Intraoperative Neurophysiologic Monitoring

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This book is dedicated to God in whom all is possible; the love and support of my parents; the humor and inspiration of my sons Nadeem and Corey; the encouragement of my darling Bruce; and the tolerance of Jordan my Great Dane who missed many long walks while I spent time writing this book.

Gloria Galloway

Contents

Preface *page* ix
Acknowledgments x

1 **Introduction, history, and staffing for intraoperative monitoring** 1
Marc R. Nuwer

2 **The preoperative assessment** 10
Gloria M. Galloway

3 **Magnetic stimulation** 19
Khaled M. Zamel

4 **The operating-room environment and team approach: pitfalls and technical factors** 33
Khaled M. Zamel

5 **Basic pharmacology of anesthetic agents and their effects on neurophysiological monitoring** 42
Gloria M. Galloway

6 **Somatosensory evoked potential monitoring with scalp and cervical recording** 52
Marc R. Nuwer

7 **Transcranial electric motor stimulation: technique and exclusionary criteria** 64
Gloria M. Galloway

8 **Electrocorticography and intraoperative electroencephalography** 77
Marc R. Nuwer

9 **Brainstem auditory evoked potential monitoring** 90
Khaled M. Zamel

10 **Pedicle screw application and electromyographic recording** 101
Gloria M. Galloway

11 **Cranial nerve monitoring** 109
Jaime R. López

12 **Peripheral nerve monitoring: basics and indications** 142
Jaime R. López

13 **Special considerations in pediatric surgical monitoring** 163
Khaled M. Zamel

14 **Intraoperative neurophysiologic monitoring of vascular disorders** 172
Jaime R. López

15 **Selective dorsal rhizotomies: technique and protocol for monitoring** 196
Gloria M. Galloway

16 **Interpreting and reporting the neurophysiologic data to the surgical team: how to do it and when it is indicated** 207
Jaime R. López

17 **Intraoperative wake-up test** 221
Marc R. Nuwer

18 **Postoperative studies and outcomes: clinical indications and usefulness of a postoperative study** 225
Gloria M. Galloway

Index 236

The color plates appear between pages 214 and 215.

Preface

Since its inception clinically in the late 1970s and early 1980s, intraoperative neurophysiologic monitoring has shown a steady increase in use for surgeries in which neural structures may be at risk of injury. The types of and varieties of neurophysiologic techniques available for multimodality monitoring have allowed a patient-centered individualized approach to the practice and planning of these surgical cases. Some neurophysiologic techniques may carry inherent risks. An example of this is the potential risk of induction of seizures with the use of direct cortical and transcranial electric motor stimulation. Other risks involve inadvertent motor movements, tongue and lip lacerations. In addition, the more widespread use of multimodality intraoperative neurophysiologic techniques has allowed surgeons to become somewhat more aggressive and expansive in their surgical approaches. An example of this is the ability to be more expansive during resection of an intramedullary spinal tumor when motor, sensory, and possibly electromyography monitoring indicate that no change in electrophysiologic signals from these pathways has occurred.

The risk of consequential harm as a result of a neurophysiologic technique coupled with the increased ability to be more expansive surgically has changed methods of neurophysiologic monitoring and allowed the field to make an impact on patient safety and quality of care during surgical procedures. Therefore, it is especially important that those performing and interpreting these studies be adequately trained. This has been challenging given the relatively small number of training programs in the field: furthermore, several organizations whose members practice intraoperative neurophysiology have been led to develop guidelines, training courses, and additional certification programs specially geared toward this increasing subspecialty. Fellowship training programs have been around for many years in general neurophysiology as well as subspecialty areas such as epilepsy, including surgical epilepsy and electromyography (EMG). Often interest in intraoperative neurophysiology begins through subspecialty fellowships in EEG, epilepsy, or EMG. Several years ago a separately defined neurologic fellowship track was developed in intraoperative neurophysiology, similar to the tracks that already exist in EEG and EMG.

This book is a compilation of the current trends in intraoperative neurophysiology with chapters on various modalities and clinical uses. Separate chapters devoted to anesthesia, operating-room environment, special considerations in pediatrics and the interpretation and reporting of neurophysiologic data are useful and complementary. This book can be helpful to trainees as well as neurophysiologists already in practice but interested in other approaches to familiar techniques or in reviewing new techniques outside of their typical practice pattern. Questions on the topics covered in the chapters with detailed answers serve as a nice supplement on the accompanying website (www.cambridge.org/9780521518031). In some chapters, illustrative case examples are also included.

Physicians, PhD neurophysiologists, technicians, fellows, and residents can use this book for self-review and preparation and, through improved quality techniques and interpretation, may positively impact patient care.

Gloria Galloway

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