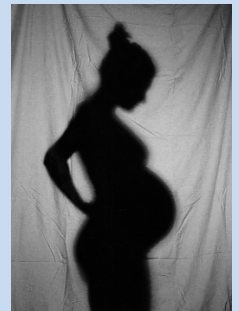


# ***Neuroaxial Morphine*** ***for Post-cesarean Analgesia: Yes, No and Why***

**Alexander Ioscovich MD**

Chief of Gynecological and High Risk Obstetric Anesthesia Unit, Shaare Zedek Medical Center, Jerusalem  
Chairman of Israel Association of Obstetric Anesthesia  
Clinical Senior Lecturer, Hebrew University



**Shaare Zedek**  
Medical Center, Jerusalem

האוניברסיטה העברית בירושלים  
The Hebrew University of Jerusalem



# Shaare Zedek Medical Center, Jerusalem



**16.000 + 6.000  
labors annually**

**“OB-anesthesia activity”**  
**53-56% epidural analgesia**  
**12% of caesarean sections**

# Why is it so important to treat acute post cesarean pain?

1



2



\$\$\$

3

International Journal of Obstetric Anesthesia (2013) 22, 133-145  
0959-289X/\$ - see front matter © 2013 Elsevier Ltd. All rights reserved.  
<http://dx.doi.org/10.1016/j.ijoa.2013.01.008>



ELSEVIER  
[www.obstetanesthesia.com](http://www.obstetanesthesia.com)

REVIEW ARTICLE

## Chronic pain after childbirth

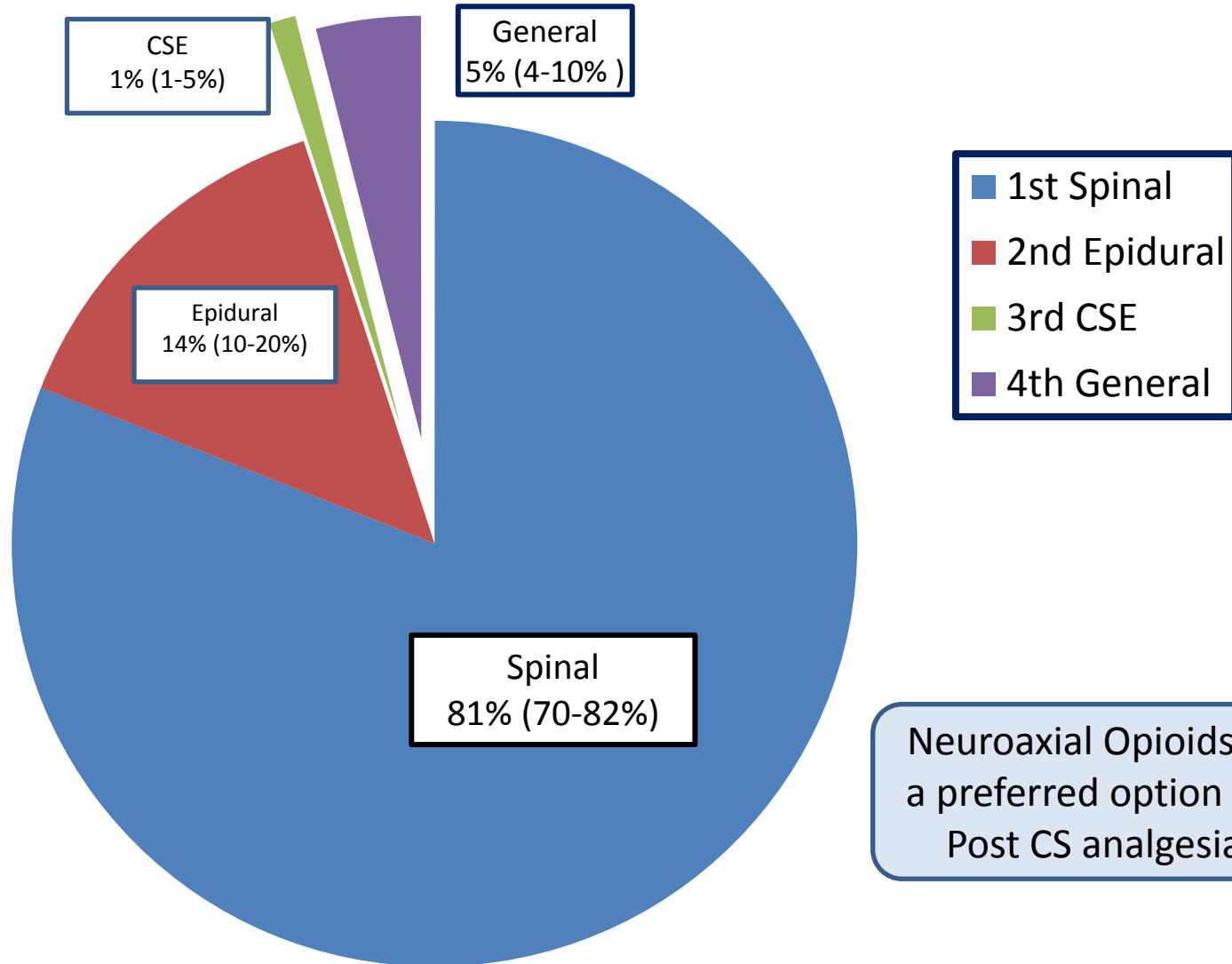
R. Landau, L. Bollag, C. Ortner

Department of Anesthesiology and Pain Medicine, University of Washington Medical Center,  
Seattle, WA, USA

**Poor treatment of acute post cesarean pain as a favorite reason for chronic pain after childbirth**

\$\$\$

# Anesthesia for CS in SZ Med Center



# Regional versus General Anesthesia for Cesarean Section

- The use of general anesthesia has fallen dramatically in the past few decades and now accounts for only about 5 percent of cesarean deliveries in the United States and United Kingdom.

[Cochrane Database Syst Rev.](#) 2012 Oct

Regional versus general anaesthesia for caesarean section.

[Afolabi BB](#), [Lesi FE](#).

***Neuroaxial Morphine***  
***for Post-Cesarean Analgesia***  
***95% of all our Cesarean Sections***

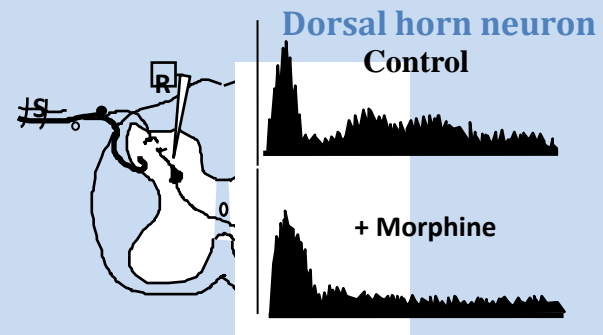


# A little bit of history

Analgesia mediated by a direct spinal action of narcotics.

Yaksh TL, Rudy TA.

*Science*. 1976 Jun 25;192(4246):1357-8.



- Narcotic analgesics administered directly into the subarachnoid space of the rat via a chronically inserted catheter, produce a potent analgesia that can be antagonized by naloxone.
- The narcotics, acting only at the spinal level, changed cord function to block not only spinal reflexes but also the operant response to painful stimuli.

# From rat to man

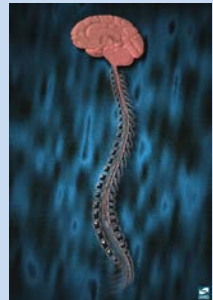
Anesthesiology  
50:149-151, 1979

## Pain Relief by Intrathecally Applied Morphine in Man

JOSEF K. WANG, M.D.,\* LEE A. NAUSS, M.D.,\* JUERGEN E. THOMAS, M.D.†

\* Consultant, Department of Anesthesiology, Mayo Clinic and Mayo Foundation; Assistant Professor of Anesthesiology, Mayo Medical School.

Eight patients who had severe intractable pain in the back and legs secondary to malignancies of the genitourinary tract with invasion of the lumbosacral plexus were selected for study.



# “Nothing new under the sun...”

The first application of neuraxial opioids can be traced to 1901, when a Japanese surgeon used 10 mg intrathecal morphine with eucaine (LA) in two cancer patients.

Matsuki A. “Nothing new under the sun – a Japanese pioneer in the clinical use of intrathecal morphine.”

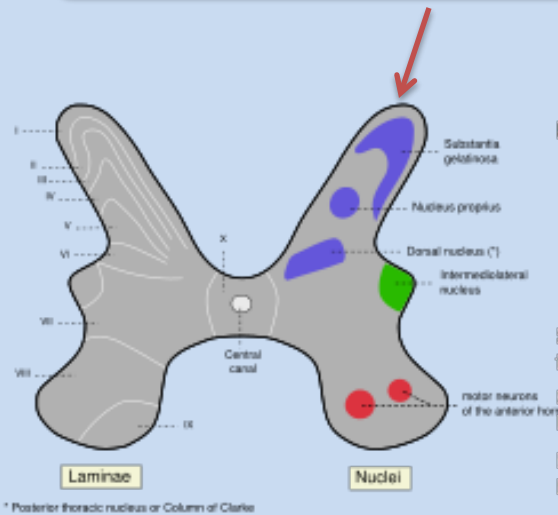
Anesthesiology 1983; 58: 289-290



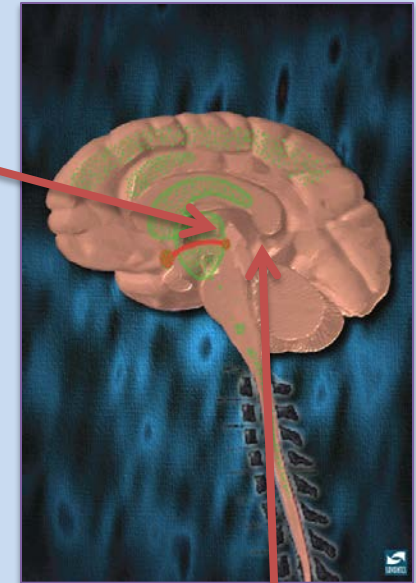
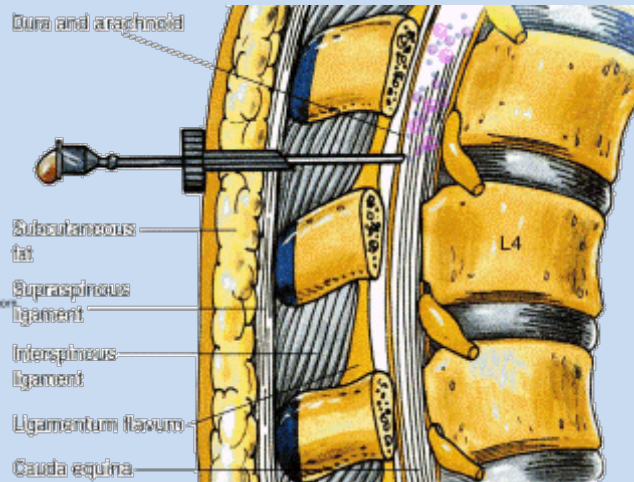


# A little bit of physiology

Substantia gelatinosa



Cisterna magna



Fourth and lateral ventricles

Placement of opioids in the subarachnoid space to manage acute or chronic pain is based on the knowledge that opioid receptors (principally mu receptors) are presented in

- the substantia gelatinosa of the spinal cord
- the cisterna magna
- the fourth and lateral ventricles

# And some more physiology

**Hydrophilic opioids** such as Morphine are several hundred times more potent spinally than intravenously.

In contrast, **lipophilic opioids** (sufentanil, fentanyl, etc.) are only 10-20 times more potent with intrathecal versus intravenous administration.

**Table - 3 : Comparisons between morphine and lipophilic opioids for intrathecal analgesia**

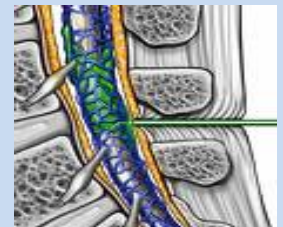
Opioid	IT/IV Potency Ratio	Onset of IT Analgesia (min)	Duration of Analgesia (hrs)	Time of peak Respiratory Depression	Clinical dose range
Morphine	200-300 : 1	60-120	18-24	8-10 hrs	0.1–0.5 mg
Fentanyl	10-20 : 1	< 10	1-4	5-20 min	6-30 $\mu$ g
Sufentanil	10-20 : 1	< 10	2-6	5-20 min	2.5-10 $\mu$ g*



# Trial of clinical use of intrathecal morphine

- [Intrathecal morphine after hip and knee arthroplasty.](#)  
Rathmell JP at al. Anesth Analg. 2003 Nov;97(5):1452-7
- [Large-dose intrathecal morphine for coronary artery bypass grafting.](#)  
Chaney MA at al. Anesth Analg. 1996 Aug;83(2):215-22.
- [Spinal morphine injection for postthoracotomy pain control in children.](#)  
Ioscoich A at al. Paediatr Anaesth. 2004 Nov;14(11):971-2.

All of these procedures require significant additional analgesia: intravenous or regional.



# Successful use of spinal MO for postoperative pain treatment

- Prostatectomy Sved PD

*Urology 2005;65:509-12*

- Hysterectomy Karaman S

*Adv Ther 2006;23:295-306*

- **Cesarean Section**

- Aboulesh E *Reg Anesth 1991;16:137-40*
- Dahl JB *Anesthesiology 1999; 91:1919-27*
- Gadsden J *Anesth Analg 2005; 101:62-69*



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- Clinical Trial
- Review
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- [Cesarean Section Under Combined Spinal and Epidural Anesthesia for a Pregnant Woman with Primary Biliary Cirrhosis.](#)  
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- [Quadratus lumborum block for postoperative pain after caesarean section: A randomised controlled trial.](#)  
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- [Neuraxial anaesthesia for pain control after caesarean section - a prospective randomised trial comparing three different neuraxial techniques in clinical practice.](#)  
 Koyuncu H, Hincal S, Zengin B, Wainwright K, Gonenel S, Ozdemir M, Ozgenel S, Ozdemir M

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The effects of morphine and fentanyl alone or in combination added to intrathecal bup [Agri. 2011]

Safety and effectiveness of coadministration of intrathecal sufentanil and [J Opioid Manag. 2009]

[Spinal anesthesia for cesarean section with 0.5% isobaric bupiva [Rev Bras Anesthesiol. 2003]

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```
spinal[All Fields] AND
("morphine"[MeSH Terms] OR
"morphine"[All Fields]) AND
("caesarean section"[All Fields]
OR "cesarean section"[MeSH
```

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362

# Why Cesarean Section?

- Operation on soft tissue - intensity of pain
- Urinary catheter for 6-8 h
- Low (even theoretical) risk of respiratory depression

“Morphine is currently the “gold-standard” neuraxial opioid for postcesarean analgesia.” *ASA Focused Review Anesth Analg Sept 2008*

“The National Institute (UK) for Clinical Excellence guidelines suggest intrathecal or epidural diamorphine administration for analgesia after CS”  
*IJOA 2005 Wee MYK*

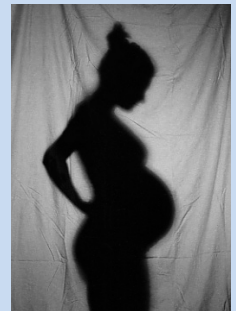


# What is the optimal dose of spinal MO for post-CS analgesia?

*A meta-analysis of Dahl JB et al. Anesthesiology 1999;91:1919-27*

## ● Dosing range for analgesia

- 0.5mg Chadwick HS *Anesthesiology 1988;68:925-9*
- 0.075mg Palmer CM *Anesthesiology 1999;90:437-44*
- Demonstrated excellent efficacy of MO dose of 0.1-to 0.2 mg
- No additional pain relief with dose >0.2 mg.
- Dose smaller than 0.1 mg had little effect on pain relief.



# Side effect - pruritus and nausea

➤ 0.1 versus 0.2 mg demonstrated no difference in postoperative nausea but increased rate of pruritus.

*Sarvela J. et al. Anesth Analg 2002;95:436-40*

➤ Yang T. et al. demonstrated decreased incidence of pruritus and nausea with decreasing of dose

*Can J Anaesth 1999;46:856-60*

➤ Dahl JB. et al. Showed that the incidence of pruritus and nausea increased as morphine dose increased from 0.05 to 0.25mg.

*Anesthesiology 1999;91:1919-27*





# Side effect – Respiratory depression.

*“Respiratory depression after neuraxial opioids in the Obstetric Setting”*

**Carvalho B.** *Anesth. Analg* 2008

“No studies reported serious sequelae, although **some patients required naloxone** administration.”

“Pregnant women have increased progesterone, a respiratory stimulant that may further decrease the risk of respiratory depression.”

Leich CH 1986      Epidural MO      5mg

Etches RC 1989      Spinal MO      1-5mg

Fuller JG 1990      Epidural MO      5mg



# Prevention of respiratory depression

- **Identify Patients at Risk**

- Significant coexisting diseases
- Preoperative opioid tolerance
- Obstructive sleep apnea
- Morbid obesity
- Magnesium sulfate treatment

- **Limit dose** - intrathecal dose of MO > 200  $\mu\text{g}$  is unnecessary

**MAX 200  $\mu\text{g}$**





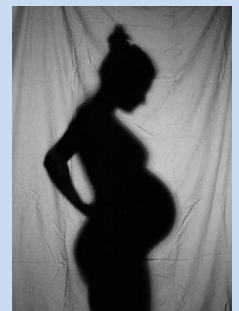
## REVIEW ARTICLE

# Risks and side-effects of intrathecal morphine combined with spinal anaesthesia: a meta-analysis

M. Gehling<sup>1</sup> and M. Tryba<sup>2</sup>

*1 Consultant Anaesthetist and 2 Head of Department, Department of Anaesthesiology, Intensive Care Medicine and Pain Therapy, Klinikum Kassel, Kassel, Germany*

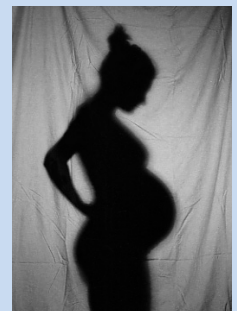
With a dose < 0.3 mg we found there were no more episodes of respiratory depression than in placebo patients who received systemic opioid analgesia.



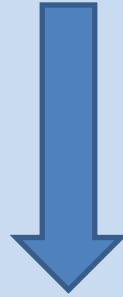
## ***Practice Guidelines for the Prevention, Detection, and Management of Respiratory Depression Associated with Neuraxial Opioid Administration***

*An Updated Report by the American Society of Anesthesiologists Task Force on Neuraxial Opioids\**

*Single-injection Neuraxial Hydrophilic Opioids (e.g., Morphine, Not Including Sustained- or Extended-release Epidural Morphine):* Monitoring should be performed for a *minimum* of 24 h after administration. Monitoring should be performed at least once per hour for the first 12 h after administration, followed by monitoring at least once every 2 h for the next 12 h (i.e., from 12 to 24 h). After 24 h, frequency of monitoring should be dictated by the patient's overall clinical condition and concurrent medications.



**Evidence-based medicine**



**Mentors' opinion**

- **Stephen Halpern**

Professor of Anesthesia, Director of Obstetric Anesthesia Research Unit,  
Women's College Health Sciences Centre, University of Toronto, Canada  
Editor of textbook "Evidence-Based Obstetric Anesthesia" and  
articles on OB anesthesia



- **Yaakov Beilin**

Professor of Anesthesiology and OB-GYN  
Associate Director of Obstetric Anesthesia  
Mount Sinai School of Medicine of New York University, New York, USA  
Author of > 50 articles on OB anesthesia



- **Felicity Reynolds**

Professor of Obstetric Anaesthesia, Editor emeritus of International  
Journal of Obstetric Anesthesia, London, UK  
Author of four books and >90 research papers



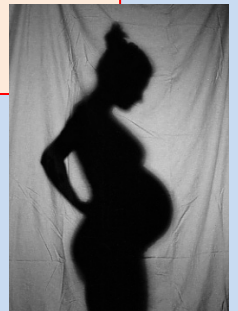
- **Dan Benhamou**

Professor of Anesthesia and Intensive Care. Chairman of the Department of  
Anesthesia and Director of the Research Unit, Hôpital de Bicêtre, France  
Author of >100 publications on OB anesthesia



# What is the best kind of post-cesarean pain relief for a healthy woman who is able to receive regional anesthesia?

- Beilin (US) – Spinal 0.2 mg MO
- Halpern (Canada) – Spinal 0.15 mg MO
- Reynolds (UK) – Spinal diamorphine
- Benhamou (France) – Spinal 0.1 mg MO



# Postoperative recommendations!!!

**Sunnybrook**  
HEALTH SCIENCES CENTRE

## PHYSICIAN'S ORDERS

**PHYSICIAN'S ORDERS**  
All orders shall be DATED, TIMED, and SIGNED  
All medication orders shall be written in the GENERIC or non-proprietary name.  
All orders shall be written legibly using ball point pen.

PATIENT IDENTIFICATION

TIME & DATE

No Known Allergies

Penicillin Allergy (choose one option below based on history):  
 Anaphylaxis, or hives within first 48 hrs: cephalosporins should be avoided.  
 Other or unknown history: cephalosporins may be used.

Other Allergies (specify): \_\_\_\_\_ Date: \_\_\_\_\_  
 MD signature: \_\_\_\_\_

Y / M / D

**COMPLETE ABOVE ALLERGY BOX AT TIME OF INITIAL ORDERS**

**ORDERS FOR PATIENTS RECEIVING SPINAL OR EPIDURAL MORPHINE**  
SUNNYBROOK HEALTH SCIENCES CENTRE

Yes	No	Doctor must check off appropriate orders.
		Epidural/spinal morphine given at (date) <sup>(YY/MM/DD)</sup> _____ (time) _____ h. Dose _____ mg.
		1 All parenteral opioids, sedatives, hypnotics or anxiolytics must be ordered by the Anesthesiologist for the first 18h after administration.
		2 Patients must have a functioning intravenous catheter for 18h after the dose was given. Rate and content of intravenous fluids to be ordered by the Obstetrician/Surgeon.
		3 Naloxone inj 0.4 mg ampoule to be ready and available.
		4 Oxygen and suction setup to be ready and available.
		5 Check and record the respiratory rate and level of consciousness every hour for 18h after the dose was given.
		6 If the patient is sleeping, Respiratory rate > 10, do not wake patient. Respiratory rate ≤ 10, rouse patient. If the patient is not easily rousable, call the 1 <sup>st</sup> call Anesthesiologist STAT.
		7 If the respiratory rate is < 8, Stimulate the patient, obtain help. Call the 1 <sup>st</sup> call anesthesiologist stat. Administer naloxone 0.2 mg IV stat and q 1 min prn until the respiratory rate is > 10. Connect the Laerdal bag to 12 litre flow of oxygen. Support respirations, bag with a self inflating bag.

SIGNATURE OF NURSE



Time and dose of injection

No other opioids or hypnotic drugs!

Monitoring of respiratory rate and level of consciousness

Call for help!!!



# Epidural anesthesia for CS

**Quality of analgesia increases as the dose of epidural morphine increases to at least 3.75 mg. (3-4mg)**

- Increasing the dose further to 5 mg did not improve analgesia.
  - Side effects (PONV and Pruritus) were not dose related.
- For optimal analgesia, augmentation of epidural morphine with systemic analgesics or other epidural medications may be necessary.

[Acta Anaesthesiol Scand.](#) 1992 Oct;36(7):698-701.

**A two-dose epidural morphine regimen for cesarean section patients: therapeutic efficacy. (5mG)**

[Zakowski MI](#), [Ramanathan S](#), [Turndorf H](#).

Department of Anesthesiology, New York University Medical Center, New York.

[Anesth Analg.](#) 2000 Apr;90(4):887-91.

**Postcesarean epidural morphine: a dose-response study. (0,1.25, 2.5, 3.75, or 5 mg)**

[Palmer CM](#), [Nogami WM](#), [Van Maren G](#), [Alves DM](#).

[J Anaesthesiol Clin Pharmacol.](#) 2012 Oct;28(4):491-5.

**Postoperative analgesia with epidural opioids after cesarean section: Comparison of sufentanil, morphine and sufentanil-morphine combination.**

[Vora KS](#), [Shah VR](#), [Patel B](#), [Parikh GP](#), [Butala BP](#).



# Shaare Zedek Medical Center

110-year  
Anniversary!!



- 22000 deliveries per year (2015)
- 12% CS (~2650/y)
- 80% of CS with spinal anesthesia (~2110/y)
- 15% Conversion Epidural
- 5% General Anesthesia

# Data from



Shaare Zedek  
Medical Center, Jerusalem

Year	Number of CS
2004	~400 (from March)
2005	913
2006	939
2007	1010
2008	1043
2009	1090
2010	1144
2011	1188
2012	1324
<b>Total</b>	<b>&gt;9000</b>

Spinal anesthesia with bupivacaine 10mg and morphine 100-200  $\mu\text{g}$

**End of 2015**

Name hospital:

**Shaare Zedek (+ Bikur Holim from Jan 2013)**

Using spinal or epidural morphine since: **2002**

Doses used:

**Spinal 150 mcg; Epidural 3-3.5mg**

Number of cases since starting: **Spinal**

**~15.000 Epidural (from 2007) - ~3000**

Number (if any) cases with respiratory depression requiring any intervention (ventilation, narcan, ICU): **No**



*Shaare Zedek*  
Medical Center, Jerusalem

# Standard postoperative recommendation

- ~2h in PACU - SaO2/BP/HR/RR monitoring
- Hourly SaO2/BP/RR monitoring for first 12 h in maternity department
- Optalgin SOS for "rescue" analgesia

Shaare Zedek Medical Center  
affiliated with the Faculty of Medicine  
The Hebrew University of Jerusalem  
Department of Obstetrics  
& High Risk Pregnancy  
Prof. A. Samueloff, Chairman



ב"ה  
המרכז הרפואי שערי צדק  
מסונף לפקולטה לרפואה  
האוניברסיטה העברית ירושלים  
המחלקה למיילדות  
וסיבוכי הריון  
פרופ' א. סמואלוב, מנהל

## פקודות רופא

זמן קבלה:

זמן בדיקה:

בדיקת פרמטרים:

פעמים ביום	בדיקה
	:במשך 24 השעות הראשונות
	מאזן נוזלים
	שתן
	דימום נרתיקי/מפצע ניתוח
3	חום
	:במשך 12 השעות הראשונות
12	לחץ דם
12	דופק
12	סטורציה

הוראות למתן תרופות:

תצורה	תרופה	י. מ.	מינון	X	מתן	למשך	SOS	תוספת	זמן התחלה
	Optalgin	MG	1000	D 1/4	I.V/P.O	D 5	ק		08/12/09
SIN	PRAMIN INJECTION	MG	10	D 1/4	I.V	D 1	ק		08/12/09
	Phenergan	MG	25	D 1/2	I.V	D 1	ק		08/12/09
IV/IM	Oxytocin 10 IU	IU	10	hr 1/8	I.V	D 1		Hartman - Ringer Lactate - cc 1000 ML/hr 120	08/12/09

הערות לתרופות:

תרופה	הערות
Optalgin	לא יותר מ-4 פעמים ליום

רגישות לתרופות:

חתימה:



Shaare Zedek  
Medical Center, Jerusalem

## “Risk Groups” for prolonged monitoring!!!

- Moderate or severe systemic diseases
- Opioid tolerance (prolonged opioids treatment or abuse)
- Obesity
- Sleep apnea
- Magnesium therapy

Don't feel comfortable - don't use



Don't feel comfortable – keep in PACU for 24h





Shaare Zedek  
Medical Center, Jerusalem



178 kg



182 kg

# Usage of spinal morphine for CS in uncommon conditions

## [Anesthesia for obstetric patients with Gaucher disease: survey and review.](#)

Ioscovich A, Elstein Y, Halpern S, Vatashsky E, Grisaru-Granovsky S, Elstein D.  
Int J Obstet Anesth. 2004 Oct;13(4):244-50

## [Peripartum anesthetic management of patients with Takayasu's arteritis: case series and review.](#)

Ioscovich A, Gislason R, Fadeev A, Grisaru-Granovsky S, Halpern S.  
Int J Obstet Anesth. 2008 Oct;17(4):358-64.

## [Anesthesia for cesarean section in a patient with Holt-Oram syndrome.](#)

Ioscovich A, Akoury H, Sternberg L, Halpern S.  
Int J Obstet Anesth. 2007 Jan;16(1):86-8.

## [Combined general anesthesia and postoperative spinal analgesia for cesarean section in a patient with critical aortic stenosis.](#)

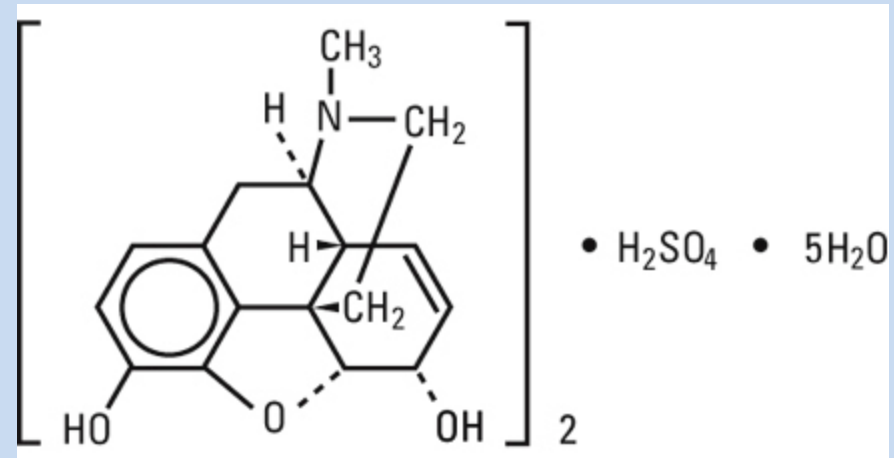
Ioscovich A, Nyman DJ.  
Int J Obstet Anesth. 2006 Oct;15(4):335-6.

## [Perioperative anaesthetic management of high-order repeat caesarean section: audit of practice in a university-affiliated medical centre.](#)

**Ioscovich A, Mirochnitchenko E**, Halpern S, Samueloff A, Grisaru-Granovsky S, Gozal Y, Einav S.  
Int J Obstet Anesth. 2009 Oct;18(4):314-9.



# Preservative free Morphine !!!



**Neurotoxic effect of sodium bisulfite**



Shaare Zedek  
Medical Center, Jerusalem

# Conclusion

Advantages	Disadvantages
Effective	Monitoring
Safe	Side Effects
Cheap	

Anesthesiology 2007; 106:843-63

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## *Practice Guidelines for Obstetric Anesthesia*

*An Updated Report by the American Society of Anesthesiologists Task Force on Obstetric Anesthesia\**

**Recommendations.** For postoperative analgesia after neuraxial anesthesia for cesarean delivery, neuraxial opioids are preferred over intermittent injections of parenteral opioids.



# Our case of “Post spinal MO Respiratory Depression”

35 y. old (~85kg)

12h after her second CS (Spinal anesthesia with  
150  $\mu$ gm MO)

Bradipnea ~8/min and low SaO<sub>2</sub> - 86-88%

Push Naloxone 0.2mg

Blood Gases : pH 7.32 PCO<sub>2</sub>- 55 HCO<sub>3</sub> – 28 PO<sub>2</sub> - 60

Transfer to Recovery Room

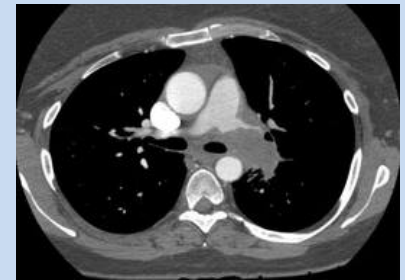
Second push of Naloxone → Naloxone drip

No changes in respiratory rate (10/min → 12/min)

Spiral CT



**Chronic PE**



**ORIGINAL ARTICLES**

**National Survey of Postoperative Pain Control after Cesarean Delivery**

Sharon Orbach-Zinger, Alexander Ioscovich, Amir Aviram, Sergei Babytz, Shai Fein, Alon Reuveni and Leonid A. Eidelman

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Click on the icon on the upper right hand side for the article written by Sharon Orbach-Zinger MD, Alexander Ioscovich MD, Amir Aviram MD, Sergei Babytz MD, Shai Fein MD, Alon Reuveni MD and Leonid A. Eidelman MD.  
IMAJ 2014; 16: Mars: 153-156

**ABSTRACT**

**Background:** Postoperative pain is a common problem after cesarean deliveries.

**Objectives:** To characterize common obstetric anesthesia practices after cesarean deliveries in Israel in order to standardize postoperative pain relief protocols.

**Methods:** A questionnaire was completed during an interview with every obstetric anesthesia unit in all 25 delivery wards in Israel. Data were gathered on intraoperative anesthesia and analgesia protocols as well as postoperative pain relief protocols. A sub-analysis compared units whose director completed a formal obstetric anesthesia training program with those whose directors did not.

**Results:** Neuraxial morphine was used routinely in 12% of hospitals. No unit providing intrathecal morphine complied with American Society of Anesthesiologists guidelines for respiratory monitoring after use of neuraxial opioids. Additionally, non-steroidal anti-inflammatory drugs (NSAIDs) were used routinely in only half the wards, while patient-controlled analgesia was used infrequently. Postoperative verbal analog scores were not recorded routinely in 71% of units on postoperative day 1. The unit director's training significantly influenced the unit protocols.

**Conclusions:** Intrathecal morphine, the gold standard of care in cesarean deliveries, is rarely used, mainly due to shortage of staff and lack of formal obstetric anesthesia training. In addition, NSAIDs are also underused. There is a need for more formal training for obstetric anesthesiologists in Israel.



**החוג להרדמה מיילדותית, איגוד הרופאים המרדמים בישראל**  
**Israel Association of Obstetric Anesthesia**

**Post Cesaren Section pain treatment - 30,000 decisions in Israel annually**

יום שישי, 15.2.2013, בבית סוראסקי, תל השומר.

Ruth Landau, MD אורח כבוד

Professor of Anesthesiology, Director of Obstetric Anesthesia and Clinical Genetics Research

Department of Anesthesiology and Pain Medicine, University of Washington  
מנחה ד"ר יוסקוביץ', יו"ר חוג להרדמה מיילדותית

9:00-8:30 התכנסות וארוחת בוקר  
9:10-9:00 דברי פתיחה

Prof. Ruth Landau **Genetics and pain** -9:40-9:10

**Post CS treatment by systemic opioids and adjuvant** - 9:40-10:10  
ד"ר יואל שפירא, המרכז הרפואי הדסה, ירושלים

**Neuroaxial Morphine in obstetric anesthesia** - 10:10-10:40  
ד"ר יוסקוביץ', המרכז הרפואי שערי צדק, ירושלים

10:40-11:00 הפסקת קפה

**Continuous wound infiltration for post CS pain** - 11:00-11:30  
פרופ' בריאן פרידמן, המרכז הרפואי מאיר, כפר סבא

Prof. Ruth Landau **Post CS chronic pain** -11:30-12:00

**Post Cesarean Section pain control in Israel: a nationwide survey.** - 12:00-12:20

ד"ר שרון אורבך-זינגר, המרכז הרפואי רבין, פתח תקווה

Year	2012	2016
<b>Neuroaxial MO for CS</b>	<b>12% Obstetric Units</b>	<b>32% Obstetric Units</b>

**Thank you  
and welcome to Israel!**

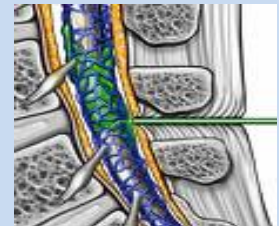




## Side-effects after spinal MO (general population)

Pruritus	~ 35%
Vomiting and Nausea	~20%
Urinary retention	~ 17%
Respiratory depression	up to 3%

Risks and side-effects of intrathecal morphine combined with spinal anaesthesia: a meta-analysis. Gehling M.  
*Anaesthesia* 2009;64:643-651



## Patient for CS with General Anesthesia

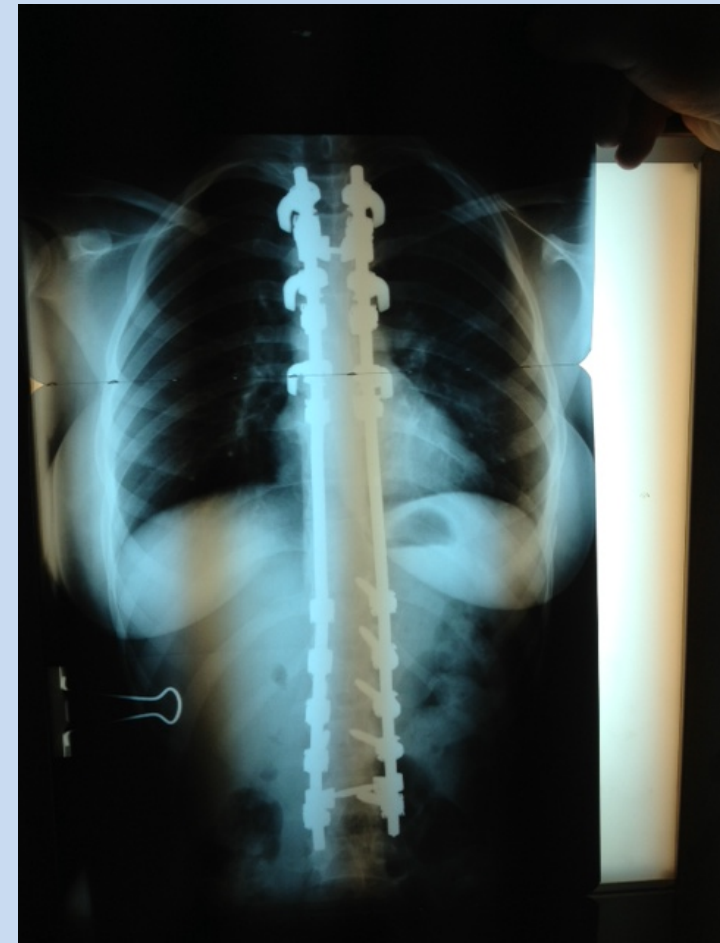
- 23 y old 140sm/47kg
- 1-st pregnancy
- Severe congenital scoliosis
- s/p 2-3 ribs removing
- Severe restrictive lung diseases
  - FVC 30%







- 22 –y old
- 38<sup>th</sup> week of her 1nd pregnancy
- s/p Correction of Severe Scoliosis



**The patient was schedule for Cesarean Section under General Anesthesia.  
What will be our tactic for postop pain treatment?**



# “PainBuster” Pain Relief System

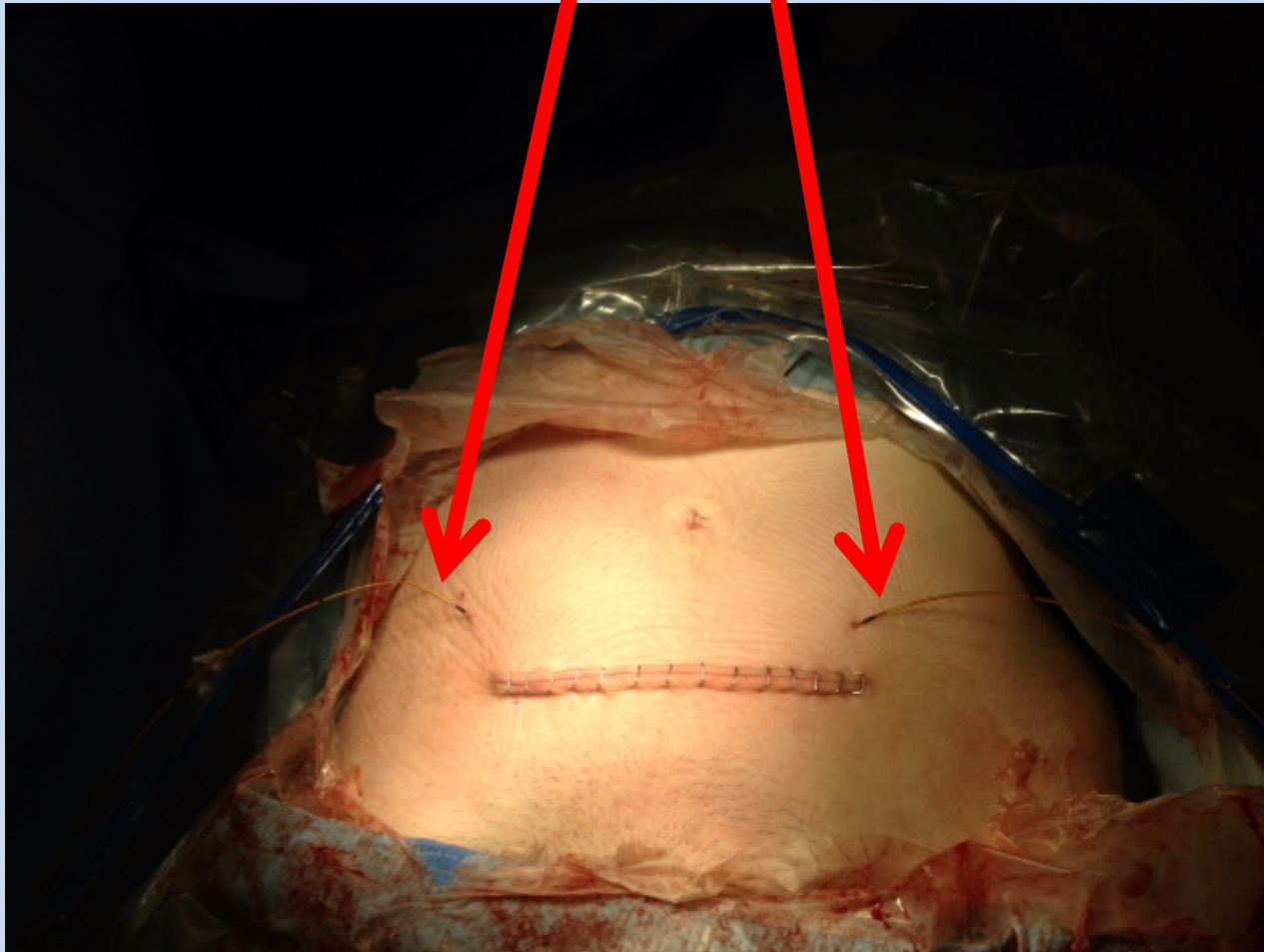


Continuous wound infiltration  
4mL/h  
0.25% Bupivacaine  
For 72h

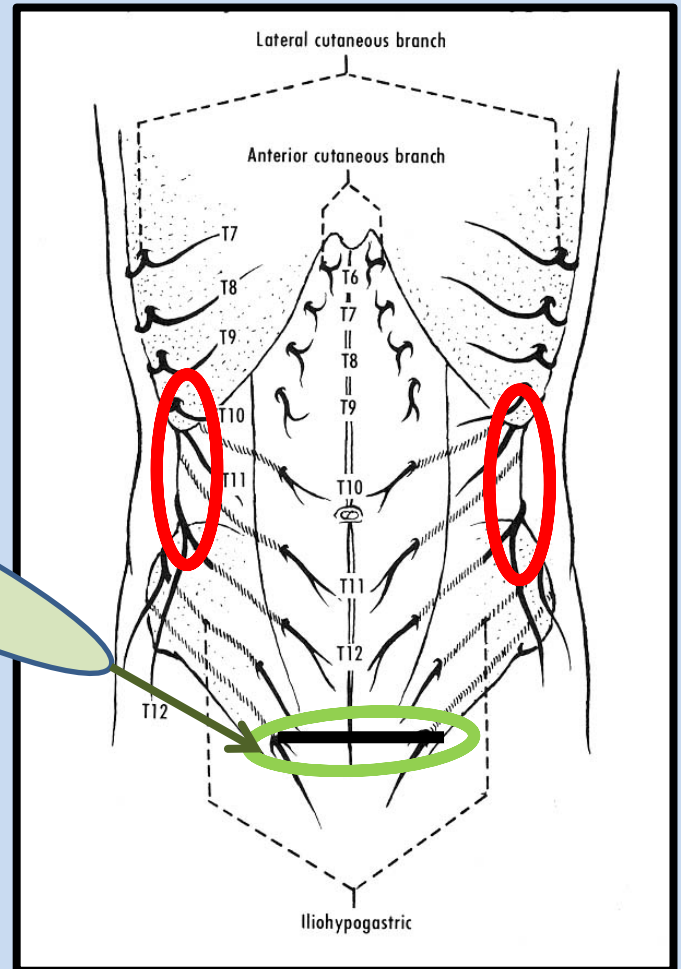
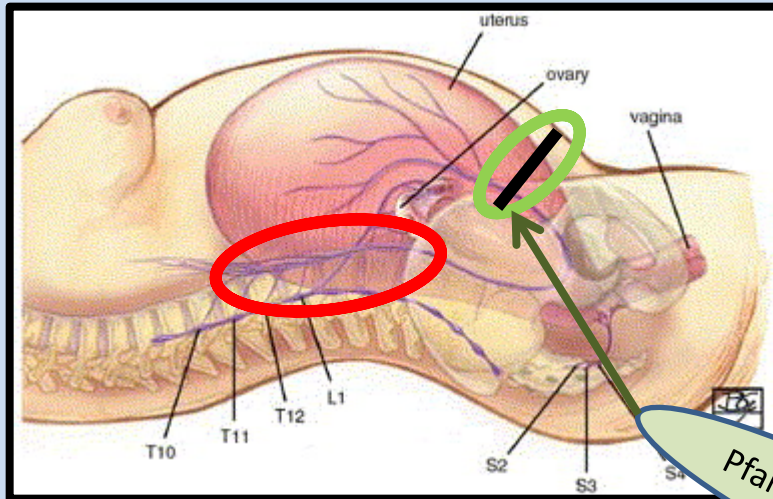


For 72h post op period  
1 gm IV/PO Optalgin or  
1gm IV/PO Paracetamol up to 3 times  
VAS -1-3

# Catheters for Continuous wound infiltration

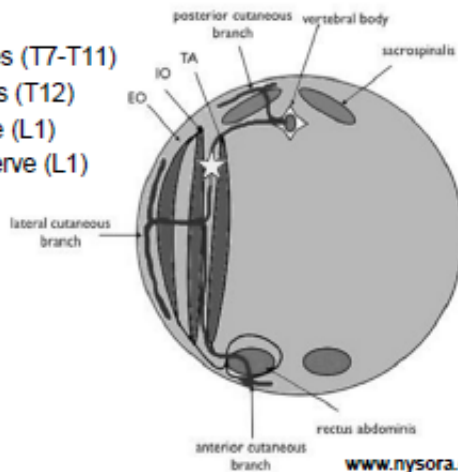


# Transversus Abdominis Plane (TAP) Block



## Nerves to be Blocked:

- Intercostal nerves (T7-T11)
- Subcostal nerves (T12)
- Iliioinguinal nerve (L1)
- Iliohypogastric nerve (L1)



# Transversus Abdominis Plane (TAP) Block

2001: Dr RAFI introduces a simple but novel concept

- “Novel approach to block the lower intercostal nerves and iliohypogastric and ilioinguinal...as they travel between internal oblique and transversus”
- Use of triangle of Petit: “because it is the only place where the internal oblique can be localized directly”



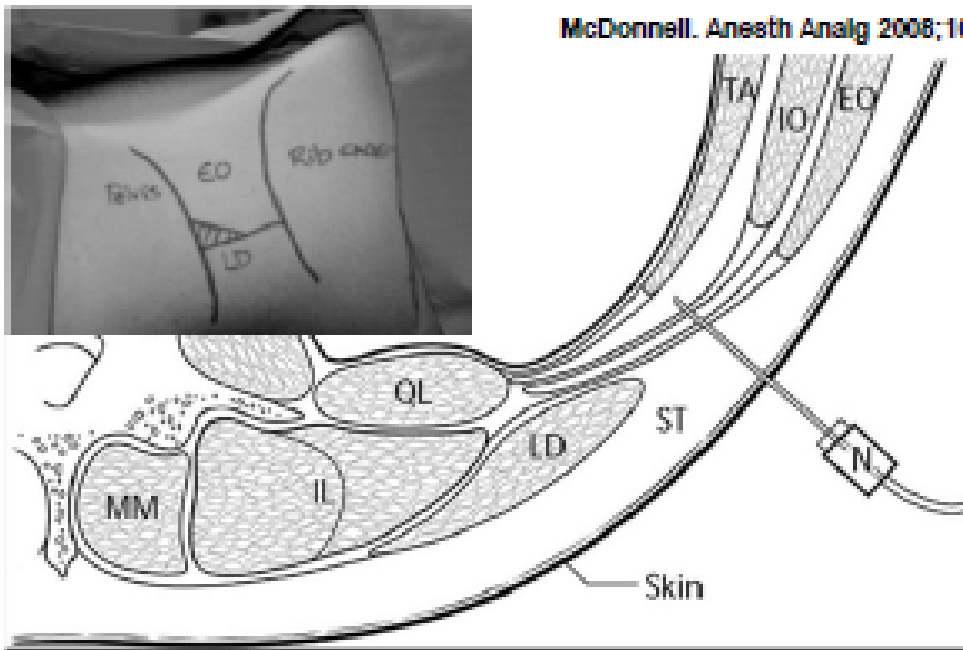
**Figure 4.** Surface anatomy labelled for landmark insertion of TAP block in an adult male in the supine position

# Techniques

## Landmark/ Blind through the **triangle of Petit** and Ultrasound technique

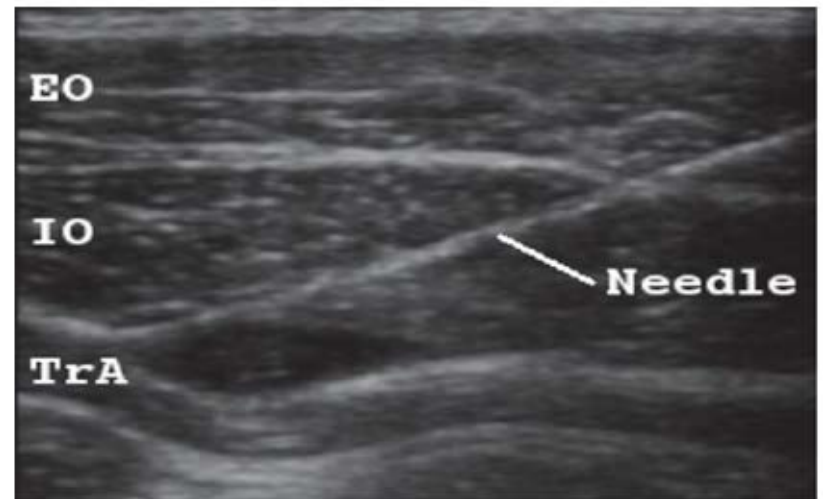
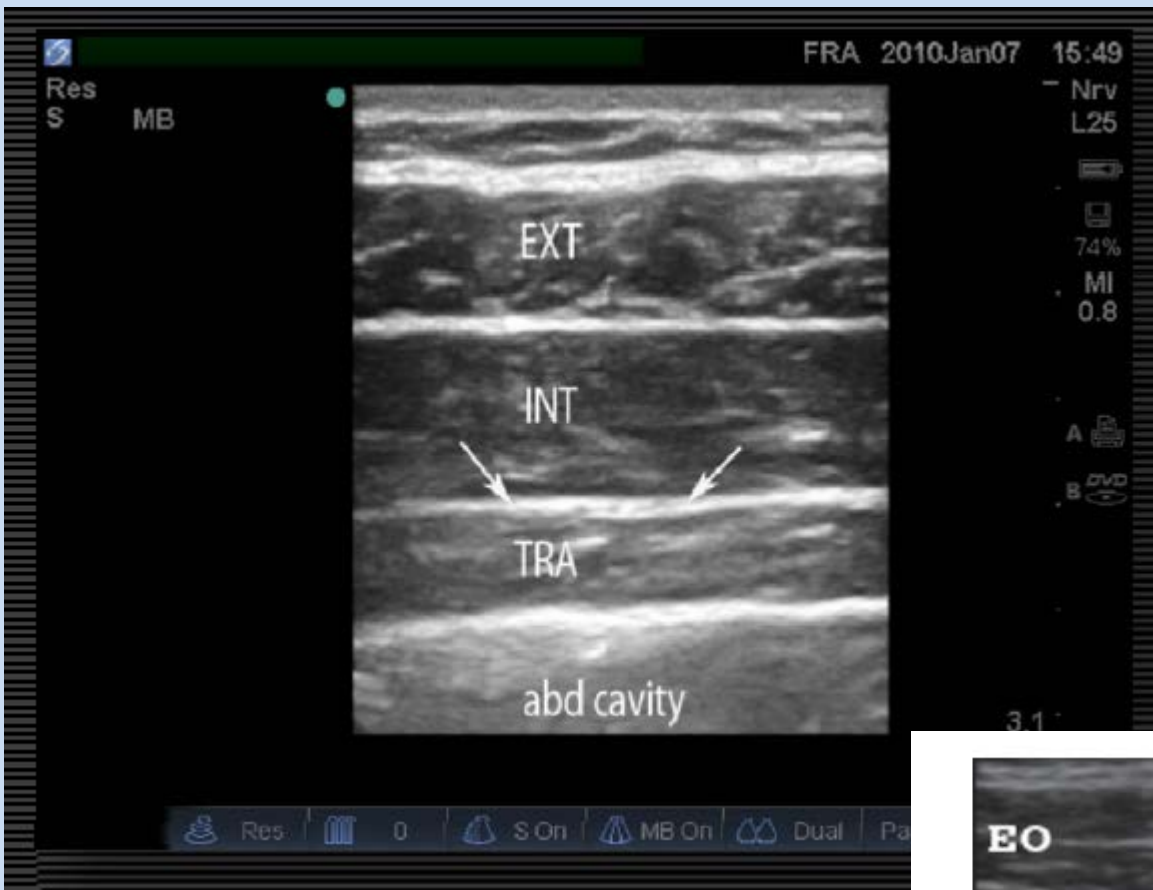
### Transversus Abdominis Plane Block *Blind Technique*

McDonnell. *Anesth Analg* 2008;106:186-91



**Figure 4.** Surface anatomy labelled for landmark insertion of TAP block in an adult male in the supine position

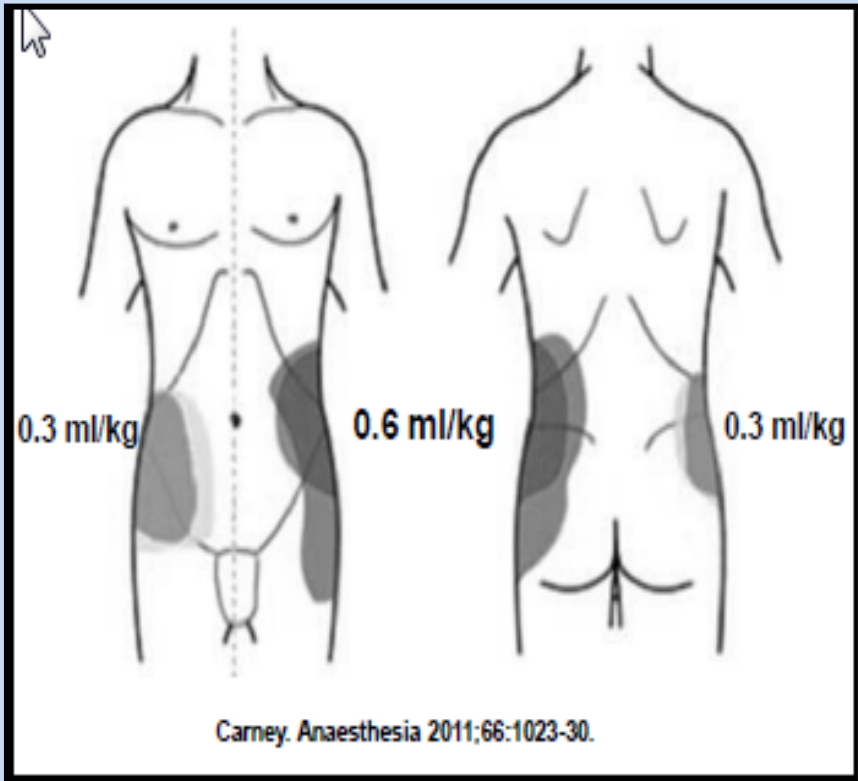
# Ultrasound technique



**Figure 7.** Ultrasound image during initial injection of 5ml local anaesthetic. Injectate is in the transversus plane and alters the muscle layer appearance. EO: external oblique, IO: internal oblique, TrA: transversus abdominis



# Dosage



***This is a high volume block!***

**Calculate dosage to avoid local anesthesia toxicity!**

- **Bilateral 20 cc bupivacaine 0.25%**
- **Bilateral 20cc ropivacaine 0.5%**
- **Bilateral 30cc ropivacaine 0.375%**

J of Anesth, 2011  
IJOA, 2010

# How effective is this TAP block???

Two meta analysis in 2012

Mishriky et al , CJA 2012

Abdallah et al, BJA 2012



## **TAP versus Placebo (No ITM)**

Significantly Reduced at 6, 12 hours

No difference at 48 hours

Controversy about 24 hours

## **TAP versus Placebo (With ITM)**

No difference 6, 12, 24, 48 hours

# Discussion!!!

