Pharmacology and Physiology for Anesthesia, Second Edition

Hugh C. Hemmings Jr, Talmage D. Egan (Editors). Elsevier, Philadelphia, 2019, Hardcover, \$207.99, 994 pages. ISBN 9780323481106

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Physiology and pharmacology are the scientific foundations of our specialty. Clear, detailed understanding of these domains is essential for successful clinical practice that involves increasingly complex patients. Unsurprisingly, therefore, these topics have become the subjects of numerous volumes targeting anesthesia trainees and providers of all backgrounds. With this second edition of *Pharmacology and Physiology for Anesthesia*, Hemmings and Talmage edge into a market replete with well-reputed competitors.

The text is organized into eight sections (basic principles of pharmacology; nervous system; cardiovascular system; pulmonary system; gastrointestinal and endocrine systems; immunity and infection; fluid, electrolyte, and hematologic homeostasis; and blood and hemostasis). Each section begins with foundational concepts in pharmacology pertinent to anesthesia and then addresses the physiology and pharmacology of the major organ systems. Although there are a few unusual categorization choices – e.g., grouping the pharmacology and physiology of pregnancy with the gastrointestinal and endocrine systems but separate from that of other special populations (e.g., elderly, neonatal/pediatric, obese) – the organization of the text creates a logical flow of concepts from basic science through clinical application. Indeed, although the chapters dealing with physiology delve appropriately into molecular pathways and regulation, the clinically oriented focus of the book remains clear. Despite the large number of authors, the chapters are pleasantly cohesive and well-organized. The explanations of core topics are clear and complemented by appropriately illustrative, well-captioned figures and tables. Each chapter concludes with key points,

which concisely summarize the foregoing text and serve well as quick reminders of the chapter's content. An online and mobile version of the textbook, accessible through Elsevier's Expert Consult, accompanies the hardcover edition and improves the utility of the book via enhanced search features, digital annotation tools, and easy portability.

As expected, the authors deliver on essential anesthesia content pertaining to the cardiorespiratory and nervous systems' physiology and pharmacology. One feature that distinguishes this book from similar volumes is its treatment of associated concepts in physics and anatomy. Sub-chapters devoted to fundamental concepts in physics as well as imaging and anatomy are tactfully interspersed to supplement content from the primary chapter without distracting from the core material. For example, a sub-chapter reviewing state transformations and ideal gas laws accompanies the chapter on the pharmacokinetics of inhaled anesthetics, providing the reader with a convenient refresher on those subjects, if needed, without clouding the focus of the preceding chapter. Supplementary chapters on gas monitoring, electronics, medical ultrasound, fluid dynamics, principles of invasive monitoring systems, blood gas measurement systems, and pulse oximetry are found throughout the book in association with conventional chapters on cardiorespiratory and nervous system physiology. Similarly, valuable sub-chapters on basic anatomy and imaging of the central nervous system **and** the cardiovascular and respiratory systems are embedded after chapters on cerebrovascular, cardiovascular, and pulmonary physiology, respectively.

Arguably, the authors' and editors' most significant accomplishment with this second edition of *Pharmacology and Physiology for Anesthesia* is the overall attention paid to making each chapter and section clinically relevant. This effort is particularly noteworthy in chapters dealing with

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special populations (e.g., elderly, obese, pediatric, obstetric), where major physiologic differences are highlighted alongside implications for anesthetic management and pertinent clinical guidelines, when applicable. The chapter dealing with chemotherapy and immunosuppression proved to be a high-yield review of two pharmacologic categories with rapidly evolving therapeutic options less commonly encountered in anesthetic practice but with important considerations for perioperative care. Space near the end of each chapter reserved for “emerging developments” maintains a forward look at the practice of anesthesia with a brief discourse on new developments in our understanding of clinically interesting, but poorly understood, topics such as the effects of in utero anesthetic exposure on neurocognitive development and the impact of anesthetics on oncologic outcomes after surgery.

In this edition of *Pharmacology and Physiology for Anesthesia*, Hemmings and Talmage have curated a comprehensive resource from which anesthesia trainees could gain specialty-specific knowledge. Experienced practitioners, particularly those involved in resident education, may find that the brevity and clinical focus of the text presents an attractive alternative to other reference books on the subject. I recommend this textbook as a reference for anesthesia trainees seeking a concise resource for foundational concepts in physiology and pharmacology framed by clinical practice.

Conflicts of interest None declared.

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