Top-up epidural for immediate c.section success or failure?

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Emergency c-deliveries

- No use of epidural catheters sited earlier for labour analgesia
- No spinal anaesthesia for emergencies
- Oxytocin 10IU was given (rapidly) to all parturients

Anaesthesia, 1979, Volume 34, pages 992–995

The extension of labour epidural analgesia for Caesarean section

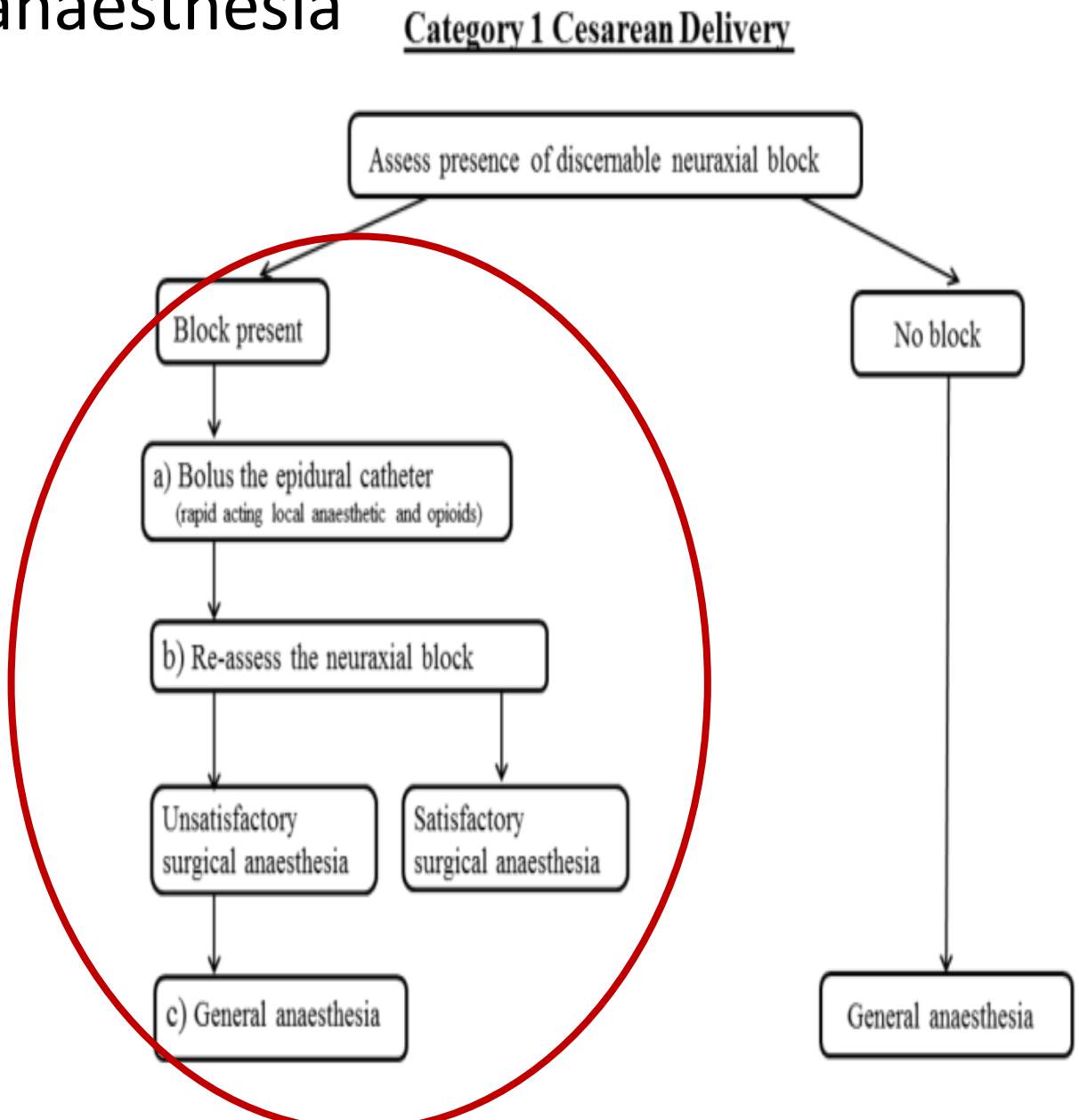
M.K. MILNE, D.G. DALRYMPLE, R. ALLISON AND J.I.M. LAWSON

722 L-EDA , “successful” conversion of 554

(21 needed GA during procedure)

Almost all patients expressed enthusiasm for the technique

Allow the additional time for regional anaesthesia



Vaida S, 2015: 1-8

GA vs Regional anaesthesia

- Regional anaesthesia has many benefits in obstetrics
  - Reduce the harm to mothers for C-deliveries
  - Improves analgesia
  - Epidural catheter often in situ due to the increased use of regional analgesia

General anaesthesia vs. regional block

- Should GA always be avoided?
  - NO
    - More often complaints after regional block
    - Longer time delay from decision to delivery when regional bock is established
  - SAFETY IMPROVED
    - LM/videolaryngoscopes
    - Attention to difficult airway

General anaesthesia N=9634

- 5-years cohort study
  - Independent association with lower neonatal 5 – min Apgar scores after GA

Palmer 2018; Anesthesia

- NICE:
  - “ regional anaesthesia for C-section is safer and results in less maternal and

    neonatal morbidity than general anaesthesia”

Why mothers die 2011

- Woman died in a cannot ventilate/intubate situation – general anaesthesia being the first choice despite a well-functioning labour EDA in situ

- The very short time frames from decision to delivery still make us go for general anaesthesia in the most urgent situations

International Journal of Obstetric Anesthesia (2012) 21, 294–309
0959-289X/$ - see front matter
http://dx.doi.org/10.1016/j.ijoa.2012.05.007

www.obstetanesthesia.com

ORIGINAL ARTICLE

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

Bauer 2012

3

Epidural quality during labour

Urgency of the C-delivery

Experience of the anaesthetists

Epidural quality during labour

Labour analgesia failure

- Unclear :
  - Definition of a failed or inadequate epidural analgesia varies
  - Ranges from 0.9% to 24%.
  - Which risk factors should we look for?

Table 1. Patient and epidural characteristics associated with successful use of epidural catheters for cesarean delivery

	Catheters successfully converted ($n = 220$)	Catheters not successfully converted ($n = 20$)
Height (cm)	162 ± 7	162 ± 5
Weight (kg)	77 ± 14	81 ± 15
Depth to epidural space (cm)	4.7 ± 1.1	5.0 ± 1.3
Catheter length in space (cm)	4.8 ± 1.0	4.7 ± 0.8
Duration of labor analgesia (h)	9.0 ± 6.0	10.0 ± 6.2
Extra boluses during labor (n)	1 (0–8)	3 (0–10)*

Mean (SD) or number (range).
* = $P < 0.001$.

Riley 2002;11:81-84

Data about epidural analgesia performed in the delivery ward.

Variable	Sufficient epidural	Failed epidural	*P*-value
Number of top-ups required by parturient	0.6 ± 1.1	1.7 ± 1.6	0.0004
Total time from onset of epidural analgesia until Cesarean section (min)	468 ± 316	531 ± 236	0.41
Total dose of local anesthetic received during labor (mg)	128. ± 84.1	147.7 ± 65.8	0.33
Number of attempts to insert the epidural catheter [median (range)]	1 (1–3)	1 (1,2)	0.31
Depth of epidural space (cm)	5.0 ± 0.8	5.4 ± 1.1	0.08
Skin marking of epidural catheter (cm)	10.1 ± 0.9	10.6 ± 1.5	0.06
Sensory level half an hour after epidural analgesia was established	T10 (T4–T12)	T10 (T6–T12)	0.75
Bromage score half an hour after epidural analgesia was established [median (range)]	4 (3–5)	4 (4–6)	0.46
VAS score half an hour after anesthesia was established	11.6 ± 11.2	12.8 ± 18.4	0.73
VAS score in 2 h preceding Cesarean section	15.7 ± 26.6	34.6 ± 32.4	0.03
Dose of continuous infusion (ml/ h)	14.9 ± 2.5	15.7 ± 1.5	0.23

Data are presented as mean ± SD except when indicated otherwise.

Orbach-Zinger 2006:50:1014-1018

Table 3 Logistic regression table. Predictors with a *P*-value of <0.05 were considered to be independent risk factors for failure

Predictor	Odds ratio and 95% confidence interval	*P*-value
Maternal height	1.08 (1.01–1.15)	0.023
More than one clinician top-ups	1.63 (1.10–2.44)	0.016
Multiple attempts (initial epidural)	3.17 (0.85–11.84)	0.086
Last cervical dilation before Caesarean section	0.84 (0.71–1.00)	0.055
Fetal heart rate abnormalities	1.11 (0.36–3.48)	0.85
Duration of labour analgesia	1.00 (1.00–1.00)	0.054

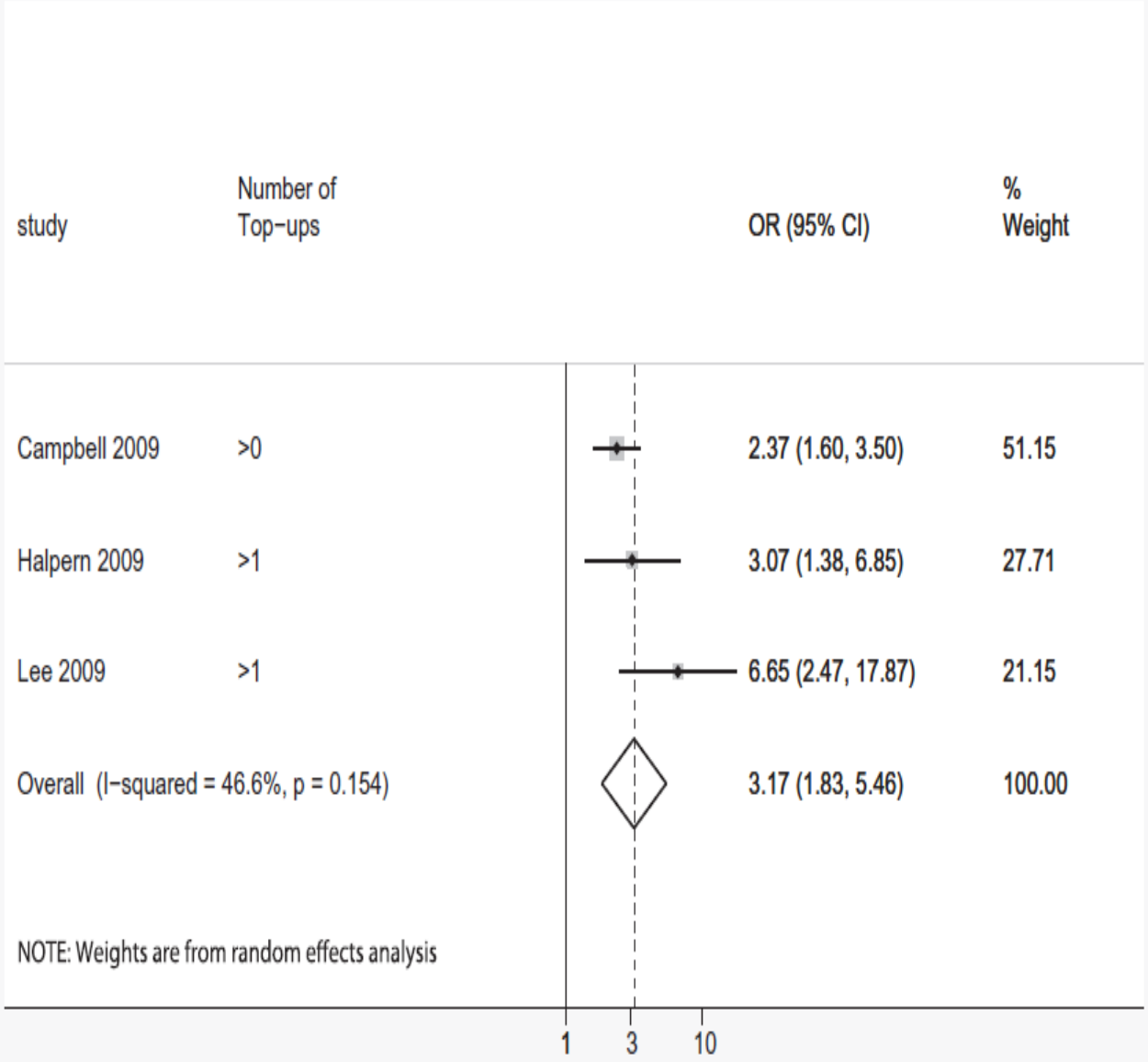
Halpern 2009;102,2:240-3

Bauer; 2012

- META – ANALYSIS: N=8628
  - Parturients with EDA for labour
  - C-delivery

  - PRIMARY-OUTCOME
    - Failed EDA top-up (insufficient analgesia)
    - Conversion to GA

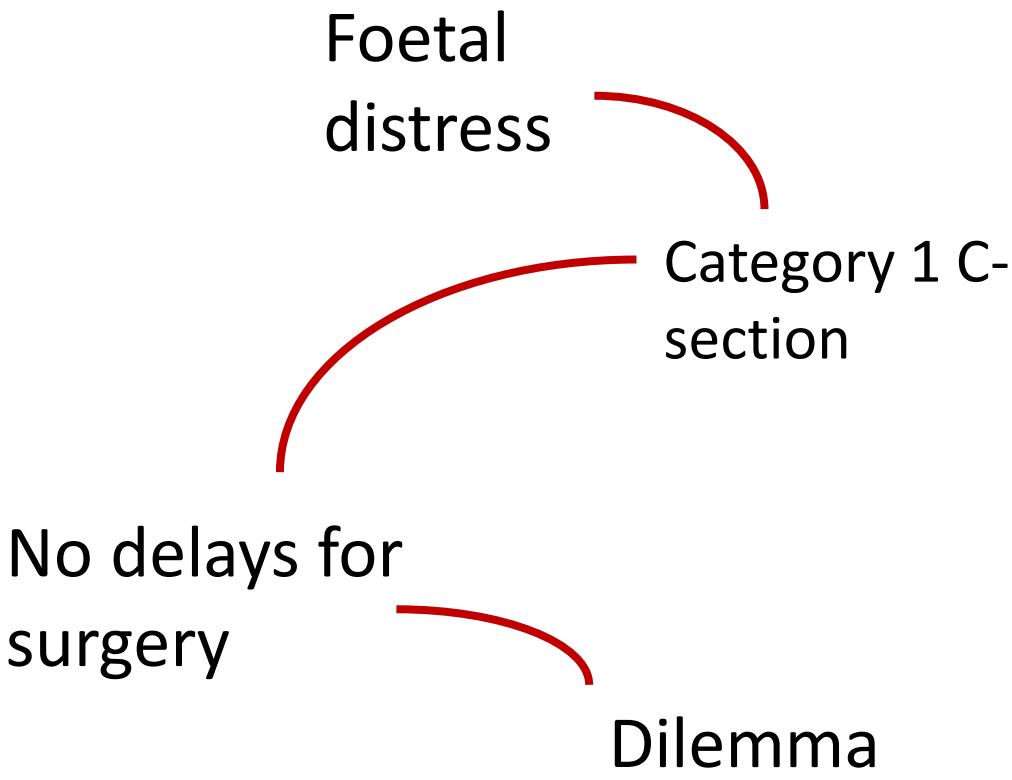
Analgesic Top-ups



Risk of failed epidural top - up

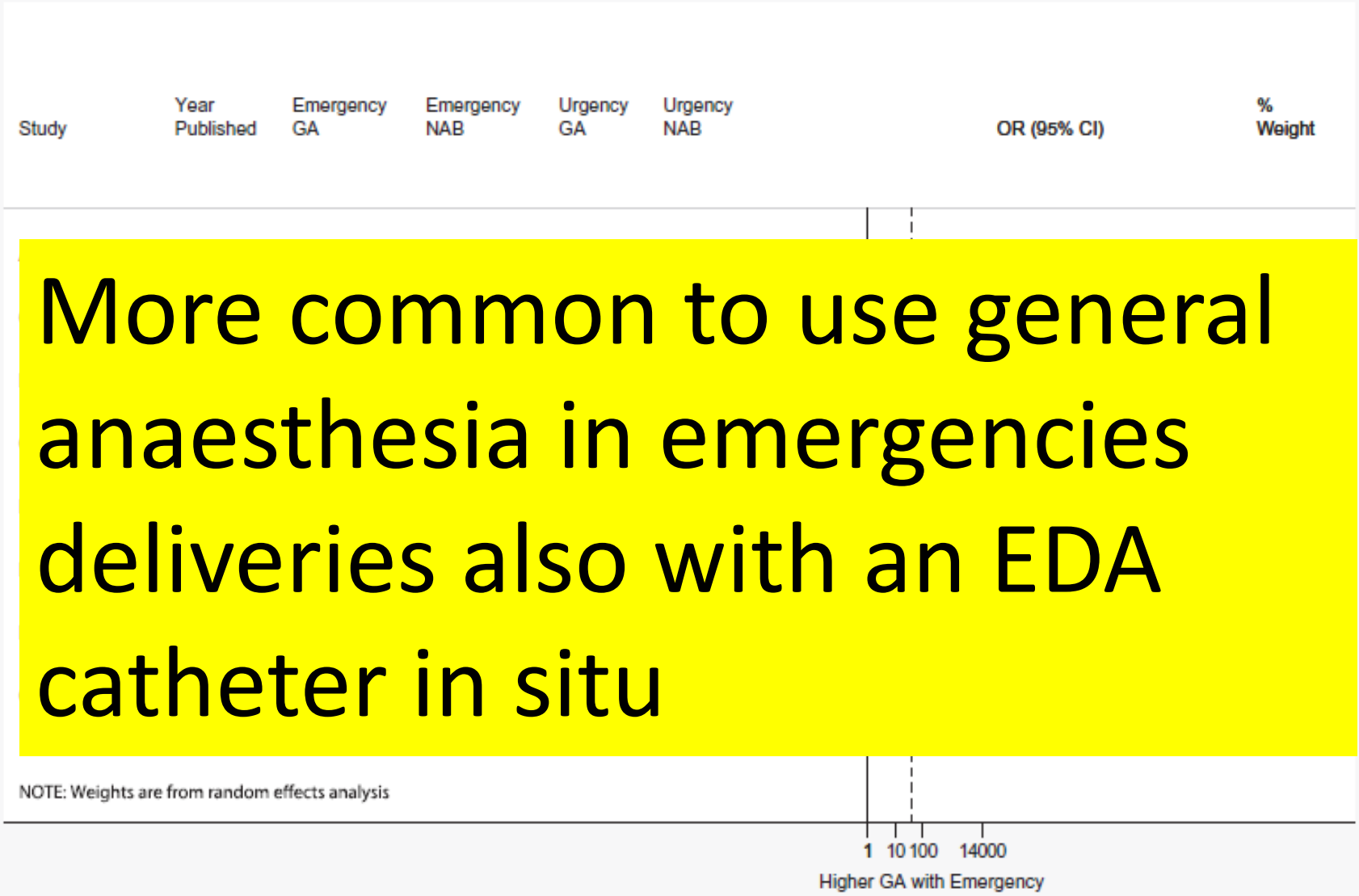
- Multiple clinical bolus doses during labour is an early warning for a failed epidural top - up

Urgency of the C-delivery



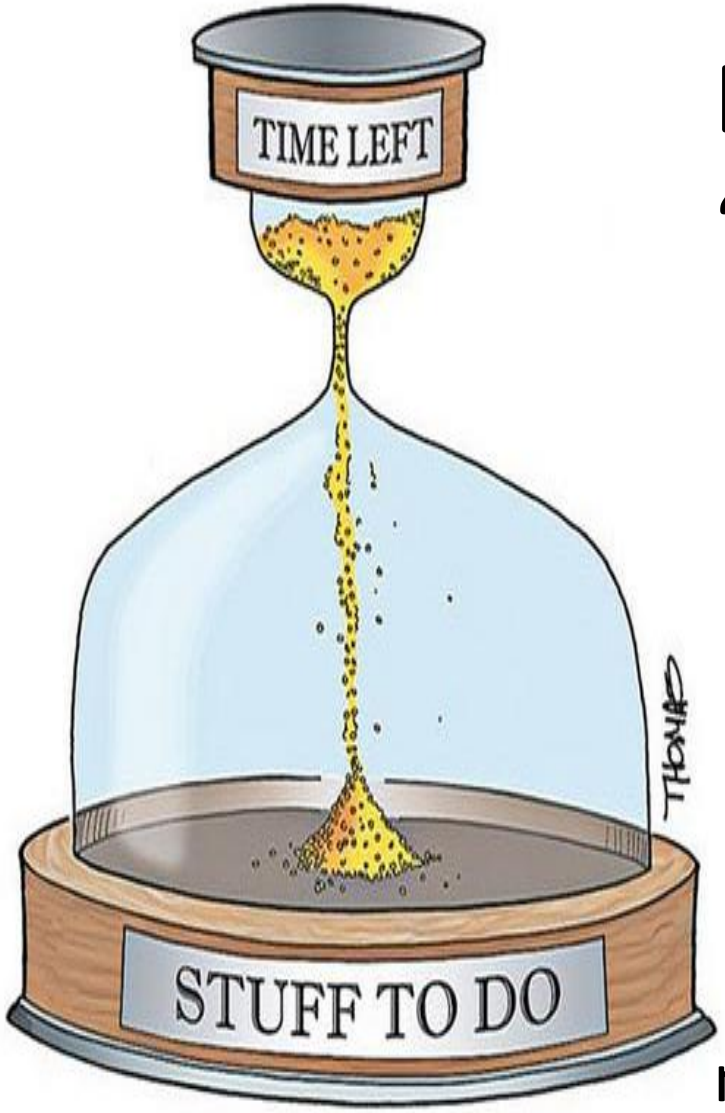
Epidural top-up or general anaesthesia

Emergency versus Urgency



More common to use general anaesthesia in emergencies deliveries also with an EDA catheter in situ

Bauer;



Epidural top-up "success"

Fast onset

Reliable

Good analgesia

Avoid harm to mother/foetus/newborn

Prevention of top –up epidural failure

- Right drug
- Right dose
- Right timing

Epidural top up – optimal local anaeshtetic?

- Lidocaine 2% with epinephrine 74%
- Chloroprocaine 3% 21%
- Bupivacaine/ropivacaine 5%

Hillyard; 2011

- Meta-analyses N=779
  - EDA for labour → C-section
- Primary outcome:
  - Time of onset
  - Anaesthetic success – block efficacy

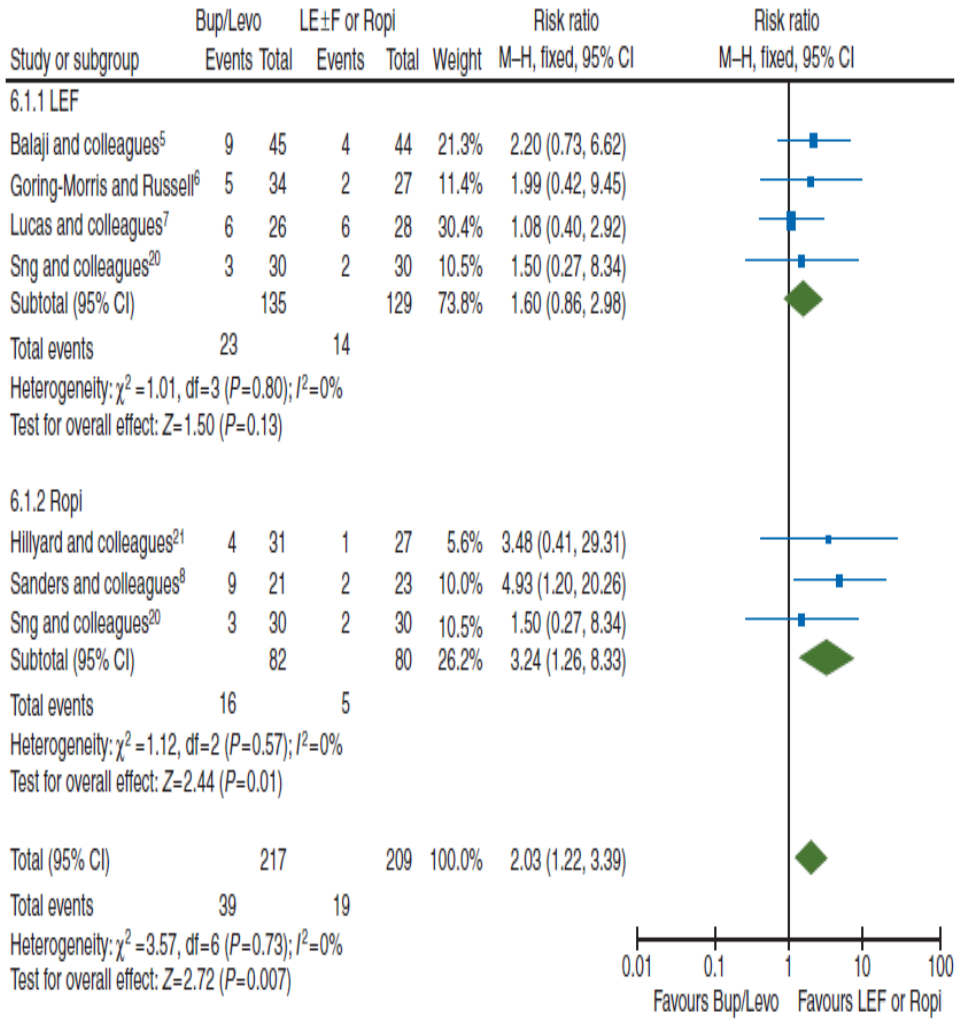


Fig 5 The need for intraoperative supplementation, comparing Bup/Levo (0.5% bupivacaine or 0.5% levobupivacaine) top-up solutions to LE±F (2% lidocaine, epinephrine, and fentanyl), or Ropi (0.75% ropivacaine) solutions.

Results

- This meta-analysis suggests that lidocaine 2% with epinephrine±fentanyl gives the fastest onset.
- Bupivacaine and levobupivacaine 0.5% were the least effective.
- But:
  - Not evaluated lido+epi+bicarb
  - Not evaluated chloroprocaine
  - No information of how the block was assessed
  - The timing of the delivery of these top ups

Conclusion

Emergency Caesarean section requires a rapid onset of sustained analgesia.

Topping-up an epidural that is already in situ is a good option,

but the best local anaesthetic solution to use is not clear.

Experience of the anaesthetist

Experience of the anaesthetist

- Is there any differences how an ob-an. specialist deals with an EDA top up as opposed to a non-specialist?

Epidural catheter function during labor predicts anesthetic efficacy for subsequent cesarean delivery

E. T. Riley, J. Papasin

Department of Anesthesia, Stanford University School of Medicine, Stanford, California, USA

Table 2. Anesthetic factors associated the unsuccessful use of epidural catheters for cesarean delivery

	n	Percent not successfully converted
CSE technique	41	7.5%
Standard epidural technique	199	8.5%
No OB specialist attending	170	11%*
OB specialist attending	70	3%

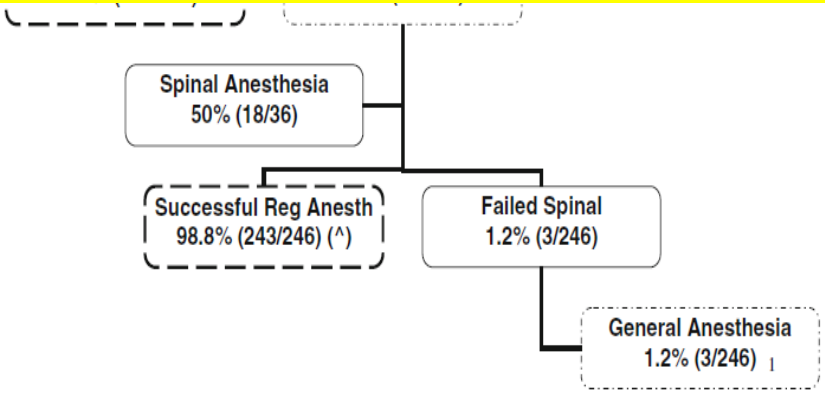
CSE = combined spinal/epidural analgesia used for labor. *$P < 0.05$ compared to OB specialist anesthesiologist.

Conversion of epidural labour analgesia to epidural anesthesia for intrapartum Cesarean delivery

Conversion d'une analgésie péridurale pour travail obstétrical en une anesthésie péridurale pour césarienne

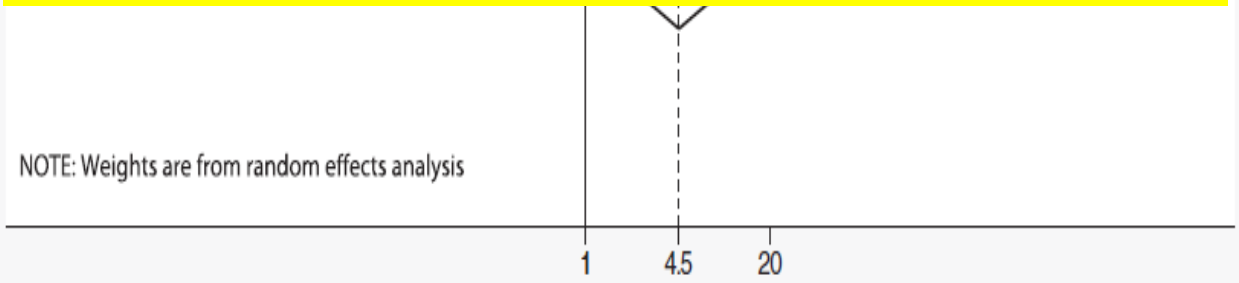
David C. Campbell, MD · Tony Tran, MD

A specialist more often will avoid general anaesthesia than a non- specialist



Non–specialist versus Obstetric Anesthesiologist

An Ob-An tend to convert a labour EDA to a surgical epidural anaesthesia significantly more often than a non-specialist



Bauer 2012

Ob specialist vs. non-specialist

- More vigilante about the patient in labour
  - More follow-up of the parturients
  - Aware of complaints about pain during labour

How to prevent epidural labour failure

- Sitting position – if anatomical landmarks are difficult to identify
- Breakthrough pain – correct position
- Unilateral block – pull out 1 cm and administer epidural top-up
- Groin pain – add a top up
- Still complaining – re - site or a CSE

Ob specialist vs. non-specialist

- More vigilante about the patient in labour
  - More follow-up of the parturients
  - Aware of complaints about pain during labour
- Prevent failure of top - ups
  - Multiple clinician bolus doses
  - Replace an EDA catheter if necessary
- Closer communication with the obstetrician
  - Who may need a c-delivery
  - Dedicated staff

Ob specialist vs. non-specialist

- Initiate the epidural top-up in the labour room

Table 1 Location of extension of epidural blockade.

Location	*n* (%)
Delivery room	136 (68)
Delivery room and theatre	25 (12.5)
Theatre	30 (15)
No answer	9 (4.5)

Regan, Anaesthesia:2008

Ob specialist vs. non-specialist

- Initiate the epidural top-up in the labour room
  - The longest delay in the decision to incision interval is the transportation of the mother to the operating theatre
  - An early start of the top –up increases the success of an adequate surgical anaesthesia in due time
    - » Rafi, 2010; intern J obstet Anesthes
    - » Mcclure, 2011; Br J Anaesthesia

Top- up EDA outside the operating theatre

- Safety - concerns
  - Suboptimal monitoring of the parturient when “topping up” the epidural
  - Risk of high block
    - Supra- arachnoidal placed catheter
  - Difficult airway challenge
  - Systemic local anaesthetic toxicity

Obstetric anaesthesiologist vs. Non-specialist

- Initiate the top up in the labour room
  - Administer a small initial dose in labour room

    Levy; Anaesthesia, 2006
  - Close follow up of the mother during transportation
  - Start pre-oxygenating of the parturient as soon as she is inside the operating theatre

- Local logistical factors
  - Dedicated staff – familiar with emergency procedures
  - Adequate system for all personal to proceed rapidly to the operating theatre for

    urgency c- deliveries

- Layout of the individual maternity units

Summary

- Use the well-functioning labour epidural for surgical delivery
- Communicate closely with the obstetrician
  - Parturients at risk of an emergency
  - Identify and correct the non-functioning LEA
- Educate the anaesthetist caring for the obstetric patient

Summary

- Speed up the onset of the epidural:
  - Use a fast on-set local anaesthetic
  - Improve logistical factors
    - Initiating the epidural in the labour room significantly increases the success rate
  - Organize the “ob” service to ensure safe anaesthesia
- Start pre-oxygenating as soon as possible