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Awareness during Anesthesia. By Mohamed Ghoneim. Oxford, Butterworth-Heinemann, 2000. Pages: 208. Price: \$59.95.

Awareness during anesthesia is an increasing concern among anesthesiologists. In part, this has been driven by the introduction of the BIS® monitor (Aspect Medical Systems Inc., Natick, MA), which the Food and Drug Administration has cleared for "monitoring the effects of certain anesthetic agents."*

The interest has also been driven by studies in neuropsychology that use clinical anesthesia as a human laboratory to study implicit and explicit memory in a variety of controlled environments.

Awareness during Anesthesia offers the practicing anesthesiologist a useful review of the current status of research in this field. It is divided into nine chapters, all written by well-qualified experts. These chapters include an overview of the research into intraoperative awareness, a review of the available data on both explicit and implicit memory formation during anesthesia, discussions of the utility of auditory evoked potentials and the Aspect BIS® monitor to assess the intraoperative mental state, a review of studies using the isolated forearm technique, and interesting assessments of the emotional and legal consequences of intraoperative awareness.

A few chapters merit special recognition. Ghoneim's chapter, "Implicit memory for events during anesthesia," is a model review of the scientific literature. Despite a strong personal investment in the field, Professor Ghoneim brings critical appraisal and welcome skepticism to his review of more than 200 studies in the area of awareness, recall, and memory during sedation and anesthesia. He finds common shortcomings in study design, execution, and data analysis. This chapter should be mandatory reading for anyone designing clinical trials that explore awareness and memory during anesthesia. Given the strong case for solid scientific research, I was surprised that the chapter failed to lament the lack of randomized, double-blinded trials in this area.

Other chapters also were also commendable. The chapter by Russell, "Memory when the state of consciousness is known: studies of anesthesia with the isolated forearm technique," convinced me that I should try the isolated forearm technique in the operating room. The chapter by Wang, "The psychological consequences of explicit and implicit memories of events during surgery," presents a compelling argument that intraoperative awareness can lead to long-term emotional sequelae. The final chapter, "Medicolegal consequences of awareness during anesthesia," by Domino and Aitkenhead, offers useful statistics on the incidence of awareness in malpractice litigation and a thoughtful review of the various mistakes in anesthetic technique that are likely to lead to inadequate drug delivery and intraoperative awareness.

The highlight of the book was the chapter by Thornton and Sharpe, "The auditory evoked responses and memory during anesthesia." First, these authors are engaging writers—I was in hysterics by the second page. Their summaries of the available data were succinct, well-organized, and thoughtfully presented. Their linkage of auditory evoked potentials to brain function was logical and compelling. Last, their final conclusion was clear: "based on currently available evidence we remain convinced that memory formation does not occur in anesthetized (unconscious) patients, and therefore it is unlikely that an unconscious patient will have memory for stimuli presented during unconsciousness." Earlier chapters had presented conflicting study results that left me, a nonexpert in this field, unable to form any conclusion as to whether my overdosed patients were listening to intraoperative banter.

The textbook is not without its flaws. The chapter by Jones and Aggarwal, "Monitoring the depth of anesthesia," was a polemic about the shortcomings of the Bispectral Index and the virtues of auditory evoked potentials, a technique closely associated with the authors. The chapter by Andrade, "Learning during sedation, anesthesia, and surgery," was similarly disappointing, representing a splicing of several of the author's published manuscripts. Also surprising was the lack of chapters from neuroscientists. It is unclear whether this is an oversight by the editor or reflects a lack of interest by neuroscientists in the use of the anesthetized state to understand the process of memory formation. *Awareness during Anesthesia* drags the reader through multiple reviews of the same studies. A future edition would benefit from better integration between chapters and less duplication.

Awareness during Anesthesia will be an invaluable resource to anyone considering research in intraoperative mental status. Practicing clinicians will also find the material interesting. However, they might want to consider Ghoneim's recent review in *ANESTHESIOLOGY*,¹ which offers a summary of the key clinical conclusions, or his earlier review of the available scientific literature.²

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References

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Local and Regional Anaesthesia. Edited by Per Rosenberg. Cornwall, United Kingdom, BMJ Books, 2000. Pages: 164. Price: \$25.00.

Local and Regional Anaesthesia is one of three titles published annually in the Fundamentals of Anaesthesia and Acute Medicine Series. The purpose of this series, which is edited in the United Kingdom, is to bring the reader up to date with authoritative reviews of the principle topics in the specialties of anesthesia, acute medicine, and intensive care. The current title, multiauthored and edited by Per Rosenberg, focuses on contemporary concepts in the clinical use of local and regional anesthesia and does not attempt to enter the already crowded field of all-encompassing textbooks about regional anesthesia. As such, the book is lightweight, portable, and very readable.

This text consists of nine chapters written by a variety of European experts. Basic review chapters include clinical pharmacology, toxicity, and complications of regional anesthesia. Common local and intravenous blocks are reviewed, as are the recent practice patterns in ambulatory and obstetric anesthesia. Additional chapters include technical advances and current controversies in regional anesthesia. As with most multiauthored texts, several topics appear more than once, and a couple of topics (continuous peripheral catheters, anticoagulation) do not appear. However, overall, the book is thorough and fulfills the goal of reviewing contemporary regional anesthesia controversies.

The chapters emphasizing the basis of safe practice (pharmacology, toxicity, and complications) are easy to read and a solid review. The chapter about clinical pharmacology of local anesthetics is terrific, with good information in a well-written format. In addition to basic pharmacology and a discussion of individual local anesthetics, new information, such as liposomal local anesthetics, is reviewed. The chapters about toxicity and complications cover all the important

* Food and Drug Administration 510(k) approval letter, for application K011534, June 15, 2001. Available at: <http://www.fda.gov/cdrh/pdf/k011534.pdf>

topics (except the test dose, which was found in other chapters), including cardiac, neural, and skeletal muscle toxicity.

By necessity, the chapters about common local anesthetic blocks and intravenous regional anesthesia are brief but complete. Figures for block performances are limited, and readers would probably find more information about how to perform specific blocks from larger textbooks. All the information needed to perform intravenous regional anesthesia safely is included. A large portion of the chapter about common local anesthetic blocks is devoted to the topic of local infiltration anesthesia in ambulatory surgery. Although this part of the chapter may be less clinically useful to anesthesiologists, it is well-written, advocating combining different techniques to minimize complications and decrease discharge times. This chapter also contains a brief discussion of a variety of peripheral nerve blocks, including intercostal, brachial plexus, femoral, and sciatic nerve blocks, as well as a discussion of neuraxial blocks. There is additional discussion of these same techniques with an emphasis on drug selection and discharge times in the section about local anesthesia for ambulatory surgery.

One of the most interesting chapters is that about controversies in the clinical practice of regional anesthesia. This was a practical discussion of three pertinent topics: the best technique for axillary brachial plexus block, the use of the epidural test dose, and transient neurologic symptoms after spinal anesthesia. All three topics are extremely

well-covered with an extensive reference list and should be read by anyone with an interest in regional anesthesia. The advice and conclusions were practical and useful—well worth the price of the book.

Technical aspects of regional anesthesia is another chapter full of new and interesting information. The history and development of needles, catheters, stimulators, and patient-controlled analgesia pumps is thorough and fascinating. It is interesting to note the differences in product availability in Europe *versus* the US. The information about new epidural systems (two-cannula systems) and spinal microcatheters is of particular interest because these products currently are not available in the US market.

Overall Local and Regional Anaesthesia fulfills the goal of a brief discussion of current topics of interest in regional anesthesia. The book is probably more appropriate for clinicians with some previous experience and knowledge about the topics discussed than for residents in training. The fact that the book is lightweight and inexpensive and that each chapter can be completed in a 30-min StairMaster session makes it ideal for the busy clinician with an interest in the current controversies in regional anesthesia.

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