

Guest editorial introduction to the special issue on “New Drugs Transforming the Paradigm of Anesthesia, Sedation, and Pain Management”

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Introduction

Anesthesiology has long evolved as a discipline dedicated to ensuring physiological stability and patient safety during surgery through advances in airway management, monitoring technologies, and the safe administration of pharmacological agents, thereby achieving substantial reductions in surgical morbidity and mortality. In recent years, however, the role of anesthesia has expanded beyond intraoperative care to encompass improvements in postoperative recovery quality, reductions in complications, and even influences on long-term outcomes and quality of life. Within this evolving landscape, the selection of anesthetic agents is no longer a secondary consideration; rather, it has emerged as a pivotal element in the design of comprehensive perioperative management and recovery pathways. Accordingly, the introduction of novel agents and innovative strategies for the use of existing drugs has become a critical driving force propelling

modern anesthesia toward recovery-centered and precision-based paradigms.

Special issue

This special issue, entitled “New drugs transforming the paradigm of anesthesia, sedation, and pain management,” was conceived against this backdrop to examine how novel agents and drug-centered approaches are reshaping contemporary practices in anesthesia, sedation, and pain management. Rather than merely cataloging the characteristics of individual drugs, this collection offers an integrated perspective on how pharmacological selection influences recovery-oriented anesthetic strategies and patient outcomes.

A comprehensive review examining the impact of perioperative drug selection on patient recovery and outcomes serves as the cornerstone article and represents the central thesis of this special issue. This review provides an integrated discussion of anesthetic strategies grounded in enhanced recovery after surgery protocols, opioid-sparing and multimodal analgesic approaches, and the clinical implications of novel agents such as sugammadex and remimazolam. The article demonstrates that anesthetic drug selection may be associated not only with short-term recovery but also with long-term clinical outcomes, illustrat-

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ing how drug-centered approaches have become a central pillar of modern anesthetic strategy [1].

A review addressing neuromuscular blockade and recovery reexamines the clinical role of sugammadex. This article demonstrates that sugammadex has evolved beyond a simple reversal agent, replacing traditional anticholinesterase-based medications, and has become a critical drug for preventing residual neuromuscular blockade and enhancing patient safety in high-risk populations and emergency situations [2].

In the domain of pain management, a critical review examining strategies to minimize or replace opioid use is included. This article provides a balanced synthesis of recent evidence on opioid-free anesthesia, emphasizing the need for individualized, multimodal analgesic strategies tailored to patient characteristics and surgical risk profiles, rather than advocating for blanket opioid exclusion [3].

Additionally, a review focusing on remimazolam, an emerging sedative agent that has garnered significant attention, systematically delineates its pharmacokinetic and pharmacodynamic properties as well as its clinical applicability. This article clarifies remimazolam's clinical positioning by highlighting advantages such as hemodynamic stability, reversibility, and predictable recovery, while also identifying future research directions, including monitoring parameters and optimal dosing strategies [4].

Finally, a review offering an integrated perspective on sedation, analgesia, and recovery strategies through a drug-centered approach provides the conceptual framework that unifies this special issue. This article emphasizes that the introduction of novel agents represents not merely the replacement of existing anesthetic drugs but a redefinition of perioperative management goals and structures, clearly demonstrating that drug selection has become a strategic element in the design of recovery pathways and clinical outcomes [5].

Discussion

The articles included in this special issue collectively highlight a paradigm shift in modern anesthesiology,

which is evolving beyond its traditional focus on intraoperative management toward a precision medicine discipline that prioritizes comprehensive recovery pathways and long-term patient outcomes. Central to this transition is the strategic selection of anesthetic agents. The clinical adoption of novel drugs such as sugammadex and remimazolam represents not merely incremental substitutions for existing agents, but a fundamental transformation in anesthetic practice.

In the context of opioid-sparing strategies, the current evidence underscores that individualized, multimodal analgesic approaches—tailored to patient characteristics and surgical risk profiles—are more clinically appropriate than the indiscriminate avoidance of opioids. This reinforces the importance of balanced analgesia within a patient-centered framework.

At the same time, several important areas warrant further investigation, including the long-term safety and cost-effectiveness of newly introduced agents, as well as the development of precision pharmacologic strategies optimized for individual patient variability.

Ultimately, drug selection in anesthesiology is no longer a simple pharmacologic choice but a strategic decision that shapes the entire trajectory of perioperative care and recovery. This special issue aims to facilitate a deeper understanding of this evolving paradigm and to encourage continued reflection on the role of anesthetic management in improving patient-centered outcomes.

Conclusion

Collectively, these articles do not simply present novel agents as “new drugs.” Instead, they demonstrate that drug selection has become a core component of anesthetic strategies centered on patient recovery and outcomes, suggesting that modern anesthesia is evolving as a discipline that simultaneously considers perioperative management, recovery quality, and long-term results. We anticipate that this special issue will assist anesthesiologists and researchers in related fields in understanding the current positioning of novel agents and drug-centered approaches, and will

serve as an opportunity to reflect on the future direction of anesthesia.

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Conflict of interest

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