

# Understanding Dementia

**Dementia is a clinical syndrome with a variety of etiologies**

# Cognitive Screening

- **Understanding Dementia**
- **Dementia Testing Options**
- **Dementia Testing Issues**
- **Wrap Up**

# Prevalence and Impact of AD

- **AD is the most common cause of dementia in people 65 years and older**
- **Affects 10% of people over the age of 65 and 50% of people over the age of 85**
- **Approximately 4 million AD patients in the United States**
- **Annual treatment costs = \$100 billion**
- **AD is the fourth leading cause of death in the United States**
- **The overwhelming majority of patients live at home and are cared for by family and friends**

# High Cost of Dementia Treatment

- 1.6X higher DIRECT health care charges each year
- 1.7X more health care services each year
- Dementia medication can SAVE \$4839 in 24 months
- Each case costs society \$195,000 (primarily family)
- Annual direct costs: Mild: \$14,904  
Moderate: \$19,272  
Severe: \$25,860

# Pathology of AD

- **There are 3 consistent neuropathological hallmarks:**
  - **Amyloid-rich senile plaques**
  - **Neurofibrillary tangles**
  - **Neuronal degeneration**
- **These changes eventually lead to clinical symptoms, but they begin years before the onset of symptoms**

# $\beta$ -amyloid Plaques



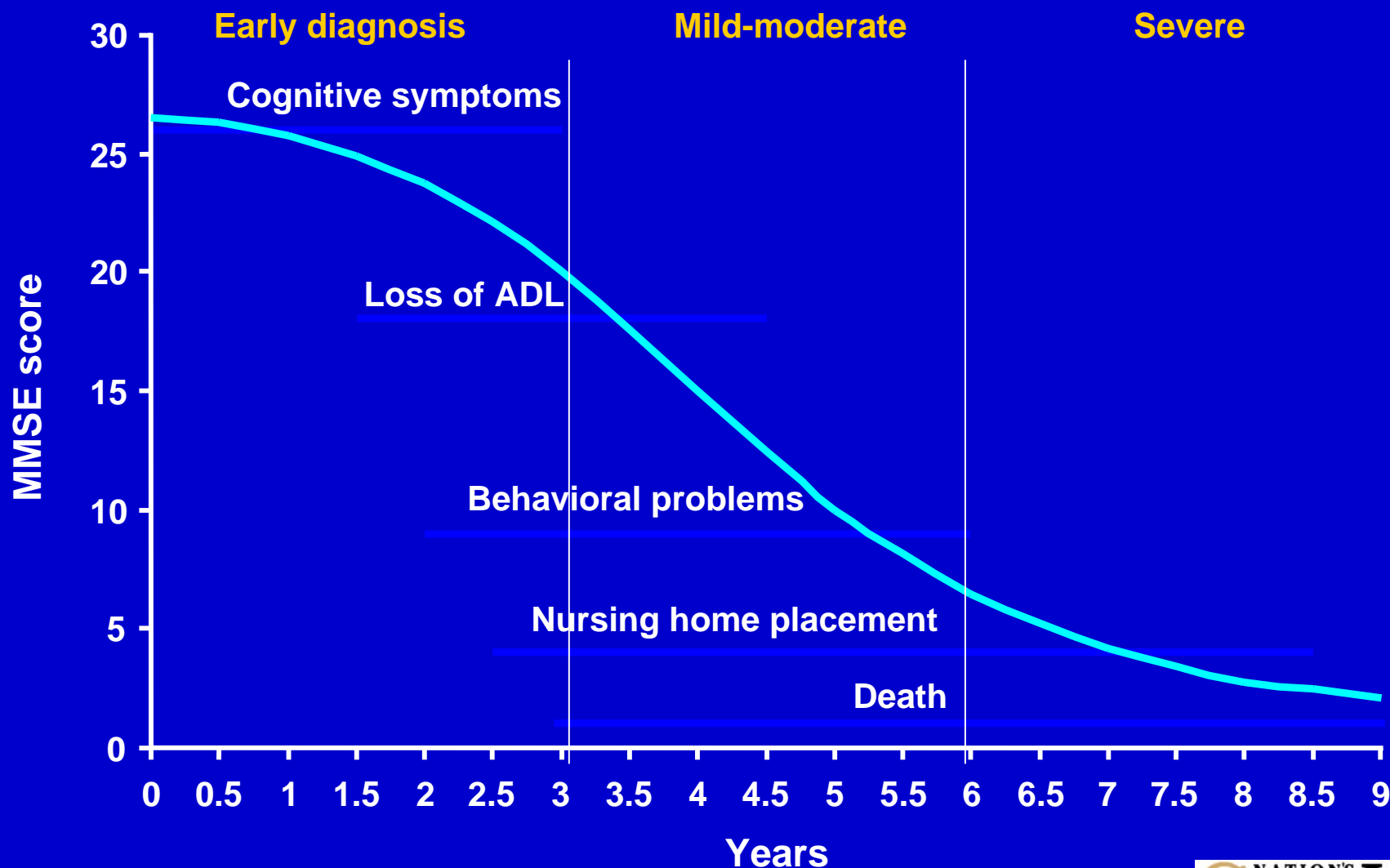
**Immunocytochemical staining of senile plaques in the isocortex of a brain of a patient with AD**

# Neurofibrillary Tangles

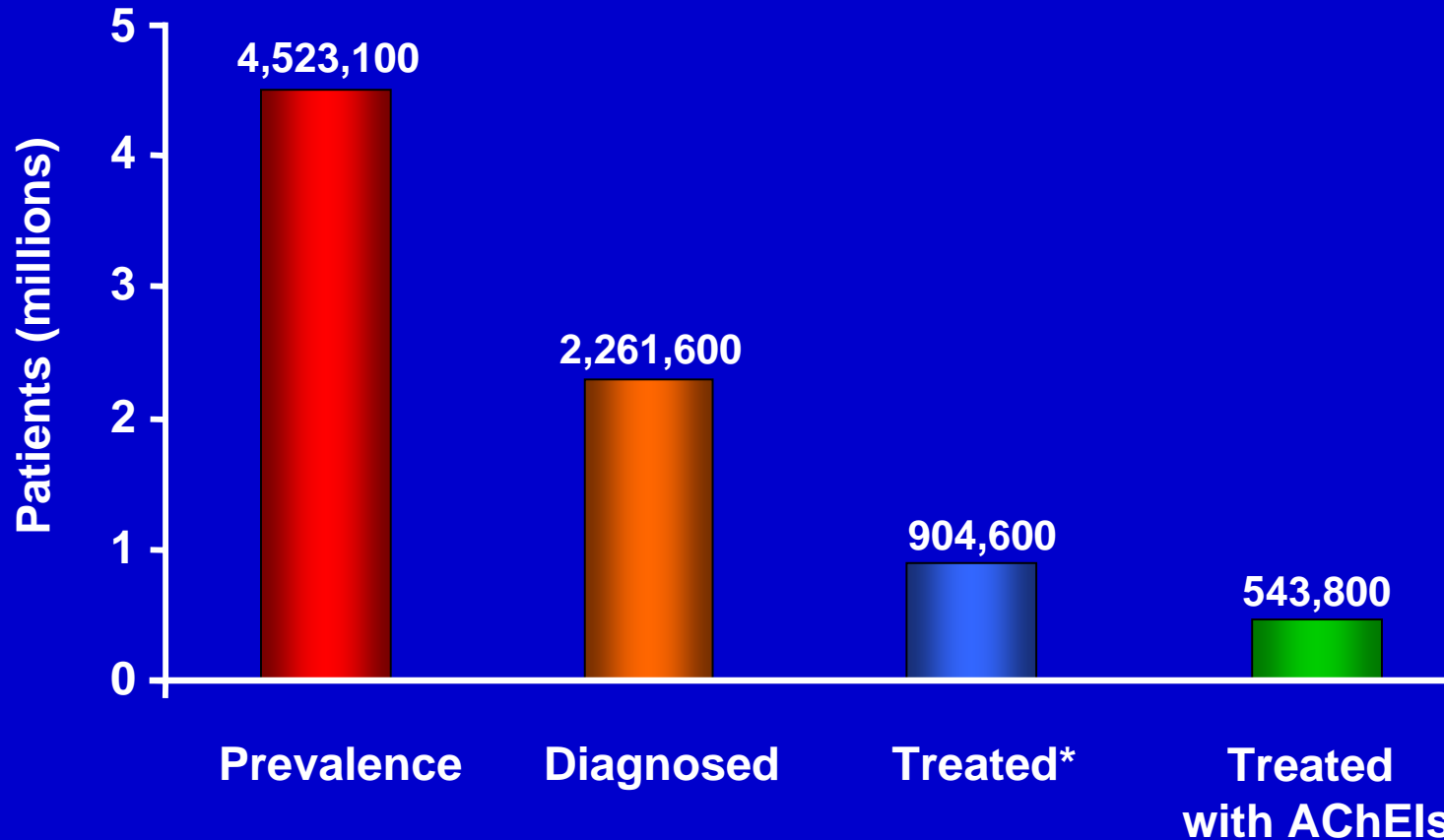


**Immunocytochemical  
staining of neurofibrillary  
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# The Progress of Alzheimer's Disease



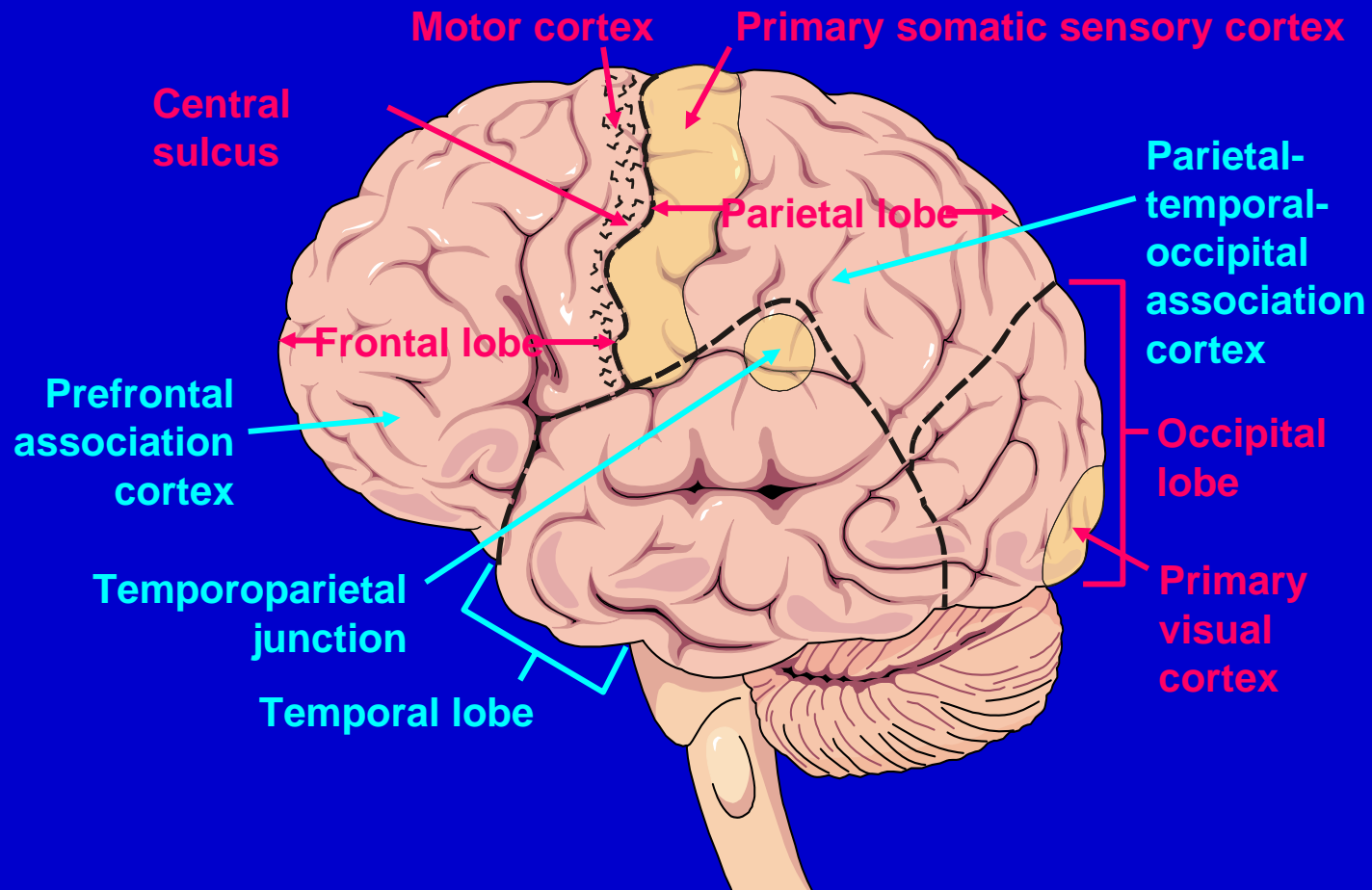
# Treatment of Alzheimer's Disease

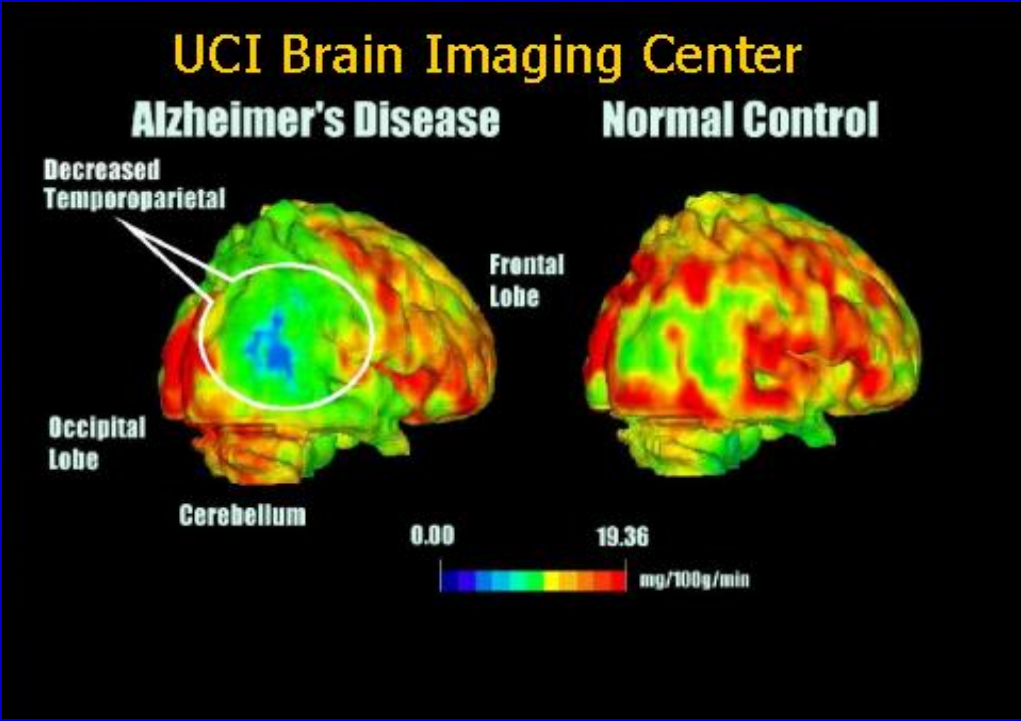
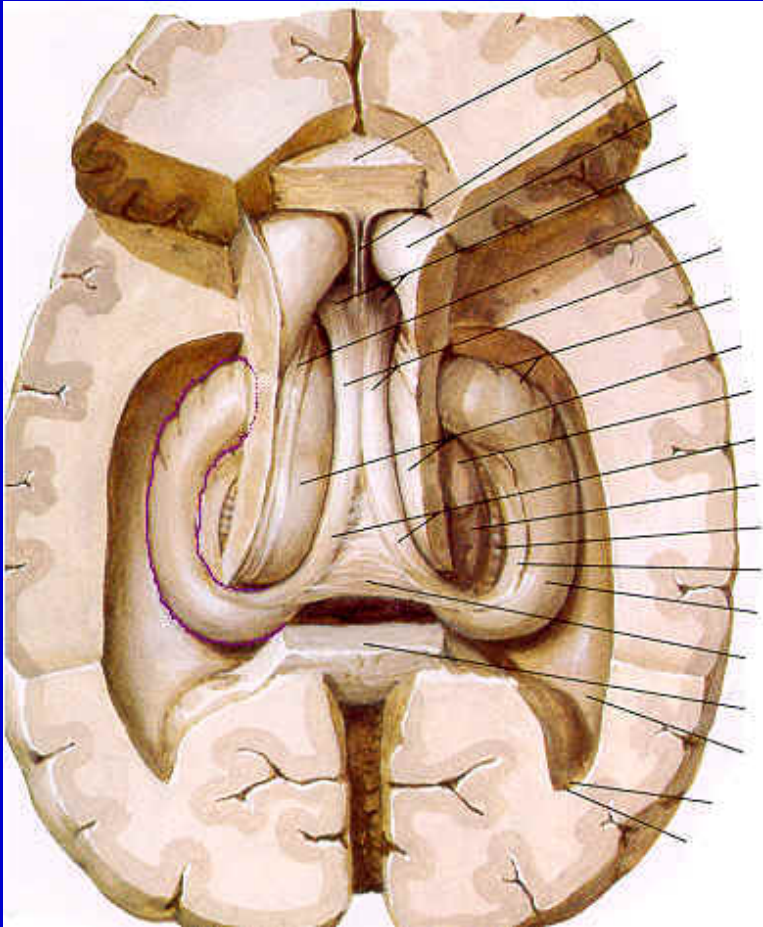
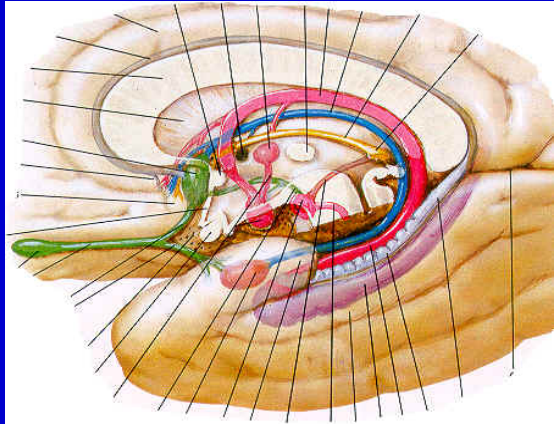


\* Any drug treatment, not limited to acetylcholinesterase inhibitors.

Source: Decision Resources, March 2000.

# AD Symptoms Correlate With Affected Areas of the Brain





# Frontal Lobe Functions

- Attention Span
- Organization-Flexibility
- Problem Solving
- Critical Thought-Judgement
- Motor Activity Memory
- Expressive Language
- Word Associations
- Sequencing Tasks
- Social Judgement
- MCAS Orientation
- MCAS Comprehension
- MCAS Repetition
- MCAS Naming
- MCAS Computation
- MCAS Judgement
- MCAS Verbal Fluency
- MCAS Attention

# Parietal Lobe Functions

- Visual Attention-Touch
- Goal Directed Movement
- Object Manipulation
- Integrate Senses to Concept
- Object Naming (Anomia)
- Produce Writing (Agraphia)
- Drawing Objects
- Mathematics (Dyscalculia)
- Space-Body Aware (Apraxia)
- MCAS Comprehension
- MCAS Naming
- MCAS Computation
- MCAS Verbal Fluency

# Temporal Lobe Function

- Understanding Speech
- Memory Acquisition
- Object Categorization
- Limited Visual Perception
- Short Term Memory
- Long Term Memory
- Facial Recognition (Prosopagnosia)
- Wernicke's Aphasia
- MCAS Orientation
- MCAS Attention
- MCAS Delayed Word Recall
- MCAS Comprehension
- MCAS Repetition
- MCAS Naming
- MCAS Verbal Fluency

# Occipital Lobe Function

- Visual Object Location
- Vision Defects
- Recognizing Patterns
- Word Blindness
- Reading-Writing
- Object Movement Recognition
- MCAS Comprehension

# Hippocampus / Enteriorrhinal Cortex

- **First Point of Attack by Alzheimer's Neurofibrillary Tangles and Plaques**
- **Limbic System-Underneath the Cortex**
- **Working (Immediate) Memory transition to Short Term Memory.**
- **The "Five Minute File Cabinet"**
- **MCAS Delayed Word Recall**
- **MCAS Comprehension**
- **MCAS Verbal Fluency**

# Complex, Time Consuming Neuropsychological Battery

Luria-Nebraska or Halstead-Reitan Battery

- **Test a variety of cognitive functions: Concepts, Tactical Performances, Speech, Sensory Perceptions and Others**
- **Both are Expensive**
- **> \$1000 per administrations**
- **Several Hours of Administration**

# Luria-Nebraska or Halstead-Reitan Battery

Most appropriate in Special Settings

- **Specific Brain Injury - small stroke**
- **Very Mild Impairment in Responsible Occupations**
  - **Physicians**
  - **Executives**
  - **Pilots**
  - **Public Service: Police/Fire**
  - **Contested Disability / Insurance**

# Less Complex- General Screening

Most Common: WAIS-R

(Weschler Adult Intelligent Scale - Revised)

- **Typically used in general psychiatric/psychological practice**
- **Requires a psychologist to administer**
- **Less Expensive**
- **\$200 - \$300 per administration**
- **One or two hours: administration & scoring**

# Least Complex - Mass Screening

- **Used to screen general public**
- **< 30 minute administration time**
- **Psychologist not necessary**
- **Various Forms**

# Desirable Characteristics of Screening Tests

- **Should detect target condition earlier than without screening**
- **Should have sufficient accuracy to avoid large numbers of false-positives or false-negatives**
- **Should be inexpensive and quick**
- **Should be convenient for the patient/client**
- **Should be straightforward to administer**

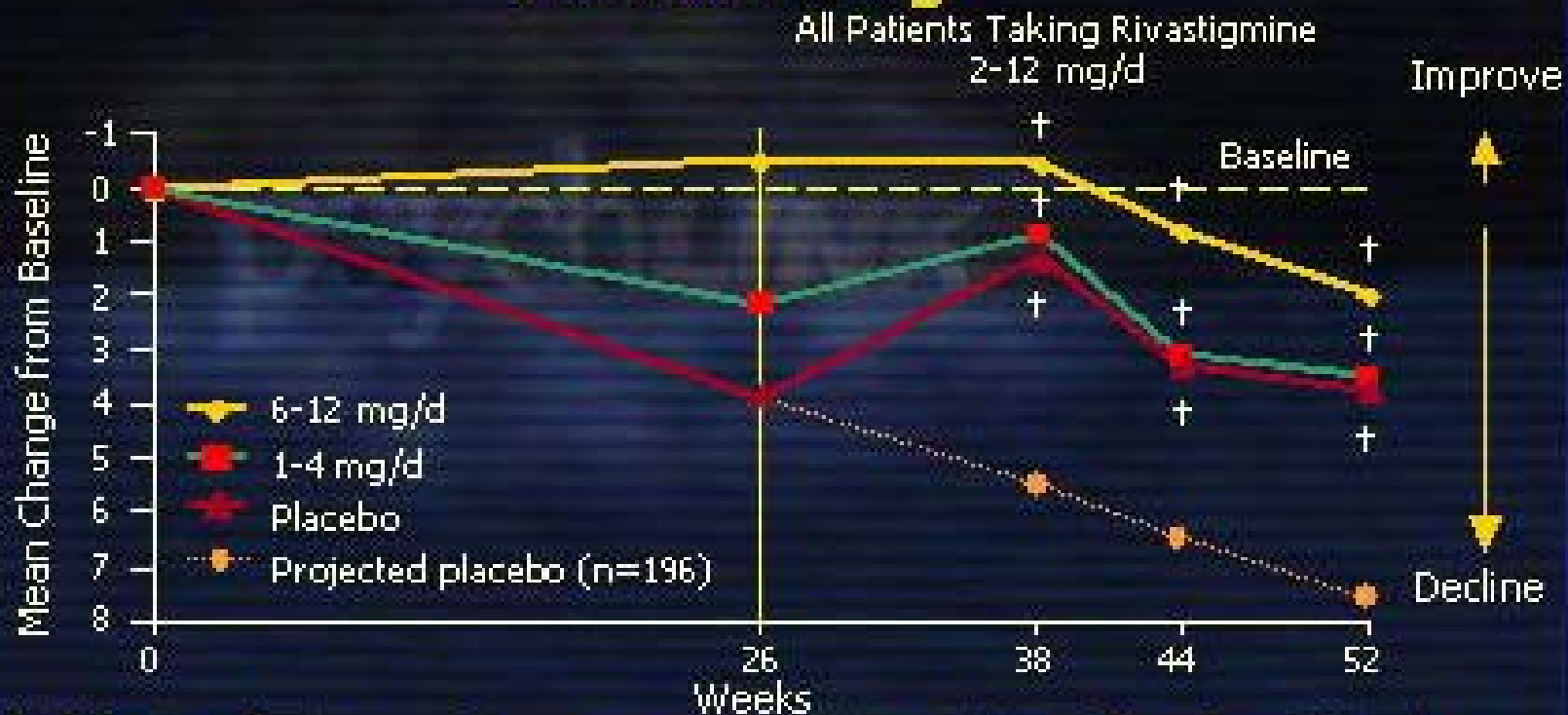
# Effectiveness of 2nd Generation Screens

	Sensitivity	Specificity	Reliability
<b>MCAS</b>	<b>97.5%</b>	<b>98.45%</b>	<b>0.93</b>
<b>D.W.R.</b>	<b>89%-96%</b>	<b>98%-100%</b>	<b>0.75</b>
<b>7-Minute Screen</b>	<b>92%</b>	<b>96%</b>	<b>0.91</b>

# Alzheimer's Disease Treatment

- **Estrogen: limited data**
- **Vitamin E: low risk, possible benefit**
- **NSAIA: ibuprofen, limited data**
- **Ginko Biloba: very limited data, low risk**
- **Acetylcholinesterase Inhibitors:**
  - **Cognex (tacrine), Exelon (rivastigmine)**
  - **Aricept (donezepil), Reminyl (galantamine)**

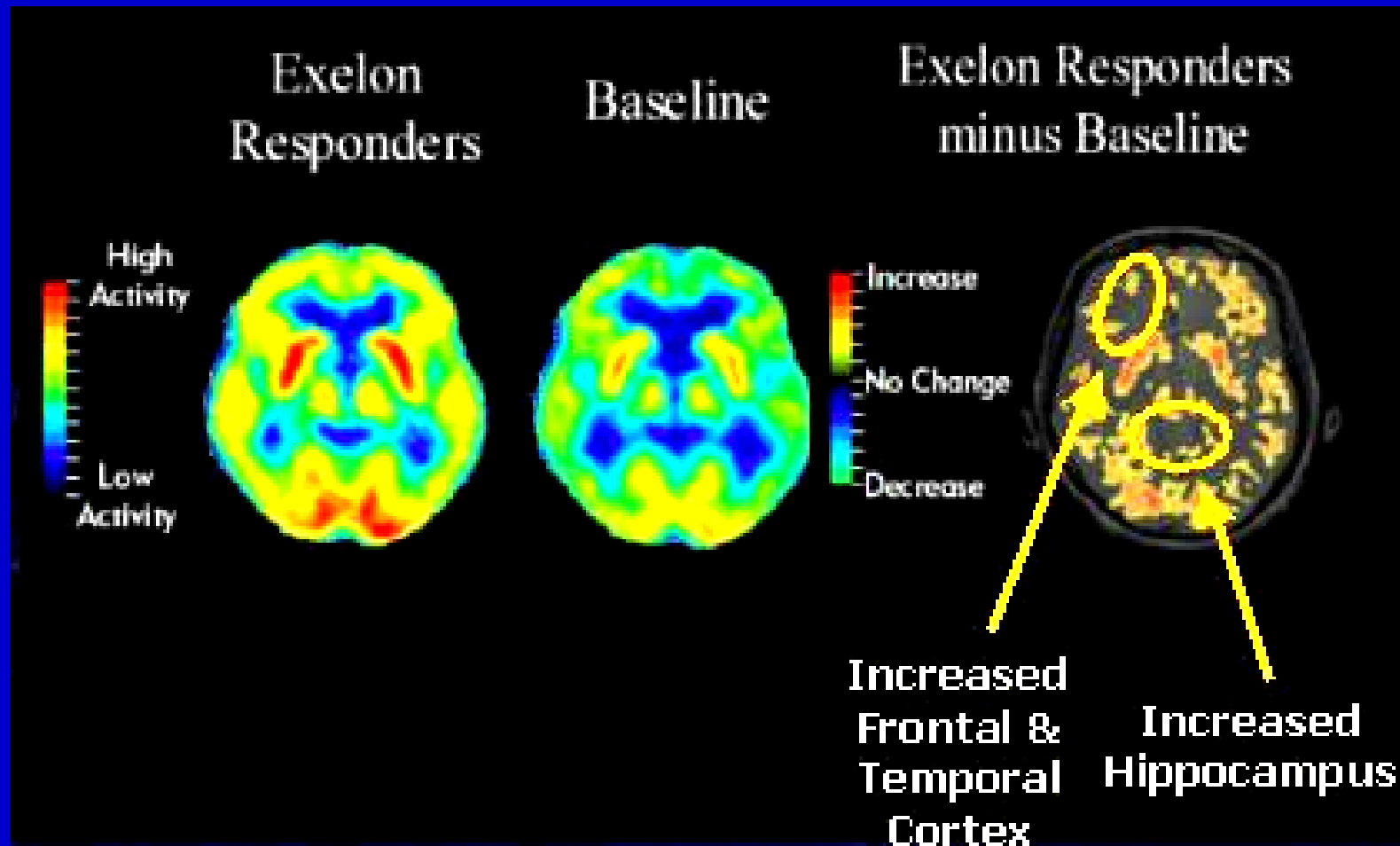
# Efficacy of Rivastigmine on Cognition Through 52 Weeks: ADAS-Cog\*



\*Alzheimer's Disease Assessment Scale - Cognitive Subscale. †P<0.05 vs projected placebo.

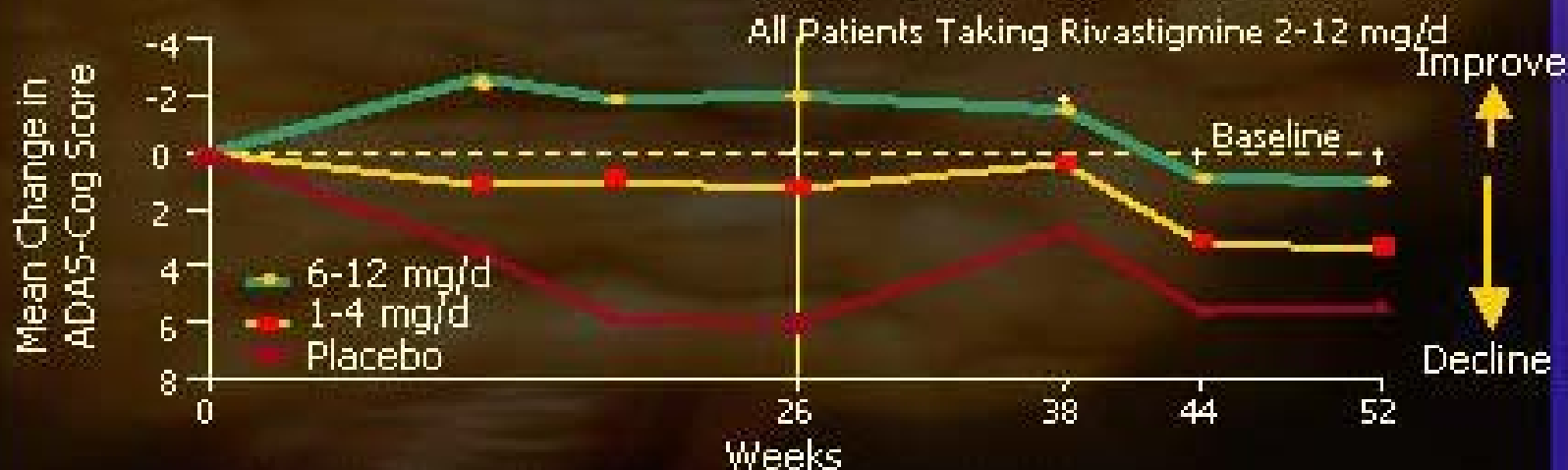
Farlow M, et al. *European Neurology* 2000. In press.

# Responders After 6 Months of Treatment with Exelon



# Long-term Effects of Rivastigmine on Cognition in Patients With More Advanced Disease (GDS\* 5-6)

*Subanalysis of Patients Rated Moderately Severe to Severe*



\*GDS = Global Deterioration Scale. \* $P < 0.05$  vs placebo.

Doraiswamy M, et al. 13<sup>th</sup> Annual Meeting of the American Association for Geriatric Psychiatry. March 12-15, 2000. Miami, FL.

Novartis Pharmaceuticals Corporation, data on file.

# Mild Cognitive Impairment

10 - 12% develop dementia each year  
vs. control populations: 1 - 2% each year

Critical Population for medication  
intervention

- Diagnosis**
- Memory complaint
  - Normal ADL's
  - Normal *general* cognition function
  - Abnormal *memory* for age
  - Not demented

# Update on the MCAS

- **Currently in use with 27 LTC Insurers**
  - **Telephonic & Face-to-Face**
  - **Underwriting & Claims**
- **Growing Interest from Life Insurers**
- **Numerous Research Projects Pending**
- **Working on Medicare Coding**

# Summary

- **Cognition is complex**
- **Accurate testing is difficult and has limitations**
- **Can spend a lot of money and time and get exceptional results**
- **Can get reasonably reliable results with a well constructed mass screening test**

# QUESTIONS