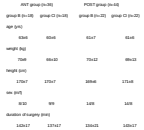
Paravertebral block study details

reference	participants' characteristics	intervention group/ control group	outcomes	critical appraisal/ conclusion
Helms et al. 2011 Intra-operative paravertebral block for postoperative analgesia in thoracotomy patients: a randomized, double-blind, placebo-controlled study. Eur J Cardiothorac Surg. 2011 Oct;40(4):902-6.	**inclusion criteria** - age18–80 yrs - scheduled for unilateral thoracotomy - a contraindication to TEA (including antiplatelet treatment, therapeutic anticoagulant treatment, hemostasis, and/or coagulation disorders, local or systemic infection, second- or third grade atrioventricular block without a pacemaker, severe aortic stenosis, severe scoliokyphosis, and known neuropathy - those who refused TEA **exclusion criteria** - difficulty in understanding the study protocol - pregnancy and breast-feeding - epilepsy - third-grade atrioventricular block without a pacemaker - severe hepatic insufficiency - anti-arrhythmic treatment - local infection at insertion site - allergy to local anaesthetics - surgical contraindications to catheter insertion **demographic data**: group R group C p age (yrs) 57.74±13.71 65.42±7.78 0.026 weight (kg) 74.65±15.302 77.00±15.01 0.598 height (cm) 171.17±8.711 172.63±6.927 0.530 ASA score 2.48±0.511 2.68±0.504 0.481 length of surgery (min) 199±38.5 220±47.3 0.151 **patient flow and follow up:** total patient number included: 47 randomised in: group R: 19 group C: 21 excluded: 7 analysed: 40 follow-up: 1, 3, 6, 12, 24, 36, and 48 h	**intervention prior to anaesthesia** - not reported **mode of anaesthesia** - not reported **surgical approach** - unilateral thoracotomy **at the end of surgery** - 1 g paracetamol and 20 mg nefopam 1 h before the end of surgery - 1 g paracetamol every 6 h and 100 mg nefopam every 24 h **supplemental analgesia** - IV PCA of morphine (1 mg morphine bolus, lo 7 min) + droperidol (0.05 mg/mL) and ketamine (1 mg/mL) **postoperative analgesia** - group R (ropivacaine): 0.5% ropivacaine as initial bolus of 0.1 mL/kg, then as a continuous 0.1 mL/kg/h infusion for 48 h postop - group C (control): same regimen as group R but with 0.9% saline	**postoperative pain [VAS 0-10; mean]: (extrapolated from graph so approximate values)** h group R group C at rest 1 2.85 2.65 3 2.60 1.90 6 1.95 1.75 12 1.85 1.90 24 2.05 2.00 36 2.4 1.60 48 1.90 1.35 on coughing 1 4.25 3.30 3 4.80 3.90 6 4.05 3.55 12 4.10 4.30 24 5.10 4.80 36 5.05 4.50 48 5.10 4.30 - patients in group R and group C experienced similar pain scores at rest (p=0.380) and on coughing (p=0.433). **time to first analgesic request [h]: mean±SD** - not reported **total dosage of morphine in 48 h [mg]: mean±SD** group R group C 45.7±33.9 43.2±30.3 - mean morphine consumption during the first 48 h postop was similar between group R and group C **adverse effects/ events: (%)** group R group C p nausea and vomiting 8.7 0 0.219 urinary retention 39.1 29.17 0.530	**methodological shortcomings** - not reported whether the sequence was adequately concealed until interventions were assigned - participant flow through each stage was not reported - method used to implement the random allocation sequence not reported - not reported how the sequence was concealed until interventions were assigned - not reported who generated the allocation sequence, who enrolled participants, and who assigned the participants to their groups **level of evidence: 1** **authors' conclusion** "Paravertebral block using a catheter placed by the thoracic surgeon was ineffective on postoperative pain after thoracotomy and did not confirm the analgesic effect that has been observed after percutaneous catheter placement."
Fibla et al. 2015 A randomized prospective study of analgesic quality after thoracotomy: paravertebral block with bolus versus continuous infusion with an elastomeric pump. Eur J Cardiothorac Surg. 2015;47(4):631-5.	**inclusion criteria** - **exclusion criteria** - **demographic data**: 	**intervention prior to anaesthesia** **mode of anaesthesia** - fentanyl **surgical approach** - anterior thoracotomy (ANT) - posterolateral thoracotomy (POST) **at the end of surgery** - 20 mL bolus of 0.5% levobupicaine in all patients **postoperative analgesia**	**postoperative pain** - since no statistical differences were observed, it was not possible to confirm differences between the LA administered in a bolus versus continuous infusion **rescue analgesia** - thirteen (16.2%) patients needed meperidine as rescue drug at some point (8 with continuous infusion and 5 with bolus) - there were no differences in the requirements for rescue analgesia between the two groups (p=0.721) **adverse effects/ events** - none reported	**methodological shortcomings** - method used to implement the random allocation sequence not reported - not reported how the sequence was concealed until interventions were assigned - not reported who generated the allocation sequence, who enrolled participants, and who assigned the participants to their groups - not reported whether the sequence was adequately concealed until interventions were assigned - number of participants (denominator) in each group included in each analysis and whether the analysis was by "intention to treat" not reported

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	 **patient flow and follow up:** total patient number included: 80 randomised in: ANT group B: 18 group CI: 18 POST group B: 22 group CI: 22 excluded: - patients with renal failure - allergy to levobupivacaine, metamizole or meperidine analysed: 80 follow-up: 1, 6, 24, 48, 72 h	- group bolus (B): bolus of 0.5% levobupivacaine given every 6 h - group continuous infusion (CI): 0.25% levobupivacaine given in continuous infusion at 5 mL/h through an elastomeric pump **rescue analgesia** - IV metamizole every 6h - SC meperidine 50 mg		- participant flow through each stage was not reported **level of evidence: 1** **authors' conclusion** "Since no statistical differences were observed between the treatment groups, it was not possible to confirm differences between the LA administered in a bolus versus continuous infusion."
Grider et al. 2012 A randomized, double-blind trial comparing continuous thoracic epidural bupivacaine with and without opioid in contrast to a continuous paravertebral infusion of bupivacaine for post-thoracotomy pain. J Cardiothorac Vasc Anesth. 2012;26(1):83-9.	**inclusion criteria** - ASA physical status I–III - age <75 yrs - undergoing elective anterolateral thoracotomy by one of two cardiothoracic surgeons **exclusion criteria** - preoperative opioid use for more than one month before surgery **demographic data**: EBO EB PB age (yrs) 52.6 (46–75) 56.9 (51–75) 54.5 (47–75) sex (m/f) 14/11 18/7 15/10 weight (kg) 72.1 (55–109) 68.9 (54–110) 71.3 (56–112) ASA class I/II/III 1/15/8 4/16/0 3/17/2 **patient flow and follow up:** total patient number included: 75 randomised in: group EBO: 25 group EB: 25 group PB: 25 excluded: group EBO: 1 group EB: 3 group PB: 2 analysed:	**mode of anaesthesia** - fentanyl **surgical approach** - anterolateral thoracotomy **at the end of surgery** - intercostal nerve blocks above and below the surgical incision with single injections of 2 mL of 0.25% bupivacaine **postoperative analgesia** - group EBO (epidural bupivacaine + opioid): 0.25% bupivacaine + 0.01 mg/mL hydromorphone (basal 2 mL/h with 1 mL every 10 mins via PCA) - group EB (epidural bupivacaine alone): 0.25% bupivacaine (basal 2 mL/h with 1 mL every 10 mins via PCA) - group PB (paravertebral catheter with bupivacaine): 0.25% bupivacaine at 8 mL/h	**postoperative pain [VAS]: mean±SD** EB±O EB PB PACU VAS (rest) 2.6±0.4* 2.9±0.5 2.4±0.5 VAS (IS) 2.8±0.3* 3.4±0.8 3.9±0.6 POD1 PM VAS (rest) 2.0±0.5* 3.4±0.4 3.3±0.4 VAS (IS) 2.1±0.4* 3.4±0.4 3.6±0.5 POD2 AM VAS (rest) 2.3±0.4* 3.0±0.4 3.4±0.6 VAS (IS) 2.4±0.4* 3.1±0.4 3.7±0.7 POD2 PM VAS (rest) 2.0±0.4* 3.4±0.3 3.6±0.6 VAS (IS) 2.7±0.5* 3.7±0.6 3.6±0.5 POD3 AM VAS (rest) 2.1±0.4* 3.5±0.6 3.6±0.3 VAS (IS) 2.9±0.5 3.6±0.5 3.9±0.6 POD3 PM VAS (rest) 2.4±0.4* 2.9±0.6 2.8±0.3 VAS (IS) 2.6±0.5* 3.5±0.7 3.9±0.6 POD4 AM VAS (rest) 2.7±0.4 2.9±0.5 3.3±0.3 VAS (IS) 2.8±0.5‡ 3.3±0.6‡ 3.7±0.6‡ *p<0.05 †Three subjects with hypotension receiving 0.125% bupivacaine dose reduction included in the intention-to-treat analysis. ‡EBO incentive spirometry VAS data missing for 1 subject on POD4 (n= 23), impacting comparison across groups. **total dosage of opioids** - there was no statistically significant difference in the opioid use among patients using IV PCA supplementation	**methodological shortcomings** - relatively small numbers of subjects in each group - the number of data points absent because of the inability to obtain VAS and IS on patients requiring ventilator support - relatively small numbers of subjects in each group - the number of data points absent because of the inability to obtain VAS and IS on patients requiring ventilator support - not reported who generated the allocation sequence, who enrolled participants, and who assigned the participants to their groups - method used to implement the random allocation sequence not reported - not reported whether the sequence was adequately concealed until interventions were assigned - method used to generate the random allocation sequence not reported - not reported how the sequence was concealed until interventions were assigned - participant flow through each stage was not reported - dates defining the period of recruitment and follow-up not reported - important adverse events or side effects not reported **level of evidence: 1** **authors' conclusion**

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	group EBO: 24 group EB: 22 group PB: 23 <u>follow-up:</u> - in the PACU before discharge, the evening of POD1, and each morning and evening of POD2 through to POD4. - 12 months post op		**postoperative pulmonary function (no of subjects obtaining incentive spirometry (IS) volume >2 L)** EB±O EB PB Preop IS>2 L 25/25 25/25 25/25 PACU IS 24/24 12/21 17/23 POD1 PM IS 20/24 11/21 18/23 POD2 AM IS 19/24 11/21 17/23 POD2 PM IS 20/24 12/21 18/23 POD3 AM IS 18/24 11/21 18/23 POD3 PM IS 22/24 15/21 19/23 POD4 AM IS 23/24 19/21 20/23 **adverse effects/ events:** - not reported	"The current study provided data that fill gaps in the current literature in 3 important areas. 1. TEA with bupivacaine and a hydrophilic opioid may provide enhanced analgesia over TEA or continuous paravertebral infusion (CPI) with bupivacaine alone. 2. In group EB, the increased basal rates required to achieve analgesia resulted in hypotension more frequently than in the bupivacaine/hydromorphone combination group, underscoring the benefit of the synergistic activity. 3. The current data suggest that CPI of local anaesthetic appears to provide acceptable analgesia for post-thoracotomy pain"