

**Session for Clinicians:
Supplemental
Neurological Exam, bvFTD
and PPA diagnoses**

Motoric Syndromes not explicitly characterized in UDS

Each of these share a common pathology with FTLD and may exhibit bv-FTD or PPA syndrome:

- Amyotrophic Lateral Sclerosis
- Progressive Supranuclear Palsy
- Corticobasal Syndrome

Supplementary Neurologic Examination

Motor
neuron
disease

Eye mvmt
Disorder

Cortico-
basal
syndrome

SECTION A						
A1.	Does the subject have limb or torso fasciculations consistent with a diagnosis of spinal muscular atrophy (SMA) or amyotrophic lateral sclerosis (ALS)*?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
A2.	Does the subject have limb weakness and/or hyperreflexia consistent with a diagnosis of primary lateral sclerosis (PLS) or ALS*?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
A3.	Does the subject have bulbar weakness and/or fasciculations consistent with a diagnosis of ALS*?	<input type="checkbox"/> 0			<input type="checkbox"/> 3	
A4.	Does the subject have eye movement abnormalities consistent with a diagnosis of progressive supranuclear palsy (PSP)*?	<input type="checkbox"/> 0			<input type="checkbox"/> 3	
A5.	Does the subject have dystonia or rigidity consistent with a diagnosis of corticobasal degeneration (CBD)*?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
A6.	Is there ideomotor apraxia* consistent with a diagnosis of CBD?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 8
A7.	Is the alien limb phenomenon* present consistent with a diagnosis of CBD?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2		<input type="checkbox"/> 8
A8.	Is there myoclonus* consistent with a diagnosis of CBD?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
A9.	Is there a cortical sensory deficit consistent with a diagnosis of CBD?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 8

Neurological Exam findings suggestive of ALS

A1.	Does the subject have limb or torso fasciculations consistent with a diagnosis of spinal muscular atrophy (SMA) or amyotrophic lateral sclerosis (ALS)?
A2.	Does the subject have limb weakness and/or hyperreflexia consistent with a diagnosis of primary lateral sclerosis (PLS) or ALS?
A3.	Does the subject have bulbar weakness and/or fasciculations consistent with a diagnosis of ALS?

Neurological Exam findings suggestive of ALS

A. The diagnosis of ALS requires the PRESENCE of:

A1. Evidence of lower motor neuron (LMN) degeneration by clinical, electrophysiological or neuropathologic examination;

A2. Evidence of upper motor neuron (UMN) degeneration by clinical examination; **and**

A3. Progressive spread of symptoms or signs within a region or to other regions, as determined by history or examination, **together with** B1. and B2. in next column.

Exclusions for diagnosis of ALS

B. The diagnosis of ALS requires the ABSENCE of:

B1. Electrophysiological or pathological evidence of other disease processes that might explain the signs of LMN and/or UMN degeneration; **and**

B2. Neuroimaging evidence of other disease processes that might explain the observed clinical and electrophysiological signs.

Although not part of the FTLD module, these exclusions are assumed if you report a diagnosis of ALS

Neurological Exam findings suggestive of Progressive Supranuclear Palsy

A4. Does the subject have eye movement abnormalities consistent with a diagnosis of progressive supranuclear palsy (PSP)?

NINDS-SPSP
criteria:
A gradually
progressive
disorder with age
of onset ≥ 40

Possible

Either vertical supranuclear palsy or both slowing of vertical saccades and postural instability with falls < 1 yr disease onset.

Probable

Vertical supranuclear palsy and prominent postural instability with falls within first year of disease onset.^a

Neurological Exam findings suggestive of Corticobasal Degeneration syndrome

A5.	Does the subject have dystonia or rigidity consistent with a diagnosis of corticobasal degeneration (CBD)*?
A6.	Is there ideomotor apraxia* consistent with a diagnosis of CBD?
A7.	Is the alien limb phenomenon* present consistent with a diagnosis of CBD?
A8.	Is there myoclonus* consistent with a diagnosis of CBD?
A9.	Is there a cortical sensory deficit consistent with a diagnosis of CBD?

Lang et al.²

Rigidity plus one cortical sign (apraxia, cortical sensory loss, or alien limb)

Or

Asymmetric rigidity, dystonia and focal reflex myoclonus.

Kumar et al.³

Chronic progressive course; asymmetric onset; presence of: “higher” cortical dysfunction (apraxia, cortical sensory loss, or alien limb);

And

Movement disorders — akinetic rigid syndrome-levodopa resistant, and limb dystonia and reflex; focal myoclonus.

Neurological Exam findings suggestive of Corticobasal Degeneration syndrome

Dystonia and Rigidity

- Focal in limb
- Present at rest at onset
- Patients with CBS have asymmetric limb dystonia with arm frequently affected. Dystonia in the head, neck, trunk or lower extremities are less common. The dystonia is often associated with rigidity, and the other signs such as apraxia. The dystonic posture often involves the hand and forearm, with adduction of the shoulder, flexion of the fingers at the metacarpophalangeal joints and extension at the distal interphalangeal joints. Contractures are sometime present.
- Rigidity is increased to with passive range of motion

Neurological Exam findings suggestive of Corticobasal Degeneration syndrome

Cortical Sensory deficit

- Impairments in the detection of complex sensory stimuli in absence of elementary sensory deficits
- Typically tested with
 - Identification of coins placed between thumb and fingers
 - Graphesthesia

Neurological Exam findings suggestive of Corticobasal Degeneration syndrome

Ideomotor Apraxia

- The inability to translate an idea into a skilled motor act
- Requires intact auditory comprehension and elementary motor functions (eg proximal/distal arm strength)
- Examples (transitive): show me how you would use a comb/toothbrush/hammer/screwdriver
- Examples (intransitive): wave goodbye, hitchhike
- In CBS, motor apraxia may also be present: difficulties with alternating motion of hand, fingers, foot

Neurological Exam findings suggestive of Corticobasal Degeneration syndrome

Alien Limb Phenomenon

- Involuntary spontaneous movements of arm or leg which move to adopt odd postures beyond control of patient (Fahn)
- Typically only unilateral
- Patients describe their affected limb as “alien,” or “uncontrollable,” or “having a mind of its own.”
- Usually a transitional phenomenon that gives way to more prominent rigidity or dystonia.

Neurological Exam findings suggestive of Corticobasal Degeneration syndrome

Myoclonus

- A sudden abrupt twitching of muscles or parts of muscles in a random manner
- Usually begins distally
- Often spontaneous, but sometimes precipitated by touch or action

Supplementary Neurologic Examination: Generalizable Gait Assessment

SECTION B		Gait disturbances
B1.	Severity	<input type="checkbox"/> 0 Normal <input type="checkbox"/> 1 Slight alteration in speed or fluidity of gait <input type="checkbox"/> 2 Walks with difficulty but requires no assistance <input type="checkbox"/> 3 Severe disturbance <input type="checkbox"/> 4 Cannot walk at all <input type="checkbox"/> 8 Untestable (specify reason): _____
B2.	Type	<input type="checkbox"/> 0 Normal <input type="checkbox"/> 1 Hemiparetic (spastic) <input type="checkbox"/> 2 Foot drop gait (lower motor neuron) <input type="checkbox"/> 3 Ataxic gait <input type="checkbox"/> 4 Parkinsonian gait <input type="checkbox"/> 5 Apractic gait ("magnetic gait") <input type="checkbox"/> 6 Antalgic gait <input type="checkbox"/> 7 Other gait disorder not listed above (specify): _____ <input type="checkbox"/> 8 Untestable (specify reason): _____

**Behavior variant
Frontotemporal
Dementia
Diagnostic
Criteria**

Neary Criteria for “FTD” 1998

These criteria replaced “Lund-Manchester criteria of 1994, which were first formal FTD criteria

I. Core diagnostic features

- A. Insidious onset and gradual progression
- B. Early decline in social interpersonal conduct
- C. Early impairment in regulation of personal conduct
- D. Early emotional blunting
- E. Early loss of insight

Neary Criteria 1998

II. Supportive diagnostic features

A. Behavioral disorder

1. Decline in personal hygiene and grooming
2. Mental rigidity and inflexibility
3. Distractibility and impersistence
4. Hyperorality and dietary changes
5. Perseverative and stereotyped behavior
6. Utilization behavior

B. Speech and language

C. Physical signs

1. Primitive reflexes
2. Incontinence
3. Akinesia, rigidity, and tremor
4. Low and labile blood pressure

Diagnostic criteria for bvFTD: International Consensus Criteria

1. Shows progressive deterioration of behavior or cognition by observation and history
2. Possible bvFTD: *3 of the following must be present*
 - A. Early behavioral **disinhibition**
 - B. Early **apathy** or inertia
 - C. Early loss of sympathy or **empathy**
 - D. Early perseverative, **stereotyped or compulsive/ ritualistic behaviors**
 - E. **Hyperorality** and dietary changes
 - F. **Executive**/generative deficits on neuropsychological testing
3. Probable bvFTD: *meets possible bvFTD criteria and*
 - A. Exhibits significant functional decline
 - B. Exhibits imaging changes in frontal or anterior temporal lobes

bvFTD Gateway Question

Gateway Question for behavior variant Frontotemporal Dementia (bvFTD)

14. Does patient have acquired, clinically important alterations in behavior, personality, or comportment consistent with bvFTD of a neurodegenerative type?

- 0 No. Skip to Q23
- 1 Yes. Proceed to Q15
- 9 Not evaluated. Skip to Q23.

bvFTD Gateway Question: Q14 asks the clinician whether there are prominent changes in behavior, personality or comportment that would justify a more detailed description of those abnormalities that is obtained with questions Q15 to Q20. Q14 does not constitute a diagnosis but is only a means for determining whether the clinician completes the detailed assessment of behaviors or skips it.

Bv-FTD Diagnostic Features

Characterizing symptoms of bvFTD				
<i>Have the following symptoms/behaviors been prominent, persistent, and recurrent in (approximately) the past three years?</i>	Absent	Questionably present	Definitely present	Not evaluated
15. Disinhibition Socially inappropriate behavior; loss of manners or decorum; impulsive, rash, or careless actions	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 9
16. Apathy or inertia Loss of interest, drive, and motivation; decreased initiation of behavior	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 9
17. Loss of sympathy/empathy Diminished response to other people's needs or feelings; diminished social interest, interrelatedness, or personal warmth	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 9
18. Ritualistic / compulsive behavior Simple repetitive movements or complex compulsive or ritualistic behaviors	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 9
19. Hyperorality and appetite changes Altered food preferences, binge eating, increased consumption of alcohol or cigarettes, oral exploration or consumption of inedible objects	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 9
20. Changes on neuropsychological testing consistent with bvFTD (refer to neuropsychological evaluation and neuropsychologist's impression)	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 9

Disinhibition

At least one of these must be present:

- Socially inappropriate behavior
 - Inappropriate touching or other physical contact with strangers; loss of modesty
- Loss of manners or decorum
 - Inappropriate laughter for context; crude, hurtful, caustic remarks; lack of etiquette
- Impulsive, rash or careless actions
 - Reckless driving, gambling, shop-lifting; indiscriminate sharing of personal info

Disinhibition: specific examples

- Excessive spending
- Excessive familiarity with strangers (talking and touching)
- Loss of modesty with dress and personal functions
- Inappropriate comments about strangers' or family members' body habitus or dress
- Roaming behavior: wandering in a pseudo-goal directed manner

Apathy

At least one of these must be present:

- Apathy
 - Loss of motivation, drive and interest in daily life. prominent passivity; ceasing to engage in prior pastimes or necessary activities, eg bathing, changing clothes - overlaps with disinhibition
- Inertia
 - Decreased initiation of behavior (Abulia)

Loss of sympathy / Loss of empathy

At least one of these must be present:

- Diminished response to other people's needs and feelings
 - For example, indifference to emotional or physical limitations of others
- Diminished social interest, interrelatedness or personal warmth
 - Related to apathy, but a general decline in interpersonal warmth, fewer social contacts, more emotional detachment; may abruptly leave family gatherings

Ritualistic/compulsive behaviors

At least one of these must be present:

- Simple repetitive movements
- Complex, compulsive or ritualistic behaviors
 - Counting and cleaning rituals, collecting, hoarding
- Stereotypy of speech
 - Words, phrases, stories that are constantly repeated
 - Humming, echolalia, palilalia

Hyperorality & Appetite changes

At least one of these must be present:

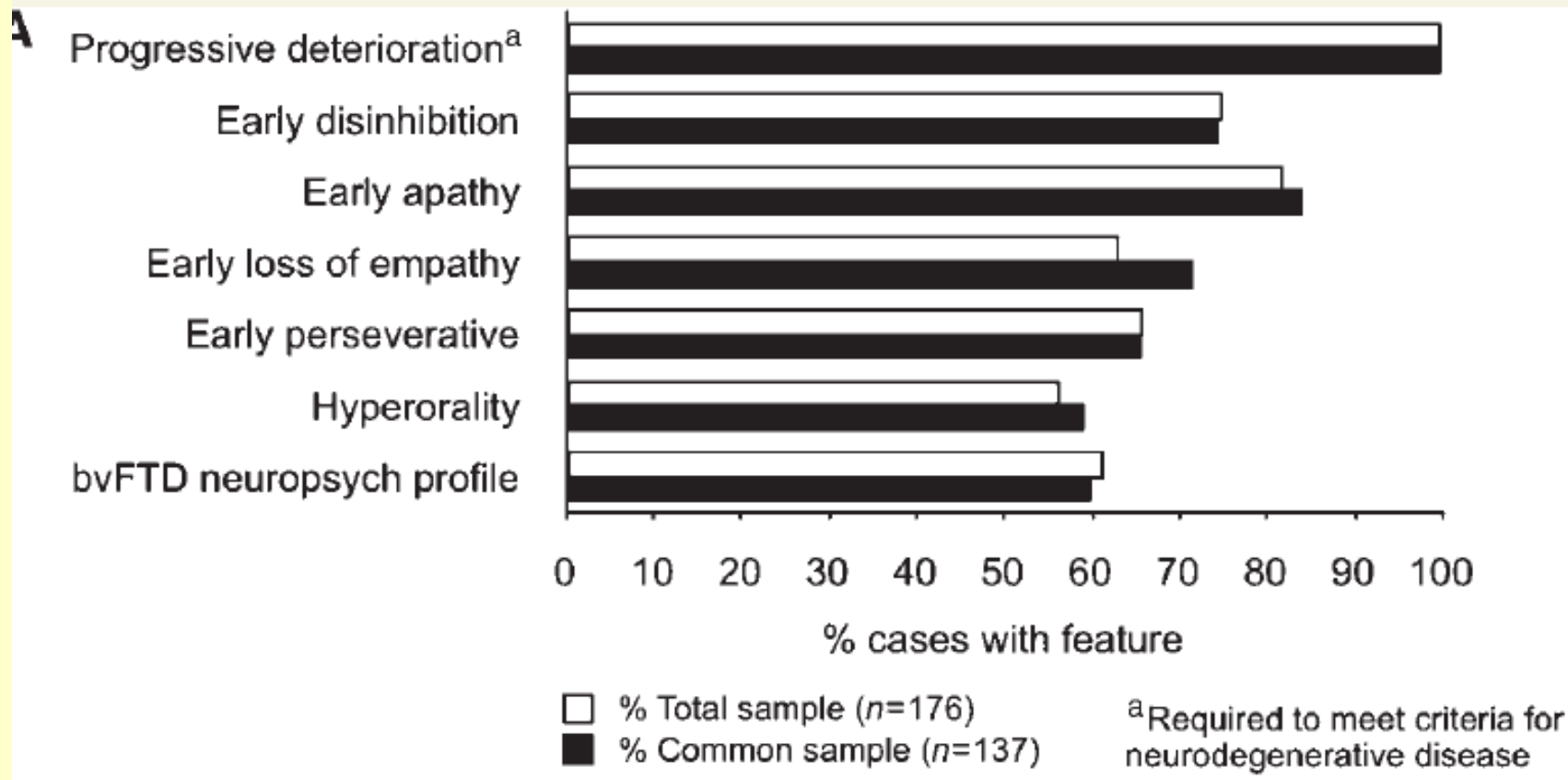
- Altered food preferences
 - Change in food habits, eg only hamburgers
- Binge eating, increased consumption of alcohol or cigarettes
- Bulimia
- Oral exploration or consumption of inedible object
 - Usually a late phenomenon

Neuropsychological changes consistent with bvFTD

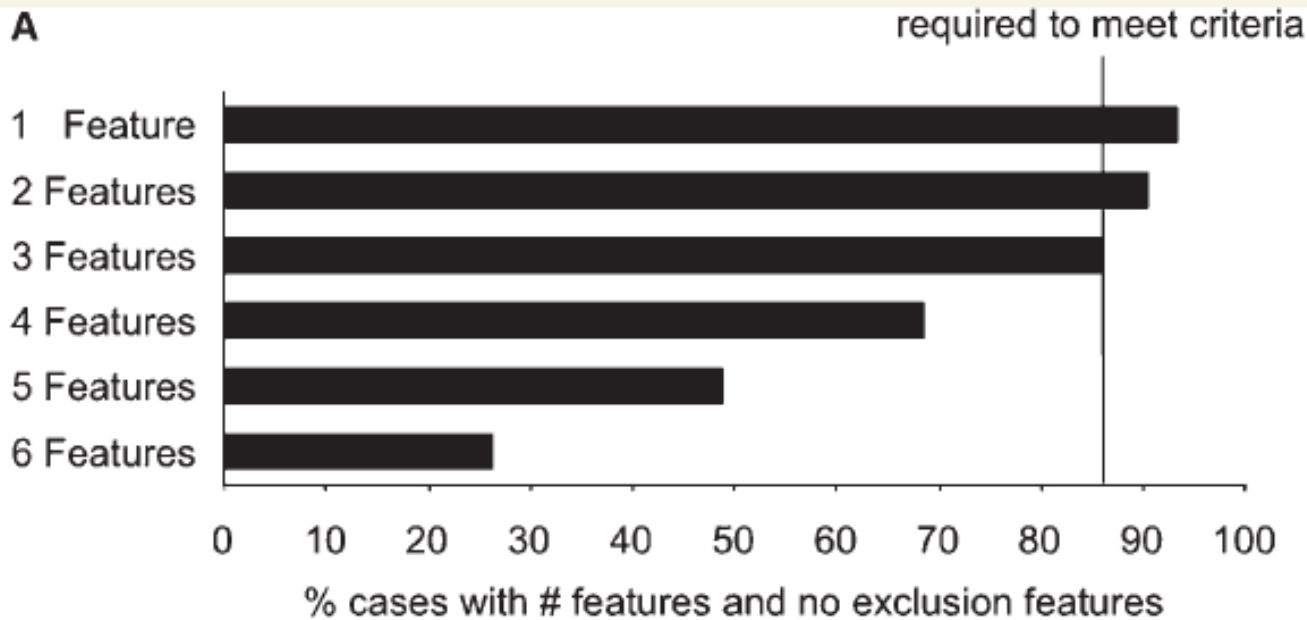
All of these must be present:

- Deficits in executive tasks
- Relative sparing of episodic memory
 - But impaired learning and memory is relatively common in bvFTD
- Relative sparing of visuospatial skills

Sensitivity of FTDC for FTLD pathology



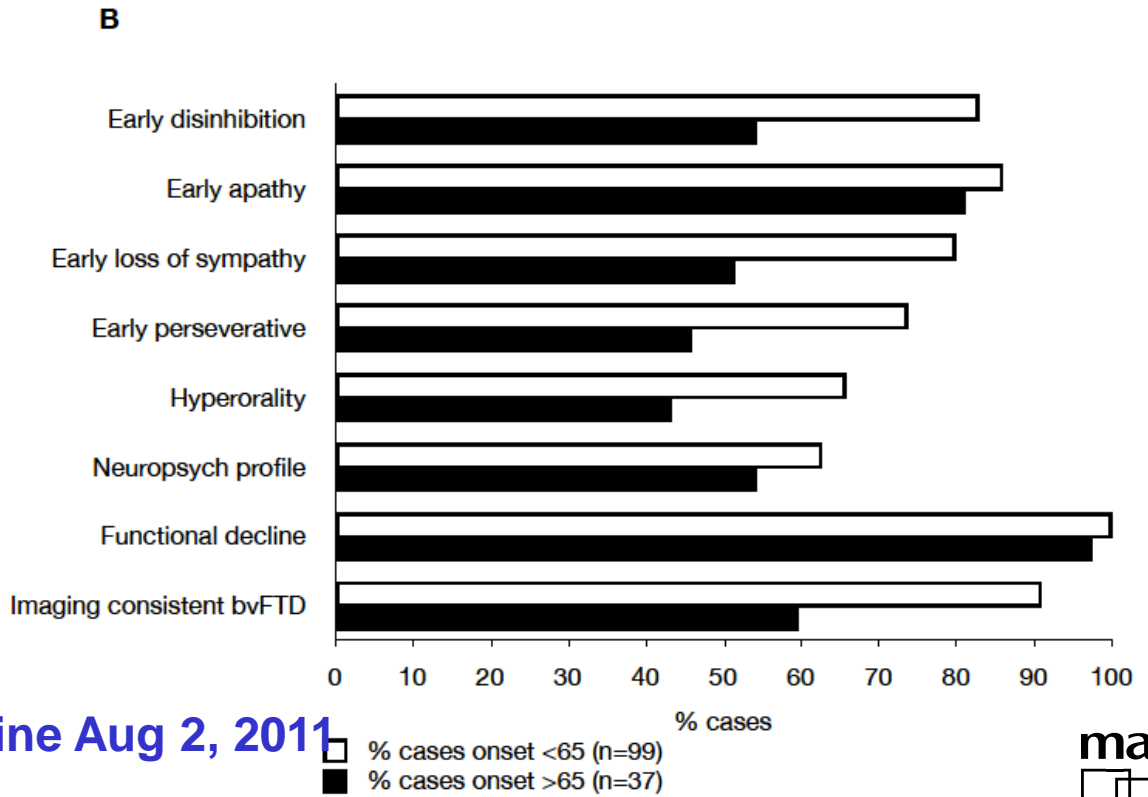
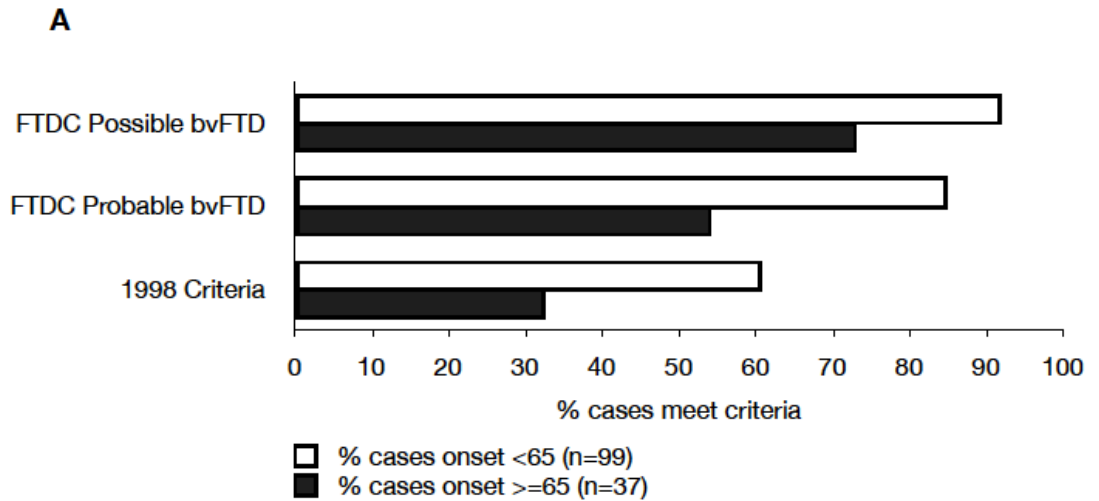
Sensitivity of FTDC for FTLD pathology



Requirement for 3 features achieved 90% sensitivity

N=137 cases

Sensitivity of bvFTD criteria by age



Rascovsky et al Brain on line Aug 2, 2011



Diagnosis of bvFTD

<p>21. Impaired Daily Functioning? Are these alterations in behavior, personality, or comporment the principal cause of impaired daily living activities?</p>	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 9
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<p>22. Does the subject meet the criteria for clinical probable* or possible** bvFTD syndrome? *PROBABLE: Meets three of the above criteria and has impaired daily functioning and has imaging consistent with bvFTD. **POSSIBLE: Meets three of the above criteria but is not functionally impaired or does not having imaging consistent with bvFTD</p> <p><i>NOTE: The diagnostic criteria in this module do not match the criteria in UDS V2.0 (Form D1). While Version 2.0 of the UDS is still in use, keep the two sets of diagnostic criteria separate.</i></p>	<p><input type="checkbox"/> 0 NO: Meets <3 of the features described in Questions 14–19: does not meetcriteria for bvFTD; or an exclusionary feature is present.</p> <p><input type="checkbox"/> 1 Probable bvFTD</p> <p><input type="checkbox"/> 2 Meets criteria for possible bvFTD and has impaired daily functioning but without evidence of diagnostic imaging.</p> <p><input type="checkbox"/> 3 Meets criteria for possible bvFTD (with or without evidence of diagnostic imaging), but daily functioning is not significantly impaired.</p>
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Diagnostic criteria for bvFTD: International Consensus Criteria

1. Shows progressive deterioration of behavior or cognition by observation and history
2. Possible bvFTD: *3 of the following must be present*
 - A. Early behavioral **disinhibition**
 - B. Early **apathy** or inertia
 - C. Early loss of sympathy or **empathy**
 - D. Early perseverative, **stereotyped or compulsive/ ritualistic behaviors**
 - E. **Hyperorality** and dietary changes
 - F. **Executive**/generative deficits on neuropsychological testing
3. Probable bvFTD: *meets possible bvFTD criteria and*
 - A. Exhibits significant functional decline
 - B. Exhibits imaging changes in frontal or anterior temporal lobes

History of PPA

- First modern description by Mesulam in 1982
- “Semantic Dementia” first described by Warrington in 1975 and elaborated upon by Snowden (1989) and Hodges (1992)
- “Progressive nonfluent aphasia” described by Grossman (1996)
- Diagnostic criteria 1998 recognized fluent and nonfluent type
- Logopenic type described by Gorno-Tempini 2004

PPA: Gateway Question

Gateway Question for Primary Progressive Aphasia (PPA)

1. Does the patient have an acquired and progressive difficulty with language* consistent with PPA of a neurodegenerative type?

* Difficulty with language = Other than simple dysarthria, are there difficulties with retrieving, using, repeating, sequencing or understanding words?

- 0 NO. Skip to Q14
- 1 Yes. Proceed to Q2
- 9 Not evaluated. Skip to Q14

Root diagnosis of PPA: Q12 is the one that records the root diagnosis of PPA. It is based on the 3 features described in Mesulam 2003. By convention, an initial diagnosis of PPA - one made at the first contact for the current neurological disease – should only be made if it is the dominant or first diagnosis.

PPA: Specific Items 1 of 2

Characterizing Speech and Language symptoms / Assigning PPA Subtype

<p><i>Are these features present on the current examination? Note: many of these items are also evaluated in the neuropsychological assessment. The responses recorded here should represent the consensus of the clinical and neuropsychological evaluation.</i></p>	Absent	Questionably Present	Definitely Present	Not evaluated
<p>2. Poor object naming (Core diagnostic feature of Semantic variant; abnormal in all variants)</p>	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 9
<p>3. Impoverished word selection / retrieval in spontaneous speech or writing (Core diagnostic feature of Logopenic variant; abnormal in all variants)</p>	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 9
<p>4. Impaired word comprehension (Core diagnostic feature of Semantic variant; absent in other variants)</p>	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 9
<p>5. Poor object / person knowledge (Secondary diagnostic feature of Semantic variant; absent in other variants)</p>	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 9
<p>6. Grammatical simplification or grammatical errors in speech or writing (Core diagnostic feature of Nonfluent/ Agrammatic variant; absent in other variants)</p>	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 9
<p>7. Effortful, halting speech (Core diagnostic feature of Nonfluent/ Agrammatic variant)</p>	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 9

PPA: Specific Items 2 of 2

Characterizing Speech and Language symptoms / Assigning PPA Subtype

<p><i>Are these features present on the current examination? Note: many of these items are also evaluated in the neuropsychological assessment. The responses recorded here should represent the consensus of the clinical and neuropsychological evaluation.</i></p>	Absent	Questionably Present	Definitely Present	Not evaluated
<p>8. Circumlocutory, empty speech (Secondary diagnostic feature of Logopenic variant; also present in Semantic variant)</p>	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 9
<p>9. Speech sound / word errors (paraphasias) Secondary diagnostic feature of Logopenic variant; abnormal in Nonfluent/ Agrammatic variant)</p>	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 9
<p>10. Impaired speech repetition (Inability to repeat verbatim sentence-length material) (Core diagnostic feature of Logopenic variant; present in non/fluent/Agrammatic type; absent in Semantic variant)</p>	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 9
<p>11. Surface Dyslexia and Dysgraphia – difficulties with reading and spelling orthographically irregular words (Secondary feature of Semantic variant)</p>	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 9

PPA summary questions

<p>12. ROOT DIAGNOSIS OF PPA Does the patient have an acquired and progressive difficulty with language consistent with PPA of a neurodegenerative type AND is the language disorder the most prominent deficit at symptom onset and for the initial (1-2 years) of the disorder?</p>	<p><input type="checkbox"/> 0 NO skip to Q14</p>	<p><input type="checkbox"/> 1 YES: proceed to Q13</p>
<p>13. Consensus diagnosis of dominant PPA subtype based on clinician and neuropsychologist: NOTE: The diagnostic criteria in this module do not match the criteria in UDS V2.0 (Form D1). While Version 2.0 of the UDS is still in use, keep the two sets of diagnostic criteria separate.</p>	<p><input type="checkbox"/> 1 PPA, semantic variant (semPPA) <input type="checkbox"/> 2 PPA, nonfluent/agrammatic variant (nf/gPPA) <input type="checkbox"/> 3 PPA Logopenic variant <input type="checkbox"/> 4 PPA not otherwise specified</p>	

Age Distribution in FTLD Multicenter study

