Can Cause Acute Bleeding**



International consensus statement on the use of uterotonic agents during caesarean section

M. Heesen,¹ B. Carvalho,² J. C. A. Carvalho,³ J. J. Duvekot,⁴ R. A. Dyer,⁵ D. N. Lucas,⁶ N. McDonnell,⁷ S. Orbach-Zinger⁸ and S. M. Kinsella⁹ Anaesthesia 2019, 74, 1305–1319

First-line drugs

Oxytocin

Elective caesarean section

Bolus 1 IU oxytocin; start oxytocin infusion at 2.5–7.5 IU.h⁻¹ (0.04–0.125 IU.min⁻¹).

If required after 2 min, give a further dose of 3 IU over ≥ 30 s.

Consider second-line agent early in the event of failure of this regimen to produce sustained uterine tone.

Review the patient's clinical condition before discontinuing the infusion; this will usually be between 2 h and 4 h after commencement.

Intrapartum caesarean section

3 IU oxytocin over ≥ 30 s; start oxytocin infusion at 7.5–15 IU.h⁻¹ (0.125–0.25 IU.min⁻¹).

Alternative – *carbetocin*

Elective caesarean section

100 µg over ≥ 30 s.

Smaller doses (as low as 20 µg) may be sufficient; in this case, doses can be repeated if required, up to 100 µg.

Do not exceed 100 µg – if required move to second-line drug.

Intrapartum caesarean section

100 µg over ≥ 30 s.

Do not exceed 100 µg – if required move to second-line drug.

Second-line drugs

These drugs should be considered for both prophylaxis and treatment of postpartum haemorrhage.

Consider early use in the event of failure of first-line drugs to produce sustained uterine tone.

Depending on local availability, the following drugs can be used:

- 1 Ergometrine (ergonovine) 200–500 μg /methylergometrine (methylergonovine) 200 μg : i.m. or slow i.v. in exceptional circumstances; may be repeated after 2 h.
- 2 Misoprostol 400–600 μg : sublingual, rectal, vaginal, oral; repeat after 15 min if required, maximum dose 800 μg .
- 3 Carboprost 250 μg : i.m. or intramyometrial (contraindicated i.v.); up to every 15 min if required, maximum eight doses.
- 4 Sulprostone 500 μg : i.v. at 100 $\mu\text{g}\cdot\text{h}^{-1}$; maximum dose 1500 μg .

Consider early use of adjunctive medication to counter adverse effects, for example, antiemetics.

Further uterotonic administration (third-line drugs) should be considered within a multimodal postpartum haemorrhage regimen (pharmacology/haematology and antifibrinolysis/surgery/interventional radiology).



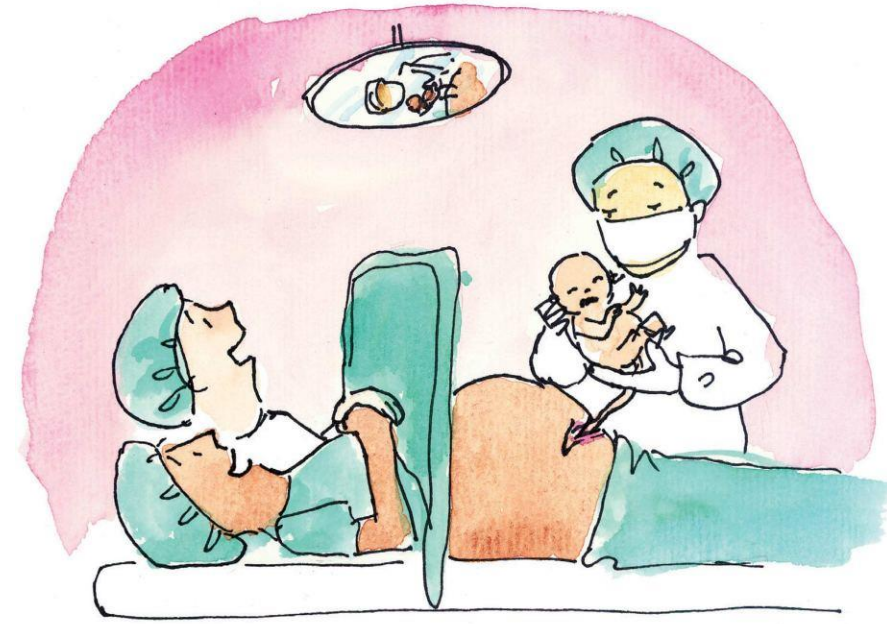
Quand?

Uterotonic medications increase uterine tone to prevent postpartum hemorrhage:

- a. In **preterm pregnancies**, due to concerns about a potential bolus of blood to preterm infants, it is recommended that intravenous uterotonic medications be administered **after clamping the cord** (*conditional, low*).
- b. In **term pregnancies**, with lower risk for bolus effects of blood, **> 37 sem** lower benefits of deferred cord clamping, and higher risk for maternal postpartum hemorrhage, it is recommended that intravenous uterotonic medications be administered with delivery of the anterior shoulder of the final infant (*conditional, low*).

Plan

- Généralités de la césarienne
- Considérations femme enceinte
- Préparation anesthésique
- Anesthésies neuraxiales
- Anesthésie générale
- Utérotoniques
- **Analgesie post-césarienne**
- ERAC



Analgésie post-césarienne



Douleur

- 30% - 80% des patientes post-césarienne ressentent douleur modérée à sévère
- Douleur aiguë sévère = facteur important pour la chronicisation de la douleur
- Traitement = Stratégie multimodale



Pain 140 (2008) 87–94

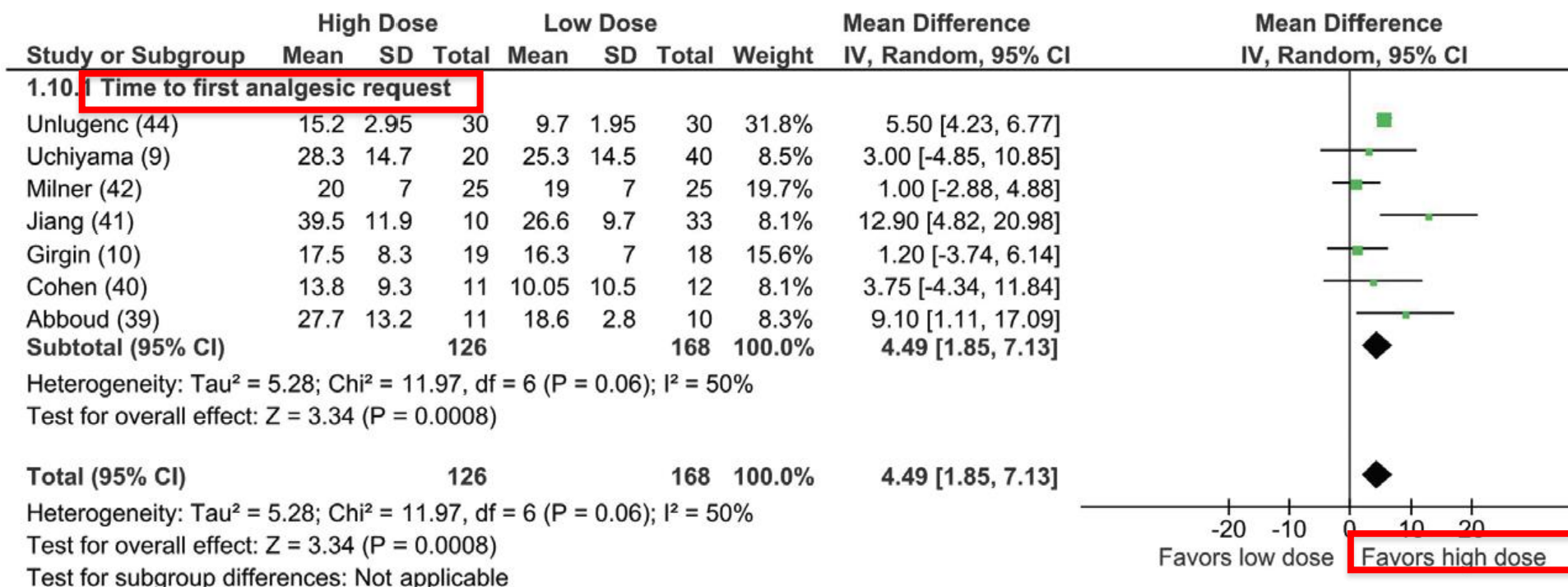
Can J Anesth/J Can Anesth (2021) 68:1802–1810



The Effect of Intrathecal Morphine Dose on Outcomes After Elective Cesarean Delivery: A Meta-Analysis

Pervez Sultan, MBChB, FRCA,* Stephen H. Halpern, MD,† Ellile Pushpanathan, MBBS, BMedSci, FRCA,‡ Selina Patel, MBBS, FRCA,* and Brendan Carvalho, MBBCh, FRCA§

Anesth Analg 2016;123:154–64



Low dose: 50-100mcg
High dose > 100-250mcg

The Effect of Intrathecal Morphine Dose on Outcomes After Elective Cesarean Delivery: A Meta-Analysis

Pervez Sultan, MBChB, FRCA,* Stephen H. Halpern, MD,† Ellile Pushpanathan, MBBS, BMedSci, FRCA,‡ Selina Patel, MBBS, FRCA,* and Brendan Carvalho, MBBCh, FRCA§

Anesth Analg 2016;123:154–64

Table 4. Summary of Maternal Secondary Outcomes

Outcomes	No. studies	No. patients (low dose, high dose)	MD/OR	MD/OR (95% CI)	P	I ²	NNT/NNH
Pain scores at 12 h	2	74, 72	MD	2.54 (–2.55 to 7.63)	0.33	0	NA
Pain scores at 24 h	1	18, 19	MD	1.00 (–2.50 to 4.50)	0.58	NA	NA
Pruritus	8	228, 192	OR	0.34 (0.20 to 0.59)	0.0001	0	5.9
Severe pruritus	5	156, 131	OR	0.32 (0.16 to 0.61)	0.0006	0	7.0
Vomiting	7	180, 138	OR	0.38 (0.19 to 0.75)	0.005	0.03	7.7
Nausea or vomiting	7	196, 174	OR	0.44 (0.27 to 0.73)	0.002	0	8.3
Antiemetics	2	79, 75	OR	0.69 (0.32 to 1.45)	0.33	0	NA

CI = confidence interval; MD = weighted mean difference; NA = not applicable; NNH = numbers needed to harm; NNT = numbers needed to treat; OR = odds ratio.

Low dose: 50-100mcg

High dose > 100-250mcg



100-150 mcg IT

Postcesarean Epidural Morphine: A Dose-Response Study

Craig M. Palmer, MD, Wallace M. Nogami, MD, Gretchen Van Maren, MD, and
Diane M. Alves, RN

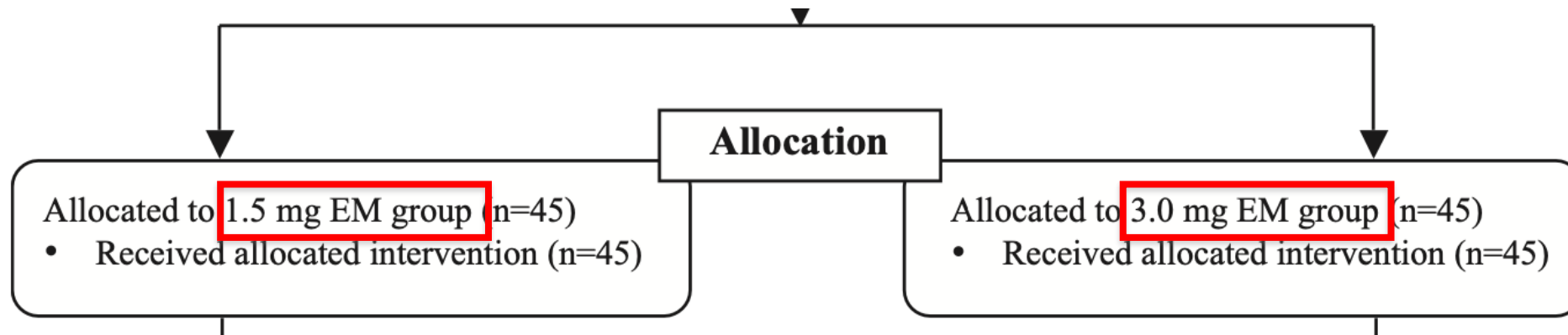
Anesth Analg 2000;90:887-91

In summary, analgesia from epidural morphine after cesarean delivery increased in a dose-related fashion as the dose increased from 0 to 3.75 mg; increasing the dose further to 5.0 mg did not enhance analgesia.

The Efficacy of 2 Doses of Epidural Morphine for Postcesarean Delivery Analgesia: A Randomized Noninferiority Trial

Sudha I. Singh, MD, FRCPC,* Sarah Rehou, BSc (Hons),† Kristine L. Marmai, MD, FRCPC,‡ and Philip M. Jones, MD, MSc, FRCPC§

(Anesth Analg 2013;117:677–85)



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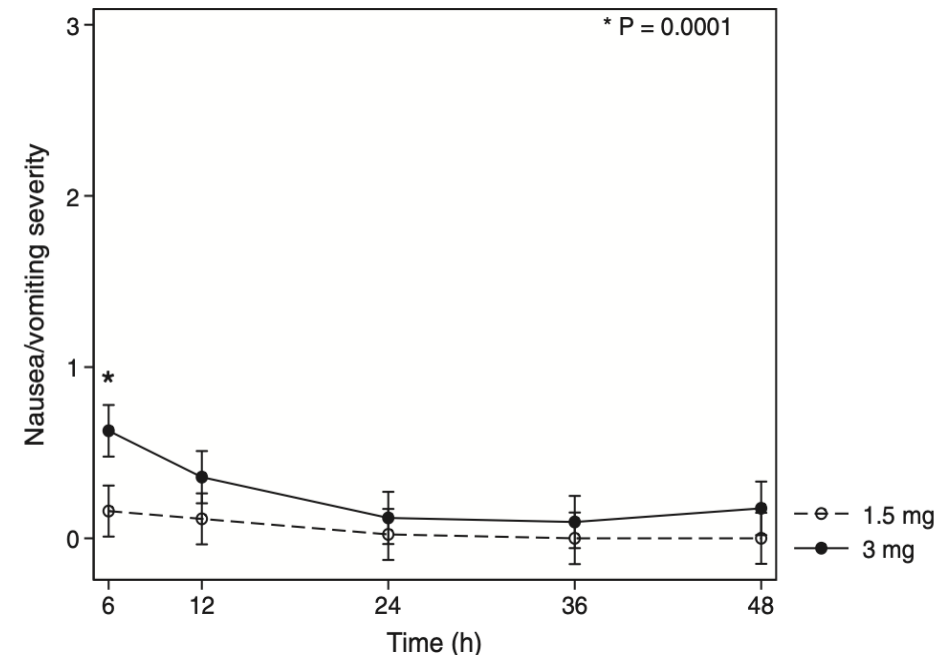
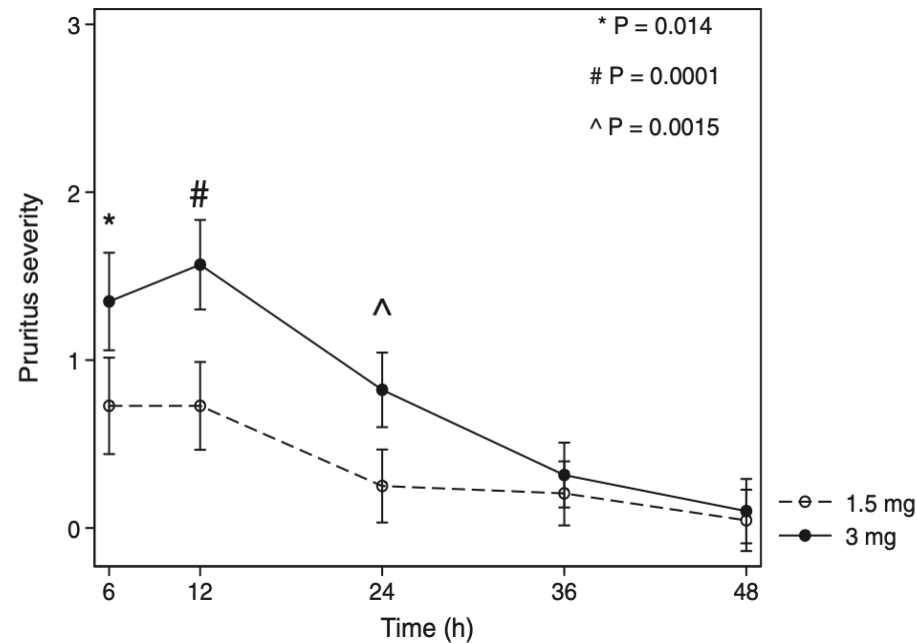
(Anesth Analg 2013;117:677–85)

Table 2. Opioid Consumption in IV Morphine Equivalents and Time to First Request				
Variable	1.5 mg EM group (n = 44)	3 mg EM group (n= 43)	Difference between groups (95% CI)	P
Primary outcome				
Median 0- to 24-h opioid consumption in milligrams (IQR)	0 (0–5)	0 (0–2.5)	0 (1-sided 95% CI, 2.5) ^a	—
Mean 0- to 24-h opioid consumption in milligrams (SD) ^b	2.4 (3.3)	2.5 (6.6)	–0.1 (1-sided 95% CI, 1.7)	—
Median 24- to 48-h opioid consumption in milligrams (IQR)	5 (0–10)	2.5 (0–7.5)	2.5 (0–7.5) ^a	0.13
Median total opioid consumption in milligrams within 48 h (IQR)	7.5 (1.25–15)	2.5 (0–7.5)	5 (2.5–13.8) ^a	0.07
Median time to first request in hours (IQR)	21.6 (14.8–29.9)	22.2 (5.3–31.8)	–0.6 (–11.8–16.0) ^a	0.67

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(Anesth Analg 2013;117:677–85)

1.5 mg morphine épidurale

Acétaminophène et AINS

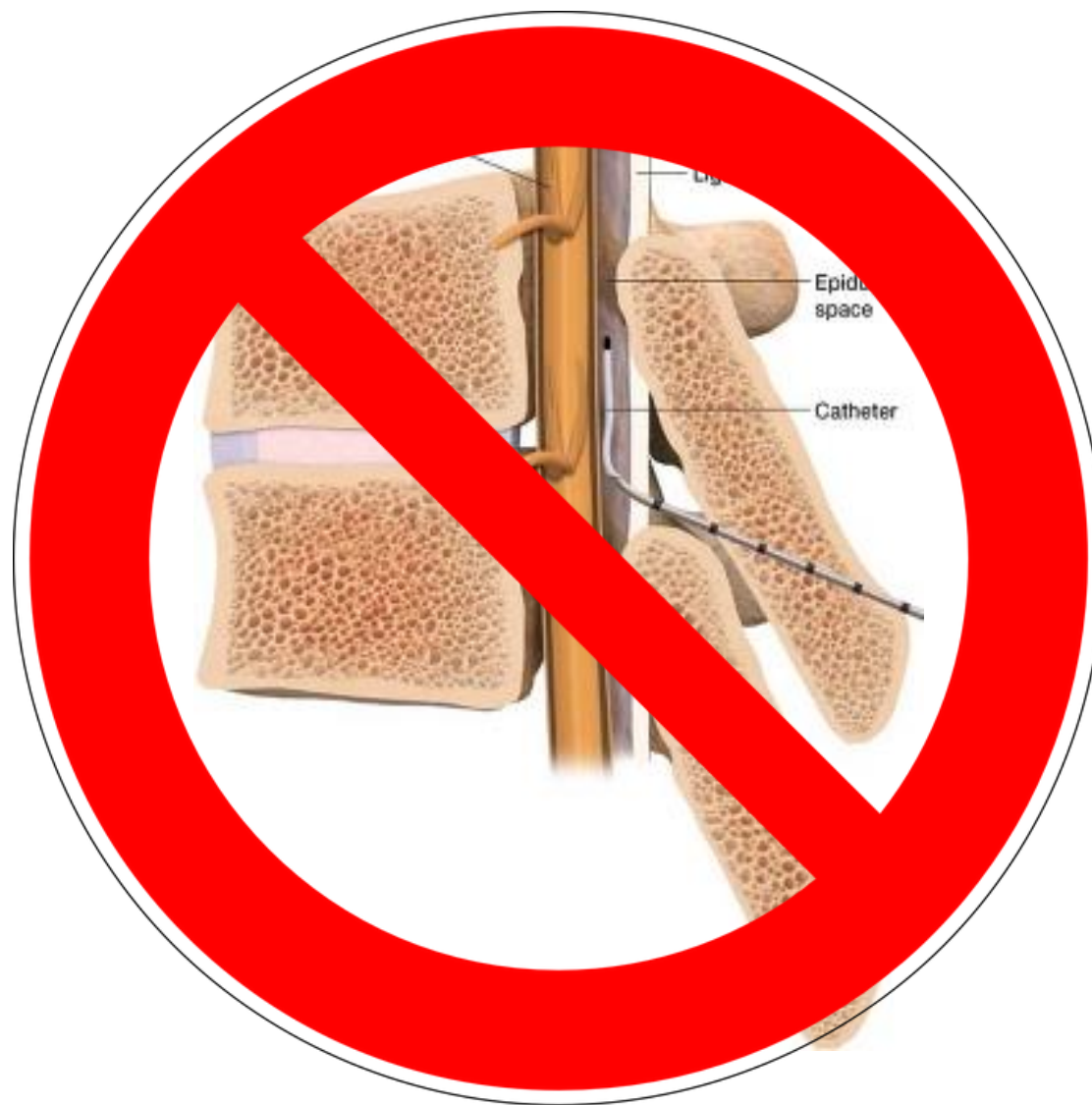


- À donner à intervalles régulières, et non en PRN
- Première dose AVANT de ressentir la douleur – en périopératoire

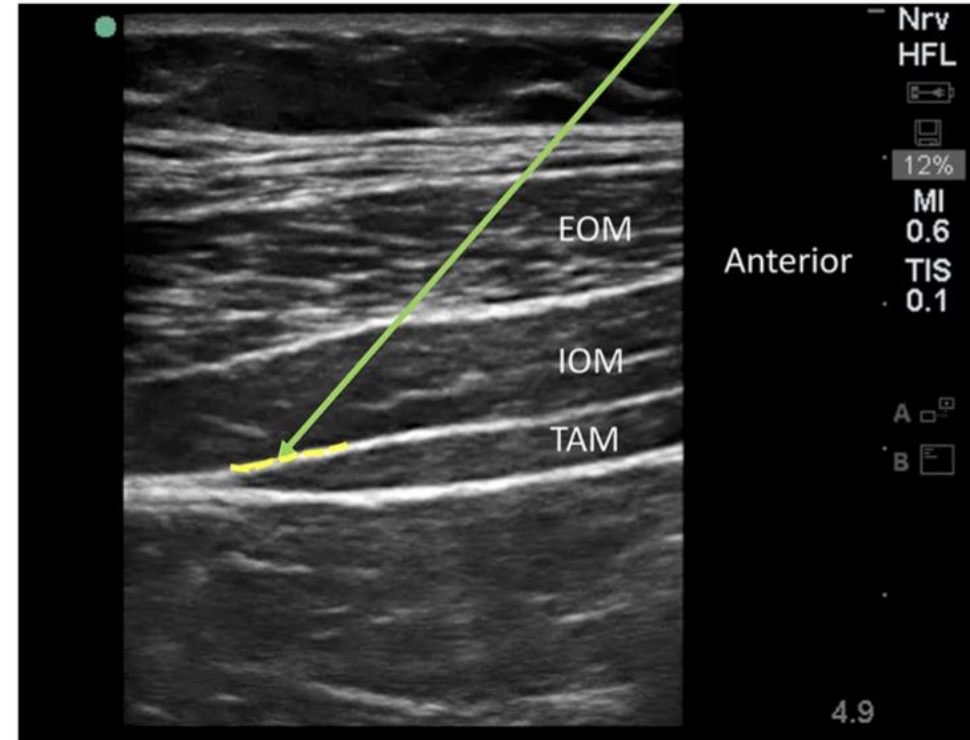
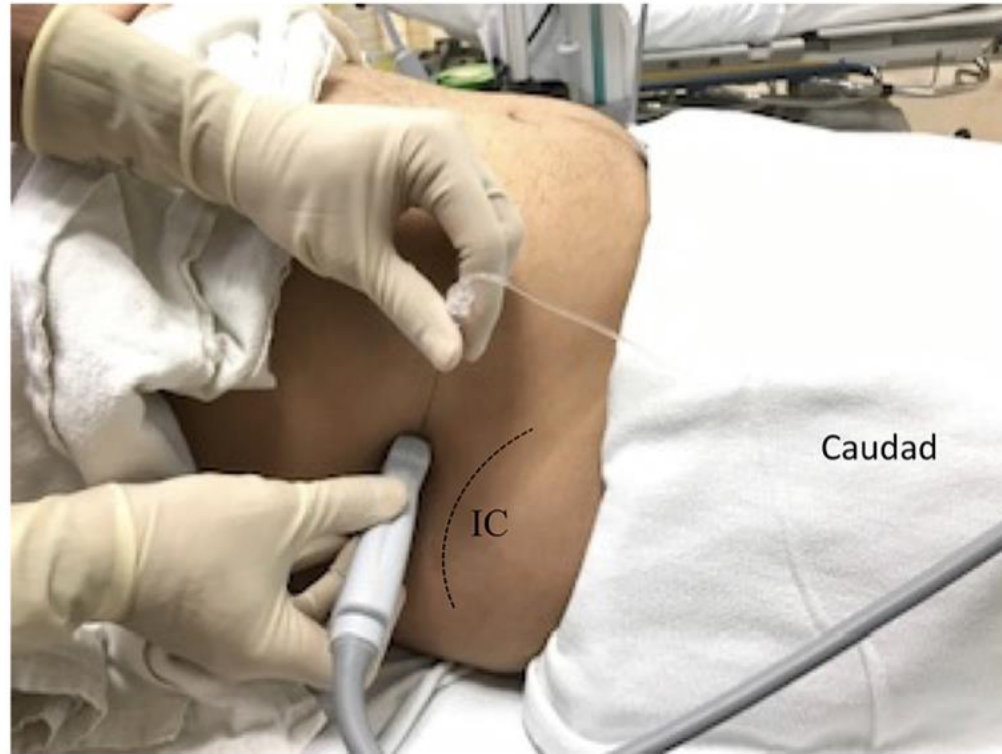
Opiacés PRN

- *Morphine*
- *Hydromorphone*
- *Oxycodone*





Transversus Abdominus Plane (TAP) bloc



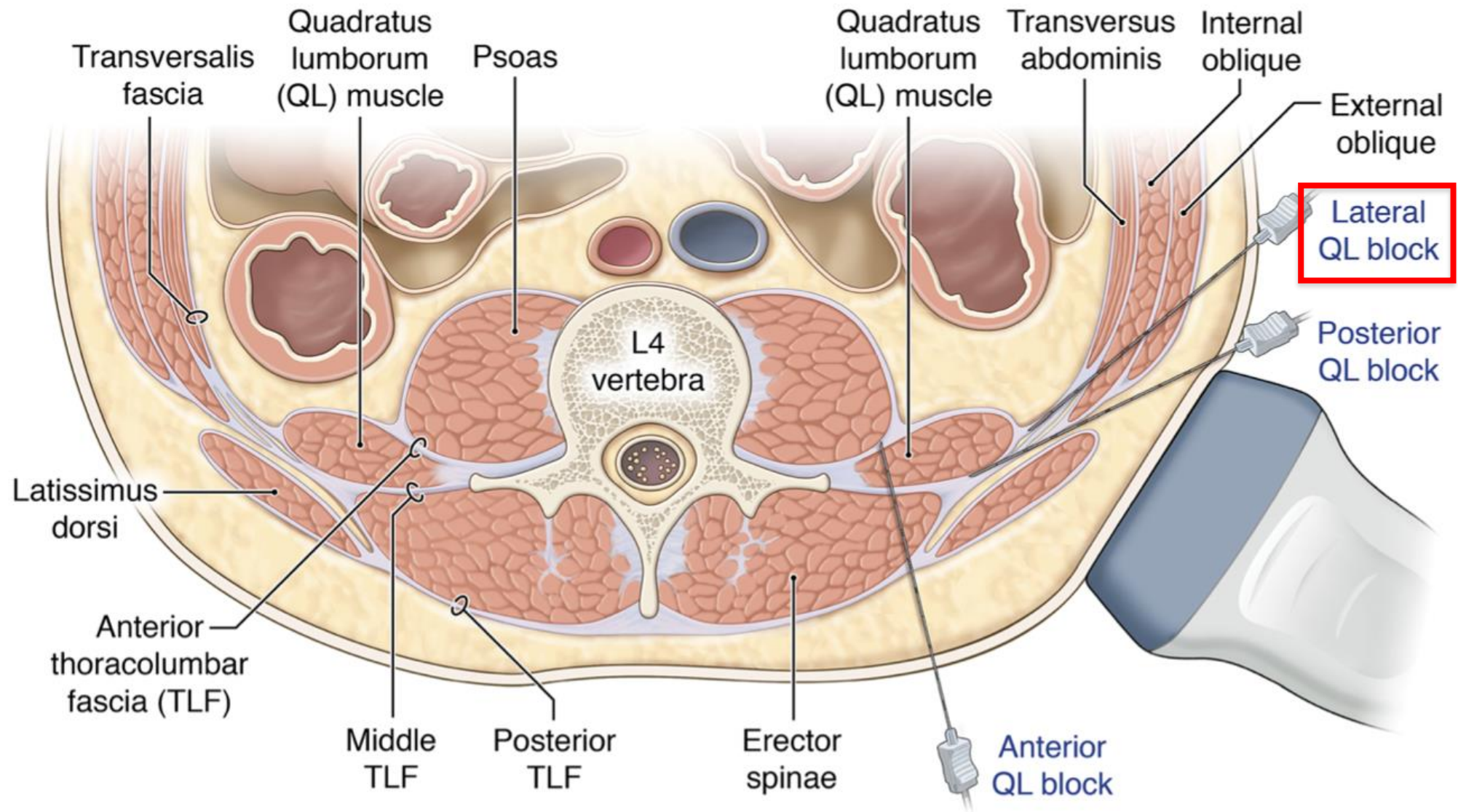
Transversus abdominis plane block for analgesia after Cesarean delivery: a systematic review and meta-analysis

Basem M. Mishriky, MD · Ronald B. George, MD

Ashraf S. Habib, MBBCh

Can J Anesth/J Can Anesth (2012) 59:766–778

In conclusion, this systematic review and meta-analysis suggests that TAP block significantly improved postoperative analgesia in women undergoing CD who did not receive ITM, and it is therefore recommended in those patients. The value of TAP block in patients receiving ITM and its comparison with ITM remains less clear and should be investigated in future studies.



Comparison of intrathecal morphine, lateral quadratus lumborum block, and their combination for analgesia and quality of recovery after Caesarean delivery: a randomised, double-blind, two-centre clinical trial

British Journal of Anaesthesia, 137 (3): 764–772 (2026)

Vishal Uppal^{1,*} , Valerie Zaphiratos² , Victoria M. Allen³ , Ana Sjaus¹ , Aaron Shephard⁴ 
Ariane Clairoux⁵ , Rami Issa⁵ , Philippe Richebé^{5,6}  and Dolores M. McKeen⁷ 

Editor's key points

- Severe postoperative pain after Caesarean delivery has been associated with a higher likelihood of persistent pain and postpartum depression compared with mild postoperative pain.
- The authors compared quality of recovery and analgesia by lateral quadratus lumborum block (QLB), a potential alternative to intrathecal morphine (ITM), for analgesia after Caesarean delivery, alone or in combination.
- Noninferiority testing for QoR-40 at 24 h between ITM and QLB was inconclusive, but QLB reduced the resting pain score at 6 h compared with ITM, and ITM+QLB reduced resting pain at 6 h, coughing pain at 6 h, and worst pain at 24 h.

Guidelines

PROSPECT guideline for elective caesarean section: updated systematic review and procedure-specific postoperative pain management recommendations

E. Roofthoof^{1,2} G. P. Joshi,³ N. Rawal,⁴ M. Van de Velde,⁵ and on behalf of the PROSPECT Working Group* of the European Society of Regional Anaesthesia and Pain Therapy and supported by the Obstetric Anaesthetists' Association

Anaesthesia 2022, 76, 665-680

Recommendations

- 1** Implement strategies to minimise systemic opioid utilisation and develop individualised or stratified post-discharge opioid prescribing practices to reduce unnecessary opioid analgesic consumption after elective caesarean section.
- 2** Add intrathecal morphine 50–100 µg or diamorphine 300 µg to spinal anaesthesia. Epidural morphine 2–3 mg or diamorphine 2–3 mg may be used as an alternative, for example, when an epidural catheter is used as part of a combined spinal-epidural technique.
- 3** Prescribe paracetamol and a non-steroidal anti-inflammatory drug (NSAID) administered after delivery and continued regularly postoperatively.
- 4** Administer a single dose of intravenous (i.v.) dexamethasone after delivery in the absence of contraindications.
- 5** Consider a single injection of local anaesthetic infiltration, continuous wound local anaesthetic infusion and/or fascial plane blocks, if intrathecal morphine is not used.
- 6** Use a surgical technique that includes the Joel-Cohen incision, non-closure of the peritoneum and abdominal binders.
- 7** Consider the use of transcutaneous electrical nerve stimulation as an analgesic adjunct.

Recommendations

- 1** Implement strategies to minimise systemic opioid utilisation and develop individualised or stratified post-discharge opioid prescribing practices to reduce unnecessary opioid analgesic consumption after elective caesarean section.
- 2** Add intrathecal morphine 50–100 µg or diamorphine 300 µg to spinal anaesthesia. Epidural morphine 2–3 mg or diamorphine 2–3 mg may be used as an alternative, for example, when an epidural catheter is used as part of a combined spinal-epidural technique.
- 3** Prescribe paracetamol and a non-steroidal anti-inflammatory drug (NSAID) administered after delivery and continued regularly postoperatively.
- 4** Administer a single dose of intravenous (i.v.) dexamethasone after delivery in the absence of contraindications.
- 5** Consider a single i.v. dose of dexamethasone with continuous wound infiltration, fascial plane blocks, or intrathecal morphine is not used.
- 6** Use a surgical technique that includes the Joel-Cohen incision, non-closure of the peritoneum and abdominal binders.
- 7** Consider the use of transcutaneous electrical nerve stimulation as an analgesic adjunct.

Dexamethasone 8 mg IV

Impact of perioperative dexamethasone on postoperative analgesia and side-effects: systematic review and meta-analysis

British Journal of Anaesthesia **110** (2): 191–200 (2013)

N. H. Waldron, C. A. Jones, T. J. Gan, T. K. Allen and A. S. Habib*

Dexamethasone 8 mg IV = dose la plus courante dans ces études

- 45 études
- 5796 patientes
- ↓ score de douleur et ↓ opiacés à 2h et 24h
- ↓ d'analgésie en « rescue »
- ↑ temps avant la première demande d'analgésique
- ↓ de temps en salle de réveil
- Pas de ↑ des infections ou guérison de plaie

Efficacy and safety of intravenous administration of dexamethasone on post-cesarean delivery pain: a systematic review and meta-analysis of current literature

International Journal of Obstetric Anesthesia 63 (2025) 104682

Dimitrios Ioannopoulos^a , Zoi Tsani^b, Eleni Chatsiou^c, Eleni Arnaoutoglou^d,
Georgia Tsaousi^{c,*}

- 17 études RC, 1327 patientes
- Dose la plus courante: Dexamethasone 8 mg IV
- Issue 1^e :
 - Temps à la première demande d'analgésie supplémentaire
 - Consommation total des opiacés



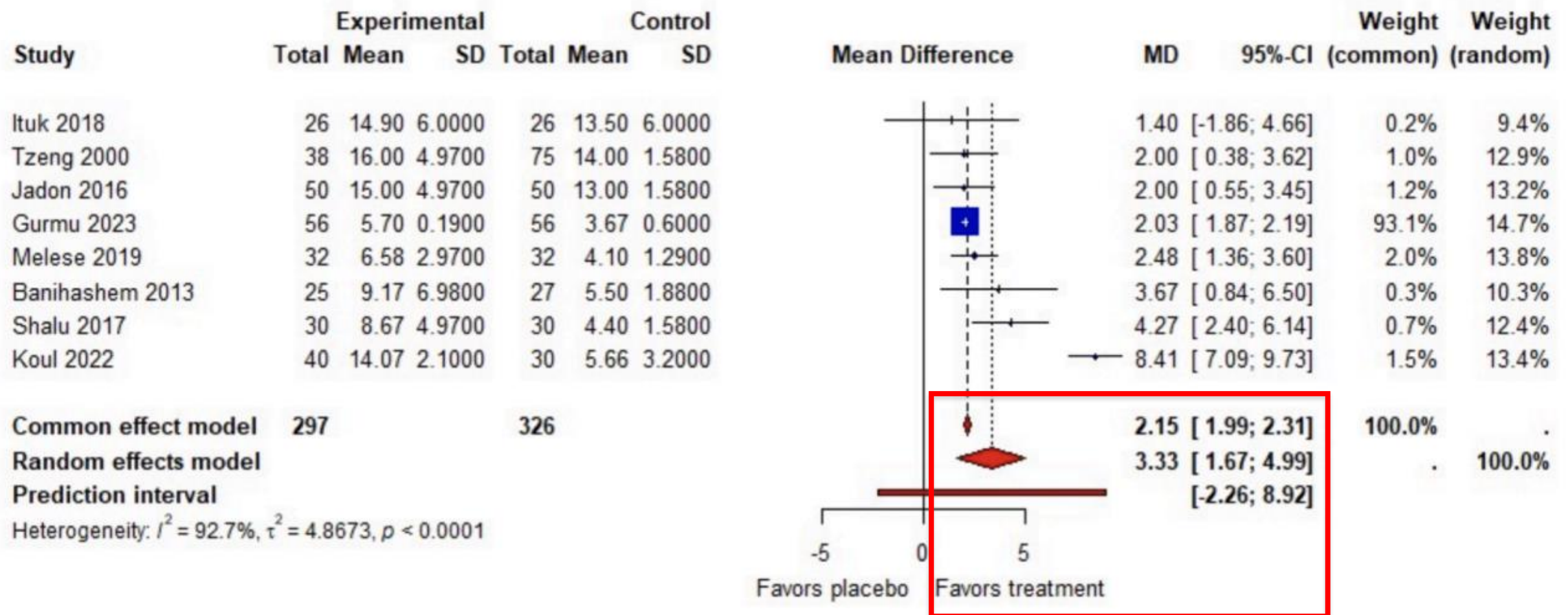


Fig. 2. Time to first analgesic request (hours).

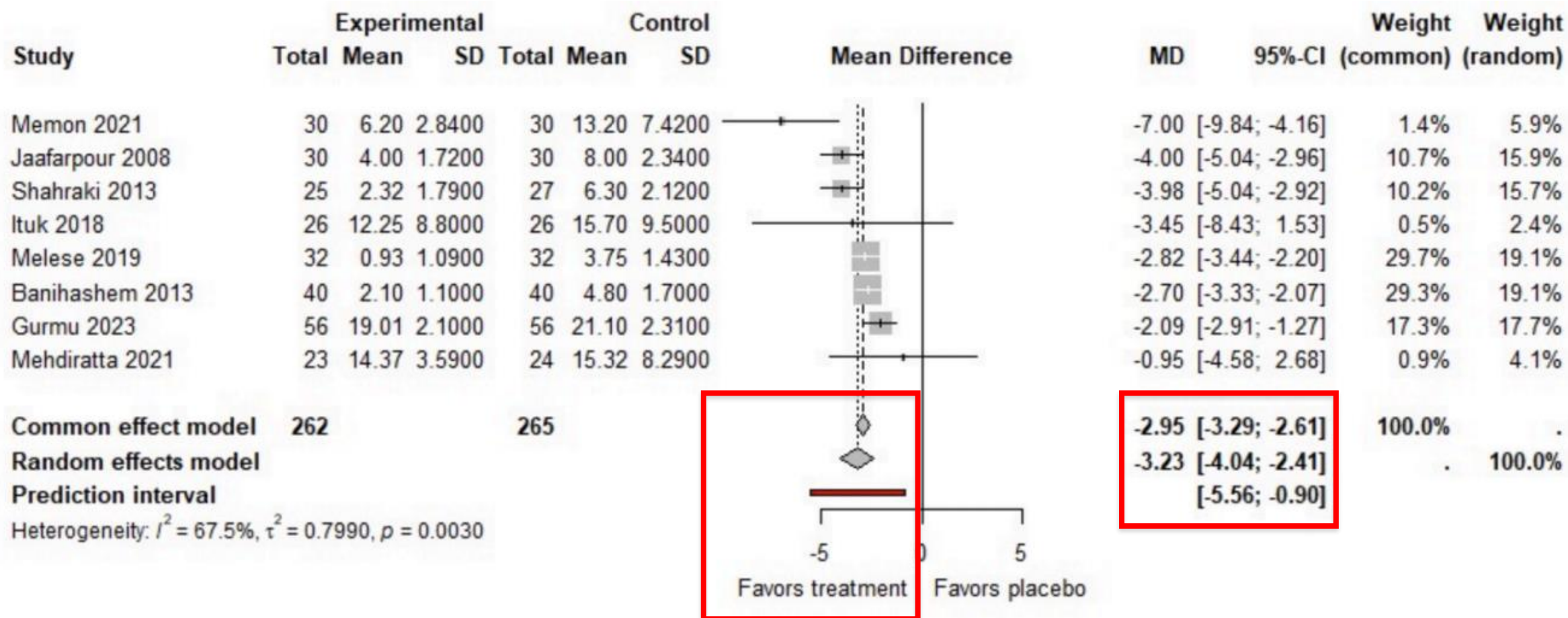


Fig. 3. Total analgesic consumption (in oral morphine milligram equivalents; MME) during the first 24 hours post-cesarean delivery.

Table 1
Characteristics of included studies, by timing of IV dexamethasone administration

Study ID	Patients	Study Arms	Type of anesthesia	Postoperative analgesia regimen
Prior to cesarean delivery				
Wu 2007 ³¹	n=120	DEX 8 mg vs. DROP vs. DEX 4 mg + DROP vs. placebo	Spinal (BUP, MOR)	DIC 75 mg IM – PRN
Cardoso 2013 ⁴⁰	n=70	DEX 10 mg vs. placebo	Spinal (BUP, MOR)	TRAM 100 mg – PRN
Banihashem 2013 ³⁵	n=52	DEX 8 mg vs. placebo	Spinal (LIDO, PETH)	MOR IV – PRN
Jadon 2016 ⁸	n=100	DEX 8 mg vs. placebo	Spinal (BUP, MOR)	DIC 75 mg IM PRN or combined PTZ 30 mg + PMT 25 mg IM
Shalu 2017 ³⁶	n=60	DEX 8 mg vs. placebo	Spinal (BUP)	TRAM 100 mg IV – PRN
Melese 2019 ³⁸	n=64	DEX 0.1 mg/kg vs. placebo	Spinal (BUP)	DIC and TRAM IV – PRN
Mehdiratta 2021 ²³	n=47	DEX 8 mg vs. placebo	Spinal (BUP, FNT, MOR)	FNT IV, OXY 5 mg/10 mg PO, MOR IV – PRN
Memon 2021 ²²	n=60	DEX 8 mg vs. placebo	Spinal (BUP)	DIC 75 mg IV – PRN
Koul 2022 ²⁴	n=120	DEX 8 mg vs. BETA vs. placebo	Spinal (BUP)	DIC 75 mg IV – PRN
Gurmu 2023 ⁴¹	n=112	DEX 8 mg vs. placebo	Spinal	Not reported

Table 1
Characteristics of included studies, by timing of IV dexamethasone administration

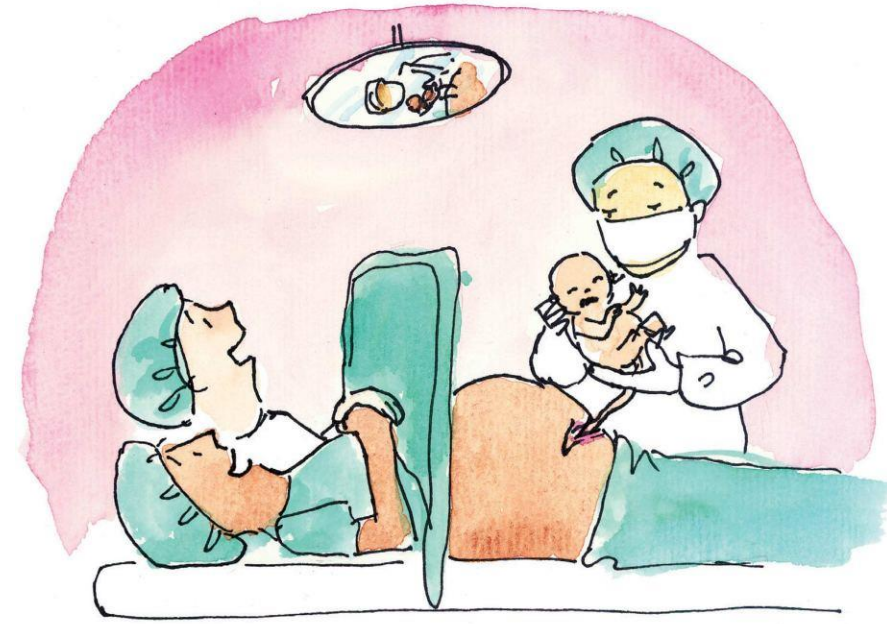
Study ID	Patients	Study Arms	Type of anesthesia	Postoperative analgesia regimen
After umbilical cord clamping				
Jaafarpour 2008 ³³	n=80	DEX 8 mg vs. placebo	Spinal (LIDO)	DIC 75 mg or PETH 50 mg
Ituk 2018 ³⁷	n=52	DEX 8 mg vs. placebo	Spinal (BUP, FNT, MOR)	Ketorolac 30 mg IV every 6 hours, OXY 5 mg + acetaminophen 325 mg PO PRN or MOR IV PRN
Shahraki 2013 ³⁴	n=60	DEX 8 mg vs. placebo	Epidural (BUP)	MOR 4 mg PRN
Post-cesarean delivery				
Wang 2001 ³²	n=175	DEX 2.5mg vs. DEX 5 mg vs. DEX 10 mg vs. placebo	Epidural (LIDO, MOR)	TNX 20 mg IV PRN
Tzeng 2000 ²⁸	n=113	DEX 8 mg vs. DROP vs. placebo	Epidural (LIDO, MOR)	DIC 75 mg IM PRN
Nortcliffe 2003 ²⁹	n=90	DEX 8 mg vs. CYC vs. placebo	CSE (BUP, FNT, MOR)	DIC 100 mg COD 300 mg + acetaminophen 500 mg PRN
Unidentified				
Maged 2018 ³⁰	n=120	DEX 16 mg IV vs DEX 16 mg SC vs. placebo	Spinal (BUP, FNT)	MOR IV PRN

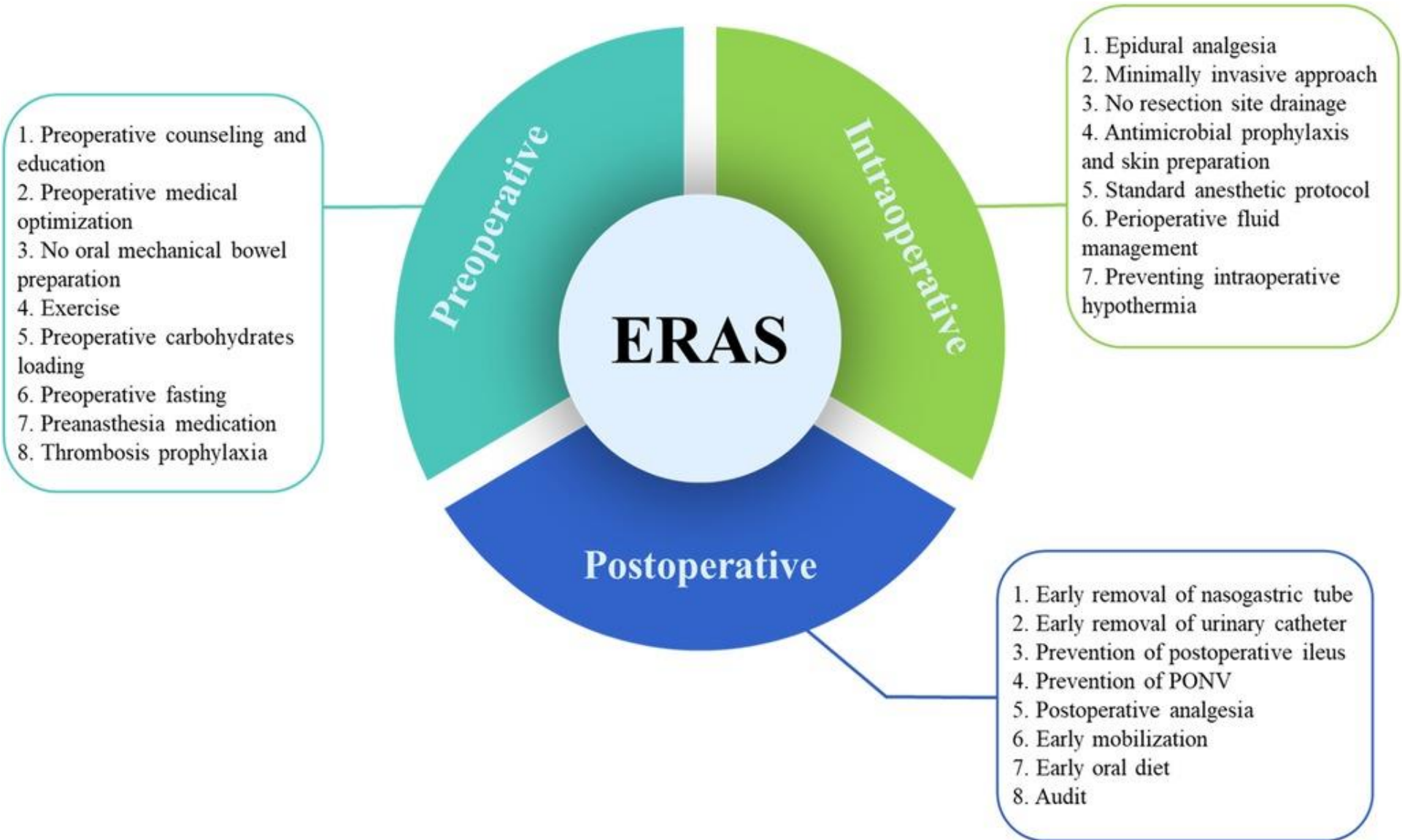
Dexamethasone pour la douleur post-op?

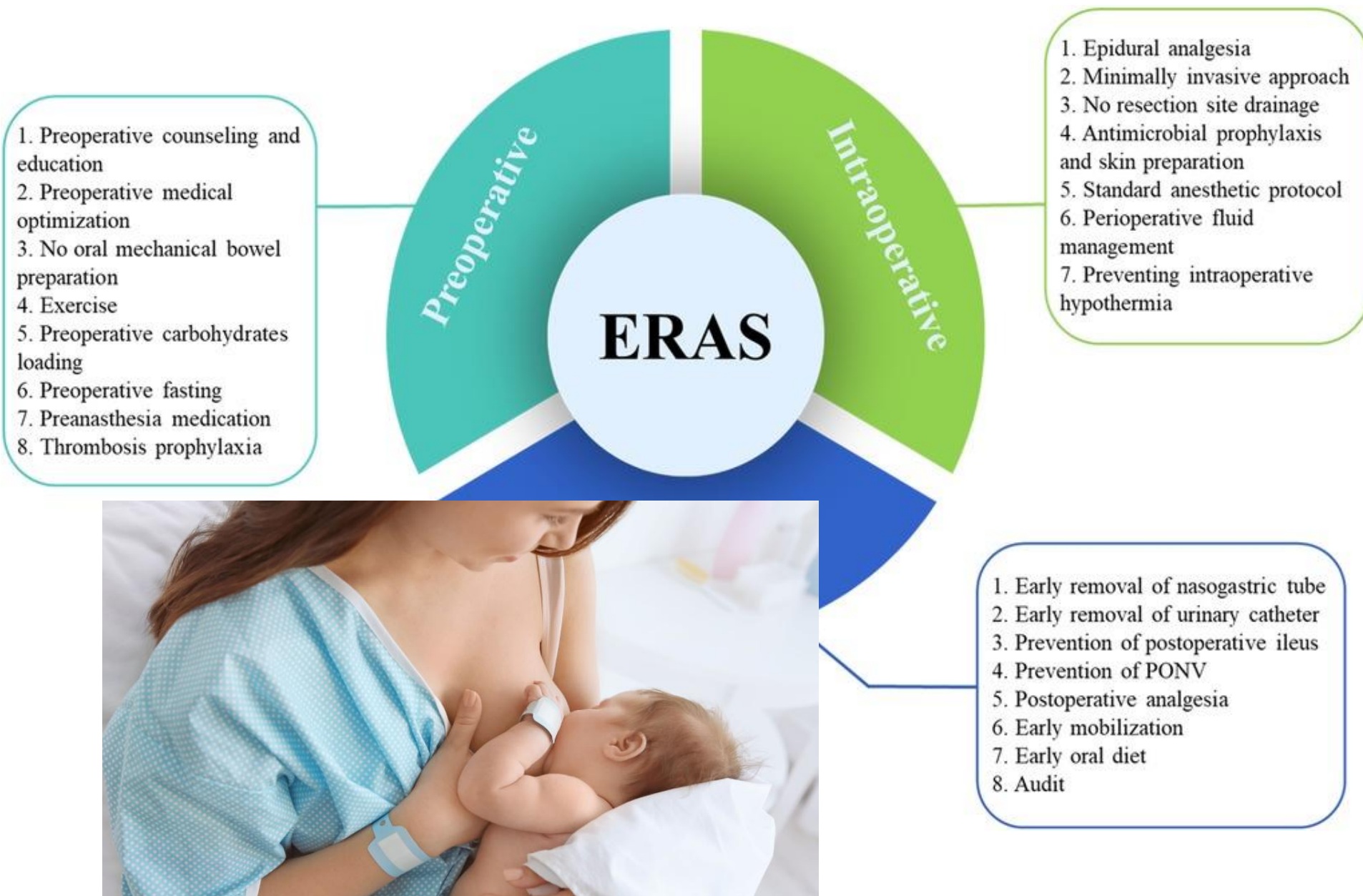
- Dexamethasone 8 mg IV post-naissance
- *Risque*: Possible augmentation transitoire de la glycémie.
Sans impact décrit sur les infections et la guérison
- *Bénéfice*: attraper les femmes du 20-30% avec douleur aiguë sévère qu'on ne peut prédire

Plan

- Généralités de la césarienne
- Considérations femme enceinte
- Préparation anesthésique
- Anesthésies neuraxiales
- Anesthésie générale
- Utérotoniques
- Analgésie post-césarienne
- **ERAC**







Society for Obstetric Anesthesia and Perinatology: Consensus Statement and Recommendations for Enhanced Recovery After Cesarean

Laurent Bollag, MD,* Grace Lim, MD, MS,† Pervez Sultan, MBChB, FRCA,‡
Ashraf S. Habib, MBBCh, MSc, MHSc, FRCA,§ Ruth Landau, MD,|| Mark Zakowski, MD,¶
Mohamed Tiouririne, MD,# Sumita Bhambhani, MD,** and Brendan Carvalho, MBBCh, FRCA‡

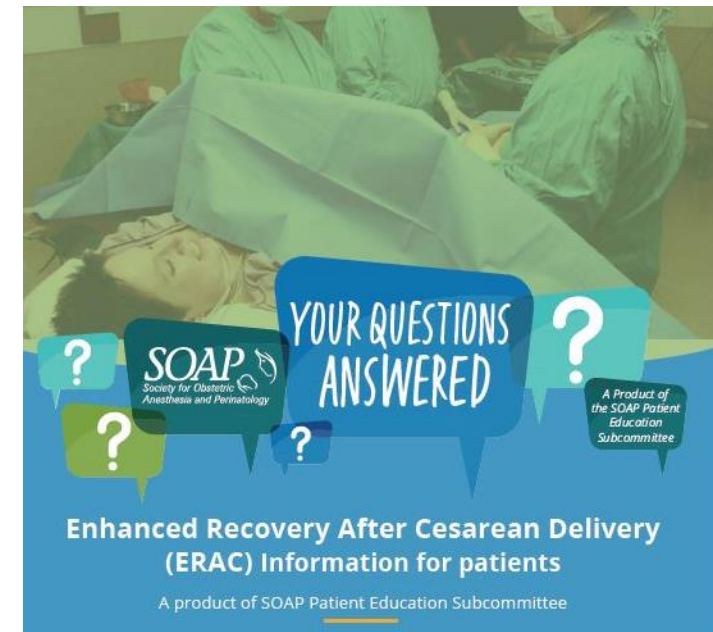
Anesth Analg 2021;132:1362–77



ERAC

Préopératoire

1. NPO: 8h solides, 2h liquides clairs
2. Charge carbohydrate liquide ad 2h avant
3. Éducation au patient sur l'ERAC
4. Éducation sur l'allaitement
5. Optimisation de l'Hb



Intraopératoire

1. Éviter hypoTA 2^e rachi
2. Normothermie
3. Optimisation des utérotoniques
4. Prophylaxie antibiotique
5. Prophylaxie N/V intra et post-op



Intraopératoire

1. Éviter hypoTA 2^e rachi
2. Normothermie
3. Optimisation des utérotoniques
4. Prophylaxie antibiotique
5. Prophylaxie N/V intra et post-op
6. **Analgésie multimodale**
7. **Peau à peau et supporter l'allaitement**
8. **Optimiser les liquides IV**
9. **Clampage du cordon retardé**



Clampage du cordon

SOGC

MESSAGES CLÉS

1. Le clampage retardé du cordon est bénéfique pour la plupart des nourrissons, en particulier pour les prématurés, et il s'agit d'une pratique exemplaire recommandée dans la plupart des cas. Il est recommandé de retarder le clampage du cordon de 60 à 120 secondes chez les prématurés et de 60 secondes chez les nourrissons à terme. La traite du cordon ombilical est déconseillée chez les grands prématurés (< 32 semaines).

**Terme > 37 sem
60 sec**

**Préma < 37 sem
60 – 120 sec**

DÉFINITIONS:

Prématuré : ≤ 37 semaines d'âge gestationnel
Grand prématuré : < 32 semaines d'âge gestationnel
Très grand prématuré : < 28 semaines d'âge gestationnel

Peau à peau

Table 2. Intraoperative ERAC Pathway Elements

Recommendation	Action	Comments
(7) Promote breastfeeding and maternal-infant bonding	• Skin-to-skin contact should occur as soon as possible in the operating room as appropriate based on maternal/neonatal condition	• Skin-to-skin contact intraoperatively supports the “golden hour” of breastfeeding initiation within 1 h of birth • Supports a safe transition of the infant from intrauterine life to extrauterine life • Facilitates mother-infant bonding • May require additional nurse support intraoperatively (follow hospital guideline for safe positioning for the newborn during skin-to-skin contact) • Ideally responsibility of nonanesthesia care team member • Ways to facilitate skin-to-skin contact intraoperatively include moving electrocardiogram leads and electrodes to the patient's back to clear space on the chest; moving equipment to allow nursing personnel space to safely accomplish skin-to-skin contact; maintain efforts to keep maternal/neonatal temperature (eg, forced air warmer, warmed blankets)



Peau à peau

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Postopératoire



1. **PO précoce**
2. Mobilisation précoce
3. Optimiser repos/ sommeil
4. Retrait sonde précoce
5. Prophylaxie
thromboembolique
6. Congé PO jour 1
7. Dépister + tx anémie
8. Support à l'allaitement
9. **Analgésie multimodale**
10. Contrôle glycémique
11. Retour du transit

A small, rectangular chalkboard with a light-colored wooden frame. The chalkboard is tilted slightly to the right. The word "Sommaire" is written in white chalk in a cursive script. In the bottom right corner of the chalkboard, there is a small, white, horizontal rectangular object, possibly a piece of chalk or an eraser.

Sommaire

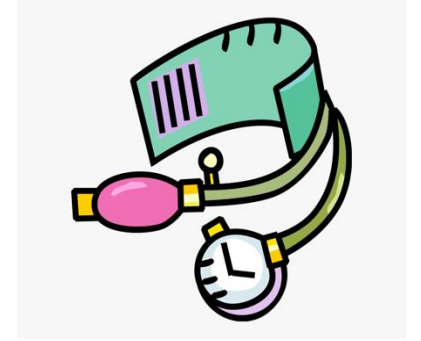
Sommaire: Généralités et préparation

- Césarienne = chirurgie la plus fréquente
 - Canada: le tiers des accouchements
- Classification des césariennes améliore la communication et aide à préciser l'anesthésie à prodiguer
- Considérations femme enceinte
- Prophylaxie antibiotique et aspiration
- Anesthésie neuraxiale à privilégier



Sommaire: Complications de la neuraxiale

- Prévenir HypoTA 2^e rachi:
 - Co-remplissage
 - ***Perfusion de vasopresseurs***
- Prévention des nausées:
 - #1 prévenir et traiter hypoTA
 - Minimum 2 antiémétiques en prophylaxie
 - Réparation utérine in situ & pas d'irrigation
- Maintenir normothermie
- Dexmedetomidine pour frissons PRN



Sommaire: Césariennes urgentes

- Bonne *analgésie* épidurale = bonne *anesthésie* pour C/S
- Bicarbonates 50% plus rapide pour obtenir bloc chirurgical
- Mortalité: AG > neuraxiale
- En urgence, le facteur ralentisseur sont les champs!
- 3 « A » des complications de l'AG
- Opiacés à l'induction avec NN PRN
- Halogénés > 1 MAC = Atonie utérine
- TIVA = Ø atonie utérine, ↓ PONV
- Rachi séquence rapide peut éviter AG



Sommaire: Naissance et post-op

- Utérotoniques (carbétocin) pour prévenir l'atonie utérine
- Favoriser le peau-à-peau et l'allaitement
- Analgésie multimodale avec morphine neuraxiale
- Dexaméthasone IV après la naissance (PONV + analgésie)
- TAP ou QLB si pas de morphine neuraxiale



Questions? Commentaires

