

## Pharmacological treatments of cardiac surgical pain: a systematic review of the literature

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### Abstract

**Introduction:** Pain management is a crucial care goal to be achieved when a patient is cared for. Pain treatment with pharmacological therapy relies on NSAIDs (non-steroidal anti-inflammatory drugs), weak and strong opioids, anticonvulsants and antidepressants (widely used in neuropathic pain), and local anesthetics. The study aims to highlight the analgesics that can be administered for each age group in cardiac surgery accompanied by the respective recommended routes of administration, resulting in uniformity of outcomes in the literature.

**Methods:** A systematic literature review was conducted between February and May 2021 using the PICOM methodology. 10 search strings from 4 databases were used: Pubmed, Cinahl, Cochrane, and Web of Science, adding 10 grey literature articles. The search returned 2739 results after the process of duplicate removal, title, and abstract screening, full-text reading, and critical appraisal using AMSTAR II tools for systematic reviews, STROBE for observational studies, and "Joanna Briggs Institute Checklist" for publishing, 54 articles were included in the review.

**Results:** The results touch on all aspects of pain management for each age group to gain a complete picture of the field of nursing care in pediatric cardiac surgery. Epidural analgesia or intravenous opioids, as part of multimodal strategies, including NSAIDs and paracetamol, have been widely used in post-thoracotomy pain. Local epidural analgesics such as infusions with Bupivacaine and Ropivacaine have demonstrated efficacy for thoracic surgery in infants and children. Multimodal continuous infusion administration of local anesthetics and opioids (Bupivacaine with Fentanyl, Morphine, Diamorphine, or other opioids) is effective in post-thoracotomy pain. Insertion of a pericardial drain in the postoperative period may require sedation or general anesthesia in combination with infiltration of local anesthetics. Analgesia for drain removal includes intravenous opioids, local anesthetics, and NSAIDs. Inhalation of agents such as Nitrous Oxide or Isoflurane may play a role in these procedures, but further studies are needed.

**Conclusions:** Pain control after cardiac surgery is of paramount relevance for the patient's well-being and for a faster and complication-free recovery. The use of analgesic pharmacological techniques must follow a precise protocol, and it is necessary to know both the beneficial and toxic effects to avoid onset, drug tolerance, or side effects. A protocol with recommendations for the responsible use of these drugs in all age groups should be followed.