



GROUPEMENT  
HOSPITALIER  
DE L'OUEST  
LÉMANIQUE

# State of the art post-cesarean section analgesia

Dr Moira Robertson

16.03.2024

Médecin Cheffe co-responsable du Service  
d'anesthésie

Hôpital de Nyon, Vaud  
Switzerland

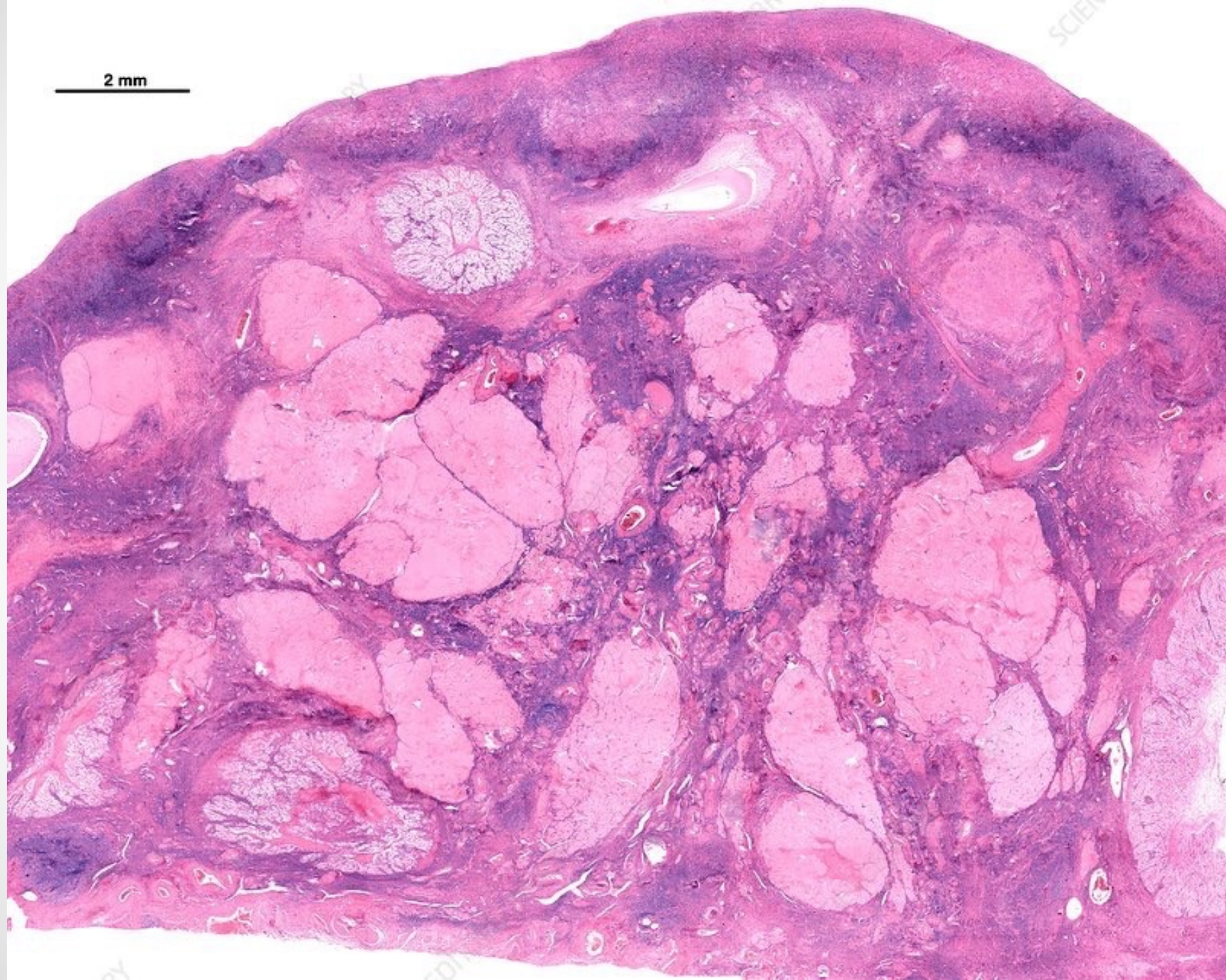








2 mm



## Conclusion

There is evidence that intrathecal morphine produced a clinically relevant reduction in postoperative pain and analgesic consumption; however, there is only evidence for a small effect with fentanyl and sufentanil. Logistic regression analysis showed that the relative risk of both postoperative pruritus and nausea/vomiting increased in a dose-dependent manner with morphine. Based on the current evidence, we recommend 0.1 mg of the drug and dose of choice. However, for women receiving 0.1 mg intrathecal morphine with a spinal anesthetic, 43 patients will experience pruritus, 10 will experience nausea, and 12 will experience vomiting postoperatively, all of whom would not have experienced these adverse effects without treatment.







# Analgesia for Caesarean section

G. Neall<sup>1</sup>, S. Bampoe<sup>2</sup> and P. Sultan<sup>3,\*</sup>

<sup>1</sup>Northwick Park Hospital, London, UK, <sup>2</sup>Centre for Perioperative Medicine, University College London, London, UK and <sup>3</sup>Stanford University School of Medicine, Stanford, CA, USA

*BJA Education*, 22(5): 197–203 (2022)

- NICE/PROSPECT
- Neuraxial anaesthesia
- LA and opioids intra/post operative
- 50-150 mcg of ITM or 1-3 mg epidural
- Intra-operative : AINS: ketorolac, diclofenac; paracetamol
- Post-operative: AINS, paracetamol, morphine

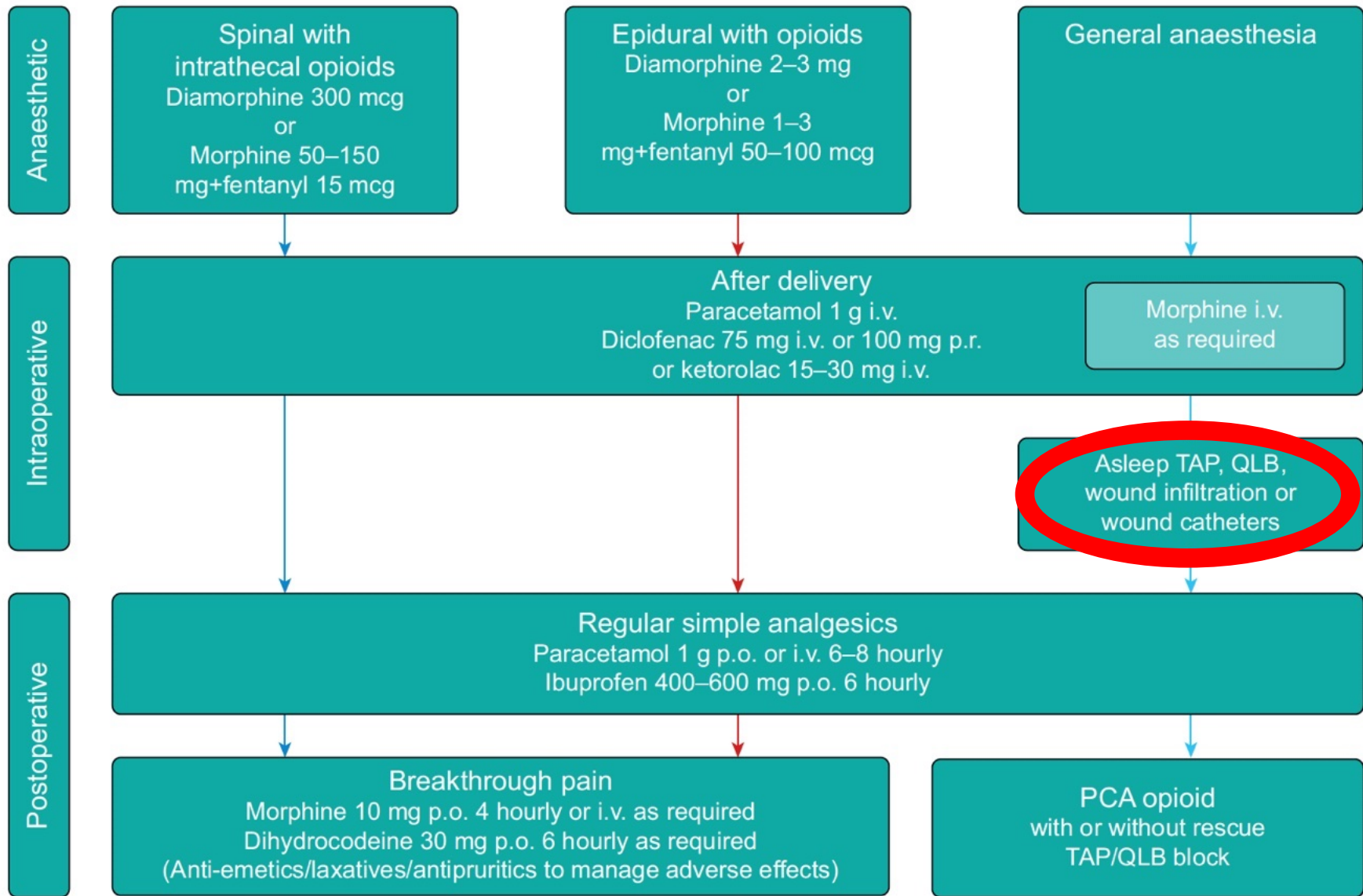
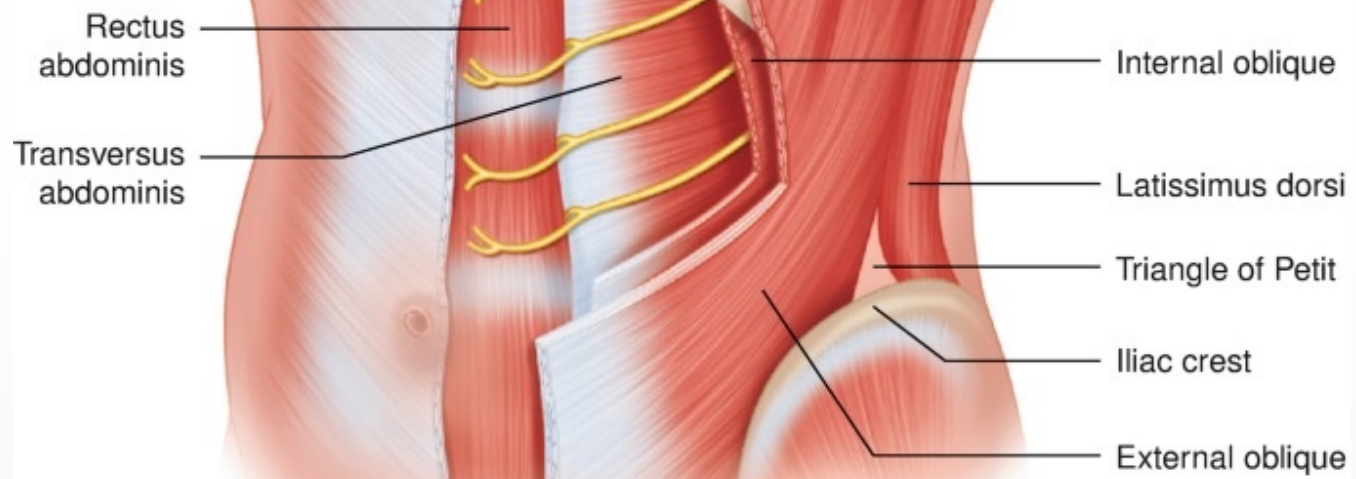


Fig 1 Example of an algorithm summarising strategies for opioid-sparing multimodal analgesia after Caesarean section. For all medications, avoid use if contraindicated. QLB, quadratus lumborum block; TAP, transversus abdominis plane; PCA, patient-controlled analgesia.

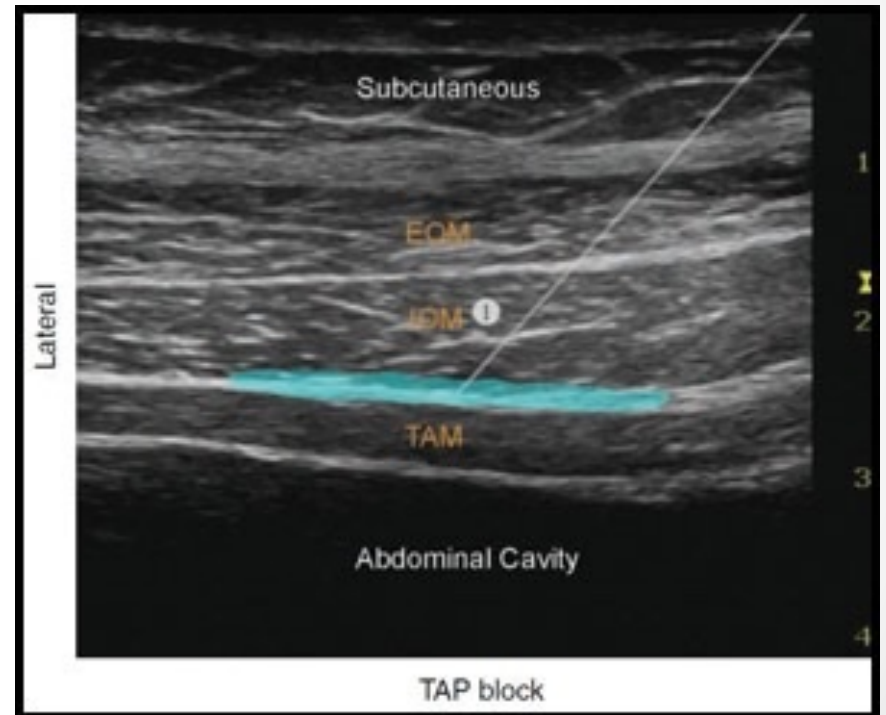
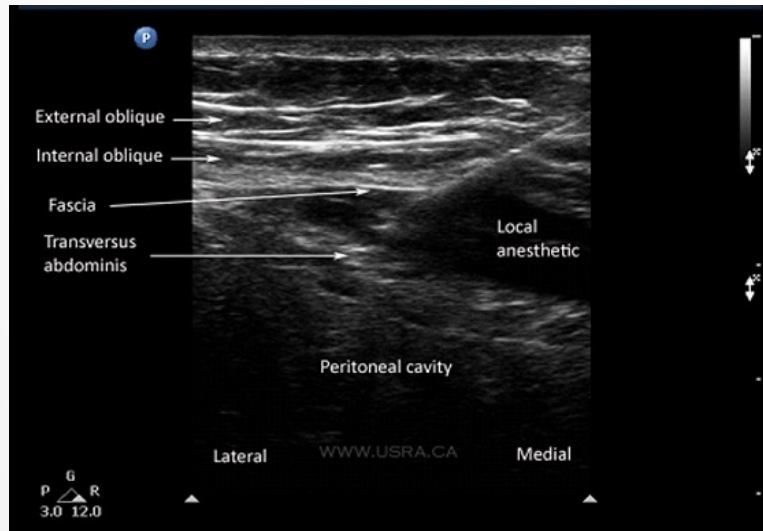
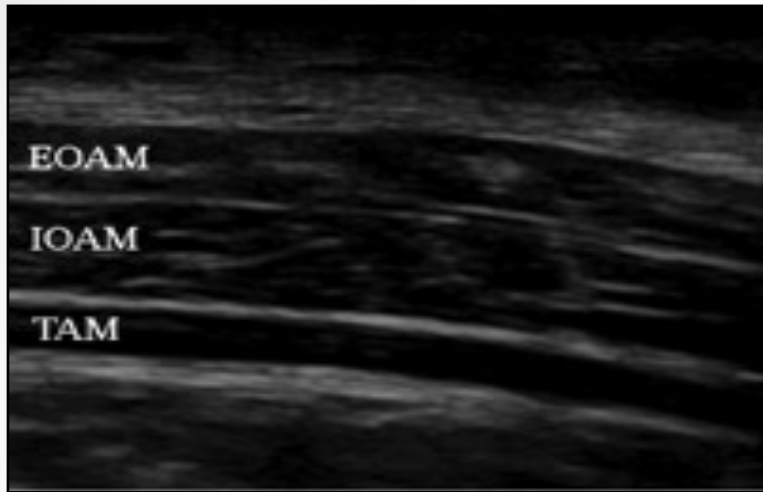
QLB/TAP block?

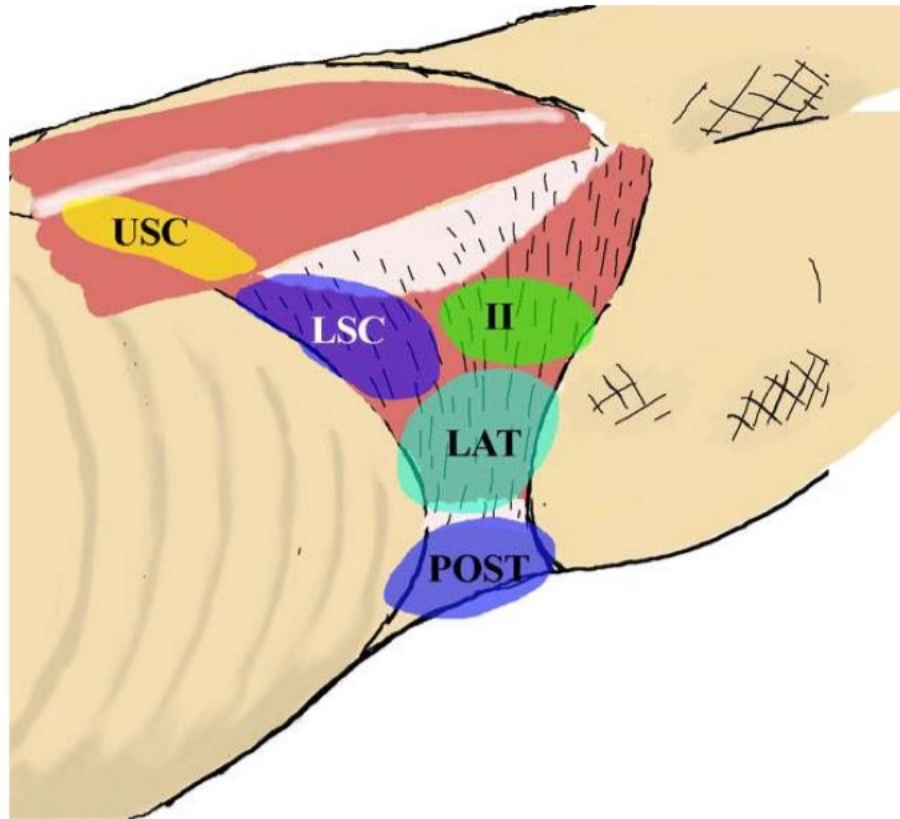


# TAP bloc using ultrasound



Hebbard P, Fujiwara Y, Shibata Y, Royse C.  
Ultrasound-guided transversus abdominis plane  
(TAP) block. *Anaesthesia and Intensive Care*.  
2007;35(4):616–617





**Figure 4** Diagram of proposed TAP zones. USC, upper subcostal; LSC, lower subcostal; LAT, lateral; POST, posterior; II, ilio-inguinal.

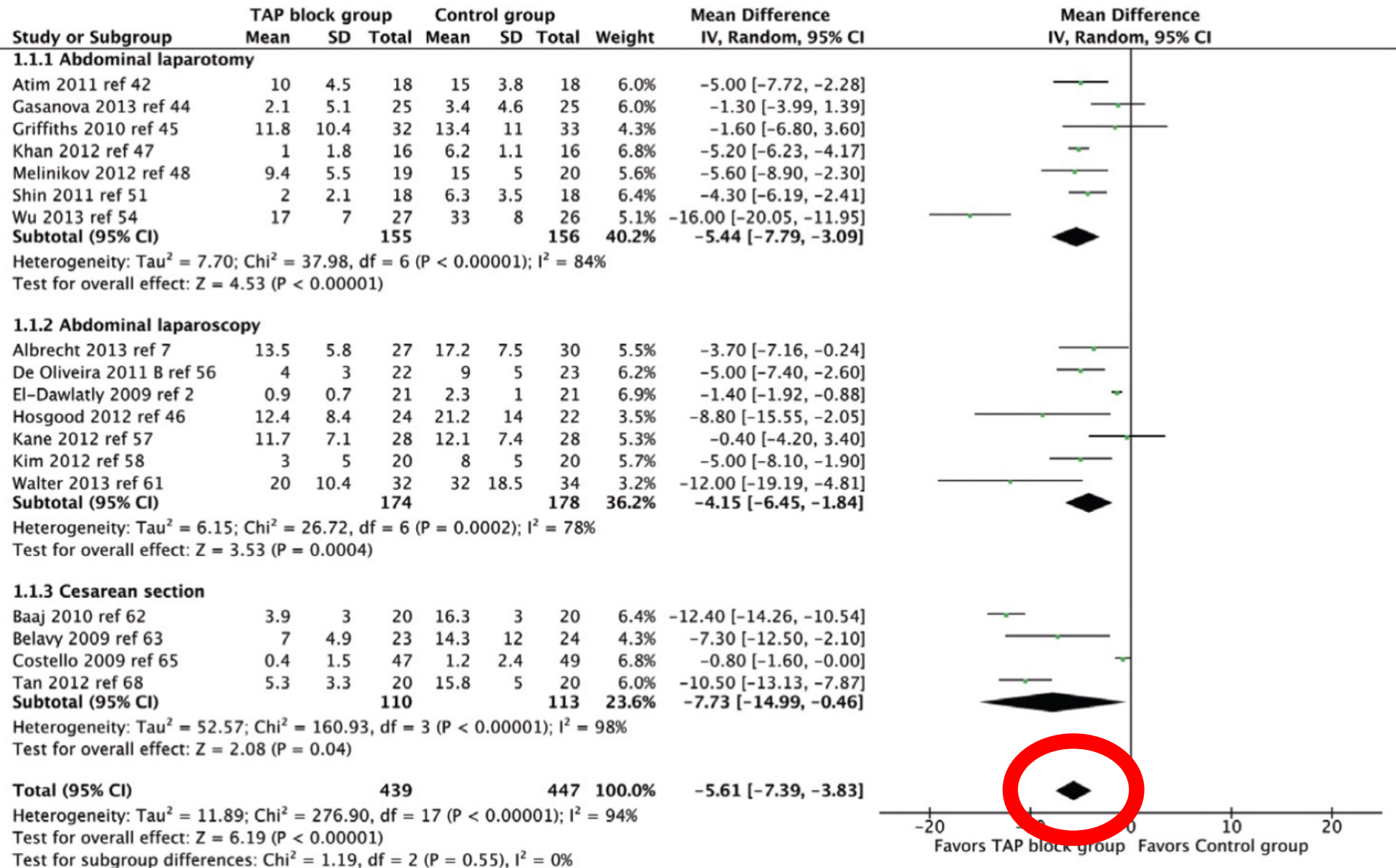
# The Analgesic Efficacy of Ultrasound-Guided Transversus Abdominis Plane Block in Adult Patients: A Meta-Analysis

Moira Baeriswyl, MD,\* Kyle R. Kirkham, MD,† Christian Kern, MD,\* and Eric Albrecht, MD\*

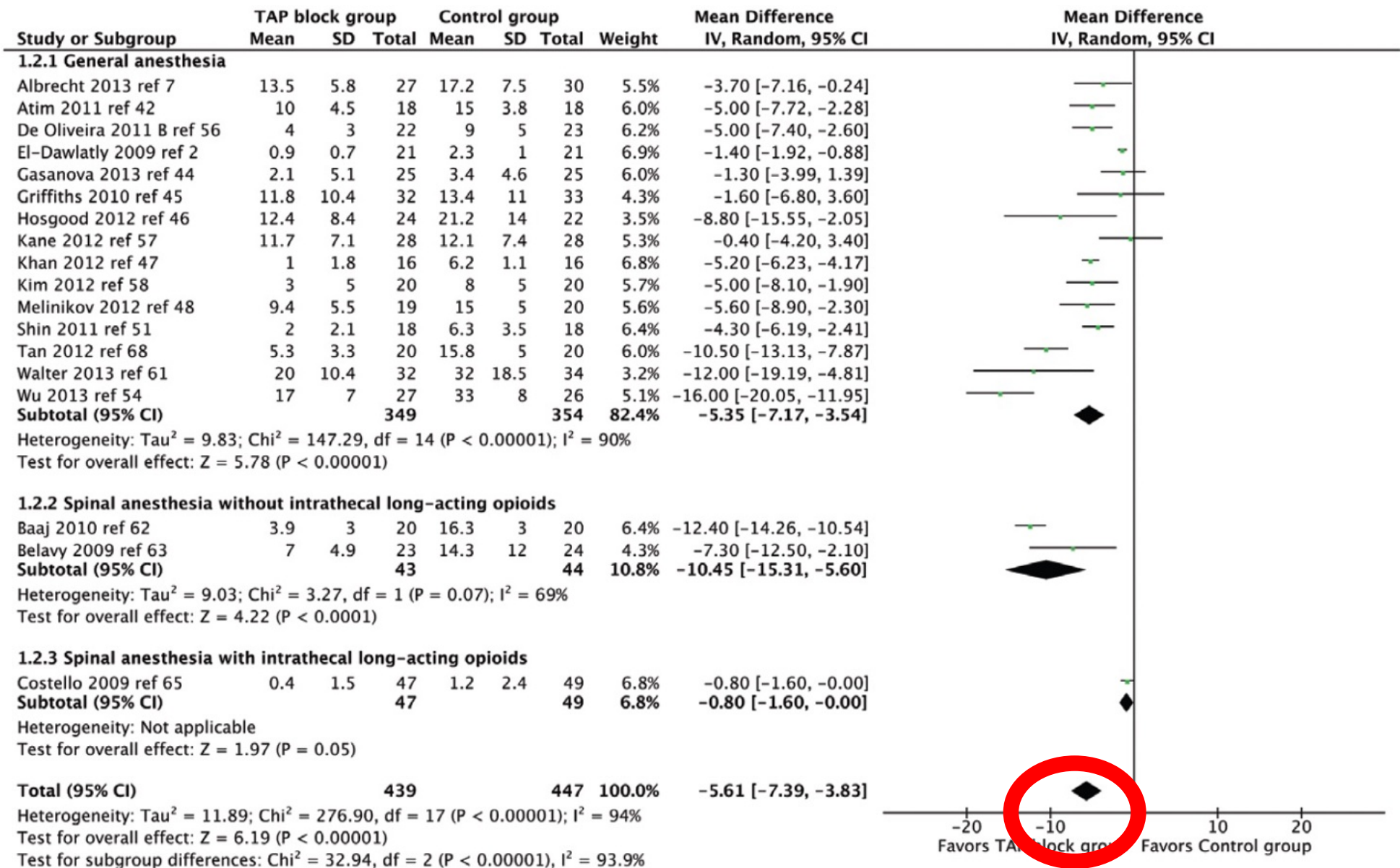
[www.anesthesia-analgesia.org](http://www.anesthesia-analgesia.org)

- 31 RCT
- 1611 patients
- Abdominal surgeries + CS (+/- morphine IT)
- Primary outcome : morphine consumption at 6h, according to surgery, type anaesthesia, block pre/post op, approach used
- Secondary outcome: morphine consumption at 24h, VAS rest, movement, PONV





**Figure 3.** Cumulative IV morphine consumption at 6 h postoperatively according to the type of surgery. CI = confidence interval; TAP = trans-versus abdominis plane.



**Figure 4.** Cumulative IV morphine consumption at 6 h postoperatively according to the type of surgical anesthesia. CI = confidence interval; TAP = transversus abdominis plane.

# The Analgesic Efficacy of Ultrasound-Guided Transversus Abdominis Plane Block in Adult Patients: A Meta-Analysis

Moira Baeriswyl, MD,\* Kyle R. Kirkham, MD,† Christian Kern, MD,\* and Eric Albrecht, MD\*

[www.anesthesia-analgesia.org](http://www.anesthesia-analgesia.org)

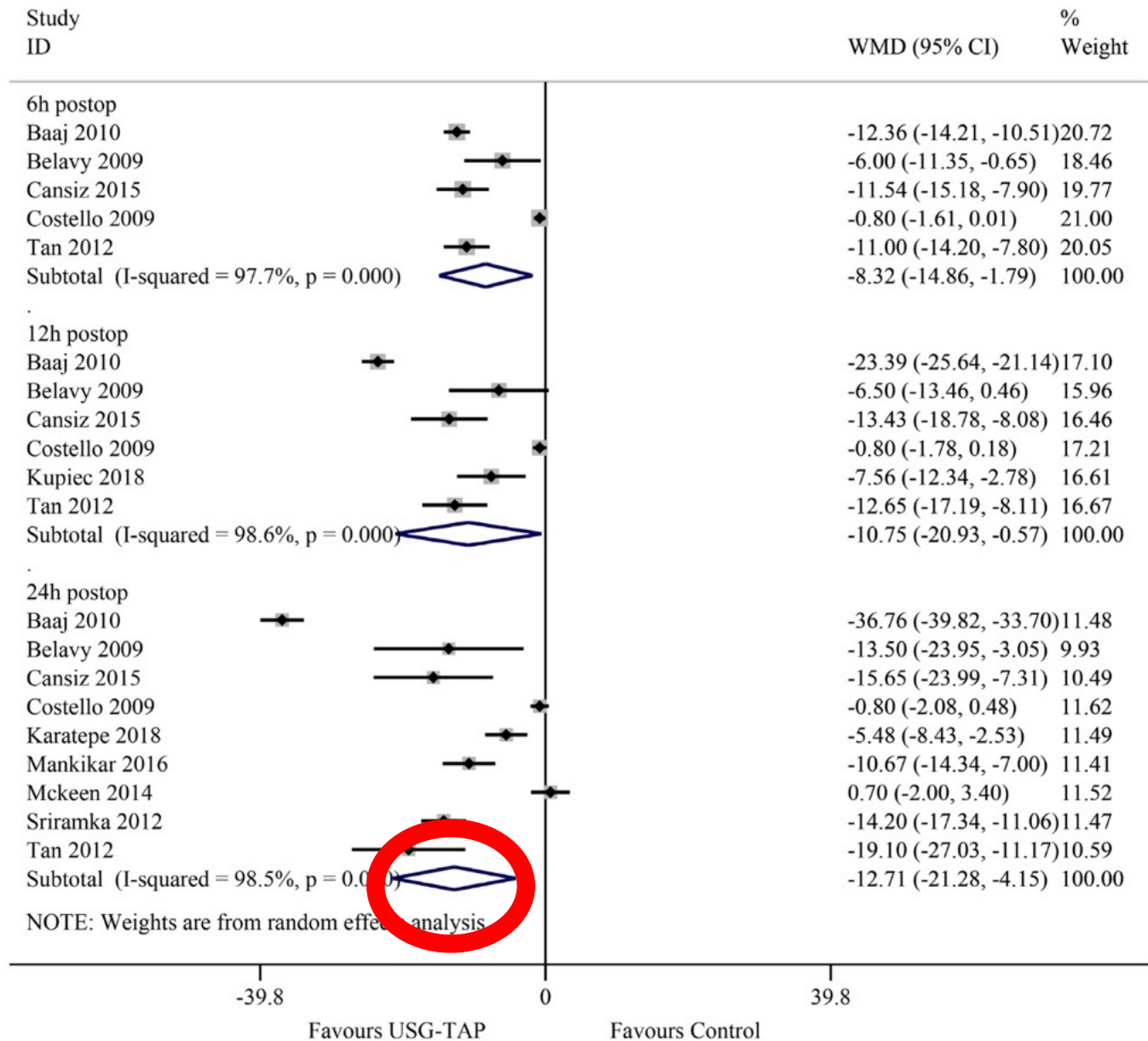
- 6h: Decrease in morphine consumption of 6 mg
- No effect pre/post operatively
- No effect where TAP done
- No effect PONV
- **No effect with ITM**

# Analgesic efficacy of ultrasound-guided transversus abdominis plane block after cesarean delivery: A systematic review and meta-analysis

Peng Wang, Xu Chen, Ying Chang, Yanping Wang, Hongyan Cui

*J. Obstet. Gynaecol. Res. Vol. 47, No. 9: 2954–2968, September 2021*

- 17 RCT 2009-2019
- 1100 pts
- US TAP after CS cp placebo/No block
- Sub group analysis :+ ITM /-ITM



**Figure 3** Summarized outcomes of cumulative opioid consumption at 6, 12, 24 h after surgery

**Table 2** A summary of subgroup analyses according to whether USG-TAP blocks were combined with intrathecal morphine or not

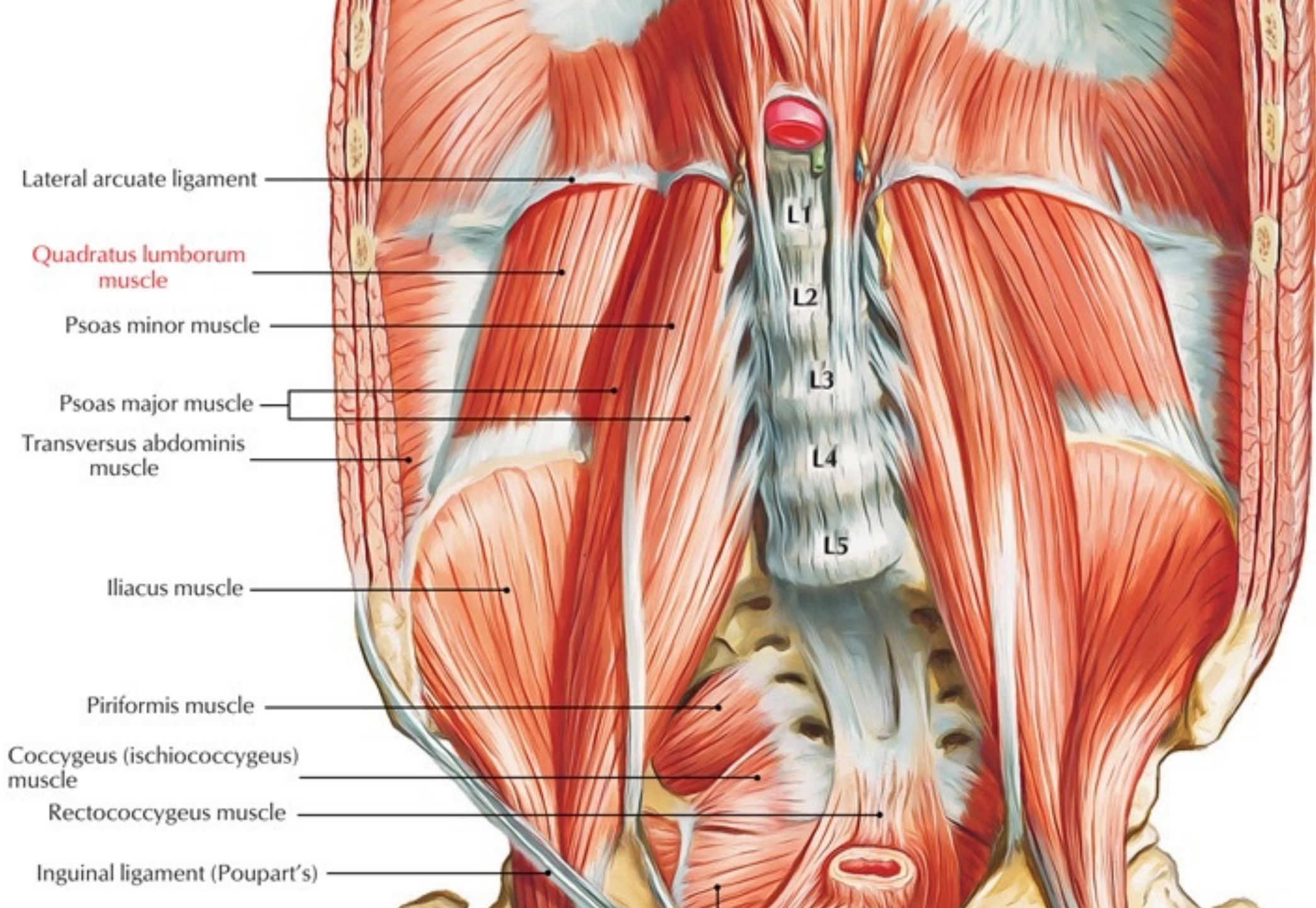
	ITM+				ITM-				
	<i>n</i>	Effect size	95% CI	<i>I</i> <sup>2</sup> (%)	<i>n</i>	Effect size	95% CI	<i>I</i> <sup>2</sup> (%)	
24 h opioid consumption	2	-0.53	-1.68, 0.63	0	7	-16.52	-26.55, -6.49 <sup>a</sup>	97.4	<sup>b</sup>
Pain intensity scores (move)									
6 h postop	3	-0.31	-0.77, 0.15	61.8	3	-0.49	-1.30, -0.31 <sup>a</sup>	79.8	
24 h postop	5	-0.19	-0.02, 0.41	0	6	-1.02	-1.78, -0.26 <sup>a</sup>	87.9	<sup>b</sup>
Pain intensity scores (rest)									
6 h postop	2	-1.23	-0.54, 0.28	35.5	4	-1.01	-2.06, 0.04	89.6	
24 h postop	4	0.20	-0.04, 0.44	0	6	-0.66	-1.05, -0.27 <sup>a</sup>	58.6	<sup>b</sup>
Ask for rescue analgesia	3	0.84	0.54, 1.30	0	3	0.18	0.07, 0.51 <sup>a</sup>	54.8	<sup>b</sup>

*Note:* Regarding effect size, weighted mean differences (WMD) were calculated for opioid consumption; standardized mean differences (SMD) for pain intensity scores; risk ratios (RR) for rescue analgesia. “ITM+” representing USG-TAP blocks in addition to ITM, while “ITM-” representing USG-TAP blocks in the absence of ITM; Abbreviations: ITM, intrathecal morphine; *n*, number of included studies; postop, postoperatively; <sup>a</sup>Indicating significant differences between USG-TAP blocks and control groups. <sup>b</sup>Indicating significant differences between two subgroups (ITM+ and ITM-).

# Analgesic efficacy of ultrasound-guided transversus abdominis plane block after cesarean delivery: A systematic review and meta-analysis

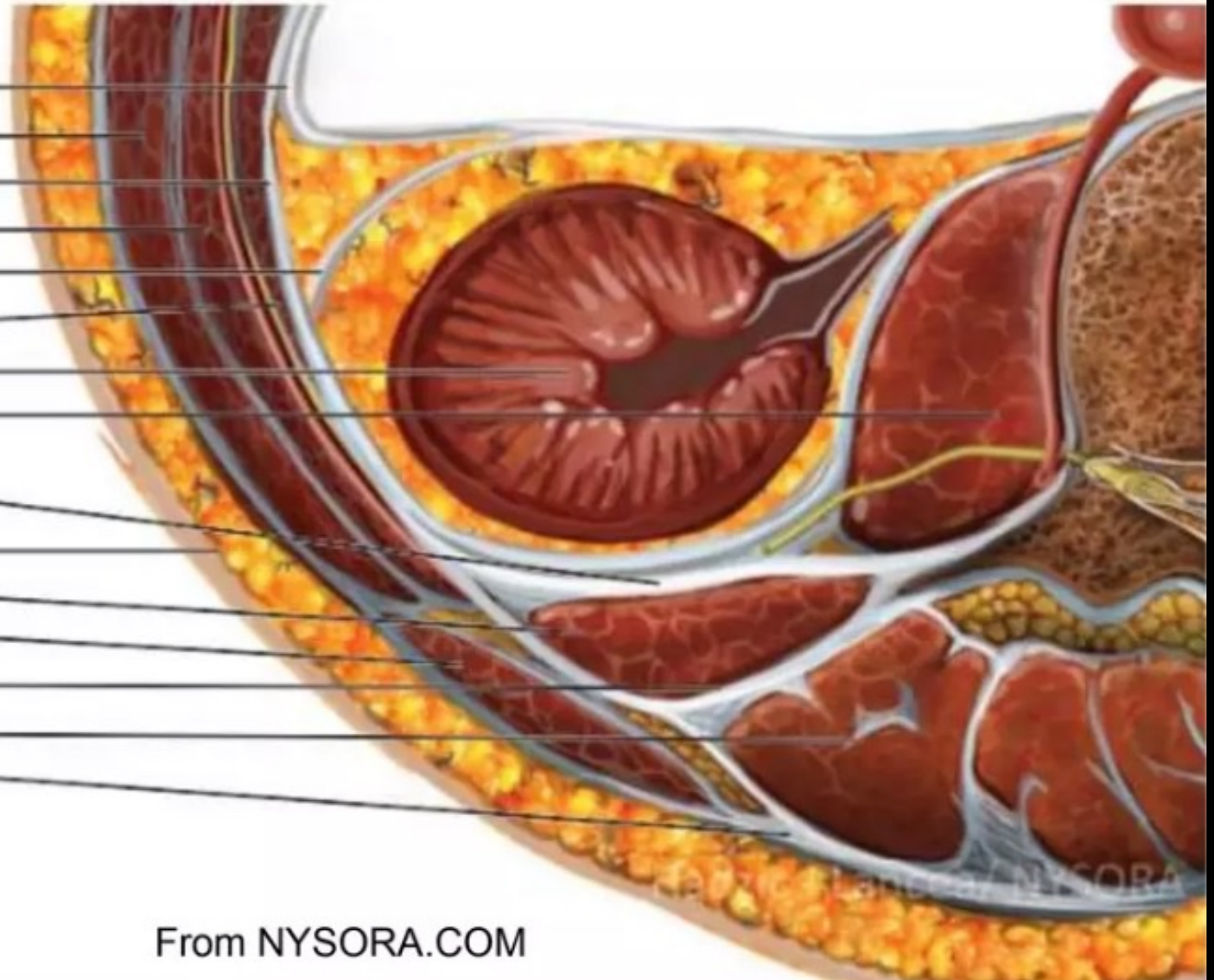
*J. Obstet. Gynaecol. Res. Vol. 47, No. 9: 2954–2968, September 2021*

- 17 RCT 2009-2019
- 1100 pts
- US TAP after CS cp placebo/No block
- Sub group analysis :+ ITM /-ITM
- **-ITM+ TAP: decreases morphine 6,12, 24h**
- **ITM + TAP : no benefit**

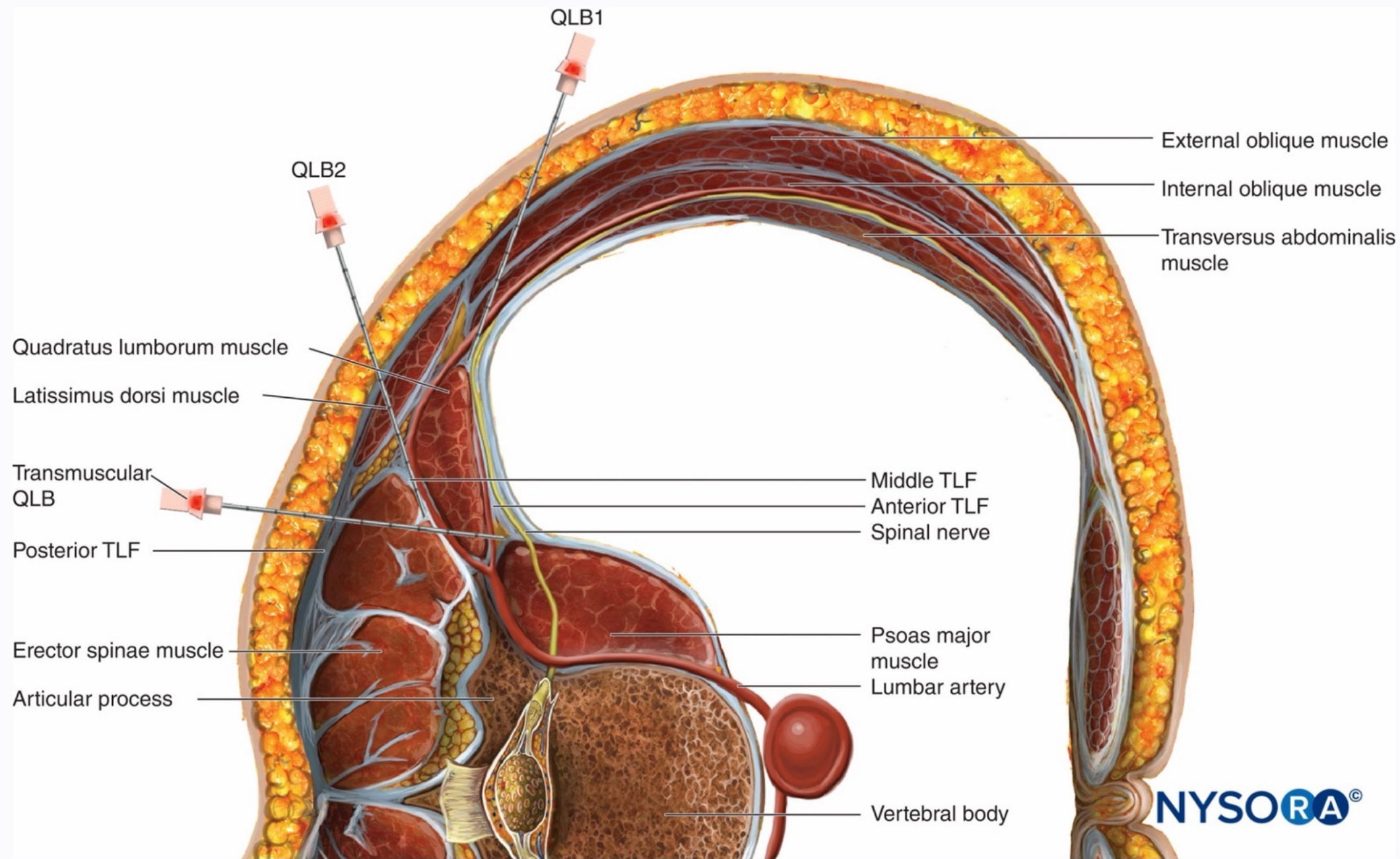




- Peritoneum
- External oblique
- Transversalis fascia
- Internal oblique
- Renal fascia
- Transversus abdominis
- Kidney
- Psoas major
- Anterior layer of TLF
- Subcutaneous fascia
- Quadratus lumborum
- Latissimus dorsi
- Middle layer of TLF
- Erector spinae
- Posterior layer of TLF



From NYSORA.COM



**FIGURE 10.** Trajectory of the needle for all three approaches of the quadratus lumborum (QL) nerve block (QLB1, QLB2, and QLB3).

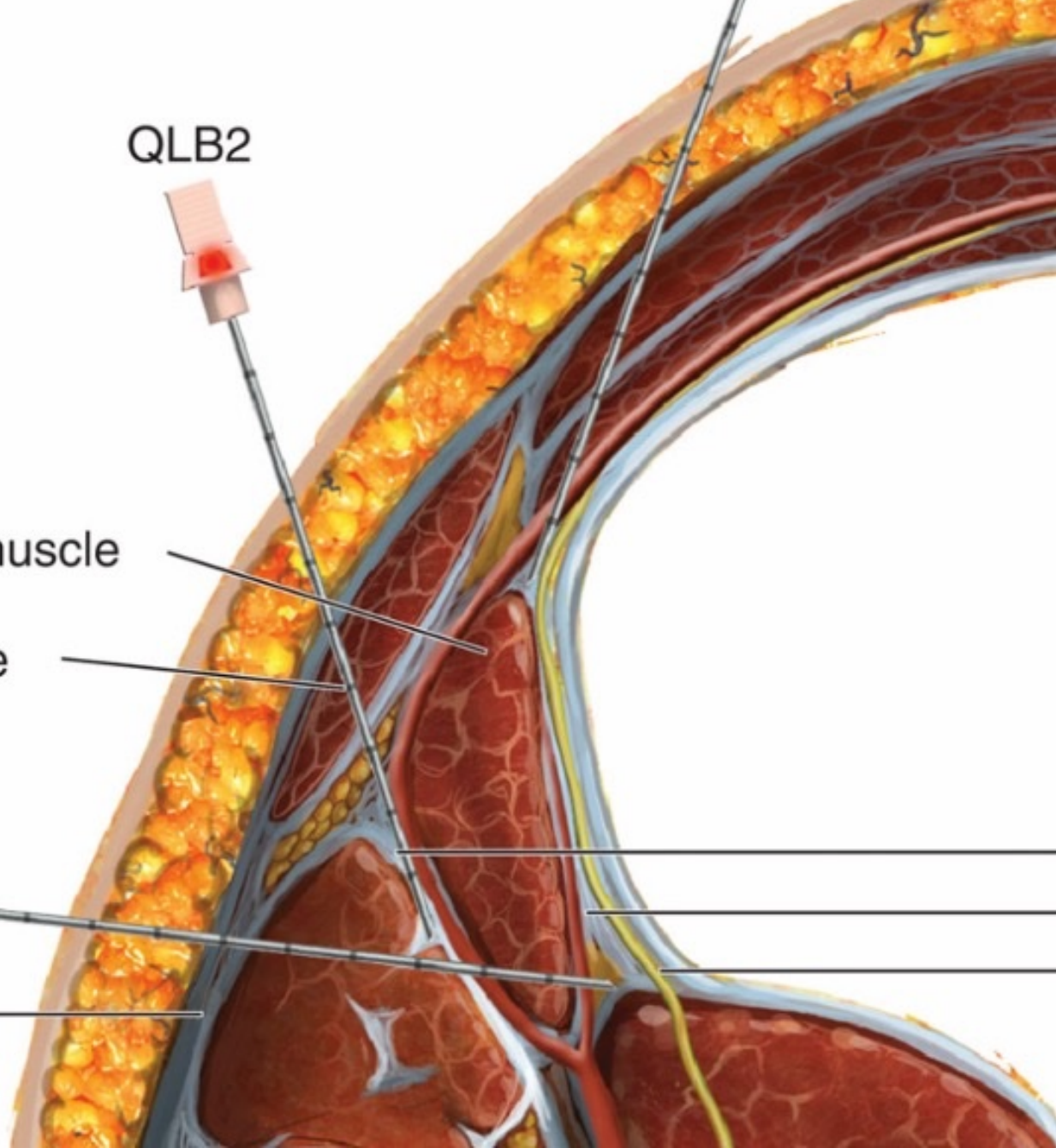
QLB2

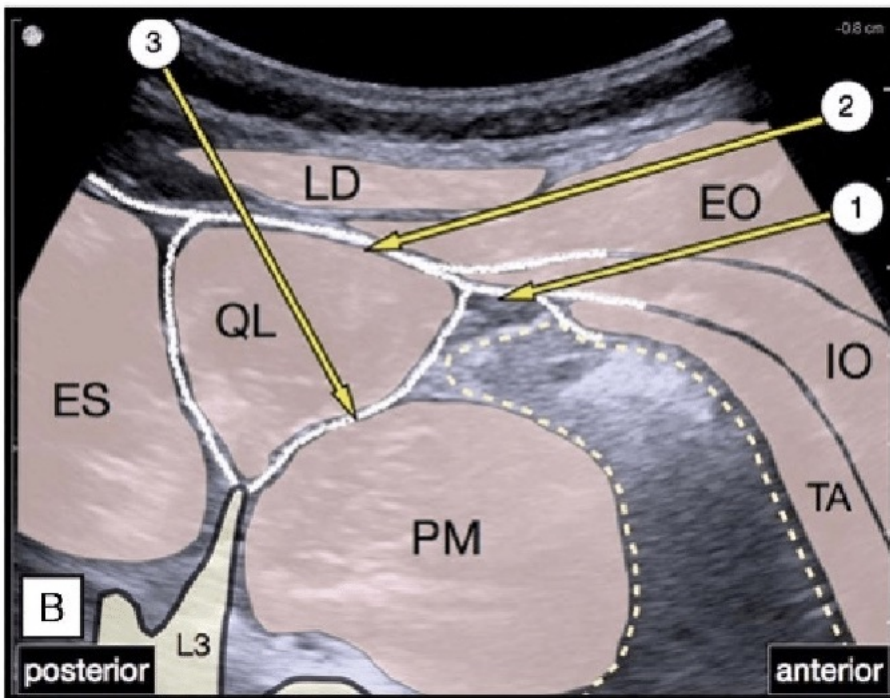
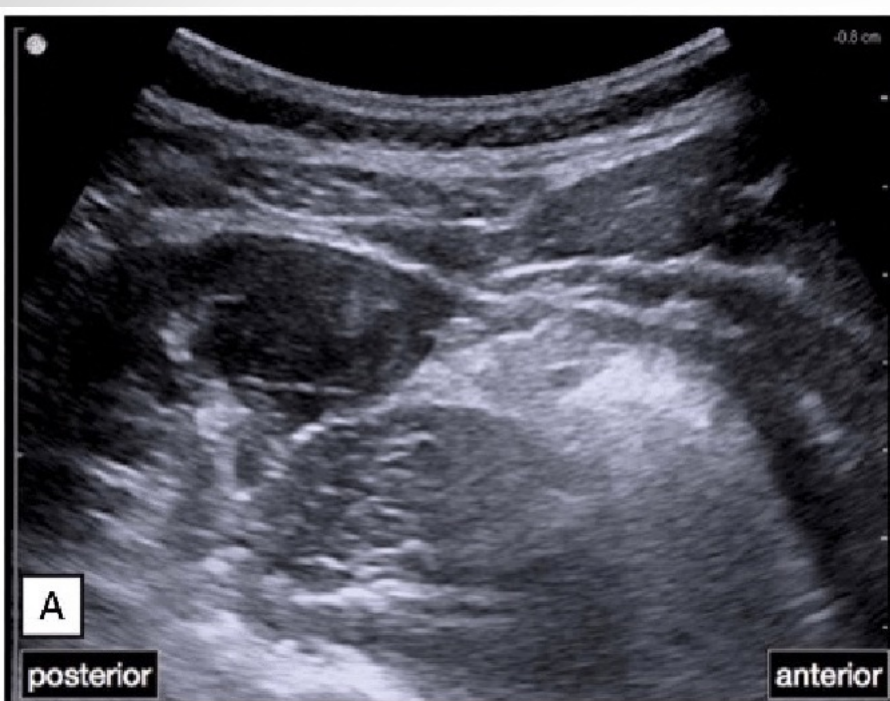
eratus lumborum muscle

imus dorsi muscle

muscular

rior TLF





- QL1: Latéral
- QL2: Postérieure
- QL3: Transmusculaire, antérieur
- QL4: Intramusculaire

	QL1	QL2	QL3	QL4
Coverage	T7-L1	T7-L1	T10-L4	Confined to AL muscle
Indications	Surgery bellow umbilicus	Surgery either above or bellow umbilicus	Surgery either above or bellow umbilicus	Back pain
Lower extremity weakness	Not reported	Not reported	Potential	
Spread to lumbar plexus	Not reported	Not reported	Potential	

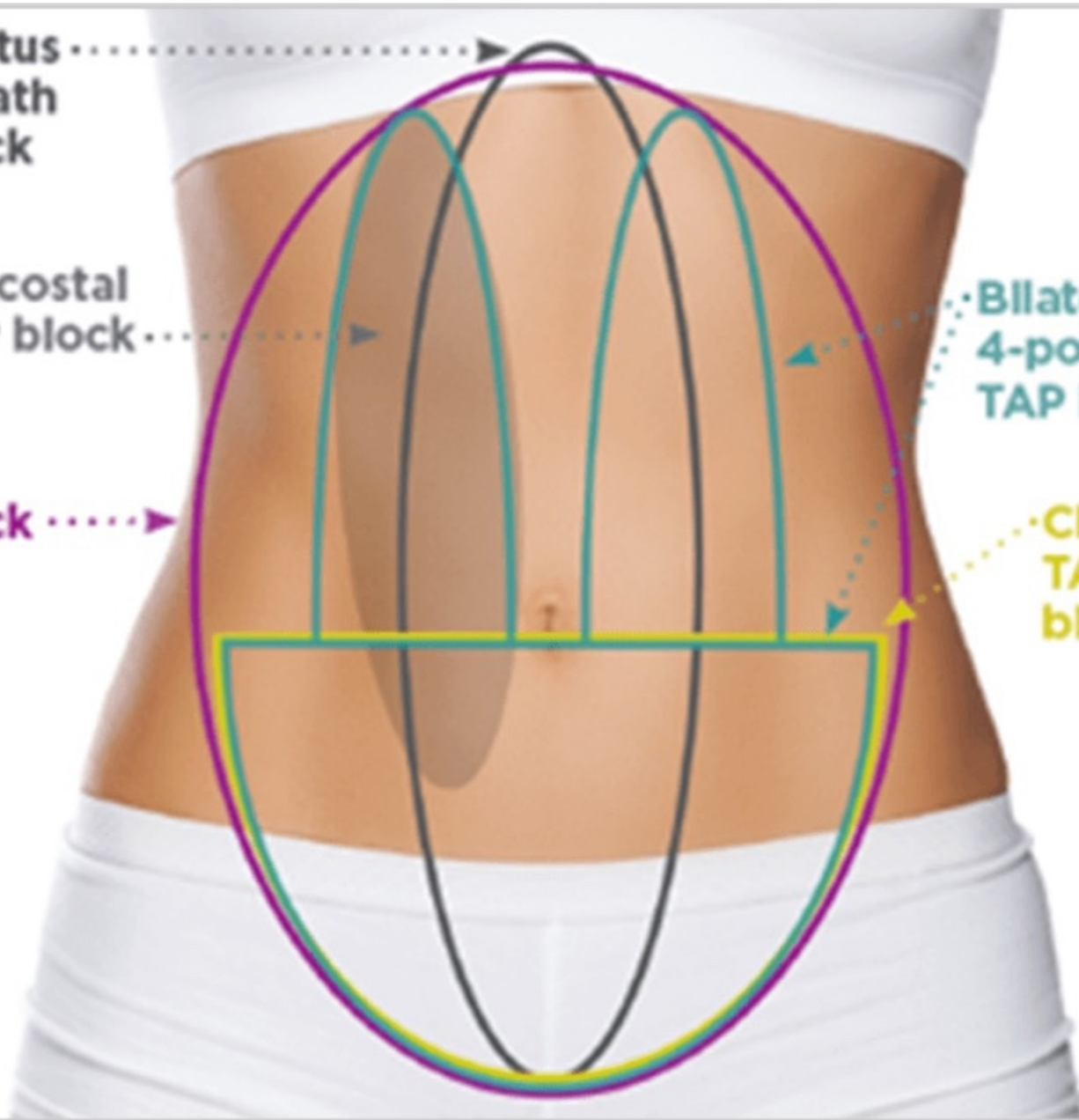
Rectus sheath block

Subcostal TAP block


QL block

Bilateral 4-point TAP block

Classic TAP block

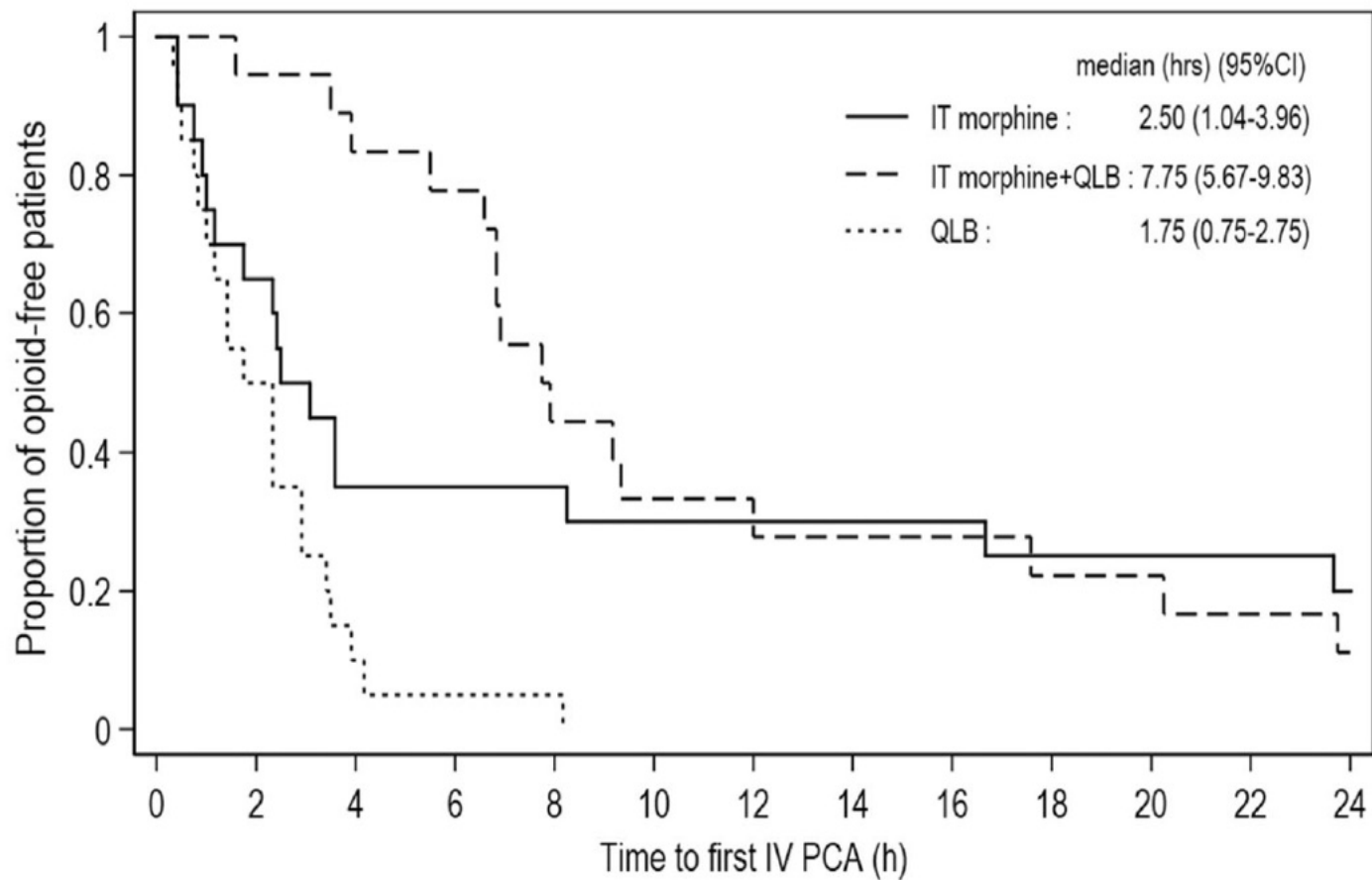


# Bilateral posterior Quadratus Lumborum block for pain relief after cesarean delivery: a randomized controlled trial

Pawinee Pangthipampai<sup>1\*</sup> , Sukanya Dejarkom<sup>1</sup>, Suppachai Poolsuppasit<sup>1</sup>, Choopong Luansritisakul<sup>1</sup> and Suwida Tangchittam<sup>2</sup>

Pangthipampai et al. *BMC Anesthesiology* (2021) 21:90

- 80 pts elective CS
- Spinal
- 3 gps:
  - ITM + QLB placebo
  - ITM + QLB bupi 0.25% 25ml
  - QLB bupi 0.25% 25ml
- Primary outcome: Consumption morphine 24 h



**Fig. 2** Kaplan-Meier plot of time to first request for morphine (pain-free period) at the 2nd interim analysis, Log-rank overall  $p < 0.001$ . Abbreviations: IT, intrathecal; QLB, quadratus lumborum block; IV, intravenous; PCA, patient-controlled analgesia; h, hours



# Bilateral posterior Quadratus Lumborum block for pain relief after cesarean delivery: a randomized controlled trial

Pawinee Pangthipampai<sup>1\*</sup> , Sukanya Dejarkom<sup>1</sup>, Suppachai Poolsuppasit<sup>1</sup>, Choopong Luansritisakul<sup>1</sup> and Suwida Tangchittam<sup>2</sup>

Pangthipampai *et al.* *BMC Anesthesiology* (2021) 21:90

- QLB + ITM > ITM > QLB
- Decrease in Mo consumption postop 6, 12 hr.

# ANESTHESIOLOGY

## **Postoperative Analgesic Effectiveness of Quadratus Lumborum Block for Cesarean Delivery under Spinal Anesthesia**

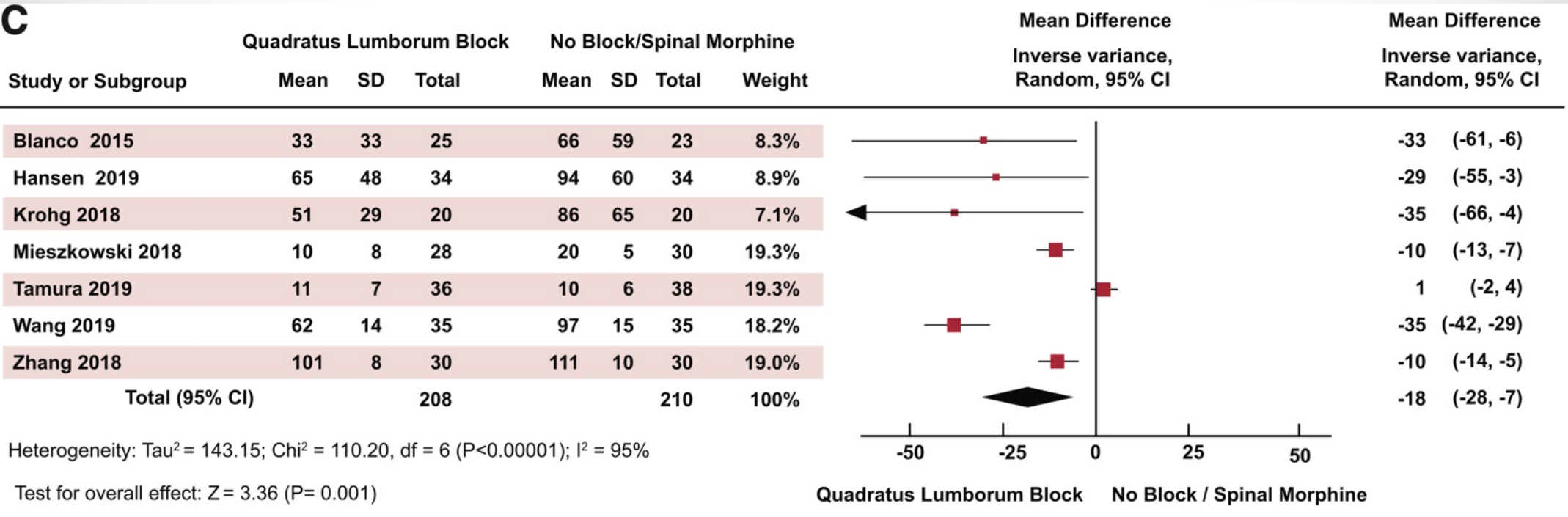
A Systematic Review and Meta-analysis

Nasir Hussain, M.D., M.Sc., Richard Brull, M.D., F.R.C.P.C.,  
Tristan Weaver, M.D., Meiqin Zhou, M.D.,  
Michael Essandoh, M.D., Faraj W. Abdallah, M.D., M.Sc.

*ANESTHESIOLOGY* 2021; 134:72–87

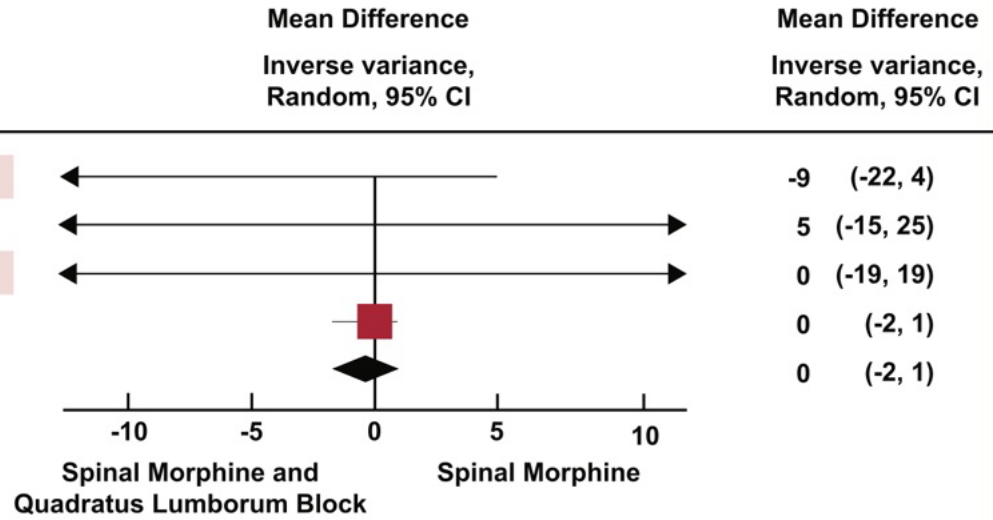
- 12 RCT
- 924 pts
- 3 gps:
  - ITM vs ITM + QLB
  - ITM vs QLB
  - No ITM/bloc vs QLB
- Primary outcome:  
consumption morphine 24  
hr + pain at 4 and 6 hr

**C**



**A**

Study or Subgroup	Spinal Morphine and Quadratus Lumborum Block			Spinal Morphine			Weight
	Mean	SD	Total	Mean	SD	Total	
Ferreira 2020	6	10	15	15	22	13	0.9%
Irwin 2019	49	48	44	44	46	42	0.4%
Pangthipampai 2020	15	27	28	15	42	27	0.4%
Tamura 2019	2	3	34	2	3	38	98.3%
<b>Total (95% CI)</b>			<b>121</b>			<b>120</b>	<b>100%</b>

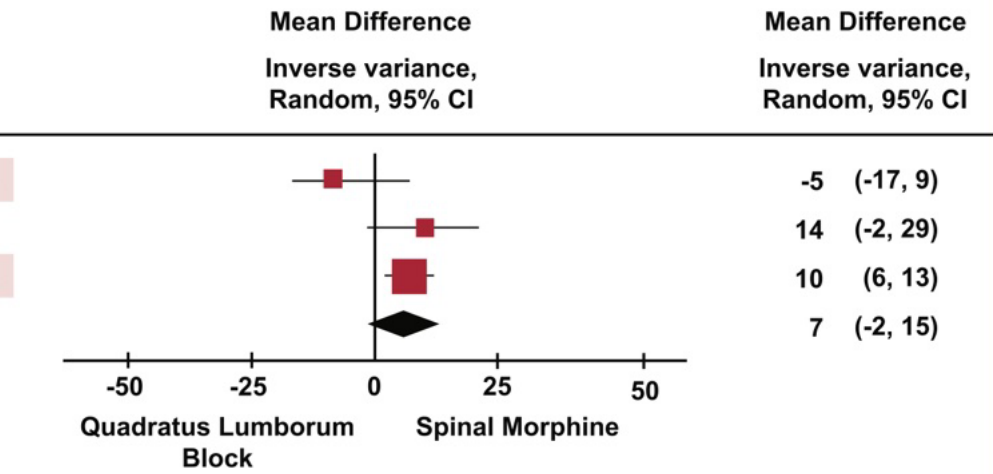


Heterogeneity: Tau<sup>2</sup> = 0; Chi<sup>2</sup> = 2.08, df = 3 (P = 0.522); I<sup>2</sup> = 0%

Test for overall effect: Z = 0.74 (P = 0.450)

**B**

Study or Subgroup	Quadratus Lumborum Block			Spinal Morphine			Weight
	Mean	SD	Total	Mean	SD	Total	
Ferreira 2020	10	9	15	15	22	13	25.1%
Felfel 2018	61	43	60	47	40	60	21.1%
Tamura 2019	11	6	36	1	8	38	53.8%
<b>Total (95% CI)</b>			<b>111</b>			<b>111</b>	<b>100%</b>



Heterogeneity: Tau<sup>2</sup> = 33.02; Chi<sup>2</sup> = 4.44, df = 2 (P = 0.113); I<sup>2</sup> = 55%

Test for overall effect: Z = 1.55 (P = 0.146)



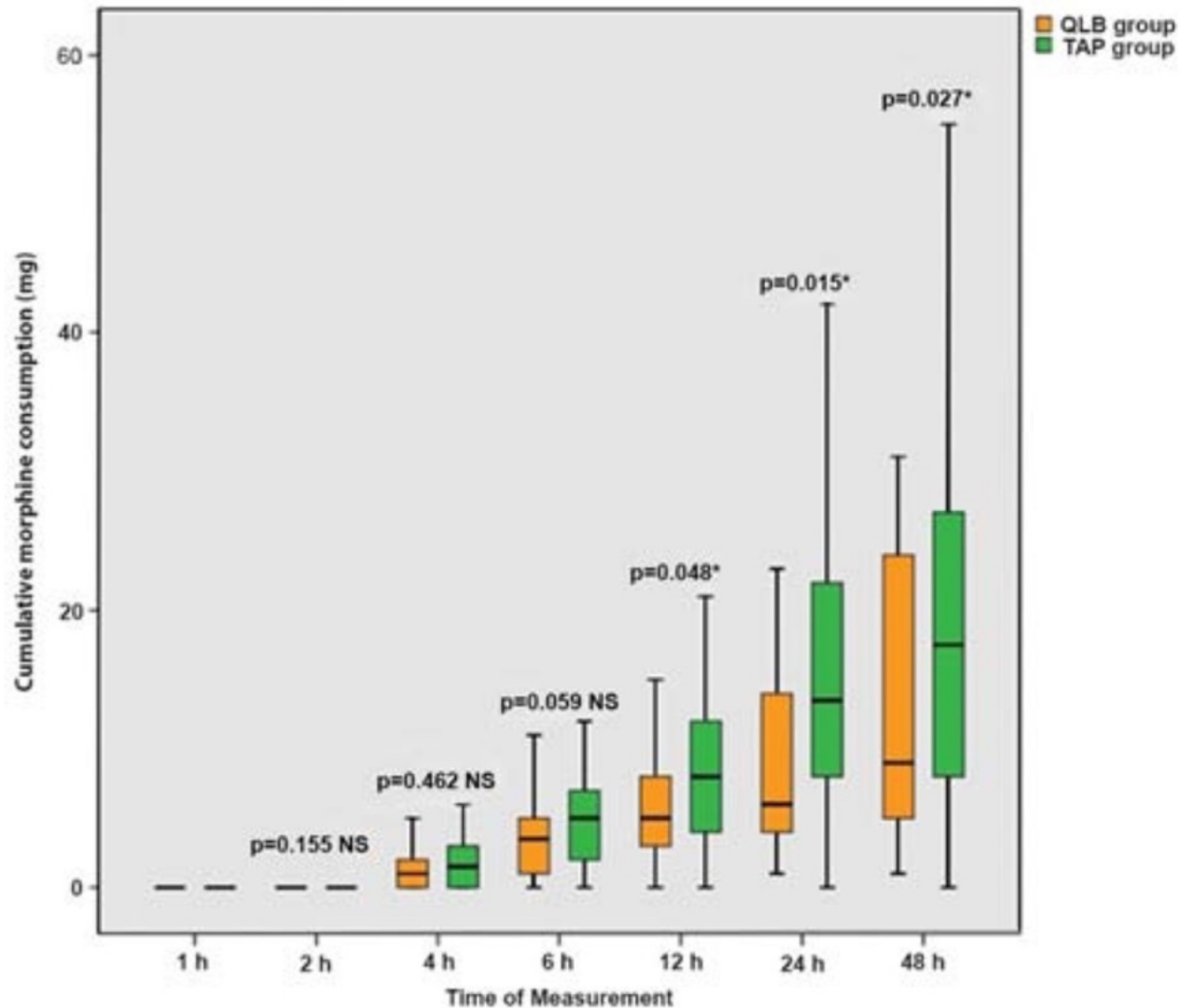
# Quadratus Lumborum Block Versus Transversus Abdominis Plane Block for Postoperative Pain After Cesarean Delivery

## *A Randomized Controlled Trial*

*Regional Anesthesia and Pain Medicine* • Volume 41, Number 6, November-December 2016

*Blanco et al*

- 76 pts RCT
- CS with spinal: Bupivacaine + fentanyl
- Gp QLBB or TAP
- Primary outcome: morphine consumption at 4,6,12,24,48 hr
- Secondary outcome: PONV, blood pressure, RS rate...



**FIGURE 2.** Graphic representation of consumption in the 2 groups: QLB shown in orange and TAP shown in green. NS, not significant.

# Quadratus Lumborum Block Versus Transversus Abdominis Plane Block for Postoperative Pain After Cesarean Delivery

## *A Randomized Controlled Trial*

*Regional Anesthesia and Pain Medicine* • Volume 41, Number 6, November-December 2016

*Blanco et al*

Patients who received QLB had significantly less cumulative morphine doses than patients who received the TAP block ( $P < 0.005$ ) at 12 hours (median, 5.0; IQR, 3.0–8.5 vs median, 8.0; IQR, 4.0–12.5;  $P = 0.048$ ), 24 hours (median, 6.0; IQR, 4.0–15.25 vs median, 13.5; IQR, 7.5–22.0;  $P = 0.015$ ), and 48 hours (median, 9.0; IQR, 4.75–24.25 vs median, 17.5; IQR, 7.5–27.25;  $P = 0.027$ ). The differences were 37.5%, 55%, and 48%, respectively. After cesarean delivery, patients who had the



# Quadratus lumborum block vs. transversus abdominis plane block for caesarean delivery: a systematic review and network meta-analysis\*

K. El-Boghdadly,<sup>1,2</sup>  N. Desai,<sup>1,2</sup> S. Halpern,<sup>3</sup> L. Blake,<sup>4</sup> P. M. Odor,<sup>5</sup> S. Bampoe,<sup>5</sup>  
B. Carvalho<sup>6</sup> and P. Sultan<sup>7</sup>

Anaesthesia 2021, 76, 393-403

- 31 RCT
- 2188 pts
- Primary outcome: Morphine consumption at 24 h
- Secondary outcome: pain at rest and upon movement

**Table 2** Summary of the results of the meta-analysis and GRADE quality of evidence assessment for the primary and secondary outcomes.

Outcome	Number of trials	Total number of participants	Number of direct comparisons	Number of indirect comparisons	Conclusion	Quality of evidence	Comments
Cumulative i.v. morphine-equivalent consumption							
8–12 h							
Network (No ITM)	8	429	3	0	QLB and TAP superior to control	Low quality (⊕⊕)	Rated down for serious inconsistency and serious imprecision
24 h							
Network (No ITM)	10	517	3	0	QLB and TAP superior to control	Moderate quality (⊕⊕⊕)	Rated down for serious imprecision
Network (ITM)	2	160	2	1	No differences between interventions	Moderate quality (⊕⊕⊕)	Rated down for serious imprecision
48 h							
Network	8	522	7	8	QLB and TAP superior to control	Low quality (⊕⊕)	Rated down for serious inconsistency and serious imprecision

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

**E. Roofthoof<sup>1,2</sup> G. P. Joshi,<sup>3</sup> N. Rawal,<sup>4</sup> M. Van de Velde,<sup>5</sup> 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

- 145 RCT 2014-2020
- CS Spinal
  - -ITM with block; ITM 50-100ug Morphine/ Diamorphine 300ug
  - Paracetamol
  - AINS
  - Dexamethasone

**Table 1** Overall recommendations for pain management in patients undergoing elective caesarean section.**Pre-operatively**

- Intrathecal long-acting opioid (e.g. morphine 50–100 µg or diamorphine up to 300 µg) (Grade A). Epidural morphine 2–3 mg or diamorphine up to 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 (Grade A)
- Oral paracetamol (Grade A)

**Intra-operative after delivery**

- Intravenous paracetamol if not administered pre-operatively (Grade A)
- Intravenous non-steroidal anti-inflammatory drugs (Grade A)
- Intravenous dexamethasone (Grade A)
- If intrathecal morphine not used, local anaesthetic wound infiltration (single-shot) or continuous wound infusion and/or regional analgesia techniques (fascial plane blocks such as transversus abdominis plane blocks and quadratus lumborum blocks) (Grade A)

**Postoperative**

- Oral or intravenous paracetamol (Grade A)
- Oral or intravenous non-steroidal anti-inflammatory drugs (Grade A)
- Opioid for rescue or when other recommended strategies are not possible (e.g. contra-indications to regional anaesthesia) (Grade D)
- Analgesic adjuncts include transcutaneous electrical nerve stimulation (Grade A)

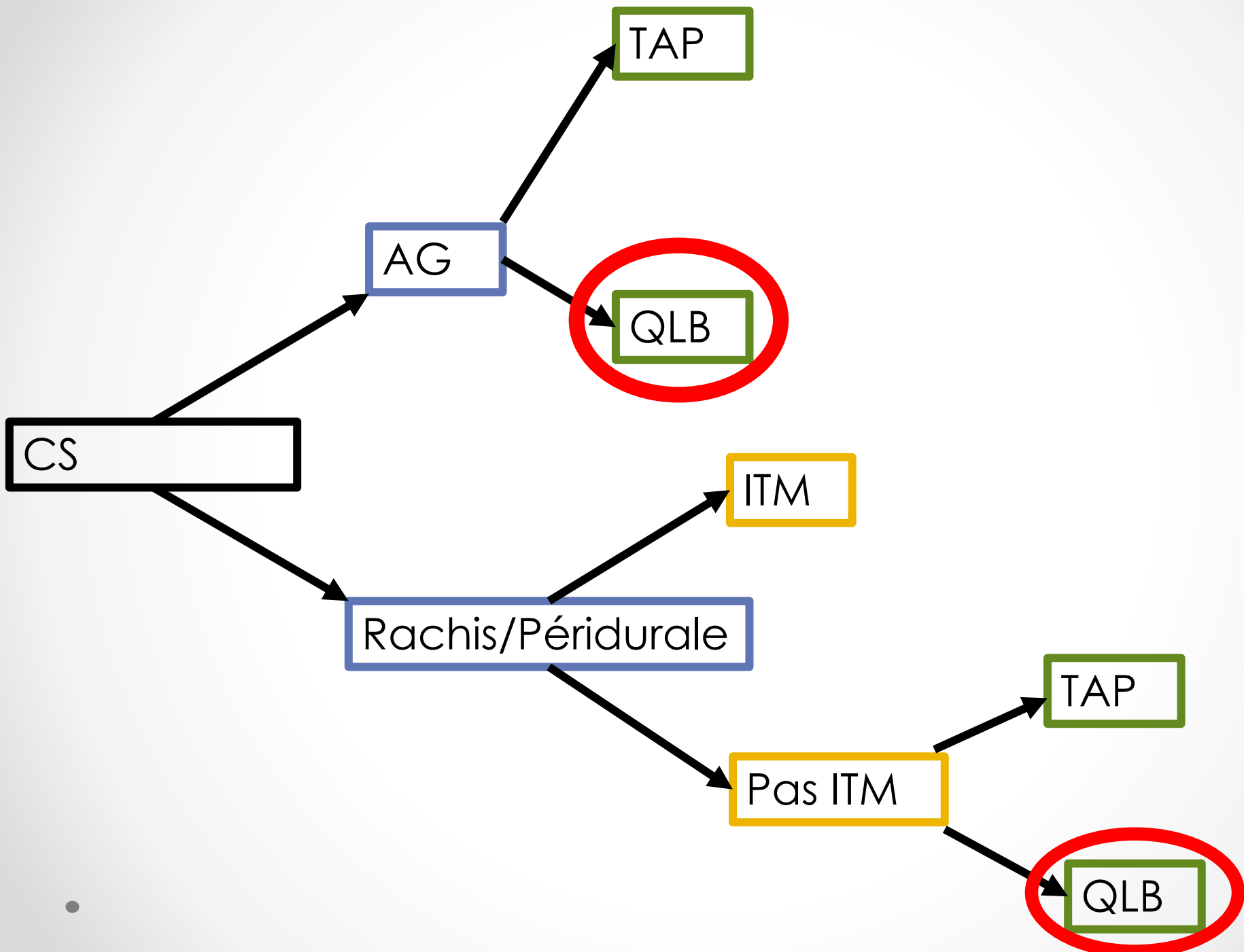
**Surgical technique**

- Joel-Cohen incision (Grade A)
- Non-closure of peritoneum (Grade A)
- Abdominal binders (Grade A)

**Table 2** Analgesic interventions that are not recommended for pain management in patients undergoing elective caesarean section.

	<b>Intervention</b>	<b>Reason for not recommending</b>
<b>Pre-operative</b>	Gabapentinoids	Limited procedure-specific evidence and concerns of side-effects
<b>Intra-operative</b>	Intravenous ketamine	Limited procedure-specific evidence and concerns of side-effects
	Intravenous dexmedetomidine	Limited procedure-specific evidence and concerns of side-effects
	Intravenous tramadol and butorphanol	Limited procedure-specific evidence
	Neuraxial clonidine	Inconsistent procedure-specific evidence and concerns of side-effects
	Neuraxial dexmedetomidine	Inconsistent procedure-specific evidence and concerns for side-effects
	Intrathecal buprenorphine	Limited procedure-specific evidence
	Epidural hydromorphone	Limited procedure-specific evidence
	Intrathecal midazolam	Limited procedure-specific evidence and concerns of side-effects
	Intrathecal neostigmine	Concerns of side-effects
	Intrathecal ketamine	Limited procedure-specific evidence and concerns of side-effects
	Intraperitoneal local anaesthetic	Lack of procedure-specific evidence
	Topical skin analgesia	Lack of procedure-specific evidence
	Clonidine added to TAP	Lack of procedure-specific evidence
	Dexmedetomidine added to TAP	Limited procedure-specific evidence
	Fentanyl added to TAP	Lack of procedure-specific evidence
	Rectus sheath block	Lack of procedure-specific evidence
	Field block	Lack of procedure-specific evidence
Music	Limited procedure-specific evidence	
<b>Postoperative</b>	Skin-to-skin contact	Limited procedure-specific evidence
	Intravenous lidocaine	Lack of procedure-specific evidence
	Patient controlled epidural analgesia	Limited procedure-specific evidence and concerns of side-effects
<b>Surgical technique</b>	Method of incision: diathermy	Inconsistent procedure-specific evidence
	Absence of a bladder flap	Limited procedure-specific evidence
	Blunt fascial opening	Limited procedure-specific evidence
	Uterine exteriorisation	Inconsistent procedure-specific evidence
	Skin incision lasering postoperatively	Limited procedure-specific evidence
	Type of skin closure	Lack of procedure-specific evidence
	Vaginal cleansing	Lack of procedure-specific evidence
	Cervical dilation	Inconsistent procedure-specific evidence
	Type of pyramidalis muscle dissection	Lack of procedure-specific evidence
	Rectus muscle re-approximation	Limited procedure-specific evidence

TAP, transversus abdominis plane block.



# Conclusions

- ITM gold standard
- Morphine 100ug + fentanyl
- QLB seems superior to TAP block
- QLB1 less risk and tech easier
- ITM + TAP no use
- ITM + QLB block







GROUPEMENT  
HOSPITALIER  
DE L'OUEST  
LÉMANIQUE

# State of the art post-cesarean section analgesia

Dr Moira Robertson

16.03.2024

Médecin Cheffe co-responsable du Service  
d'anesthésie

Hôpital de Nyon, Vaud  
Switzerland