PAINWEEK®

A Perfect Storm: How to Run an Acute Pain Service in Times of Opioid Crisis and COVID-19 Pandemic

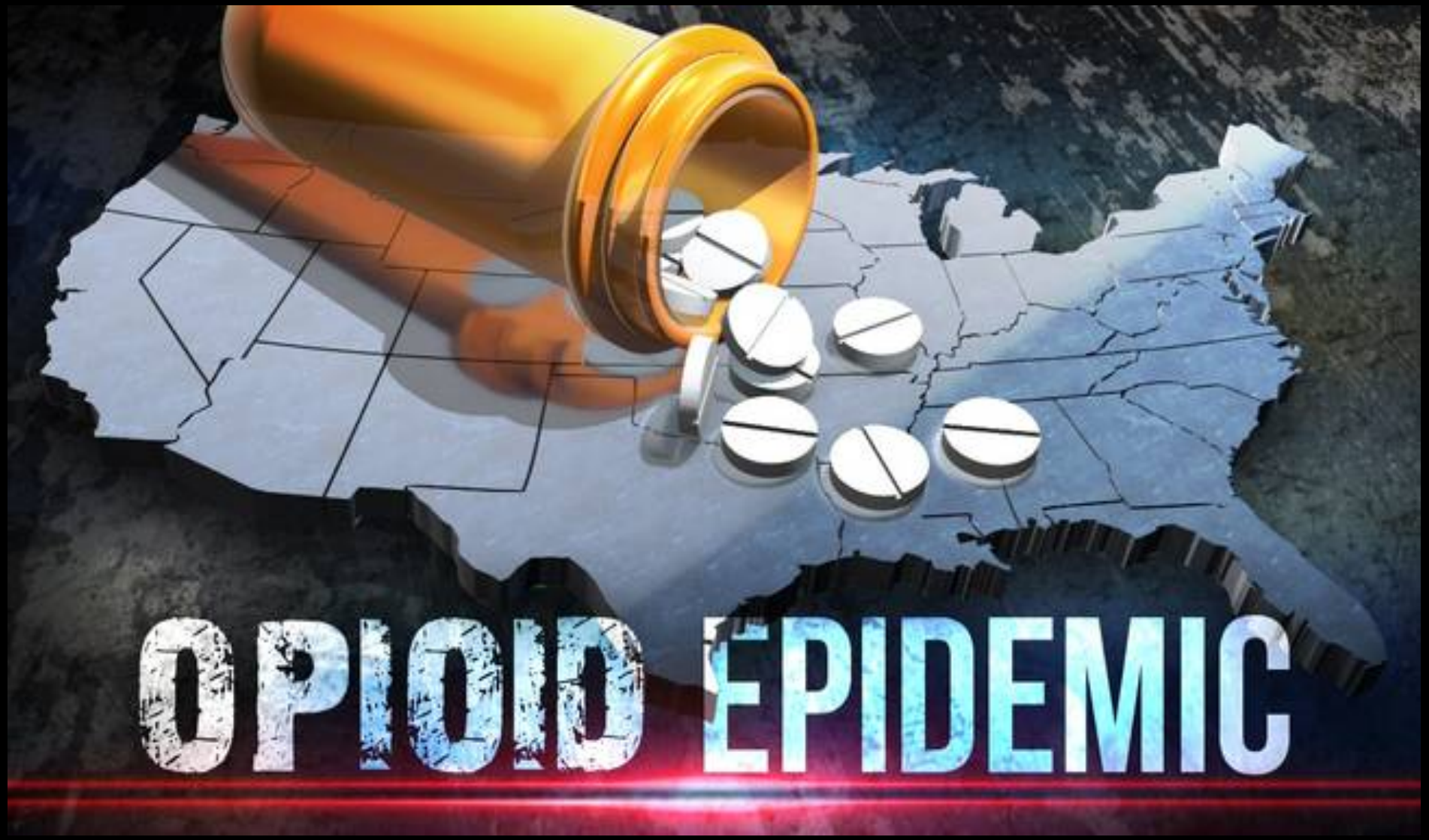
Ralf E. Gebhard, MD, FASA

Disclosure

- None

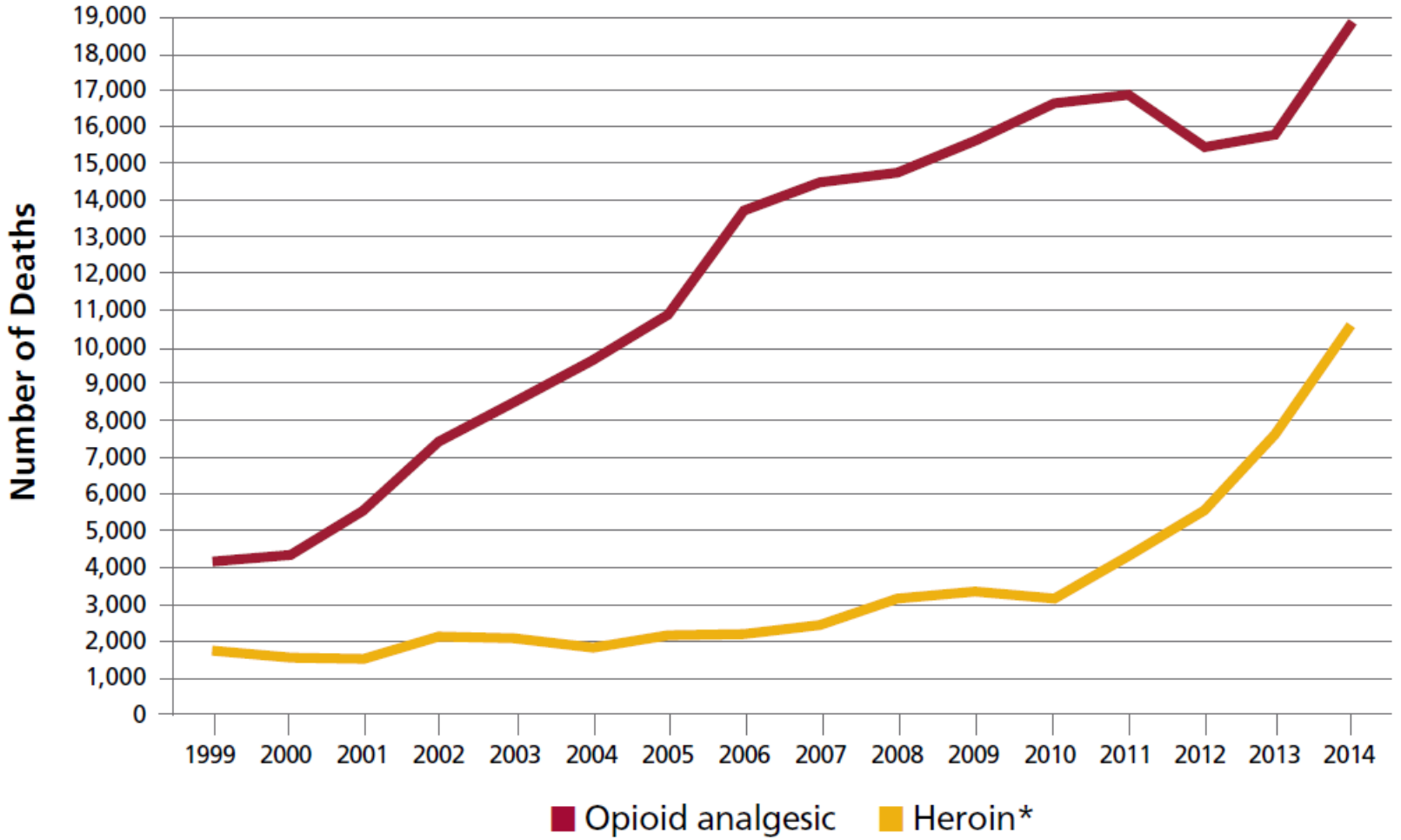
Learning Objectives

- Review non-opioid alternatives for acute pain management in the perioperative setting
- Identify strategies for perioperative management of patients on opioid use disorder medications
- Review challenges for acute pain management in COVID-19 patients
- Discuss PROs and CONs for peripheral nerve blocks as anesthetic technique in COVID-19 patients



PainWeek®

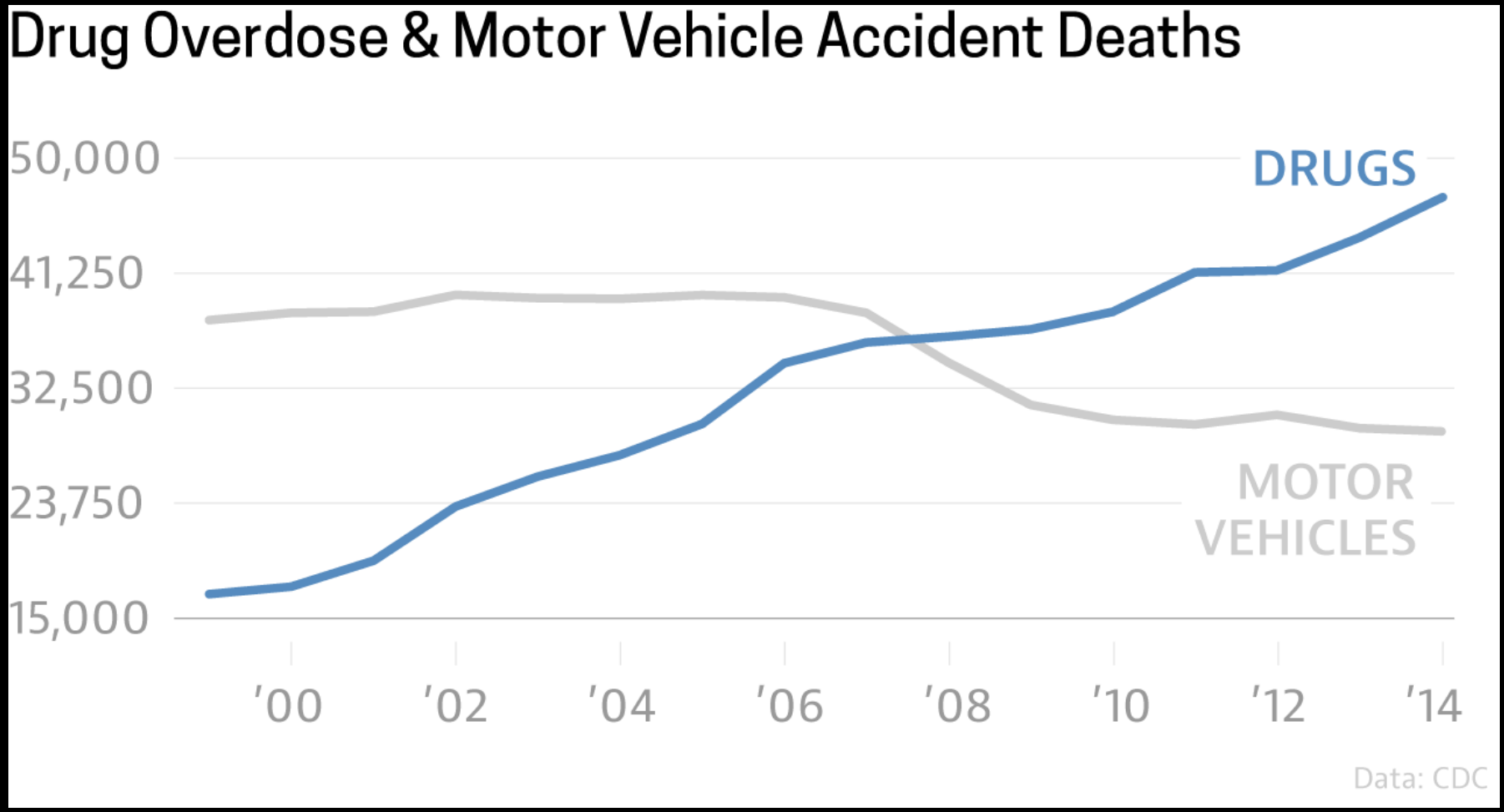
U.S. Deaths from Opioids & Heroin: 1999-2014



*Heroin includes opium.

1999-2013 Statistics: CDC/NCHS NVSS Multiple Cause of Death Files.

2014 Statistics: American Society of Addiction Medicine (ASAM). Opioid Addiction: 2016 Facts & Figures.


Drug Overdose & Motor Vehicle Accident Deaths
50,000
41,250
32,500
23,750
15,000
DRUGS
MOTOR VEHICLES
'00
'02
'04
'06
'08
'10
'12
'14
Data: CDC

On an average day in the U.S.:

- More than **650,000 opioid prescriptions** dispensed[1]
- **3,900 people** initiate nonmedical use of prescription opioids[2]
- **580 people** initiate heroin use[2]
- **78 people** die from an opioid-related overdose*[3]

*Opioid-related overdoses include those involving prescription opioids and illicit opioids such as heroin

Source: IMS Health National Prescription Audit[1] / SAMHSA National Survey on Drug Use and Health[2] / CDC National Vital Statistics System[3]

Economic Impact of the Opioid Epidemic:

- **55 billion** in health and social costs related to prescription opioid abuse each year[1]

- **20 billion** in emergency department and inpatient care for opioid poisonings[2]

Source: Pain Med. 2011;12(4):657-67.[1]
2013;14(10):1534-47.[2]

Opioid Epidemic – Causes?

- Overprescribing after surgery
- Pharmaceutical industry (extended release oxycodone)
- JCAHO (pain 5th vital sign)
- Patient factors (e.g., depression)

Kim N et al. J Bone Joint Surg Am 2016;98:1-9
Carroll I et al. Anesth Analg 2012;115:694-702
Joint Commission on Accreditation of Healthcare Organizations. Jt Comm Perspect. 1999;19:6–8.

Experts Recommendation to Manage Postsurgical Pain:

The Joint Commission[3]

- "Use an individualized, multimodal treatment plan to manage pain"

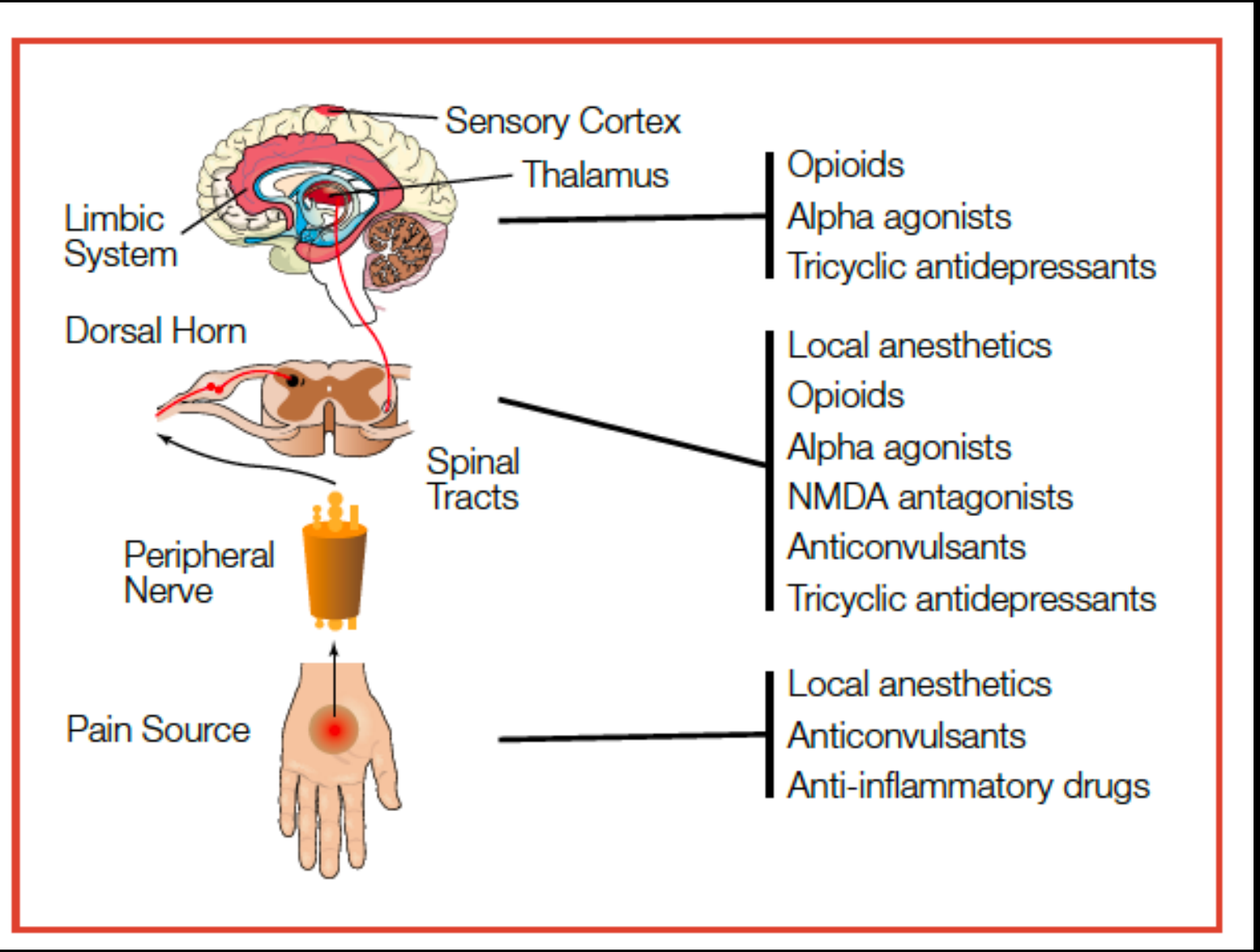
National Action Plan to Prevent Adverse Drug Events[4]

- "Federal agencies should promote…nonopioid pharmacological therapies…as part of an overall pain management plan"

American Society of Anesthesiologists Task Force on Acute Pain Management[5]

- "Whenever possible, anesthesiologists should use multimodal pain management therapy"

Multimodal Analgesia



Multimodal Analgesia

OVERALL GOAL:

Minimizing/Sparing Opioids

Multimodal Analgesia

OVERALL GOAL:

Minimizing/Sparing Opioids

While avoiding significant additional side effects

Multimodal Analgesia

What tools do we have available?

What is the best timing for administration pre/intra/post?

Are certain surgeries more susceptible to certain treatments ?

Preoperative “Preemptive” Therapeutics

EJP
European Journal of Pain

REVIEW ARTICLE

Preoperative preemptive drug administration for acute postoperative pain: A systematic review and meta-analysis

R.-R. Nir[1,2], H. Nahman-Averbuch[1,2], R. Moont[1,2], E. Sprecher[1,2], D. Yarnitsky[1,2]

1 Department of Neurology, Rambam Health Care Campus, Haifa, Israel
2 Laboratory of Clinical Neurophysiology, The Bruce Rappaport Faculty of Medicine, Technion – Israel Institute of Technology, Haifa, Israel

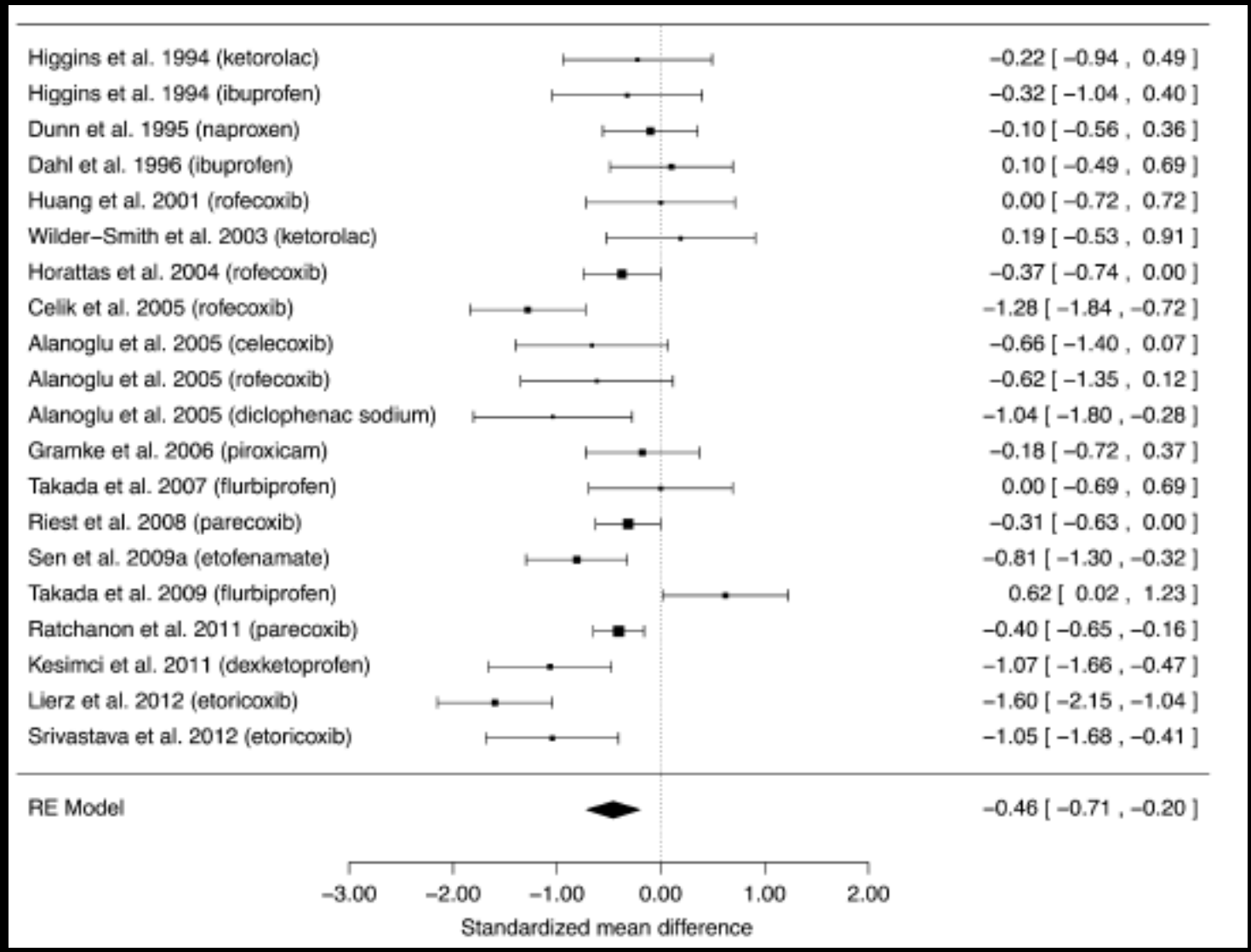
511 articles screened

39 articles included

Data from 3172 patients

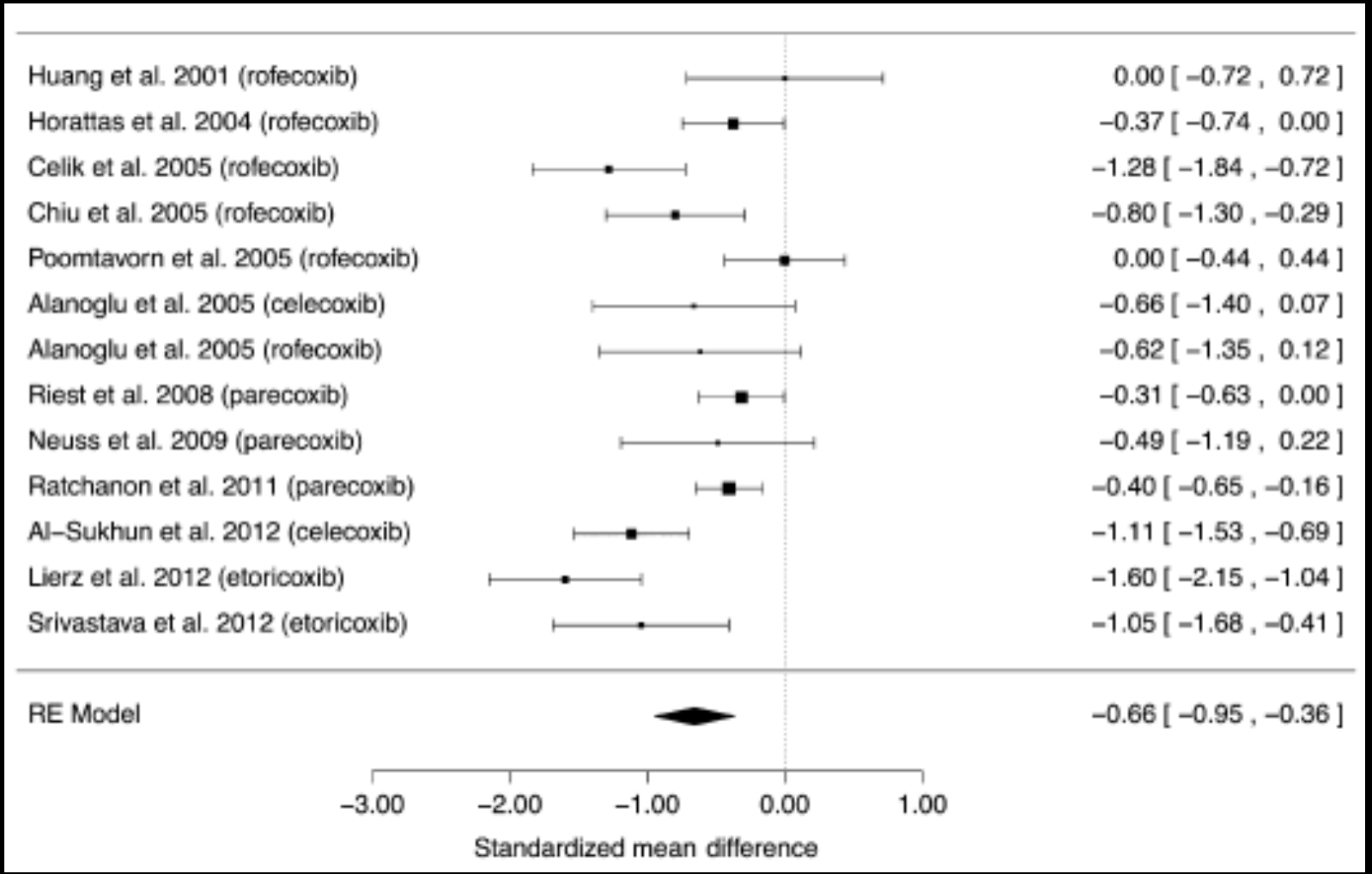
Nir RR et al. Eur J Pain 2016;20:1025-43

All NSAIDS – Postop Opioid Consumption



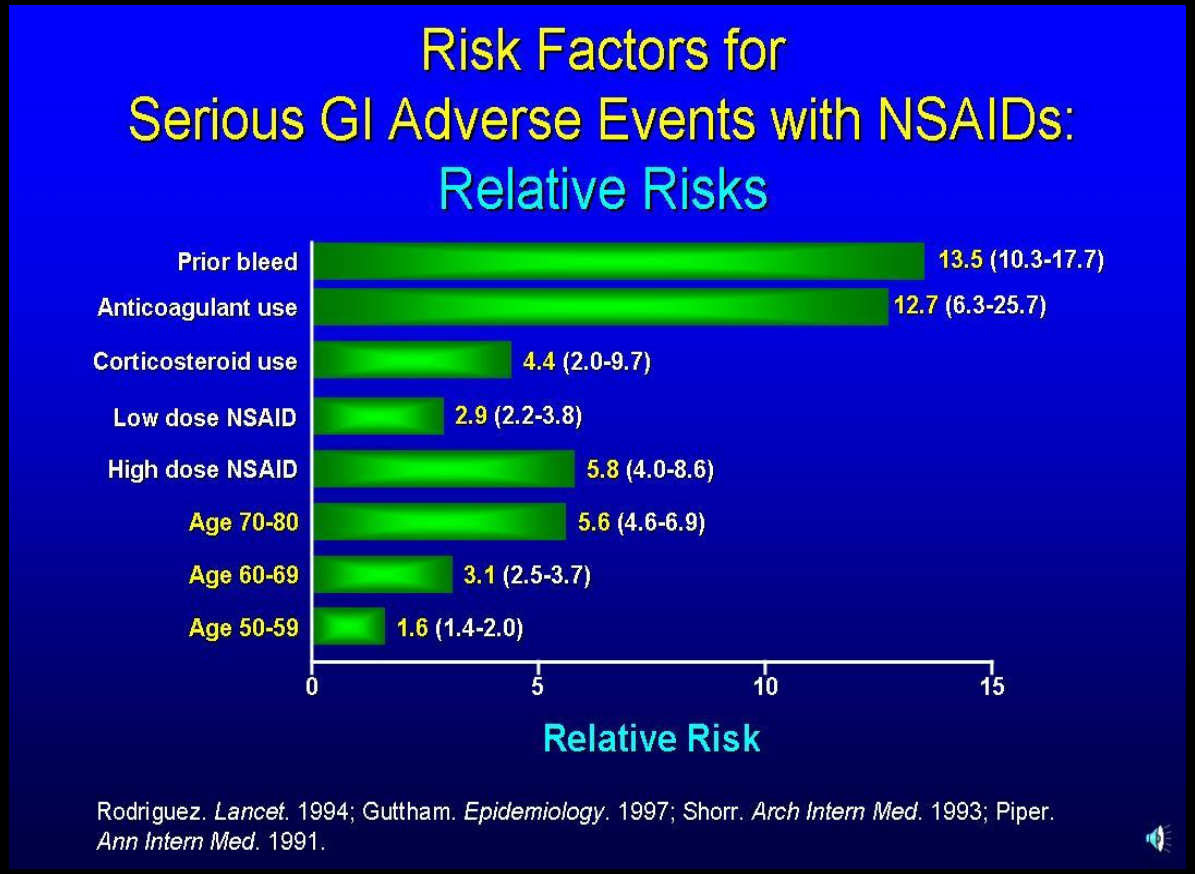
Nir RR et al. Eur J Pain 2016;20:1025-43

COX-2 Inhibitors – Postop Opioid Consumption



Nir RR et al. Eur J Pain 2016;20:1025-43

NSAIDs – Bleeding Risk



Relative Risk by NSAID

- Celecoxib 1.42
- Ibuprofen 2.69
- Diclofenac 3.89
- Meloxicam 4.15
- Naproxen 5.63
- Piroxicam 9.93
- Ketorolac 14.54

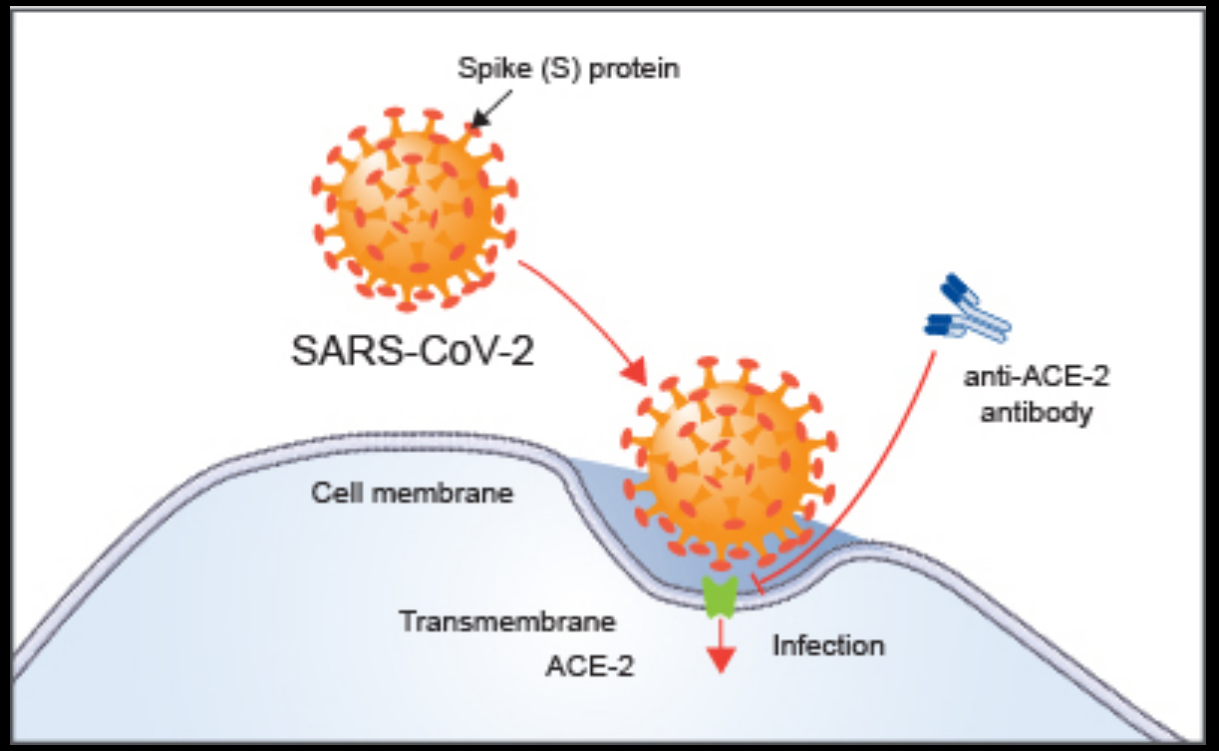
Are NSAIDS Safe in COVID-19 Patients?

Herzberg DL et al. Reg Anesth Pain Med 2020; epub ahead of print

Are NSAIDS Safe in COVID-19 Patients?

- SARS corona virus-2 infects cells by binding to ACE-2 (common in cardiovascular, GI and renal system)

- Ibuprofen could increase levels of cellular expressed ACE-2 and result in more severe disease

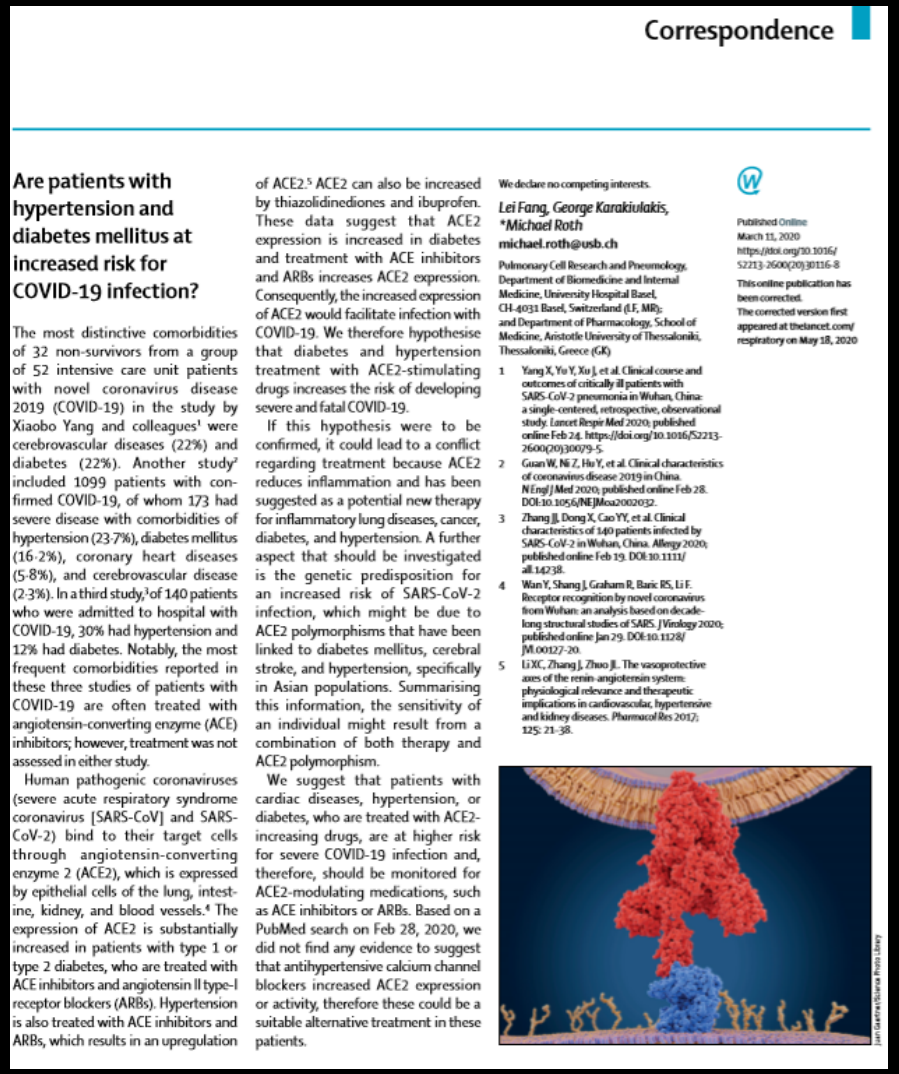


Herzberg DL et al. Reg Anesth Pain Med 2020; epub ahead of print

Are NSAIDS Safe in COVID-19 Patients?

THE LANCET

March11,2020



Correspondence

Are patients with hypertension and diabetes mellitus at increased risk for COVID-19 infection?

The most distinctive comorbidities of 32 non-survivors from a group of 52 intensive care unit patients with novel coronavirus disease 2019 (COVID-19) in the study by Xiaobo Yang and colleagues[1] were cerebrovascular diseases (22%) and diabetes (22%). Another study[2] included 1099 patients with confirmed COVID-19, of whom 173 had severe disease with comorbidities of hypertension (23·7%), diabetes mellitus (16·2%), coronary heart diseases (5·8%), and cerebrovascular disease (2·3%). In a third study,[3] of 140 patients who were admitted to hospital with COVID-19, 30% had hypertension and 12% had diabetes. Notably, the most frequent comorbidities reported in these three studies of patients with COVID-19 are often treated with angiotensin-converting enzyme (ACE) inhibitors; however, treatment was not assessed in either study.

Human pathogenic coronaviruses (severe acute respiratory syndrome coronavirus [SARS-CoV] and SARS-CoV-2) bind to their target cells through angiotensin-converting enzyme 2 (ACE2), which is expressed by epithelial cells of the lung, intestine, kidney, and blood vessels.[4] The expression of ACE2 is substantially increased in patients with type 1 or type 2 diabetes, who are treated with ACE inhibitors and angiotensin II type-I receptor blockers (ARBs). Hypertension is also treated with ACE inhibitors and ARBs, which results in an upregulation of ACE2.[5] ACE2 can also be increased by thiazolidinediones and ibuprofen. These data suggest that ACE2 expression is increased in diabetes and treatment with ACE inhibitors and ARBs increases ACE2 expression. Consequently, the increased expression of ACE2 would facilitate infection with COVID-19. We therefore hypothesise that diabetes and hypertension treatment with ACE2-stimulating drugs increases the risk of developing severe and fatal COVID-19.

If this hypothesis were to be confirmed, it could lead to a conflict regarding treatment because ACE2 reduces inflammation and has been suggested as a potential new therapy for inflammatory lung diseases, cancer, diabetes, and hypertension. A further aspect that should be investigated is the genetic predisposition for an increased risk of SARS-CoV-2 infection, which might be due to ACE2 polymorphisms that have been linked to diabetes mellitus, cerebral stroke, and hypertension, specifically in Asian populations. Summarising this information, the sensitivity of an individual might result from a combination of both therapy and ACE2 polymorphism.

We suggest that patients with cardiac diseases, hypertension, or diabetes, who are treated with ACE2-increasing drugs, are at higher risk for severe COVID-19 infection and, therefore, should be monitored for ACE2-modulating medications, such as ACE inhibitors or ARBs. Based on a PubMed search on Feb 28, 2020, we did not find any evidence to suggest that antihypertensive calcium channel blockers increased ACE2 expression or activity, therefore these could be a suitable alternative treatment in these patients.

We declare no competing interests.

*Lei Fang, George Karakiulakis, *Michael Roth*
michael.roth@usb.ch

Pulmonary Cell Research and Pneumology, Department of Biomedicine and Internal Medicine, University Hospital Basel, CH-4031 Basel, Switzerland (LF, MR); and Department of Pharmacology, School of Medicine, Aristotle University of Thessaloniki, Thessaloniki, Greece (GK)

1 Yang X, Yu Y, Xu J, et al. Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. *Lancet Respir Med* 2020; published online Feb 24. https://doi.org/10.1016/S2213-2600(20)30079-5.
2 Guan W, Ni Z, Hu Y, et al. Clinical characteristics of coronavirus disease 2019 in China. *N Engl J Med* 2020; published online Feb 28. DOI:10.1056/NEJMoa2002032.
3 Zhang JJ, Dong X, Cao YY, et al. Clinical characteristics of 140 patients infected by SARS-CoV-2 in Wuhan, China. *Allergy* 2020; published online Feb 19. DOI:10.1111/all.14238.
4 Wan Y, Shang J, Graham R, Baric RS, Li F. Receptor recognition by novel coronavirus from Wuhan: an analysis based on decade-long structural studies of SARS. *J Virology* 2020; published online Jan 29. DOI:10.1128/JM.00127-20.
5 Li XC, Zhang J, Zhuo JL. The vasoprotective axes of the renin-angiotensin system: physiological relevance and therapeutic implications in cardiovascular, hypertensive and kidney diseases. *Pharmacol Res* 2017; 125: 21–38.

Published Online
March 11, 2020
https://doi.org/10.1016/S2213-2600(20)30116-8

This online publication has been corrected.
The corrected version first appeared at thelancet.com/respiratory on May 18, 2020

PAINWEEK

Are NSAIDS Safe in COVID-19 Patients?

Original Research

Ibuprofen Attenuates Cardiac Fibrosis in Streptozotocin-Induced Diabetic Rats

Qiao W.[a-c] · Wang C.[d] · Chen B.[c] · Zhang F.[b] · Liu Y.[b] · Lu Q.[b] · Guo H.[b] · Yan C.[c] · Sun H.[c] · Hu G.[a] · Yin X.[a, b]

Author affiliations

Keywords: Diabetes · Cardiac fibrosis · Ibuprofen · Angiotensin-converting enzyme · Angiotensin-converting enzyme 2

Cardiology 2015;131:97-106

https://doi.org/10.1159/000375362

PAINWEEK

Qiao W et al. Cardiology 2015;131:97-106

Are NSAIDS Safe in COVID-19 Patients?

- Ratio ACE: ACE 2 was raised in diabetic rats
- This was reversed by Ibuprofen
- Ibuprofen relatively raised ACE-2

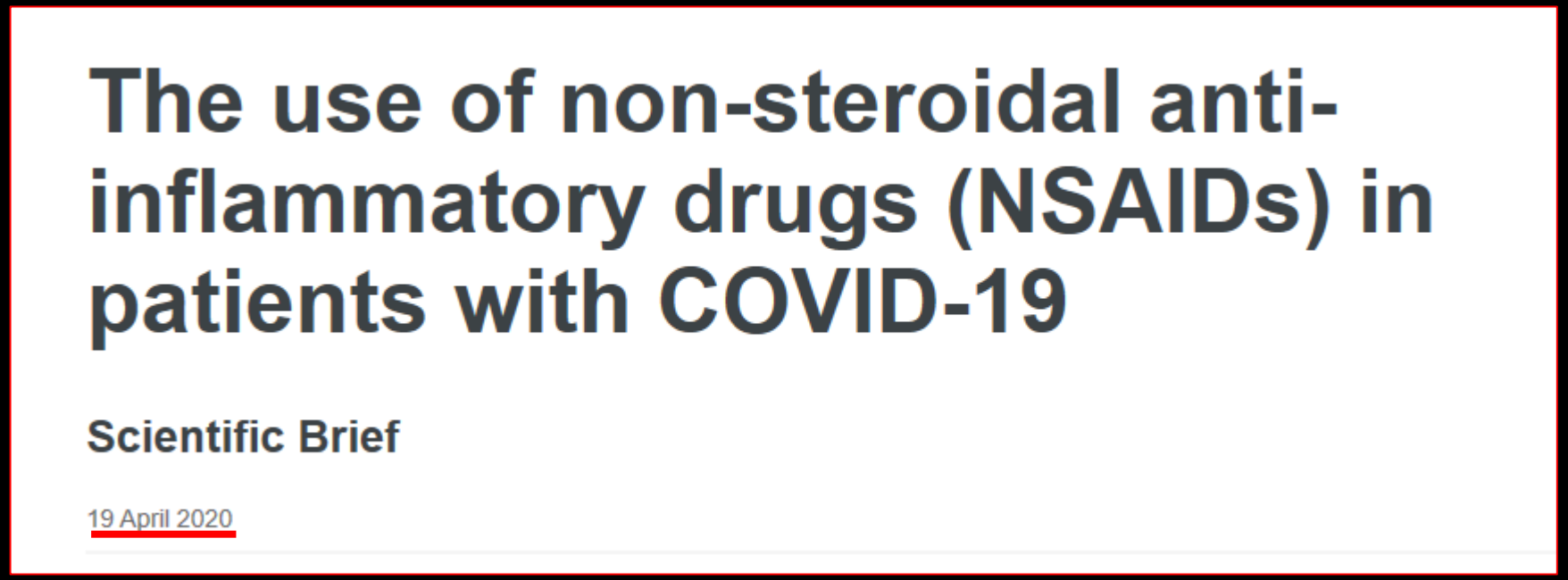
Qiao W et al. Cardiology 2015;131:97-106

Are NSAIDS Safe in COVID-19 Patients?

Are NSAIDS Safe in COVID-19 Patients?

PAINWEEK

Are NSAIDS Safe in COVID-19 Patients?



World Health Organization

Are NSAIDs Safe in COVID-19 Patients?

"At present there is no evidence of severe adverse events, acute healthcare utilization, long-term survival, or quality of life in patients with COVID-19, as a result of the use of NSAIDs"

World Health Organization

Are NSAIDs Safe in COVID-19 Patients?

Clin Infect Dis. 2020 Jul 27;ciaa1056. doi: 10.1093/cid/ciaa1056. Online ahead of print.

Association between NSAIDs use and adverse clinical outcomes among adults hospitalized with COVID-19 in South Korea: A nationwide study

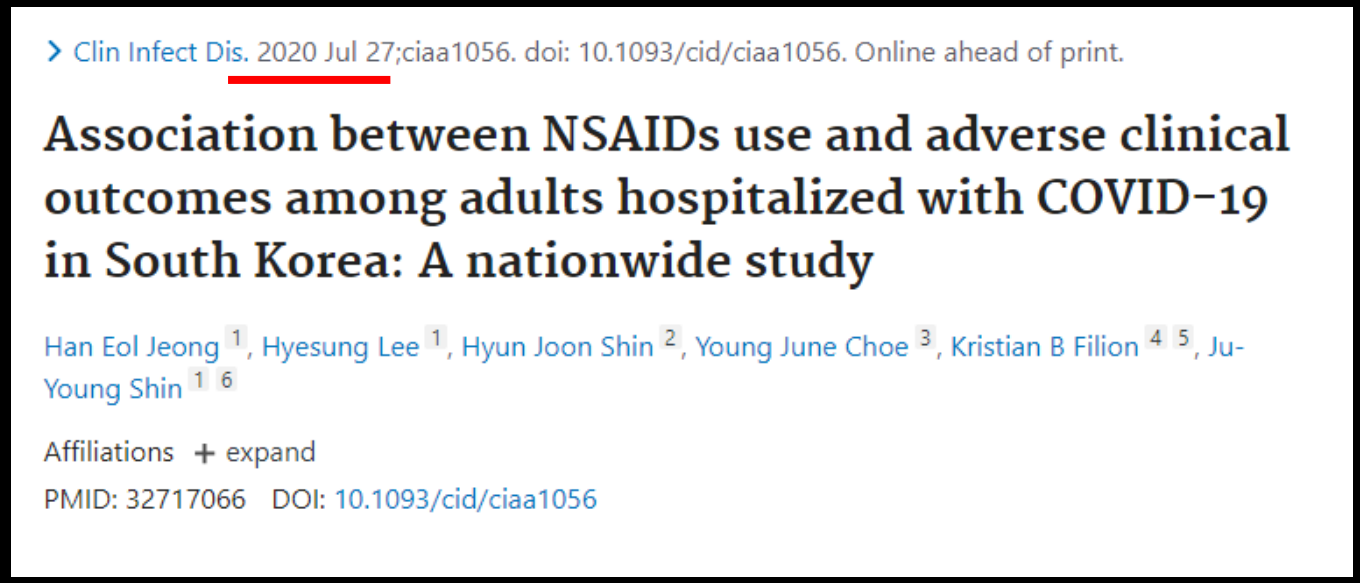
Han Eol Jeong [1], Hyesung Lee [1], Hyun Joon Shin [2], Young June Choe [3], Kristian B Filion [4 5], Ju-Young Shin [1 6]

Affiliations + expand

PMID: 32717066 DOI: 10.1093/cid/ciaa1056

South Korea's National Database COVID-19
Hospitalized patients: 1824
NSAIDs Users: 354

Are NSAIDs Safe in COVID-19 Patients?



Clin Infect Dis. 2020 Jul 27;ciaa1056. doi: 10.1093/cid/ciaa1056. Online ahead of print.

Association between NSAIDs use and adverse clinical outcomes among adults hospitalized with COVID-19 in South Korea: A nationwide study

Han Eol Jeong [1], Hyesung Lee [1], Hyun Joon Shin [2], Young June Choe [3], Kristian B Filion [4 5], Ju-Young Shin [1 6]

Affiliations + expand

PMID: 32717066 DOI: 10.1093/cid/ciaa1056

"NSAIDs use was associated with increased risk of the primary composite outcome." (in-hospital death, ICU admission, ventilator use, sepsis)

Are NSAIDs Safe in COVID-19 Patients?

My opinion:

err on the side of caution

Journal of Pain Research

Dovepress

open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

Use of preoperative gabapentin significantly reduces postoperative opioid consumption: a meta-analysis

Sudha Arumugam[1]
Christine SM Lau[1,2]
Ronald S Chamberlain[1–3]

[1]Department of Surgery, Saint Barnabas Medical Center, Livingston, NJ, USA; [2]Saint George's University School of Medicine, Grenada, West Indies; [3]Department of Surgery, Rutgers University, New Jersey Medical School, Newark, NJ, USA

Anticonvulsant

Mechanism of action: unknown

Arumugam S et al. J Pain Res 2016;9:631-40

812 Articles screened

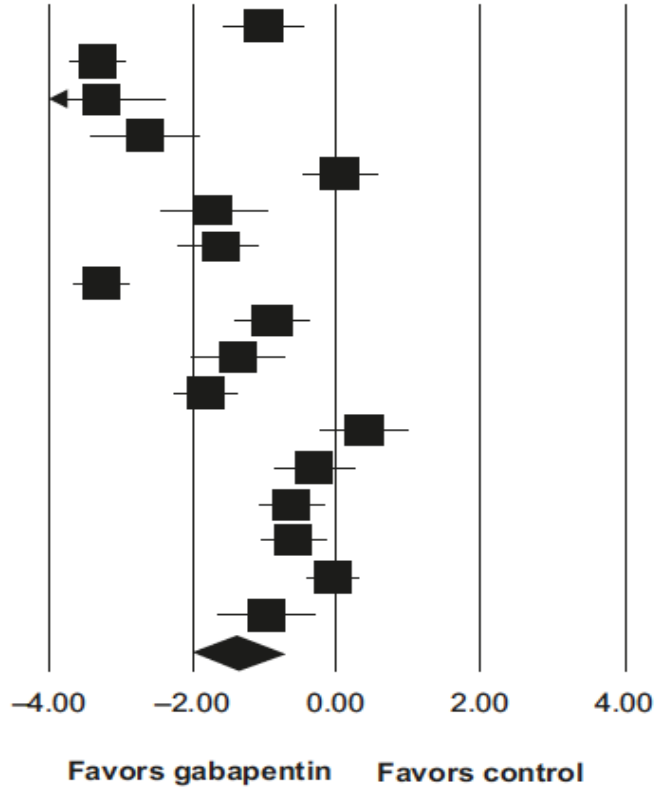
17 RCTs selected

1791 patients

Arumugam S et al. J Pain Res 2016;9:631-40

Opioid Consumption

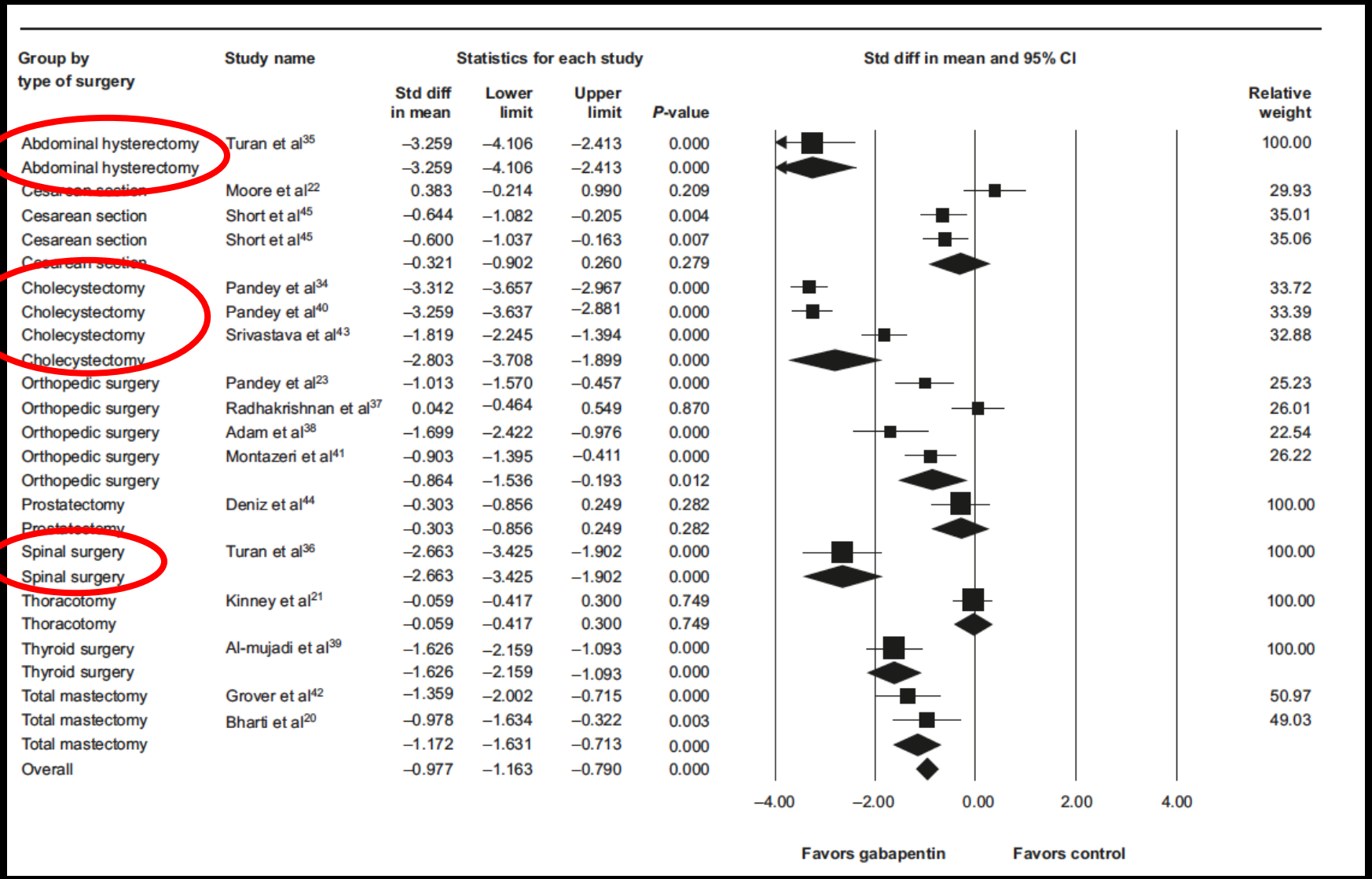
Study name	Std diff in mean	Lower limit	Upper limit	*P*-value	Relative weight
Pandey et al[23]	–1.013	–1.570	–0.457	0.000	5.88
Pandey et al[34]	–3.312	–3.657	–2.967	0.000	6.06
Turan et al[35]	–3.259	–4.105	–2.413	0.000	5.53
Turan et al[36]	–2.663	–3.425	–1.902	0.000	5.65
Radhakrishnan et al[37]	0.042	–0.464	0.549	0.870	5.93
Adam et al[38]	–1.699	–2.422	–0.976	0.000	5.70
Al-Mujadi et al[39]	–1.626	–2.159	–1.093	0.000	5.91
Pandey et al[40]	–3.259	–3.637	–2.881	0.000	6.04
Montazeri et al[41]	–0.903	–1.395	–0.411	0.000	5.95
Grover et al[42]	–1.359	–2.002	–0.715	0.000	5.79
Srivastava et al[43]	–1.819	–2.245	–1.394	0.000	6.00
Moore et al[22]	0.383	–0.214	0.980	0.209	5.84
Deniz et al[44]	–0.303	–0.856	0.249	0.282	5.89
Short et al[45]	–0.644	–1.082	–0.205	0.004	5.99
Short et al[45]	–0.600	–1.037	–0.163	0.007	5.99
Kinney et al[21]	–0.059	–0.417	0.300	0.749	6.06
Bharti et al[20]	–0.978	–1.634	–0.322	0.003	5.78
	–1.350	–1.965	–0.735	0.000	



PainWeek

Arumugam S et al. J Pain Res 2016;9:631-40

Type of Surgery



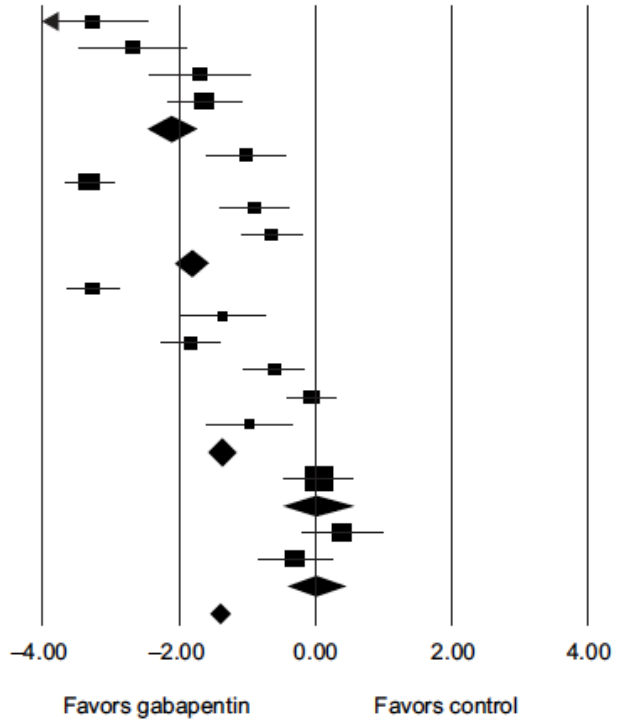
Group by type of surgery	Study name	Std diff in mean	Lower limit	Upper limit	*P*-value	Relative weight
Abdominal hysterectomy	Turan et al[35]	−3.259	−4.106	−2.413	0.000	100.00
Abdominal hysterectomy		−3.259	−4.106	−2.413	0.000	
Cesarean section	Moore et al[22]	0.383	−0.214	0.990	0.209	29.93
Cesarean section	Short et al[45]	−0.644	−1.082	−0.205	0.004	35.01
Cesarean section	Short et al[45]	−0.600	−1.037	−0.163	0.007	35.06
Cesarean section		−0.321	−0.902	0.260	0.279	
Cholecystectomy	Pandey et al[34]	−3.312	−3.657	−2.967	0.000	33.72
Cholecystectomy	Pandey et al[40]	−3.259	−3.637	−2.881	0.000	33.39
Cholecystectomy	Srivastava et al[43]	−1.819	−2.245	−1.394	0.000	32.88
Cholecystectomy		−2.803	−3.708	−1.899	0.000	
Orthopedic surgery	Pandey et al[23]	−1.013	−1.570	−0.457	0.000	25.23
Orthopedic surgery	Radhakrishnan et al[37]	0.042	−0.464	0.549	0.870	26.01
Orthopedic surgery	Adam et al[38]	−1.699	−2.422	−0.976	0.000	22.54
Orthopedic surgery	Montazeri et al[41]	−0.903	−1.395	−0.411	0.000	26.22
Orthopedic surgery		−0.864	−1.536	−0.193	0.012	
Prostatectomy	Deniz et al[44]	−0.303	−0.856	0.249	0.282	100.00
Prostatectomy		−0.303	−0.856	0.249	0.282	
Spinal surgery	Turan et al[36]	−2.663	−3.425	−1.902	0.000	100.00
Spinal surgery		−2.663	−3.425	−1.902	0.000	
Thoracotomy	Kinney et al[21]	−0.059	−0.417	0.300	0.749	100.00
Thoracotomy		−0.059	−0.417	0.300	0.749	
Thyroid surgery	Al-mujadi et al[39]	−1.626	−2.159	−1.093	0.000	100.00
Thyroid surgery		−1.626	−2.159	−1.093	0.000	
Total mastectomy	Grover et al[42]	−1.359	−2.002	−0.715	0.000	50.97
Total mastectomy	Bharti et al[20]	−0.978	−1.634	−0.322	0.003	49.03
Total mastectomy		−1.172	−1.631	−0.713	0.000	
Overall		−0.977	−1.163	−0.790	0.000	

PAINWEEK

Arumugam S et al. J Pain Res 2016;9:631-40

Dose

Group by dosage	Study name	Statistics for each study: Std diff in means	Lower limit	Upper limit	*P*-value	Relative weight
1200.00	Turan et al[35]	–3.259	–4.105	–2.413	0.000	16.34
1200.00	Turan et al[36]	–2.663	–3.425	–1.902	0.000	20.16
1200.00	Adam et al[38]	–1.699	–2.422	–0.976	0.000	22.36
1200.00	Al-Mujadi et al[39]	–1.626	–2.159	–1.093	0.000	41.14
1200.00		–2.118	–2.460	–1.777	0.000	
300.00	Pandey et al[23]	–1.013	–1.570	–0.457	0.000	15.41
300.00	Pandey et al[34]	–3.312	–3.657	–2.967	0.000	40.07
300.00	Montazeri et al[41]	–0.903	–1.395	–0.411	0.000	19.72
300.00	Short et al[45]	–0.644	–1.082	–0.205	0.004	24.80
300.00		–1.821	–2.039	–1.603	0.000	
600.00	Pandey et al[40]	–3.259	–3.637	–2.881	0.000	23.09
600.00	Grover et al[42]	–1.359	–2.002	–0.715	0.000	7.99
600.00	Srivastava et al[43]	–1.819	–2.245	–1.394	0.000	18.25
600.00	Short et al[45]	–0.600	–1.037	–0.163	0.007	17.28
600.00	Kinney et al[21]	–0.059	–0.417	0.300	0.749	25.72
600.00	Bharti et al[20]	–0.978	–1.634	–0.322	0.003	7.68
600.00		–1.387	–1.568	–1.205	0.000	
800.00	Radhakrishnan et al[37]	0.042	–0.464	0.549	0.870	100.00
800.00		0.042	–0.464	0.549	0.870	
900.00	Moore et al[22]	0.383	–0.214	0.980	0.209	46.11
900.00	Deniz et al[44]	–0.303	–0.856	0.249	0.282	53.89
900.00		0.013	–0.392	0.418	0.950	
Overall		–1.405	–1.525	–1.285	0.000	



Arumugam S et al. J Pain Res 2016;9:631-40

Secondary Outcomes/Side Effects:

Significant increase in somnolence

No impact on nausea/vomiting

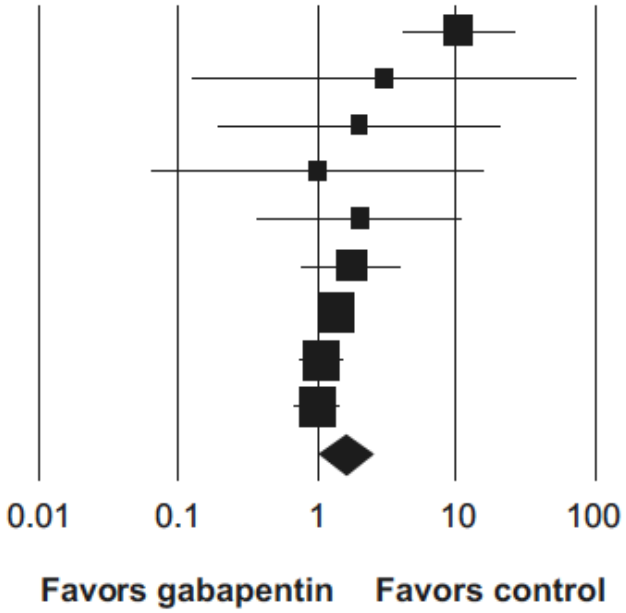
Arumugam S et al. J Pain Res 2016;9:631-40

Somnolence

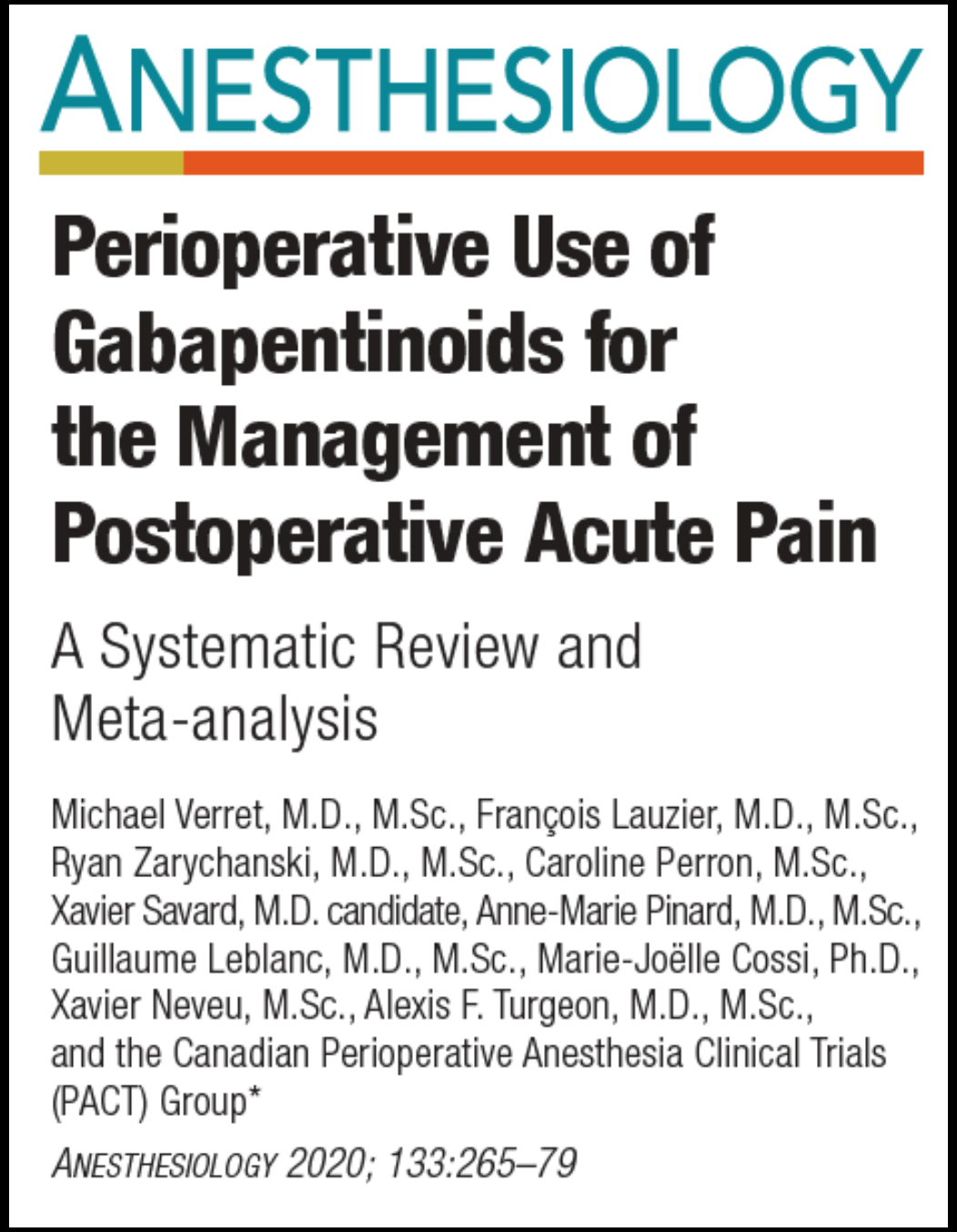
Study name	Risk ratio	Lower limit	Upper limit	*P*-value	Relative weight
Pandey et al[23]	10.400	4.271	25.323	0.000	11.45
Turan et al[35]	3.000	0.128	70.296	0.495	1.60
Turan et al[36]	2.000	0.194	20.671	0.561	2.76
Radhakrishnan et al[37]	1.000	0.066	15.260	1.000	2.09
Pandey et al[40]	2.000	0.373	10.722	0.418	4.84
Srivastava et al[43]	1.750	0.793	3.862	0.166	12.88
Moore et al[22]	1.340	1.042	1.724	0.023	22.48
Short et al[45]	1.080	0.772	1.512	0.654	21.10
Short et al[45]	1.000	0.703	1.423	1.000	20.80
	1.636	1.084	2.471	0.019	

Statistics for each study

Risk ratio and 95% CI



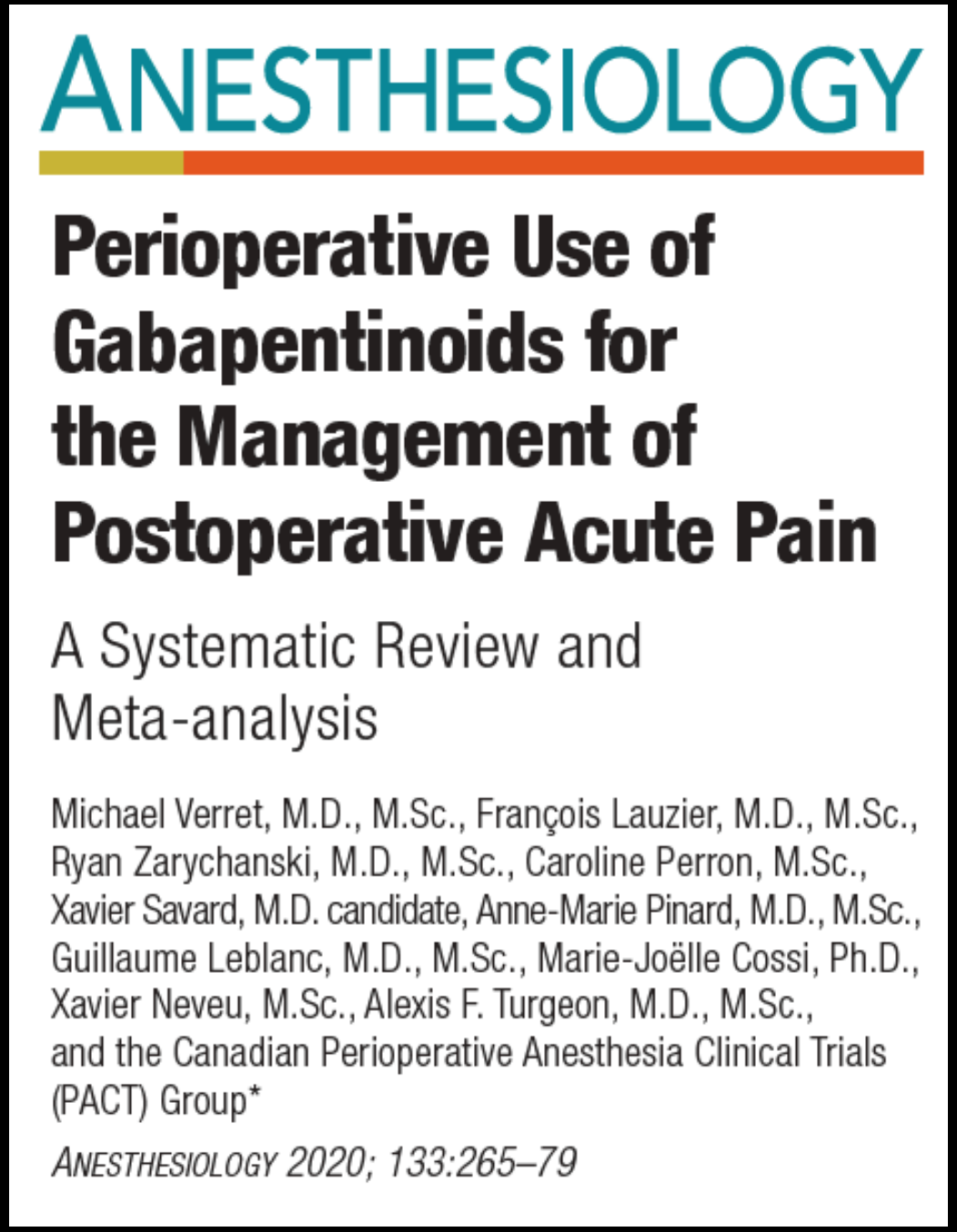
Arumugam S et al. J Pain Res 2016;9:631-40



Verret M et al. Anesthesiology 2020;133:265-79

"Conclusion: No clinically significant analgesic effect for the perioperative use of gabapentinoids was observed"

Verret M et al. Anesthesiology 2020;133:265-79



"Uber meta-analysis"

-6795 articles screened

- 281 RCTs selected

- 24682 patients

Verret M et al. Anesthesiology 2020;133:265-79

Risk of Bias:

High: 27% of trials

Low: 11% of trials

Unclear: 62% of trials

Verret M et al. Anesthesiology 2020;133:265-79

Gabapentin – Pregabalin:

Gabapentin: 52% of trials

Pregabalin: 43% of trials

Both: 5% of trials

Verret M et al. Anesthesiology 2020;133:265-79

Gabapentin – Pregabalin:

Gabapentin: 52% of trials

Pregabalin: 43% of trials

Both: 5% of trials

No stratification by type of surgery

Verret M et al. Anesthesiology 2020;133:265-79

Primary Outcome – Pain Intensity:

"A slightly lower pain intensity was observed at 6, 12, 24, and 48h with gabapentinoids administration…"

Not clinically significant – below 10 points out of a 100 on VAS scale

Verret M et al. Anesthesiology 2020;133:265-79

Secondary Outcome – Opioids Administered:

"The amount of opioids administered at 24h was slightly lower with the use of gabapentinoids"

Verret M et al. Anesthesiology 2020;133:265-79

Secondary Outcome – Opioids Administered:

"The amount of opioids administered at 24h was slightly lower with the use of gabapentinoids"

MME: 25.3 mg vs 38.7mg

Verret M et al. Anesthesiology 2020;133:265-79

Secondary Outcome – Opioids Administered:

"The amount of opioids administered at 24h was slightly lower with the use of gabapentinoids"

MME: 25.3 mg vs 38.7mg

35% lower – "not clinically significant"

Verret M et al. Anesthesiology 2020;133:265-79

Preoperative “Preemptive” Meds

Summary:

Preop. Cox-2 Inhibitors	+ + +
Preop. Gabapentin	+ +
Acetaminophen PO	+
Other NSAIDS	-
Preop. Opioids	-

Nir RR et al. Eur J Pain 2016;20:1025-43

Arumugam S et al. J Pain Res 2016;9:631-40

Intra/Post-operative Therapeutics

CLINICAL CONCEPTS AND COMMENTARY

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

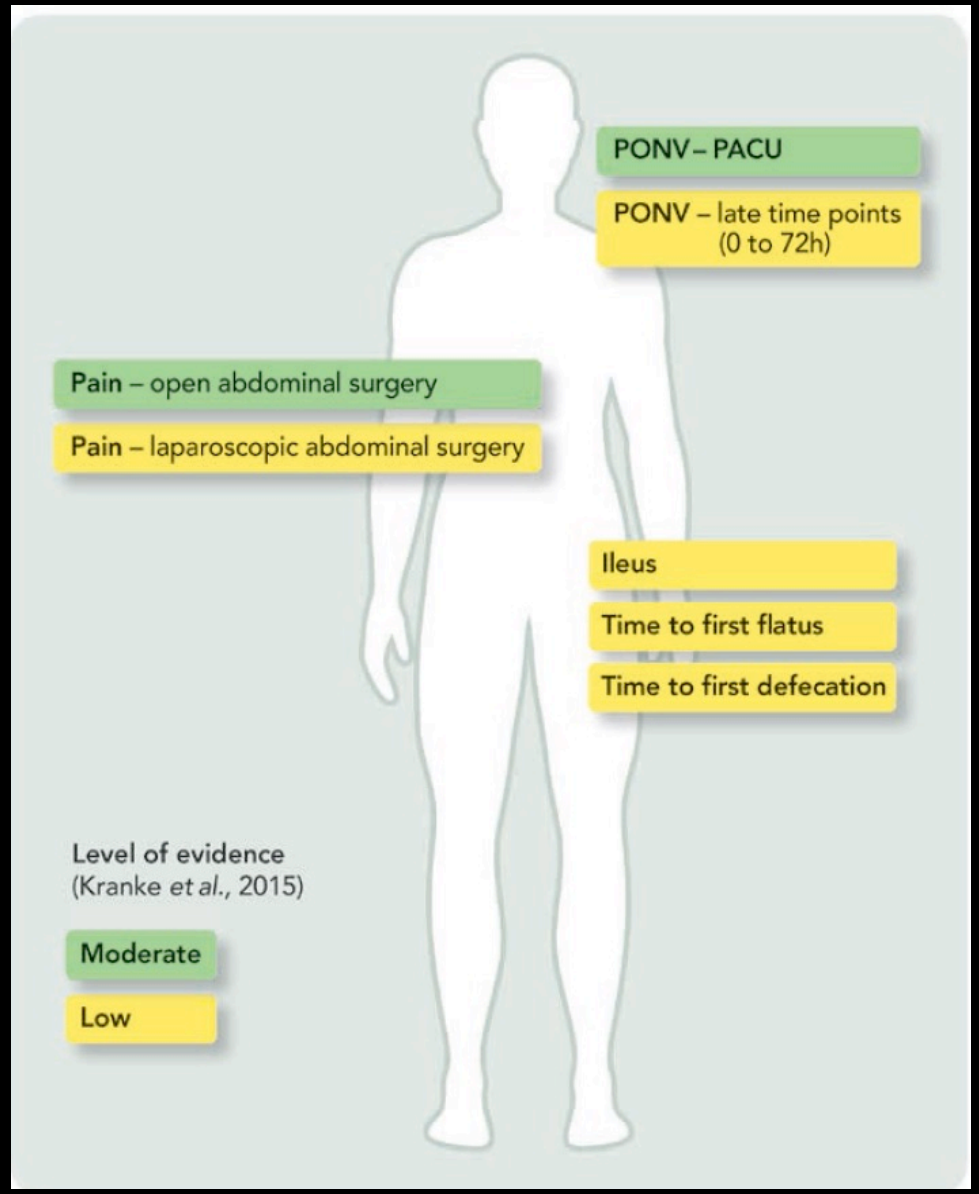
Perioperative Use of Intravenous Lidocaine

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

Anesthesiology 2017; 126:00-00

Mechanism :

- Effects are observed with infusion rates that mimic the plasma concentration obtained with epidural administration
- Clinical effects exceed the duration of the infusion by over 8h (5.5 times the half-life
- Likely not primarily Na channel blockade
- Attenuation of portions of the pro-inflammatory system (pain, ileus)
- Opioid sparing



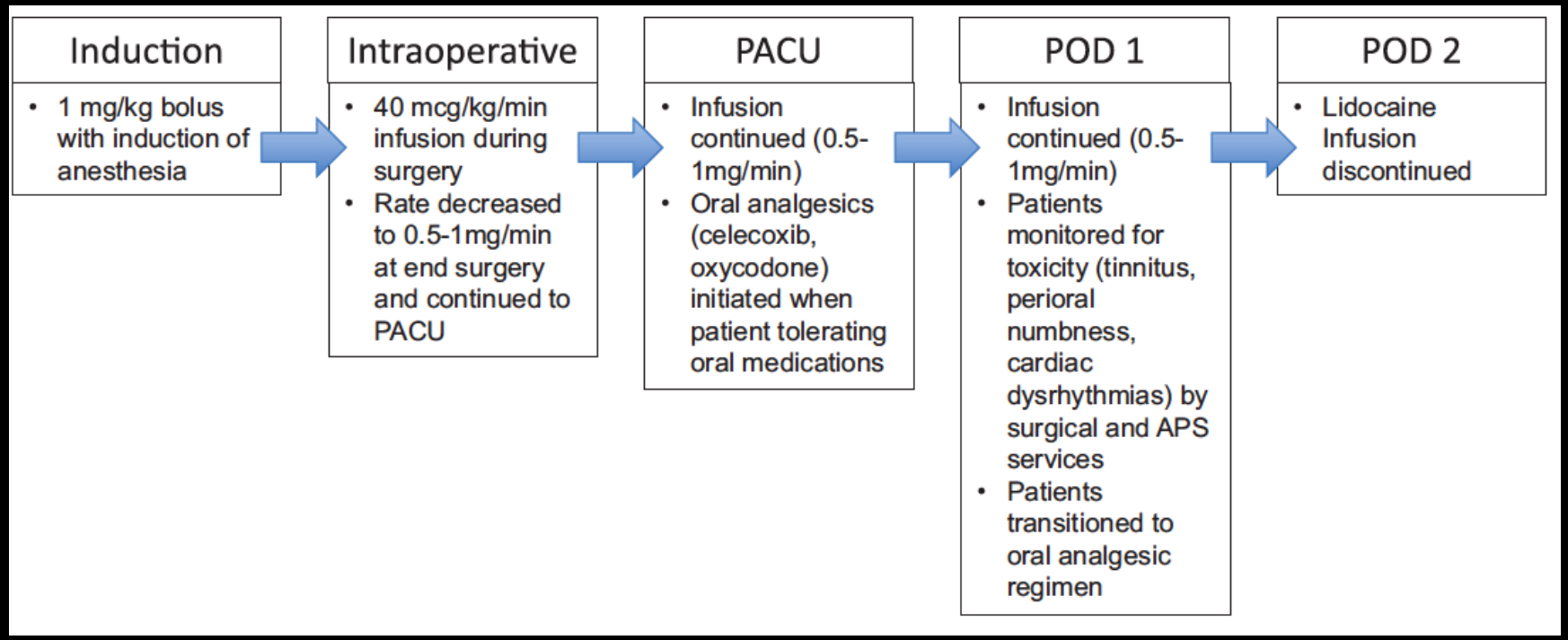
Anesthesiology 2017; 126:00-00

Type of Surgery:

Open Abdominal	+ + +
Lap. Abdominal	+ + +
Prostate, Breast	+ +
Multilevel Spine	+ +
Hip, Cardiac	-

Anesthesiology 2017; 126:00-00

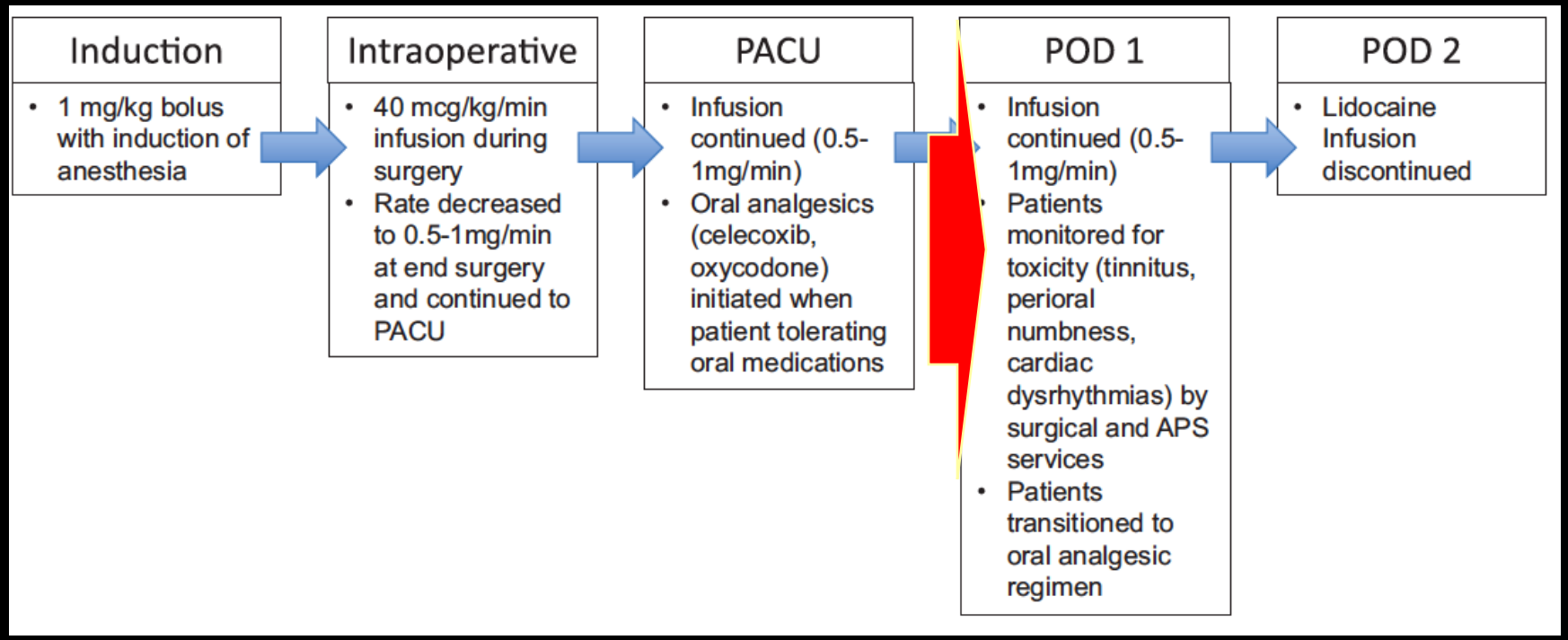
Typical Lidocaine Infusion Protocol



Anesthesiology 2017; 126:00-00

Typical Lidocaine Infusion Protocol

2/3 of studies with the strongest support stopped the infusion at the end of surgery or in the PACU



Anesthesiology 2017; 126:00-00

Can J Anesth/J Can Anesth (2011) 58:911–923
DOI 10.1007/s12630-011-9560-0

REPORTS OF ORIGINAL INVESTIGATIONS

A systematic review of intravenous ketamine for postoperative analgesia

Revue méthodique de l'utilisation de la kétamine intraveineuse pour l'analgésie postopératoire

Kevin Laskowski, MD · Alena Stirling, MD · William P. McKay, MD · Hyun J. Lim, MD

2257 articles reviewed

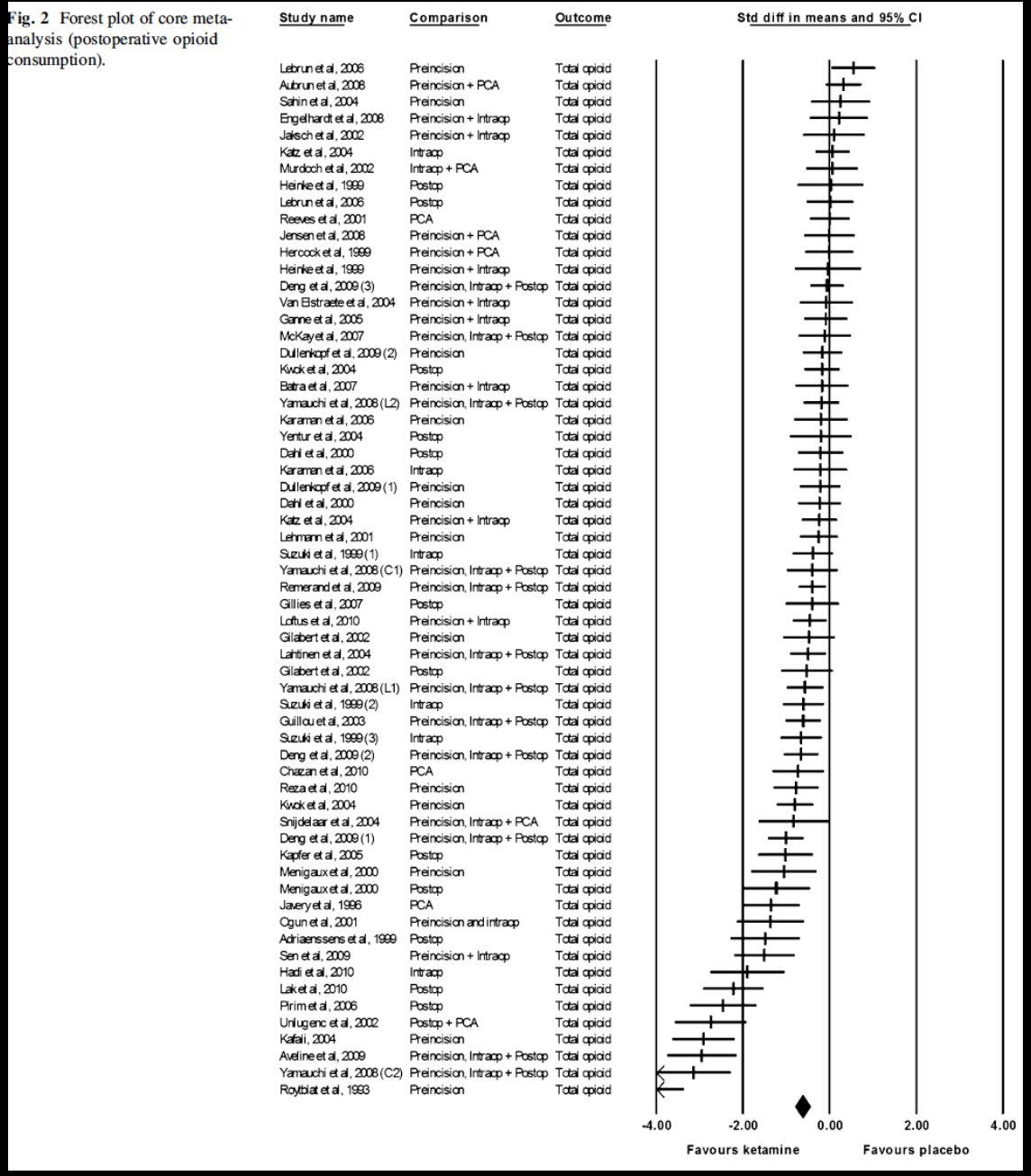
70 RCTs included

4701 patients

Laskovski K et al. Can J Anesth 2011;58:911-23

- NMDA receptor agonist
- Duration: 15 min (rapid redistribution)

Laskovski K et al. Can J Anesth 2011;58:911-23



Opioid Consumption

Laskovski K et al. Can J Anesth 2011;58:911-23

Type of Surgery:

Upper Abdominal	+ + +
Thoracic	+ + +
Major Orthopedic	+ +
Lower Abdominal	+ +
Head/Neck, Dental Tonsillectomy	-

Laskovski K et al. Can J Anesth 2011;58:911-23

Side Effects

Side effect		Ketamine	Placebo	*P* (corrected)
Neuropsychiatric	Overall	166 (7.35)	87 (4.95)	0.018
	When efficacious	60 (7.69)	20 (3.05)	<0.001
	When not	97 (8.24)	64 (7.3)	0.99
PONV	Overall	472 (25.64)	460 (30.4)	0.018
	When efficacious	124 (16.94)	155 (25.88)	<0.001
	When not	308 (34.34)	245 (33.61)	0.99
Sedation	Overall	17 (2.53)	25 (4.42)	0.99
	When efficacious	3 (1.23)	9 (4.15)	0.981
	When not	14 (5.12)	12 (5.8)	0.99

Laskovski K et al. Can J Anesth 2011;58:911-23

Small Dose Ketamine – Typical Regiment:

Bolus after induction: 0.25 mg/kg

Cont. infusion: 0.25 mg/kg/h

Continue in PACU/ICU

Wean over 48h

Effect of Perioperative Systemic α2 Agonists on Postoperative Morphine Consumption and Pain Intensity

Systematic Review and Meta-analysis of Randomized Controlled Trials

Grégoire Blaudszun, M.D.,* Christopher Lysakowski, M.D.,† Nadia Elia, M.D., M.Sc.,‡
Martin R. Tramèr, M.D., D.Phil.§

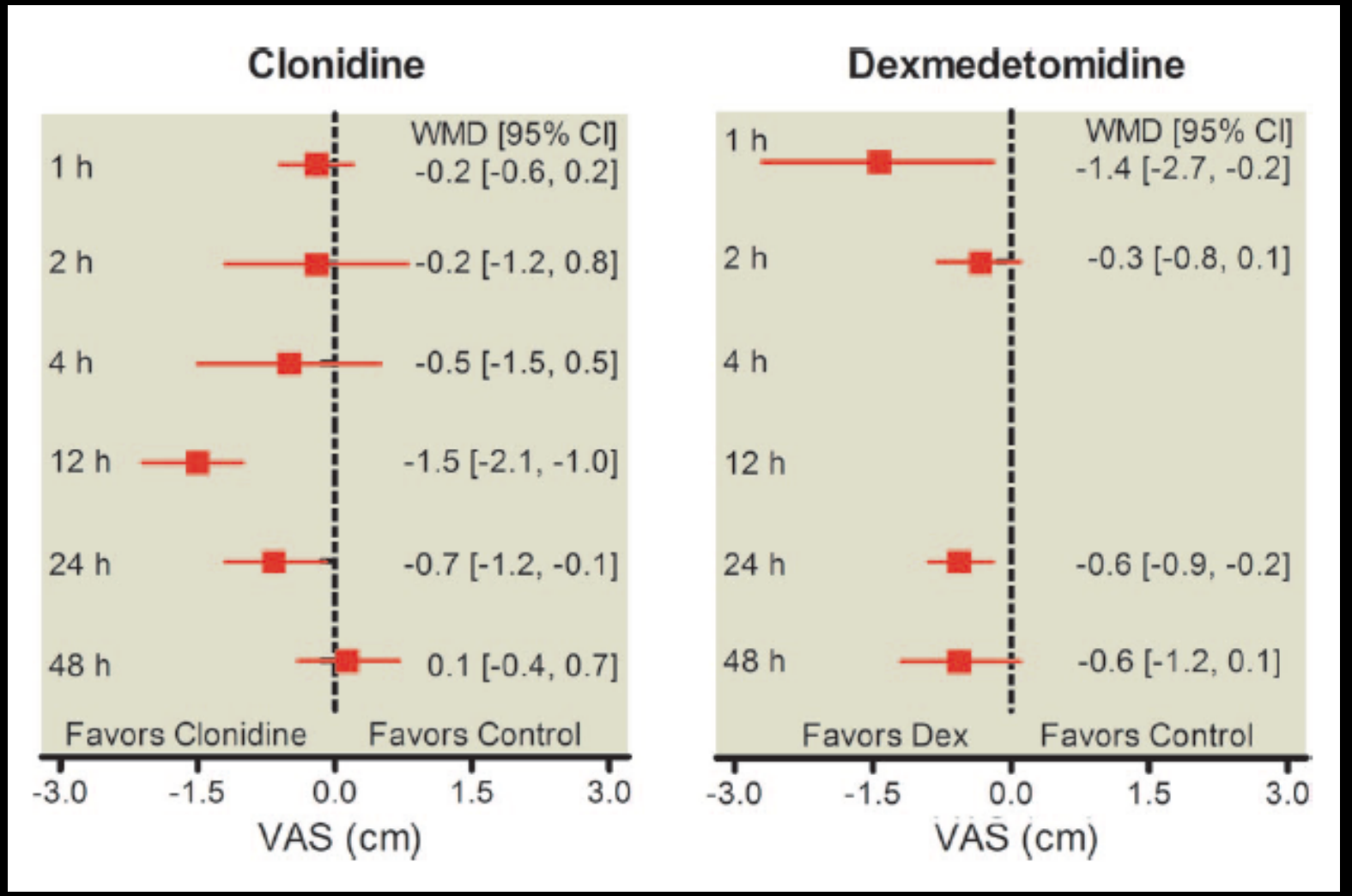
159 article reviewed

30 RCTs included

1792 patients

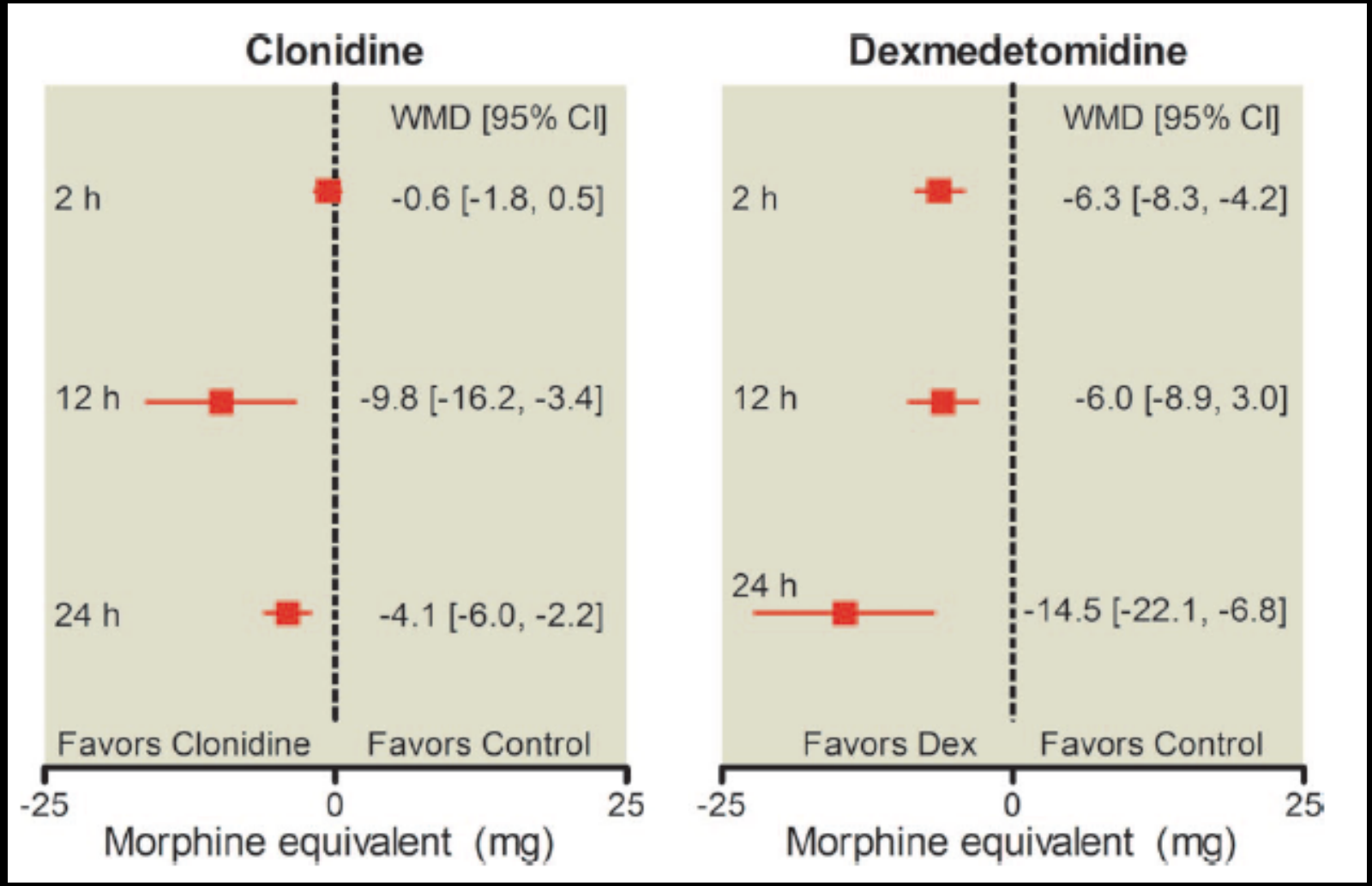
Blaudszun et al. Anesthesiology 2012;116:1312-22

Pain Scores



Blaudszun et al. Anesthesiology 2012;116:1312-22

Morphine Sparing



Blaudszun et al. Anesthesiology 2012;116:1312-22

Hemodynamic Side Effects

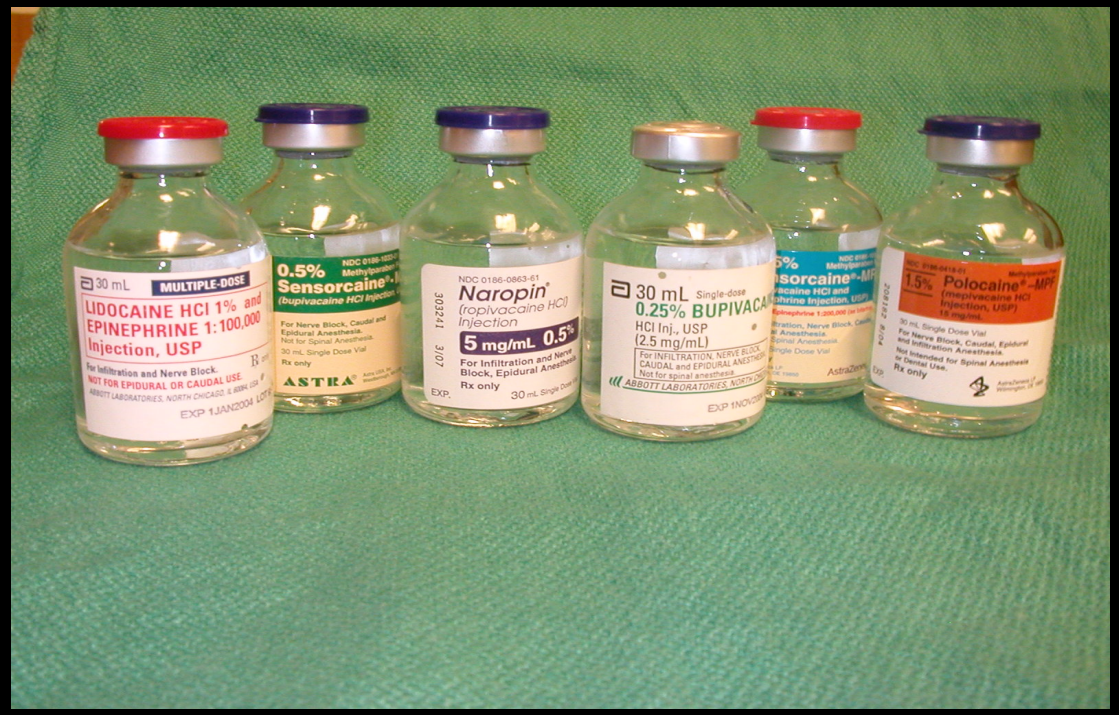
	Number of Trials	Number of Patients with Event/Total Number of Patients (%)		Risk Ratio [95% CI]	Number Needed to Treat (NNT) Number Needed to Harm (NNH) [95% CI]	References
		Active	Control			
Intraoperative events						
Bradycardia						
Clonidine	6	16/214 (7.5)	8/228 (3.5)	1.95 [0.95, 3.98]	—	18, 20, 28, 29, 32, 38
Dexmedetomidine	1	n/a	n/a	n/a	n/a	42
Hypotension						
Clonidine	6	31/229 (13.5)	6/243 (2.5)	4.75 [2.17, 10.4]	NNH 9.0 [6.3, 16]	18, 20, 28, 29, 38, 41
Dexmedetomidine	1	n/a	n/a	n/a	n/a	39
Hypertension						
Clonidine	4	15/103 (14.6)	62/122 (50.8)	0.46 [0.16, 1.29]	—	18, 28, 29, 38
Dexmedetomidine	2	9/85 (10.6)	24/45 (53.3)	0.26 [0.13, 0.52]	NNT 2.3 [1.7, 3.7]	39, 42
Postoperative events						
Bradycardia						
Clonidine	4	4/160 (2.5)	3/155 (1.9)	1.33 [0.36, 4.90]	—	20, 26, 29, 37
Dexmedetomidine	2	16/50 (32.0)	0/50 (0.0)	17.0 [2.35, 123]	NNH 3.1 [2.2, 5.2]	25, 42
Hypotension						
Clonidine	5	15/230 (6.5)	3/185 (1.6)	3.37 [1.27, 8.92]	NNH 20 [12, 82]	20, 26, 29, 37, 41
Dexmedetomidine	1	n/a	n/a	n/a	n/a	42
Hypertension						
Clonidine	2	0/111 (0.0)	8/106 (7.5)	0.06 [0.00, 0.94]	NNT 13 [8.0, 40]	20, 32
Dexmedetomidine	0	n/a	n/a	n/a	n/a	—

Blaudszun et al. Anesthesiology 2012;116:1312-22

Hemodynamic Side Effects

	Number of Trials	Number of Patients with Event/Total Number of Patients (%)		Risk Ratio [95% CI]	Number Needed to Treat (NNT) Number Needed to Harm (NNH) [95% CI]	References
		Active	Control			
Intraoperative events						
Bradycardia						
Clonidine	6	16/214 (7.5)	8/228 (3.5)	1.95 [0.95, 3.98]	—	18, 20, 28, 29, 32, 38
Dexmedetomidine	1	n/a	n/a	n/a	n/a	42
Hypotension						
Clonidine	6	31/229 (13.5)	6/243 (2.5)	4.75 [2.17, 10.4]	NNH 9.0 [6.3, 16]	18, 20, 28, 29, 38, 41
Dexmedetomidine	1	n/a	n/a	n/a	n/a	39
Hypertension						
Clonidine	4	15/103 (14.6)	62/122 (50.8)	0.46 [0.16, 1.29]	—	18, 28, 29, 38
Dexmedetomidine	2	9/85 (10.6)	24/45 (53.3)	0.26 [0.13, 0.52]	NNT 2.3 [1.7, 3.7]	39, 42
Postoperative events						
Bradycardia						
Clonidine	4	4/160 (2.5)	3/155 (1.9)	1.33 [0.36, 4.90]	—	20, 26, 29, 37
Dexmedetomidine	2	16/50 (32.0)	0/50 (0.0)	17.0 [2.35, 123]	NNH 3.1 [2.2, 5.2]	25, 42
Hypotension						
Clonidine	5	15/230 (6.5)	3/185 (1.6)	3.37 [1.27, 8.92]	NNH 20 [12, 82]	20, 26, 29, 37, 41
Dexmedetomidine	1	n/a	n/a	n/a	n/a	42
Hypertension						
Clonidine	2	0/111 (0.0)	8/106 (7.5)	0.06 [0.00, 0.94]	NNT 13 [8.0, 40]	20, 32
Dexmedetomidine	0	n/a	n/a	n/a	n/a	—

Blaudszun et al. Anesthesiology 2012;116:1312-22



Local Anesthetics

Local Anesthetics:

Neuraxial Techniques

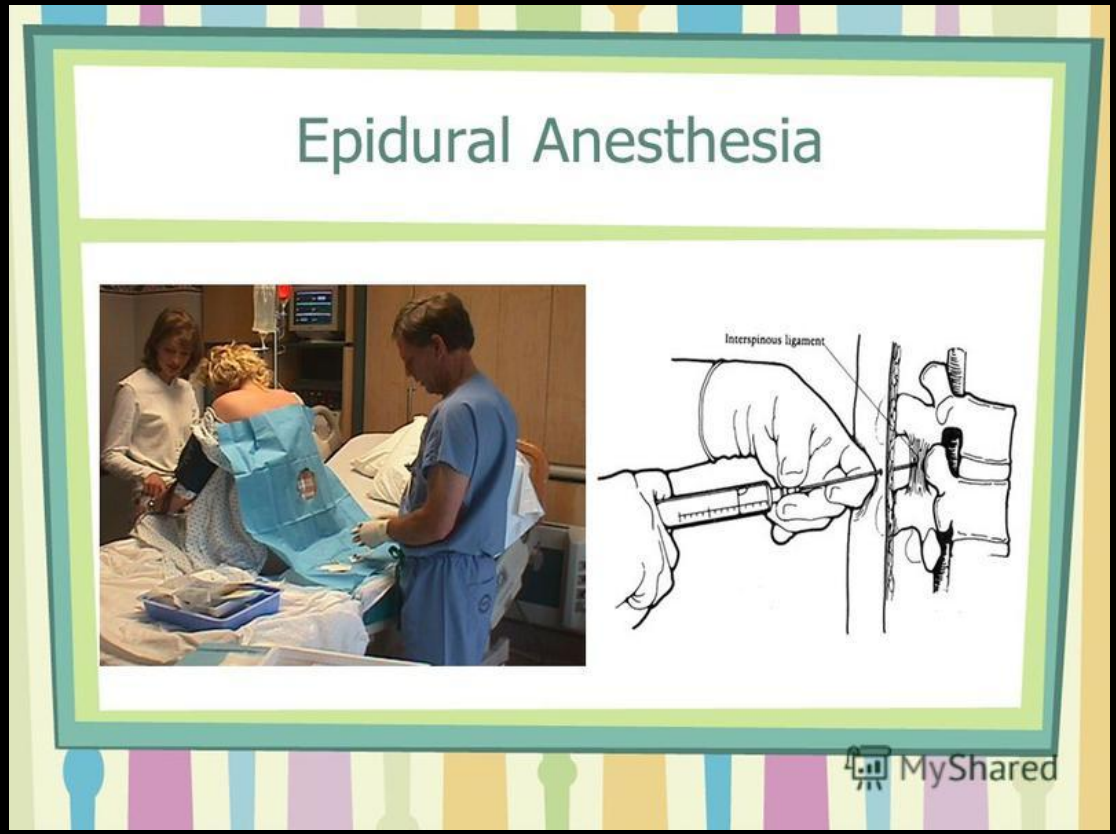
Peripheral Nerve Blocks

Infiltration Techniques

Continuous Epidural:

"Gold standard" for thoracotomy

Open laparotomy?



Continuous Epidural:

Disadvantages:

- Technical challenging (THORACIC)
- High failure rate
- Labor intensive
- Hemodynamic changes (goal directed fluid therapy)

Continuous Peripheral Nerve Block:

"Gold standard" for major orthopedics

"Gold standard" for amputations

Continuous Peripheral Nerve Block:

Advantages:

- Tailored to 1 extremity
- High success rate
- No hemodynamic changes
- Home discharge possible

Continuous Peripheral Nerve Block:

Disadvantages:

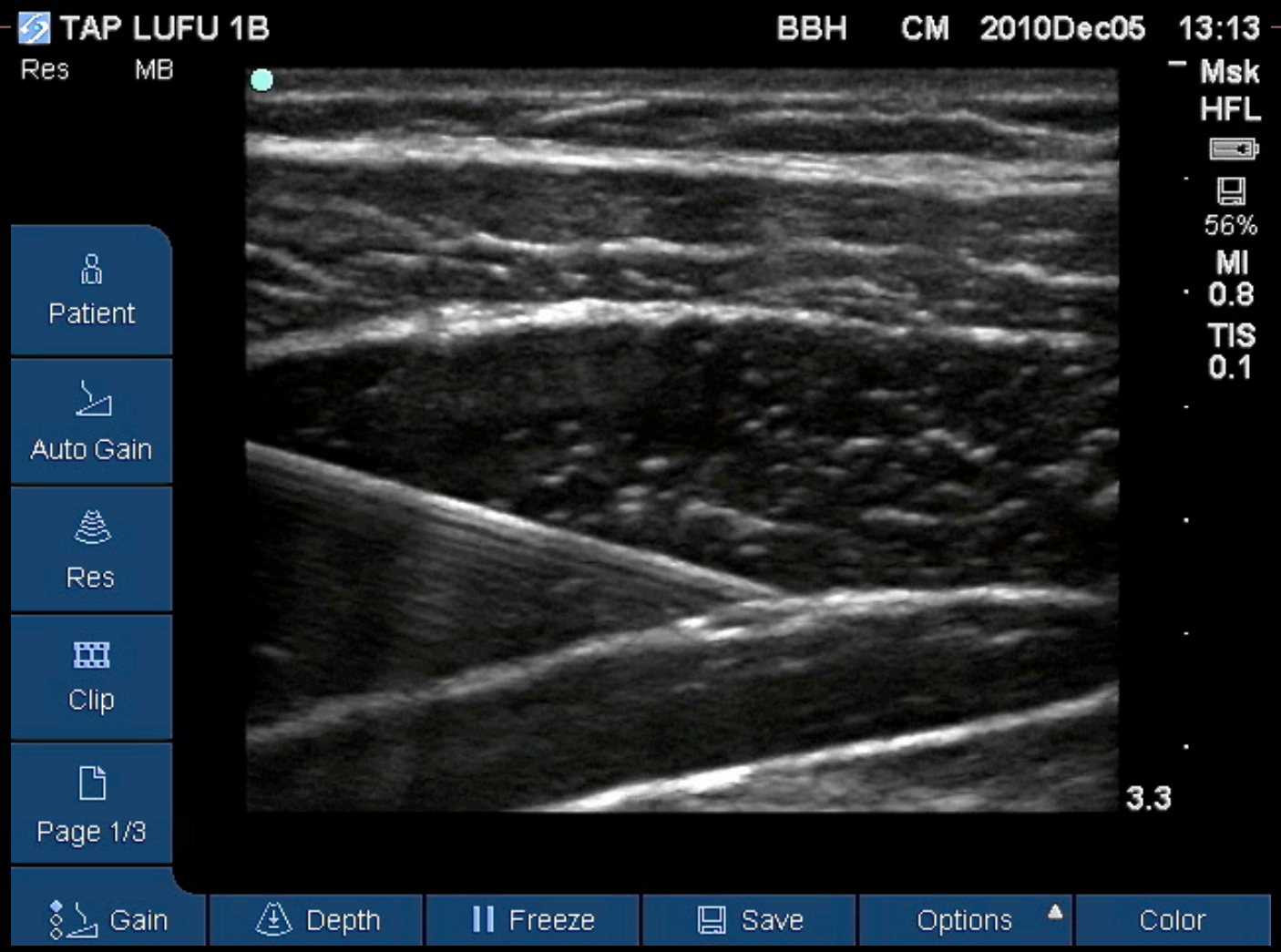
- Requires experience with technique
- Until recently limited to extremity surgeries

New Nerve Block Techniques:

Abdominal Wall and Chest Wall:

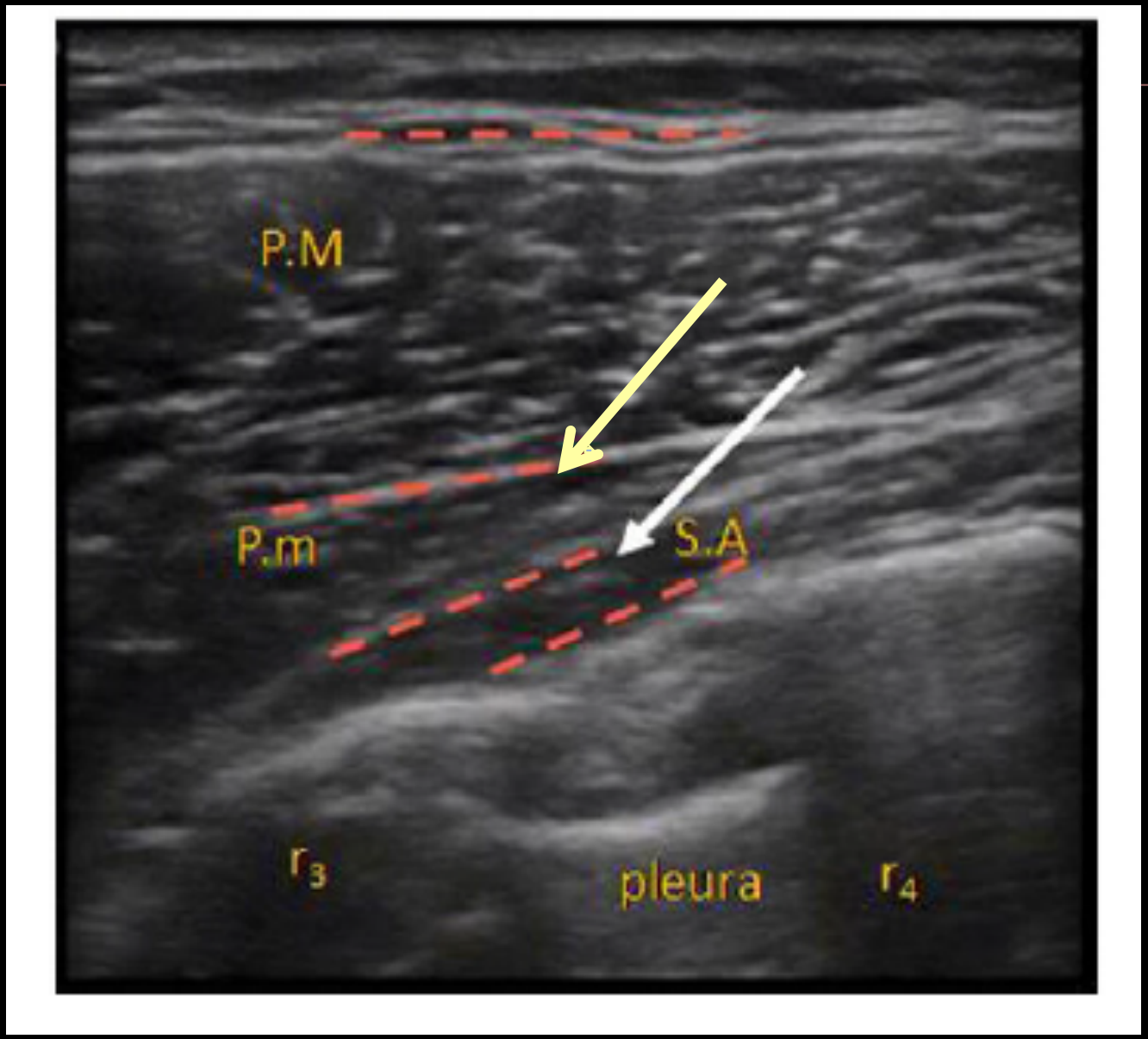
- Transverse abdominus plane (TAP) block
- Pectoralis (PEC) blocks

TAP BLOCK

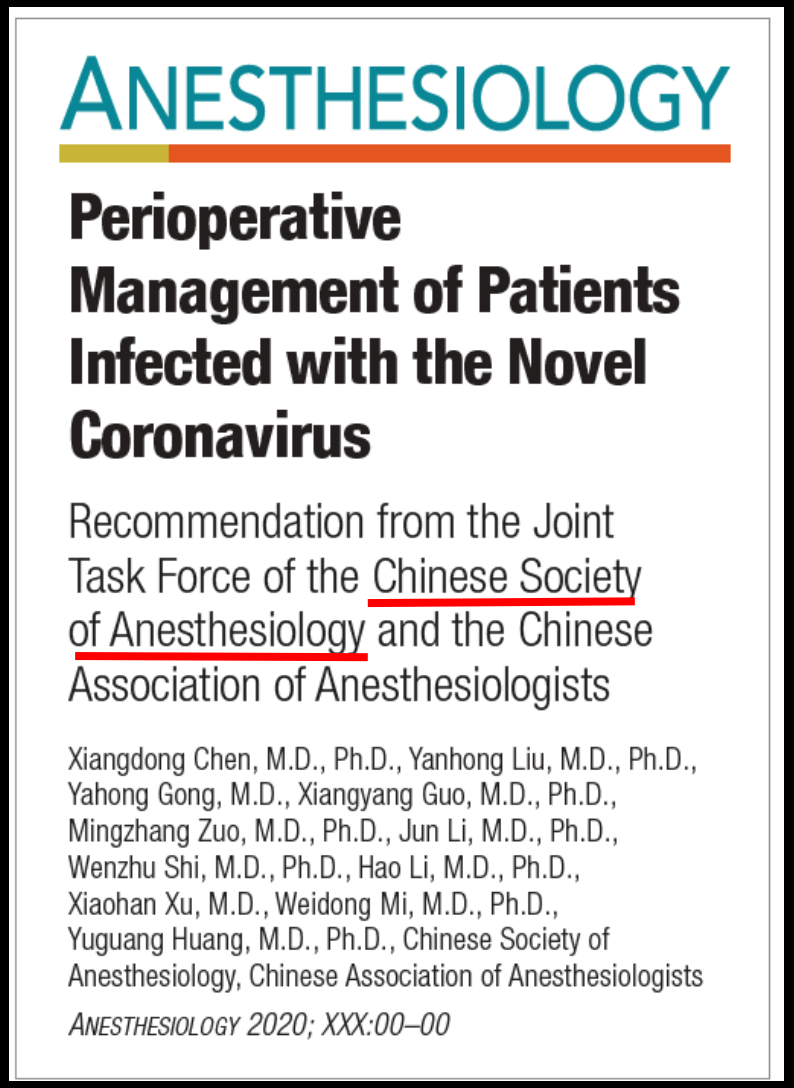


PainWeek

PEC BLOCK



Regional or General Anesthesia in COVID-19 Patients?



ANESTHESIOLOGY

Perioperative Management of Patients Infected with the Novel Coronavirus

Recommendation from the Joint Task Force of the Chinese Society of Anesthesiology and the Chinese Association of Anesthesiologists

Xiangdong Chen, M.D., Ph.D., Yanhong Liu, M.D., Ph.D., Yahong Gong, M.D., Xiangyang Guo, M.D., Ph.D., Mingzhang Zuo, M.D., Ph.D., Jun Li, M.D., Ph.D., Wenzhu Shi, M.D., Ph.D., Hao Li, M.D., Ph.D., Xiaohan Xu, M.D., Weidong Mi, M.D., Ph.D., Yuguang Huang, M.D., Ph.D., Chinese Society of Anesthesiology, Chinese Association of Anesthesiologists

ANESTHESIOLOGY 2020; XXX:00–00

Chen X et al. Anesthesiology 2020;132(6):1307-1316

Regional or General Anesthesia in COVID-19 Patients?

Psychologic Preparation
and Self Encouragement

Chen X et al. Anesthesiology
2020;132(6):1307-1316

Regional or General Anesthesia in COVID-19 Patients?

"General anesthesia is recommended for patients with suspected or confirmed COVID-19 to reduce the risk of patients coughing and bucking, which can generate airborne materials and droplets"

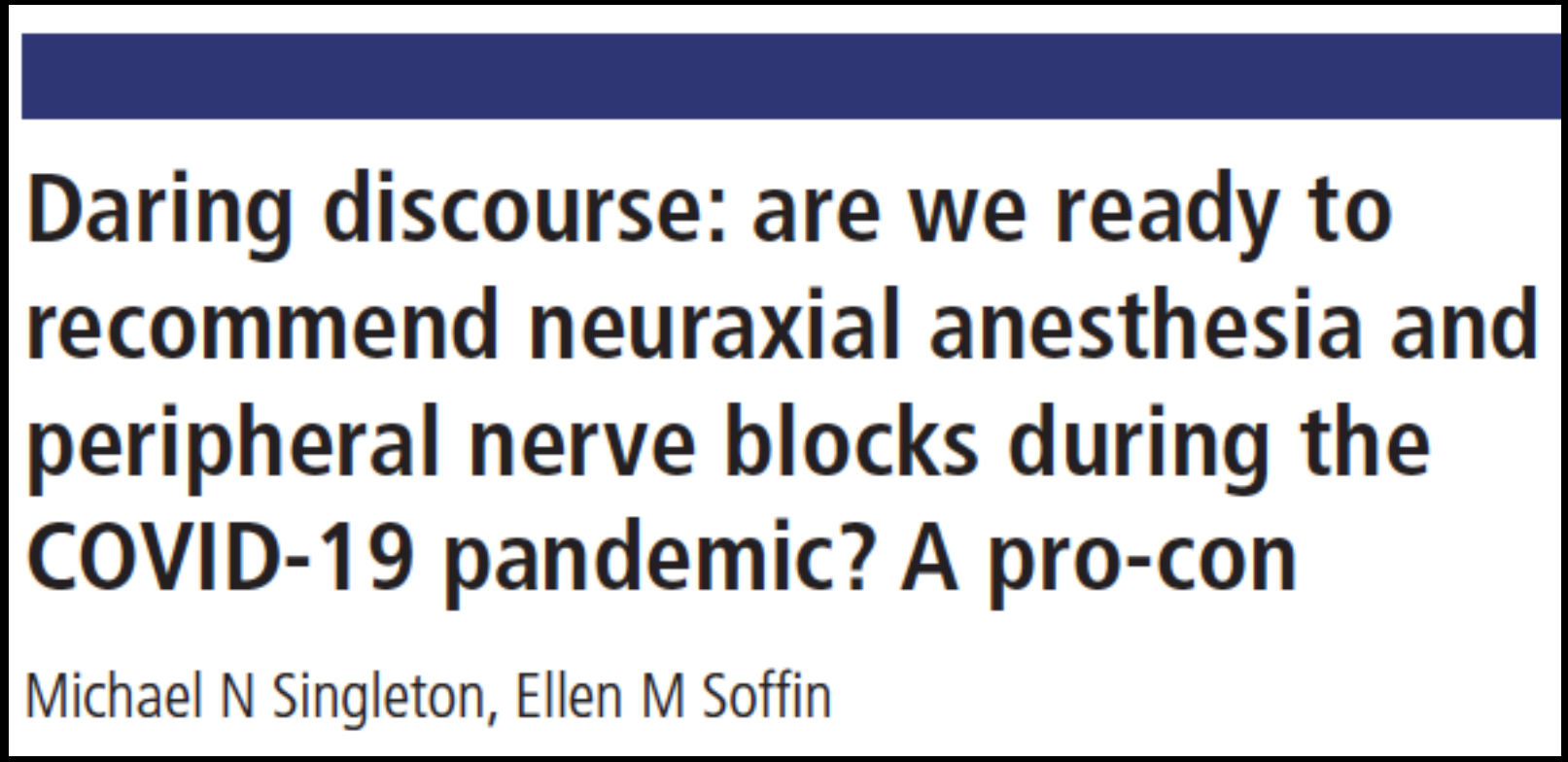
Chen X et al. Anesthesiology 2020;132(6):1307-1316

Regional or General Anesthesia in COVID-19 Patients?

"Spinal anesthesia is still recommended as the primary choice for anesthesia for cesarean delivery in a mother with COVID-19"

Chen X et al. Anesthesiology 2020;132(6):1307-1316

Regional or General Anesthesia in COVID-19 Patients?



Daring discourse: are we ready to recommend neuraxial anesthesia and peripheral nerve blocks during the COVID-19 pandemic? A pro-con

Michael N Singleton, Ellen M Soffin

Singleton MN, Soffin EM. Reg Anesth Pain Med 2020; epub ahead of print

Regional or General Anesthesia in COVID-19 Patients?

PRO-Regional

- Avoidance of Intubation (aerosol)
- Benefits of regional anesthesia (L&D, hip)
- Potentially resource preserving

CON-Regional

- Coagulopathy
- Higher failure rate (due to PPE)?
- Conversion to GA
- Respiratory compromise (phrenic nerve)
- Other aerosol generating events (cough)?

Singleton MN, Soffin EM. Reg Anesth Pain Med 2020; epub ahead of print

General or Regional Anesthesia in COVID-19 Patients?

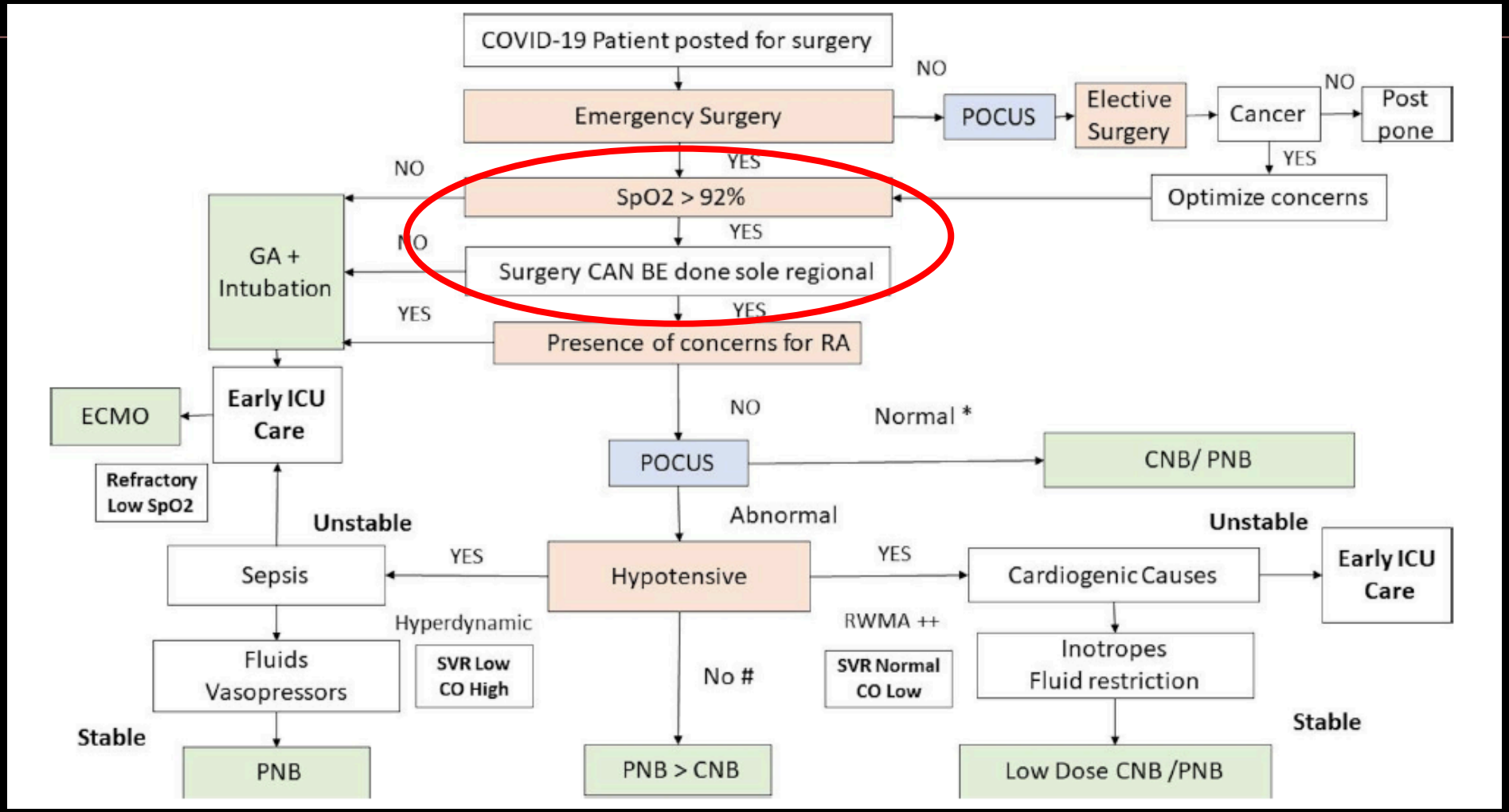
Education

Reconfiguring the scope and practice of regional anesthesia in a pandemic: the COVID-19 perspective

Balakrishnan Ashokka ,[1,2] Arunangshu Chakraborty ,[3]
Balavenkat J Subramanian,[4] Manoj Kumar Karmakar ,[5] Vincent Chan[6]

Ashokka B et al. Reg Anesth Pain Med 2020;45:536-43

General or Regional Anesthesia in COVID-19 Patients?



PainWeek

Ashokka B et al. Reg Anesth Pain Med 2020;45:536-43

Regional or General Anesthesia in COVID-19 Patients?

- There are no data suggesting that one technique is superior to the other in the COVID-19 population
- Decision regarding anesthetic technique should be case by case and take into consideration:

- Current disease state (respiratory, coagulation, hemodynamics, organ failure)
- ”Sedation obstacles” (e.g., OSA)
- Type and duration of planned surgery
- Respiratory or hemodynamic impact of regional technique

Chen X et al. Anesthesiology 2020;132(6):1307-1316

Adjuvant Therapy

- Music Therapy
- Acupuncture

Adjuvant Therapy

- Music Therapy
- Acupuncture

Mixed evidence

No harm!

Music as an aid for postoperative recovery in adults: a systematic review and meta-analysis

Jenny Hole, Martin Hirsch, Elizabeth Ball, Catherine Meads

Summary

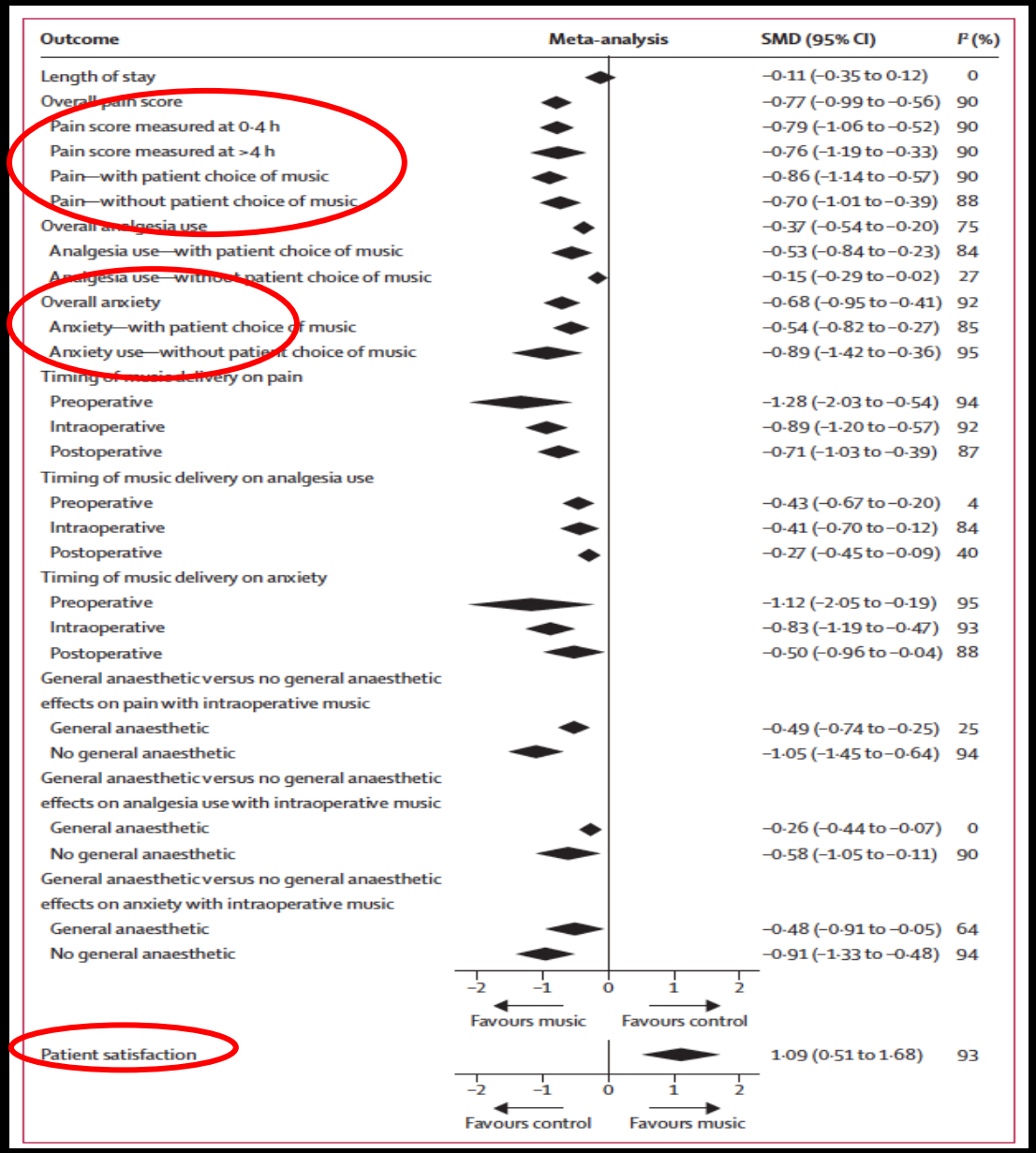
Background Music is a non-invasive, safe, and inexpensive intervention that can be delivered easily and successfully. We did a systematic review and meta-analysis to assess whether music improves recovery after surgical procedures.

Lancet 2015; 386: 1659–71

Published Online August 13, 2015

PAINWEEK

Hole J et al. Lancet 2015;386:1659-71



Hole J et al. Lancet 2015;386:1659-71

Music Therapy

ACCUEIL PROTOCOLE PROFESSIONNELS CONTACT Mon compte

MUSIC CARE
Le bien-être au quotidien

Choisissez dès maintenant votre séance

Musique Classique


Autour de la Clarinette


Autour de la Harpe


Autour du Piano


Autour du Piano 2

Musique d'Ailleurs


Cahier d'Orient


Douceur d'Asie


Evocation Indienne


Groove d'Afrique

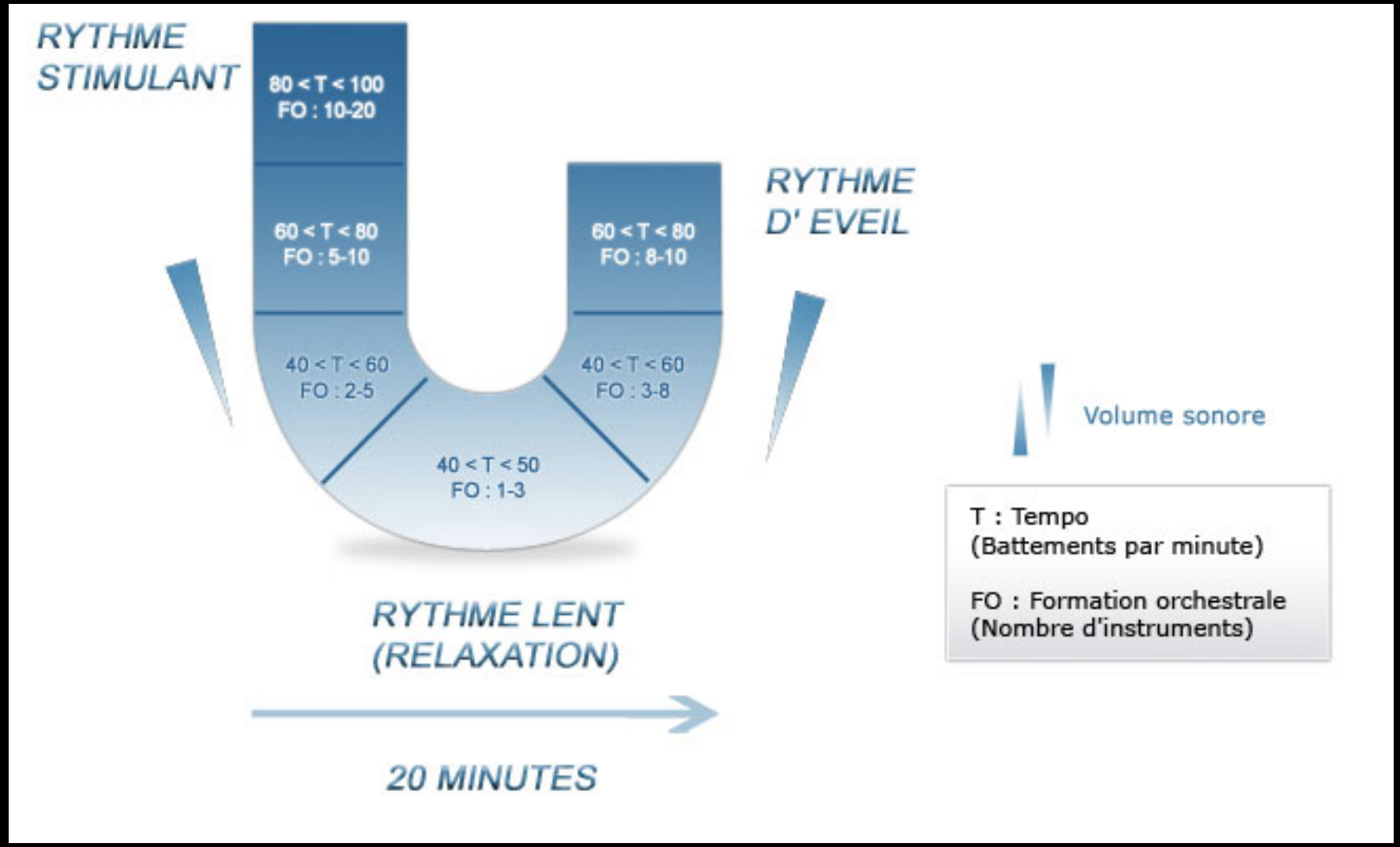
Musique d'Aujourd'hui


Accordéon Parisien


Ballade Jazzy


Ballade pour Piano


Electro Jazz


RYTHME STIMULANT
80 < T < 100
FO : 10-20
60 < T < 80
FO : 5-10
40 < T < 60
FO : 2-5
40 < T < 50
FO : 1-3
60 < T < 80
FO : 8-10
40 < T < 60
FO : 3-8
RYTHME D' EVEIL
Volume sonore
T : Tempo
(Battements par minute)
FO : Formation orchestrale
(Nombre d'instruments)
RYTHME LENT
(RELAXATION)
20 MINUTES

REVIEW ARTICLE

Acupuncture for Acute Postoperative Pain after Back Surgery: A Systematic Review and Meta-analysis of Randomized Controlled Trials

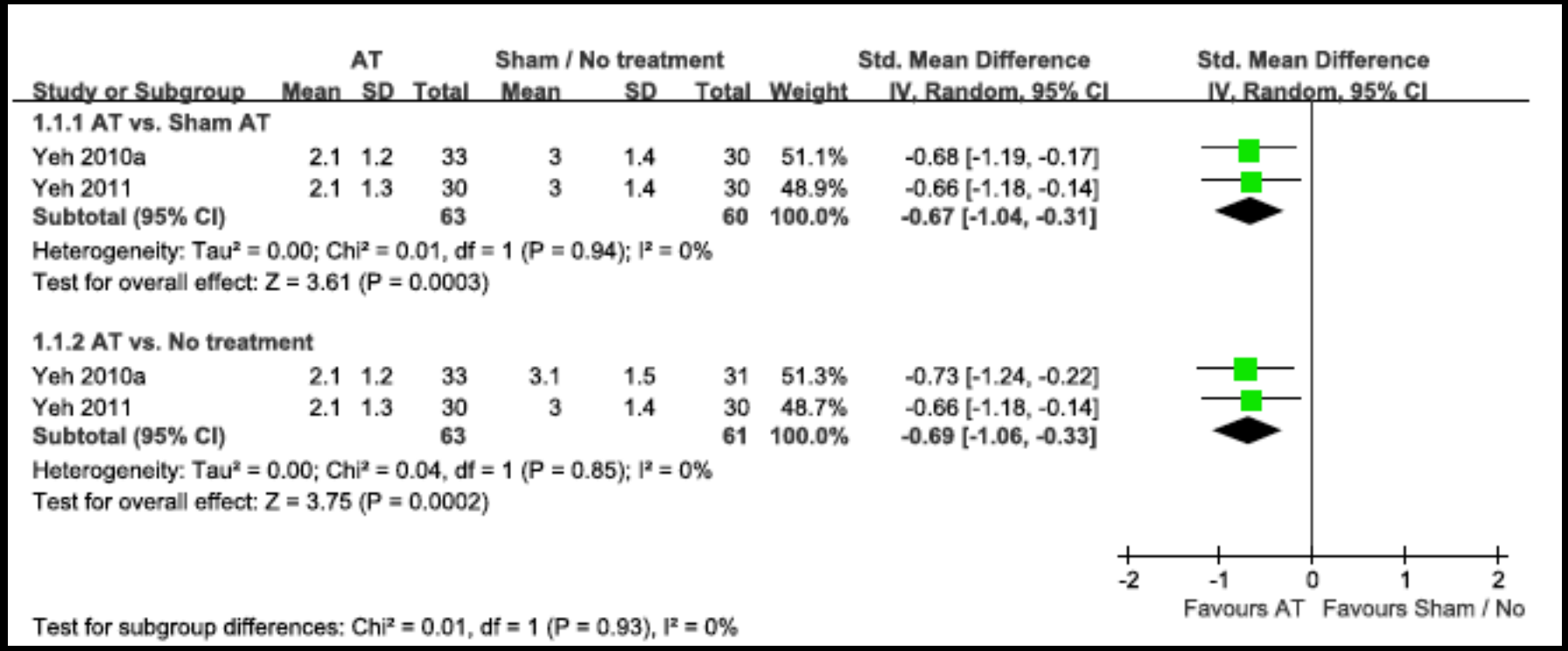
1515 Publications

5 RCTs selected (3 from same author)

480 patients

Young-Hun Cho, MS et al. Pain Practice 2014;201:279-91

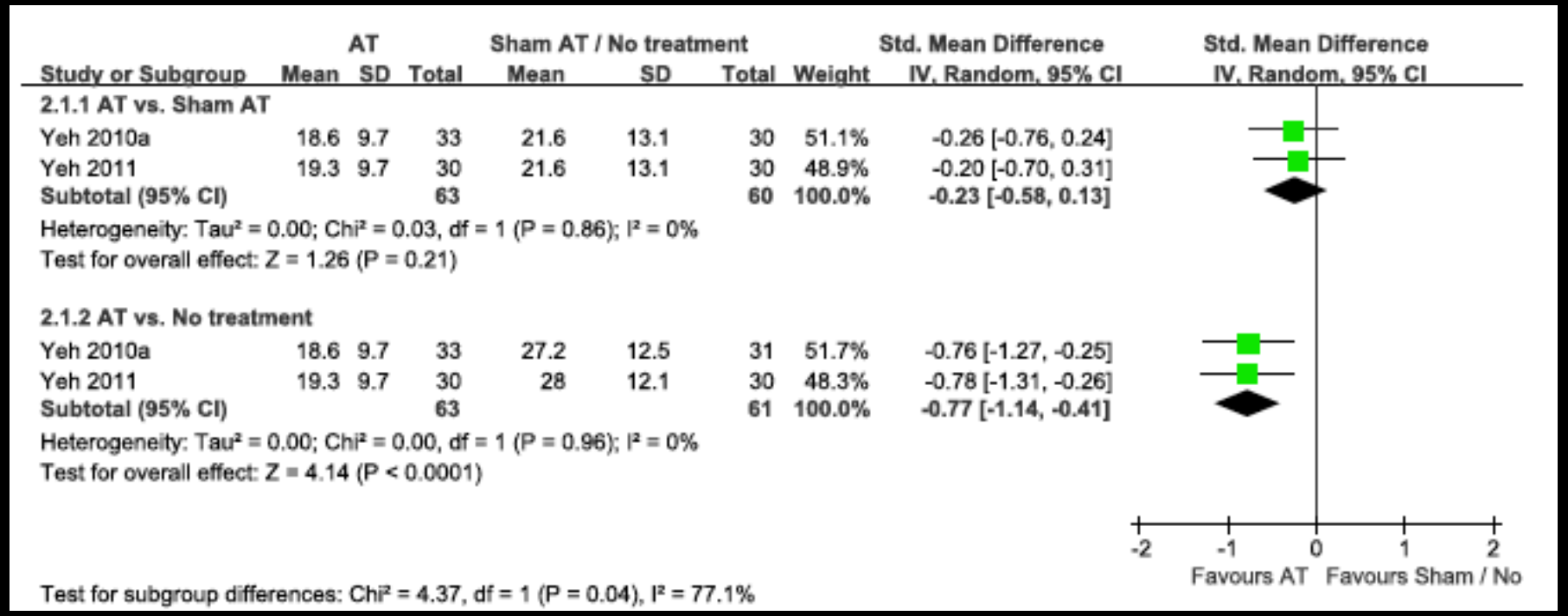
Pain Scores



Study or Subgroup	AT Mean	AT SD	AT Total	Sham / No treatment Mean	Sham / No treatment SD	Sham / No treatment Total	Weight	Std. Mean Difference IV, Random, 95% CI
1.1.1 AT vs. Sham AT								
Yeh 2010a	2.1	1.2	33	3	1.4	30	51.1%	-0.68 [-1.19, -0.17]
Yeh 2011	2.1	1.3	30	3	1.4	30	48.9%	-0.66 [-1.18, -0.14]
Subtotal (95% CI)			63			60	100.0%	**-0.67 [-1.04, -0.31]**
Heterogeneity: Tau² = 0.00; Chi² = 0.01, df = 1 (P = 0.94); I² = 0%								
Test for overall effect: Z = 3.61 (P = 0.0003)								
1.1.2 AT vs. No treatment								
Yeh 2010a	2.1	1.2	33	3.1	1.5	31	51.3%	-0.73 [-1.24, -0.22]
Yeh 2011	2.1	1.3	30	3	1.4	30	48.7%	-0.66 [-1.18, -0.14]
Subtotal (95% CI)			63			61	100.0%	**-0.69 [-1.06, -0.33]**
Heterogeneity: Tau² = 0.00; Chi² = 0.04, df = 1 (P = 0.85); I² = 0%								
Test for overall effect: Z = 3.75 (P = 0.0002)								
Test for subgroup differences: Chi² = 0.01, df = 1 (P = 0.93), I² = 0%								

Young-Hun Cho, MS et al. Pain Practice 2014;201:279-91

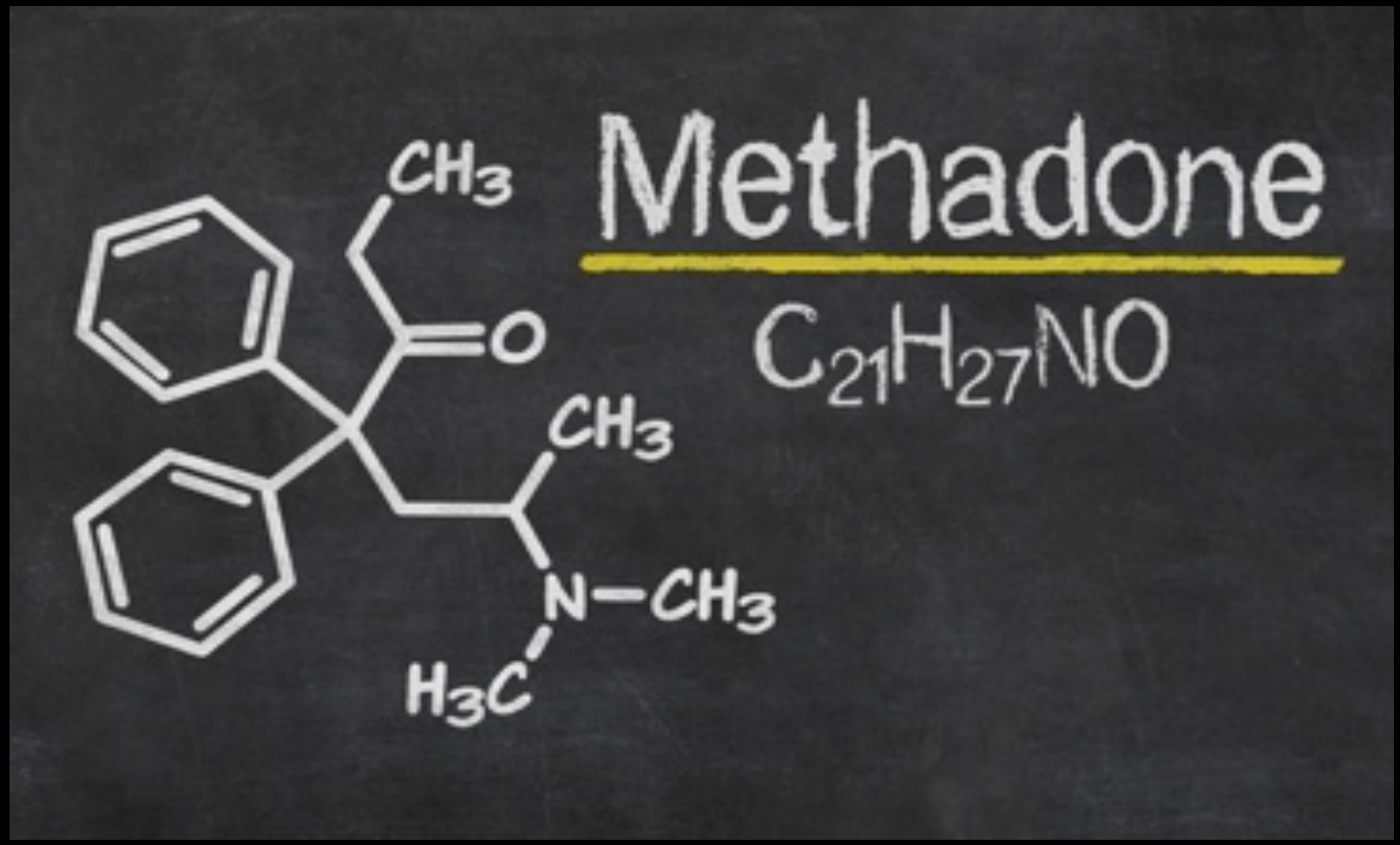
Opioid Sparing



Study or Subgroup	AT Mean	AT SD	AT Total	Sham AT / No treatment Mean	Sham AT / No treatment SD	Sham AT / No treatment Total	Weight	Std. Mean Difference IV, Random, 95% CI
2.1.1 AT vs. Sham AT								
Yeh 2010a	18.6	9.7	33	21.6	13.1	30	51.1%	-0.26 [-0.76, 0.24]
Yeh 2011	19.3	9.7	30	21.6	13.1	30	48.9%	-0.20 [-0.70, 0.31]
Subtotal (95% CI)			63			60	100.0%	-0.23 [-0.58, 0.13]
Heterogeneity: Tau² = 0.00; Chi² = 0.03, df = 1 (P = 0.86); I² = 0%								
Test for overall effect: Z = 1.26 (P = 0.21)								
2.1.2 AT vs. No treatment								
Yeh 2010a	18.6	9.7	33	27.2	12.5	31	51.7%	-0.76 [-1.27, -0.25]
Yeh 2011	19.3	9.7	30	28	12.1	30	48.3%	-0.78 [-1.31, -0.26]
Subtotal (95% CI)			63			61	100.0%	-0.77 [-1.14, -0.41]
Heterogeneity: Tau² = 0.00; Chi² = 0.00, df = 1 (P = 0.96); I² = 0%								
Test for overall effect: Z = 4.14 (P < 0.0001)								
Test for subgroup differences: Chi² = 4.37, df = 1 (P = 0.04), I² = 77.1%								

Young-Hun Cho, MS et al. Pain Practice 2014;201:279-91

Is there a "GOOD" Opioid?



- Developed in Germany between 1937-1939
- Synthetic opioid
- Targets the NMDA receptor in addition to the μ-receptor
- Long half-life 15-60h, mean 22h (CYP3A4, CYP2B6, CYP2D6)

Intraoperative Methadone for the Prevention of Postoperative Pain

A Randomized, Double-blinded Clinical Trial in Cardiac Surgical Patients

Glenn S. Murphy, M.D., Joseph W. Szokol, M.D., Michael J. Avram, Ph.D., Steven B. Greenberg, M.D., Jesse H. Marymont, M.D., Torin Shear, M.D., Kruti N. Parikh, B.S., Shivani S. Patel, B.A., Dhanesh K. Gupta, M.D.

N = 156, scheduled for cardiac surgery

Randomized to either receive 0.3mg/kg methadone or fentanyl 12 mcg/kg

Half of dose at induction, other half infused over next 2h

Murphy GS et al. Anesthesiology 2015;122:1112-22

	Methadone Group	Fentanyl Group	Difference (99% CI)	*P* Value
Time of first morphine rescue (h)	6.5 (3.25 to 9.25)	3.75 (1.5 to 5.75)	2.25 (1 to 4)	<0.001
Morphine (mg)				
First 24 h	6 (4 to 12)	10 (6 to 22)	−4 (−8 to −2)	<0.001
Second 24 h	0 (0 to 2)	1 (0 to 6)	0 (−2 to 0)	0.036
Third 24 h	0 (0 to 0)	0 (0 to 0)	0 (0 to 0)	0.403
Total	8 (4 to 14)	14 (8 to 28)	−6 (−10 to −2)	<0.001
Morphine dose ≥20 mg first 24 h	2 (2.6%)	23 (29.1%)	−26.5 (−41.4 to −12.9)	<0.001
Oral pain tablets				
First 24 h	2 (0 to 4)	2 (0 to 4)	0 (0 to 0)	0.859
Second 24 h	4 (2 to 8)	4 (2 to 6)	0 (−2 to 2)	0.607
Third 24 h	2 (0 to 6)	4 (0 to 8)	0 (−2 to 0)	0.130
Total	10 (4 to 16)	12 (6 to 16)	0 (−4 to 2)	0.443

Murphy GS et al. Anesthesiology 2015;122:1112-22

	Methadone Group	Fentanyl Group	Difference (99% CI)	*P* Value
Time of first morphine rescue (h)	6.5 (3.25 to 9.25)	3.75 (1.5 to 5.75)	2.25 (1 to 4)	<0.001
Morphine (mg)				
First 24 h	6 (4 to 12)	10 (6 to 22)	−4 (−8 to −2)	<0.001
Second 24 h	0 (0 to 2)	1 (0 to 6)	0 (−2 to 0)	0.036
Third 24 h	0 (0 to 0)	0 (0 to 0)	0 (0 to 0)	0.403
Total	8 (4 to 14)	14 (8 to 28)	−6 (−10 to −2)	<0.001
Morphine dose ≥20 mg first 24 h	2 (2.6%)	23 (29.1%)	−26.5 (−41.4 to −12.9)	<0.001
Oral pain tablets				
First 24 h	2 (0 to 4)	2 (0 to 4)	0 (0 to 0)	0.859
Second 24 h	4 (2 to 8)	4 (2 to 6)	0 (−2 to 2)	0.607
Third 24 h	2 (0 to 6)	4 (0 to 8)	0 (−2 to 0)	0.130
Total	10 (4 to 16)	12 (6 to 16)	0 (−4 to 2)	0.443

Murphy GS et al. Anesthesiology 2015;122:1112-22

	Methadone Group	Fentanyl Group	Difference (99% CI)	*P* Value
Level of pain at rest				
15 min	3 (1 to 5)	5 (2 to 8)	−2 (−4 to −1)	<0.001
2 h	3 (1 to 5)	4.5 (2 to 7)*	−1 (−3 to 0)	0.002
4 h	2 (1 to 4)	3 (1 to 6)*	−1 (−2 to 0)	0.012
8 h	2 (0 to 4)	4 (2 to 6)*	−2 (−3 to 0)	<0.001
12 h	2 (0 to 4)†	4 (2 to 5)	−1 (−2 to 0)	<0.001
24 h	2 (1 to 4)†	4 (2 to 7)*	−2 (−3 to 0)	<0.001
48 h	2 (0 to 3)‡	3 (1 to 5)§	−1 (−2 to 0)	0.002
72 h	2 (0 to 3)†	3 (0 to 5)§	−1 (−2 to 0)	0.002
Level of pain with coughing				
15 min	5 (3 to 6)	7 (4 to 10)	−2 (−4 to −1)	<0.001
2 h	4 (3 to 6)	7 (4 to 8.5)*	−2 (−3 to −1)	<0.001
4 h	4 (3 to 6)	6 (4 to 8)*	−2 (−3 to −1)	<0.001
8 h	4 (2 to 5)	7 (5 to 8)*	−3 (−4 to −2)	<0.001
12 h	4 (3 to 5)†	6 (4 to 8)	−2 (−3 to −1)	<0.001
24 h	5 (3 to 6)†	7 (5 to 9)*	−2 (−3 to −1)	<0.001
48 h	4 (2 to 6)‡	6 (4 to 8)§	−2 (−3 to −1)	<0.001
72 h	4 (2 to 5)†	5 (3 to 7)§	−2 (−3 to 0)	<0.001
Overall satisfaction with pain management				
15 min	90 (75 to 95)	70 (40 to 90)	17 (5 to 30)	<0.001
2 h	90 (75 to 97)	75 (50 to 90)	10 (0 to 20)	<0.001
4 h	90 (80 to 98)	80 (60 to 90)	10 (0 to 20)	0.003
8 h	90 (80 to 100)	80 (60 to 95)	10 (0 to 20)	0.002
12 h	90 (80 to 100)†	85 (70 to 95)	5 (0 to 10)	0.025
24 h	95 (90 to 100)‡	90 (77.5 to 100)*	5 (0 to 10)	0.006
48 h	95 (90 to 100)‖	90 (75 to 100)§	5 (0 to 10)	<0.001
72 h	100 (90 to 100)	90 (80 to 100)§	5 (0 to 10)	<0.001

Murphy GS et al. Anesthesiology 2015;122:1112-22

Methadone – Risks:

- Cardiac arrhythmias – QT prolongation

22600649

- **2011: 26% of all opioid related deaths in the US**

Perioperative Management of Opioid Use Disorder Medications

Guidelines

Buprenorphine Formulations: Clinical Best Practice Strategies Recommendations for Perioperative Management of Patients Undergoing Surgical or Interventional Pain Procedures

Adrian B. Jonan, MD[1], Alan D. Kaye, MD, PhD[2], and Richard D. Urman, MD[1,2]

Jonan AB et al. Pain Physician 2018;21:E1-E12

Formulation	Brand Name	Dosage	Time to Peak Plasma Concentration (hrs)	Mean Half Life (hrs)
Buccal Film	Belbuca	75, 150, 300, 450, 600, 750, 900 mcg	2.5–3	16.4–38.8
Sublingual Tablet	Subutex	2, 8 mg	1.3–1.8	31–35
Intravenous	Buprenex	0.3 mg	5–15 mins	1.2–7.2
Transdermal System	Butrans	5, 7.5, 10, 15, 20 mcg/hr	72 hrs	26
Buccal Film (Buprenorphine and naloxone)	Bunavail	2.1 mg/0.3 mg 4.2 mg/0.7 mg 6.3 mg/1 mg (buprenorphine/naloxone)	Not reported	16.4–27.5 (buprenorphine) 1.9–2.4 (naloxone)
Sublingual Tablet (Buprenorphine and naloxone)	Zubsolv	0.7 mg/0.18 mg 1.4 mg/0.36 mg 2.9 mg/0.71 mg 5.7 mg/1.4 mg 8.6 mg/2.1 mg 11.4 mg/2.9 mg (buprenorphine/naloxone)	Not reported	24–42 (buprenorphine 2–12 (naloxone)
Sublingual Film (Buprenorphine with naloxone)	Suboxone	2 mg/0.5 mg 4 mg/1 mg 8 mg/2 mg 12 mg/3 mg (buprenorphine/naloxone)	0.5–1	24–42 (buprenorphine) 2–12 (naloxone)

Jonan AB et al. Pain Physician 2018;21:E1-E12

- Patients presenting for elective highly invasive surgery for which regional techniques can NOT be utilized (e.g., complex spinal fusion) AND being treated with HIGH dose buprenorphine/naloxone (8/2 and 12/3) should be postponed and referred to a pain clinic for suboxone weaning.

- Patients presenting for elective minimal/moderate invasive surgery for which multimodal analgesia (including regional techniques) can be utilized (e.g., TKA) AND being treated with small to moderate doses of buprenorphine/naloxone (2/0.5 and 4/1) are ok to proceed.

Setting Expectations:

Starts with preoperative visit

Involve pain service early

Continue home meds/ add IR meds

Periop. period NOT the right time to wean chronic meds


ANY
QUESTIONS
?