

*Michael J. Avram, Ph.D., Editor*

### **Consciousness, Awareness, and Anesthesia.**

Edited by George A. Mashour, M.D., Ph.D. New York, Cambridge University Press, 2010. Pages: 272. Price: \$89.00.

With the development of modern investigational tools and intellectual frameworks for understanding the human brain, the time has arrived for a new attempt to formulate an integrated science of consciousness, memory, cognition, and anesthesia. A new book edited by George A. Mashour, M.D., Ph.D., *Consciousness, Awareness, and Anesthesia*, represents a timely and important contribution to the advancement of our understanding of how anesthesia offers a “second power” to probe the mind and how such a multidisciplinary scientific pursuit provides great potential to promote both theoretic and practical clinical gains and benefits. The book focuses on the clinical problem of intraoperative awareness, a theme that connects the chapters in the book, approaching the problem from the perspectives of cognitive neuroscience, clinical anesthesiology, psychology, and even philosophy. Overall, the book presents a comprehensive, up-to-date, multidisciplinary collection of results, reviews, and opinions written by international scholars and clinicians who are well known for their contributions to the field.

The book begins with two chapters that are particularly informative introductions to the current understanding of the neurobiologic substrates of sleep and consciousness and their relevance to anesthesia-induced loss of consciousness. The types of neurons, neural circuits, and neurotransmitters targeted by the actions of multiple anesthetic agents are discussed in great detail. The mechanisms of these anesthetic actions can be appreciated in the context of the search for the neural correlates of consciousness and the related theoretic frameworks of consciousness. Although the evidence collectively shows that there is no single “anesthesia center” in the brain responsible for the loss of consciousness, the hypothesis that anesthetics suppress consciousness by ultimately disrupting high-order cortical information integration is highlighted. Chapter 3 provides a wonderful review of memory and how it is modulated by general anesthesia, ranging from basic concepts to neurobiology, behavioral assessment, and evidence obtained from electrophysiologic and brain-imaging studies. The discussions on the various types of memory and anesthetic drugs’ direct effect or indirect effect (through modifying consciousness, emotion, and attention) on the functioning of memory are particularly insightful. An intriguing phenomenon, dreaming in anesthesia, is addressed in Chapter 4. Risk factors leading to intraoperative awareness and the current methodologies for monitoring anesthetic

depth are reviewed comprehensively in chapters 5 and 6. An interesting arrangement of the book is that chapters 7 and 8 are dedicated to discussion of the current controversies in studying intraoperative awareness. The inclusion of these chapters reflects the intent of the editor to have a diversity of opinions with respect to the existing debate on terminology, diagnosis, prevention, and incidence of intraoperative awareness. It also serves to provide the reader a sense of the complexity of the issues involved in tackling the problem of intraoperative awareness. The specific area of awareness during anesthesia in the pediatric population is addressed in chapter 9, with its difference from that in the adult population duly highlighted. The rest of the chapters elaborate on the potential consequences of intraoperative awareness, from both psychologic and medicolegal perspectives, including discussions of patient expectations and appropriate strategies for clinical management. The book concludes by discussing philosophical implications that are relevant to the study of awareness during general anesthesia. Although the content of the last chapter may be more philosophical than is generally favored by neuroscientists, it offers a unique window into anesthesia’s “second power” for probing the mind, and how, as a marvelous tool, it allows us to reversibly modulate awareness and thus helps us understand the fundamental nature of consciousness.

The chapters of the book are arranged to present a great deal of information in a compact and engaging style, with cited references clearly presented. A brief summary is provided at the end of each chapter to highlight and help readers review the major content. The book should be appealing to neuroscientists, anesthesiologists, psychologists, and philosophers, providing an excellent read for anyone who is interested in the mechanism, prevention, and effects of intraoperative awareness. As mentioned by the editor at the beginning of the book, “we are only just beginning to harness anesthesia’s ‘second power’ of probing the mind.” Almost every chapter leaves the reader with questions and thoughts about future directions, which emphasizes the need for continued research toward a more complete understanding of the scientific problem of consciousness and the clinical problem of awareness in general anesthesia.

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### **Cancer Pain: From Molecules to Suffering.**

Edited by Judith A. Pace, Ph.D., Rae F. Bell, M.D., Ph.D., Eija A. Kalso, M.D., D.Med.Sci., Olaitan A. Soyannwo, M.B.B.S., D.A., M.Med. Seattle, Washington, IASP Press, 2010. Pages: 354. Price: \$75.00.

*Cancer Pain: From Molecules to Suffering* is a one-of-a-kind book in the large collection of publications on the subject of cancer pain management. It is based on presentations delivered at an exceptional research symposium sponsored by the International Association for the Study of Pain. Its 20 chapters, divided into 6 parts, were written by a distinguished international panel of experts and draw upon the most recent laboratory and clinical research focused on cancer pain. Every chapter addresses not only ongoing research endeavors but also their potential clinical implications. This up-to-date information is presented in a reader-friendly format and an easy-to-carry size.

The first part, "Basic Mechanisms of Cancer Pain," begins with a plea for more basic, translational, and clinical research on chemotherapy-induced neuropathic pain to maximize chemotherapeutic efficacy while minimizing pain associated with cancer treatment. It then covers mechanisms of cutting-edge radiotherapy that can be applied either curatively or palliatively in the treatment of cancer. Colorful illustrations complement the state-of-the-art updates in radiotherapy. The final focus of this part is on bone pain, which is the most common pain in patients with advanced cancer. It discusses pioneering animal models of bone cancer that effectively mirror the clinical presentation of bone pain in humans and could contribute to mechanism-based therapies to alleviate intractable bone pain caused by cancer.

The next part, "Inflammation, Hyperalgesia, and Cancer Pain," first discusses how cytokine gene variants affect the experience of cancer-related symptoms and response to interventions. For example, tumor necrosis factor- $\alpha$  and interleukins-8 and -6 have been identified as markers for incapacitating symptoms associated with cancer and treatment. The clinical application of antagonists or agonists at certain cytokine receptors might offer benefits of pain relief and effect on tumor growth. The critical linkage between systemic inflammation and cancer pain is reviewed next, and the future of inflammation-targeted therapies to reduce cancer sequelae, such as cachexia pain and depression, is discussed. This part ends with highlights of the current knowledge of the effect of long-term opioid treatment on cancer-induced pain and disease progression. Preclinical studies suggest coadministration of agents, such as cyclooxygenase inhibitors, neurokinin-1 antagonists, and serotonin antagonists, with opioids that may ameliorate the escalation of opioid doses and their adverse effects, including hyperalgesia and analgesic tolerance.

The third part, "Opioid Tolerance," begins with a description of mechanisms of opioid tolerance by adaptation and desensitization of opioid receptors. The altered equilibrium between pronociceptive and endogenous antinociceptive systems validates the emerging mechanism of opioid-induced hyperalgesia. Some novel approaches for reduction and elimination of opioid tolerance are discussed. Factors associated with failure of opioid therapy and adverse effects in cancer pain management are then explored as is the evidence that "opioid switching" in cancer pain management helps to optimize pain relief and reduce adverse effects. The

conclusion of this part introduces innovative treatments that act against opioid tolerance, such as of *N*-methyl-D-aspartate receptor antagonists, opioid antagonists, adrenoceptor antagonists, antioioid peptide antagonists, and inhibitors of glial activation.

Two of the most promising new drugs for cancer pain relief, transient receptor potential vanilloid-1 antagonists and anti-nerve growth factor treatments with human monoclonal antibodies, are discussed at the beginning of part IV, "Clinical Trial Design in Cancer Pain." Clinical trial design and methodologic issues in studies of pharmacologic treatment of cancer pain are then discussed. The authors propose an international and consensus-based classification tool become a standard in the study of cancer pain. Important and unique methodologic issues for clinical trials of nonpharmacologic interventions in cancer pain are outlined in the final chapter of this part.

The chapters of part V, "Psychology of Cancer Pain: The Basic Research and Clinical Research Agenda," describe how the psychologic context of cancer greatly affects the entire pain experience, leading to further extraordinary suffering and existential distress. The roles of anxiety, behavioral and cognitive coping, hopelessness, catastrophic pain, and methods of attention management have been thoroughly investigated.

The final part, "Interaction, Education, and Resources," begins with a clarification of the concept of empathy, "the capacity to allow one's own feelings to be engaged with others, as well as an active and deliberate process of engagement," in medical settings of cancer treatment and pain management. Even when little can be done to relieve a cancer patient's physical state, such as pain, most of the time something can be offered to help the patient meet his or her psychologic and social needs. A global perspective on cancer pain education for patient and family is then presented followed by a proposal of how to teach students in medicine and health-care professionals about cancer pain. The book concludes with a summary of the obstacles to global relief of cancer pain and exploration of the optimization of resources, including education and medications for cancer pain, needed to meet the needs in the developing world.

The editors of *Cancer Pain: From Molecules to Suffering* effectively meet their goal of providing an inspiring and comprehensible text on cancer pain for both clinicians and researchers. The editors are to be congratulated for a book that has impeccable consistency and a seamless transition from bench research to bedside application. This book facilitates the understanding of physiology and pharmacology of cancer pain that can readily be translated into better treatment and satisfactory outcome.

The scope and applicability of this text could be expanded in the next edition. For instance, medical marijuana and cannabinoid receptor agonists for the management of not only cancer pain but also chemotherapy-induced nausea and vomiting in cancer treatment have attracted interest and

stirred heated discussion. As another example, although there have been major advances in pharmacotherapy, non-pharmacologic treatment, including complementary and alternative medicine, may offer hope and support in both cancer treatment and pain management.

I highly recommend *Cancer Pain: From Molecules to Suffering* to all trainees in pain management as a supplemental text to standard references on pain management. The first three parts may well be selected as topics for journal clubs or clinical symposia. This book can certainly inspire the entire team of health-care professionals in both oncology and pain management. Medical students and resident physicians in not only primary care but also all other specialties could benefit from studying this book in their early stage of training. In addition, many bench and clinical researchers devoted to advance cancer pain management may also find this book and its future editions to be a valuable resource.

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**Comprehensive Textbook of Perioperative Transesophageal Echocardiography, Second Edition.** Edited by Robert M. Savage, M.D., F.A.C.C., Solomon Aronson, M.D., F.A.C.C., F.C.C.P., F.A.H.A., F.A.S.E., and Stanton K. Shernan, M.D. Philadelphia, Lippincott Williams & Wilkins, 2011. Pages: 770. Price: \$229.00.

As the foreword indicates, the breadth of the second edition of *Comprehensive Textbook of Perioperative Transesophageal Echocardiography* is expansive, aptly mirroring the growth of echocardiography in perioperative medicine. For those of us striving to improve our echocardiography skills and improve patient care, this book will serve as a must-read, must-have reference. To reduce the burden of lugging around a heavy textbook, purchasers of each book gain access to an online version accessible from anywhere! The book covers everything a reader could want in an organized, well-thought-out manner. Filled with vibrant color illustrations and an extensive topic list, the text has a wonderful flow.

Section 1 details the basics of perioperative echocardiography, starting with physics. This often-maligned topic is covered in detail, yet remains easy to read. Comprehensive illustrations help the reader along as the complex physics of

echocardiography are unwoven. Although the illustrations in this chapter are slightly busy, they appropriately convey the information needed. The text builds nicely on this basic knowledge by correlating the physical principles of ultrasound with real-life image pitfalls and artifacts in chapter 2 and image optimization in chapter 3. A section called Key Points at the end of each chapter succinctly summarizes important concepts. The book transitions smoothly from “machine” to “man” as the subsequent chapters of section 1 outline the anatomy of the heart, transesophageal echocardiography indications, and both the comprehensive and abbreviated transesophageal echocardiography examination before delving deeper into each area of the heart.

Section 2 discusses the use of transesophageal echocardiography and transthoracic echocardiography in the critical care setting. Detailed evaluation of the patient with endocarditis and the use of rescue echocardiography in the intensive care unit are added to this edition as new chapters.

Advanced applications of echocardiography are examined in section 3. From a new chapter on epiaortic imaging to chapters on congenital heart disease, as well as surgical considerations in valve and heart failure surgery, this section builds heavily on the basics. The level of detail and precision shines through as each chapter offers a wealth of information, clinical data, and images to support the echocardiographer through tough clinical scenarios. New chapters on strain echocardiography and three-dimensional echocardiography complete this section. It is a must-read for those working toward advanced certification in transesophageal echocardiography.

With a text version, online version, 3 sections, 39 chapters, more than 60 contributing authors, 770 pages, and thousands of referenced articles, this text truly lives up to its name. It is comprehensive in every sense of the word. Yet, despite such a vast number of contributors and broad scope, it reads in a singular, focused manner. Topic after topic, it builds on the basics before advancing to an expanse of clinical application. I expect its readership will range from beginner to expert. For beginners, it is simple and easy to follow. For those already skilled, it is detailed and comprehensive. It is clearly informative for those seeking transesophageal echocardiography certification and those certified long ago. In short, it is well worth the asking price.

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