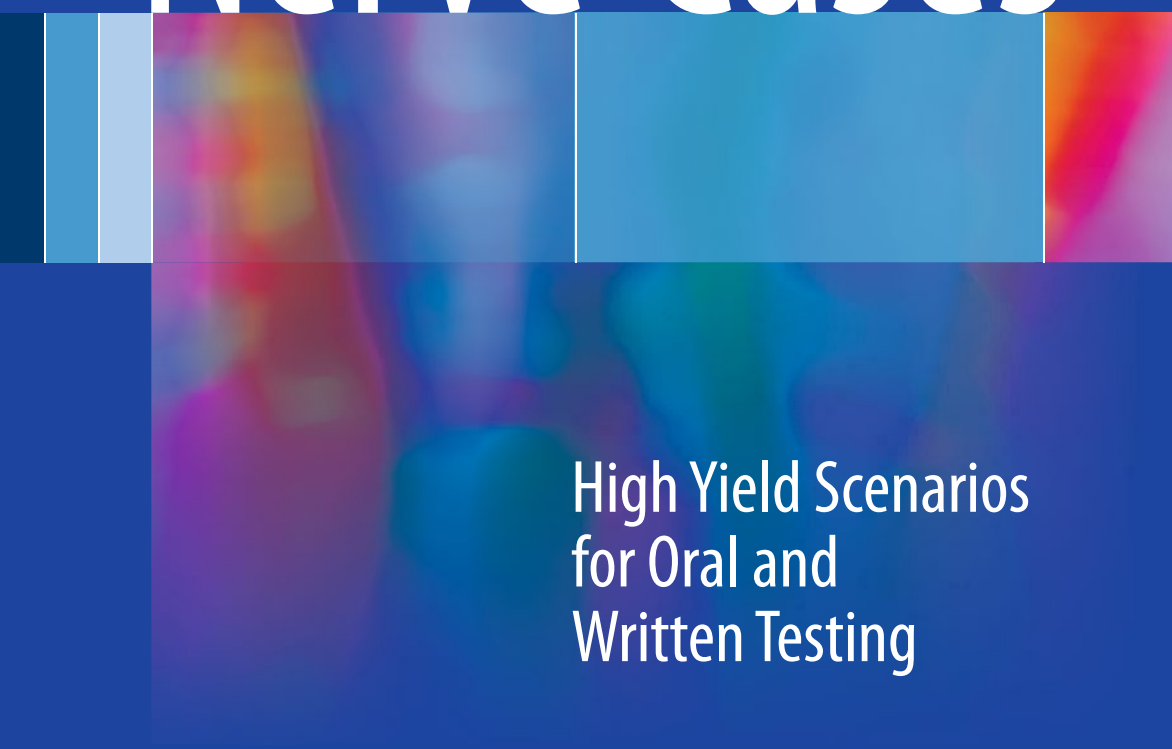
Amgad S. Hanna

Nerve Cases



High Yield Scenarios for Oral and Written Testing

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In memory of my father, Dr. Saddik M Hanna, and my mother, Dr. Aida R Istefanos, who inspired me significantly as physicians and as persons.

To my wife and children

To my brothers

To my teachers

Foreword

What a pleasure it is to read and digest this book of cases presented as a suggested part of the preparation for surgical boards where questions concerning nerve injury and disease can and do occur. To summarize, the diabetic femoral neuropathy does not need expensive imaging of the spine and pelvis nor an unnecessary lumbar spine procedure, but first it needs to be recognized as such. Of course, nothing totally substitutes for first-hand experience with actual cases and their physical, radiologic, electrical, and operative examinations, appearances, and outcomes. However, these cases which are so thoughtfully presented should remind one of actual cases experienced by the reader who is a candidate or those noncandidates seeking help for cases of a similar nature that they are managing. Is every detail as presented in this book perfect or agreed on by all working in this field let alone by this reviewer? No. That would be too much to expect of any clinically oriented book where each author's experiences and prejudices vary. Nonetheless, the science as well as the basic decisions and management algorithms presented herein are accurate and worth a lot of thoughtful study by the reader. As a result, small book is a gem.

David G Kline, MD
Emeritus Chairperson and Boyd Professor
LSUHSC Neurosurgery-retired
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Peripheral nerve disorders and their treatment lie at the interface of Neurosurgery, Orthopedic Surgery, and Plastic Surgery, and as such, trainees and practicing surgeons may not have experienced these disorders as their main focus of practice. In this book, Dr. Hanna has presented the most common disorders (and confounders) in a very clear, concise format that not only serves as a valuable resource for surgeons undergoing oral or written board examinations, but also serves as a high-yield reference for practicing surgeons. The case-based presentations supplemented with

ancillary studies and images, followed by the discussion of differential diagnoses, assessment, and treatment (supplemented by key references), simulate the real-life thought processes required to evaluate patients in the clinical setting. The reader will enjoy perusing or studying in more detail the included cases, and Dr. Hanna's *Nerve Cases: High Yield Scenarios for Oral and Written Testing* is a worthy addition to the medical literature.

Lynda J-S Yang, MD, PhD
Department of Neurosurgery,
University of Michigan
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It is my pleasure to write this introduction for *Nerve Cases: High Yield Scenarios for Oral and Written Testing* by Amgad S. Hanna. This book serves as an excellent companion to the first book by the author, entitled "Anatomy and Exposures of Spinal Nerves." Together they complement the learning and testing required to show mastery of a particular topic.

This book serves many purposes and groups. Every early learner in neurosurgical training is required to show mastery and understanding of the peripheral nerve anatomy and its clinical applicability. I anticipate that every neurosurgical training program will require the two books to be among the *CORE* readings required among its residents. Furthermore, upon graduation, and along the journey to board certification, to prove their expert standing in the field of neurosurgery, each young attending will find the current case format to be exactly aligned with the traditional Oral Board testing process – which has and likely forever will be case-based. Finally, as the applications for peripheral nerve access grows with the advent of technologies, I suspect many more surgeons will pick up this text and use it as a quick and easy refresher reference.

Finally, on a personal note, I am proud of being a part of Dr. Hanna's initial training and his career. The book represents a second milestone in his continued pursuit and commitment to the neurosurgical education. His own experience in being dual fellowship trained in spine and peripheral nerve, his ability to identify the gaps in didactic peripheral nerve education, and his ability to fill those knowledge areas with such high quality text are indeed commendable. I will particularly look forward and am sure will be surprised again as he identifies his next project.

Ashwini D Sharan, MD
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Preface

The idea of this book arose from the huge gap in the peripheral nerve knowledge amongst neurosurgeons. Nevertheless, this endeavor constitutes an integral part of the oral board testing. I have taught oral board webinars sponsored by the Congress of Neurological Surgeons (CNS), as well as breakout sessions in the American Association of Neurological Surgery (AANS) Goodman course. This book is case-based and includes the highest yield scenarios for oral boards including mostly nerve entrapments, trauma, and tumors. There is no logical sequence nor obvious titles to the chapters to avoid guessing the diagnoses. To search the book by topics, the reader is referred to the key words in the index at the end of the book. The book is in question-and-answer format. To maximize the benefit, the reader is encouraged to think about the cases and respond to the questions as if taking the actual test before reading the answers. Some nonnerve cases are comprised because of their importance in the differential diagnosis. Included are common pitfalls candidates have fallen into, a section on nerve examination including video recordings, and another section about important clinical findings that should be diagnosed from the first look. Histology pictures are presented in some cases for completion, but are not necessarily an integral part of testing. I hope this book will be a useful tool to take away the stress over peripheral nerves. It can benefit neurosurgeons, plastic surgeons, orthopedic surgeons, and neurologists. This book will not include a detailed anatomical review. For this the reader is encouraged to consult my other book "Anatomy and Exposures of Spinal Nerves," for a quick review of anatomy or surgical procedures with video recordings of the approaches.

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Acknowledgments

I am very grateful to Dr. David Kline for reviewing this book. Dr. Kline trained several generations of nerve surgeons.

Dr. Lynda Yang provided a scientific review and made very helpful suggestions.

Mrs. Linda Hanna reviewed the book for English style.

Miss. Barbara Hanna reviewed the book for English grammar.

Christopher Hanson, information processing consultant, Jacob Lescher, BS, and Kutluay Uluc, MD, assisted with the videos and photos of the nerve examination section (Part II).

M Shahriar Salamat, MD, PhD, assisted with providing the pathology slides and their interpretation.

Contents

Abbreviations

ADQ	Abductor Digiti Quinti
AIN	Anterior Interosseous Nerve
ALS	Amyotrophic Lateral Sclerosis (Lou Gehrig's disease)
APB	Abductor Pollicis Brevis
CMAP	Compound Muscle (Motor) Action Potential
CRP	C-Reactive Protein
CSF	Cerebrospinal Fluid
CT	Computerized Tomography
CTA	Computerized Tomography Angiogram
CTS	Carpal Tunnel Syndrome
DIP	Distal Inter-Phalangeal Joint
DTRs	Deep Tendon Reflexes
DVT	Deep Venous Thrombosis
ECU	Extensor Carpi Ulnaris
EHL	Extensor Hallucis Longus
EMG	Electromyography
EPB	Extensor Pollicis Brevis
EPL	Extensor Pollicis Longus
ESR	Erythrocyte Sedimentation Rate
ETT	Endotracheal Tube
FCU	Flexor Carpi Ulnaris
FDI	First Dorsal Interosseous
FDP	Flexor Digitorum Profundus
FDS	Flexor Digitorum Superficialis
FH	Family History
FPL	Flexor Pollicis Longus
IO	Interossei
IPJ	Interphalangeal joints
LFCN	Lateral Femoral Cutaneous Nerve
LMA	Laryngeal Mask Anesthesia
LP	Lumbar Puncture
MABC	Medial Antebrachial Cutaneous Nerve
MAC	Monitored Anesthesia Care
MPJ	Metacarpo-Phalangeal Joints

MRA	Magnetic Resonance Angiogram
MRC	Medical Research Council
MRI	Magnetic Resonance Imaging
N	Nerve
NAPs	Nerve Action Potentials
NCS	Nerve Conduction Studies
NF1	Neurofibromatosis Type 1
NF2	Neurofibromatosis Type 2
Nn	Nerves
NSAIDs	Non-steroidal anti-inflammatory drugs
Op P	Opponens Pollicis
OT	Occupational Therapy
PET	Positron Emission Tomography
PIN	Posterior Interosseous Nerve
PIP	Proximal Inter-Phalangeal Joint
PMH	Past Medical History
Preop	Preoperative
PSH	Past Surgical History
PT	Physical Therapy
SCM	Sternocleidomastoid
SNAP	Sensory Nerve Action Potential
TA	Tibialis Anterior
TOS	Thoracic Outlet Syndrome
US	Ultrasound
VAS	Visual Analogue Scale
WHO	World Health Organization

Part I

Nerve Cases