

HOSPITAL PHYSICIAN®

NEUROLOGY BOARD REVIEW MANUAL

STATEMENT OF EDITORIAL PURPOSE

The *Hospital Physician Neurology Board Review Manual* is a peer-reviewed study guide for residents and practicing physicians preparing for board examinations in neurology. Each manual reviews a topic essential to the current practice of neurology.

PUBLISHING STAFF

PRESIDENT, GROUP PUBLISHER

Bruce M. White

EDITORIAL DIRECTOR

Debra Dreger

EDITOR

Tricia Faggioli, ELS

ASSISTANT EDITOR

Farrawh Charles

EXECUTIVE VICE PRESIDENT

Barbara T. White

EXECUTIVE DIRECTOR

OF OPERATIONS

Jean M. Gaul

PRODUCTION DIRECTOR

Suzanne S. Banish

PRODUCTION ASSISTANT

Nadja V. Frist

ADVERTISING/PROJECT DIRECTOR

Patricia Payne Castle

SALES & MARKETING MANAGER

Deborah D. Chavis

NOTE FROM THE PUBLISHER:

This publication has been developed without involvement of or review by the American Board of Psychiatry and Neurology.

Neurologic Infections

Editor:

Alireza Atri, MD, PhD

Instructor in Neurology, Harvard Medical School; Assistant in Neurology, Massachusetts General Hospital, Boston, MA; Associate Director, Center for Translational Cognitive Neuroscience, Geriatric Research Education and Clinical Center, VA Medical Center, Bedford, MA

Associate Editor:

Tracey A. Milligan, MD

Instructor in Neurology, Harvard Medical School; Associate Neurologist, Brigham and Women's and Faulkner Hospitals, Boston, MA

Contributors:

Tracey A. Cho, MD, MA

Instructor in Neurology, Harvard Medical School; Assistant in Neurology, Assistant Director, Neurology-Infectious Diseases Clinic, Massachusetts General Hospital, Boston, MA

Nagagopal Venna, MD, MRCP

Associate Professor of Neurology, Harvard Medical School; Director, Neurology and Neurology-Infectious Diseases Clinics, Massachusetts General Hospital, Boston, MA

Table of Contents

Introduction.....	2
Acute Bacterial Meningitis.....	2
Recurrent Aseptic Meningitis.....	4
Viral Encephalitis.....	7
Focal Brain Infection.....	9
Infectious Myelitis.....	12
References.....	15

Cover Illustration by Kathryn K. Johnson

Copyright 2008, Turner White Communications, Inc., Strafford Avenue, Suite 220, Wayne, PA 19087-3391, www.turner-white.com. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, mechanical, electronic, photocopying, recording, or otherwise, without the prior written permission of Turner White Communications. The preparation and distribution of this publication are supported by sponsorship subject to written agreements that stipulate and ensure the editorial independence of Turner White Communications. Turner White Communications retains full control over the design and production of all published materials, including selection of topics and preparation of editorial content. The authors are solely responsible for substantive content. Statements expressed reflect the views of the authors and not necessarily the opinions or policies of Turner White Communications. Turner White Communications accepts no responsibility for statements made by authors and will not be liable for any errors of omission or inaccuracies. Information contained within this publication should not be used as a substitute for clinical judgment.

Neurologic Infections

Tracey A. Cho, MD, MA, and Nagagopal Venna, MD, MRCP

INTRODUCTION

Infections can affect every part of the nervous system, and presentations are diverse. The nervous system may be primarily involved, or neurologic symptoms can develop as a result of systemic infection. Except in cases of penetrating head trauma or neurosurgery, most infections gain access via other parts of the body. Common sources for brain and intraspinal abscesses include contiguous spread from dental infection, sinusitis, or osteomyelitis and hematogenous spread from infected heart valves or hardware. Meningitis may occur as a result of spread from pneumonia, sinusitis, or otitis media.

The nature of neurologic infectious disease depends on both host factors and microbial tropism. An immunocompromised state (eg, HIV infection, post-transplantation, hematologic or autoimmune disorder, alcoholism, malnutrition, diabetes) may predispose to a broader array of infections as well as more severe manifestations of common infections. The extremes of age also cause relative immunocompromise and lead to different patterns of neurologic infection.

Many infections have geographic patterns of distribution, and travel history is an essential part of the evaluation. In addition, certain seasonal and environmental exposures are associated with increased risk for specific infections and should be assessed in the proper context. For example, mosquito- and tick-borne diseases are more common in the late summer and early fall in locations where these vectors are more prevalent, intravenous (IV) drug use predisposes to intracranial and epidural abscess, and swimming in fresh water may expose patients to schistosomiasis and amoebae. Finally, certain microbes have a tropism for different parts of the nervous system. Bacterial meningitis in immunocompetent adults is most commonly due to pneumococcus or meningococcus, whereas the cause of intracranial abscesses tends to be polymicrobial, including anaerobes. Tuberculosis, syphilis, and borreliosis (Lyme disease) affect almost every part of the central nervous system (CNS). Herpes simplex virus type 1 (HSV-1) migrates to the trigeminal ganglion and spreads to the temporal and orbitofrontal brain parenchyma, while HSV-2 has

a predilection for sacral dorsal root ganglia and may cause recurrent meningitis or lumbosacral radiculitis.

Many neurologic infections are treatable, and knowledge of proper diagnostic and treatment approaches can lead to a good prognosis. With global travel and immigration on the rise, neurologists must be able to recognize and triage patients with diverse neurologic infections. By assessing for host factors and keeping in mind microbial tropism, the neurologist can narrow the possible infectious differential. Evidence for systemic involvement (clinical or based on diagnostic studies) can help secure a diagnosis when direct CNS detection is not possible.

This manual approaches neurologic infections based on the neurologic localization. Although not meant to be a comprehensive review, several cases are presented to illustrate the approach to infections of the nervous system. Neurologic complications of HIV infection were addressed in a previous manual.¹

ACUTE BACTERIAL MENINGITIS

CASE 1 PRESENTATION



A 48-year-old man with no significant past medical history presents to the emergency department (ED) with recent-onset fever, headache, neck stiffness, and confusion. The patient was in his usual state of health until the day prior to presentation, when he developed right ear pain and drainage, followed by fevers, chills, and headache. During the night he began vomiting and became confused.

In the ED, the patient is febrile (103°F), confused, and agitated, but he is awake and otherwise his examination is nonfocal. He complains of a stiff neck. Physical examination reveals no rash or signs of pulmonary consolidation. Otologic examination reveals purulent discharge from the right ear. Acute bacterial meningitis is suspected.

- **What are common causes of acute bacterial meningitis? What is included in the differential diagnosis?**

This patient has the classic syndrome of acute bacterial meningitis, specifically fever, headache, neck stiffness, and mental status changes. Forty percent to 50% of patients