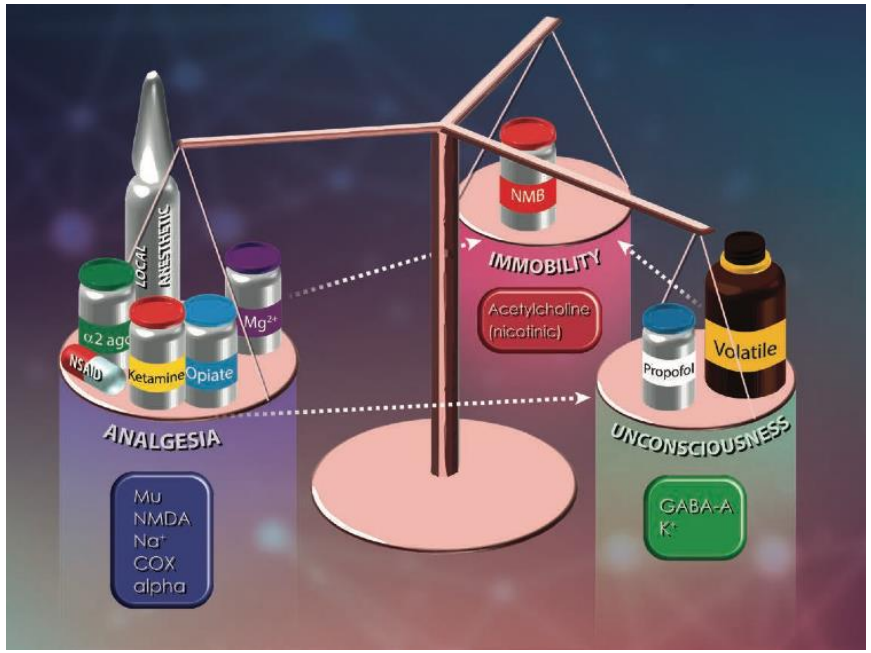
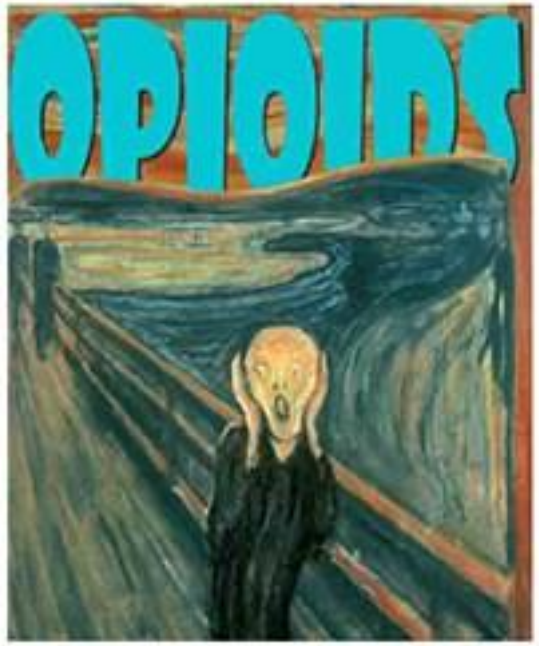




ANESTESIA MULTIMODAL O LIBRE DE OPIOIDES (OFA)

4ª Reunión de Equipos de Cirugía Esofagogastrica y Obesidad de la Comunidad de Madrid y Zona Centro

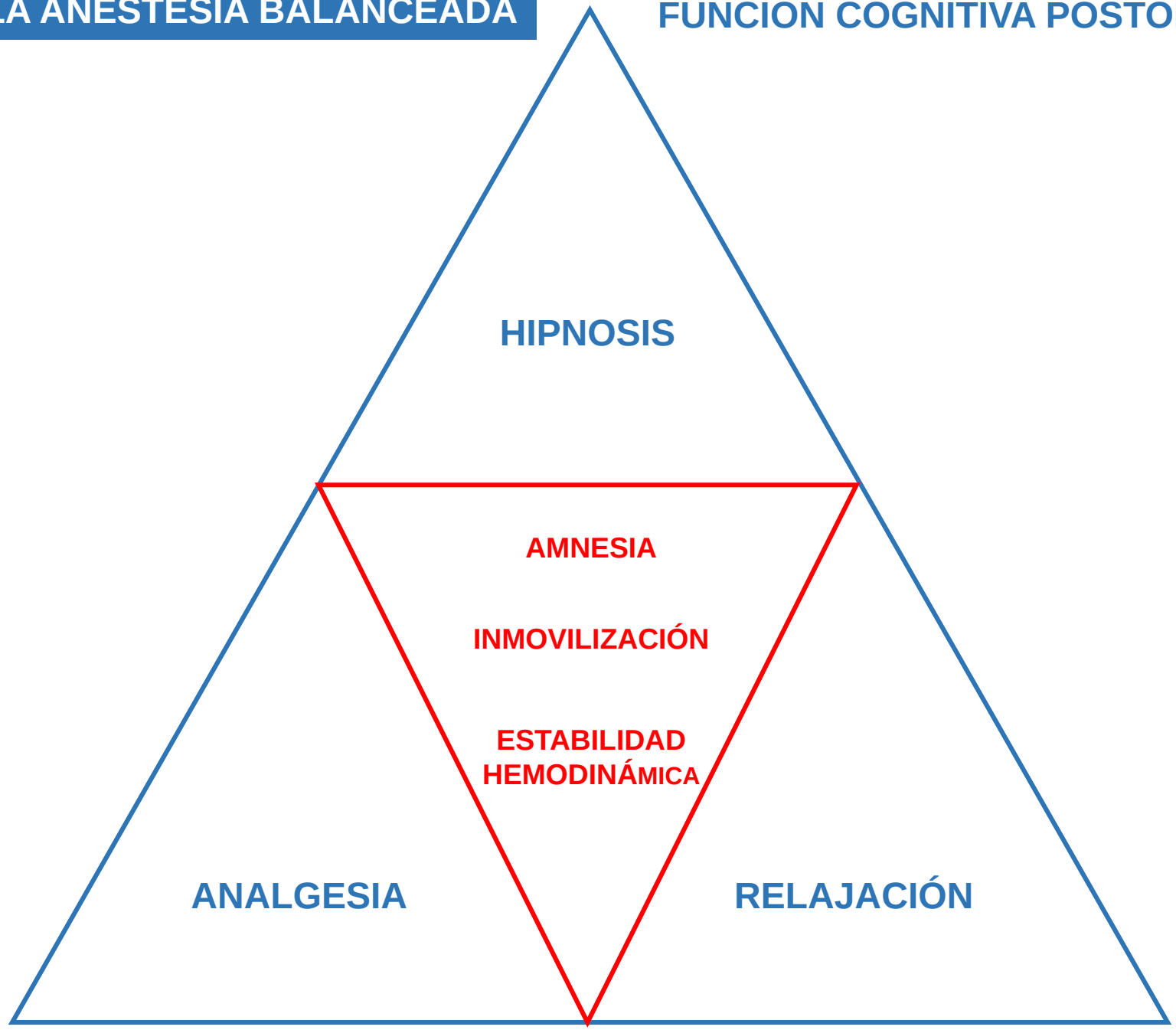
INNOVACIÓN ASISTENCIAL

MARILUZ PINDADO MARTINEZ
JEFE SECCIÓN H.U.G.


¿Debemos cambiar?
¿Por qué ?
DERMAGRIP

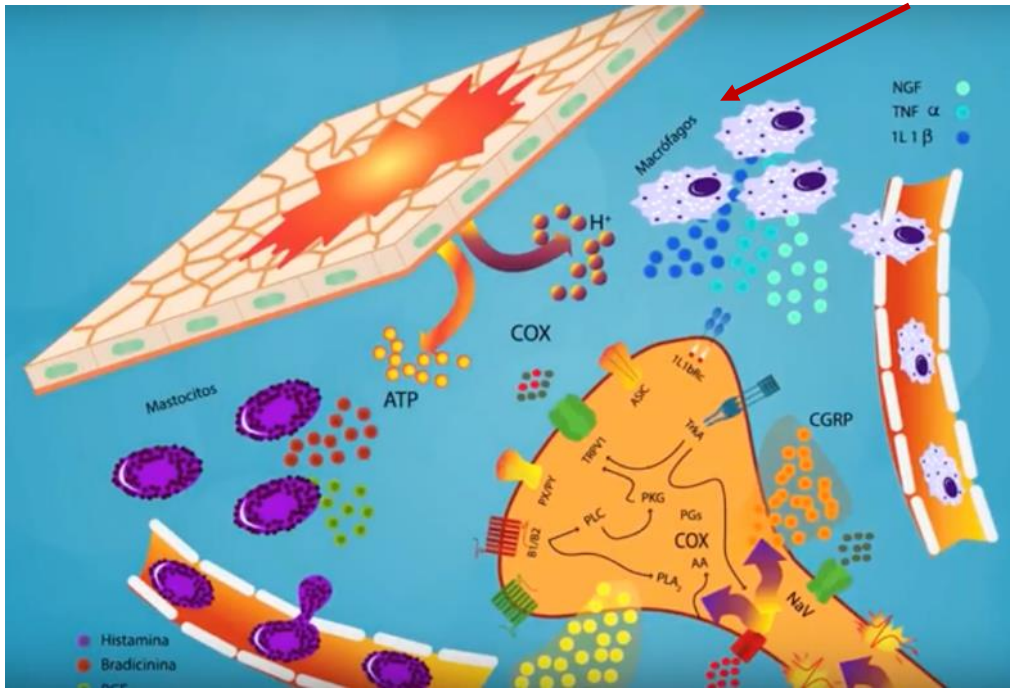
1 PILARES DE LA ANESTESIA BALANCEADA

FUNCIÓN COGNITIVA POSTOPERATORIA NORMAL



Ante una lesión quirúrgica…

Citokinas, Leucotrienos, PG, Histamina, Serotonina, TNF, eicosanoides, calicreina, IL 1,2 y 6…



<u>VÍA NEURONAL</u>: ESTIMULO NOCICEPTIVO

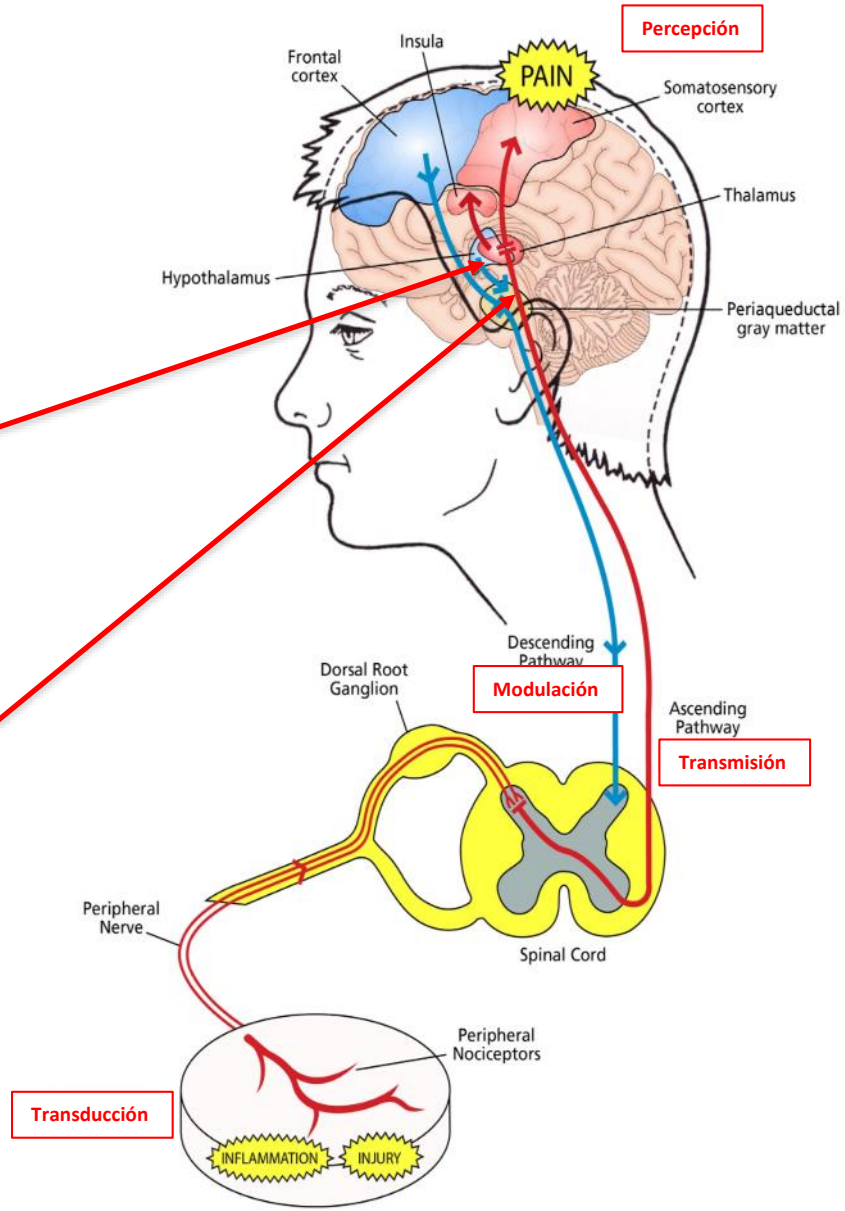
<u>VÍA SANGUINEA</u>: SUSTANCIAS INFLAMATORIAS

AFERENCIAS: Neuronal y Vascular

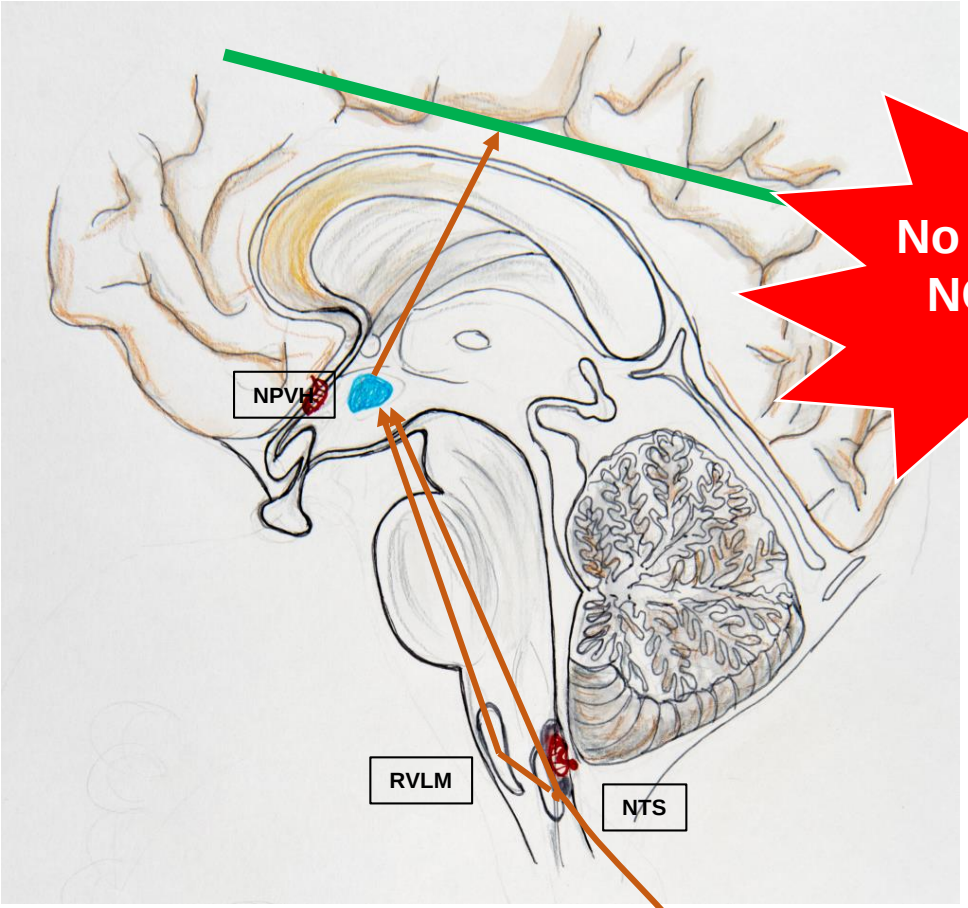
Vía Neuronal: Estimulo Nociceptivo

1. **Transducción**: Nociceptores Periféricos
2. **Transmisión:** Médula Espinal
3. **Percepción**: Tronco Cerebral
4. **Modulación**: Vías Descendentes

Vía Vascular: Sustancias proinflamatorias



VÍA NEURONAL



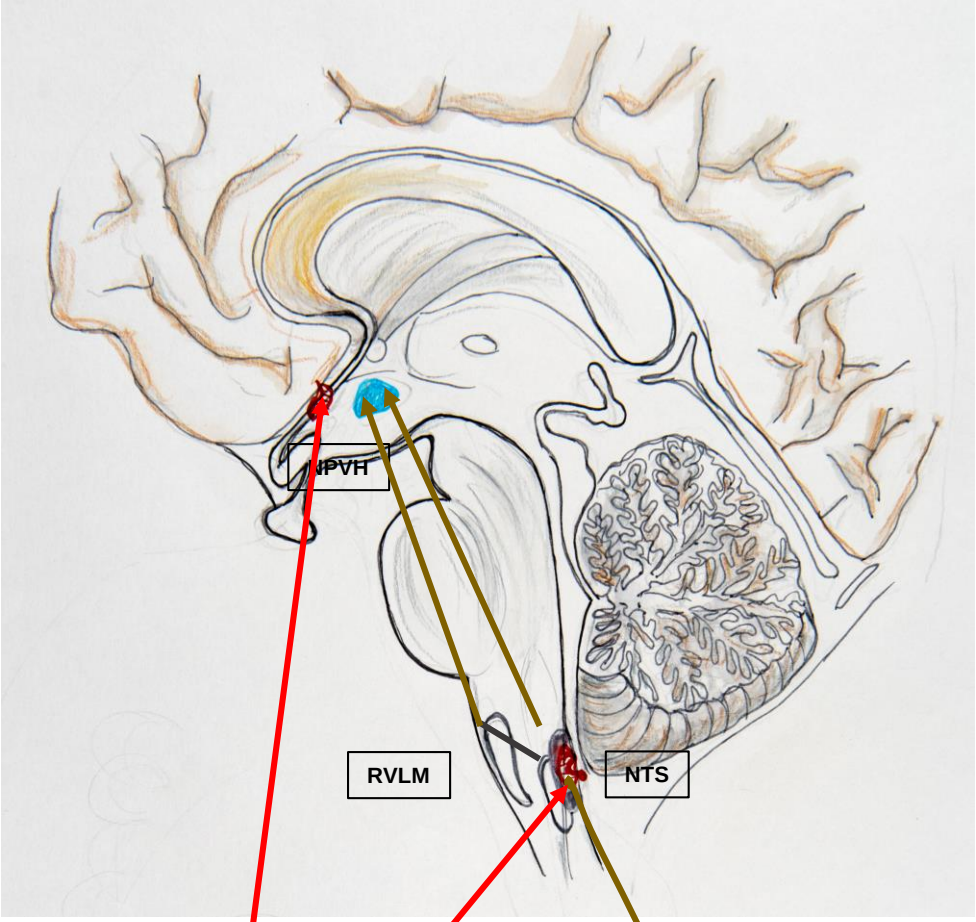
No percepción
NO DOLOR

NUEVO PARADIGMA

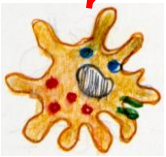
Nervio Vago
y Haz Espinotalámico

IL proinflamatorias

VÍA SANGUINEA



Aferencia vascular



IL proinflamatorias

Nervio Vago
y Haz Espinotalámico

EFERENCIAS: Neuronal y Vascular

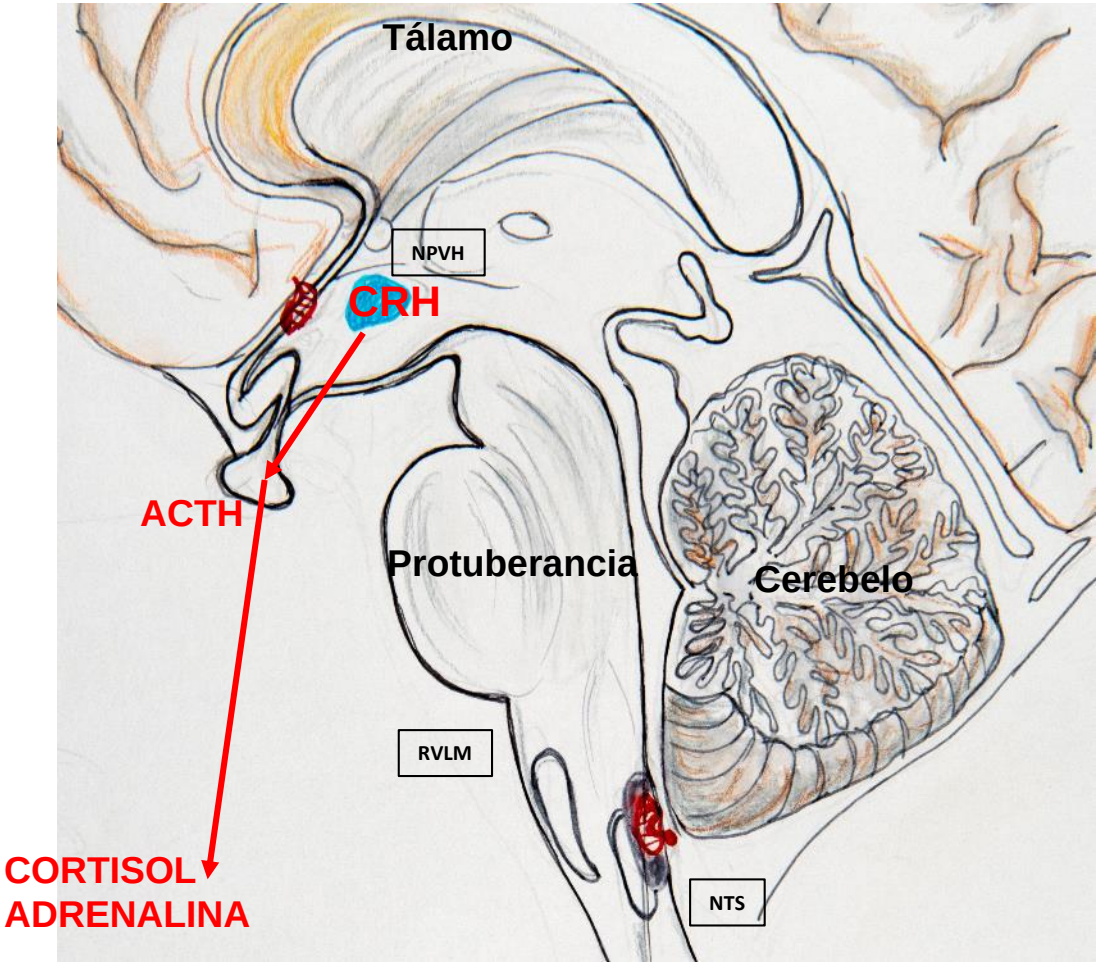
Respuesta neuroendocrina

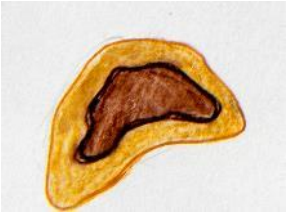
Respuesta Endocrina

1- Eje Hipotalamo-Hipofisario-Adrenal.

Cortisol
Catecolaminas

S. HIPERMETABÓLICO

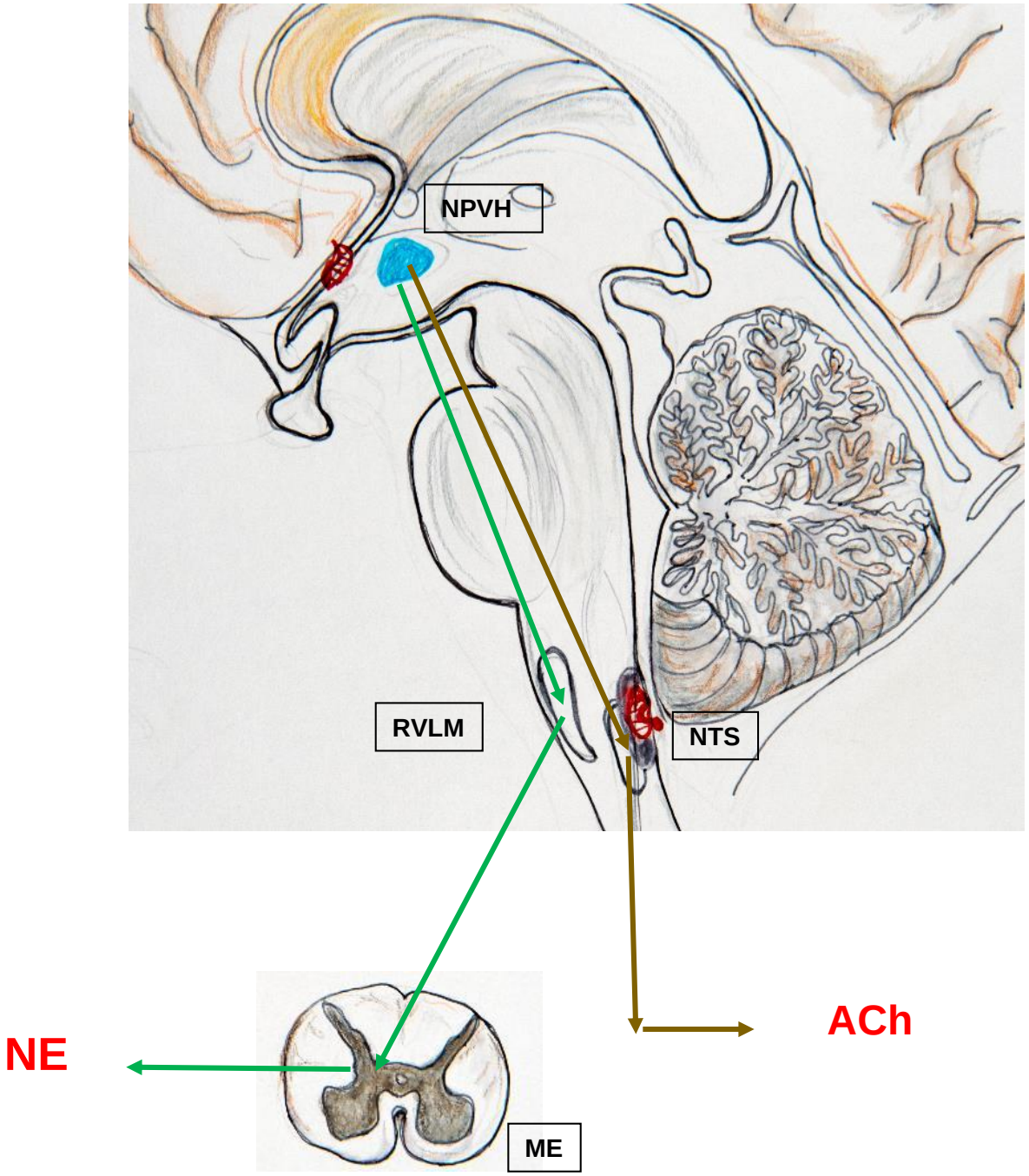




RESPUESTA NEURONAL

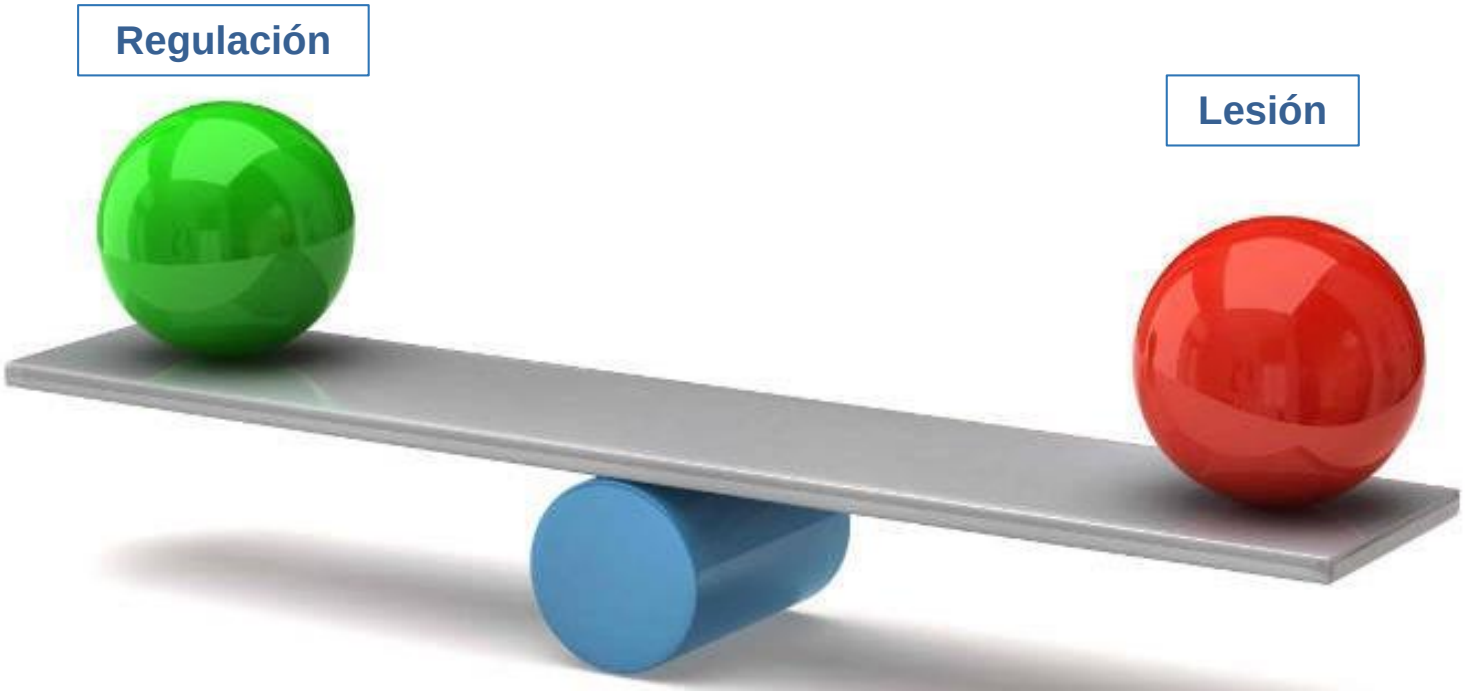
2- S.N. SIMPÁTICO

3- S.N. PARASIMPÁTICO



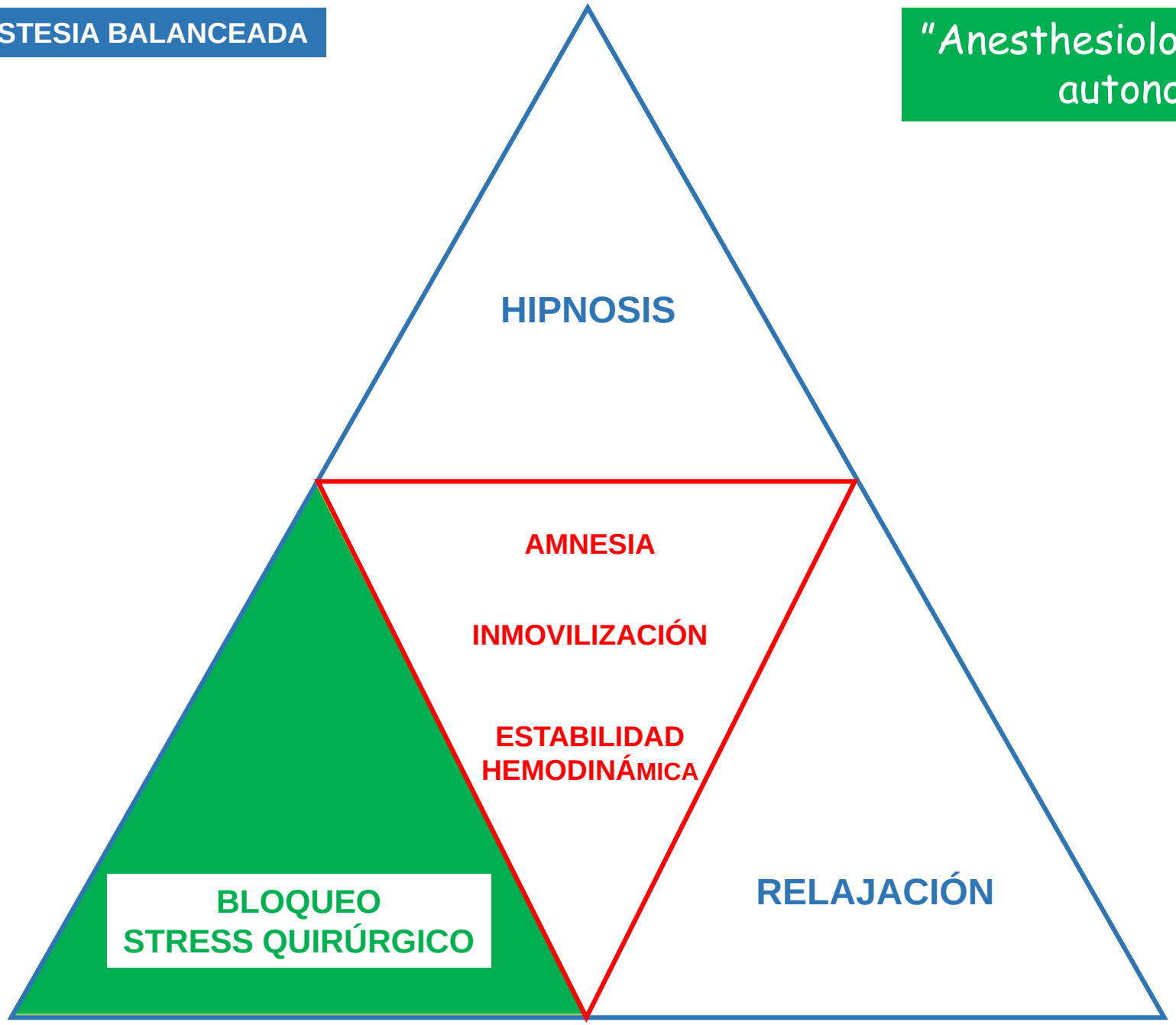
MODULACIÓN DEL SNA

EQUILIBRIO BALANCEADO



PILARES DE LA ANESTESIA BALANCEADA

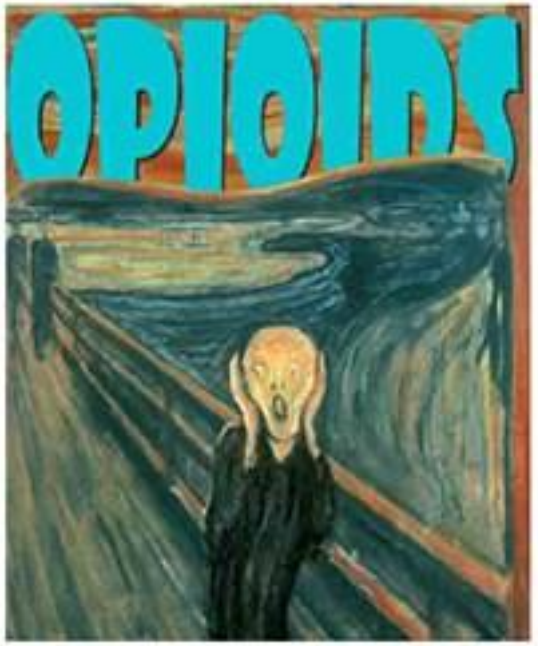
"Anesthesiology is the practice of autonomic medicine"



MODULACIÓN DEL SNA

↓ TONO SIMPÁTICO

↑ TONO PARASIMPÁTICO



2 EFECTOS SECUNDARIOS DE LOS OPIOIDES

DEPRESIÓN RESPIRATORIA CENTRAL

OBSTRUCCIÓN VÍA AÉREA (SAHS)

NAUSEAS Y VÓMITOS

ÍLEO - ESTREÑIMIENTO

MAREOS y SOMNOLENCIA

PRURITO

RETENCIÓN URINARIA

INMUNOSUPRESIÓN

ANALGESIA
"Neuroadaptación"

Tolerancia es la necesidad de aumentar las dosis de un opioide para conseguir un mismo efecto analgésico. Responde al aumento de dosificación del opioide.

- Tolerancia Aguda con una única dosis.
- Tolerancia Crónica con dosis a largo plazo

Hiperalgesia es una aumentada sensibilidad al estímulo doloroso por disminución del umbral al estímulo nociceptivo. No responde al aumento de dosificación del opioide.

CLINICAL CONCEPTS AND COMMENTARY

Jerrold H. Levy, M.D., F.A.H.A., F.C.C.M., Editor

Differential Opioid Tolerance and Opioid-induced Hyperalgesia

A Clinical Reality

Christina J. Hayhurst, M.D., Marcel E. Durieux, M.D., Ph.D.

Anesthesiology 2016; 124:483-8

Tolerancia Diferencial:

Analgesia > Depresión respiratoria > Síntomas digestivos

OPIOIDES

TOLERANCIA **HIPERALGESIA**

EFECTO PARADÓJICO DEL OPIOIDE

+ DOLOR POSTOPERATORIO → + OPIOIDE → + EFECTOS SECUNDARIOS

ESTRATEGIAS DE PREVENCIÓN

3 USO Y ABUSO DE OPIODES PERIOPERATORIOS

SPECIAL SERIES

The Opioid Epidemic and New Legislation in Massachusetts: Time For a Culture Change in Surgery?

Haytham M. A. Kaafarani, MD, MPH,† Eric Weil, MD,†‡ Sarah Wakeman, MD,†‡ and David Ring, MD, PhD§*

SPECIAL SERIES

Iatrogenic Opioid Dependence in the United States

Are Surgeons the Gatekeepers?

Jennifer F. Waljee, MD, MS, Linda Li, BA,† Chad M. Brummett, MD,‡ and Michael J. Englesbe, MD§*

SPECIAL SERIES

Preoperative Opioid Use is Independently Associated With Increased Costs and Worse Outcomes After Major Abdominal Surgery

David C. Cron, BS, Michael J. Englesbe, MD,* Christian J. Bolton, BS,† Melvin T. Joseph, BS,† Kristen L. Carrier, BS,‡ Stephanie E. Moser, PhD,† Jennifer F. Waljee, MD, MPH, MS,§ Paul E. Hilliard, MD,† Sachin Kheterpal, MD, MBA,† and Chad M. Brummett, MD†*

Annals of Surgery. Volumen 265, Number 4, April 2017

"Houston, We Have a Problem!": The Role of the Anesthesiologist in the Current Opioid Epidemic

Myron Yaster, MD,* Honorio T. Benzon, MD,† and T. Anthony Anderson, MD, PhD‡

A Review of Opioid-Sparing Modalities in Perioperative Pain Management: Methods to Decrease Opioid Use Postoperatively

Kanupriya Kumar, MD,* Meghan A. Kirksey, MD, PhD,* Silvia Duong, BScPharm, PharmD,† and Christopher L. Wu, MD‡

Impact of Enhanced Recovery After Surgery and Opioid-Free Anesthesia on Opioid Prescriptions at Discharge From the Hospital: A Historical-Prospective Study

Delara Brandal, MD,* Michelle S. Keller, MPH,† Carol Lee, RN-BC,* Tristan Grogan, MS,* Yohei Fujimoto, MD, PhD,*‡ Yann Gricourt, MD,*§ Takashige Yamada, MD, PhD,*‖ Siamak Rahman, MD,* Ira Hofer, MD,* Kevork Kazanjian, MD,¶ Jonathan Sack, MD,¶ Aman Mahajan, MD, PhD,* Anne Lin, MD,¶ and Maxime Cannesson, MD, PhD*

Anesth Analg. Volumen 125, Number 5, Nov 2017


SPECIAL REPORT
MARCH 5, 2018
TIME
THE OPIOID DIARIES
Photographs by
JAMES NACHTWEY
Marzo 2018
time.com

4

PROGRAMAS ERAS

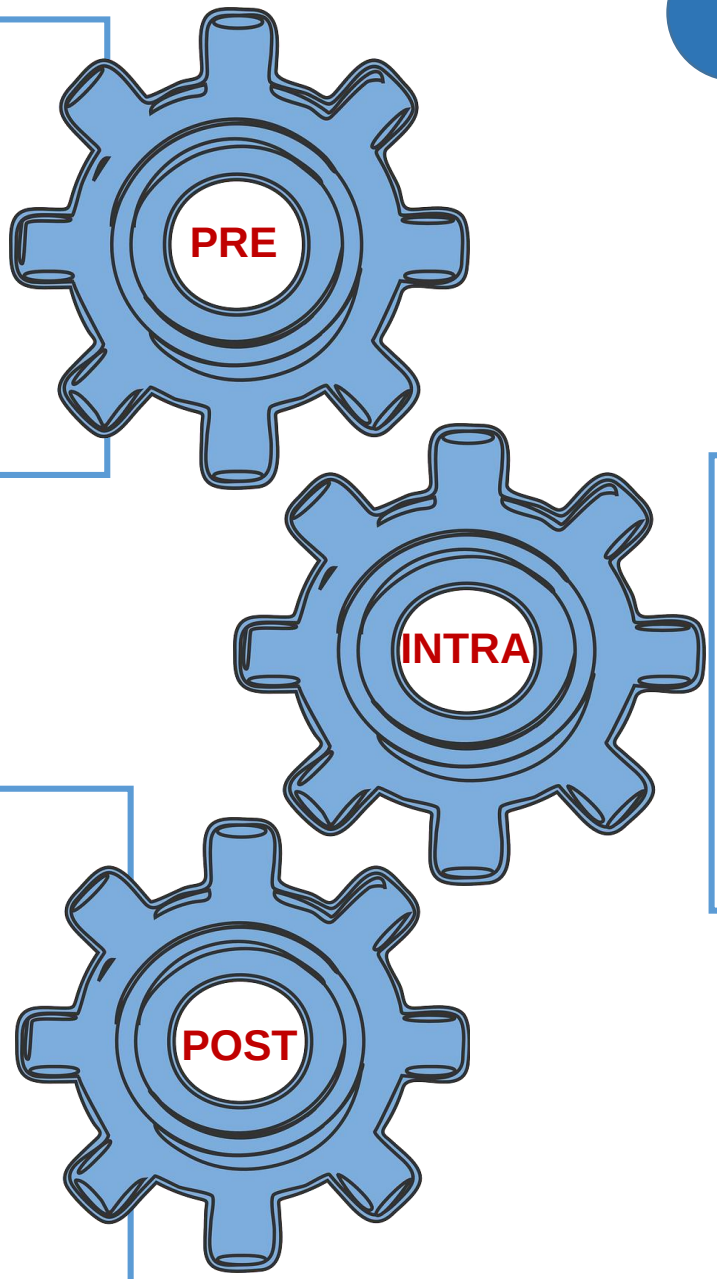
PREHABILITACIÓN:

DIETA

AYUNO

AJUSTE MEDICACIÓN

EVITAR SEDACIÓN



CIRUGÍA MINIMAMENTE INVASIVA

ANESTESICOS DE ACCIÓN CORTA

ANALGESIA LIBRE DE OPIODES.

EVITAR HIPOTERMIA

VENTILACIÓN PROTECTORA PULMÓN

EXTUBACIÓN

NO OPIODES

FISIOTERAPIA INCENTIVADA

PROFILAXIS PONV

NO DRENAJES - NO SONDAS

DEAMBULACIÓN PRECOZ

¿CÓMO?

The European Society for Perioperative Care of the Obese Patient

ESPCOP

PROGRAMAS ERAS / FAST-TRACK EN CIRUGÍA BARIÁTRICA

(Enhanced Recovery After Surgery)

Jan P. Mulier **www.Publicationslist.com/jan.mulier**

BRUJAS

BÉLGICA

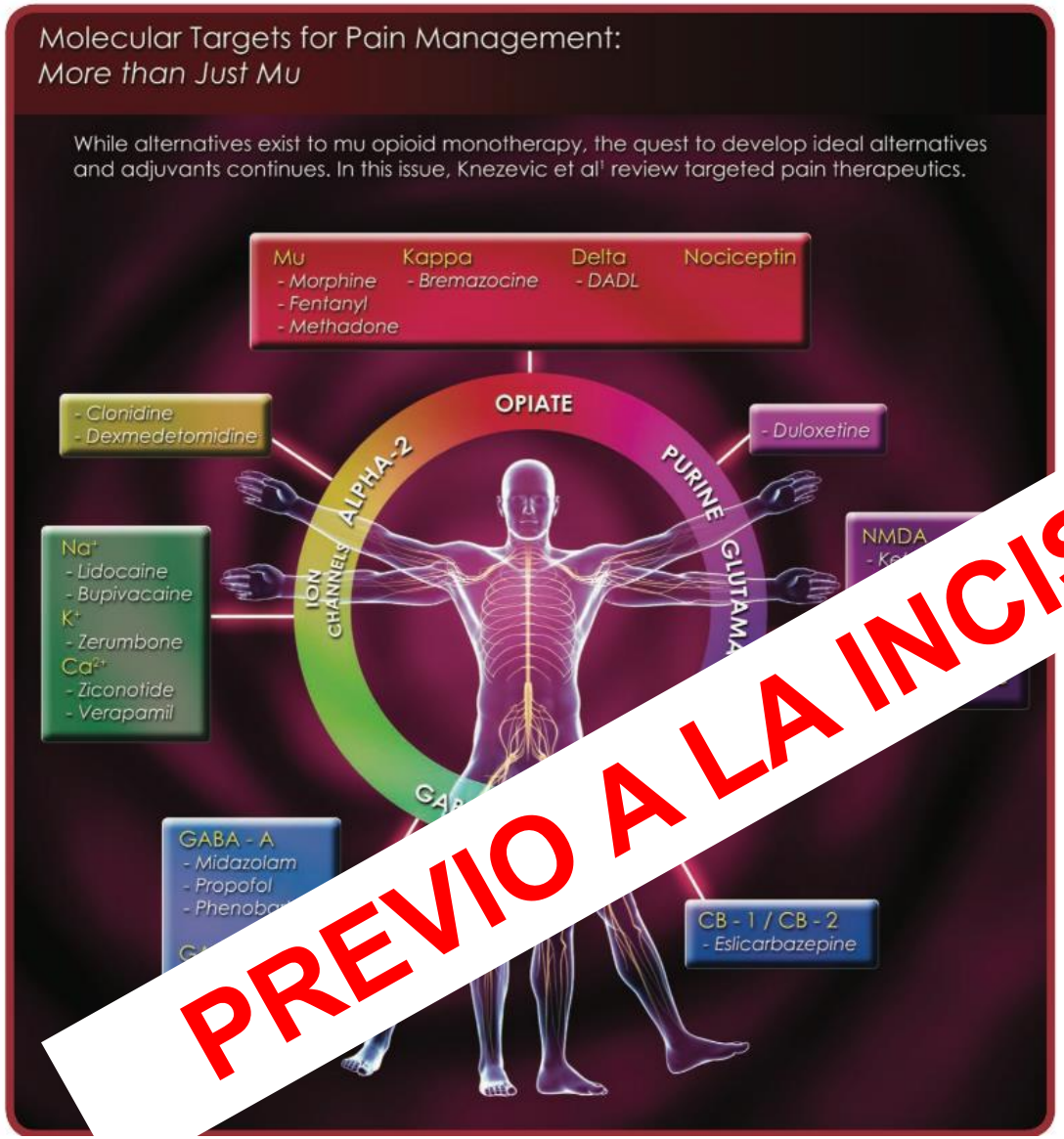
Jan P Mulier www.Publicationslist.com/jan.mulier

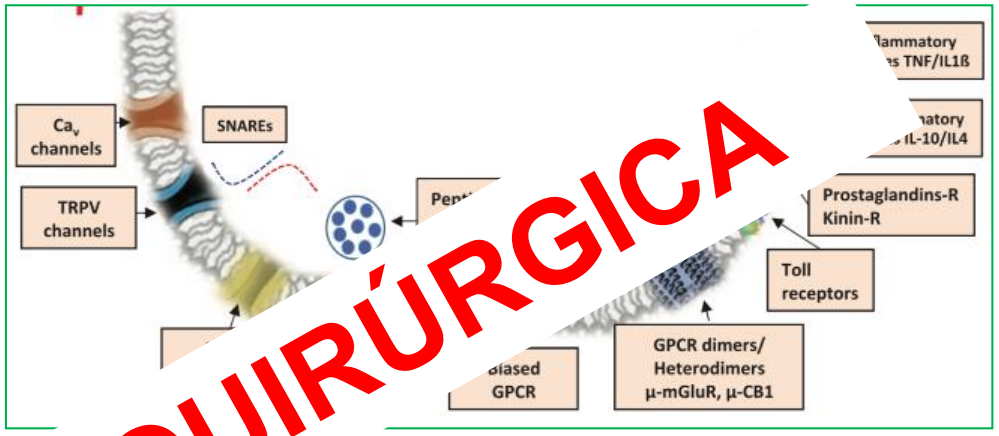
ANALGESIA MULTIMODAL BALANCEADA

Disminuir el proceso inflamatorio.

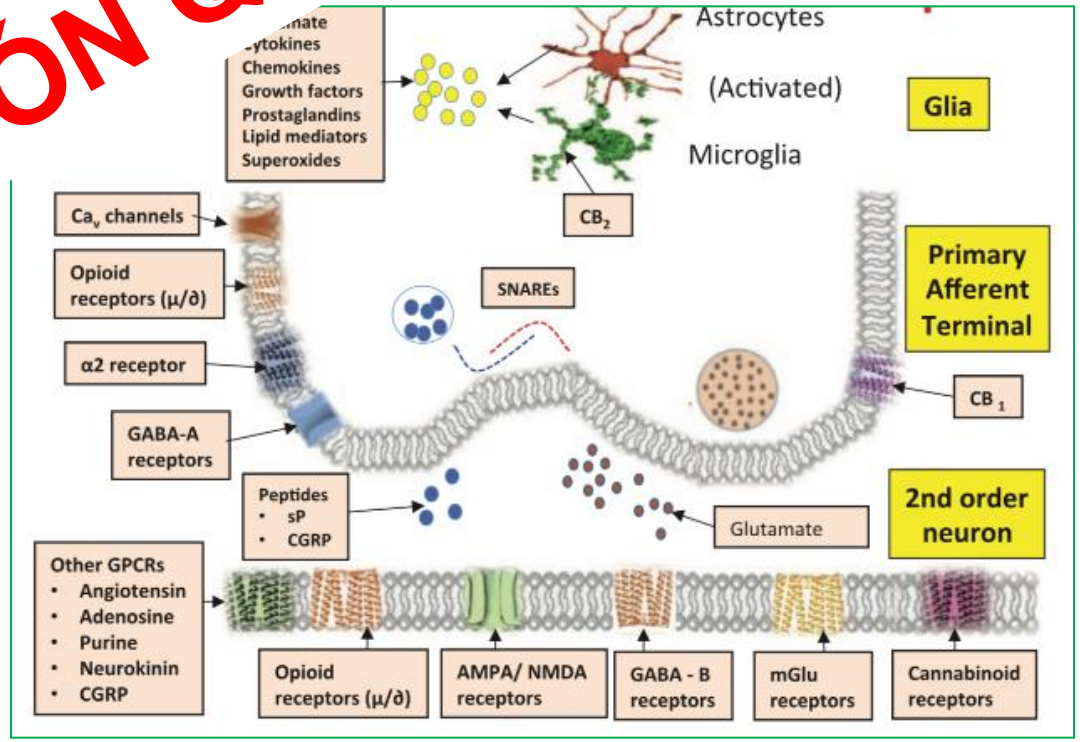
Disminuir los efectos secundarios de los opioides

ANALGESIA MULTIMODAL PRE-EMPTIVA





Receptores periféricos

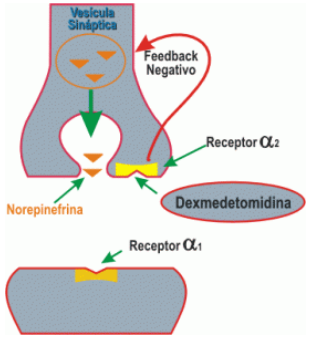


Receptores centrales

PREVIO A LA INCISIÓN QUIRÚRGICA

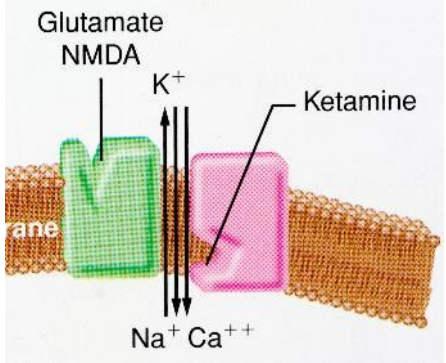
Anesth Analg. Volumen 125,
Number 5, Nov 2017

1- BLOQUEO DEL S. N. SIMPÁTICO CENTRAL Y PERIFÉRICO.



- α_2 Agonistas: Clonidina. Dexmedetomidina
- β-Bloqueantes: Metoprolol. Esmolol

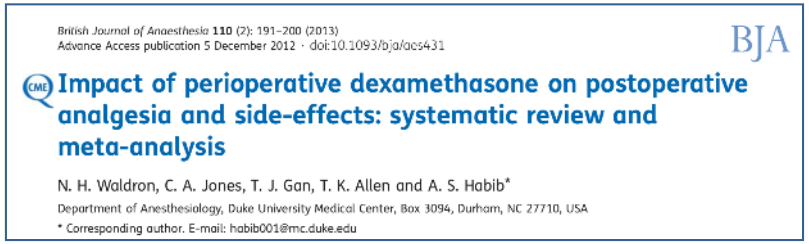
2- BLOQUEO CANALES IÓNICOS Y DE RECEPTORES NMDA



- Anestésicos Locales: Lidocaína
- Anti-NMDA: Magnesio y Ketamina

3- BLOQUEO DE RECEPTORES PROINFLAMATORIOS

- AINES: Dexketoprofeno. Paracetamol
- Dexametasona


British Journal of Anaesthesia 110 (2): 191–200 (2013)
Advance Access publication 5 December 2012 · doi:10.1093/bja/aes431

BJA

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

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

Department of Anesthesiology, Duke University Medical Center, Box 3094, Durham, NC 27710, USA

* Corresponding author. E-mail: habib001@mc.duke.edu

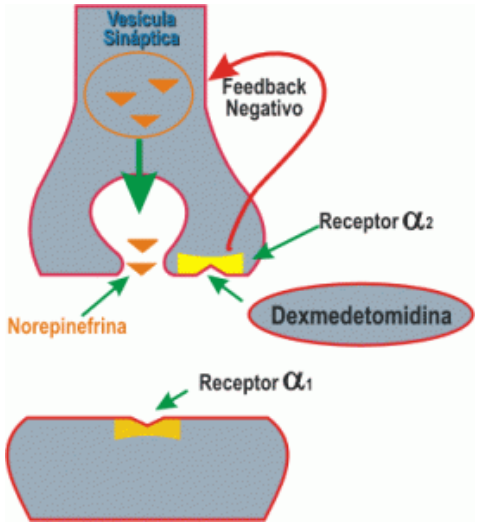
BLOQUEO SIMPÁTICO: α_2 AGONISTAS:

Inhibe liberación de Noradrenalina

DEXMEDETOMIDINA: 0,5-1µg/kg . (20-30µ) IV. 15 min antes de la inducción

Hipotensión y bradicardia. Hipertensión inicial
Sedación (80%)
No depresión respiratoria
Neuroprotector
Analgesia (20%)
Disminuye nauseas y vómitos

Potente +++.
Rápido inicio, pico a los 15' y Vm 2 horas



CLONIDINA: 150µ/kg PO/IV. 60-90 min antes de la inducción

Hipotensión y bradicardia
Sedación
No depresión respiratoria
Analgesia

Potente +.
Lento Inicio , Pico a los 60-90' y Vm 10-12 horas

BLOQUEO SIMPÁTICO: β- BLOQUEANTES

ESMOLOL IV : Bloqueante cardioselectivo β_1. Duración 9 min.

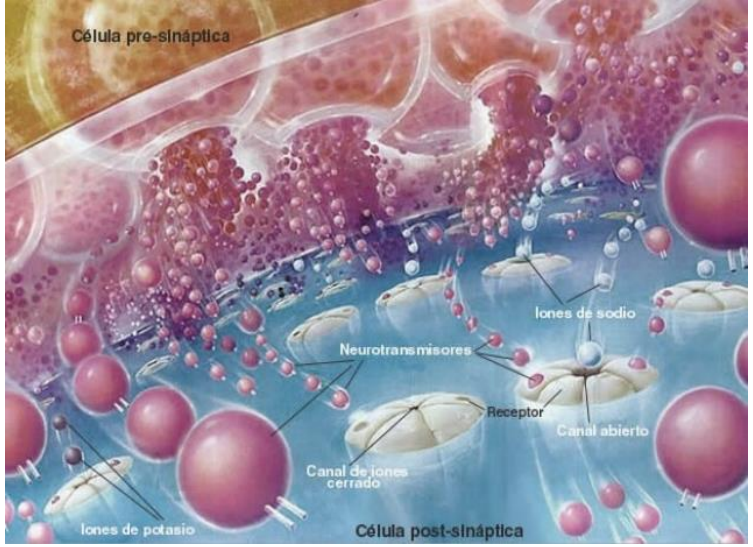
Perfusión 50-200 µg/kg/min

METROPROLOL IV: Bloqueante cardioselectivo β_1. Sin actividad simpaticomimética intrínseca.

Dosis 1-2 mg según síntomas

ANESTÉSICOS LOCALES

LIDOCAÍNA:



Analgésico: Bloquea canales de Sodio.

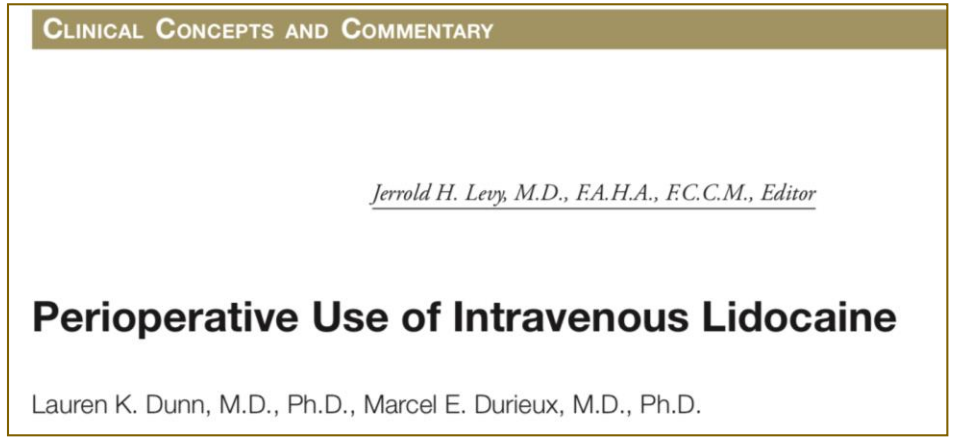
Antiinflamatorio: Bloquea degranulación neutrófilos.

Antihiperalgésico: Bloquea receptores NMDA.

Rápida recuperación del íleo y función intestinal.

Dosis: Bolo: 1,5 mg/kg (100mg) 1 minuto antes de la inducción.

Perfusión: 2mg/kg/h

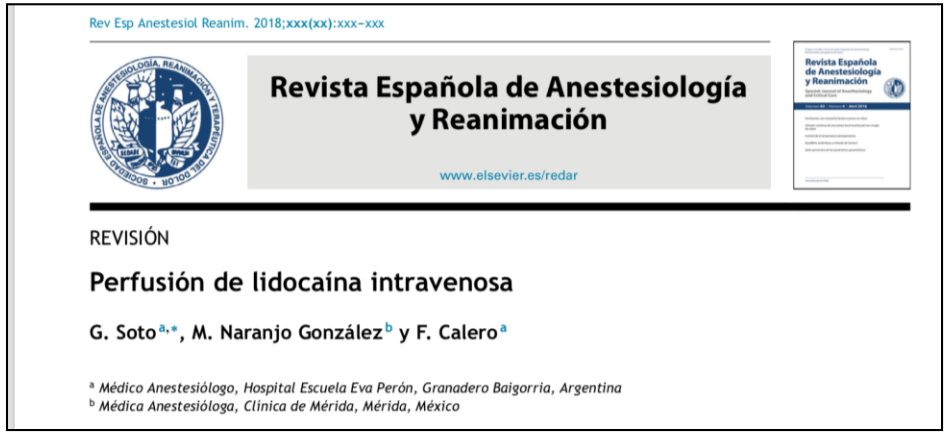

CLINICAL CONCEPTS AND COMMENTARY

Jerrold H. Levy, M.D., F.A.H.A., F.C.C.M., Editor

Perioperative Use of Intravenous Lidocaine

Lauren K. Dunn, M.D., Ph.D., Marcel E. Durieux, M.D., Ph.D.

Anesthesiology 2017; 126: 729-37


Rev Esp Anestesiol Reanim. 2018;xxx(xx):xxx–xxx

Revista Española de Anestesiología y Reanimación

www.elsevier.es/redar

REVISIÓN

Perfusión de lidocaína intravenosa

G. Soto[a,*], M. Naranjo González[b] y F. Calero[a]

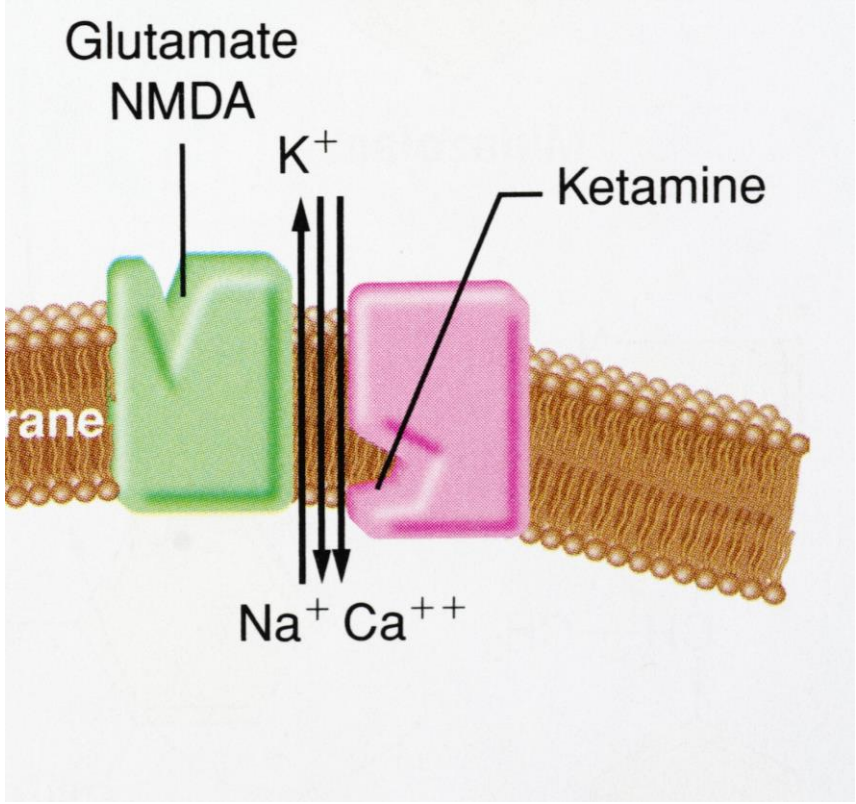
[a] *Médico Anestesiólogo, Hospital Escuela Eva Perón, Granadero Baigorria, Argentina*
[b] *Médica Anestesióloga, Clinica de Mérida, Mérida, México*

Rev Esp Anestesiol Reanim 2018;

BLOQUEO RECEPTOR NMDA

SULFATO DE MAGNESIO: Bolo 40 mg/kg PI (2,5-3 gr). Perfusión 10mg/Kg/h.

- Previene la tolerancia e hiperalgesia a los opioides. Impide la entrada de Calcio y Glutamato
- Antinflamatorio (disminución IL-6 TNFα).
- Vasodilatación periférica. Bradicardia.
- Neuroprotector
- Broncodilador
- Analgésico.



KETAMINA: Bolo 0,1- 0,25 mg/kg (10-15 mg).
Perfusión 2µg/kg/m

- Previene la tolerancia e hiperalgesia de los opioides
- Analgésico: Antiµ y antiδ. Se deben **dar antes de cualquier opioide.**
- Antinflamatorio: Bloquea canales Na^+ y Ca^{++}

BLOQUEO DE MEDIADORES ANTIINFLAMATORIOS

CORTICOIDES: DEXAMETASONA IV 0,1-0,2 mg/kg (8mg).

Antiinflamatorio: Inhiben Fosfolipasa A2 y

Disminuyen actividad lipoxigenasa y ciclooxigenasa.

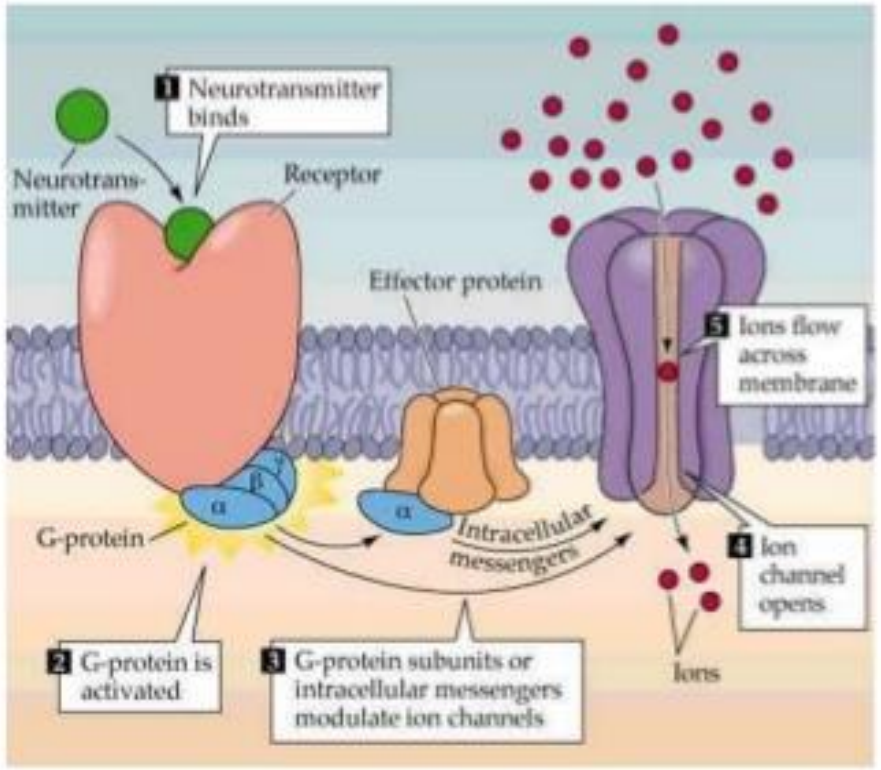
Antiemético.

Antes de la incisión quirúrgica.

Sensación dolorosa perineal.

ANTICOX 1- 2: ENANTYUM IV 50mg/8h

PARACETAMOL: ANTI COX-3 1gr/6h



Sistema de segundos mensajeros

ANTIEMÉTICO:

Open Access Full Text Article

ORIGINAL RESEARCH

Efficacy of ondansetron for the prevention of propofol injection pain: a meta-analysis

This article was published in the following Dove Press journal:
Journal of Pain Research
21 February 2017
Number of times this article has been viewed

Shenglin Pei[1,*]
Chengmao Zhou[2,*]
Yu Zhu[2]
Bing Huang[1]

[1]Department of Anesthesiology, Affiliated Tumor Hospital of Guangxi Medical University, Nanning, [2]Zhaoqing Medical College, Zhaoqing, People's Republic of China

*These authors contributed equally to this work

Aim: This review was performed to investigate the effect of ondansetron on the prevention o propofol injection pain.

Methods: PubMed, Cochrane Library, and China National Knowledge Infrastructure (CNKI were searched for randomized controlled trials (RCTs) of ondansetron in preventing the pain or injection of propofol. Then, RevMan 5.2 was adopted to conduct a meta-analysis on propofo injection pain.

Results: Ten RCTs, totaling 782 patients, were included in this analysis. The meta-analysis showe that: 1) compared with the control group, the ondansetron group was related to a decreasing inci- dence of propofol injection pain, and it was statistically significant (risk ratio [RR] = 0.41, 95% confidence interval [CI, 0.34, 0.49], $P < 0.00001$); 2) compared with the incidence of propofo injection pain in the lidocaine group, there was no difference and no statistical significance (RR = 1.28, 95% CI [0.85, 1.93], $P = 0.25$); 3) no statistically significant differences were found between the ondansetron and magnesium sulfate groups in the incidence of propofol injection pain (RR = 1.20, 95% CI [0.87, 1.66], $P = 0.27$); and 4) the incidence of ondansetron group igniting moderate pain (RR = 0.37, 95% CI [0.26, 0.52], $P < 0.00001$) and severe pain (RR = 0.27, 95% CI [0.17, 0.43] $P < 0.00001$) was less likely to occur during the injection of propofol compared with the control group, but there was no difference between the ondansetron and control groups in the incidence of mild propofol injection pain (RR = 0.83, 95% CI [0.63, 1.10], $P = 0.20$).

Conclusion: Ondansetron can effectively prevent propofol injection pain, and the effect is similar to that of magnesium sulfate and lidocaine.

Keywords: ondansetron, propofol injection pain, meta-analysis

Introduction

Propofol, as an induction agent in general anesthesia, has been widely used in clinical anesthesia and sedation. Propofol can make one wake up quickly, and it is commonly used in the induction and maintenance of anesthesia. It has a few side effects, but injection pain is a common one.[1] A study[2] reported that the total incidence of propofol injection pain ranged from 40% to 86%.

Currently, lidocaine and opioid drugs have been used to prevent propofol injection pain, but they have generated several adverse reactions. In addition to preventing nausea and vomiting, ondansetron can also prevent propofol injection pain. In this study, a meta-analysis was performed to study the efficacy of ondansetron for the prevention of propofol injection pain.

Correspondence: Bing Huang
Department of Anesthesiology, Affiliated Tumor Hospital of Guangxi Medical University, 71 River Road, Nanning, Guangxi 532100, People's Republic of China
Fax +86 771 533 0700
Email Huangbing187@126.com

ONDANSETRON: 4 mg.

Los anti 5-HT tienen propiedades antiinflamatorias y analgésicas por su unión con receptores μ y bloqueo de los canales de sodio.

NUEVOS FÁRMACOS ANESTÉSICOS

Table. Introduction of New Anesthetics During 4 15-Year Periods, From 1955–1970 to 2001–2014

Period	Name and Year of Introduction	Total No.
1955–1970	Halothane (1956)	7
	Enflurane (1968)	
	Methohexital (1960)	
	Ketamine (1966)	
	Mepivacaine (1957)	
	Prilocaine (1960)	
	Bupivacaine (1963)	
1970–1984	**Isoflurane (1971)**	
	Sevoflurane (1975)	6
	Etomidate (1973)	
	Propofol (1977)	
	Etidocaine (1972)	
	Articaine (1983)	
1985–1999	**Desflurane (1990)**	4
	Midazolam (1985)	
	Ropivacaine (1997)	
	Levobupivacaine (1998)	
2000–2014	**Fospropofol (2008)**	1

NUEVOS FÁRMACOS ANESTÉSICOS

Archives of Biochemistry and Biophysics 660 (2018) 36–52

Contents lists available at ScienceDirect

Archives of Biochemistry and Biophysics

journal homepage: www.elsevier.com/locate/yabbi

Review article

Recent progress in non-opioid analgesic peptides

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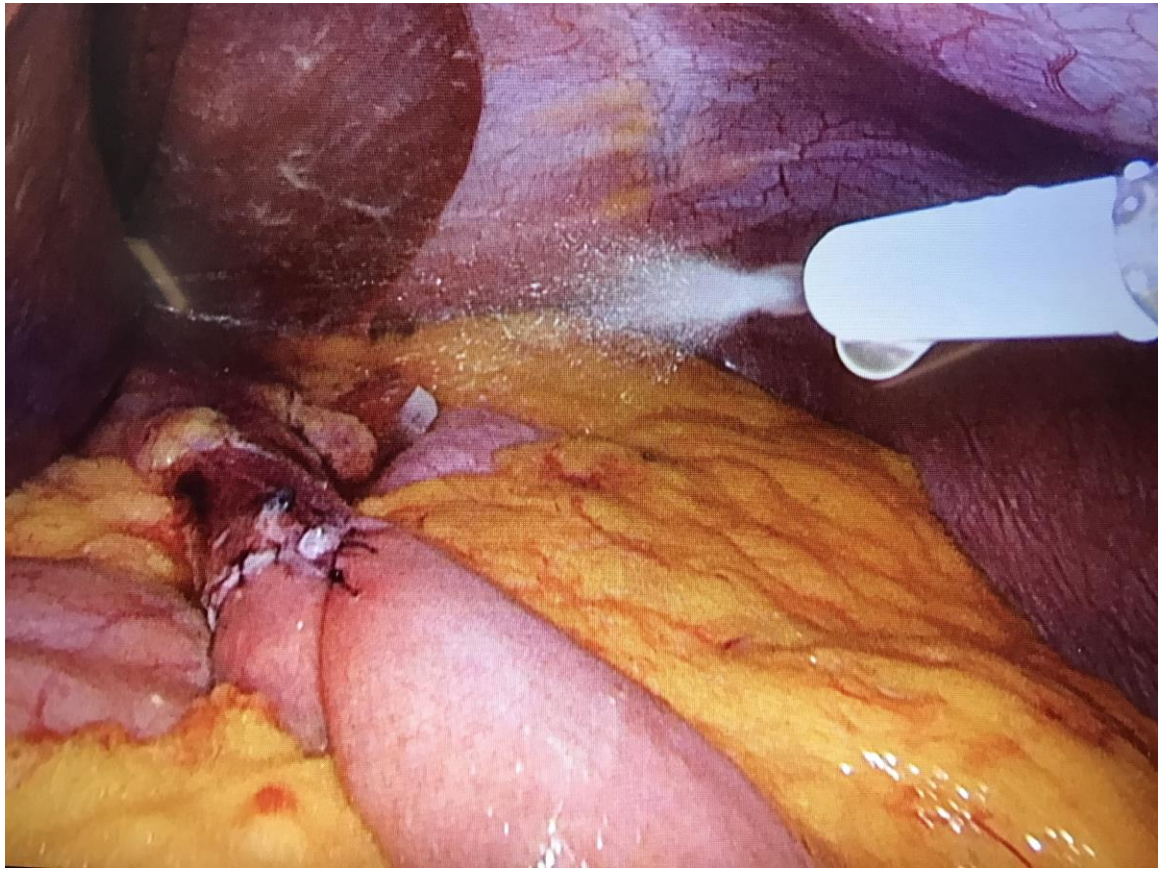
ARTICLE INFO

Keywords:
Analgesic peptides
Ion channels
GPCR
Protein-protein interactions
Pain

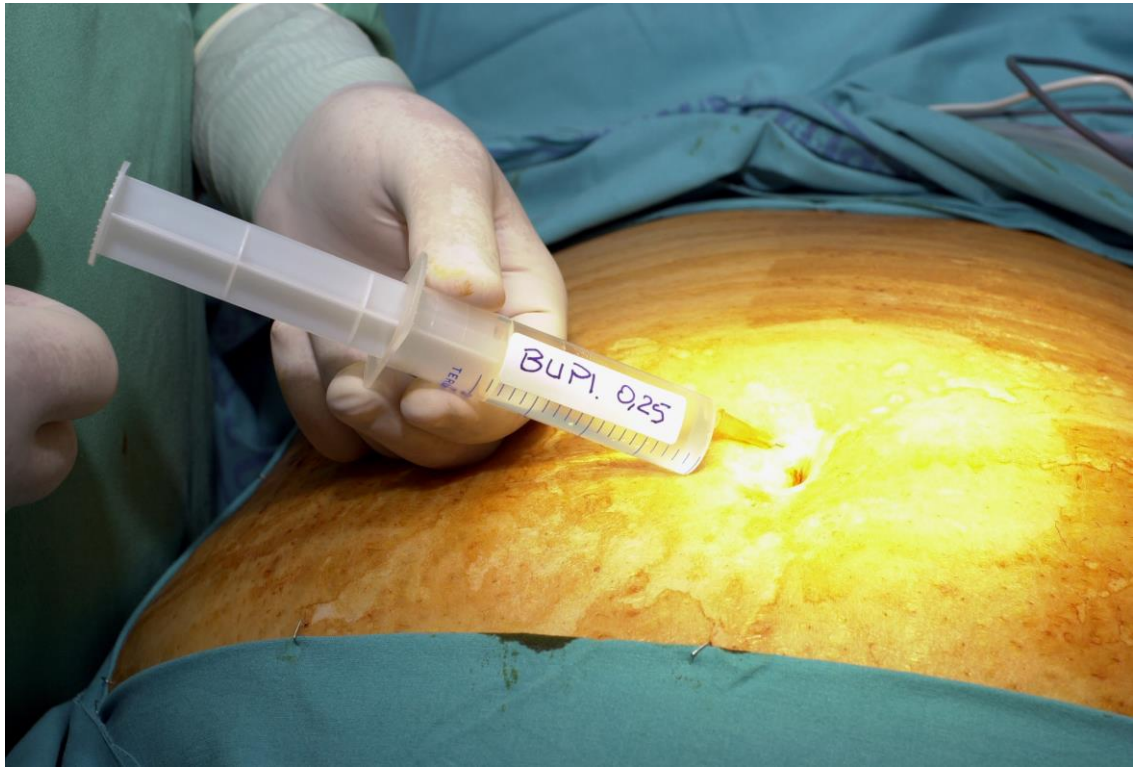
ABSTRACT

Pain is a prevalent complex medical problem, characterized by physically debilitating and mentally destabilizing conditions. Current pain therapeutics mainly include non-steroidal anti-inflammatory drugs and narcotics (opioids), but they exhibit limitations in efficacy, unwanted side effects and the problem of drug abuse. To overcome these issues, the discovery of different molecular players within pain pathways could lead to new opportunities for therapeutic intervention. Among other strategies, peptides could be powerful pharmaceutical agents for effective opioid-free medications for pain treatment. This review is a compendium of representative non-opioid analgesic peptides acting directly or indirectly at different ion channels and receptors distributed in nociceptive pathways. They include peptides targeting Ca^{2+}, Na^{+} and K^{+} voltage-gated ion channels, the neuronal nicotinic receptors (nAChR), transient receptor potential channels (TRP), and different non-opioid G-protein coupled receptors (GPCRs), like the calcitonin gen-related peptide (CGRP), cannabinoid, bradykinin and neurotensin receptors, among others. Peptides engineered from protein-protein interactions among pain-related receptors and regulatory proteins also led to new therapeutic approaches for pain management. Following some successful examples, already in the clinics or under clinical trials, the improved understanding of pain mechanisms, and the advances in peptide permeation and/or delivery, could afford new analgesic peptides in the near future.

ANALGESIA LOCAL:



A.L. INTRAPERITONEAL AL INICIO Y FINAL



ANALGESIA LOCAL INCISIONES INICIO Y FINAL

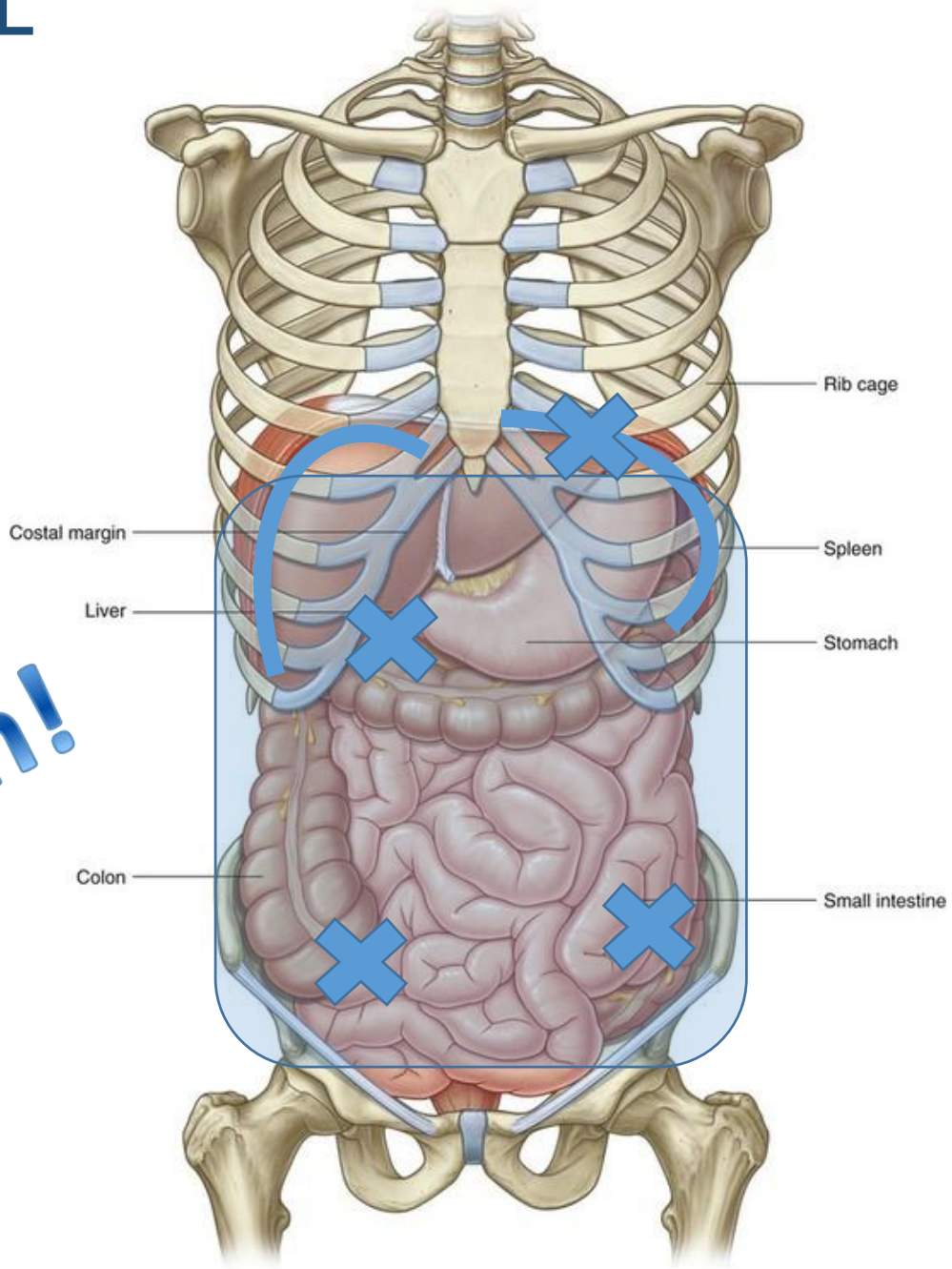
Intraperitoneal administration of local anesthetics in laparoscopic surgery: pharmacological, anatomical, physiological and pathophysiological considerations

O. IOANNIDIS [1], C. D. ANASTASILAKIS [2], I. VARNALIDIS [3], G. PARASKEVAS [4]
S. G. MALAKOZIS [1], S. GATZOS [1], M. NTOUMPARA [1], L. TSIGKRIKI [1], D. PAPAPOSTOLOU [1]
A. MAKRANTONAKIS [1], A. PAPADOPOULOU [1], N. MAKRANTONAKIS [1]

MINERVA CHIR 2013; 68:599-612

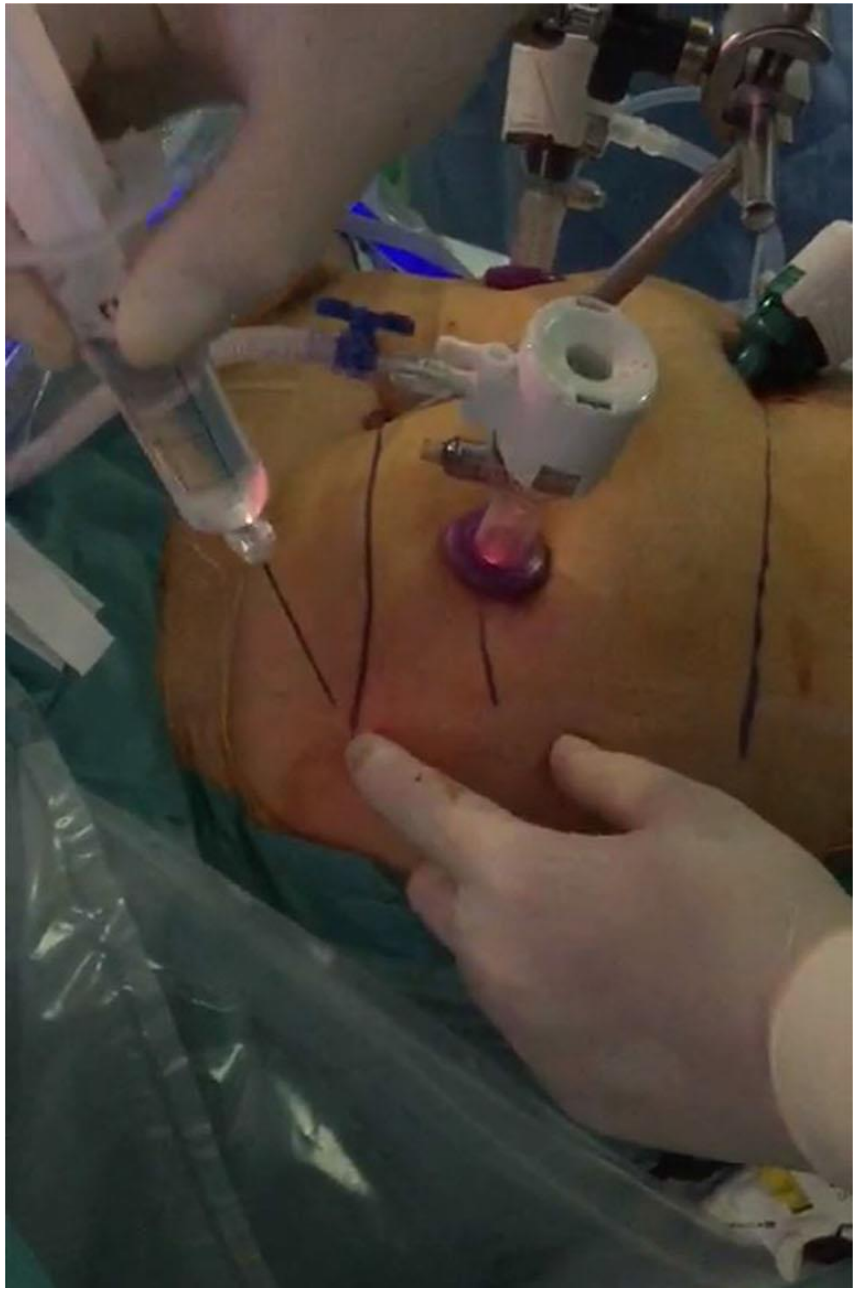
ANESTESIA INTRAPERITONEAL

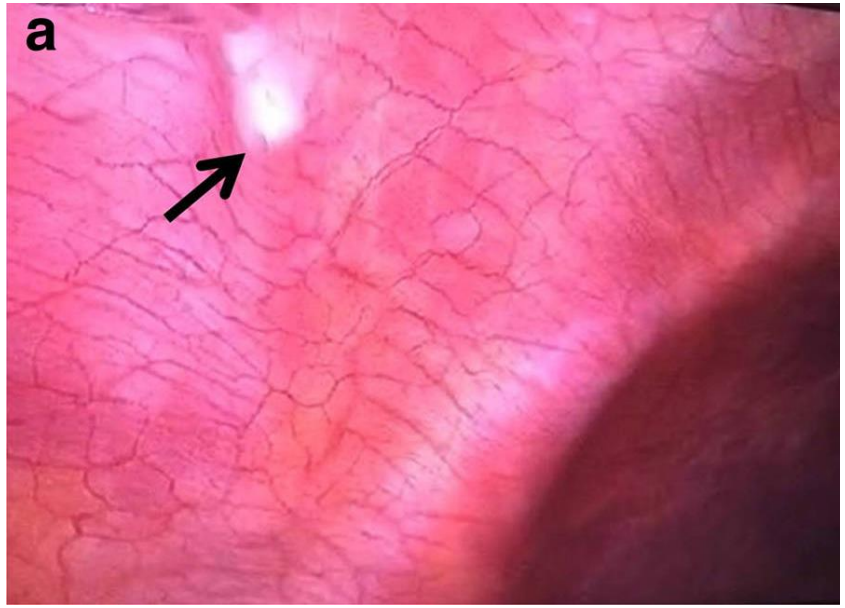
- **Lugares a irrigar:**
  - **Cúpulas diafragmáticas.**
  - **Pared abdominal.**
  - **Zonas a intervenir.**

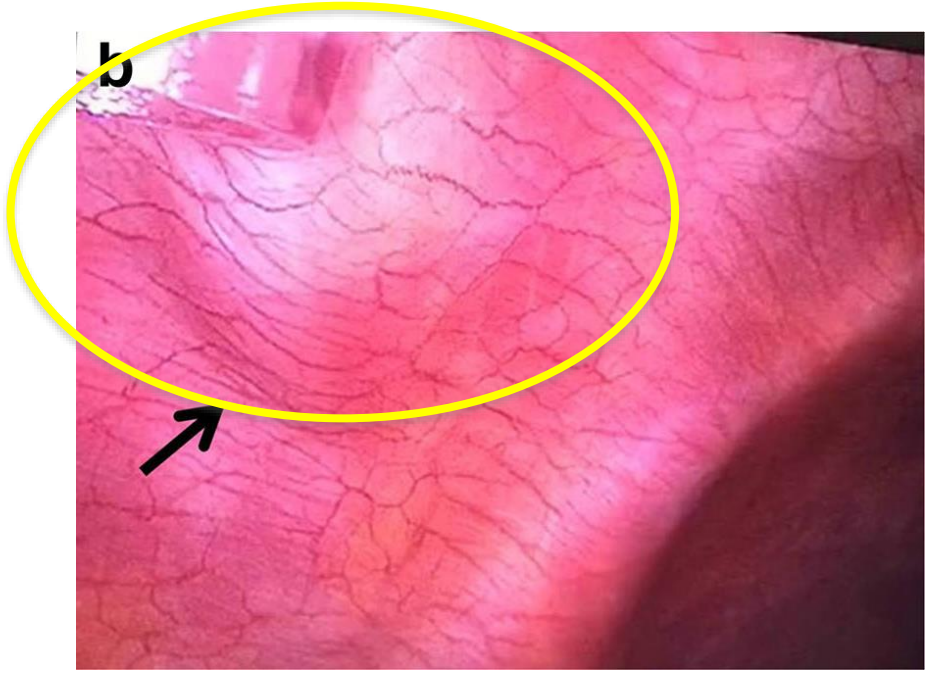


¡Nebulización!

TAP Transversus Abdominis Plane

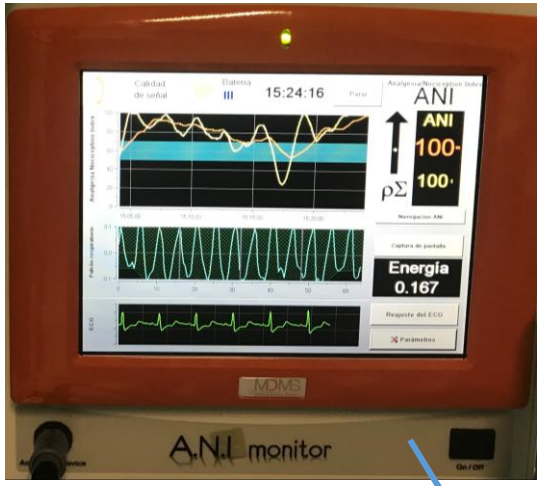






MONITORIZACIÓN ANESTESIA MULTIMODAL

BIS



ANI

HIPNOSIS

AMNESIA

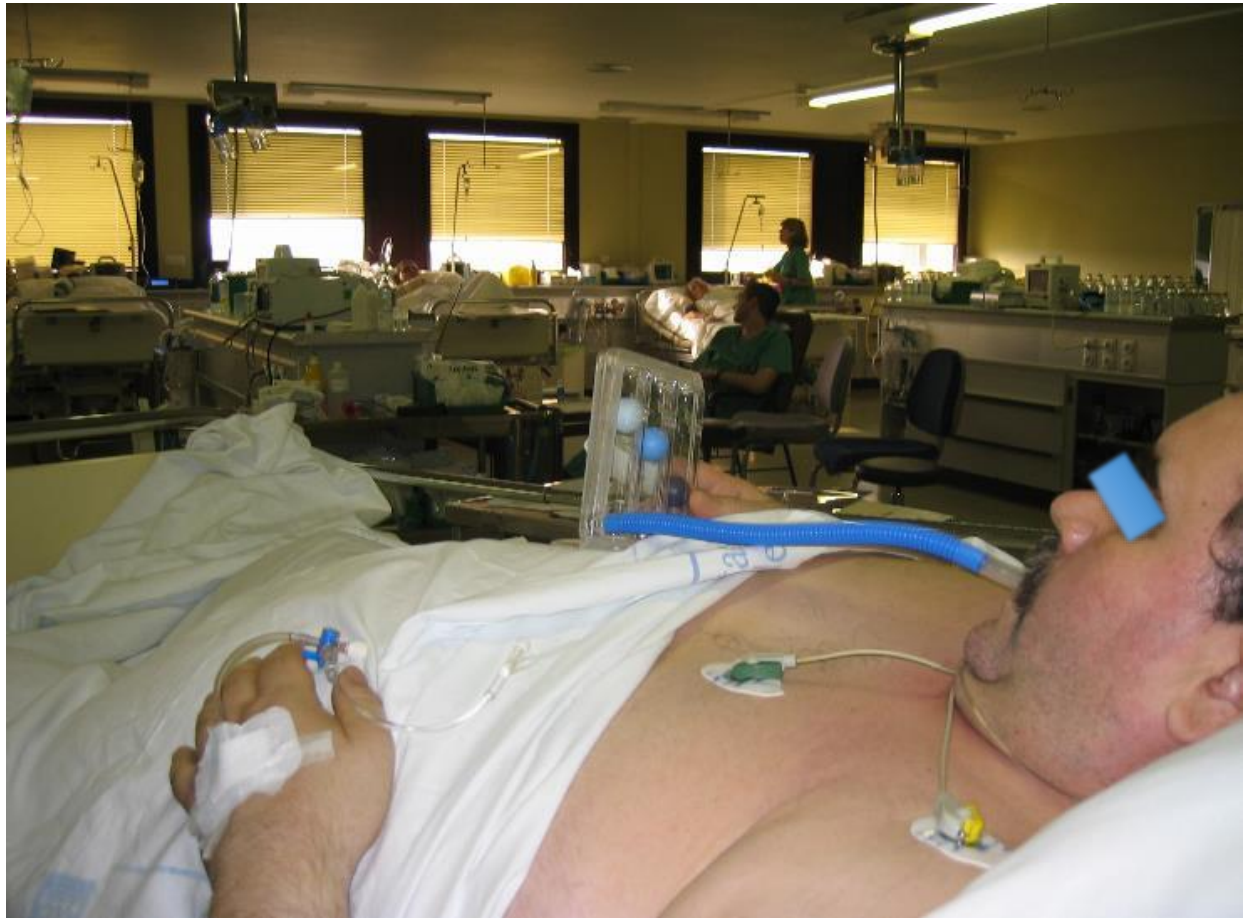
INMOVILIZACIÓN

ESTABILIDAD HEMODINÁMICA

ANTINOCICEPCIÓN

RELAJACIÓN

TOF



BUENA ANALGESIA

FISIOTERAPIA INCENTIVADA

MOVILIZACIÓN PRECOZ MMII

TOLERANCIA ORAL

ALTA EN 4 HORAS

6 horas postoperatorio

PACIENTES OBESOS Y/O CON SAHS PASAN A PLANTA EN 4 H.
NO DEPRESIÓN RESPIRATORIA

DEAMBULACIÓN PRECOZ EL MISMO DÍA DE LA CIRUGÍA.
PREVENCIÓN TVP/EP

TOLERANCIA EN 6 HORAS: NO ÍLEO PARALÍTICO
NO NAUSEAS NI VÓMITOS

4 horas postoperatorio

DISMINUCIÓN DE LA ESTANCIA HOSPITALARIA

	Lunes (Cirugía)	Martes	Miércoles	Jueves	
AÑO 2015					*OPIOIDES*
AÑO 2016					*OFA*
AÑO 2017					*OFA + NP*

< 1 DÍA (33%)

MUCHAS GRACIAS!!!!