

MULTIMODAL ANALGESIA

Kelly Mayson
December 4th, 2016
BCAS/WSSA Meeting

Disclosures

- Speaker for 3M on perioperative hypothermia in 2015



Objectives

- Review the importance of multimodal analgesia
 - Perioperative use of acetaminophen and NSAIDS
 - Perioperative use of IV lidocaine infusions
 - Perioperative use of ketamine
 - Literature review and local experience
-


Multimodal analgesia

- Optimization of pain management is a key component to an Enhanced Recovery After Surgery Protocol
 - Defined as the administration of two or more drugs that act by different mechanism for providing analgesia
 - Effective analgesia and minimize opioid-related side effects
 - VH definition of “adherence to multi-modal analgesia within ERAS”: minimum of two non-opioid modalities
-


Adverse Effect of Under Treatment of Perioperative Pain

- Risk of thromboembolic complications
 - Pulmonary complications
 - Prolonged PACU, ICU, hospital stay
 - Hospital re-admissions for further pain management
 - Needless suffering
 - Impairment of health related quality of life
 - Development of chronic pain
-

Guidelines on Postoperative Pain



RESEARCH
EDUCATION
TREATMENT
ADVOCACY



PUBLISHED BY
ELSEVIER

The Journal of Pain, Vol 17, No 2 (February), 2016: pp 131-157
Available online at www.jpain.org and www.sciencedirect.com

2016

Guidelines on the Management of Postoperative Pain
Management of Postoperative Pain: A Clinical Practice Guideline
From the American Pain Society, the American Society of Regional Anesthesia and Pain Medicine, and the American Society of Anesthesiologists' Committee on Regional Anesthesia, Executive Committee, and Administrative Council

Roger Chou,^{*} Debra B. Gordon,[†] Oscar A. de Leon-Casasola,[‡] Jack M. Rosenberg,[§] Stephen Bickler,[¶] Tim Brennan,^{||} Todd Carter,^{**} Carla L. Cassidy,^{††} Eva Hall Chittenden,^{‡‡} Ernest Degenhardt,^{§§} Scott Griffith,^{¶¶} Renee Manworren,^{|||} Bill McCarberg,^{***} Robert Montgomery,^{†††} Jamie Murphy,^{‡‡‡} Melissa F. Perkal,^{§§§} Santhanam Suresh,^{¶¶¶} Kathleen Sluka,^{||||} Scott Strassels,^{****} Richard Thirlby,^{††††} Eugene Viscusi,^{‡‡‡} Gary A. Walco,^{§§§§} Lisa Warner,^{¶¶¶¶} Steven J. Weisman,^{||||||} and Christopher L. Wu^{‡‡}

- 32 recommendations
- Only 4 supported by high quality of evidence
- **Recommendation 6:** *“The panel recommend that clinicians offer multimodal analgesia, or the use of variety of analgesia and techniques combined with non-pharmacological interventions”*

Strong Recommendations/High Quality Evidence

- Recommendation 23: *“Clinicians consider surgical site-specific peripheral regional anesthesia techniques”*
 - Recommendation 25: *“Clinicians offer neuroaxial analgesia for major thoracic and abdominal procedures, particularly in patients at risk for cardiac and/or pulmonary complications, or prolonged ileus”*
 - Recommendation 15: *“Clinicians provide acetaminophen and NSAIDS as a part of multimodal analgesia for management of postoperative pain in patients without contraindications”*
-

Acetaminophen

- Reduce opioid consumption by ~30%
 - Prophylactic dose of ~1 g IV preop reduced nausea by 30% and pain if given prior to surgical incision
 - Apfel CC et al. Pain 2013;154:677-89
 - Route of administration
 - pharmacological studies show higher and earlier plasma and CSF levels with IV
 - Rectal absorption can be erratic
 - Systemic review—no evidence that increased bioavailability of the IV form enhances efficacy outcomes
 - Jibril et al. Can J Hosp Pharm 2015;68:238-47
-

NSAIDS

- Strong evidence that they have benefit
 - Recent meta-analysis found that administration during surgery is more effective than administration pre-emptively or after surgery
 - Gurusamy KS et al. *Cochrane Database Syst Rev* 2014:3
 - Classical NSAIDs—are more effective in early pain after laparoscopy than COX-2 inhibitors
 - A number of meta-analysis, RCT, Cohort, retrospective have not demonstrated an effect on overall mortality, CVS events*, surgical bleeding, or renal impairment in patient without kidney disease, and normal pre-op function
 - Mathiesen O et al. *Acta Anaesthesiol Scand* 2014;58:1182-1198
-

NSAIDS & colorectal surgery

Nonsteroidal Anti-inflammatory Drugs and Anastomotic Dehiscence in Bowel Surgery: Systematic Review and Meta-Analysis of Randomized, Controlled Trials

Dis Colon Rectum 2013;56:126

Thomas P. Burton, M.B.Ch.B.¹ • Anubhav Mittal, M.B.Ch.B., Ph.D., F.R.A.C.S.¹
Mattias Soop, M.D., Ph.D.^{1,2}

¹ Department of Surgery, The University of Auckland, Auckland, New Zealand

² Colorectal Surgery Unit, Department of Surgery, North Shore Hospital, Auckland, New Zealand

5.1% VS 2.4%

World J Surg (2014) 38:2247–2257
DOI 10.1007/s00268-014-2531-1

World Journal
of Surgery

Postoperative Nonsteroidal Anti-inflammatory Drugs and Risk of Anastomotic Leak: Meta-analysis of Clinical and Experimental Studies

Aneel Bhangu • Prashant Singh • J. Edward F. Fitzgerald •
Alistair Slesser • Paris Tekkis

OR ratio non-selective 2.37

Nonsteroidal Anti-inflammatory Drugs and the Risk for Anastomotic Failure

A Report From Washington State's Surgical Care and Outcomes Assessment Program (SCOAP)

Timo W. Hakkarainen, MD, MS; Scott R. Steele, MD; Amir Bastaworous, MD, MBA; E. Patchen Dellinger, MD;
Ellen Farrokhi, MD, MPH; Farhood Farjah, MD, MPH; Michael Florence, MD; Scott Helton, MD; Marc Horton, MD;
Michael Pietro, MD; Thomas K. Varghese, MD; David R. Flum, MD, MPH

- 13,082 patient undergoing bariatric or colorectal surgery, and 24% (3158 pts) received NSAIDS.
- Anastomotic leak was 4.8 vs 4.2%. . This association was isolated to non-elective colorectal surgery, for which the leak rate was 12.3% in NSAID vs 8.3% in the non group OR 1.70

Postoperative Nonsteroidal Anti-inflammatory Drug Use and Intestinal Anastomotic Dehiscence: A Systematic Review and Meta-Analysis

Stephen A. Smith, M.D. • Derek J. Roberts, M.D., Ph.D. • Mark E. Lipson, M.D.
W. Donald Buie, M.D. • Anthony R. MacLean, M.D.

Department of Surgery, University of Calgary and the Foothills Medical Centre, Calgary, Alberta, Canada

REVIEW

J Visceral Surg 206:153:269-75

Colonic anastomoses and non-steroidal anti-inflammatory drugs



K. Slim^{a,*}, J. Joris^b, H. Beloeil^c, le Groupe
Francophone de Réhabilitation Améliorée après
Chirurgie (GRACE)^d

- *Reviewed the two prior meta-analysis and now 12 studies.
- *Smith et al concluded that there was an OR 1.46 (1.14-1.86) of anastomotic dehiscence in observational studies
- *Slim—48 hours of NSAID likely safe, but should not be used if risk factors for anastomotic leaks—advanced age, malnutrition, severe co-morbidities, and or intraoperative difficulties

NSAID in Orthopedic/Spine Surgery

- Animals studies suggest a link between bone non-union but no high quality evidence in humans
 - Some observational studies suggest a possible association between high dose NSAID and non-union in spinal fusion
 - High quality and pediatric studies do not show an statistical difference in non-union
-

NSAIDs and Risk of Heart Failure

- Large retrospective study—10 year, 10 million pts, 4 European countries
- Use of NSAID in the prior 14 days was associated with a 19% risk of heart failure OR 1.19 (1.17-1.22)
- Dependent on NSAID
 - Naproxen OR 1.16 (1.07-1.27)
 - Ketorolac OR 1.83 (1.66-2.02)
 - Ibuprofen OR 1.18 (1.12-1.23)
 - Diclofenac OR 1.19 (1.15-1.24)
 - Celecoxib—OR 0.96 (0.9-1.02) no increased risk



The NEW ENGLAND JOURNAL of MEDICINE

[HOME](#)[ARTICLES & MULTIMEDIA ▾](#)[ISSUES ▾](#)[SPECIALTIES & TOPICS ▾](#)[FOR AUTHORS ▾](#)[CME >](#)

ORIGINAL ARTICLE

Cardiovascular Safety of Celecoxib, Naproxen, or Ibuprofen for Arthritis

Steven E. Nissen, M.D., Neville D. Yeomans, M.D., Daniel H. Solomon, M.D., M.P.H., Thomas F. Lüscher, M.D., Peter Libby, M.D., M. Elaine Husni, M.D., David Y. Graham, M.D., Jeffrey S. Borer, M.D., Lisa M. Wisniewski, R.N., Katherine E. Wolski, M.P.H., Qiuqing Wang, M.S., Venu Menon, M.D., Frank Ruschitzka, M.D., Michael Gaffney, Ph.D., Bruce Beckerman, M.D., Manuela F. Berger, M.D., Weihang Bao, Ph.D., and A. Michael Lincoff, M.D., for the PRECISION Trial Investigators*

November 13, 2016 | DOI: 10.1056/NEJMoa1611593

~24,000 patients: 3 groups—celecoxib 100 mg BID (200mg BID), naproxen 375 mg BID (500 mg BID), ibuprofen 600 mg TID (800 mg TID)

Risk of major adverse CVS complication: celecoxib 4.2%, naproxen 4.3%, ibuprofen 4.8%

NSAID “recommendations”

- NSAID should likely be avoided in non-elective colorectal surgery
 - Avoid in patients with epidurals who are receiving VTE prophylaxis
 - Risks /benefits of NSAID must be determined
 - Cardiac hx/CHF
 - Renal function
 - Surgical procedure
 - Risk of anastomotic leaks
 - Need to be discussed at debriefing and if appropriate give prior to emergence
-

Recommendation 19: IV lidocaine

- *Clinicians should consider IV lidocaine in adults who undergo open and laparoscopic surgery who not have contraindications*
 - Weak recommendation
 - Moderate quality of evidence
-

Systemic Lidocaine

- Anti-inflammatory analgesic
 - Inhibition of N-methyl-D-aspartate receptors and leukocyte priming
 - Stimulates the secretion of the anti-inflammatory cytokine interleukin-1 receptor antagonist
 - Antihyperalgesic
 - Selective depression in pain transmission in the spinal cord and reduction in tonic neural discharge of active peripheral fibers
-

Lidocaine infusions

Impact of Intravenous Lidocaine Infusion on Postoperative Analgesia and Recovery from Surgery

Drugs 2010;70:1149-1163

A Systematic Review of Randomized Controlled Trials

Grace C. McCarthy, Sohair A. Megalla and Ashraf S. Habib

Department of Anesthesiology, Duke University Medical Center, Durham, North Carolina, USA

Benefit in both open and MIS abdominal surgery

Decreased opioid requirements postoperatively, decreased PONV

Accelerated return of bowel function

Doses 100 mg bolus, 1.5-3 mg/kg/hr in OR +/- 1 hr in PACU

2011- meta-analysis

Can J Anesth/J Can Anesth (2011) 58:22–37
DOI 10.1007/s12630-010-9407-0

REPORTS OF ORIGINAL INVESTIGATIONS

Perioperative intravenous lidocaine infusion for postoperative pain control: a meta-analysis of randomized controlled trials

Perfusion intraveineuse périopératoire de lidocaïne pour le contrôle de la douleur postopératoire: une méta-analyse d'études randomisées contrôlées

**Louise Vigneault, MD · Alexis F. Turgeon, MD · Dany Côté, MD ·
François Lauzier, MD · Ryan Zarychanski, MD · Lynne Moore, PhD ·
Lauralyn A. McIntyre, MD · Pierre C. Nicole, MD · Dean A. Fergusson, PhD**

- 29 studies. Lidocaine reduced pain scores, opioid requirements, time to first flatus. Abdominal surgery was strongly associated with benefit.

Continuous intravenous perioperative lidocaine infusion for postoperative pain and recovery (Review)

Kranke P, Jokinen J, Pace NL, Schnabel A, Hollmann MW, Hahnenkamp K, Eberhart LHJ, Poepping DM, Weibel S



**THE COCHRANE
COLLABORATION®**

This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in *The Cochrane Library* 2015, Issue 7

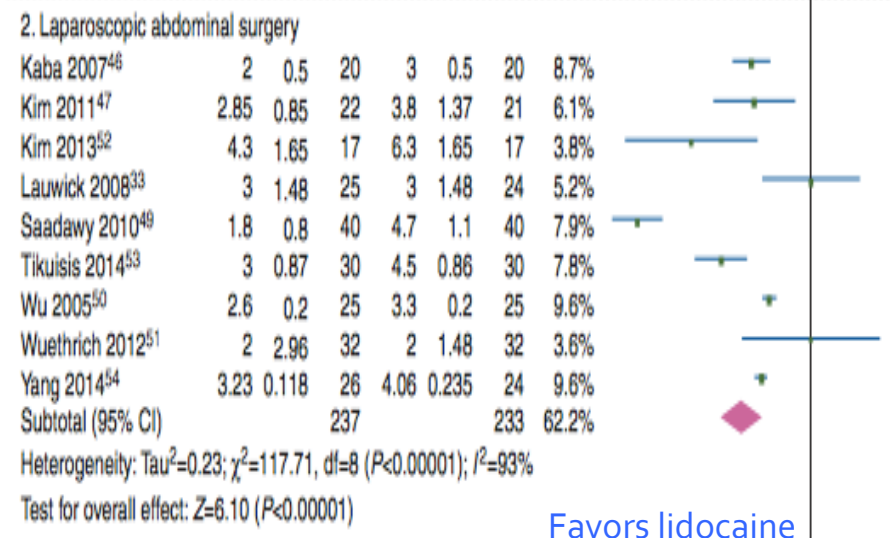
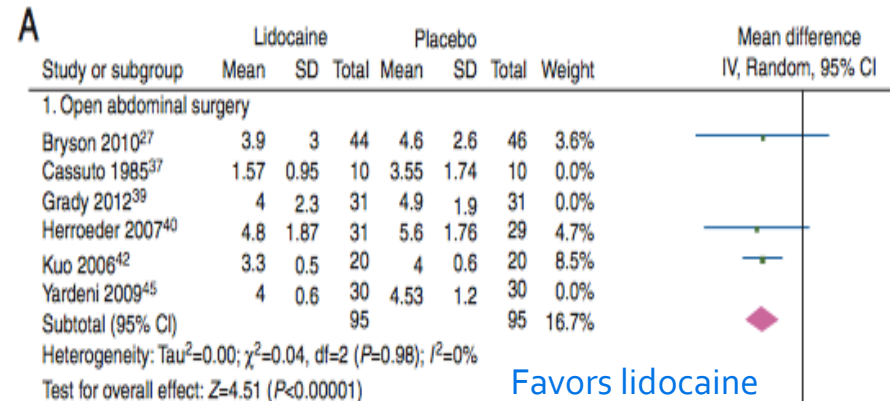
<http://www.thecochranelibrary.com>

Efficacy and safety of intravenous lidocaine for postoperative analgesia and recovery after surgery: a systematic review with trial sequential analysis[†]

S. Weibel^{1,*}, J. Jokinen¹, N. L. Pace², A. Schnabel¹, M. W. Hollmann³, K. Hahnenkamp⁴, L. H. J. Eberhart⁵, D. M. Poepping⁶, A. Afshari⁷ and P. Kranke¹

IV Lidocaine vs placebo

- Decreased early pain scores in MIS and open abdominal procedures
- ≥ 2 mg/kg/hr
- VAS pain scores 4-24 hrs lidocaine in MIS was beneficial
- Decreases ileus, time to first flatus, BM



IV Lidocaine

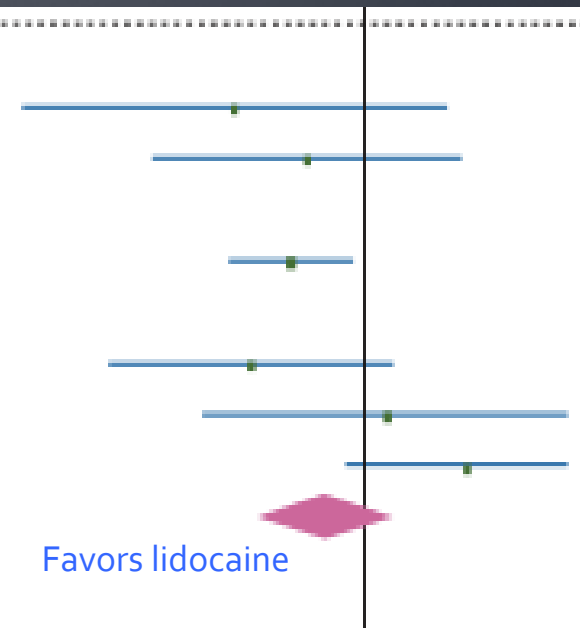
- Secondary outcomes
 - Decreased PONV
 - Decrease length of stay
 - Decreased intraoperative and postoperative opioid requirements
 - Only 17/45 of studies systematically looked at adverse effects, but there does not seem to be increased risk
 - Optimal dose and duration of infusion is still unclear
-

Other surgical procedures

3. Other surgery

Farag 2013 ⁵⁵	4.2	5.28	57	5.35	4.95	58	1.8%
Grigoras 2012 ⁵⁸	1.68	1.9	17	2.19	2.26	19	2.9%
Insler 1995 ⁶⁰	3.5	1.5	44	3.1	0.78	45	0.0%
Kang 2011 ⁶¹	2.7	1.13	32	3.35	1.13	32	7.0%
McKay 2009 ⁶⁵	3.1	2.04	29	4.5	2.9	27	0.0%
Omar 2013 ⁵⁶	3	2.22	24	4	2.22	24	3.2%
Slovack (unpublished) ⁷¹	2.9	2.6	19	2.7	2.4	17	2.2%
Striebel 1992 ⁶⁸	4.9	2	20	4	1.41	20	3.9%
Subtotal (95% CI)			169			170	21.1%

Heterogeneity: $\text{Tau}^2=0.23$; $\chi^2=8.46$, $\text{df}=5$ ($P=0.13$); $I^2=41\%$

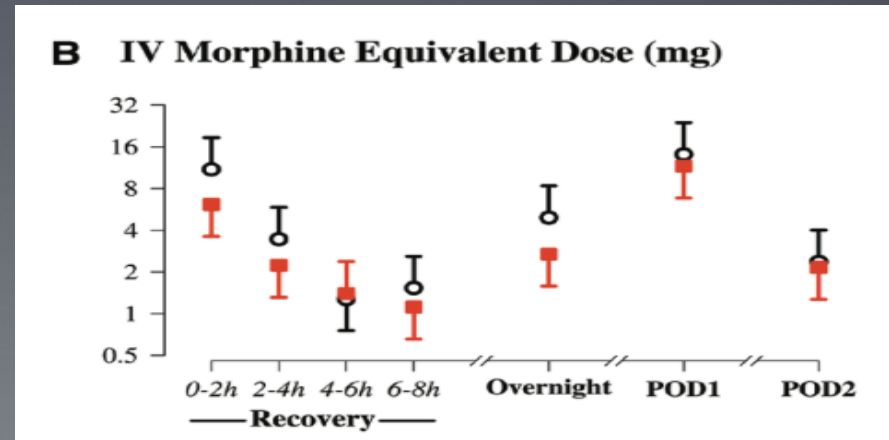
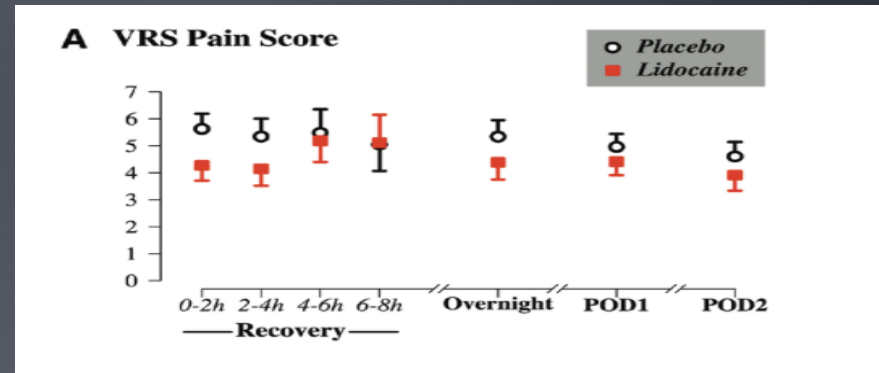


Effect of Perioperative Intravenous Lidocaine Administration on Pain, Opioid Consumption, and Quality of Life after Complex Spine Surgery

Ehab Farag, M.D., F.R.C.A.,* Michael Ghobrial, M.D.,† Daniel I. Sessler, M.D.,‡ Jarrod E. Dalton, Ph.D.,§ Jinbo Liu, M.D.,|| Jae H. Lee, B.A.,# Sherif Zaky, M.D.,** Edward Benzel, M.D.,†† William Bingaman, M.D.,‡‡ Andrea Kurz, M.D.§§

Anesth 2013:119

- 116 patients elective multilevel spine surgery +/- instrumentation
- 2 mg/kg/hr infusion starting at induction and continued until discharge from PACU, or a max 8 hr vs saline
- Case duration mean 269 min
- Pain scores, opioid requirements, N&V, LOS, 30 day complication, quality of life



“Complex” spine surgery post-discharge

- 30 day complication OD
0.91 (0.84-1.00) p=0.045
- Quality of life –validated Health Survey SF-12
- Lidocaine patients had higher SF-12 composite scores
- Limitation: did not assess quality of life prior to surgery

	Placebo	Lidocaine	P value
SF-12 physical 1M	33(27-42)	38(31-47)	0.002
SF-12 physical 3M	34(28-44)	39(31-47)	0.04
SF-12 mental 1M	54(46-59)	56(50-61)	0.74
SF-12 mental 3M	54(43-60)	58(50-61)	0.08

Postoperative Use of Lidocaine

- Majority of studies ran infusions in OR or for an additional 1 hour in PACU
 - Limited studies of prolonged infusions
 - Complex spine surgery—most OR ~ 4 hr, infusions for a maximum of 8 hours or until discharge from PACU (2mg/kg/hr)
 - Grady et al. 2012 –open hysterectomy: **1.2 mg/kg/hr X 24 hr**
 - Cassuto etl al 2mg/min X 24 hr
 - Horroeder 2007 2 mg/min 4 hours, stayed in PACU for additional 30 minutes
 - Kohr et al 2007 Laparoscopy CR **1.33 mg/kg/hr X 24 hours**
 - Tikuisis et al 2014 1 mg/kg/hr in PACU
 - Swenson et al 2010— postop until 24 hours after return of bowel function (**2mg/min for pt < 70 kg, and 3 mg/min >70 kg**)
-

Lidocaine “protocols”

- American Society of Enhanced Recovery ASER
 - www.aserhq.org/protocols
 - University of Virginia—Intraoperative lidocaine and postoperative lidocaine until POD 2
 - Beaumont Hospitals—1.5 mg/kg bolus and then 2 mg/kg/hr in OR
 - John Hopkins 1.5 mg/kg bolus and infusion 1.5/kg/hr in OR
 - McGill University 1.5 mg/kg bolus and 2 mg/kg/hr in OR
 - Vanderbilt 1.5 bolus and 2mg/kg/hr intraop infusion. Postop 1mg/min < 70 kg, 1.5mg/min 70-100 kg, 2 mg/min for > 100 kg
-

IV Lidocaine vs. Thoracic Epidural

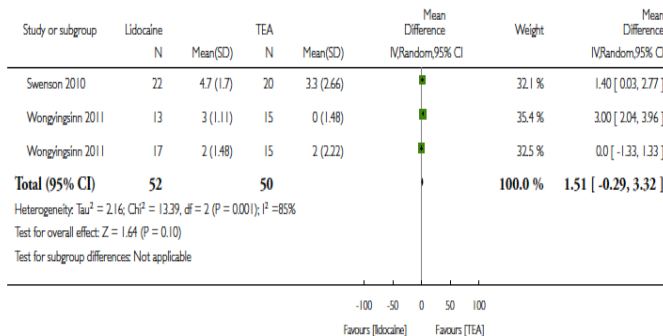
- Two studies
- 42 pts/60 pts
- Not inferior

Analysis 2.1. Comparison 2 Lidocaine IV versus TEA, Outcome 1 Pain score (VAS 0 to 10), rest, "intermediate time points" (24h).

Review: Continuous intravenous perioperative lidocaine infusion for postoperative pain and recovery

Comparison: 2 Lidocaine IV versus TEA

Outcome: 1 Pain score (VAS 0 to 10), rest, "intermediate time points" (24h)

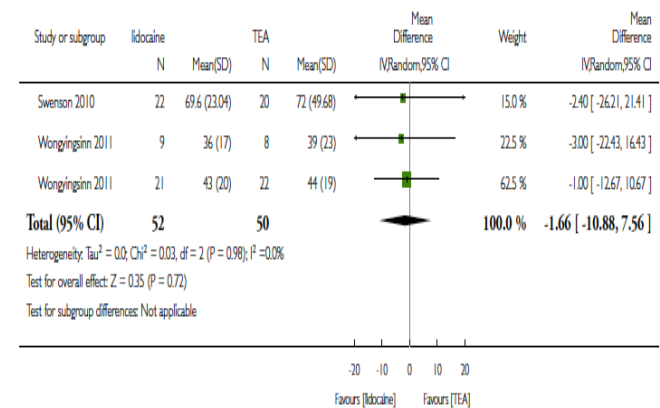


Analysis 2.3. Comparison 2 Lidocaine IV versus TEA, Outcome 3 Time to bowel movements/sounds (h).

Review: Continuous intravenous perioperative lidocaine infusion for postoperative pain and recovery

Comparison: 2 Lidocaine IV versus TEA

Outcome: 3 Time to bowel movements/sounds (h)



ORIGINAL ARTICLE

A Clinical Comparison of Intravenous and Epidural Local Anesthetic for Major Abdominal Surgery

Abdullah S. Terkawi, MD, Siny Tsang, PhD,† Ali Kazemi, MD,* Steve Morton, BSN, RN,* Roy Luo, MD,*
Daniel T. Sanders, MD,* Lindsay A. Regali, MD,* Heather Columbano, MD,*
Nicole Y. Kurtzeborn, MD,* and Marcel E. Durieux, MD, PhD**

-Retrospective study U Va
-216 patients (108 each arm)

-Majority (88.5%) lidocaine
started in OR 2-3 mg/min
-Postop 0.5-1.0 mg/min

Patient Demographics: IV lidocaine vs Epidural

TABLE 1. Demographic and Clinical Characteristics of the Patients

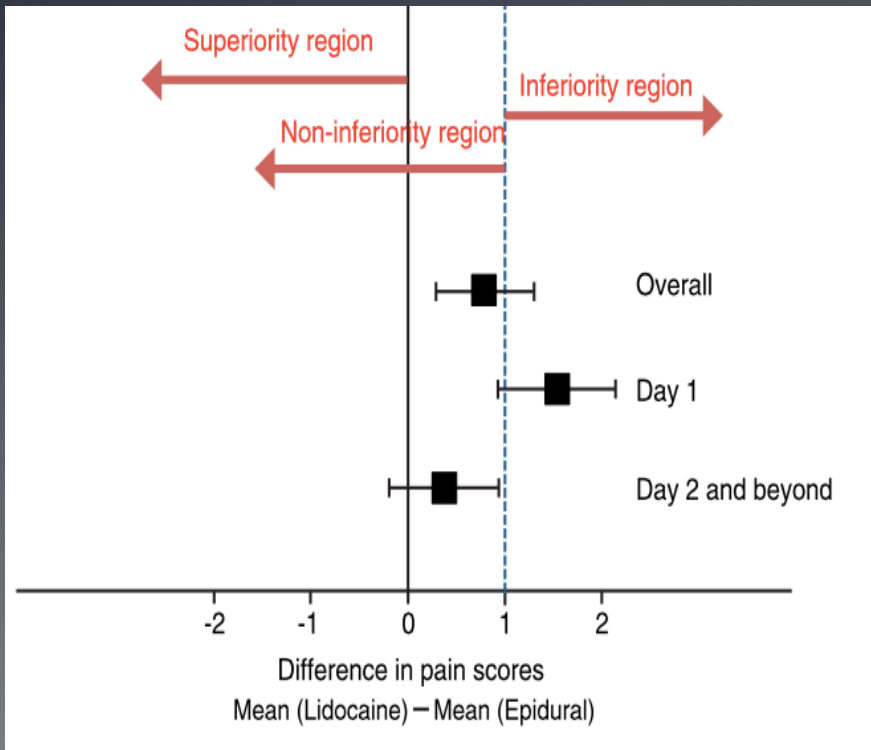
Characteristics	Lidocaine Group (n = 108)	Epidural Group (n = 108)	<i>P</i>
Age,* y	57.3 (14.8)	58.2 (13.7)	0.706
Sex†			
Male	39	49	0.439
Female	69	59	0.555
Body mass index,‡ kg/m ²	26.8 (23.1–30.7)	27.2 (23.0–32.0)	0.881
Chronic preoperative opioid use†	33	25	0.432
Procedure anatomical site†			
1. Bladder/prostate	8	6	0.808
2. Colorectal	19	42	0.013
3. Gastric	6	1	0.119
4. Gynecology	27	16	0.171
5. Hepatobiliary	11	3	0.052
6. Small bowel	29	27	0.929
7. Spleen/pancreas	6	5	1

*Presented as mean (SD), *P* value from simple *t* test.

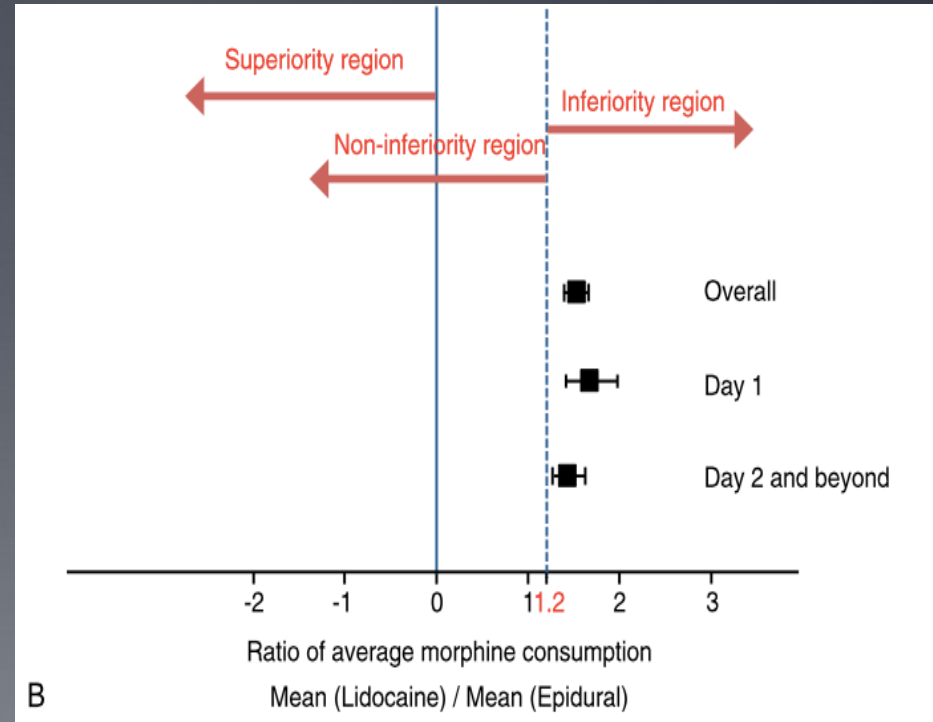
†Presented as frequency, *P* value from χ^2 or Fisher exact test.

Pain Scores and Opioid

Pain Scores



Opioid consumption



Summary of Secondary Outcomes

	LIDOCAINE IV	EPIDURAL	P values
Hypotension	3.7% (N=4)	26.1% (N=25)	< 0.0001
PONV POD 1	13% (N=14)	25.2% (N=25)	0.09
PONV POD 2	12.1% (N-12)	27.1% (N=28)	0.042
Urinary Retention			
Pruiritis	2.8% (N=3)	27.1% (N=38)	< 0.001
Foley out (hrs)	26 (20-58)	50 (37-96)	<0.001
Time to first BM (hrs)	61 (41-85)	84 (53-107)	0.019

LIDOCAINE INFUSION VGH experience (N=98)

	LIDOCAINE INFUSION	NO LIDOCAINE INFUSION	P values
PACU Fentanyl	34.2 (59.2) ug	81.7 (77.9) ug	< 0.05
PACU Hydromorphone	0.76 (1.3) mg	1.46(1.3) mg	< 0.05
Excessive Pain in PACU	4.25%	18.4%	<0.05

Bolus of 1.5 mg/kg and run on an infusion of 1-2 mg/kg/hr in OR only.

VGH Lidocaine Experience Within an ERAS program

- Colorectal cases—consider in MIS and open cases when epidurals contraindicated
 - 53.4% of cases currently receiving a lidocaine infusion
 - Conversion of MIS to open—consider postoperative infusion
 - Radical Cystectomy Cases—consider in robotic cases. Open cases currently receiving epidurals or rectus sheath
 - Gynecology/Oncology Cases—MIS and open. Consider postoperative infusions in complex surgery with bowel resection—intraoperative usage 20.5%
-

Contraindications

- Unstable coronary disease, Recent MI
 - Heart failure
 - 1st and 2nd degree heart conduction block
 - Electrolyte disturbances
 - Liver disease
 - Seizure disorder
-

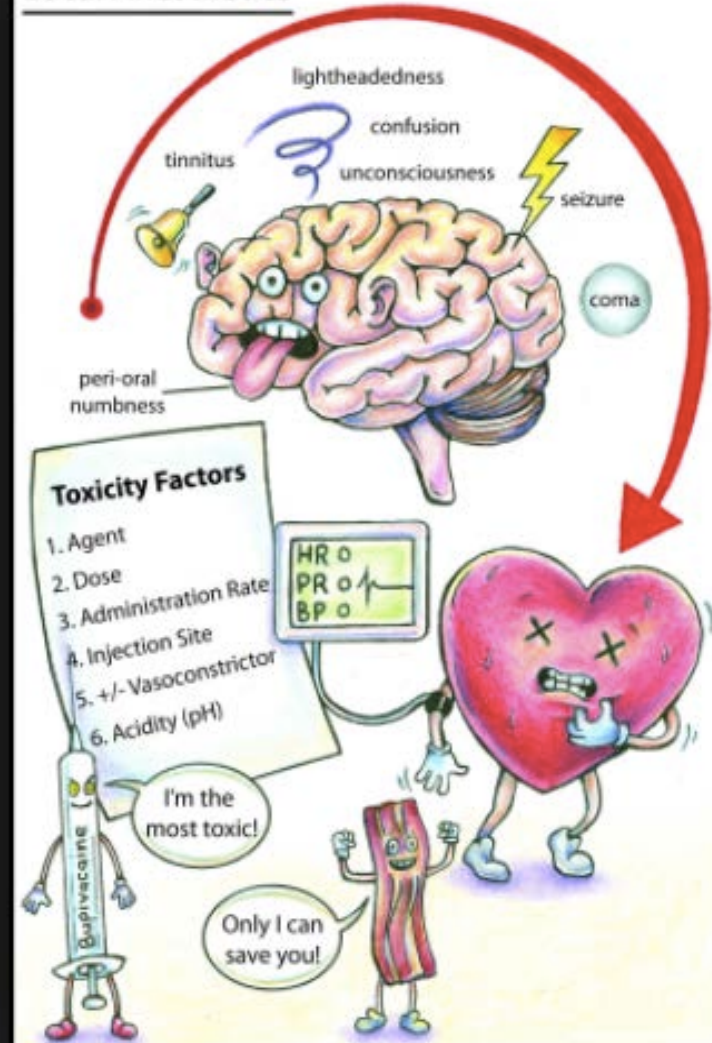
Compatibility

- NS
 - D₅W
 - LR
 - Plasmalyte
-

Monitor for Adverse Effects

- MILD
 - Numbness & tingling in fingers in toes, or inside mouth
 - Lightheadness, dizziness, visual disturbances, confusion
 - Metallic taste
 - Ringing in ears
- MODERATE
 - Nausea and vomiting
 - Decreased hearing
 - BP changes and HR
 - confusion
- SEVERE
 - Loss of consciousness
 - Muscle twitching
 - Convulsions
 - Cardiac arrhythmias, cardiac arrest

Local Anesthetics



If Adverse Events Occur

- Stop Infusion
 - Page Perioperative Pain Service/Anesthesia
 - Regional Cart with Intralipid from OR then sent to ward if necessary
-

Recommendation 18: Ketamine

- *Clinicians consider IV ketamine as a component of multimodal analgesia in adults*
 - Weak recommendation
 - Moderate quality evidence
-

Ketamine

- NMDA Receptor antagonist
- FDA approved in 1970

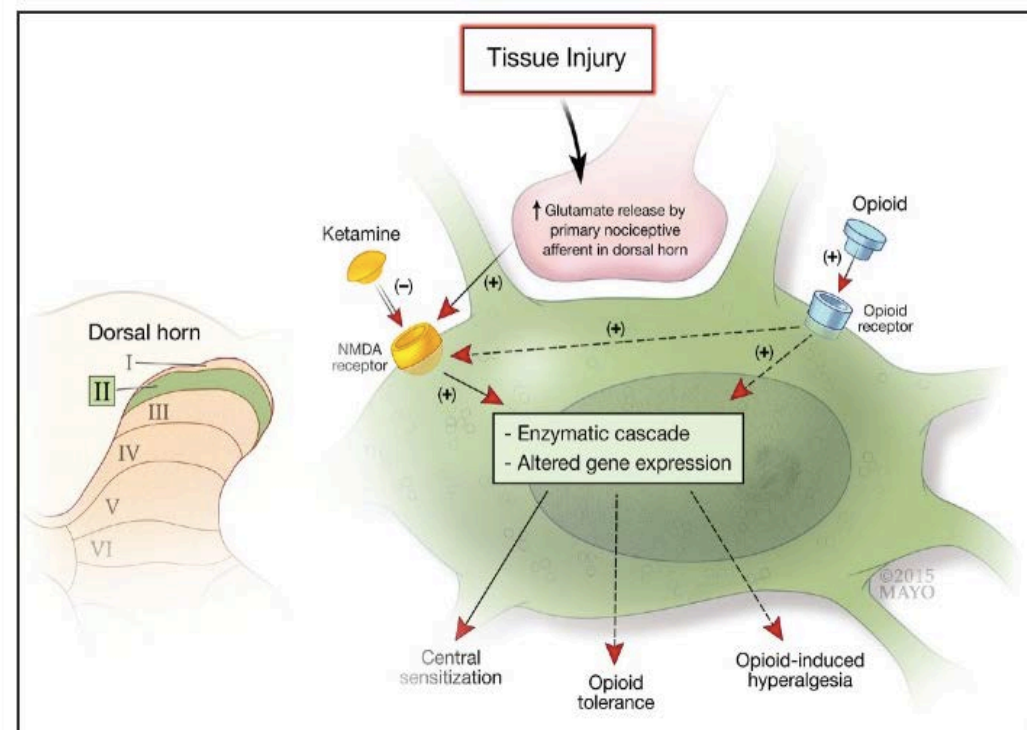


Figure 2

The activated primary nociceptive afferent from the periphery releases glutamate at the second order sensory neuron in the dorsal horn of the spinal cord which binds to N-methyl-d-aspartate receptors. Ketamine blocks the N-methyl-d-aspartate receptor ...

Systematic Reviews

Acta Anaesthesiol Scand 2005; **49**: 1405–1428
Printed in UK. All rights reserved

Copyright © *Acta Anaesthesiol Scand* 2005
ACTA ANAESTHESIOLOGICA SCANDINAVICA
doi: 10.1111/j.1399-6576.2005.00814.x

Review Article

Peri-operative ketamine for acute post-operative pain: a quantitative and qualitative systematic review (Cochrane review)

R. F. BELL¹, J. B. DAHL², R. A. MOORE³ and E. KALSO⁴

2005

Systematic Reviews

Acta Anaesthesiol Scand 2005; 49: 1405–1428
Printed in UK. All rights reserved

Copyright © Acta Anaesthesiol Scand 2005
ACTA ANAESTHESIOLOGICA SCANDINAVICA
doi: 10.1111/j.1399-6576.2005.00814.x

Review Article

Peri-operative ketamine for acute post-operative pain: a

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

2011

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

Systematic Review

Pain Medicine

Pain Medicine 2015; 16: 383–403
Wiley Periodicals, Inc.



ACUTE & PERIOPERATIVE PAIN SECTION

Original Research Article

The Use of Intravenous Infusion or Single Dose of Low-Dose Ketamine for Postoperative Analgesia: A Review of the Current Literature

“Low” dose Ketamine

- ≤ 1.2 mg/kg/hr as a continuous infusion and or ≤ 1 mg/kg when given as a bolus
 - 23/34 studies –mean reduction of opioid consumption was 40%. The degree of opioid consumption tended to be correlated with the dose of ketamine administered, however a clear dose-related effect could not be drawn
 - It was not associated with serious side effects or a significant increase in the likelihood of adverse events
 - No impact on sedation scores
 - Long term effect on residual pain when administered as an IV infusion (intraop or intraop +24 hrs, but not as a single dose)
-

Suggested Doses?

- 0.15 -0.5 mg/kg bolus at induction
 - 0.042 mg/kg/hr—0.6 mg/kg/hr in OR
 - Stop 45 minutes prior to emergence with laparoscopic procedures, and decrease dose by 50% with open
 - Postoperatively 0.042—0.09 mg/kg/hr up to 48 hr
-

Mayo Clinic Recommendation

Painful procedures

Surgery with high risk for developing chronic postsurgical pain

Opioid tolerant patients

Patients with opioid-induced hyperalgesia

Desire to minimize perioperative opioids

Short case (<60 min)

0.1-0.3 mg/kg IV bolus with induction

Long case but no plan for postoperative infusion

0.1-0.3 mg/kg IV bolus with induction

Repeat bolus 0.1-0.3 mg/kg every 30-60 min during operation

Avoid dose within 30 min of emergence

Planning on postoperative infusion

0.1-0.3 mg/kg IV bolus with induction followed by 0.1-0.2 mg/kg/h infusion

Infusion can be continued for 24-72 h

After 24 h consider reducing dose to 10 mg/h or less

IV = Intravenous

VGH Ketamine Usage

- 0.25-0.5 mg/kg bolus
 - Infusion rates 0.125-0.25 mg/kg/hr or 10 mg/hr
 - Postoperative rates for opioid tolerant patients 5-15 mg/hr
 - Colorectal ERAS cases
 - 20.5% of cases
 - Gynecology Oncology ERAS cases
 - 37.2% of cases are receiving intraoperatively
-

S.G. HART

WHAT'S THE STRONGEST OVER-THE-COUNTER PAIN KILLER YOU GOT ?



Questions?

kelly.mayson@vch.ca