

# Avances en analgesia multimodal tras cirugía pediátrica

Valencia, 28 de octubre de 2014

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*Madrid*

# ¿Es importante el dolor tras la cirugía pediátrica?

## The New England Journal of Medicine

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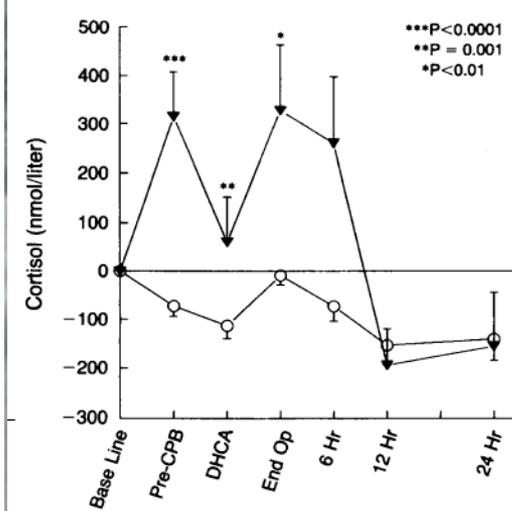
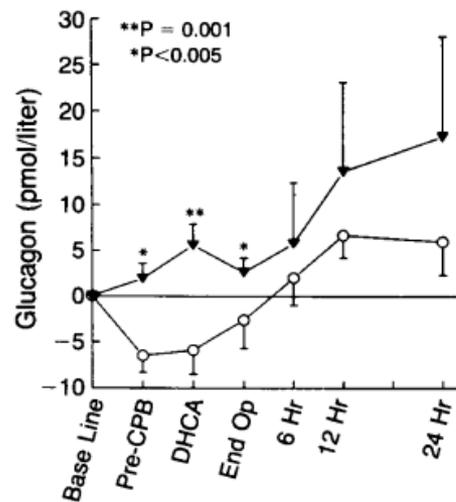
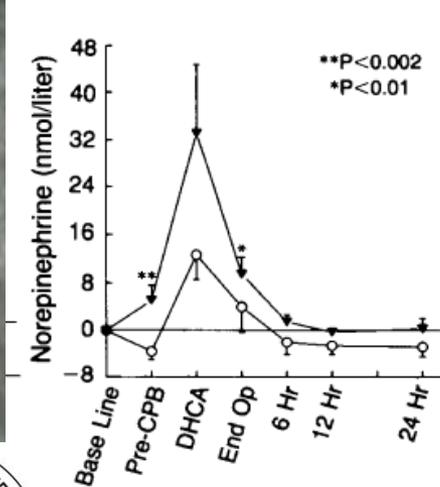
Volume 326

JANUARY 2, 1992

Number 1

### HALOTHANE-MORPHINE COMPARED WITH HIGH-DOSE SUFENTANIL FOR ANESTHESIA AND POSTOPERATIVE ANALGESIA IN NEONATAL CARDIAC SURGERY

K.J.S. ANAND, M.B., B.S., D.PHIL., AND P.R. HICKEY, M.D.



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### HALOTHANE-MORPHINE COMPARED WITH HIGH-DOSE SUFENTANIL FOR ANESTHESIA AND POSTOPERATIVE ANALGESIA IN NEONATAL CARDIAC SURGERY

K.J.S. ANAND, M.B., B.S., D.PHIL., AND P.R. HICKEY, M.D.

Table 4. Postoperative Complications and Outcome in the Two Groups of Neonates.\*

FINDING	HALOTHANE GROUP (N = 15)	SUFENTANIL GROUP (N = 30)	P VALUE†
Hypotension	11 (73)	13 (43)	0.055
Arrhythmias	7 (47)	6 (20)	0.154
Sepsis or necrotizing enterocolitis	3 (20)	0	0.032
Disseminated intravascular coagulation	3 (20)	0	0.032
Seizures	4 (27)	3 (10)	0.154
Metabolic acidosis	4 (27)	0	0.009

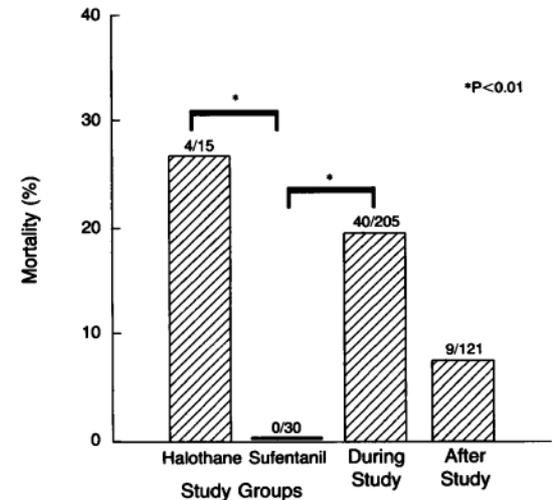


Figure 5. Mortality in the Study Groups and Hospital Mortality in All Neonates Undergoing Cardiopulmonary Bypass and Hypothermic Circulatory Arrest during the Study Period (July 1985 to December 1987) and afterward (July 1990 to June 1991).



# ¿Es importante el dolor tras la cirugía pediátrica?

Outpatient tonsillectomy in children: a 7-year experience.

Hanss J, Nowak C, Deoaux A, Penon C, Bobin S.

Eur Ann Otorhinolaryngol Head Neck Dis. 2011 Dec;128(6):283-9.

**Pain and bleeding are the main determinants of unscheduled contacts after outpatient tonsillectomy.**

Ove sen T, Kamarasukas G, Dahl M, Mainz J.

Dan Med J. 2012 Feb;59(2):A4382

**Reingresos  
(n=276)  
4.2%**

**Consultas  
(n=614)  
23%**

**Sangrado  
2.8%**

**Sangrado  
4%**

**Dolor  
1.4%**

**Dolor  
12%**



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# ¿Es importante el dolor tras la cirugía pediátrica?

## Postoperative management following sphincter pharyngoplasty.

Kilpatrick LA, Kline RM, Hufnagle KE, VanIue MJ, White DR.

Otolaryngol Head Neck Surg. 2010 Apr; 142(4):562-5

**75%**

## Combined regional and general anesthesia for ambulatory peripheral orthopedic surgery in children

Claudine E.L. Khoury<sup>a</sup>, Christine Dagher<sup>a</sup>, Ismat Ghanem<sup>b</sup>, Nicole Naccache<sup>a</sup>, Dolly Jawish<sup>a</sup> and Patricia Yazbeck<sup>a</sup>

Journal of Pediatric Orthopaedics B 2009, 18:37-45

**85%**

Table 8 Distribution of patients needing tramadol according to the type of surgery

Type of surgery	Number of patients needing tramadol
Soft tissue procedures	
Clubfoot	6/18
Tenotomies	3/14
Tendon transfers	2/4
Bony procedures	
Osteotomy	4/18
Fracture fixation	2/3
Limb lengthening	2/2

it scores and good postoperative comfort were observed.  
 if Parents' satisfaction was greater than eight out of 10 in  
 88.3% of the cases, and 85% of the parents would choose  
 ambulatory surgery in case of a second procedure. RA  
 used with level I or II analgesics is compatible with  
 e ambulatory peripheral pediatric orthopedic surgery.



# ¿Podemos predecir el dolor tras la cirugía pediátrica?

## pediátrica?



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# ¿Podemos predecir el dolor tras la cirugía pediátrica?

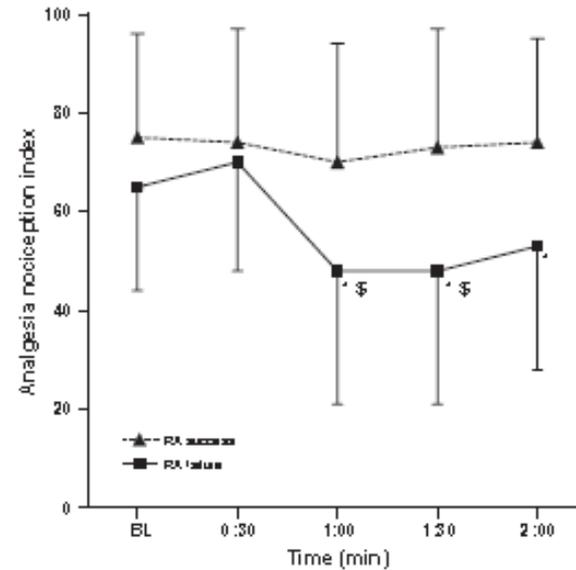
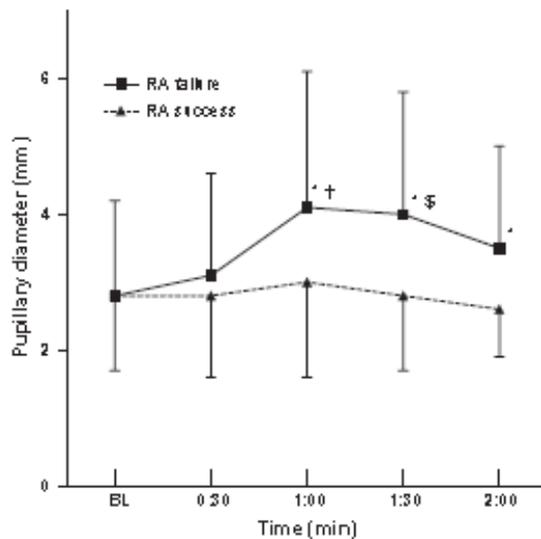
## Pediatric Anesthesia

Pediatric Anesthesia ISSN 1155-5645

ORIGINAL ARTICLE

### Pupillary reflex dilatation and analgesia nociception index monitoring to assess the effectiveness of regional anesthesia in children anesthetised with sevoflurane

Anne Migeon<sup>1</sup>, François Pierrick Desgranges<sup>1</sup>, Dominique Chassard<sup>1</sup>, Benjamin J. Blaise<sup>1</sup>, Mathilde De Queiroz<sup>1</sup>, Adrienne Stewart<sup>2</sup>, Jean Christophe Cejka<sup>1</sup>, Sylvie Combet<sup>1</sup> & Ossam Rhondali<sup>1</sup>



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# ¿Podemos predecir el dolor tras la cirugía pediátrica?



**BJA** BIA  
British Journal of Anaesthesia

ABOUT THIS JOURNAL CONTACT THIS JOURNAL SUBSCRIPTIONS CURRENT ISSUE

Oxford Journals > Medicine & Health > BJA > E-Letter

Published April 14, 2014

**Immediate Postoperative Pain can also be predicted by Pupillary Pain Index in Children** ▲

**Diana Ly-Liu, Anaesthesia Resident Francisco Reinoso-Barbero**  
Hospital Universitario Ramon y Cajal



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# Escalas observacionales

- CHEOPS
- NIPS
- CRIES
- FLACC



NIPS	Neonatal Infant Pain Scale		
	0 point	1 point	2 points
Facial expression	Relaxed	Contracted	-
Cry	Absent	Mumbling	Vigorous
Breathing	Relaxed	Different than basal	-
Arms	Relaxed	Flexed/stretched	-
Legs	Relaxed	Flexed/stretched	-
Alertness	Sleeping/calm	Uncomfortable	-

Maximal score of seven points, considering pain  $\geq 4$ .



# Escalas observacionales

- CHEOPS
- NIPS
- CRIES
- FLACC

	DATE/TIME								
<b>Crying</b> - Characteristic cry of pain is high pitched. 0 - No cry or cry that is not high-pitched 1 - Cry high pitched but baby is easily consolable 2 - Cry high pitched but baby is inconsolable									
<b>Requires O<sub>2</sub> for SaO<sub>2</sub> &lt; 95%</b> - Babies experiencing pain manifest decreased oxygenation. Consider other causes of hypoxemia, e.g., oversedation, atelectasis, pneumothorax) 0 - No oxygen required 1 - < 30% oxygen required 2 - > 30% oxygen required									
<b>Increased vital signs (BP* and HR*)</b> - Take BP last as this may awaken child making other assessments difficult 0 - Both HR and BP unchanged or less than baseline 1 - HR or BP increased but increase in < 20% of baseline 2 - HR or BP is increased > 20% over baseline.									
<b>Expression</b> - The facial expression most often associated with pain is a grimace. A grimace may be characterized by brow lowering, eyes squeezed shut, deepening naso-labial furrow, or open lips and mouth. 0 - No grimace present 1 - Grimace alone is present 2 - Grimace and non-cry vocalization grunt is present									
<b>Sleepless</b> - Scored based upon the infant's state during the hour preceding this recorded score. 0 - Child has been continuously asleep 1 - Child has awakened at frequent intervals 2 - Child has been awake constantly									
<b>TOTAL SCORE</b>									



# Escalas observacionales

- CHEOPS
- NIPS
- CRIES
- FLACC

Medscape® [www.medscape.com](http://www.medscape.com)

Categories	Scoring*		
	0	1	2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant frown, quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid, or jerking
Cry	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging, or being talked to; distractible	Difficult to console or comfort

**Note:** \*Each of the five categories Face (F), Legs (L), Activity (A), Cry (C), and Consolability (C) is scored from 0-2, which results in a total score between 0 and 10.

**Note:** From Merkel, Voepel-Lewis, Shayevitz, & Malviya (1997). The FLACC: A behavioral scale for scoring postoperative pain in young children. *Pediatric Nursing*, 23(3), 293-297.

Source: *Pediatr Nurs* © 2003 Jannetti Publications, Inc.



# Escala LLANTO

ARTICLE IN PRESS

An Pediatr (Barc). ■■■■(■):■■■-■■■



ELSEVIER  
DOYMA

ANALES DE PEDIATRÍA

www.elsevier.es/anpediatr



ORIGINAL BREVE

## Escala LLANTO: instrumento español de medición del dolor agudo en la edad preescolar

F. Reinoso-Barbero\*, A.I. Lahoz Ramón, M.P. Durán Fuente,  
G. Campo García y L.E. Castro Parga

*Unidad de Dolor Infantil, Servicio de Anestesiología Infantil, Hospital Universitario La Paz, Madrid, España*

Recibido el 12 de abril de 2010; aceptado el 12 de agosto de 2010



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# Escala LLANTO

<b>LL</b> ANTO	No llora	 Hospital Universitario La Paz Comunidad de Madrid
<b>A</b> CTITUD <b>P</b> SICOLÓGICA	Dormido o tranquilo	
<b>N</b> ORMORRESPIRACIÓN	Rítmica o pausada	
<b>T</b> ONO <b>P</b> OSTURAL	Relajado	
<b>O</b> BSERVACIÓN <b>F</b> ACIAL	Contento o dormido	



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# ¿Es fiable la colaboración de los familiares?



**SI, PERO...**



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# ¿Es fiable la colaboración de los familiares?

## Parental Postoperative Pain Management: Attitudes, Assessment, and Management

PEDIATRICS Volume 125, Number 6, June 2010



**WHAT'S KNOWN ON THIS SUBJECT:** Previous research demonstrated that after outpatient surgery, many parents do not provide their children with prescribed analgesics. Reasons for undertreating may be related to attitudinal barriers in parents, such as incorrect knowledge and misconceptions regarding pain management for children.



**WHAT THIS STUDY ADDS:** This study demonstrated that parents provided few doses of postoperative analgesics. Many parents reported misconceptions regarding the utility and safety of analgesia. Parents who had more misconceptions about analgesia use in children provided fewer doses of analgesics at home.

**AUTHORS:** Rachel Yaffa Zisk Rony, PhD, RN, MPH,<sup>a</sup> Michelle A. Fortier, PhD,<sup>b,c</sup> Jill MacLaren Chorney, PhD,<sup>b</sup> Danielle Perret, MD,<sup>b</sup> and Zeev N. Kain, MD, MBA<sup>b,c,d,e</sup>

<sup>a</sup>Department of Family Medicine, University of Wisconsin-Madison, Madison, Wisconsin; Departments of <sup>b</sup>Anesthesiology and Perioperative Care, <sup>c</sup>Pediatrics, and <sup>d</sup>Psychiatry and Human Behavior, University of California-Irvine, Irvine, California; and <sup>e</sup>Department of Psychology, Children's Hospital of Orange County, Orange, California

### KEY WORDS

children, postoperative pain, pain assessment, pain management, attitudinal barriers, parents

### ABBREVIATIONS

PPEP—Parental Pain Expression Perceptions  
MAQ—Medication Attitude Questionnaire  
PPPM—Parent Postoperative Pain Measure



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# Fiabilidad parental

- > Edad de los niños<sup>1,2</sup>
- = Sexo parental<sup>3</sup>
- Tipo de dolor: D. agudo = infraestiman<sup>4</sup>
- Experiencia: Niños discapacitados<sup>5</sup>

1. Singer AJ, Gulla J, Thode HC Jr. Parents and practitioners are poor judges of young children's pain severity. *Acad Emerg Med* 2002; 9: 609-12
2. Kelly AM, Powell CV, Williams A. Parent visual analogue scale ratings of children's pain do not reliably reflect pain reported by child. *Pediatr Emerg Care* 2002; 18: 159-62.
3. Rosenbloom E, Goldman M, Konki N, Edelman S, Baram W, Kozler E. Parental sex and age: their effect on pain assessment of young children. *Pediatr Emerg Care* 2011; 27: 266-9.
4. Chambers CT, Giesbrecht K, Craig KD, Bennett SM, Huntsman E. A comparison of faces scales for the measurement of pediatric pain: children's and parents' ratings. *Pain* 1999; 83: 25-35.
5. Voepel-Lewis T, Malviya S, Tait AR. Validity of parent ratings as proxy measures of pain in children with cognitive impairment. *Pain Manag Nurs* 2005; 6: 168-74



# ¿Paracetamol o metamizol?

Braz J Otorhinolaryngol.  
2013;79(1):89-94.

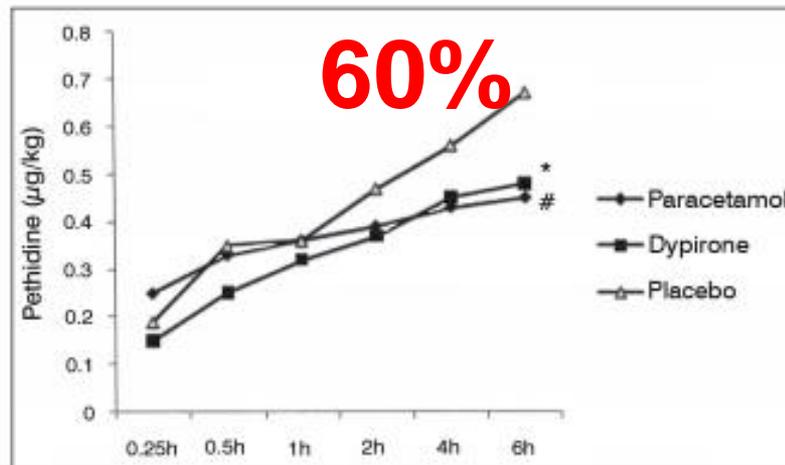
DOI: 10.5935/1808-8694.20130015

BJORL.org

ORIGINAL ARTICLE

## Intravenous paracetamol and dipyron for postoperative analgesia after day-case tonsillectomy in children: a prospective, randomized, double blind, placebo controlled study

Aysu Inan Kocum<sup>1</sup>, Mesut Sener<sup>1</sup>, Esra Caliskan<sup>1</sup>, Nesrin Bozdogan<sup>1</sup>, Deniz Micozkadioglu<sup>2</sup>, Ismail Yilmaz<sup>2</sup>, Anis Aribogan<sup>3</sup>



**Figure 3.** Cumulative pethidine requirement. Data expressed as mean  $\pm$  SD. \* Dypirone significantly decrease pethidine requirement compared to placebo ( $p$ : 0.03). # Paracetamol significantly decrease pethidine requirement compared to placebo ( $p$ : 0.01).



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# ¿Utilizar opiáceos potentes?



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# ¿Utilizar opiáceos potentes?

*Pain Medicine 2012; 13: 472–483  
Wiley Periodicals, Inc.*

## A Descriptive Feasibility Study to Evaluate Scheduled Oral Analgesic Dosing at Home for the Management of Postoperative Pain in Preschool Children Following Tonsillectomy

	Yes % (N)	No % (N)	Unsure % (N)
Did your child have more pain after his/her surgery than you expected?	23.4 (11)	74.5 (35)	2.1 (1)
Did you feel adequately prepared to manage your child's pain at home after surgery?	93.6 (44)	6.45 (3)	0 (0)
Do you think that the pain medicine helped your child?	95.7 (45)	4.3 (1)	0 (0)
Do you think your child's pain management could have been improved?	4.3 (2)	0 (0)	14.9 (7)



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# ¿Utilizar opiáceos potentes?

*Pain Medicine 2012; 13: 472-483  
Wiley Periodicals, Inc.*

## A Descriptive Feasibility Study to Evaluate Scheduled Oral Analgesic Dosing at Home for the Management of Postoperative Pain in Preschool Children Following Tonsillectomy

	Time Point			
	Day of Surgery % (N)	POD1 % (N)	POD2 % (N)	POD3 % (N)
Daytime sedation	35.5 (16)	8.9 (4)	15.5 (7)	8.9 (4)
Nausea	26.7 (12)	28.9 (13)	24.4 (11)	8.9 (4)
Vomiting	22.7 (10)	13.6 (6)	15.9 (7)	2.3 (1)
Constipation	2.4 (1)	19.0 (8)	16.7 (7)	11.9 (5)
Light-headedness, feeling dizzy	13.9 (6)	9.3 (4)	2.3 (1)	2.3 (1)
Nightmares	0	0	2.3 (1)	2.3 (1)

POD = postoperative day.

# 52%



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# ¿Nuevos opiáceos?

Journal of Clinical Anesthesia (2011) 23, 53–57



ELSEVIER

Journal of  
Clinical  
Anesthesia

# 60%

Original contribution

## The efficacy of intravenous paracetamol versus tramadol for postoperative analgesia after adenotonsillectomy in children

Hale Yarkan Uysal MD (Specialist in Anesthesiology)\*,

**Table 2** Recovery and analgesic requirements in the study groups

Variable	Paracetamol group (n = 32)	Tramadol group (n = 32)	P-value
Aldrete score at PACU admission	10 (6-10)	10 (8-10)	0.767
No. of patients requiring rescue analgesia (%)	10 (31.2)	9 (28.1)	0.784
Time to first rescue analgesia (min)	10.5 ± 5.98	18.88 ± 20.12	0.968

Data are medians (minimum-maximum), means ± SD, or absolute numbers of patients (%).

PACU = Postanesthesia Care Unit.



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# ¿Nuevos opiáceos?

in vivo 25: 291-296 (2011)

## 75%

### A Single Blind Controlled Comparison of Tramadol/ Paracetamol Combination and Paracetamol in Hand and Foot Surgery. A Prospective Study

A.M. SPAGNOLI<sup>1</sup>, M.I. RIZZO<sup>1</sup>, A. PALMIERI<sup>2</sup>, V. SORVILLO<sup>1</sup>, L. QUADRINI<sup>1</sup> and N. SCUDERI<sup>1</sup>

<sup>1</sup>Department of Plastic and Reconstructive Surgery, La Sapienza University of Rome, 00161 Rome, Italy;

<sup>2</sup>Department of Infectious, Parasitic and Immune-mediated Diseases (MIPI),  
National Institute of Health, 00161 Rome, Italy

Table II. Number of patients and pain score (VAS 0-4).

	Group												p-Value
	P						TP						
VAS	0	1	2	3	4	Average	0	1	2	3	4	Average	
Preoperative	0	0	0	20	37	3.649	0	0	0	19	38	3.666	0.0389
Postoperative time													
0-6 h	14	8	3	32	0	1.92	44	7	2	4	0	0.40	<0.005
6-12 h	53	3	0	11	0	0.63	54	3	0	0	0	0.05	0.4386
12-24 h	50	0	0	7	0	0.36	57	0	0	0	0	-	
24-72 h	57	0	0	0	0	-	57	0	0	0	0	-	
7 days	57	0	0	0	0	-	57	0	0	0	0	-	



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# ¿Asociamos AINES?

## Fentanyl Sparing Effects of Combined Ketorolac and Acetaminophen for Outpatient Inguinal Hernia Repair in Children

Jeong-Yeon Hong, Sang Won Han, Won Oak Kim and Hae Keum Kil\*

KETOROLAC AND ACETAMINOPHEN FOR PEDIATRIC POSTOPERATIVE PAIN

1553

**Table 2.** Postoperative consumption of fentanyl

	Control Group	KA Group	p Value
No. pts (%):			
More than 1 dose	22 (81.5)	8 (28.6)	0.001
More than 2 doses	11 (40.7)	2 (7.1)	0.000
Mean $\pm$ SD rescue fentanyl ( $\mu$ g/kg)	1.37 $\pm$ 0.2	0.54 $\pm$ 0.3	0.001

Number of patients treated and consumption dose at recovery unit were significantly lower in KA group compared to controls.

**Table 3.** Incidence of side effects

	No. Control Group (%)	No. KA Group (%)	p Value
Sedation	15 (55.6)	7 (25.0)	0.023
Vomiting	9 (33.3)	3 (10.7)	0.016
Pruritus	4 (14.8)	1 (3.6)	0.148

Sedation is based on modified Ramsay sedation scale (score higher than 4).

72%



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# ¿Analgesia basada en la anestesia regional?

**An opioid-free anaesthetic using nerve blocks enhances rapid recovery after minor hand surgery in children.**

De Windt AC, Asehmoune K, Roquilly A, Guillaud C, Le Roux C, Pinaud M, Lejus C.  
From the Service of Anaesthesiology, Hôtel-Dieu - Hôpital Mère Enfant, CHU, Nantes, France.

*Eur J Anaesthesiol.* 2010 Jun;27(6):521-5

**91%**



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# ¿Analgesia regional hasta cuando?

Successful ultrasound guidance for transversus abdomini plane blocks for postoperative analgesia after open appendectomy in children

Francisco Reinoso-Barbero, Guadalupe Población, Lina M. Builes, Luis E. Castro and Ana I. Lahoz

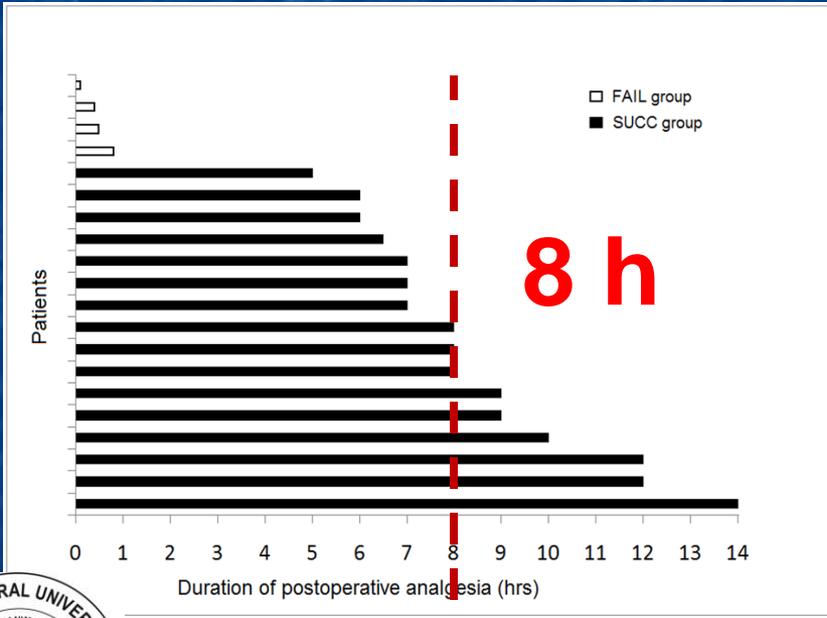
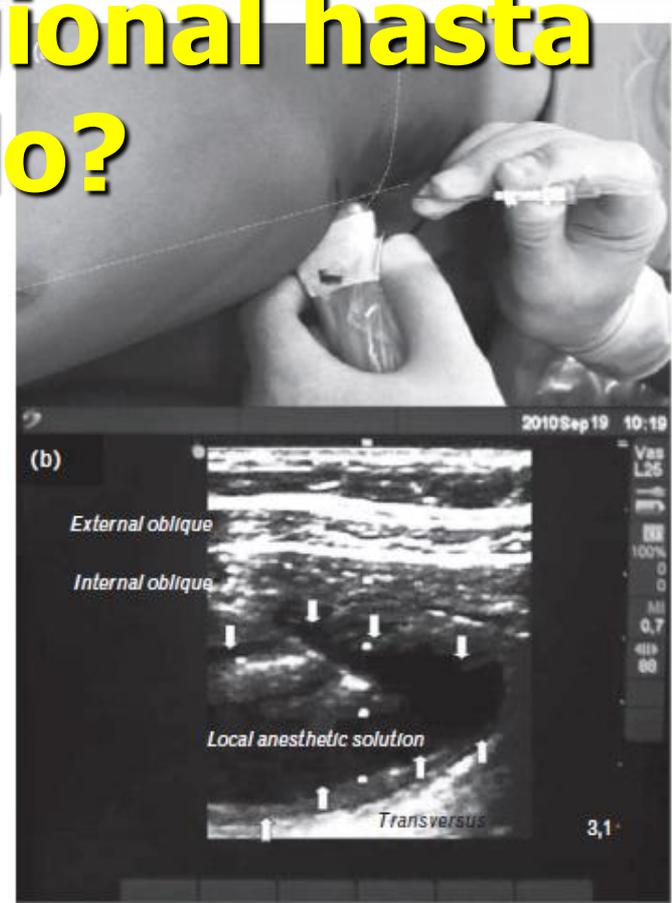


Fig. 1



Performance of transversus abdomini plane block. (a) Positioning of ultrasound probe between 12th rib and iliac crest. (b) Ultrasound image showing the spread of local anesthetic between the internal oblique muscle and the transversus muscle.



# ¿Prolongar la analgesia periférica con coadyuvantes?

Acta Anaesthesiol Scand. 2002 Aug;46(7):821-6.

**No enhancement of sensory and motor blockade by ketamine added to ropivacaine interscalene brachial plexus blockade.**

Lee IO, Kim WK, Kong MH, Lee MK, Kim NS, Choi YS, Lim SH.

Department of Anesthesia, Woo-Kyung Kim, College of Medicine, Korea University, Korea University Guro Hospital, Seoul, South Korea. [iloklee@hotmail.com](mailto:iloklee@hotmail.com)

8h



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# ¿Prolongar la analgesia periférica con coadyuvantes?

Anesthesiology 2009; 111:406-15

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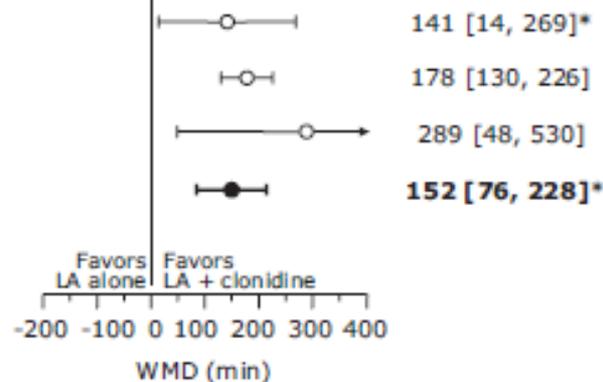
## *Clonidine as an Adjuvant to Local Anesthetics for Peripheral Nerve and Plexus Blocks*

### *A Meta-analysis of Randomized Trials*

Daniel M. Pöpping, M.D.,\* Nadia Ella, M.D., M.Sc.,† Emmanuel Marret, M.D.,‡ Manuel Wenk, M.D.,\* Martin R. Tramèr, M.D., D.Phil.§

#### Long-acting LA

Ropivacaine 150 µg <sup>20,24,26</sup>	53/53	690
Bupivacaine 150 µg <sup>12,26</sup>	35/33	954
Levo-Bupivacaine 150 µg <sup>12</sup>	20/20	1102
<b>Combined</b>	<b>108/106</b>	<b>850</b>



**10h**



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# ¿Prolongar la analgesia periférica con coadyuvantes?



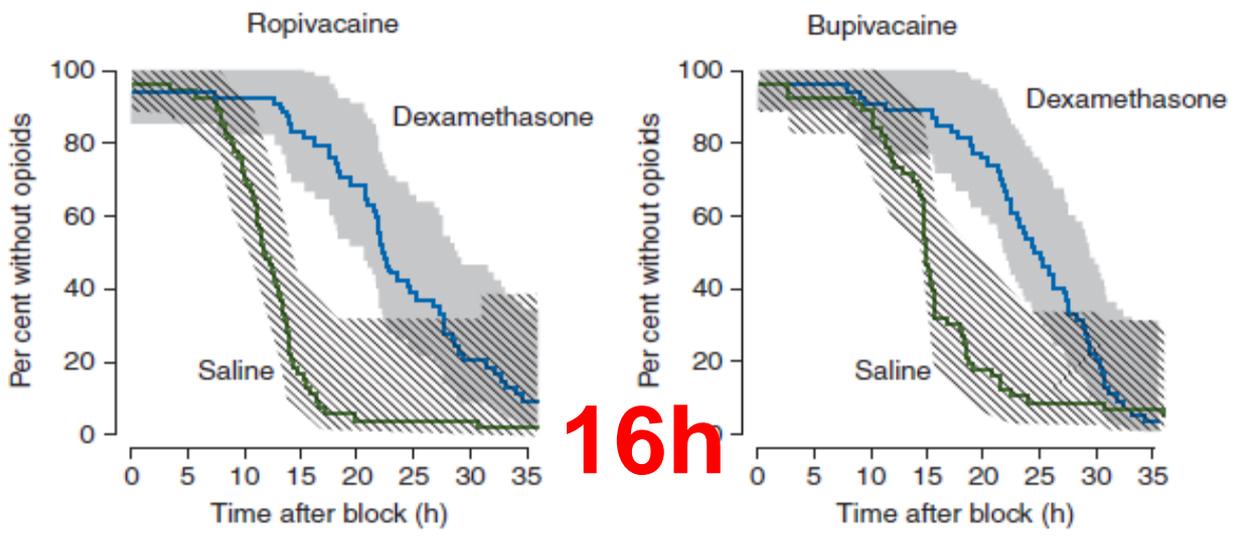
Full Text (HTML)  
**Analgesic efficacy of caudal dexamethasone combined with ropivacaine in children undergoing orchiopexy**

*Br. J. Anaesth.* (2014) 112 (5): 885-891 first published online February 2, 2014

British Journal of Anaesthesia  
Advance Access

BJA

Effect of dexamethasone on the duration of interscalene nerve blocks with ropivacaine or bupivacaine



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# ¿Prolongar la analgesia caudal con coadyuvantes?

British Journal of Anaesthesia 103 (2): 268–74 (2009)  
doi:10.1093/bja/aep159 Advance Access publication June 18, 2009

BJA

## Addition of clonidine or dexmedetomidine to bupivacaine prolongs caudal analgesia in children

A. M. El-Hennawy, A. M. Abd-Elwahab, A. M. Abd-Elmaksoud, H. S. El-Ozairy\* and S. R. Boulis

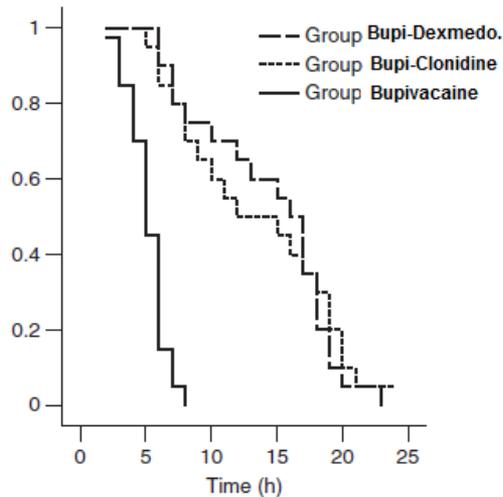


Fig 2 Kaplan–Meier survival curve of time to first analgesic stratification.

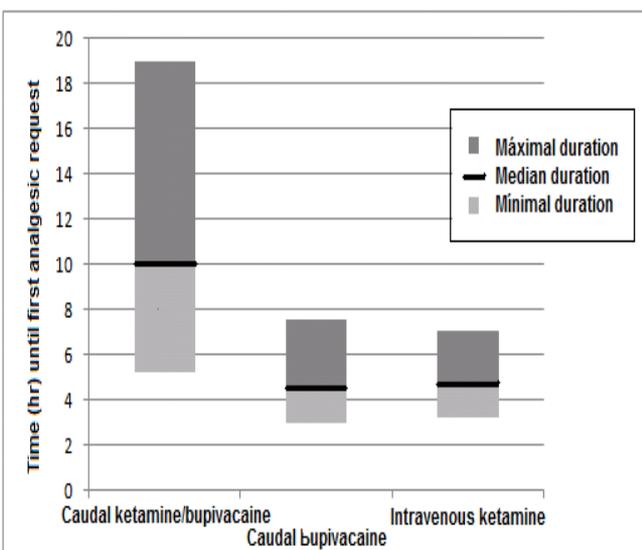
16h

British Journal of Anaesthesia 92 (3): 344–7 (2004)  
DOI: 10.1093/bja/ae076 Advanced Access publication January 22, 2004

BJA

## Double-blind randomized controlled trial of caudal versus intravenous S(+)-ketamine for supplementation of caudal analgesia in children

S. J. Martindale, P. Dix and P. A. Stoddart\*



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Valencia 28 de Octubre de 2014

# ¿Prolongar la analgesia periférica con coadyuvantes?

Mar. Drugs 2011, 9, 2717-2728; doi:10.3390/md9122717

OPEN ACCESS

Marine Drugs

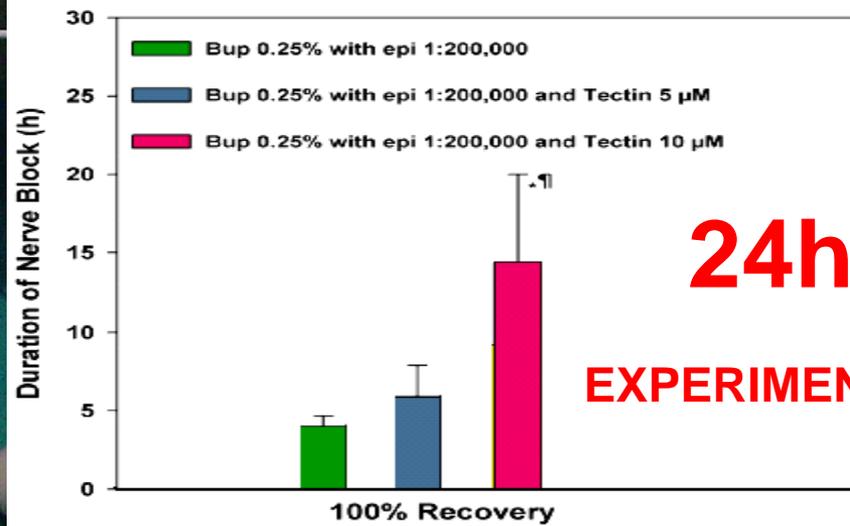
ISSN 1660-3397

www.mdpi.com/journal/marinedrugs

Article

## Tetrodotoxin-Bupivacaine-Epinephrine Combinations for Prolonged Local Anesthesia

Charles B. Berde <sup>1,\*</sup>, Umeshkumar Athiraman <sup>1</sup>, Barak Yahalom <sup>1</sup>, David Zurakowski <sup>1</sup>, Gabriel Corfas <sup>2</sup> and Christina Bognet <sup>1</sup>



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# ¿Prolongar la analgesia periférica con liposomas?

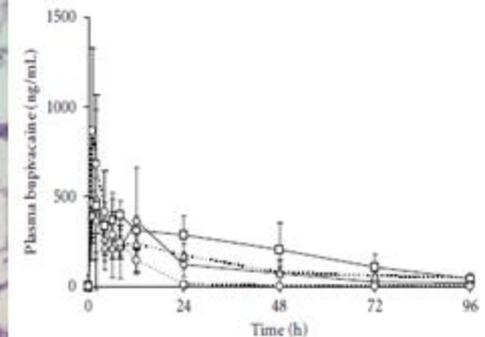
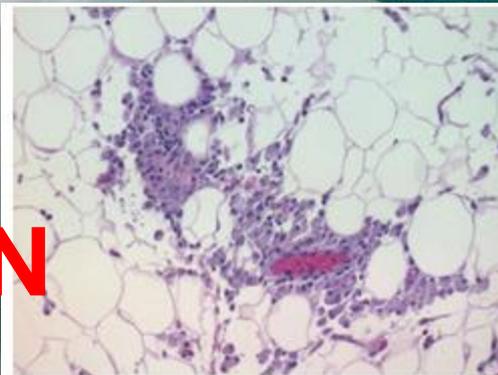


Journal of Drug Delivery  
Volume 2012, Article ID 962101, 10 pages  
doi:10.1155/2012/962101

## Research Article

### The Safety of EXPAREL® (Bupivacaine Liposome Injectable Suspension) Administered by Peripheral Nerve Block in Rabbits and Dogs

Brigitte M. Richard,<sup>1</sup> Paul Newton,<sup>2</sup> Laura R. Ott,<sup>2</sup> Dean Haan,<sup>2</sup> Abram N. Brubaker,<sup>2</sup> Phaedra I. Cole,<sup>2</sup> Paul E. Ross,<sup>2</sup> Marlon C. Rebelatto,<sup>2</sup> and Keith G. Nelson<sup>2</sup>



(a)

(b)

FIGURE 3: Mean pharmacokinetic profile of EXPAREL in dogs from 0–24 hours (a) and 0–96 hours (b).

**NO INDICACION  
PEDIATRICA**



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# ¿Prolongar con catéteres tronculares?

## 72 h

Society for Pediatric Anesthesia

Section Editor: Peter J. Davis

### Ambulatory Continuous Peripheral Nerve Blocks in Children and Adolescents: A Longitudinal 8-Year Single Center Study

Harshad Gurnaney, MBBS, MPH, F. Wickham Kraemer, MD, Lynne Maxwell, MD, Wallis T. Muhly, MD, Laura Schleelein, MD, and Arjunan Ganesh, MBBS

**BACKGROUND:** Although the role of regional anesthesia in pediatric patients has been increasing over the last few years, there are only a few small case series that describe the use of ambulatory continuous peripheral nerve blocks (CPNBs) in this patient population. In this report, we describe our experience with the use of ambulatory CPNBs in 1285 children.

**METHODS:** Data were collected for consecutive children who had a CPNB placed between January 2005 and December 2011 at The Children's Hospital of Philadelphia from the departmental regional anesthesia database. Data collected included demographics, the site of catheter placement and technique of nerve block, presence of sensory/motor blockade, use of perioperative opioids, and any complications related to CPNBs.

**RESULTS:** Continuous infusions of local anesthetics were administered via the catheters in 1285 outpatients. The mean duration of the CPNB was  $50.7 \pm 14.4$  hours (mean  $\pm$  SD). Among patients discharged home with the CPNBs, 969 (75.4%) of the patients required either no supplemental opioids or oral opioids only on an "as needed" basis in the postoperative period (confidence interval, 73.0%–77.8%). Two patients were readmitted for IV pain management after they were discharged home with the CPNB catheters. No neurological deficit related to the CPNBs was identified in any of the patients at their 6-month follow-up with the orthopedic surgeon (confidence interval, 0%–0.29%).

**CONCLUSION:** This audit of 1285 children shows ambulatory CPNBs can provide postoperative analgesia and may reduce the need for inpatient parenteral opioid therapy. (Anesth Analg

**Table 3. Complications Related to the Continuous Peripheral Nerve Block Catheters**

Complications	No.
Excessive leakage	15
Accidental catheter removal	24
Accidental vascular injury	1
Catheter failure	4
Repeat bolus needed	10
Local anesthetic related side effects	5
Catheter site problems	3
Difficulty removing catheter	2
Total	64



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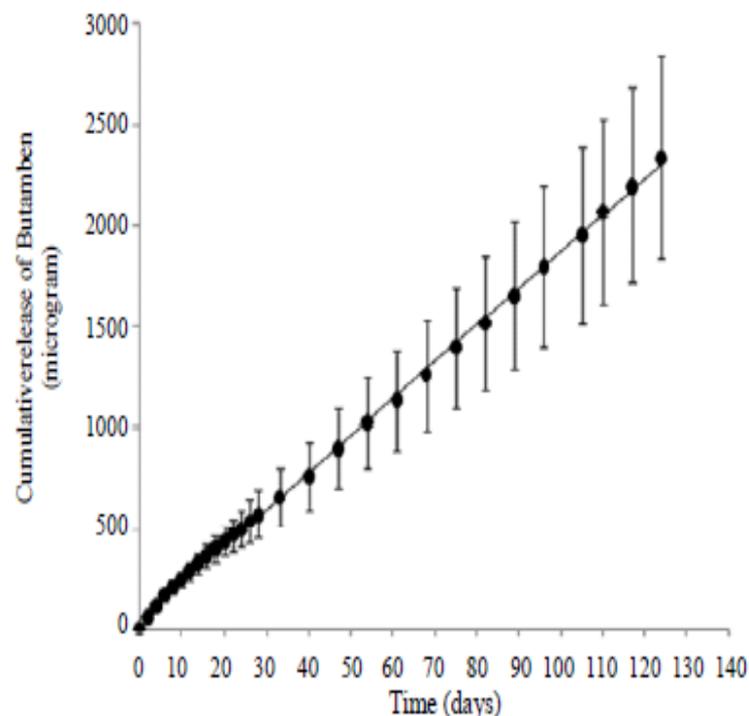
# Prolonged Release of the Local Anesthetic Butamben for Potential Use in Pain Management

Ashish Rastogi<sup>1,2</sup>, Salomon Stavchansky<sup>2</sup>, Phillip D. Bowman<sup>1\*</sup>

## ¿Futuro?



Figure 1. The drug delivery system with microhole on the surface. Hole diameter = 200  $\mu$ m; Tube diameter = 1.8 mm; Tube length = 20 mm. The size of the device and the perforations can be scaled to fit the need of the therapeutic application [12].





# Conclusiones

1. Valorar adecuadamente el dolor perioperatorio
2. Los AINES-AINES LIKE disminuyen los efectos secundarios de los opiáceos
3. COADYUVANTES epidurales duplican la acción de los Anestésicos Locales
4. Catéteres tronculares continuos seguros durante 3 días

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