Neuropsychology of Aging and Dementia

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Cognitive Neurology and Alzheimer’s Disease Center
Northwestern University Feinberg School of Medicine
• Changing concepts of cognitive aging

• Neurodegenerative disease is focal and affects large-scale neurocognitive networks, producing distinctive neuropsychological profiles of dementia

• Role of neuropsychology, assessment principles

• Neuropsychological Profiles Of Dementia: Amnestic, Aphasic, Visuospatial, Comportmental
SPECTRUM OF AGE-RELATED COGNITIVE CHANGE: A Race Against Time

“Super” Aging

“Normal” Aging

Preclinical

“Mild Cognitive Impairment”

“Alzheimer’s Disease or other dementia”
WMS-III Average For Age

Evans, Grodstein, Loewenstein, Kaye, Weintraub, JAD, 2011
DEMENTIA: If not politically correct, still a useful concept

• Progressive decline in cognition and/or behavior from a prior level of functioning in one or more of: memory, reasoning, language, visual processes, executive functions, social-interpersonal behaviors, comportment, personality
• Interferes with customary activities of daily life and social relationships, causing dependence, alienation
• Caused by irreversible brain disease

Wicklund and Weintraub, Turkish Journal of Neurology, 2004
DIFFERENTIAL DIAGNOSIS

ACUTE/SUBACUTE
- Metabolic
- Vascular
- Toxic
- Infectious
- Epileptic
- Paraneoplastic

INSIDIOUS/GRADUAL
- Hydrocephalus
- Vascular
- Tumor

Neurodegenerative
- Non Alzheimer’s Disease
  - Diffuse Lewy Body
  - Prion Disease
- Alzheimer’s Disease
  - FTLD
  - TAUOPATHIES
    - Pick Disease, CBD, PSP
    - Tangle Predominant SD
    - Argyrophilic Grain Disease
    - FTDP-17
    - Dementia Pugilistica
    - Etc.
  - UBIQUITINOPATHIES
    - TDP-43 +
    - TDP-43-
  - FUS NIFID BIBD
HOW DO LEVELS OF DEMENTIA TERMS MAP ONTO ONE ANOTHER?

CLINICAL SYNDROME
- e.g. Progressive supranuclear palsy
- Primary progressive aphasia

1:1

NEUROANATOMICAL DISTRIBUTION
- e.g., Corticobasal degeneration

??

TISSUE DX
- e.g., TDP-43 proteinopathy

??

GENETIC MUTATIONS
- e.g., PS1, PS1, PGRN, MAP-T

??

Adapted from Weintraub and Mesulam, 1993.
In the absence of biomarkers...

Neuropsychological assessment provides:

• Objective markers of symptoms – is there a dementia?
• Early detection
• Magnitude of change and rate of decline
• Differential diagnosis
• Blueprint for management and education
Amnestic Dementia aka Probable AD

Level of Impairment

SEVERE

Mild

Moderate

Early

Late

Attention

Mood/Affect

Language

Visual Perception

Explicit Memory

Reasoning

Executive

Comportment
Progressive Visuospatial Dysfunction
Aka Posterior Cortical Atrophy

Level of Impairment

SEVERE

MODERATE

MILD

Attention
Mood/Affect
Language
Visual
Perception
Explicit
Memory
Reasoning
Executive
Comportment

Early
Late

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Initial Neuropsychological Profile

1:1

Large-Scale Neuroanatomical Network
(Memory, Language, Visuospatial, Executive)

AD
CLBD
FTLD-TDP43
FTLD-TAU
Vascular
Initial Neuropsychological Profile
AMNESIA +

1:1 Correspondence

Large-Scale Neuroanatomical Network
LIMBIC-TEMPORAL

90% 10%

AD
OTHER Vascular CLBD...
### Nomenclature for neuropathologic subtypes of frontotemporal lobar degeneration: an update.

**Acta Neuropathologica, 2010**


<table>
<thead>
<tr>
<th>Old terminology</th>
<th>2009 terminology</th>
<th>2010 terminology</th>
<th>Associated genes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tau-positive FTLD</td>
<td>FTLD-tau</td>
<td>FTLD-tau</td>
<td></td>
</tr>
<tr>
<td>Pick disease</td>
<td>FTLD-tau (PiD)</td>
<td>FTLD-tau (PiD)</td>
<td></td>
</tr>
<tr>
<td>CBD</td>
<td>FTLD-tau (CBD)</td>
<td>FTLD-tau (CBD)</td>
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<tr>
<td>Progressive supranuclear palsy</td>
<td>FTLD-tau (PSP)</td>
<td>FTLD-tau (PSP)</td>
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</tr>
<tr>
<td>Argyrophilic grain disease</td>
<td>FTLD-tau (AGD)</td>
<td>FTLD-tau (AGD)</td>
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<tr>
<td>Mult. syst. tauop. w/ dementia</td>
<td>FTLD-tau (MSTD)</td>
<td>FTLD-tau (MSTD)</td>
<td>MAPT</td>
</tr>
<tr>
<td>Tangle-predom senile dementia</td>
<td>FTLD-tau (NFT-dementia)</td>
<td>FTLD-tau (NFT-dementia)</td>
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</tr>
<tr>
<td>WM tauop w/ glob. glial inclusions</td>
<td>FTLD-tau (WMT-GGI)</td>
<td>FTLD-tau (WMT-GGI)</td>
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<tr>
<td>Unclassifiable tauopathy</td>
<td>FTLD-tau (unclassifiable)</td>
<td>FTLD-tau (unclassifiable)</td>
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<tr>
<td>Tau-negative FTLD</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>FTLD-U</td>
<td>FTLD-TDP (TDP positive)</td>
<td>FTLD-TDP</td>
<td>GRN, VCP, 9p, TARDP</td>
</tr>
<tr>
<td>Types 1-4</td>
<td>Types 1-4</td>
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<td></td>
</tr>
<tr>
<td>Unclassifiable</td>
<td>Unclassifiable</td>
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<td></td>
</tr>
<tr>
<td>FTLD-UPS (TDP negative)</td>
<td>FTLD-UPS</td>
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<td>CHMP2B</td>
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<tr>
<td>FTD-3</td>
<td>FTD-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>aFTLD-U</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NIFID</td>
<td>FTLD-IF</td>
<td>FTLD-FUS</td>
<td>FUS</td>
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<td>NIFID</td>
<td>aFTLD-U</td>
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<tr>
<td>BIBD</td>
<td>NIFID</td>
<td>BIBD</td>
<td></td>
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<tr>
<td>DLDH</td>
<td>FTLD-ni</td>
<td>FTLD-ni</td>
<td></td>
</tr>
</tbody>
</table>

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Is there change from a prior level of functioning?

ESTIMATED PEAK PRIOR ABILITY:

- IQ/Reading SCORES
- Level and quality of education
- Career/home accomplishments
- Civic/social responsibilities
- Hobbies/recreation
- Usual emotional reactions
Activities of Daily Living Questionnaire (ADL-Q)
Johnson, Barion, Rademaker, Rehkemper, Weintraub, ADAD, 2004

Self-Care                Household Care
Employment/Recreation    Shopping/Money
Travel                   Communication

Recreation

0 = Same as usual
1 = Engages in recreational activities less frequently
2 = Has lost some skills necessary for recreational activities (e.g., bridge, golfing); needs coaxing to participate
3 = No longer pursues recreational activities
9 = Never engaged in recreational activities OR don't know

Mild=0-33%; Moderate=34-66% Severe=>66%
Staging Dementia Severity
Mild, Moderate, Severe

Staging TESTS:
MMSE
Blessed Dementia Scale (BDS)
Mattis Dementia Rating Scale
Montreal Cognitive Assessment
RBANS

Observer RATINGS:
Clinical Dementia Rating (CDR)
Does the MMSE capture severity in PPA and BvFTD?

- MMSE most common tool to gauge dementia severity
- Heavily weighted towards cognitive deficits of AD (memory)
- Heavily dependent on Language
**The MMSE In Behavioral Variant Frontotemporal Dementia And Primary Progressive Aphasia**

Osher, Wicklund, Rademaker, Johnson, Weintraub

American Journal of Alzheimer’s Disease and Other Dementias, 2007

---

**Table 1: Sample Demographics**

<table>
<thead>
<tr>
<th>Demographic Variables</th>
<th>bvFTD (N=41)</th>
<th>PPA (N=30)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Median</strong></td>
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<td></td>
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<tr>
<td>Age (years)</td>
<td>61</td>
<td>67</td>
</tr>
<tr>
<td><strong>25th-75th%ile</strong></td>
<td>(56-70) *</td>
<td>(62-72)</td>
</tr>
<tr>
<td>Education (years)</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td><strong>25th-75th%ile</strong></td>
<td>(12-16)</td>
<td>(14-16)</td>
</tr>
<tr>
<td>Symptom Duration (years)</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>25th-75th%ile</strong></td>
<td>(2-4)</td>
<td>(2-5)</td>
</tr>
<tr>
<td>MMSE (Total = 30)</td>
<td>23</td>
<td>24</td>
</tr>
<tr>
<td><strong>25th-75th%ile</strong></td>
<td>(18-27)</td>
<td>(21-27)</td>
</tr>
<tr>
<td>ADLQ (0-100%)</td>
<td>27</td>
<td>13</td>
</tr>
<tr>
<td><strong>25th-75th%ile</strong></td>
<td>(19-40)**</td>
<td>(8-22)</td>
</tr>
</tbody>
</table>

* bvFTD were significantly younger than PPA (p<.05)

** bvFTD scored significantly higher on the ADLQ than PPA (p<.01)

---

Osher et al AJADD, 2007
Annualized percentage change on the MMSE and the ADLQ

Change Scores

<table>
<thead>
<tr>
<th></th>
<th>PPA</th>
<th>FTD</th>
</tr>
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<tbody>
<tr>
<td>% Change</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-25%</td>
<td>-20%</td>
</tr>
<tr>
<td></td>
<td>-20%</td>
<td>-15%</td>
</tr>
<tr>
<td></td>
<td>-15%</td>
<td>-10%</td>
</tr>
<tr>
<td></td>
<td>-10%</td>
<td>0%</td>
</tr>
</tbody>
</table>

* * p < .05

MMSE
ADLQ
### UDS Supplemental CDR: Behavior, Language Ratings

**Knopman, Weintraub, Pankratz, NEUROLOGY 2011**

#### SECTION 2: SUPPLEMENTAL CDR

<table>
<thead>
<tr>
<th>IMPAIRMENT</th>
<th>None</th>
<th>Questionable</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.5</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>9. BEHAVIOR, COMPORTMENT AND PERSONALITY</strong>¹</th>
<th>Socially appropriate behavior.</th>
<th>Questionable changes in comportment, empathy, appropriateness of actions.</th>
<th>Mild but definite changes in behavior.</th>
<th>Moderate behavioral changes, affecting interpersonal relationships and interactions in a significant manner.</th>
<th>Severe behavioral changes, making interpersonal interactions all unidirectional.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10. LANGUAGE</strong>³</td>
<td>No language difficulty or occasional mild tip-of-the-tongue.</td>
<td>Consistent mild word finding difficulties; simplification of word choice; circumlocution; decreased phrase length; and/or mild comprehension difficulties.</td>
<td>Moderate word finding difficulty in speech; cannot name objects in environment; reduced phrase length and/or agrammatical speech; and/or reduced comprehension in conversation and reading.</td>
<td>Moderate to severe impairments in either speech or comprehension; has difficulty communicating thoughts; writing may be slightly more effective.</td>
<td>Severe comprehension deficits; no intelligible speech.</td>
</tr>
</tbody>
</table>

**Please enter scores below**
## PROGRESSIVE APHASIA SEVERITY SCALE (PASS)

<table>
<thead>
<tr>
<th></th>
<th>Normal (0)</th>
<th>Questionable/very mild impairment (0.5)</th>
<th>Mild impairment (1)</th>
<th>Moderate impairment (2)</th>
<th>Severe impairment (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FLUENCY:</strong></td>
<td>Normal flow of speech.</td>
<td>Speech contains occasional blank pauses or use of fillers (umm); reduced WPM and/or phrase length.</td>
<td>Speech is in short phrases, interrupted with pauses or groping for words but there are occasional runs of fluent speech.</td>
<td>Dysfluencies in most utterances; phrase length rarely exceeds three words.</td>
<td>Severely dysfluent speech; phrase length rarely exceeds one word. May not speak.</td>
</tr>
<tr>
<td>Use of word forms</td>
<td>No difficulty in the use of grammar and syntax.</td>
<td>Occasional agrammatism or paragrammatism (i.e., odd sentence structure such as, &quot;I my car drive in your house.&quot;); may complain it is effortful to combine words into phrases or sentences.</td>
<td>Frequent agrammatism; sentence structures are simple; frequent misuse/omission of grammatical words or morphology.</td>
<td>Utterances contain mostly content words with rare use of syntactic word groupings, functor words, or morphological markers.</td>
<td>Single word utterances or no speech/writing.</td>
</tr>
<tr>
<td><strong>SINGLE-WORD COMPREHENSION:</strong> Ability to understand spoken or written single words</td>
<td>No difficulty understanding single words in conversation or testing.</td>
<td>Occasional difficulty understanding low frequency words (e.g., cork); may question the meaning of words (e.g., “What is a ____?”</td>
<td>Displays lack of word comprehension several times in a brief conversation but able to carry on reasonably meaningful conversation.</td>
<td>Understands some high frequency and/or familiar words. Questions the meaning of many words in conversation.</td>
<td>Minimal comprehension of single words.</td>
</tr>
</tbody>
</table>
Neuropsychological Battery

Neurocognitive Domains

Attention
Executive Functions
Mood/Affect/Behavioral Scales
Memory
Language
Visuospatial
Reasoning

Specialized (neglect; semantic deficits; simultanagnosia)
Principles Of Assessment

- Select “pure” measures
- Cover all domains, but be brief
- Identify PRIMARY DOMAIN Of Deficit
- Identify “Secondary” symptoms- i.e., word list memory test failed due to aphasia
- Choose tests appropriate for demographics
Test Choices - Memory

• HARD
  • CVLT, RAVLT
  • Selective Reminding Test
  • Rey-Osterreith Figure; Benton VRT

• MODERATE
  • WMS Logical Memory
  • WMS Word List or CERAD List (10 items)
  • RBANS Word List; Story; Design

• EASY
  • Three Words Three Shapes
  • 3 words from MMSE
Case 1

- 81 yo male
- retired M.D.
- insidious onset
- progressive, 4y
- repetitive, losing belongings
- PMH: CAD
- allergies, asthma
- CT unremarkable

- Dementia? Yes
- Memory abn? Yes
- Other abn? EF
- Profile: Amnesia
- DX: PrAD

<table>
<thead>
<tr>
<th>PROCEDURE</th>
<th>Level</th>
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</thead>
<tbody>
<tr>
<td>MMSE</td>
<td>Normal</td>
</tr>
<tr>
<td>ADL Scale</td>
<td>Mild</td>
</tr>
<tr>
<td>Geriatric Depression Scale</td>
<td>Normal</td>
</tr>
<tr>
<td>TRAIL MAKING B</td>
<td>Mild</td>
</tr>
<tr>
<td>Word List Learning</td>
<td>Average</td>
</tr>
<tr>
<td>Word List Delayed Recall</td>
<td>Impaired</td>
</tr>
<tr>
<td>Word List Recognition</td>
<td>Impaired</td>
</tr>
<tr>
<td>Story Recall Immediate</td>
<td>Average</td>
</tr>
<tr>
<td>Story Recall Delayed</td>
<td>Average</td>
</tr>
<tr>
<td>Judgment Of Line Orientation</td>
<td>Superior</td>
</tr>
<tr>
<td>Visual Verbal Test</td>
<td>Normal</td>
</tr>
<tr>
<td>Boston Naming Test</td>
<td>Average</td>
</tr>
<tr>
<td>Word List Generation</td>
<td>Average</td>
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</tbody>
</table>
Drilled Word Span Procedure

1. Word list = forward digit span minus one

2. Drill to criterion (3 correct successive trials)

3. Test recall after: 60 seconds with no distraction, 60 seconds with distraction, 3 minutes

<table>
<thead>
<tr>
<th>Words</th>
<th>Learning Trials</th>
<th>Recall Trials</th>
<th>Recognition</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>60” ND 60” D 3Min</td>
<td>Y/N FP</td>
</tr>
<tr>
<td>apple</td>
<td>1 1 1</td>
<td>1 1</td>
<td>+</td>
</tr>
<tr>
<td>shoe</td>
<td>2 2 2</td>
<td>2 2</td>
<td>+</td>
</tr>
<tr>
<td>horse</td>
<td>3 3 3</td>
<td>3 3</td>
<td>+</td>
</tr>
<tr>
<td>truck</td>
<td>4 4 4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>window</td>
<td>5 5 5</td>
<td>5</td>
<td>+</td>
</tr>
</tbody>
</table>

ND= No distraction
D= Distraction
Drilled Word Span Procedure

1. Word list = forward digit span minus one
2. Drill to criterion (3 correct successive trials)
3. Test recall after: 60 seconds with no distraction, 60 seconds with distraction, 3 minutes

<table>
<thead>
<tr>
<th>Words</th>
<th>Learning Trials</th>
<th>Recall Trials 60” ND 60” D 3Min</th>
<th>Recognition</th>
<th>Y/N  FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>1 1 1 1 1</td>
<td>1 1 1</td>
<td>Apple</td>
<td>+</td>
</tr>
<tr>
<td>Shoe</td>
<td>2 1 2 2 2</td>
<td>2 2 2</td>
<td>Pencil</td>
<td>+ None</td>
</tr>
<tr>
<td>Horse</td>
<td>2 3 3 3 3</td>
<td>3 3 3</td>
<td>Orange shoe</td>
<td>+</td>
</tr>
<tr>
<td>Truck</td>
<td>3 4 4 4 4</td>
<td>4 4 4</td>
<td>Horse</td>
<td>+</td>
</tr>
<tr>
<td>Window</td>
<td>5 5 5</td>
<td>5</td>
<td>Park</td>
<td>+</td>
</tr>
</tbody>
</table>

ND= No distraction
D= Distraction

INATTENTIVE PROFILE (toxic/metabolic, depression, FTD, NC)
Case 2

- 46 yo, woman, PhD, nurse; insidious onset, progressive, 2 y
- word-finding difficulty
- MRI: Non specific bifrontal atrophy, L>R; Auditory EPs- abn, L temporal
- PMH: breast cancer
- FH: learning disabilities (spelling, writing)

Case 3, Weintraub et al, 1990

Language and Related Tests

Non Language Tests

Auditory Comprehension
Repetition-Words
Repetition-Sentences
Oral Reading- Words
Oral Reading-Sentences
Confrontation Naming
Word Fluency
Reading Comprehension
Praxis-Buccofacial
Praxis Limb
Calculation
Memory-Orientation
Memory 3W3S
Line Orientation
Facial Recognition
Hooper VOT
Reasoning-Raven’s Matrices
Reasoning- Shipley
Reasoning-Visual-Verbal
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dementia?</td>
<td>YES</td>
</tr>
<tr>
<td>Memory Impaired?</td>
<td>NO</td>
</tr>
<tr>
<td>Other Deficits?</td>
<td>NO</td>
</tr>
<tr>
<td>Neurocognitive Profile?</td>
<td>Aphasia</td>
</tr>
<tr>
<td>Neuroanatomy?</td>
<td>L Perisylvian</td>
</tr>
<tr>
<td>DX?</td>
<td>Primary Progressive Aphasia</td>
</tr>
<tr>
<td>Cause?</td>
<td>FTLD</td>
</tr>
</tbody>
</table>
M. K. - PPA. Female, onset at age 44. Died 16 years after disease onset.
PATH DX: PICK’S DISEASE
BOSTON NAMING TEST
Kaplan, Goodglass, Weintraub, 1983

Word Frequency
The Northwestern Anagram Test (NAT):
Measuring Sentence Production in Primary Progressive Aphasia
Weintraub, Mesulam, Wieneke, Rademaker, Rogalski, Thompson
AJADD, 2009
Cortical Thickness Correlation With NAT Performance in 16 Mixed PPA Patients

X = Inferior frontal gyrus
## Case 3

- 61 yo man, professional landscaper
- insidious onset
- progressive, 5 y
- Trouble “seeing”
- PMH: none
- CT, MRI, EEG normal

### Dementia? Yes
- Memory abn? No
- Other abn? Yes
- Profile: Visuospatial
- Anatomy: Parietal; temporo-occipital
- Pathology: AD vs LBD

<table>
<thead>
<tr>
<th>Domain / Tests (cut off scores)</th>
<th>Scores</th>
<th>Level</th>
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<tbody>
<tr>
<td>ADL</td>
<td></td>
<td></td>
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<tr>
<td>Mattis DRS Total (123/144)</td>
<td>121</td>
<td>Abn</td>
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<tr>
<td>ATTENTION</td>
<td></td>
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<tr>
<td>DRS ATT (32/37)</td>
<td>32</td>
<td>Borderline</td>
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<tr>
<td>DRS INIT (29/37)</td>
<td>23</td>
<td>Abn</td>
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<td>Digit Span (F,B)</td>
<td>6,3</td>
<td>Abn</td>
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<td>LANGUAGE</td>
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<tr>
<td>Speech</td>
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<td>BNT (45/60)</td>
<td>60</td>
<td>Normal</td>
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<td>Verbal fluency</td>
<td>9</td>
<td>NL</td>
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<tr>
<td>Calculations</td>
<td>4/8</td>
<td>Abn</td>
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<tr>
<td>VISUOSPATIAL</td>
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<tr>
<td>DRS Construc (4/6)</td>
<td>2</td>
<td>Abn</td>
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<tr>
<td>Cube Copy</td>
<td>Distorted</td>
<td>Abn</td>
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<td>MEMORY</td>
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<td>DRS Memory (19/25)</td>
<td>25</td>
<td>NL</td>
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<td>REASONING</td>
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<td>DRS Concept (32/39)</td>
<td>39</td>
<td>NL</td>
</tr>
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<td>COMPORTMENT</td>
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</table>

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Case 4

- 61 yo woman, assembly line worker
- Insidious onset
- progressive, 2 y
- “Dwelling” on her birth mother, inattentive, bizarre
- PMH: none
- CT, EEG normal
- Memory abn? No
- Other abn? Yes
- Profile: Exec/Comport
- Anatomy: Frontotemporal
- Pathology: FTLD

<table>
<thead>
<tr>
<th>Domain / Tests</th>
<th>2 years</th>
<th>2.5 years</th>
<th>3 years</th>
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<tr>
<td>(cut scores)</td>
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<tr>
<td>ADL</td>
<td>Impaired</td>
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<tr>
<td>WAIS VIQ/PIQ</td>
<td>80/85</td>
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<td>32</td>
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<tr>
<td>DRS INIT (29/37)</td>
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<tr>
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<td>Speech</td>
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<tr>
<td>BNT</td>
<td>35/85</td>
<td>23/85</td>
<td>33/85</td>
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<tr>
<td>Verbal fluency</td>
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<td>Calculations</td>
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<td>VISUOSPATIAL</td>
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<td>3</td>
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<tr>
<td>List Recall (delayed)</td>
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<td>Abnormal</td>
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</table>
Visual-Verbal Test (Feldman & Drasgow, 1959)

SORT 1

SHIFT

SORT 2
NEUROPSYCHOLOGICAL PROFILE: PROGRESSIVE COMPORTEMENTAL/EXECUTIVE DYSFUNCTION
Referrals for Neuropsychological Examination

1. MMSE is normal in an individual with complaints.
2. Is there cognitive decline beyond age/personal best?
3. Are there character changes without explanation?
4. What is the rate of decline? What level of care is needed?
5. Is treatment having an effect?
6. Are cognitive/behavioral changes under age 65 signs of young onset dementia?

7. Can delirium be differentiated from dementia?

8. Is the patient safe/able to live alone? To drive?

9. What can the patient/family do to address cognitive/behavioral symptoms?