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## **HIV and the Brain: New Challenges in the Modern Era (Current Clinical Neurology)**

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## BOOK REVIEW

# HIV and the Brain: New Challenges in the Modern Era (Current Clinical Neurology)

R.H. Paul, N.C. Sacktor, V. Valcour, and K.T. Tashima, eds. *Totowa, New Jersey: Humana Press; 2009, 400 pages, 10 illustrations, \$139.00.*

This enjoyable and fascinating 400-page book, *HIV and the Brain: New Challenges in the Modern Era*, part of the series *Current Clinical Neurology*, attempts to bring us all up-to-date on the evolution and current challenges of the human immunodeficiency virus (HIV), particularly as it relates to the brain. Reviewing for us the paradigm shift of how infection with HIV has changed from an acute and often fatal illness, in which opportunistic organisms gained the upper hand because of the severe cellular immunodeficiency induced by HIV, to its current state as a chronic disease following the advent of highly active antiretroviral therapy (HAART), these authors try to explain to their multidisciplinary audience why research focused on the effect of HIV on the brain is so important. According to the authors, knowledge that HIV gains access to the brain very early after initial HIV exposure and that the brain acts as a reservoir for the virus gives greater impetus in this post-HAART era for clinicians and researchers to understand all the stages of neurocognitive dysfunction induced by HIV as well as its interaction with the aging process and other comorbidities, such as hepatitis C and drug abuse. The authors make a poignant point that while HAART has allowed longer life spans, other unique challenges have arisen as the HIV-infected population ages. They urge us then to take a multidisciplinary approach to confront the neuropsychological, neurobehavioral, and medication-adherence issues that impact the daily activities of the HIV-positive patient now living with this chronic illness, just as we do with Alzheimer disease and other potentially dementing illnesses.

This lightweight 9.5 × 6.38 inch book, comprising 18 chapters and written by 42 contributors, is easy to carry, take on a plane when traveling, bring to the office, take home to read, and put up and put down. The fact that each chapter is self-contained and can be read 1 at a time as one's schedule permits is a definite appeal. Another strong appeal is the number of different specialties involved in the writing of the book. Represented are disciplines from infectious diseases; medicine; neurology; psychiatry and behavioral sciences; geriatric medicine; pathology and neuropathology; Infant, Child, and Adolescent Research Programs; the Alzheimer Disease Aging Brain Research Centers; the Psychiatry Center for Neurologic Imaging; and the HIV Neurobehavioral Research Center.

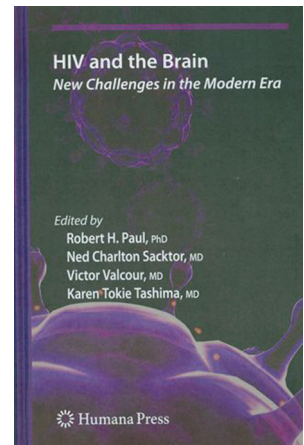
This book, then, is "transdisciplinary," as the authors themselves term it, a book directed toward clinical researchers, basic scientists, and clinicians. For anyone interested in HIV infection of the central nervous system and in neurocognitive dysfunction, this book is a ready reference with the most up-to-date material covering laboratory markers, neuropsychological test measures, drug-resistance issues, the latest treatment regimens, and the like. For anyone wanting to keep up with

this ever-evolving fast-changing disease, the references listed at the end of each chapter, ranging from 14 to 493, are great resources. Most chapters list more than 100 references, including historic reviews and the most recently published articles. Through these chapters and the references, the authors hope to meet their goals in the post-HAART era of dealing with the effect of HIV on brain function, its chronic treatment, the interaction of HIV with age, and international studies dealing with clade diversity.

In this era of globalization, most readers will take particular notice of the chapters that stress the global impact of this infection and the neurocognitive dysfunction it can cause as well as the cross-cultural differences that we need to understand to properly diagnose and treat this infection and its effect on the brain. Readers will be interested to learn that because of the many different genetic strains (clades) of this virus, there are resultant differences in the degree of neurovirulence of HIV, its mode of transmission, its biologic properties and behavior, its treatment, and even the types and prevalence of opportunistic infections associated with the different strains of HIV. What will be surprising to many is the vast diversity among clades and the difficulties this engenders and how important it is for us all to be familiar with these differences in today's global setting.

This book will definitely appeal to its target audience of clinicians and both basic and clinical researchers because its 18 chapters include those dealing with how to diagnose (with biomarkers and neuroimaging), measure, monitor, and treat neurocognitive changes in HIV in the post-HAART era (ranging from HIV-1 – Associated Minor Cognitive/Motor Disorder to HIV-Associated Dementia according to the American Academy of Neurology criteria or ranging from HIV-1 – Associated Mild Neurocognitive Disorder to HIV-1 Associated Dementia, according to the Grant and Atkinson criteria); how to deal with the influence of comorbidities, including what adjunctive therapy the clinician needs to offer for long-term support when this intensified neuropsychological decline occurs; how to recognize clade diversity and its impact on neurocognitive dysfunction; how to recognize the neuropathology of HIV and the sequelae of long-term treatment; and how to be cognizant of future research directions.

With respect to the neuroradiologist, this book offers a ready reference for up-to-date clinical material. It also forces us to expand our differential diagnosis of white matter lesions in this post-HAART era. No longer should more routine causes of white matter lesions such as ischemic demyelination be ignored because the HIV-infected population is aging. Furthermore, it behooves us to familiarize ourselves post-HAART with the immune reconstitutive syndrome (IRIS) because IRIS can simulate other disease processes and can be fatal. Additionally, when discussing cases with international col-



leagues, neuroradiologists need to be cognizant of the fact that differential diagnoses may vary or may need to be reordered depending on the country or region. We need to be aware that there are differing incidences of opportunistic infections, depending on the world location, such as in Brazil, where there has been an increased incidence of progressive multifocal leukoencephalopathy post-HAART. Neuroradiologists also need to understand that following the advent of HAART, there has been a decrease in the prevalence of HIV-associated dementia with a concomitant increase in the prevalence of the milder forms of neurologic impairment, namely HIV-associated neurocognitive disorders, as explained by Cysique and Brew in Chapter 7.

While this book does have appeal then for neuroradiologists, especially those interested in central nervous system infection and neurocognitive impairment, neuroradiologists will undoubtedly be disappointed that there are not more chapters on neuroimaging. Even though the chapter entitled “Neuroimaging among HIV-Infected Patients: Current Knowledge and Future Directions,” by David F. Tate, Jared J. Conley, Dominik S. Meier, Bradford A. Navia, Ronald Cohen, and Charles R.G. Guttman is an excellent one, well-written and up-to-date, and includes a discussion of conventional MR imaging, proton MR spectroscopy, magnetization transfer imaging, diffusion tensor imaging (DTI), positron-emission tomography, and other functional imaging, the neuroradiologist will definitely want to see more neuroimaging chapters in the next edition of this book.

Because neuroimaging is such an important part of the noninvasive diagnosis and treatment monitoring of HIV patients with neurocognitive dysfunction, because it offers mea-

surable markers of disease progression and of disease response, and because it could hold the key with DTI to understanding the striatal-frontal and other networks that are injured in HIV infection, it would seem that the authors, who do emphasize a multidisciplinary approach, would want to include more neuroimaging chapters and many more illustrations and would want to stress that future research directions should be inextricably bound to neuroimaging. Just as neuroradiologists played a critical role in the pre-HAART era in diagnosing potentially treatable opportunistic infections and neoplasms and just as they have more recently played an important role in the detection, classification, and treatment monitoring of neurocognitive dysfunction with proton MR spectroscopy, DTI, and other imaging modalities, they should also play a vital role in any future research and clinical-application endeavors directed at this elusive virus. Neuroimaging should certainly become a more integral part of this multidisciplinary approach because it represents a critical component of patient care.

In summary, this book is excellent—it is well-organized, easy to read, and interesting. It offers clinical information important in our global setting for combating HIV and for meeting the challenges created by the neurocognitive disorders that it induces. Clinicians from a wide variety of disciplines and researchers will certainly benefit from and enjoy having this book in their personal library. While neuroradiologists will also enjoy reading this book and will definitely value its content, many will look forward to the next edition of this book as more chapters devoted to neuroimaging become available.

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