

# CNS SPECTRUMS®

THE INTERNATIONAL JOURNAL OF NEUROPSYCHIATRIC MEDICINE

## CME PSYCHCAST™

**Alzheimer's Disease Summit**  
*Translating Research Advances Into Clinical Practice*

### **Advances in Neuroimaging and Biomarkers**

(71 Minutes)

**Use of Magnetic Resonance Imaging to Identify  
Mild Cognitive Impairment**

*Liana G. Apostolova, MD*

**FDG and Amyloid Positron Emission Tomography**

*Mark A. Mintun, MD*

**Cerebrospinal Fluid: When Is It Worthwhile to Do a Lumbar Puncture?**

*Elaine R. Peskind, MD*

**Other PsychCasts™ in this series include:**

**Advances in Clinical Assessment**

*Z. Nasreddine, K. Welsh-Bohmer, and E. Woo*

**Read the extended CME Expert Review  
Supplement related to this activity at  
[cnsspectrums.com](http://cnsspectrums.com).**

**To learn more about the Alzheimer's Disease  
Summit, please visit [alzsummit.com](http://alzsummit.com).**

CME 1



This activity is jointly sponsored by the Mount Sinai School of Medicine and MBL Communications, Inc.



[cmepsychcast.mblcommunications.com](http://cmepsychcast.mblcommunications.com)

**Release date:** December 2008

**Termination date:** December 31, 2010

**Estimated time to complete this activity:** 1 hour

## Acknowledgment of Commercial Support

Funding for this activity has been provided by educational grants from Forest Pharmaceuticals, Inc., Eisai Inc., Medivation, Inc., and Elan Pharmaceuticals, Inc.

## CME Course Director

This activity has been peer reviewed and approved by James C.-Y. Chou, MD, associate clinical professor of Psychiatry at the Mount Sinai School of Medicine. Review Date: September 24, 2008.

## Faculty Affiliations

Liana G. Apostolova, MD, is assistant professor of neurology at UCLA Alzheimer's Disease Center in Los Angeles, California.

Mark A. Mintun, MD, is professor of radiology with joint appointments in psychiatry, neurobiology and biomedical engineering; interim director of radiological science; director of the Center for Clinical Imaging Research; and director of the Division of Research Development, at Washington University School of Medicine in St. Louis, Missouri.

Elaine R. Peskind, MD, is associate director of the Alzheimer's Disease Research Center and professor in the Department of Psychiatry and Behavioral Sciences at the University of Washington School of Medicine in Seattle, Washington.

## Faculty Disclosure Policy Statement

It is the policy of the Mount Sinai School of Medicine to ensure objectivity, balance, independence, transparency, and scientific rigor in all CME-sponsored educational activities. All faculty participating in the planning or implementation of a sponsored activity are expected to disclose to the audience any relevant financial relationships and to assist in resolving any conflict of interest that may arise from the relationship. Presenters must also make a meaningful disclosure to the audience of their discussions of unlabeled or unapproved drugs or devices. This information will be available as part of the course material.

## Faculty Disclosures

Dr. Apostolova reports no financial, academic, or other interest in any organization that may pose a conflict of interest.

Dr. Mintun reports no financial, academic, or other interest in any organization that may pose a conflict of interest. He includes discussion of investigational uses of 11C-PIB for evaluation of dementia and risk of Alzheimer's disease.

Dr. Peskind reports no financial, academic, or other interest in any organization that may pose a conflict of interest.

## Peer Reviewer

James C.-Y. Chou, MD, reports no affiliation with or relevant financial interest in any organization that may pose a conflict of interest.

## Learning Objectives

- Explain the importance of a structural brain scan in the elderly patient with cognitive impairment
- Describe the state of the art understanding of how to use molecular imaging for diagnosis in Alzheimer's disease
- Recognize the clinical utility of lumbar puncture in the differential diagnosis of dementia and delirium

## Statement of Need and Purpose

Alzheimer's disease (AD) is a progressive brain disorder that affects cognitive, behavioral, and functional abilities. Patients progress from mild cognitive impairment to death in a span of approximately 10 years, with increasing functional disability, cognitive impairment, and behavioral symptoms. AD currently affects 4.5 million Americans, and its prevalence is rapidly rising. In addition, many patients are not diagnosed until late in their disease progression, and available treatments are underutilized. Research advances must be translated into clinical practice to maximally impact the care of patients.

New technologies are evolving to assist clinicians in dementia recognition, including screening exams, computerized neuropsychological test batteries, and neuropsychological testing. Neuroimaging and biomarkers play a growing role in research and clinical practice. Knowing when to apply these new techniques in clinical practice and how to interpret their results is increasingly important to clinicians and patients. AD therapeutics is poised to change dramatically in the next few years. There have been new indications for the use of cholinesterase inhibitors. Improved understanding of the pathophysiology of AD has presented well-informed targets for therapeutic intervention, and disease-modifying agents are currently being tested in clinical trials. Anti-amyloid strategies, neuroprotective strategies, immunotherapies, enzyme inhibitors, and neuroprotective approaches are some of the directions being explored. Practitioners need information about the changing landscape of AD research to respond to patient questions, anticipate new therapeutic directions, and refer to clinical trials.

The Alzheimer's Disease Summit (ADS), held on May 3, 2008, in Washington, DC, translated cutting-edge research into day-to-day practice. Leading experts discussed the latest research advances in four critical areas—diagnosis, imaging and biomarkers, current treatment, and evolving treatment approaches—and related this new knowledge to clinical practice. This PsychCast, based on information presented at the ADS, presents valuable clinical content to a broad audience of primary care physicians, psychiatrists, geriatricians, and neurologists.

## Target Audience

This activity is designed to meet the educational needs of neurologists, primary care physicians, and psychiatrists.

## Accreditation Statement

This activity has been planned and implemented in accordance with the Essentials and Standards of the Accreditation Council for Continuing Medical Education (ACCME) through the joint sponsorship of the Mount Sinai School of Medicine and MBL Communications, Inc. The Mount Sinai School of Medicine is accredited by the ACCME to provide continuing medical education for physicians.



## Credit Designation

The Mount Sinai School of Medicine designates this educational activity for a maximum of 1 *AMA PRA Category 1 Credit™*. Physicians should only claim credit commensurate with the extent of their participation in the activity.

## To Receive Credit for this Activity

Listen to the PsychCast™, reflect on the information presented, and complete the CME posttest and evaluation. To obtain credit, you should score 70% or better. Early submission of this posttest is encouraged. Please submit this posttest by December 1, 2010 to be eligible for credit.



# FDG AND AMYLOID POSITRON EMISSION TOMOGRAPHY

By Mark A. Mintun, MD

## SLIDE LIBRARY

**SLIDE 1**  
*Pattern Consistent with Alzheimer's Disease<sup>1</sup>*

**SLIDE 3**  
*PET Scans of PIB*

PET=positron emission tomography; PIB=Pittsburgh compound B; DAT=dementia of the Alzheimer's type; cntrl=control subject without dementia.

**SLIDE 2**  
*FDG PET Imaging of Dementias<sup>2</sup>*

MCI=mild cognitive impairment; AD=Alzheimer's disease; FTD=frontotemporal dementia; DLB=dementia with Lewy bodies

**SLIDE 4**  
*Average Binding Potential Values*

Region	DAT	Old Controls	Young Controls
Occipital	~0.30	~0.10	~0.05
Prefrontal	~0.70	~0.10	~-0.05
Temporal	~0.50	~0.15	~0.05
Precuneus	~0.80	~0.20	~0.05
Caudate	~0.40	~0.05	~-0.05
Gyrus Rectus	~0.50	~-0.05	~-0.15

DAT=dementia of the Alzheimer's type; BP=binding potential.

### References

1. Reiman EM, Caselli RJ, Yun LS, et al. Preclinical evidence of Alzheimer's disease in persons homozygous for the epsilon 4 allele for apolipoprotein E. *N Engl J Med.* 1996;334(12):752-758.
2. Mosconi L, Tsui WH, Herholz K, et al. Multicenter standardized 18F-FDG PET diagnosis of mild cognitive impairment, Alzheimer's disease, and other dementias. *J Nucl Med.* 2008;49(3):390-398.

## ALZHEIMER'S DISEASE SUMMIT: ADVANCES IN NEUROIMAGING AND BIOMARKERS

### CME QUESTIONS

- 1. The leading hypothesis for reduced concentration of cerebrospinal fluid (CSF)  $A\beta_{42}$  is:**
  - A. Increased clearance of CSF  $A\beta_{42}$  into plasma
  - B. Interference with the CSF  $A\beta_{42}$  assay by phosphorylated tau
  - C. Aggregation and sequestration of  $A\beta_{42}$  into amyloid plaques in brain parenchyma
  - D. Smaller volume of CSF in Alzheimer's disease
- 2. Which one of the following structural brain abnormalities is not associated with slowly progressive cognitive decline?**
  - A. Subdural hematoma
  - B. Normal pressure hydrocephalus
  - C. Intraparenchymal bleed
  - D. Slowly growing brain neoplasm
- 3. How can incidence of post lumbar puncture headache be reduced?**
  - A. 60 minutes recumbent posture following lumbar puncture
  - B. Use of the Sprotte 24g atraumatic spinal needle
  - C. Reducing the amount of local anesthetic used
  - D. Rapid removal of CSF
- 4. In patients with early Alzheimer's disease, what does functional positron emission tomography (PET) imaging with [ $^{18}$ F]fluorodeoxyglucose (FDG) typically show?**
  - A. Increased metabolism in frontal cortex
  - B. Decreased metabolism in caudate and thalamus
  - C. Decreased metabolism in parietal and temporal regions
  - D. Decreased hippocampal and frontal metabolisms
- 5. Which structural abnormality is highly suggestive of AD pathology in the amnesic MCI patient?**
  - A. White matter hyperintensities
  - B. Ventriculomegaly
  - C. Atrophic and pale substantia nigra
  - D. Hippocampal atrophy
- 6. Scans with [ $^{11}$ C]PIB and similar PET tracers show increased regional uptake in patients with Alzheimer's disease because they stick to:**
  - A. Tau proteins
  - B. Amyloid plaques
  - C. Neurons with decreased function
  - D. Proteins that produce amyloid

# REGISTRATION

## DECEMBER 2008 CME POSTTEST



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### ANSWER FORM

Expert Review PsychCast™ – Alzheimer's Disease Summit: *Advances in Neuroimaging and Biomarkers*

**TERMINATION DATE:** December 31, 2010

To receive credit, you should score 70% or better (participants will receive certification for their records in approximately 4–6 weeks). Early submission of this posttest is encouraged. Please submit this test by December 1, 2010, to be eligible for credit. If you have any questions about this, or any of our other CME materials, please e-mail CME@mblcommunications.com

*Please circle your answers*

1. A B C D

2. A B C D

3. A B C D

4. A B C D

5. A B C D

6. A B C D

### EVALUATION SECTION (please provide the information below and print clearly)

- Was this activity relevant to your practice? Yes  No
- Did this activity meet the stated learning objectives? Yes  No
- Did this activity increase your knowledge and/or skills in delivering patient care? Yes  No
- Does the information you received from this CME activity confirm the way you presently manage your patients? Yes  No
- Will the information you received from this CME activity change the way you will manage your patients in the future? Yes  No

If you answered yes, what change(s) do you intend to make in your practice? \_\_\_\_\_

- Did this CME activity provide a balanced, scientifically rigorous presentation of therapeutic options related to the topic without commercial bias and influence? Yes  No

- Do you feel these topics should be repeated/updated in future CME activities? Yes  No   
If you answered yes, what suggestions would you make to improve this activity? \_\_\_\_\_

- Was the format of this activity appropriate for the content being presented? Yes  No

- Please check your preferred formats for CME activities (select one or more):

Print media  Internet text  Internet multi-media  Live meeting  PDA  Podcast

- Please list three clinical topics you would like to be addressed in future educational activities:

Topic 1: \_\_\_\_\_

Topic 2: \_\_\_\_\_

Topic 3: \_\_\_\_\_

- Additional comments: \_\_\_\_\_

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I certify that I completed this CME activity (signature) \_\_\_\_\_ Date \_\_\_\_\_

I have read the CME article and completed this activity in \_\_\_\_\_ hours.