

**Preventing Alzheimer's Disease
& Related Disorders:
Delaying Onset & Progression Through
Prevention, Early Detection & Treatment**

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The Importance of Early Detection, Diagnosis and Treatment

The AD Timeline: Functional Assessment Staging Test

USA:

- A. 3.1 Million Have Detected AD
- B. 3.1 Million Have AD Not Yet Detected (FAST 2-4)
- C. 6.2 Million Have AD in Total

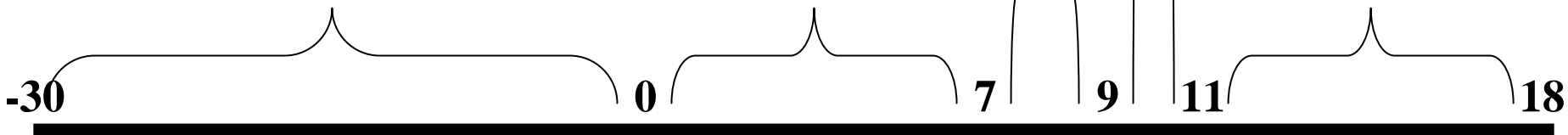
Moderate Dementia:
FAST Stages 5-6: lose basic ADLs

Mild Dementia:
FAST Stage 4:
lose complex ADLs

Severe Dementia:
FAST Stage 7:
lose speech, gait, posture

No Symptoms:
FAST Stage 1

Mild Cog. Imp.:
FAST Stages 2-3



if prevention started here, \$17,400/patient
\$54.4 Billion

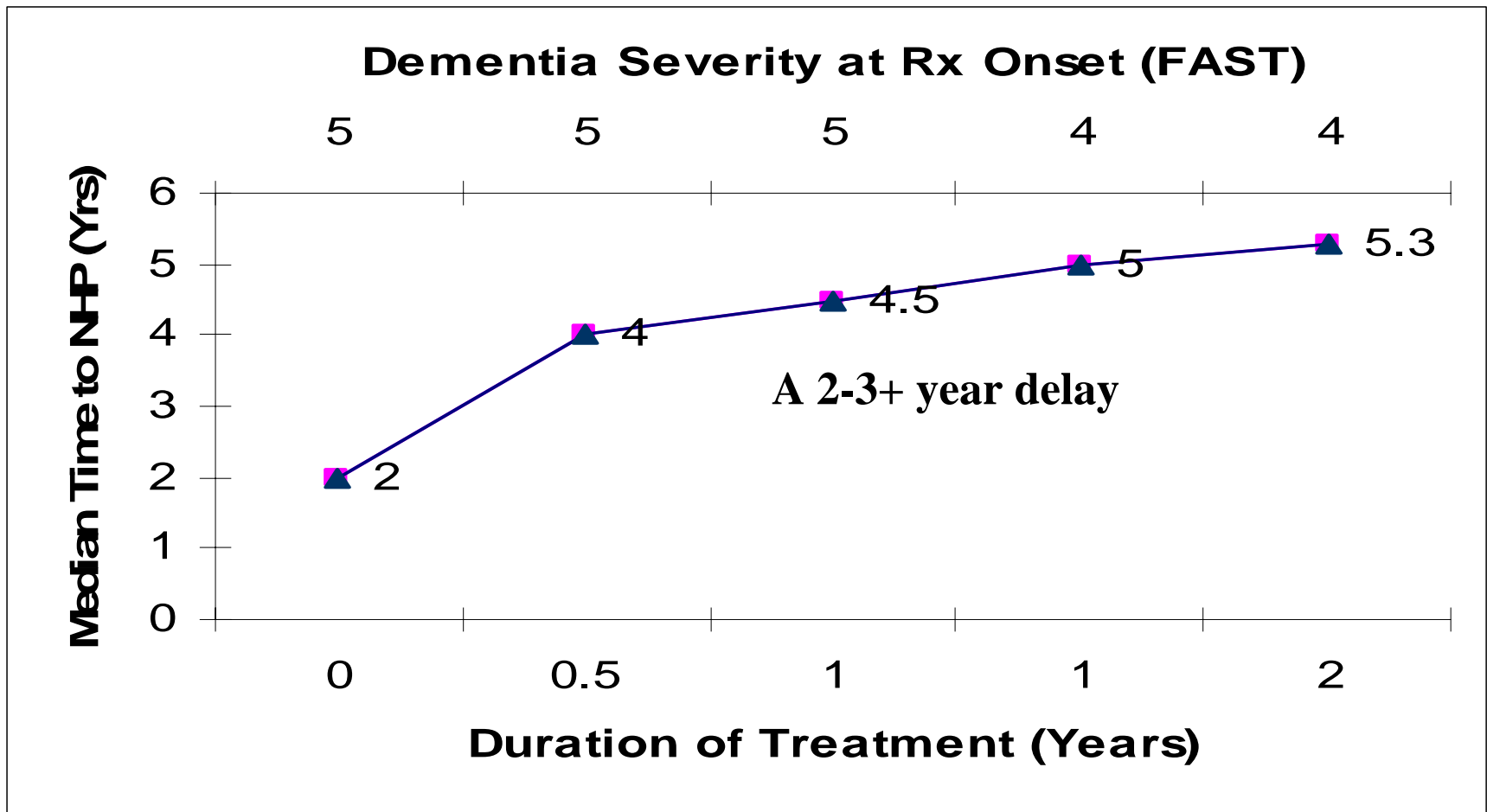
if first detected here, \$71,100/patient.
\$222.6 Billion

>2/3 first detected here,
\$142,000/LTC claim
\$444.2 Billion

Cost Per Claim:
Total USA Claims Cost:

The Impact of Treatment of Alzheimer's Disease

CheI Treatment Delays NHP: Effects of Rx Duration and Early Rx





Early Dx & Rx of Alzheimer's Disease Reduces Total Disease Costs

\$40,000 Average Annual Cost Per Patient

- **Physician & ER visits (2X non-demented)¹**
- **Hospitalization (\$4000 more/hosptlztn)^{1,2}**
- **Medications (\$3,000 more for comorbidities)^{1,3}**
- **Long-term care: \$56K/yr (4X cost of home care)²**
- **Medicare Costs are 1.6 times that of non-demented patients⁴**
- **Early Detection & Rx Can Reduce These Costs By 17-44%**

¹Doraiswamy PM, et al. Neurology. 1996;52(suppl 2):A126.

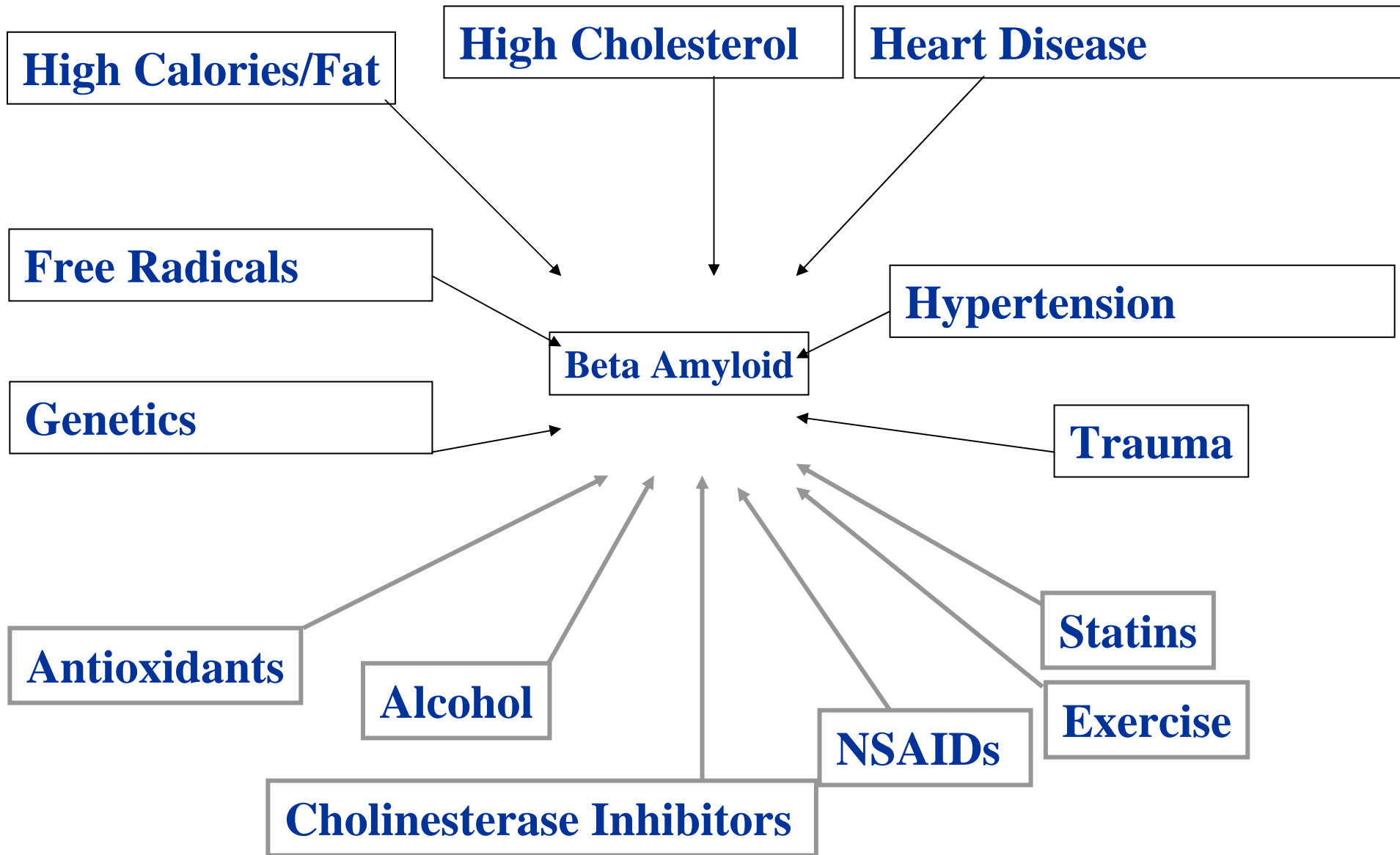
²Torian LV, et al. Int Psychogeriatr. 1994;4:231-239.

³Gutterman EM et al. J Am Geriatr Soc. 1999;47:1065-1071.

⁴Taylor DH. Research and Practice in Alzheimer's Disease. 2001. Vol. 5. Springer Pub.: 222-227

Preventing Alzheimer's: Delaying Its Onset

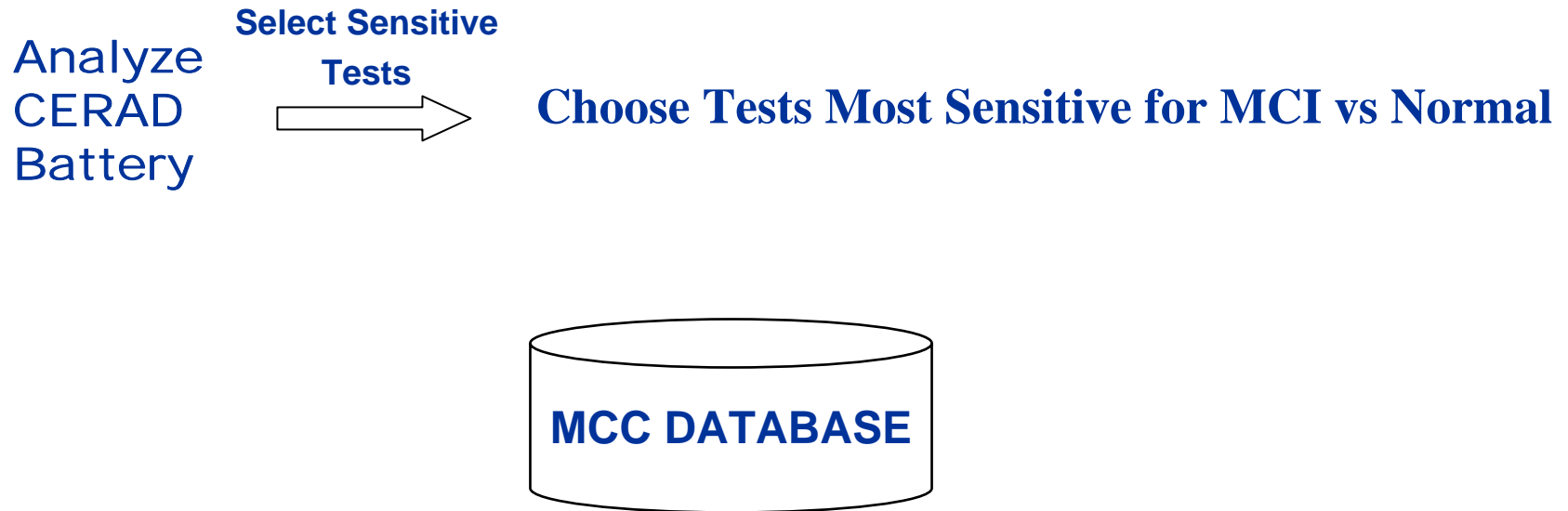
Factors Influencing Progression of Alzheimer's Disease Neuropathology



The Science Behind Detecting Mild Cognitive Impairment

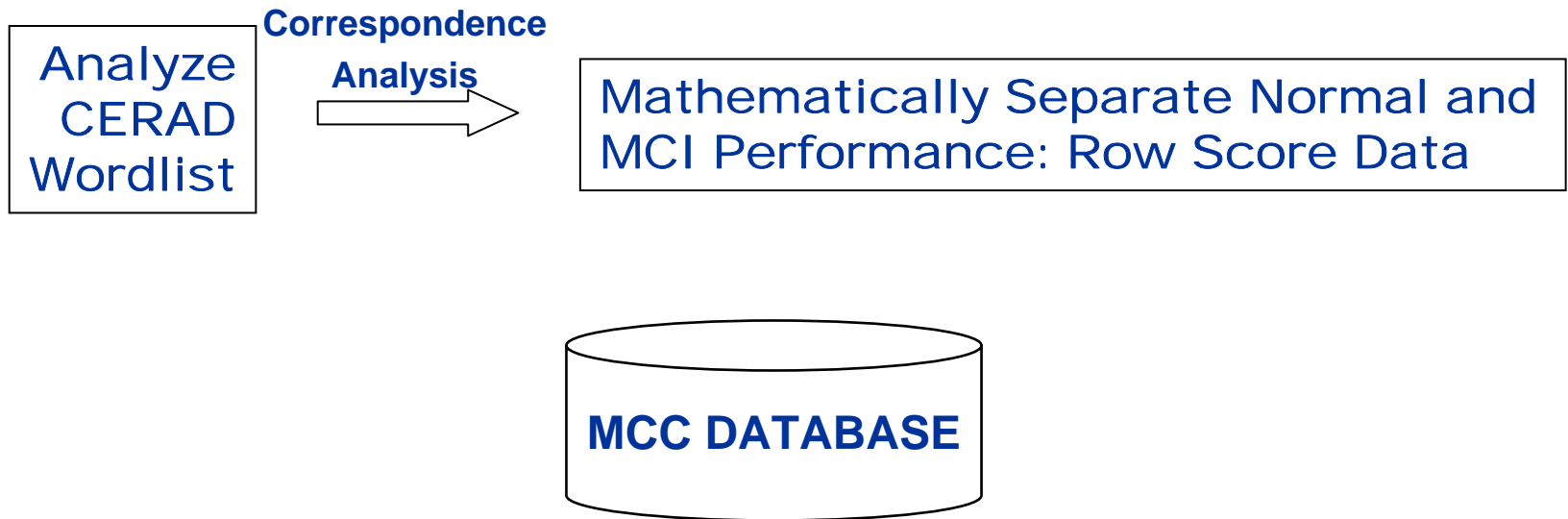
The Mathematical Filter

Developing The MCI Detection System



The CERAD Wordlist was the most sensitive test for purposes of early detection

Developing The MCI Detection System

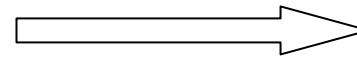


The Science Behind Detecting Mild Cognitive Impairment

The Neural Modeling Filter

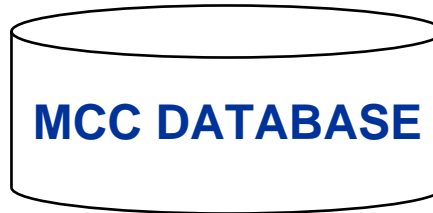
Developing The MCI Detection System

**Examine The Strength of Encoding
and Recalling or Not Recalling
Each Word in Each Trial**



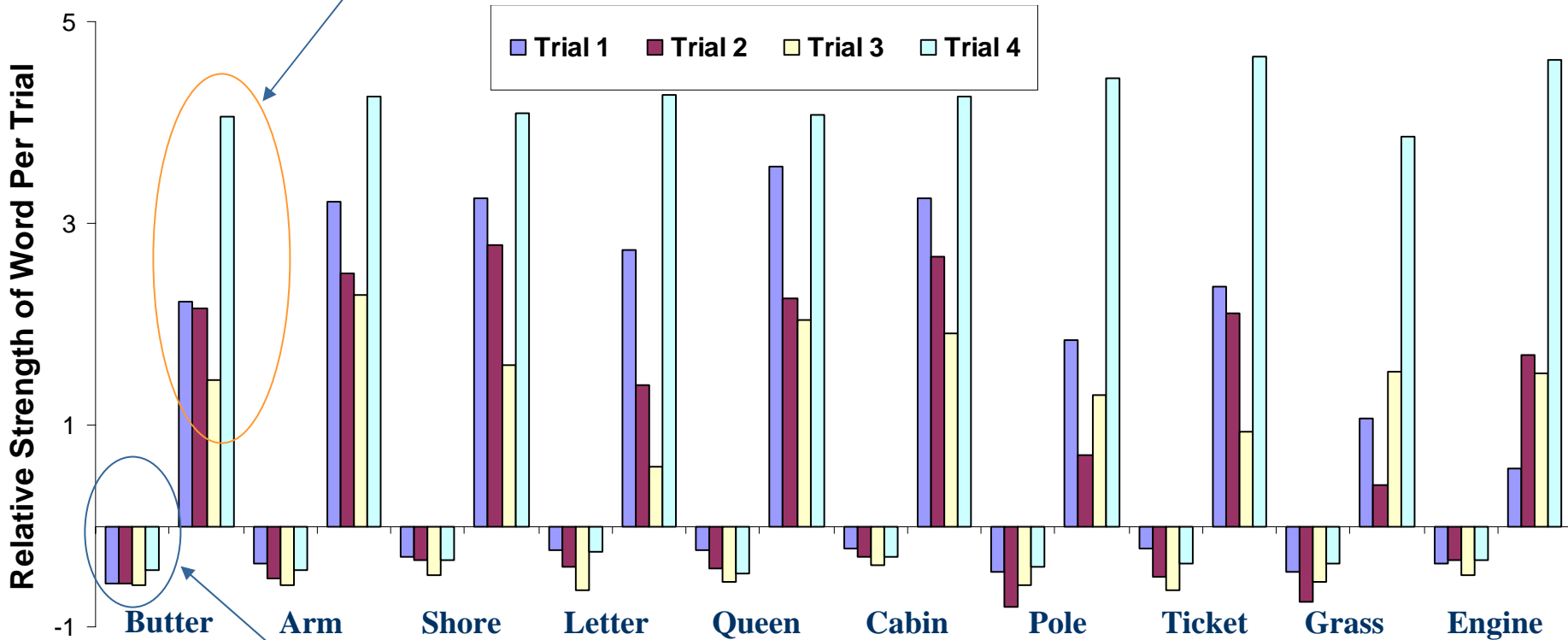
Column Scores

**Capture Processing of
Episodic Memory in the
Hippocampus**



Every Word Counts: Encoding Strength of Each Word In Each Trial Can Be Captured

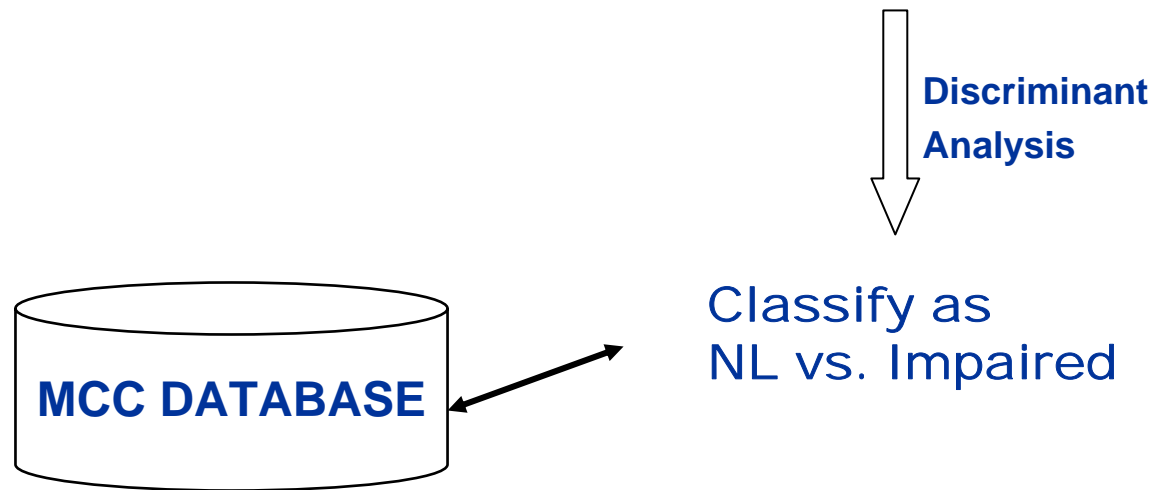
Encoding Strength of "Butter" if recalled for each of the four trials



Encoding Deficit of "Butter" if not recalled for each of the four trials

Developing The MCI Detection System

Feed Filtered Data Into Discriminant Analysis



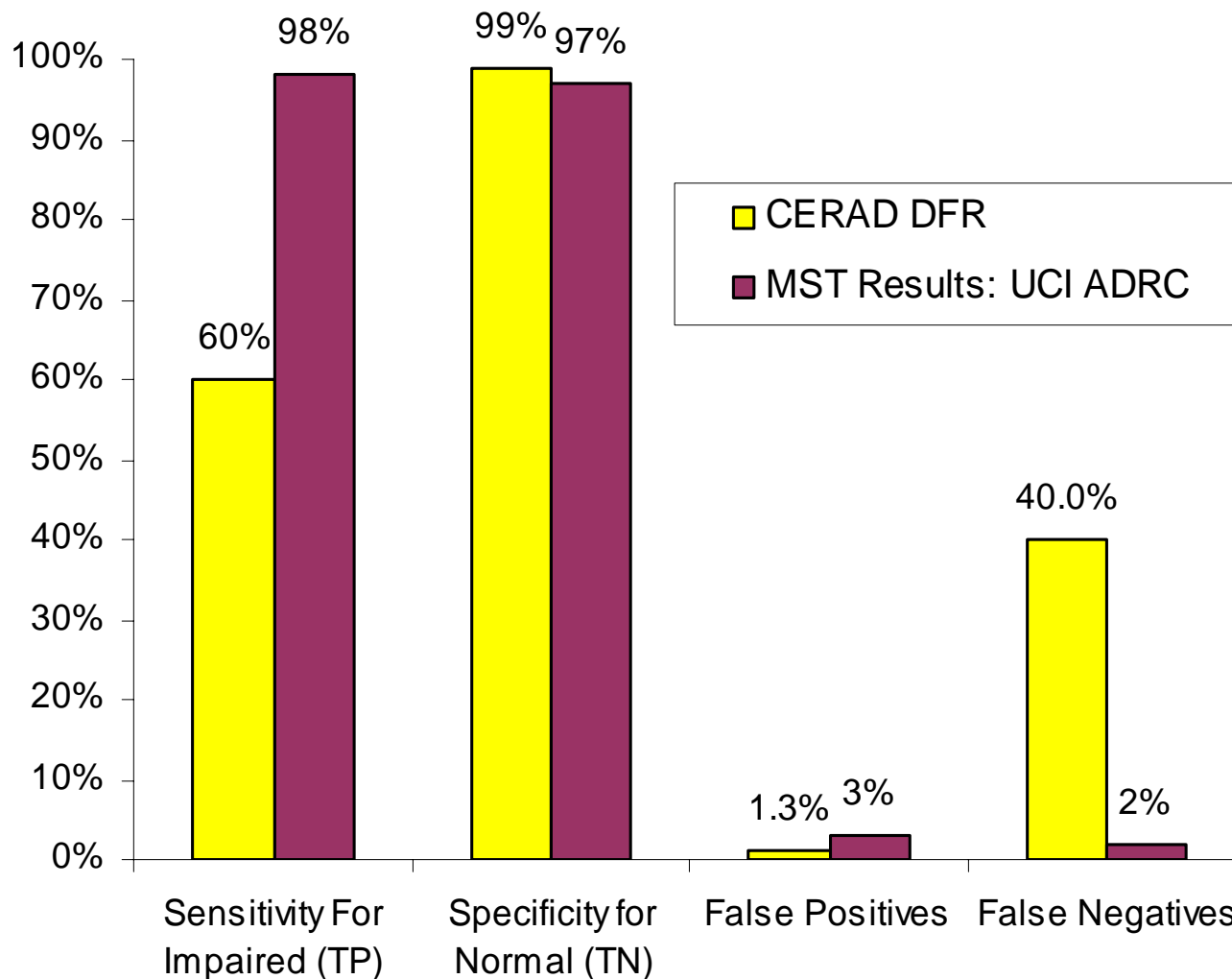
Correspondence Analysis Of The CERAD Wordlist Item Scores Gives The Most Accurate Detection of Normal Aging and MCI

| <u>CDRS</u> | <u>Dementia Severity Class</u> | <u>Classification Accuracy (%)</u> |
|-------------|------------------------------------|------------------------------------|
| 0 | (Normal) | 97% |
| 0.5 | (Mild Cognitive Impairment) | 80% |
| 0.5 | (Mild Cognitive Impairment AD) | 98% |
| 0.5 | (Mild Cognitive Impairment non-AD) | 76% |
| 1 | (Mild Dementia) | 98% |
| 2 | (Moderate Dementia) | 100% |
| 3 | (Severe Dementia) | 100% |

If the screening result is normal, then the subject does not have AD

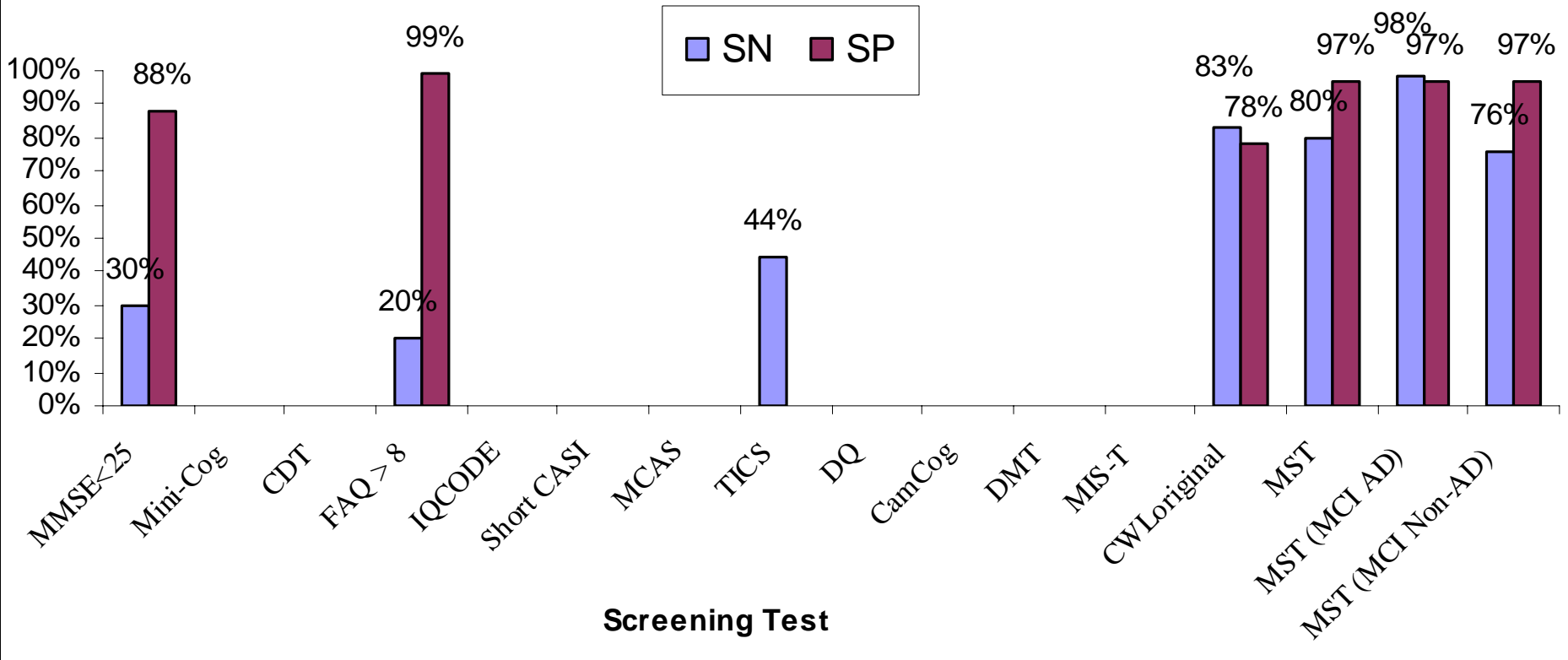
If the result is impaired, then proceed with differential diagnosis and treatment

Accuracy of MCI AD Detection For CERAD Wordlist Delayed Free Recall Compared to CERAD Wordlist Algorithm (MST: Mental Skills Test)



Note: The best possible cutoff criteria for the CERAD Wordlist still misses ~40% of well diagnosed MCI AD cases

Screening Accuracy in Normal Aging vs. Mild Cognitive Impairment

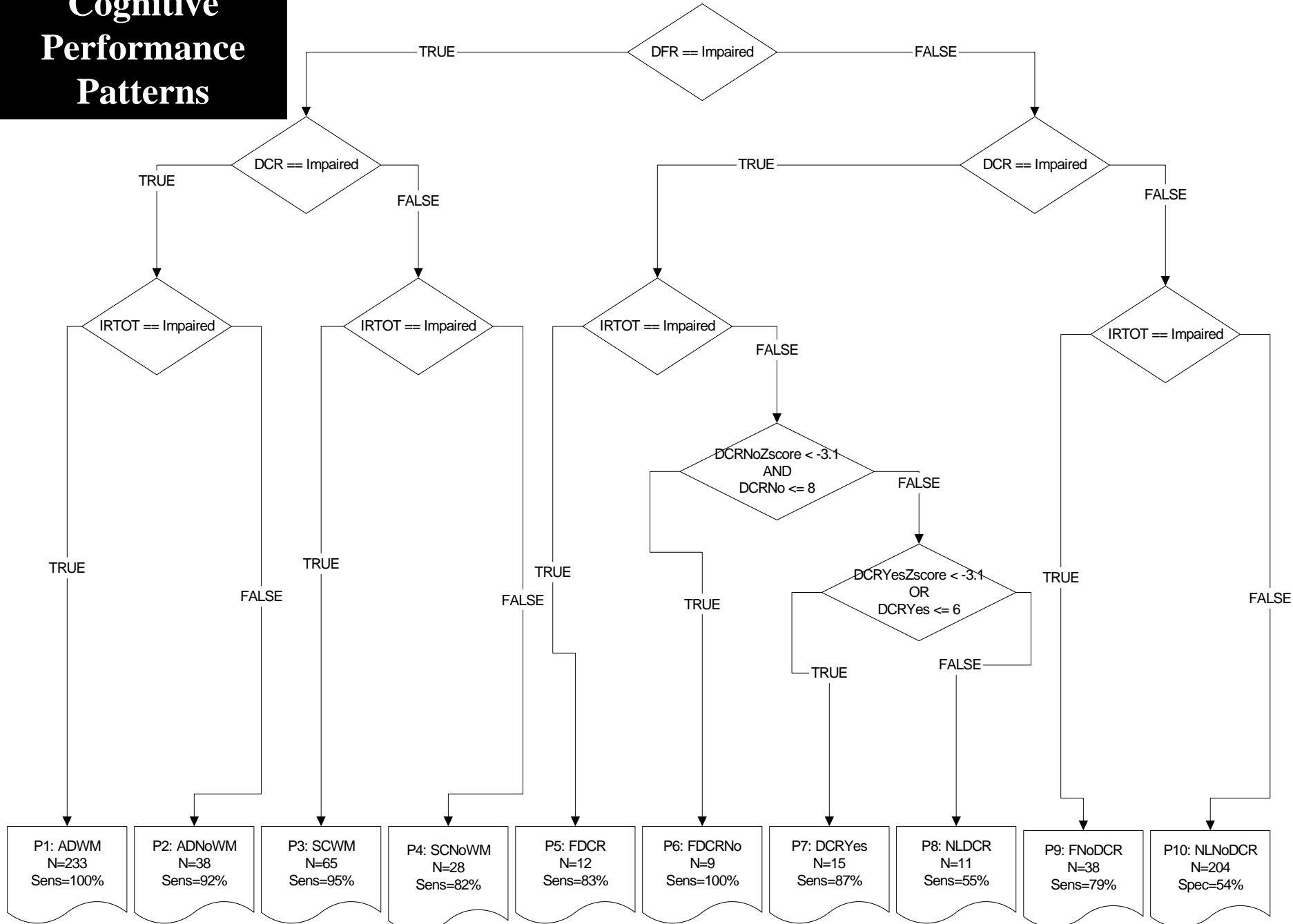


Only the MMSE, FAQ, TICS and CERAD Wordlist have published comparisons of accuracy for discriminating Mild Cognitive Impairment from Normal Aging

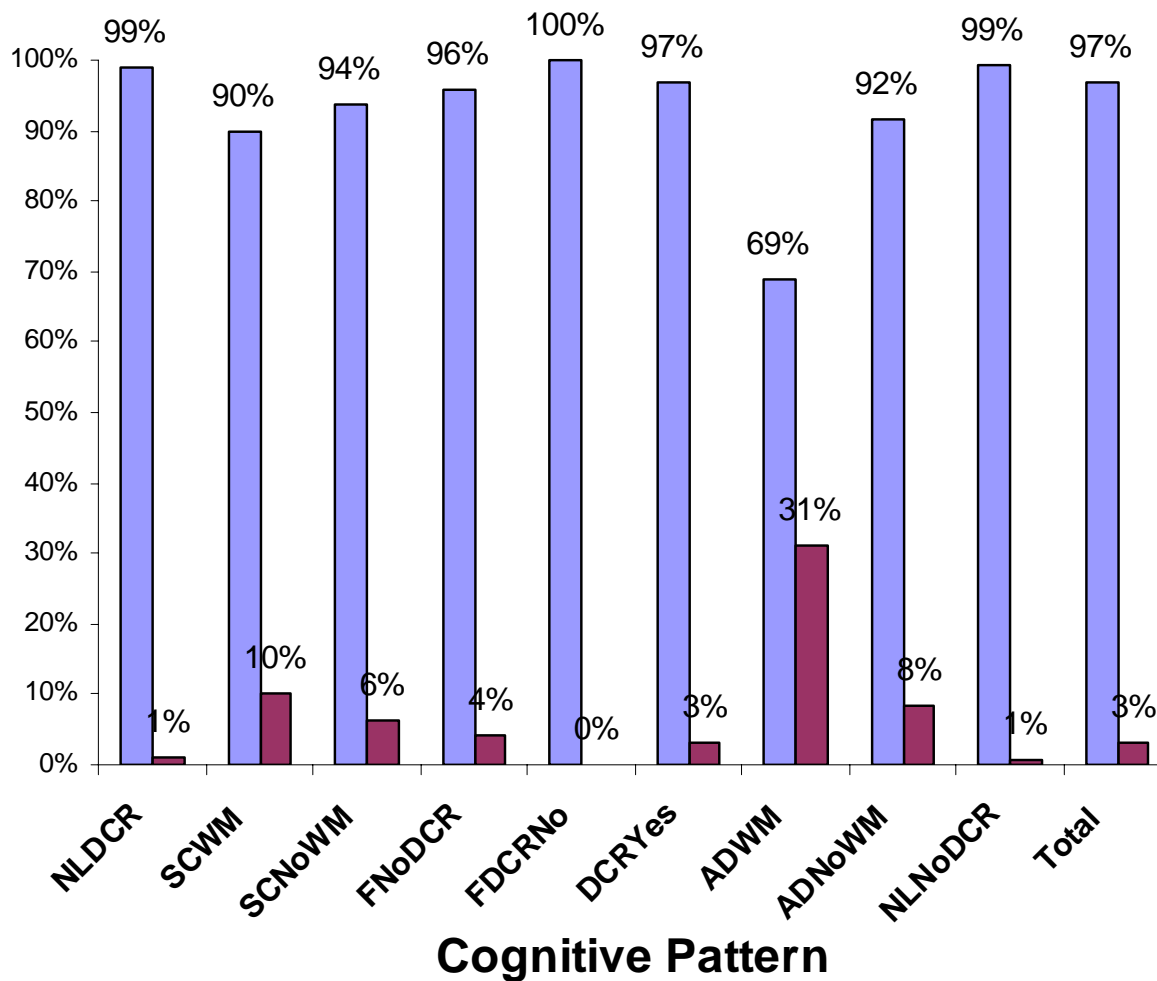
The Science Behind Detecting Mild Cognitive Impairment

The Clinical Filter

Cognitive Performance Patterns



Patterns of Cognitive Performance Further Characterize Normal & Impaired Applicants



Note: 4 cognitive performance patterns-ADWM, ADNoWM, SCNoWM and SCWM—have relatively more impaired subjects, and strongly suggest Alzheimer's Disease or Vascular Dementia.

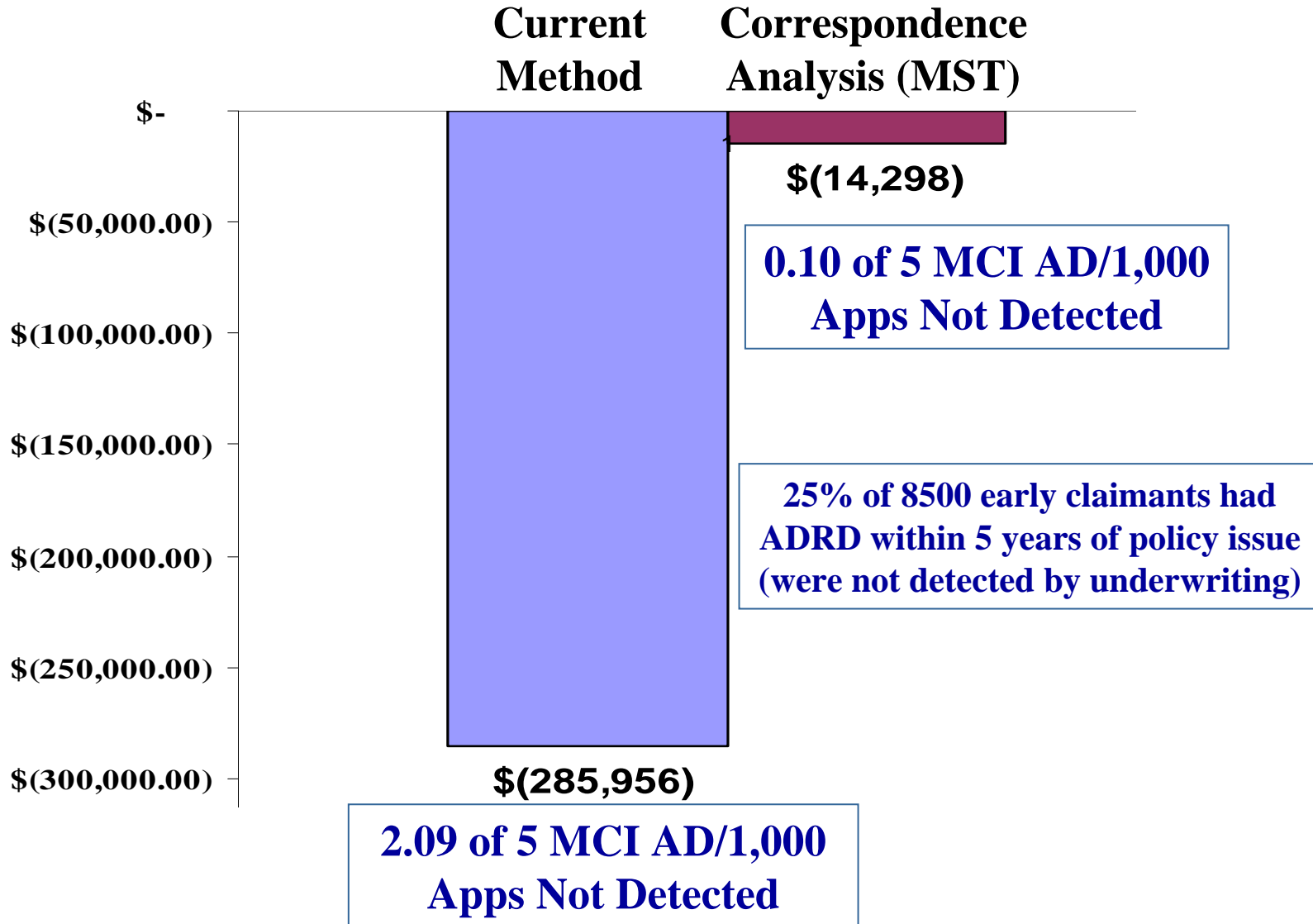
Mathematical, Clinical and Hippocampal Filters Combine to Form The Mental Skills Test To Detect Normal Aging vs. MCI

| Infoducer™ Early ADRD Detection | No. of Subjects | Sensitivity (Impaired) | Specificity (Normals) |
|--|------------------------|-------------------------------|------------------------------|
| Mental Skills Test: MCI AD vs. Normal | 641 | 98% | 97% |
| Memory Screen: MCI vs. Normal | 476 | 94% | 80% |

Mental Skills Test

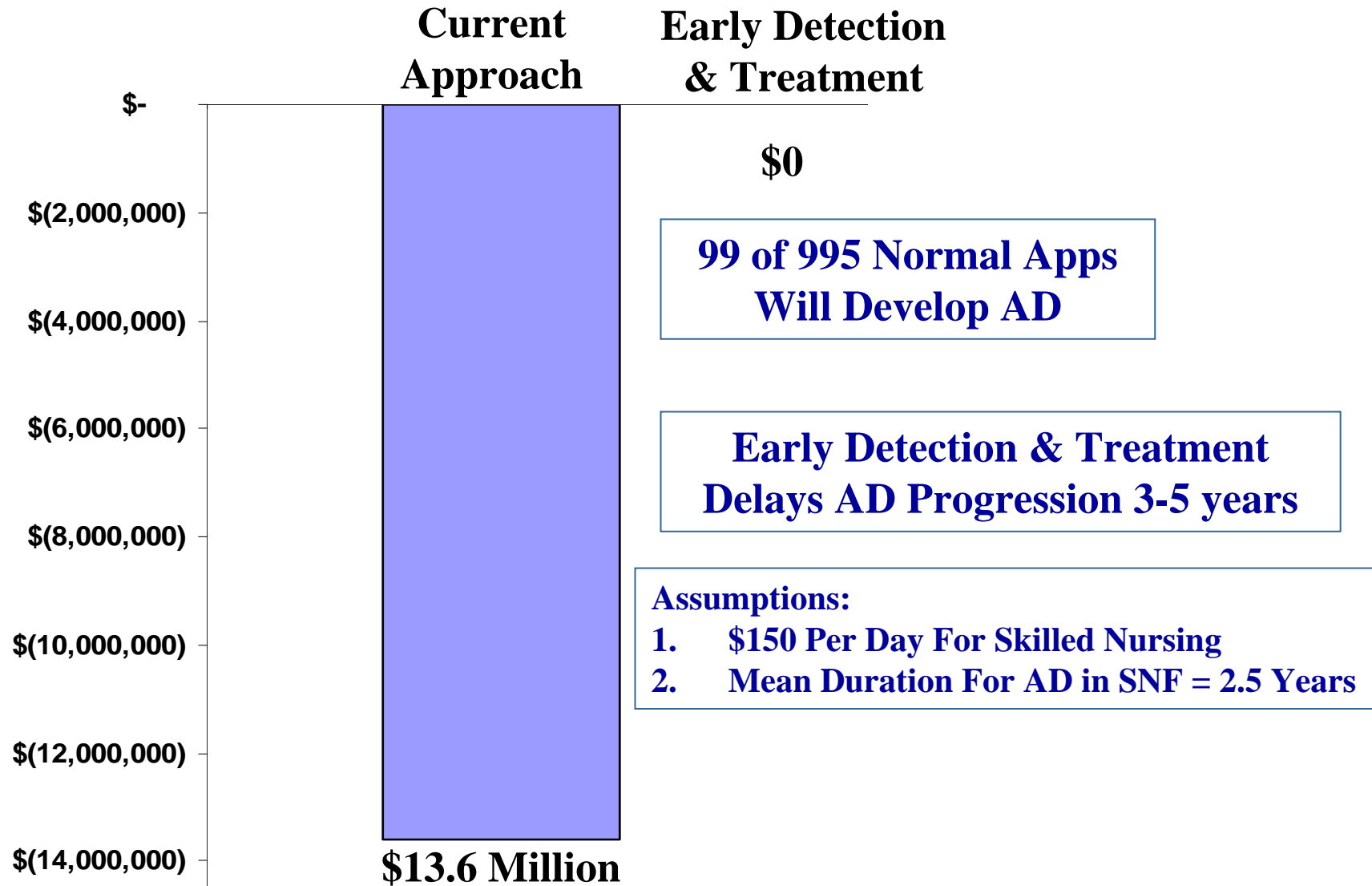
- **98% Accurate**
- **8-10 Minutes**
- **Office Staff gives test**
- **Online 7/24**
- **Immediate Report (Pt+MD)**

Comparison of Claims Costs of MCI AD Cases Not Detected Per 1,000 Applicants During Underwriting, and Issued a Long-Term Care Policy



Better Detection of MCI AD Saves \$272,000 Per 1,000 LTC Applicants

Comparison of Claims Costs of Normal Cases Issued a Long-Term Care Policy Who Later Develop AD: Effect of Early Detection and Treatment



Early Detection & Treatment AD Saves \$13.6 Million Per 1,000 LTC Applicants

The Mental Skills Test: Diverse Areas Tested

Frontal Lobe

- Behavior
- Mood
- Judgment
- Processing Speed
- Working Memory

Parietal Lobe

- Comprehension



Temporal Lobe

- Comprehension
- Naming
- Episodic Memory