BOOK REVIEWS

Electronic Myoanatomic Atlas for Clinical Electromyography Muscle Localization for Needle Insertion in Clinical EMG CD-ROM

by P. E. Barkhaus and S. D. Nandedkar, New York, CASA, 1997, $200

and

Electronic Atlas of Electromyographic Waveforms, EMG on CD. Vol. II, Parts I–IV

by P. E. Barkhaus and S. D. Nandedkar, New York, CASA, $600

The two volumes under review are in the form of compact disks, which combines video pictures and verbal text. Clinical electromyography is mostly learned from watching and performing studies, as in an apprenticeship. Reading should supplement knowledge, but there is no substitute for observation and participation. The subject is thus ideally suited for computer-aided learning.

The CDs are played through PC based computers. There are minimal computing requirements, which differ for the two volumes; the most demanding requirements are a PC computer with a 133-MHz processor (233 MHz for lap-top computers), Windows 95 or 98, a 6× CD-ROM, and 50 megabytes of free space on the hard drive to run the program. Although I have minimal experience with PC computers and Windows operating systems, I was able easily to sort through the opening and execution of the programs. Operations of the program are straightforward, with a table of contents on the opening screen of each CD-ROM, and the various chapters are opened by marking them with the cursor and clicking with the mouse. Each chapter in turn may have several sections that can be opened similarly. Only one subsection of a chapter failed to open, and one error message occurred; restarting the program solved the problem.

Electronic Myoanatomic Atlas for Clinical Electromyography consists of one CD that includes a book of text and a pictorial atlas of muscles commonly used in clinical electromyography. The book covers general techniques of electromyography as well as descriptors of muscles and how to study them. It has many valuable tips and pointers about how to be a better electromyographer. The book can be printed. The main body of the CD is an atlas of upper and lower extremity muscles as well as cranial and paraspinal muscles. The introduction acknowledges that the selection of muscles is not exhaustive, but there are 23 muscles of the upper limb, 19 muscles of the lower limb, and 7 cranial and paraspinal muscles. In general, the selection of muscles is appropriate. The only muscle I found lacking was the tibialis posterior.

For each muscle there is a textual description of its innervation (nerve and roots), origin, and insertion; the optimum positioning and method of activating the muscle; and a description of where to insert the electrode with appropriate cautions. There is a still image of the muscle with arrows pointing to landmarks, etc., and two live action videos, at different magnifications. I found reviewing the different muscles very informative. Electromyographers are creatures of habit (initial training), and viewing the CDs amounted to a "busman's holiday," seeing how other electromyographers position and activate muscles. Two areas were found wanting. One was that the resolution of the video pictures was marginal and it was difficult to see contours of muscles. The second was that it would have been helpful to include a diagrammatic picture of the muscle beside or after the live video to better visualize the muscle in question from surrounding muscles. Nevertheless, I felt that this was an ideal way for new electromyographers to learn and review muscles and for experienced electromyographers to see another way to position the limb, activate the muscle, and insert the electrode.

Electronic Atlas of Electromyographic Wave Forms, consisting of four CDs, constitutes a unique tutorial in electromyography. Dr. Nandedkar is an electrical engineer who has focused his career on the analysis of EMG waveforms. Dr. Barkhaus is a clinical electromyographer with extensive experience with quantitative EMG and electrode recording characteristics. They bring an extraordinary amount of experience to these CDs. They are very good and clear teachers.

The first CD contains a section on instrumentation, including recording characteristics of electrodes, a section on cables, the principles of amplifiers and filters, and discussion on how to make manual measurements of motor unit action potentials. With this as a background, the CD contains normal electromyographic tracings from different muscles, showing characteristic differences with respect to discharge frequency, amplitude, and waveform configuration. The second CD focuses on spontaneous activity and it includes insertion activity, endplate activity, fasciculation potentials, complex discharges, fibrillation and positive waves, and iterative discharges. It also includes a section on the practical use of changing filter settings to clarify signals. The first two CDs include assessment quizzes for recognizing spontaneous activity and motor unit waveforms.

The third CD focuses on motor unit potentials. It starts with a tutorial discussing the generation of the motor unit potential and its relationship to muscle architecture. It focuses on motor units seen in various disease states in-

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cluding defects of neuromuscular transmission. It discusses specific recording techniques, including the use of a delay line and triggering circuit as well as multimotor unit analysis. The authors also introduce the concepts of neuromuscular jitter and blocking as recorded by a "poor persons" single-fiber EMG (raising the filter to 500 Hz). The second half of the disk includes examples of motor units found in various disease states. The fourth CD starts with a tutorial on the analysis of interference pattern. This includes basic information about recruitment and firing rates at low levels of contraction and ends with analysis of full interference pattern, including analysis of turns and amplitude and precision decomposition. The second half of the disk consists of examples of normal, neuropathic, and myopathic interference patterns.

All in all, I found the method of live presentation very effective. An apt analogy is given in the introduction: if a picture is worth a thousand words, a video is worth a million. Drs. Nandedkar and Barkhaus are pioneering a new medium for teach electromyography. It is like having a private tutorial with an experienced engineer and clinician, with a complete spectrum of patients. This series of CDs will obviously appeal to residents and fellows as they start their training, but it is also a refresher course for experienced electromyographers. I highly recommend this for all teaching programs, for any trainee, and for anyone who wishes to improve their skills. It will be especially valuable for those who are taking certifying examinations.

Mark B. Bromberg, MD, PhD

Neuroscience for Rehabilitation

edited by Helen Cohen, 544 pp., ill., Philadelphia, Lippincott Williams & Wilkins, 1998

Neuroscience for Rehabilitation, edited by Helen Cohen, provides a nice review of central nervous system physiology directed primarily to those rehabilitation allied health professionals caring for patients with brain dysfunction. The book concentrates almost exclusively on the central nervous system, with reviews of the sensory systems including vestibular, auditory, and chemical sensations, as well as anterolateral and dorsal column sensation. There is only a very short section on the peripheral nervous system, so that the book is less useful for those treating peripheral disorders. The last several chapters are particularly useful for those treating brain injury, including an excellent section on recovery of function after brain injury and another on the neuromechanism of learning and memory.

The figures are large in number and very helpful in supplementing the text. They are mostly schematic diagrams, with a few scattered photomicrographs and MRIs. The text is easy to read and is appropriate for those with only a basic understanding of neurophysiology. There is an extensive glossary in the back of the book. Each chapter has its own bibliography, typically containing 50 to 80 references.

Overall, this is a well-written book directed toward allied professionals such as occupational and physical therapists, who treat patients with brain injury or dysfunction. It seems appropriate for those at a somewhat advanced undergraduate level or at a graduate level, as well as the practicing professional.

Lawrence R. Robinson, M.D.

Opioids in Pain Control: Basic and Clinical Aspects

edited by Christoph Stein, 359 pp., ill., New York, Cambridge University Press, 1999, $95

This multiauthor book is a comprehensive and current treatise on all aspects of opioid pharmacology. The book chapters are extensively referenced and follow a consistent style, a tribute to the efforts of the editor and his broadly international group of 38 contributors. The first eight chapters cover basic opioid pharmacology in depth but remain readable for clinicians. The molecular biology of the three main families of opioid receptors are reviewed in detail, including recent progress in cDNAs, splice variants, knockout mice, and cloning of the different receptors.

Included are topics sometimes overlooked, such as the evidence for and against the analgesic strategy of inhibiting degradation of enkephalins by peptidase inhibitors. Supraspinal, spinal, and peripheral mechanisms of opioid analgesia are each covered in depth and with appropriate perspective. The review of receptor-based and postreceptor mechanisms of opioid tolerance illustrate how large a gap remains between basic studies and data generated in clinical trials of longer-term opioid administration.

Opioid–nonopioid interactions are of increasing interest clinically, and the roles of alpha-2 adrenergic receptor agonists, antiopioid peptides, NMDA receptors, CCK, and other mechanisms are reviewed. Some topics rarely included in reviews of opioids receive full chapters, such as preemptive analgesia and transplantation of opioid-producing cells.

Compared with the breadth and depth of coverage of basic science issues, the chapters most directly connected to clinical use of opioids are all well written but brief. However, chapters on the clinical implications of the physicochemical properties of opioids and the clinical pharmacology of opioid adverse effects are excellent and delve deeply into these important areas.

Overall, this book should be considered essential reading for anyone engaged in clinical or basic science research with opioids and a useful reference book for clinicians administering opioids in any medical setting.

Michael C. Rowbotham, MD

Mononeuropathies. Examination, Diagnosis and Treatment

by A. Staal, J. van Gihn, and F. Spaans. 242 pp., ill. London, W.B. Saunders, 1999, $59

This short monograph approaches the topic of common mononeuropathies in a well-organized fashion by trying to gather all the essential information in one place. The book

is divided into three sections. The first two cover mononeuropathies of the arm and trunk and mononeuropathies of the leg, respectively; the third section contains a collection of eight short chapters that discuss causes of mononeuropathies other than focal compression.

The introductory chapter reviews general information about mononeuropathies, including details that are relevant in terms of history, physical examination, electrophysiology, and other diagnostic modalities. The authors then approach each of the common mononeuropathies by first discussing briefly the gross anatomy of the nerve, and then succinctly reviewing the typical histories, physical findings, differential diagnoses, and electrophysiological findings. These initial sections are followed by a discussion of the causes of the mononeuropathy under discussion, supplemented by illustrative case vignettes and tables that review the reported etiologies and provide literature citations. For the less common mononeuropathies, the tables are omitted, but the same information is provided in the discussion. Each chapter concludes with a short section on treatment and prognosis. The references are reasonably complete and current for a small work.

In the third section of the book, the authors turn to conditions other than simple compression or obviously traumatic focal lesions. In concise chapters they discuss neuralgic amyotrophy, hereditary neuropathy with liability to pressure palsies, infections, metabolic and endocrine disorders, ischemia, nerve tumors, injuries by physical agents such as radiation, and multiple mononeuropathies.

In the preface, the authors offer an apologia for succumbing to "the incurable disease of writing," and then point out the difficulty of finding all the relevant information about mononeuropathies in one location. This information is indeed widely scattered. Detailed discussions of the anatomy, physical examination findings, electrophysiology, and treatment usually have to be gleaned from different sources. The authors' attempt to bring all the relevant information "under one roof" in a succinct, readable monograph with a reader-friendly format is laudable. Certainly, other sources are available. *Focal Neuropathies* by Stewart is far more comprehensive but is also about twice as long, has a higher text density, and does not cover examination techniques in any detail. *Entrapment Neuropathies* by Dawson et al., recently out in a new edition, is also more comprehensive in terms of disorders and therapy but is much longer and has variable coverage of anatomy and examination techniques. Various books by surgeons discuss anatomy and surgical decompression but give scant, if any, coverage to noncompressive lesions, examination techniques, or electrophysiology. Sunderland's works remain the definitive source, but only the most determined and diligent reader can digest such a volume of material.

For its stated aims, this small book is an unqualified success. The examination sections are clearly written and nicely illustrated (by an artistic neurologist, Dr. Djo Hasan) with shaded line drawings. I think the most useful feature of the book is its tables. They summarize, in an orderly and systematic fashion, the etiologies of each mononeuropathy by providing short, one-line descriptions of one or more literature citations. In trying to keep the length manageable, the coverage of anatomy is limited and there is no attempt to discuss variants and anomalies. There are occasional unusual expressions, such as the term "stretch" rather than extend, and "dropping fingers" rather than finger drop. I had a few minor disagreements with content, such as the statement that muscle power is best assessed with the muscle in a shortened position, but my head nodded in the affirmative more often than not.

In summary, this is an excellent short text and a useful ready reference to check on examination technique for a particular muscle or the sensory innervation zone of a nerve, and especially to provide a tabular checklist of possible etiologies for a particular focal nerve lesion. I plan to station a copy in each of the offices and laboratories that I frequent.

W.W. Campbell, MD, MSHA