PALERMO 5-7 Ottobre
XXVIII CONGRESSO NAZIONALE

European Society of Regional Anaesthesia & Pain Therapy
ESRA ITALIA

Postoperative implications after loco-regional anesthesia: the fast track

Dott.ssa Simona Silvetti

IRCCS San Martino Genova

Pain Location, Distribution, and Intensity After Cardiac Surgery*

Xavier M. Mueller, MD; Francine Tinguely, MD; Hendrick T. Tevaearai, MD; Jean-Pierre Revelly, MD; René Chioléro, MD; and Ludwig K. von Segesser, MD

(CHEST 2000; 118:391–396)

- Surgical approach
- Chest retraction
- Internal mammary artery harvesting
- Chest tubes
- Sternal wires
- Visceral pain
- Vascular catheters
- Pericardiotomy

Post operative pain

- Pulmonary system → atelectasis, pneumonia, and bronchial secretion stasis
- Cardiovascular system → Increased oxygen consumption and tachycardia
- Nausea → Nutritional status compromission
- Immunosupression → Infections
- Dependence and chronic pain

Reintubation and extension in post operative recovery


MORPHINE
Injection, USP

Short term side effects

- Respiratory depression
- Delirium
- Ileum
- Nausea e vomito
- Bradycardia

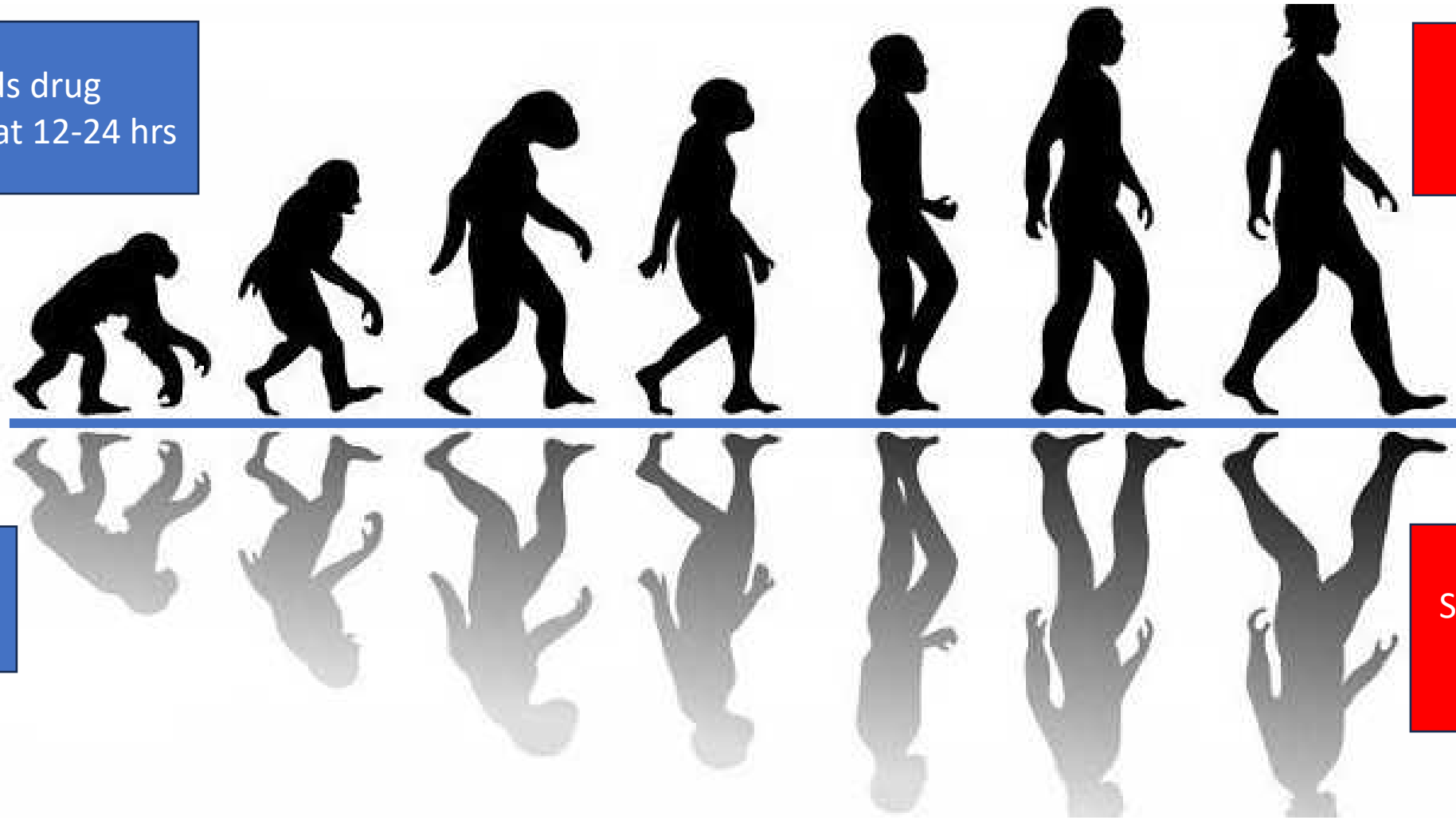
Long term side effects

- Drug tollerance
- Hyperalgesia
- Drug abuse


MORPHINE
Injection, USP

Oppiods drug
Extubation at 12-24 hrs

Oppiods sparing
Extubation at 6 hrs



1990s

Second Millennium =
FAST TRACK ERA

https://www.erascardiac.org

JAMA Surgery | Special Communication

Guidelines for Perioperative Care in Cardiac Surgery
Enhanced Recovery After Surgery Society Recommendations

Daniel T. Engelman, MD; Walid Ben Ali, MD; Judson B. Williams, MD, MHS; Louis P. Perrault, MD, PhD; V. Seenu Reddy, MD; Rakesh C. Arora, MD, PhD; Eric E. Roselli, MD; Ali Khoynezhad, MD, PhD; Marc Gerdisch, MD; Jerrold H. Levy, MD; Kevin Lobdell, MD; Nick Fletcher, MD, MBBS; Matthias Kirsch, MD; Gregg Nelson, MD; Richard M. Engelman, MD; Alexander J. Gregory, MD; Edward M. Boyle, MD

Enhanced Recovery After Surgery (ERAS) evidence-based protocols for perioperative care can lead to improvements in clinical outcomes and cost savings. This article aims to present consensus recommendations for the optimal perioperative management of patients undergoing cardiac surgery. A review of meta-analyses, randomized clinical trials, large nonrandomized studies, and reviews was conducted for each protocol element. The quality of the evidence was graded and used to form consensus recommendations for each topic. Development of these recommendations was endorsed by the Enhanced Recovery After Surgery Society.

JAMA Surg. doi:10.1001/jamasurg.2019.1153
Published online May 4, 2019.

Invited Commentary

Supplemental content

Author Affiliations: Author affiliations are listed at the end of this article.

Corresponding Author: Daniel T. Engelman, MD, Heart and Vascular Program, Baystate Medical Center, 759 Chestnut St, Springfield, MA 01199 (daniel.engelman@baystatehealth.org).

PALERMO 5-7 Ottobre
XXVIII CONGRESSO NAZIONALE
European Society of Regional Anaesthesia & Pain Therapy
ESRA ITALIA

ERAS® CARDIAC

SUMMARY: ERAS Expert Recommendations for Cardiac Surgery

Includes Class of Recommendation (COR) and Level of Evidence (LOE)

COR	LOE	Recommendations
I	A	Tranexamic acid or epsilon aminocaproic acid is recommended during on-pump cardiac surgical procedures.
I	B-R	Perioperative glycemic control is recommended.
I	B-R	A care bundle of evidenced based best practices is recommended to reduce surgical site infections.
I	B-R	Goal directed fluid therapy is recommended to reduce postoperative complications.
I	B-NR	A multimodal, opioid-sparing, pain management plan is recommended postoperatively.
I	B-NR	Persistent hypothermia after CPB should be avoided in the early postoperative period.
I	B-NR	Maintenance of chest tube patency is recommended to prevent retained blood.
I	B-NR	Postoperative systematic delirium screening is recommended at least once per nursing shift.
I	C-LD	Smoking and hazardous alcohol consumption should be stopped 4 weeks before elective surgery.
IIa	B-R	Early detection of kidney stress and interventions to avoid acute kidney injury are recommended following surgery.
IIa	B-R	Rigid sternal fixation can be useful to improve/accelerate sternal healing and reduce mediastinal wound complications.
IIa	B-NR	Prehabilitation is recommended for patients undergoing elective surgery with multiple comorbidities or significant deconditioning.
IIa	B-NR	An insulin infusion is recommended to treat hyperglycemia in all patients postoperatively.
IIa	B-NR	Strategies to ensure extubation within 6 hours of surgery are recommended.
IIa	C-LD	Patient engagement tools, including online/application-based systems to promote education, compliance, and patient-reported outcomes are recommended.
IIa	C-LD	Chemical thromboprophylaxis is recommended following surgery.
IIa	C-LD	Preoperative measurement of hemoglobin A1c is recommended to assist with risk stratification.
IIa	C-LD	Preoperative correction of nutritional deficiency is recommended when feasible.
IIb	C-LD	Clear liquids may be continued up until 2-4 hours before general anesthesia.
IIb	C-LD	Preoperative carbohydrate loading may be considered before surgery.
III (No Benefit)	A	Stripping or breaking the sterile field of chest tubes to remove clot is not recommended.
III (Harm)	B-R	Hyperthermia (>37.9 C) while rewarming on cardiopulmonary bypass is potentially harmful and should be avoided.

PALERMO 5-7 Ottobre
XXVIII CONGRESSO NAZIONALE

European Society of Regional Anaesthesia & Pain Therapy
ESRA ITALIA

The Society for Enhanced Recovery after Cardiac Surgery (ERAS® Cardiac) **recommends effective perioperative pain control** to improve patient outcomes.

ERAS®
CARDIAC

JAMA Surgery | Special Communication

Guidelines for Perioperative Care in Cardiac Surgery
Enhanced Recovery After Surgery Society Recommendations

Table 1. Classification of Recommendation and Level of Evidence

LOE by COR	Recommendation
I	
A	Tranexamic acid or epsilon aminocaproic acid during on-pump cardiac surgical procedures
B-R	Perioperative glycemic control
B-R	A care bundle of evidence-based best practices to reduce surgical site infections
B-R	Goal-directed fluid therapy
B-NR	A perioperative, multimodal, opioid-sparing, pain management plan
B-NR	Avoidance of persistent hypothermia (<36.0°C) after cardiopulmonary bypass in the early postoperative period.
B-NR	Maintenance of chest tube patency to prevent retained blood
B-NR	Postoperative systematic delirium screening tool use at least once per nursing shift
C-LD	Stopping smoking and hazardous alcohol consumption 4 weeks before elective surgery

JAMA Surgery | Special Communication

Guidelines for Perioperative Care in Cardiac Surgery
Enhanced Recovery After Surgery Society Recommendations

IIa		
	B-R	Early detection of kidney stress and interventions to avoid acute kidney injury after surgery
	B-R	Use of rigid sternal fixation to potentially improve or accelerate sternal healing and reduce mediastinal wound complications
	B-NR	Prehabilitation for patients undergoing elective surgery with multiple comorbidities or significant deconditioning
	B-NR	An insulin infusion to treat hyperglycemia in all patients postoperatively
	B-NR	Strategies to ensure extubation within 6 h of surgery
	C-LD	Patient engagement tools, including online/application-based systems to promote education, compliance, and patient-reported outcomes
	C-LD	Chemical or mechanical thromboprophylaxis after surgery
	C-LD	Preoperative measurement of hemoglobin A1c to assist with risk stratification
	C-LD	Preoperative correction of nutritional deficiency when feasible

PALERMO 5-7 Ottobre
XXVIII CONGRESSO NAZIONALE

European Society of Regional Anaesthesia & Pain Therapy
ESRA ITALIA

Early Extubation in Enhanced Recovery from Cardiac Surgery

Ciana McCarthy, MB, FCAI, JFICMI, EDIC, MEd[a,*],
Nick Fletcher, MBBS, FRCA, FFICM[b,c,1]

KEYWORDS

• Cardiac surgery • Early extubation • Ventilation • Enhanced recovery
• Fast-track recovery

KEY POINTS

- Early extubation is a key component of the enhanced recovery from cardiac surgery pathway, enabling early mobilization and oral nutrition.
- An effective nurse-led early extubation protocol will define prompt time points for cessation of sedation and return to spontaneous ventilation modes.
- Successful early extubation strategies are also associated with reduced intensive care unit and hospital length of stays.
- A focus on reduced dosages of shorter-acting opiates together with multimodal analgesia, including local anesthetic blockade, can reduce ventilatory weaning times.
- The strategy for an early extubation pathway starts from the moment the patient is scheduled for surgery with a prehabilitation program and respiratory testing and optimization.

A focus on reduced dosages of shorter-acting opiates togheter with multimodal analgesia, including local anesthetic blockade, can reduce ventilatory weaning times.

Postoperative Multimodal Analgesia in Cardiac Surgery

Linda F. Barr, MD[a], Michael J. Boss, MD[b], Michael A. Mazzeffi, MD, MPH, MSc[c], Bradley S. Taylor, MD[c], Rawn Salenger, MD[c,*]

Table 1
Nonopioid agents used to manage pain

Medication	Mechanism of Action	Suggested Dosing	Side Effects	Precautions	Comments
Ketamine[51]	NMDA antagonist also acts at: Mu GABA Muscarinic Monoaminergic	Bolus up to 0.35 mg/kg IV. Infusion immediately after loading at 0.1–0.2 mg/kg/h IV	Confusion Delirium Excitement, dreamlike state hallucinations vivid imagery, sialorrhea hyper-/hypotension Increased interocular or intracranial pressure (mainly seen in doses higher than those recommended for analgesia)	• Pregnancy • Should avoid in severe hepatic disease/use cautiously in patients with less severe liver disease • Poorly regulated cardiovascular disease • Active or severe psychosis • Increased intraocular pressure/intracranial pressure (all poorly studied in subanesthetic doses). (Pediatric dose-dependent study does not demonstrate increase in IOP with low-dose ketamine)[52]	• Many studies use higher bolus doses—consensus guidelines acknowledge this. • Infusion rate may be increased or decreased as necessary depending on tolerance/side effects. • Most studies note subanesthetic doses to be 0.5 mg/kg bolus and 0.5 mg/kg/h infusion or less
Gabapentin/ Pregabalin[53]	α-2δ subunit of presynaptic P/Q-type voltage-gated calcium channels	Gabapentin: preop—1200 mg PO once 2+ h before incision and postop—300 mg PO TID Pregabalin: preop—300 mg PO once 2+ h before incision AND postop—150 mg PO BID	Dizziness Visual alterations Headache Sedation Peripheral edema (gabapentin)	• Renal dysfunction • Older age • Combined sedative effect	• Adjustments must be made for decreased CrCl. • Widely varying tolerance regarding sedative effect—decrease dosage for increased age and decreased renal function. • Be mindful of sedative effect in outpatient population • Preoperative dosing not required. All dosing methods shown to reduce postoperative pain.
Dexmedetomidine	• α2 adrenergic receptor agonist • Weak peripheral α1 agonist with rapid loading	• 0.5–1 mcg/kg over 10 min (loading dose after cardiopulmonary bypass) Followed by: 0.4–1.5 mcg/kg/h infusion through extubation	Sedation Hypotension/ hypertension Profound bradycardia (most often with loading dose)	• Preadministration presence of bradycardia • High vagal tone • Hemodynamic instability	
Lidocaine	Initiation and conduction of nerve impulses blocked via decreasing membrane permeability to Na + ions	1.5–2 mg/kg loading dose Followed by: 1.5–3 mg/kg/h infusion	Tremor Tinnitus Metallic taste in mouth Lightheadedness Nausea/vomiting Seizure at toxic high concentration Bradycardia Asystole (rare)	• More severe degrees of heart block • Wolff-Parkinson-White syndrome Local anesthetic sensitivity	Inconclusive data as to effectiveness of IV lidocaine. Most likely no benefit after 24 h infusion time. Side effects/toxicity poorly studied for prolonged infusions[54]
Magnesium	NMDA antagonist	Varies 50 mg/kg load followed by: 8 mg/kg/h for 48 h[55]	Flushing Hypotension Vasodilation Toxicity (in order of increasing plasma concentration) • Loss of deep tendon reflexes • Respiratory paralysis • Cardiac conduction abnormalities • Cardiac arrest[55]	Use with caution in neuromuscular disease (myasthenia gravis)/renal impairment (increased mag concentrations over time may lead to toxicity)	Reduction in morphine used with improvement in sleep and overall satisfaction[56]
Acetaminophen	Analgesic effect on descending serotonergic inhibitory pathways in CNS. Not fully understood	1 g every 6 h	Nausea (IV administration)	• No contraindication in mild/moderate hepatic impairment • Contraindicated in severe hepatic impairment	Unclear benefit to IV administration over oral or rectal administration
Ketorolac/ NSAID	Reversible COX-1/COX-2 Inhibitor	30 mg single dose OR every 6 h—max daily dosing 120 mg. Consider lower dosing, 10 mg/15 mg, may provide similar analgesic effect[57,58]	Headache Nausea GI pain/dyspepsia	• Contraindicated in severe renal impairment or at risk of renal impairment with hypovolemia • Contraindicated in CABG (US boxed warning) • Contraindicated in heart failure secondary to sodium/ fluid retention[56] • GI inflammation	

PALERMO 5-7 Ottobre
XXVIII CONGRESSO NAZIONALE

European Society of Regional Anaesthesia & Pain Therapy
ESRA ITALIA

CURRENT OPINION

Regional anesthesia for cardiac surgery

Thomas J. Caruso[a], *Kiley Lawrence*[b], *and Ban C.H. Tsui*[a]

Purpose of review
Anesthesia for cardiac surgery has traditionally utilized high-dose opioids to blunt the sympathetic response to surgery. However, recent data suggest that opioids prolong postoperative intubation, leading to increased morbidity. Given the increased risk of opioid dependency after in-hospital exposure to opioids, coupled with an increase in morbidity, regional techniques offer an adjunct for perioperative analgesia. The aim of this review is to describe conventional and emerging regional techniques for cardiac surgery.

Recent findings
Well-studied techniques such as thoracic epidurals and paravertebral blocks are relatively low risk despite lack of widespread adoption. Benefits include reduced opioid exposure after paravertebral blocks and reduced risk of perioperative myocardial infarction after epidurals. To further lower the risk of epidural hematoma and pneumothorax, new regional techniques have been studied, including parasternal, pectoral, and erector spinae plane blocks. Because these are superficial compared with paravertebral and epidural blocks, they may have even lower risks of hematoma formation, whereas patients are anticoagulated on cardiopulmonary bypass. Efficacy data have been promising, although large and generalizable studies are lacking.

Summary
New regional techniques for cardiac surgery may be potent perioperative analgesic adjuncts, but well-designed studies are needed to quantify the effectiveness and safety of these blocks.

Keywords
analgesia, cardiac surgery, enhanced recovery, neuraxial, regional anesthesia

October 2019

Postoperative Multimodal Analgesia in Cardiac Surgery

Linda F. Barr, MD[a], Michael J. Boss, MD[b], Michael A. Mazzeffi, MD, MPH, MSc[c], Bradley S. Taylor, MD[c], Rawn Salenger, MD[c,*]

Regional anesthesia should be considered **for every patient.**

Box 1
Keys to success with multimodal therapy

Education and Planning
1. Education of front-line providers and allied staff
2. Education of patients and families
3. Set realistic, specific goals
4. Quantitative pain assessments

Interventions:
1. Multimodal analgesic strategy that targets different parts of pain pathways
2. Use of preemptive, scheduled nonopioid analgesics
3. Regional anesthetic techniques
4. Minimize opioids
5. Nausea prophylaxis
6. Remove lines and tubes as soon as possible
7. Early extubation
8. Early mobilization
9. Integration of pain management and recovery pathways into discharge planning

Continuous Improvement:
1. Longitudinal data capture for program assessment
2. Obtain feedback from providers and patients to modify program

Table 2
Cardiac surgical opioid-sparing, multimodal, and enhanced recovery after surgery pain management studies

Study Type and Reference	Patients (N)	Interventions	Outcomes—Intervention vs Control
Prospective observational Fleming et al,[59] 2016	Pre-ERAS (53) ERAS (52)	Preoperative Gabapentin 600 mg/ondansetron Postoperative Paracetamol/codeine prn/morphine prn/ondansetron x 48 h	Decreased pain scores No change in morphine use Improved nausea and enteral tolerance
Retrospective review Williams et al,[14] 2019	Pre-ERAS (489) ERAS (443)	Preoperative Gabapentin 300 mg/acetaminophen/anxiolytic Intraoperative Acetaminophen/hydromorphone/dexmedetomidine or propofol Postoperative Acetaminophen/gabapentin, 300 mg bid x 5 d or 100 mg bid for age >70 y/oxycodone prn/fentanyl IV prn/ondansetron	Decreased mean hospital stay/ICU stay/ileus/reintubation No change in duration of mechanical ventilation
Randomized, double-blind, placebo-controlled Menda et al,[60] 2010	Gabapentin (30) Control (30)	Preoperative Gabapentin, 600 mg	Decreased pain scores at rest and with cough first 12 h after surgery only/morphine use at 24 h/nausea Increased incidence of oversedation/duration of mechanical ventilation
Retrospective, case-matched Grant et al,[61] 2019	ERAS compliance: high (84) Low (231)	Preoperative Gabapentin, 600 mg or 300 mg, for age >70 y or creatinine clearance <60 mL/min/acetaminophen Intraoperative Ketamine/dexmedetomidine/bilateral serratus anterior plane block with bupivacaine/reversal neuromuscular blockade	High compliance Increased early extubation Decreased hospital length of stay (LOS)
Retrospective, case-matched Markham et al,[62] 2019	ERAS (25) Control (25)	Preoperative Gabapentin, 300 mg/acetaminophen Intraoperative Bilateral serratus anterior plane and adductor canal blocks with ropivacaine and dexamethasone/dexmedetomidine/reversal neuromuscular blockade Postoperative Gabapentin 300 mg x 1/ondansetron/opioids as needed	Decreased duration of mechanical ventilation/opioid use/intensive care LOS No change hospital LOS/ileus/arrhythmias/pericarditis
Prospective randomized Li et al,[63] 2018	ERAS (104) Control (105)	Preoperative Paravertebral nerve block T2-3, T5-6 Postoperative Patient-controlled analgesia pump with sufentanil/ropivacaine to incision/ondansetron as needed	Decreased hospital LOS/ICU LOS/duration of mechanical ventilation/hospital cost/postoperative atrial fibrillation
Randomized, double-blind, placebo-controlled Florkiewicz et al,[64] 2019	Ropivacaine (47) Control (43)	Postoperative Ropivacaine or placebo saline to sternotomy x 48 h/oxycodone and patient-controlled intravenous analgesia/propofol/paracetamol	No change in pain scores/oxycodone use/nausea and emesis/oversedation/wound infection
Prospective randomized controlled trial Rafiq et al,[65] 2014	ERAS (77) Control (74)	Postoperative Ketorolac/dexamethasone/paracetamol before extubation/then gabapentin, 300 mg/paracetamol night of surgery/then gabapentin, 300 mg, bid/ibuprofen/paracetamol/pantoprazole/magnesium oxide/morphine needed	Decreased opioid use/pain score/nausea and emesis Increased acute renal injury
Prospective randomized placebo-controlled study Subramaniam et al,[66] 2019	Dexmedetomidine/acetaminophen Propofol/acetaminophen Dexmedetomidine/placebo Propofol/placebo 120 total patients divided into 4 groups (1:1:1:1)	Postoperative acetaminophen/dexmedetomidine or propofol for up to 6 h or extubation	Decreased delirium and opioid use with acetaminophen No difference between dexmedetomidine and propofol
Meta-analysis of randomized controlled trials Peng et al,[67] 2019	9 trials (total 1308)	Intraoperative/postoperative Dexmedetomidine up to first postoperative day	Decreased acute renal injury/prolonged ventilation/pulmonary complications/delirium/hospital mortality
Meta-analysis Souvik et al,[68] 2017	4 gabapentin trials (total 220) 4 pregabalin trials (total 110)	Gabapentin 800 mg 2 h preoperative + 400 mg 2 h postextubation 600 mg 2 h preoperative 1200 mg 2 h preoperative + 600 mg bid x 2 d 1200 mg 1 h preoperative + 1200 mg daily x 2 d Pregabalin 150 mg 1–2 h preop/2 studies added 75 mg bid x 2 and 5 d postoperatively	Decreased opioid use in 3 gabapentin and 2 pregabalin studies/no difference for 1 gabapentin and 2 pregabalin studies Lower pain scores in 3 gabapentin and 3 pregabalin studies Increased duration of mechanical ventilation in 2 gabapentin studies/no difference in 1 pregabalin study
Prospective randomized double-blind placebo-controlled Lahtinen et al,[69] 2004	Ketamine (44) Placebo (46)	Intraoperative Ketamine continued x 48 h Postoperative Oxycodone patient-controlled analgesia (PCA)	Decreased opioid use Improved patient satisfaction No change in pain scores/nausea and emesis
Prospective randomized controlled Qazi et al,[70] 2015	Ibuprofen (93) Oxycodone SR (89)	Postoperative Ibuprofen SR 800 mg oral bid plus lansoprazole daily (versus oxycodone SR) x 7 d/paracetamol 1 g qid/PRN oxycodone IR	Increased acute renal injury (creatinine doubled in all ibuprofen patients, then normalized in most over 14 d, no dialysis) No change in sternal wound healing/myocardial infarction/GI bleeding
Retrospective analysis of pooled data from 2 multicenter randomized controlled trials De Souza et al,[71] 2017	NSAID preoperative and postoperative (289) NSAID preop only (257) No NSAID (3519)	Nonsteroidal antiinflammatory drug (NSAID)	No difference in mortality/myocardial infarction/stroke/renal injury/mediastinitis/reoperation for bleeding
Prospective randomized placebo-controlled, double-blind study Vrooman et al,[72] 2015	Lidocaine patch (39) Placebo patch (39)	Postoperative Lidocaine (or placebo) patch 5%—up to 3 for up to 6 mo/fentanyl PCA x 3 d/oral narcotics	No difference in opioid use/pain scores/patient satisfaction Mean pain scores were baseline for both groups by 90 d

Postoperative Multimodal Analgesia in Cardiac Surgery

Linda F. Barr, MD[a], Michael J. Boss, MD[b], Michael A. Mazzeffi, MD, MPH, MSc[c], Bradley S. Taylor, MD[c], Rawn Salenger, MD[c,*]

Crit Care Clin 36 (2020) 631–651

Which Block?

Regional anesthesia for cardiac surgery

Thomas J. Caruso[a], Kiley Lawrence[b], and Ban C.H. Tsui[a]

Table 1. Common regional anesthesia techniques for cardiac surgery

Regional technique	Advantages	Disadvantages	Physiologic effects	Catheter
Thoracic epidural anesthesia (tea)	• Well studied • Proven efficacy • Reduced risk of myocardial infarction, respiratory depression, atrial arrhythmia • Reduced mortality	• Risk of hematoma, potentially exacerbated by cardiopulmonary bypass • Risk of dural puncture	Somatic and sympathetic blockade	Well suited
Spinal anesthesia	• Well studied • Proven efficacy • Decreased stress response to cardiac surgery	• Risk of hematoma	Somatic and sympathetic blockade	Well suited
Caudal anesthesia	• May facilitate early extubation in pediatric patients • Decreased stress response to cardiac surgery	• Risk of hematoma • Risk of dural puncture • Typically only used in pediatric patients • Effectiveness not well studied in cardiac patients	Somatic and sympathetic blockade	Well suited
PVB	• Equivalent analgesia to neuraxial anesthesia • Lower incidence of minor complications compared with neuraxial techniques • Improved safety profile with ultrasound guidance	• Risk of hematoma • Risk of pneumothorax • Effectiveness not well studied in cardiac patients	Somatic and sympathetic blockade	Well suited
ESPB	• Potentially opioid-sparing • Less invasive compared with neuraxial and PVB • Theoretically low risk of hematoma and other major complications	• Effectiveness not well studied • Large studies are lacking	Somatic blockade, possible sympathetic blockade	Well suited
ICNB	• Potentially opioid-sparing	• Effectiveness not well studied • Risk of pneumothorax • Large doses of anesthetic needed for analgesic effect	Somatic blockade only	Poorly suited
PECs block	• Opioid-sparing • Theoretically low risk of hematoma and other major complications	• Effectiveness not well studied	Somatic blockade only	Poorly suited
SAPB	• Potentially opioid-sparing • Theoretically low risk of hematoma and other major complications	• Effectiveness not well studied	Somatic blockade only	Poorly suited
TTMPB	• Theoretically low risk of hematoma and other major complications	• Effectiveness not well studied	Somatic blockade only	Poorly suited
Parasternal nerve block	• Opioid-sparing • May facilitate early extubation • Theoretically low risk of hematoma and other major complications	• Requires 10 injection points • Effectiveness not well studied	Somatic blockade only	Poorly suited

ESPB, erector spinae plane block; *ICNB*, intercostal nerve block; *PECs*, pectoral interfascial; *PVB*, paravertebral block; *SAPB*, serratus anterior plane block; *TEA*, thoracic epidural anesthesia; *TTMPB*, transversus thoracic muscle plane block.

PALERMO 5-7 Ottobre

XXVIII CONGRESSO NAZIONALE

European Society of Regional Anaesthesia & Pain Therapy

ESRA ITALIA

Giuseppe Sepolvere

Mario Tedesco

Bari

D. Caruso

P. Scimia

PALERMO 5-7 Ottobre
XXVIII CONGRESSO NAZIONALE
European Society of Regional Anaesthesia & Pain Therapy
ESRA ITALIA

Zhang *et al. BMC Anesthesiology* (2021) 21:175
https://doi.org/10.1186/s12871-021-01391-w

BMC Anesthesiology

RESEARCH ARTICLE Open Access

Effects of bilateral Pecto-intercostal Fascial Block for perioperative pain management in patients undergoing open cardiac surgery: a prospective randomized study

Yang Zhang[1], Haixia Gong[1], Biming Zhan[2] and Shibiao Chen[1*]

Abstract

Background: Open cardiac surgical patients may experience severe acute poststernotomy pain. The ultrasound-guided Pecto-intercostal Fascial Block (PIFB) can cover anterior branches of intercostal nerves from T2 to T6. The aim of this study was to investigate the effect of bilateral PIFB in patients undergoing open cardiac surgery.

Methods: A group of 108 patients were randomly allocated to either receive bilateral PIFB (PIFB group) or no nerve block (SALI group). The primary endpoint was postoperative pain. The secondary outcome measures included intraoperative and postoperative sufentanil and parecoxib consumption, time to extubation, time to first feces, length of stay in the ICU and the length of hospital stay. Insulin, glucose, insulin resistance and interleukin (IL)-6 at 1, 2, 3 days after surgery were mearsured. The homeostasis model assessment (HOMA-IR) was used to measure perioperative insulin resistance.

Results: The PIFB group reported significantly less sufentanil and parecoxib consumption than the SALI group. Compared to the PIFB group, the SALI group had higher Numerical Rating Scale (NRS) pain scores at 24 h after operation both at rest and during coughing. The time to extubation, length of stay in the ICU and length of hospital stay were significantly decreased in the PIFB group compared with the SALI group. The PIFB group had a lower insulin, glucose, IL-6, HOMA-IR level than the SALI group 3 days after surgery.

Conclusion: Bilateral PIFB provides effective analgesia and accelerates recovery in patients un cardiac surgery.

Trial registration: This study was registered in the Chinese Clinical Trial Registry (ChiCTR 200 03/ 2020.

Keywords: Pecto-intercostal Fascial Block, Insulin resistance, The length of hospital stay, Sufen iac surgery

PALERMO 5-7 Ottobre
XXVIII CONGRESSO NAZIONALE

European Society of Regional Anaesthesia & Pain Therapy
ESRA ITALIA

ORIGINAL ARTICLE

JOURNAL OF CARDIAC SURGERY WILEY

Bilateral transversus thoracis muscle plane block provides effective analgesia and enhances recovery after open cardiac surgery

Yang Zhang MD[1] | Xianzhi Li MD[2] | Shibiao Chen MD[1]

Meta-Analysis > Minerva Anestesiol. 2022 Sep;88(9):719-728.
doi: 10.23736/S0375-9393.22.16272-3. Epub 2022 Apr 5.

Efficacy of ultrasound-guided parasternal block in adult cardiac surgery: a meta-analysis of randomized controlled trials

Jing Li [1], Lu Lin [2], Jian Peng [1], Shushao He [1], Yan Wen [3], Ming Zhang [4]

Affiliations + expand

PMID: 35381838 DOI: 10.23736/S0375-9393.22.16272-3

Conclusions: Through decreasing the consumption of opioids, ultrasound-guided PSB could relieve pain and limit opioid-related complications. Clinical outcomes, such as mechanical ventilation time, total length of ICU stay and hospital days, will also be improved. Our find ve that ultrasound-guided PSB is an effective regional analgesic method after adult cardiac

PALERMO 5-7 Ottobre
XXVIII CONGRESSO NAZIONALE

European Society of Regional Anaesthesia & Pain Therapy
ESRA ITALIA

Dost *et al. BMC Anesthesiology* (2022) 22:409
https://doi.org/10.1186/s12871-022-01952-7

BMC Anesthesiology

RESEARCH

Open Access

Effects of ultrasound-guided regional anesthesia in cardiac surgery: a systematic review and network meta-analysis

Burhan Dost[1*], Alessandro De Cassai[2], Eleonora Balzani[3], Serkan Tulgar[4] and Ali Ahiskalioglu[5,6]

The use of **multimodal perioperative pain management** strategies in current anesthesia practices **is recommended** instead of systemic analgesics or opioids only…

Regional anesthesia should be considered for every patient.

Barr LF, Boss MJ, Mazzeffi MA, Taylor BS, Salenger R. Postoperative Multimodal Analgesia in Cardiac Surgery. Crit Care Clin.2020;36(4):631-651

Blocks can be performed before surgery in order to minimize intraoperative opioid requirements,

or at the conclusion of surgery in order to maximize the duration of postoperative pain relief.

PALERMO 5-7 Ottobre
XXVIII CONGRESSO NAZIONALE

European Society of Regional Anaesthesia & Pain Therapy
ESRA ITALIA

ORIGINAL ARTICLE

JOURNAL OF CARDIAC SURGERY WILEY

Comparison of preincisional and postincisional parasternal intercostal block on postoperative pain in cardiac surgery

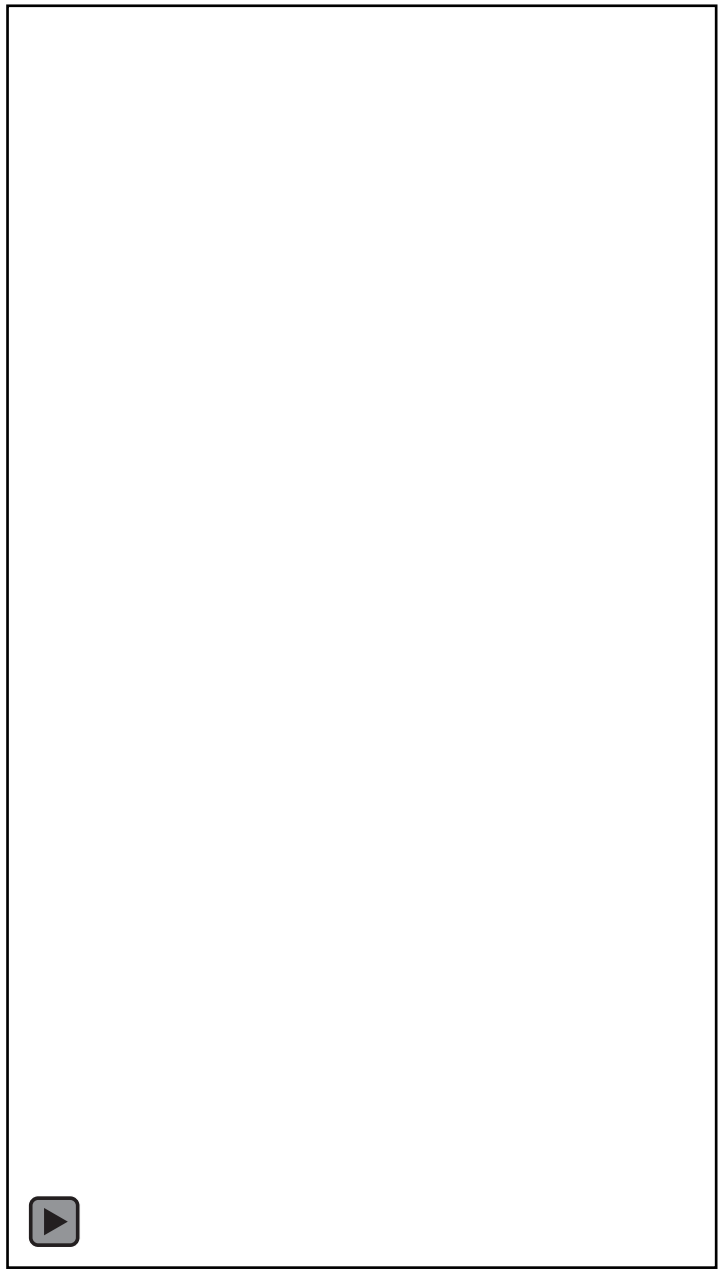
Sri Rama Ananta Nagabhushanam Padala MD | Ashok Shankar Badhe MD | Satyen Parida MD, PDCC | Ajay Kumar Jha MD, DM

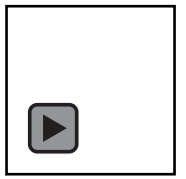
PALERMO 5-7 Ottobre

XXVIII CONGRESSO NAZIONALE

European Society of Regional Anaesthesia & Pain Therapy

ESRA ITALIA





Multimodal analgesia
And
Loco Regional Anesthesia

↓

Early extubation

↓

Prompt FAST TRACK

Grazie

Simona Silvetti

IRCCS Policlinico San Martino, Genova