
Preface

This book is based on three earlier books: Aage R. Møller: *Evoked Potentials in Intraoperative Monitoring* published in 1988 by Williams and Wilkens; and more directly by Aage R. Møller: *Intraoperative Neurophysiologic Monitoring* published in 1995 by Gordon and Breach under the imprint of Harwood Academic Publishers. This was followed by a Second Edition, published in 2006 by Humana Press. While the general organization of the book is preserved, the Third Edition of the book represents an expansion and extensive rewriting of the 2006 book. In particular, the coverage related to the monitoring of the spinal motor system and deep brain stimulation has been extended and new parts have been added. The description of the anatomical and physiological basis for these techniques has been largely rewritten, and many practical aspects of such monitoring have been added. The section on blood supply to the spinal cord has been extended. The chapters on peripheral nerves have been updated and extended. Anesthesia is now covered in more detail. Chapters on monitoring of sensory systems and monitoring in skull base surgery have also been revised. The section on techniques used in the operating room is also updated and many parts have been rewritten. This edition of the book describes many uses of intraoperative neurophysiology other than monitoring.

GENERAL OUTLINE

Chapter 1 is a general introduction to intraoperative neurophysiology and monitoring with some historical background. The general principles of intraoperative monitoring are discussed in Part I where Chap. 2 describes the basis for intraoperative monitoring. Chapter 3 discusses the various forms of electrical activity that can be recorded from nerve fibers and nerve cells; near-field activity from nerves, nuclei, and muscles that is recorded with

monopolar and bipolar electrodes. This chapter also discusses far-field potentials and the responses from injured nerves and nuclei. Chapter 4 discusses practical aspects of recording evoked potentials from nerves, nuclei, and muscles including a discussion of various stimulus techniques.

Part II covers sensory systems. Chapter 5 describes the anatomy and physiology of the somatosensory, auditory, and visual systems. Monitoring of the somatosensory system is covered in Chap. 6; Chap. 7 concerns monitoring of the auditory system and Chap. 8 concerns monitoring of the visual system.

Part III discusses motor systems, beginning in Chap. 9 with a thorough description of the anatomy and basic physiology of the two main systems, the lateral and medial systems. Practical aspects of monitoring the spinal motor and brainstem motor systems are covered in Chaps. 10 and 11, respectively.

Part IV is devoted to peripheral nerves; Chap. 12 describes the anatomy and physiology and Chap. 13 discusses practical aspects of monitoring peripheral nerves.

Part V discusses different ways that intraoperative electrophysiological recordings can guide the surgeon in an operation, thus the use of neurophysiology in the operating room. Chapter 14 discusses methods to identify motor and sensory nerves and map the spinal cord and the floor of the fourth ventricle. Chapter 15 describes methods that can guide the surgeon in an operation such as MVD operations for HFS, placement of electrodes for DBS, and for removing lesions in the thalamus and basal ganglia. Intraoperative diagnosis of peripheral nerve disorders is also discussed in this chapter.

Part VI discusses practical aspects of intraoperative monitoring. Chapter 16 discusses anesthesia and how it can affect the use of intraoperative neurophysiologic techniques in the operating room. Chapter 17 discusses general matters regarding intraoperative monitoring

and neurophysiological recordings in anesthetized patients such as how to reduce the risk of mistakes and how to reduce the effect of electrical interference of recorded neuroelectric potentials. Chapter 18 discusses equipment and data analysis related to intraoperative monitoring including electrical stimulation of nervous

tissue. The final chapter, Chap. 19, discusses the importance of evaluation of the benefits from the use of intraoperative neurophysiologic monitoring to the patient, the surgeon, and the field of surgery in general.

Aage R. Møller



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Møller, A.R.

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