



# MULTIMODAL ANALGESIA AND OPIOID-SPARING APPROACHES IN DOGS AND CATS: A MINI SYSTEMATIC REVIEW

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**Abstract:** Effective perioperative pain management in small animal practice is essential for improving patient outcomes and welfare. However, the use of opioids is associated with several adverse effects, prompting increasing interest in opioid-sparing strategies and multimodal analgesia. This mini systematic review aims to evaluate current evidence regarding the efficacy and safety of multimodal analgesia and opioid-sparing approaches in dogs and cats. A systematic literature search was conducted using PubMed, Web of Science, and ScienceDirect databases, including studies published between 2020 and 2026. Studies were selected based on predefined inclusion and exclusion criteria. The available evidence indicates that multimodal analgesia protocols are associated with improved pain control, reduced anesthetic requirements, and decreased reliance on opioids. Additionally, several studies report enhanced postoperative recovery and a lower incidence of opioid-related adverse effects. Multimodal analgesia and opioid-sparing strategies represent essential components of modern veterinary anesthesia, contributing to improved patient safety and welfare. Further research is needed to standardize protocols and optimize clinical outcomes across different surgical settings.

**Keywords:** multimodal analgesia; opioid-sparing anesthesia; veterinary anesthesia; pain management; dogs; cats

## • Introduction

Effective perioperative pain management is a fundamental component of modern small animal veterinary practice, with direct implications for patient welfare, surgical recovery, and clinical outcomes. Surgical pain in dogs and cats may induce physiological and behavioural alterations, including stress responses, delayed wound healing, immunosuppression, reduced food intake, and prolonged hospitalization. Consequently, adequate perioperative analgesia is considered both an ethical obligation and a clinical necessity in veterinary medicine.

Traditionally, opioids have played a central role in perioperative analgesia because of their potent analgesic effects. However, their administration may be associated with adverse effects such as sedation, dysphoria, respiratory depression, gastrointestinal disturbances, and delayed postoperative recovery. These limitations have increased interest in opioid-sparing and opioid-free anaesthetic approaches in both human and veterinary medicine.

The aim of this mini systematic review is therefore to evaluate and summarise current evidence regarding multimodal analgesia and opioid-sparing perioperative pain management approaches in dogs and cats, with particular emphasis on clinical efficacy, reduction in opioid requirements, postoperative recovery, and overall patient welfare.

## • Material and method

A mini systematic review was conducted to evaluate current evidence regarding multimodal analgesia and opioid-sparing perioperative pain management strategies in dogs and cats.

A literature search was performed using three electronic databases: PubMed, Web of Science, and ScienceDirect. Articles published between 2020 and 2026 were considered. The search strategy included combinations of keywords and MeSH terms related to multimodal analgesia, opioid-sparing anaesthesia, perioperative pain management, dogs, cats, and veterinary anaesthesia.

INCLUSION CRITERIA	EXCLUSION CRITERIA
<p>Studies were included if they met the following criteria:</p> <ul style="list-style-type: none"> <li>Clinical trials (randomised or non-randomised) and prospective or retrospective studies</li> <li>Conducted in dogs and/or cats</li> <li>Evaluating perioperative analgesic protocols (multimodal analgesia and/or opioid-sparing approaches)</li> <li>Reporting outcomes related to perioperative pain control, opioid consumption, or analgesic efficacy</li> <li>Published between 2020 and 2026</li> </ul>	<p>Studies were excluded if they met any of the following criteria:</p> <ul style="list-style-type: none"> <li>Review articles, narrative reviews, and guidelines</li> <li>Surveys, questionnaires, and opinion pieces</li> <li>Case reports and case series</li> <li>Cadaveric studies</li> <li>Studies conducted on non-target species</li> <li>Studies not evaluating perioperative analgesic protocols or unrelated to analgesic efficacy</li> </ul>

**Study selection process**  
 After removal of duplicate records and screening of titles and abstracts, full-text articles were assessed for eligibility.

