Book Review: *Neurosurgery Fundamentals*

Authoring a comprehensive textbook across any medical discipline is a formidable task, not only due to the need for consolidating a large amount of information, but also because making such texts immediately accessible and practically useful is often easier said than done. The neurosurgery literature has seen a number of contributions of this type, varying from the "office desk" format of Youmans and Winn.[1] to the "white coat pocket" style of Greenberg,[2] which have remained relevant by being up to date and always applicable to the ever-expanding repertoire of the modern neurosurgeon. For these and other volumes, similar challenges crop up with every new release: Which topics should be included and discarded? To whom is this book targeted? Where do the authors find the best evidence? How authors answer these questions contribute to their volumes' usefulness, and their longevity on the bookshelves of neurosurgery practitioners and trainees.

Neurosurgery Fundamentals (ed. Nitin Agarwal, Thieme, 2018) is another recent book aiming to provide an overview of the specialty, but in contrast to many other "handbooks" of neurosurgery, there seems to be a focus on the novice surgeon. In addition to a review of practical medical knowledge and decision points across all neurosurgical subspecialties, there are practical beginners' tips such as operating room behavior and a neuroanatomy review, as well as commentary on adjacent fields such as infectious disease and neurocritical care. Most notable are probably the bookend chapters, focused on the career development within neurosurgery, in particular the match process and life after residency. It seems the authors endeavored to create a "start to finish" guidebook for neurosurgery, something that trainees can put in their pockets on the first day of medical school and pass on to others after signing their first job. This approach is novel for handbooks of this type, and the authors are to be commended for bringing attention to underappreciated teaching points in our field.

The book is divided into 20 sections covering the breadth of neurosurgical topics. The bulk is composed of a review of subspecialties. Each chapter begins with an introduction to the anatomy and pathology in question and includes imaging, clinical diagnosis, and nonsurgical treatment. Discussion of surgical treatments is focused on procedural selection the pros and cons of various treatment modalities, rather than surgical technique. In general, the authors discuss the evidence around each decision point and any applicable guidelines. For instance, in discussing aneurysm treatment, the authors review the historical development of both clip ligation and coil embolization, with a review of the International Subarachnoid Aneurysm Trial and BRAT data relevant to surgical decision-making. There is a measured review of other endovascular options as well. The Neurosurgical Oncology chapter is understandably broad, including the variety of brain tumors as well as a brief discussion of pathology and molecular biology in some cases. That there is little discussion
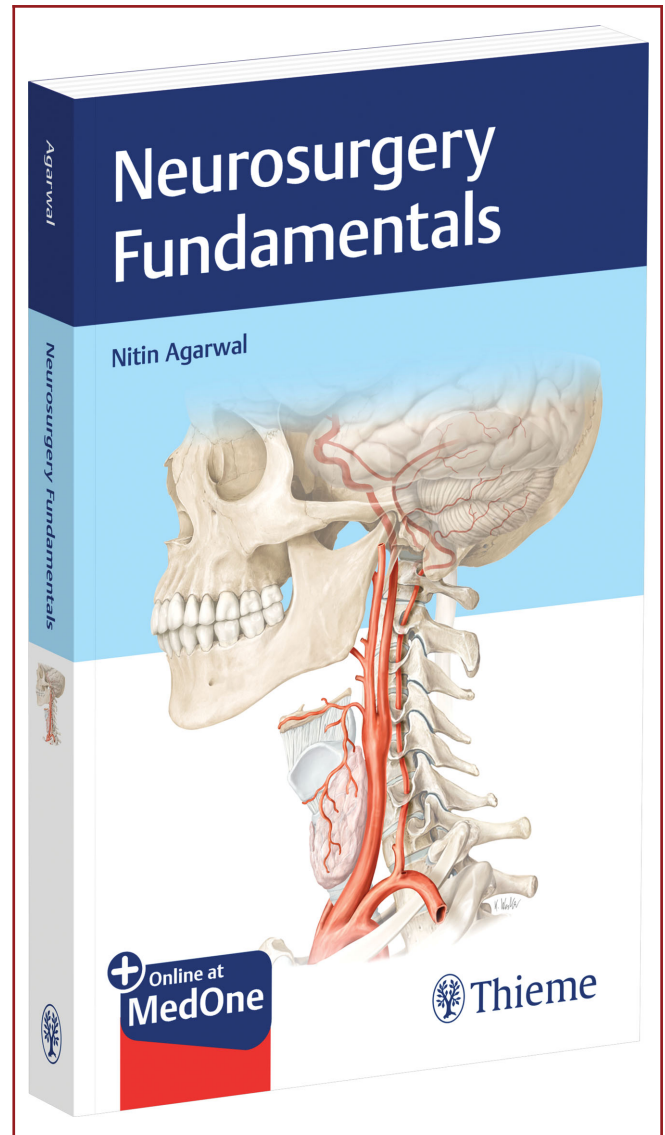
of glioma molecular subtyping (eg, 1p19q codeletions, 06-methylguanine-DNA methyltransferase methylation status, etc.) is odd, particularly given their emphasis in the latest World Health Organization central nervous system tumor guidelines. The chapter on Movement Disorders, unlike in many similar books, includes surgical indications for various ablative or stimulation procedures and a discussion of the evidence behind each. There is a remarkably thorough and helpful discussion of presurgical evaluation of epilepsy, a workup usually missed by many residents before the patient arrives in the operating room.

Each section ends with "Top Hits," a short series of questions addressing relevant key points from the chapter. For the most part, these questions hit major learning points that can be used to assess self-learning but are sometimes overly granular and of questionable practical utility (eg, the anatomy of the Artery of Percheron). Some chapters include helpful knowledge pearls as well. There are sometimes details that seem to be included for completeness but have questionable clinical usefulness, such as a table of primitive neurological reflexes or a discussion of the anatomy of Rexed's laminae: these seem to be more relevant to a written board examination review book than the other, more clinically focused tidbits. Throughout these sections, images and figures are of high quality and quite illustrative, although one wishes that more surgical anatomy or intraoperative pictures would be considered.

The strongest material in the book is in the discussion of essential neurosurgical skills for beginners, which should be essential reading for all medical students seriously considering neurosurgery or completing a neurosurgery sub-internship, as well as other providers just beginning to understand neurosurgical patients and procedures. The section on the Neurological Examination is appropriately thorough and even includes a discussion of accessory maneuvers such as FABER test and bulbocavernosus reflex which are essential to neurosurgical practice. The "Clinical Scenarios" subsection of the Neuroradiology chapter is a useful way to review the normal anatomy illustrated earlier in the chapter and offer the kind of "quick hit" pathology/radiology/treatment bullets that can be reviewed on the fly. The Operating Room chapter is a bevy of immediately useful information; all major cranial and spinal approaches are reviewed with relevant anatomical concerns, as are patient positions and common resulting complications. Many of the "positioning" sections actually describe the procedure in full, and this text might be more appropriate in the dedicated Vascular, Oncology, or Spine chapters. The discussion of operating room etiquette is a small but very worthy addition, as this is often the thing most noticed about early trainees in the operating room.

Finally, there is the unique inclusion of the "career-oriented" sections of the book, which are quite rare to find. The first is a Roadmap to a Career in Neurosurgery, wherein the authors review the statistics of recent matched applicants in neurosurgery and discuss some of the statistics behind successful matches. The

authors deserve credit for 3 important items. First, for using concrete data from the National Resident Matching Program and recently published papers on neurosurgical education to make their points, rather than off-the-cuff advice that can often be biased or incorrect. Second, for offering practical advice to medical students getting involved early in neurosurgery and all the way through their residency interview. And third, for specifically addressing the concerns of international medical graduates, who are an increasingly larger part of the applicant pool and often neglected. The profiles at the end of this chapter are charming anecdotes from well-respected practitioners, but are of questionable utility in terms of attaining a residency position. The Advice from the Masters section is mostly a compendium of available resources for neurosurgical studies, and while it is good to see them compiled and targeted for early trainees, the actual "advice" is a few short stories shuffled to the end of the chapter. The stories are, however, full of insights that are hard-earned and should be heeded by all aspiring neurosurgeons.

The goal of books such as *Fundamentals* is to start trainees down a path to understanding, to lay out the essentials of a given subfield to generate interest and questions that can be fulfilled by more detailed reading, and the authors succeed in accomplishing this. At the same time, they seem to want this volume to be a handbook reference for all trainees. All the material is of high quality and is quite insightful in terms of what content trainees should cover. But the question remains: for whom is this book written? While medical students on rotation will benefit from the early chapters, more advanced material such as tumor genetics, pathological stains, complex vascular anatomy, and the particulars of deep brain stimulation are less useful for student rotations, and if needed there are other introductory books that cover these topics more convincingly. Junior residents using this book might find it difficult to locate the algorithms, anatomical references, and clinical decision points with the immediacy their job often requires. Senior residents and attendings would likely turn to more advanced texts for a nuanced discussion.

The idea to make a catch-all guidebook for navigating a neurosurgical career is an absolutely essential one, and deserves even more text that it has been allotted in this volume; these concepts are so often held in secret among neurosurgeons as "members of the club," and sharing them would benefit us all. Future editions of this book could benefit from a more focused approach. If this is meant for medical students, junior residents, and advanced practice providers, include what exactly they need to know, from the career decision making process to the clinical knowledge that can enable them to be effective and efficient team members. If meant for more senior residents, then perhaps a renewed focus on job- and fellowship-finding is in order. Doing so would help make the book more immediately accessible and differentiate it from other neurosurgical handbooks. Still, the authors are to be praised for trying something quite new here: making a guidebook for the "whole surgeon" and addressing as many of his/her concerns *around* neurosurgery as *within* neurosurgery. Residency training is

perhaps one of the most transformative experiences in a surgeon's life, and having a book to help navigate it would be an invaluable resource. *Neurosurgery Fundamentals* is a key step toward a cogent introduction to the practice of neurosurgery, and with some refinement, should become required reading for everyone aspiring to join our most intriguing of surgical specialties.

Disclosures

The authors have no personal, financial, or institutional interest in any of the drugs, materials, or devices described in this article.

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