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Neuroanatomy and Neurophysiology: A Review

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Book Review

Neuroanatomy and Neurophysiology: A Review
Jonathan Stuart Citow and Robert L. Macdonald. New York, NY: Thieme Medical Publishers; 2001. 179 pages. $59.00.

As the title indicates, this text is a review of neuroanatomy and neurophysiology. Although this book is not comprehensive, it does provide material that physicians can use in preparing for their board examinations. The book is succinct and reads as a dictionary would, with lists of terms and names of anatomic structures and their definitions. Anyone involved in the diagnosis and care of patients with neurologic diseases can use this text, but its teaching value is limited to individuals who already have substantial knowledge of the neurosciences and need only a brief review, because no topic is covered in depth. For radiologists, the value of the book is limited because the anatomy section does not focus on cross-sectional views.

The book is divided into two main sections: anatomy and physiology. The anatomy section is further subdivided into traditional gross anatomic subjects. The end of the anatomy section lists 52 neuroanatomic terms or names, with their definitions, in a section titled "Structures to Memorize." By reviewing this list of terms, why the authors listed these terms separately is unclear, because the terms are previously mentioned in the text, and they are not necessarily important structures or terms.

The physiology section is subdivided into 32 sections, including the following: "Cellular Molecular Transport," "Membrane Potentials and Action Potentials," "Synapses and Neurotransmitters," "Sensory Receptors," "Nerve Transmission," "Somatic Sensations," "Vision," "Hearing," "Taste," "Smell," "Motor Systems," "Vestibular System," "Cerebellum," "Basal Ganglia Neurotransmitter Changes in Disease," "Motor Control," "Cortical Functions," "Thoughts and Memory," "Reticular Activating System and Neurotransmitters," "Limbic System with Hypothalamus and Hippocampus," "Brain Activity States," "Cerebral Blood Flow," "Skeletal Muscle," "Smooth Muscle," "Cardiac Muscle," "Circulation," "Respiration," "Gastrointestinal Tract," "Genitourinary Tract," "Temperature," and "Endocrine." A wide range of topics are covered but to a limited depth. An integration of some of the anatomic and physiology subsections would have served the reader well. For example, the physiology related to hearing could have been discussed in the anatomy section in which cranial nerve VIII is reviewed.

The content appears to be fairly accurate, although some errors are found. These are predominately related to the labeling of several figures. Also, the authors made some clinically relevant comments, but these are infrequent, and why some of these were included while other potentially relevant comments were omitted is unclear.

The authors relied on 12 references. These references are listed in the beginning of the book and are not cited in the text.

Surprisingly few figures are included, particularly in the anatomy section. The few figures mainly consist of diagrams from various sources, including many from Frank Netter's book. The figures are not as instructive as they could have been. For example, several good diagrams of the hippocampal formation are provided, but the labels on the depicted structures are not explained in a corresponding legend; therefore, the figure is rendered essentially useless. Frequently, the descriptions in the legends are scanty. For example, an unlabeled hematoxylin-eosin stained section of the hippocampus has only this legend: "Normal hippocampus (hematoxylin and eosin)." Because cross-sectional imaging is a dominant force in the diagnosis of neurologic disease, more correlation with cross-sectional images or anatomic sections should have been used.

This book is primarily of value to medical students, neurologists, and neurosurgeons who are preparing for board examinations. It can be useful for a relatively quick review of neuroanatomy and neurophysiology. I cannot recommend this book to radiologists or neuroradiologists because of the limited correlation with cross-sectional images. In addition, a book about these topics that is written for radiologists and neuroradiologists should attempt to correlate the relevant anatomy and physiology with images from studies such as activation MR imaging, MR spectroscopy, and positron emission tomography. As far as the use of this book as a reference text, more comprehensive books would better serve this purpose.