Testing for dementia: diagnosis to treatment and real-world implications

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Seminar Objectives

- 1. Describe the basic process of neuropsychological assessment in terms of its purpose, general methods, and uses in diagnosis of dementia versus normal aging
- 2. Observe a role play of a neuropsychological exam to help understand the process.
- 3. What can you expect if referred for neuropsychological assessment?
- 4. Discuss some of the recommendations that may arise from a neuropsychological assessment

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What is Neuropsychological Assessment?

- Diagnostic tool
- Standardized, empirically validated way of measuring brain function using paper and pencil tests
- Different cognitive domains are mediated by different neuroanatomical areas and pathways
- Cognitive domains are measured in a standardized way in a controlled environment by highly trained technicians

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Cognitive and Behavioral Domains

Domain	What is being measured
Attention	Keeping information in mind to work with it (working memory), focusing
Speed	Quickness in understanding and processing material (usually timed tests)
Language	Understanding what is said, expressing information, word finding
Visuospatial	Processing visual information (shapes, maps, designs, etc.)
Learning	Organizing new information coming in
Retrieval	Pulling up information that was presented earlier
Recognition	Picking out what was presented earlier
Executive	The CEO of the brain: planning, problem solving, organizing, multitasking
Mood	Depression, Anxiety, etc.
Personality/ behavior	Changes in behavior that are "out of character" for the person

What is "Normal"?

ଓ Each patient has a baseline
  ଓ we predict that baseline based on an algorithm using age, education, occupation, and performance on certain tests that stay stable and correlate highly with IQ (reading skills are most predictive)
ଓ Are the scores "normal" according to that particular patient's predicted baseline?

FOR EXAMPLE…

1. 70 year old, 8th-grade-educated, retired laborer vs
2. 70 year old, retired engineer

Patient #1 and Patient #2 have different baselines, and thus "normal aging" is interpreted for each patient differently
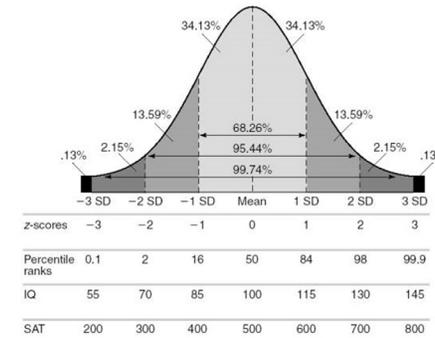
FIGURE 15.8 Percentile ranks and standard scores in relation to the normal curve. SD = standard deviation.

Typical Domains Assessed

	WNL	Subtle (<1 SD)	Mild (1-1.5 SD)	Moderate (1.5-2 SD)	Severe (>2 SD)	Not Assessed
Attention		X				
Processing Speed			X			
Language			X			
Visuospatial			X			
Learning				X		
Memory: Retrieval					X	
Memory: Recog.					X	
Executive				X		
Global Rating				X		
Effort	X					
Mood			X			
Personality/ Behavior	X					

Neuropsychologists love patterns! Different patterns of test scores are associated with different conditions

	WNL	Subtle (<1 SD)	Mild (1-1.5 SD)	Moderate (1.5-2 SD)	Severe (>2 SD)	Not Assessed
Attention		AD		VascD		
Processing Speed			AD	VascD		
Language	VascD		AD			
Visuospatial		VascD	AD			
Learning				AD, VascD		
Memory: Retrieval			VascD		AD	
Memory: Recog.	VascD				AD	
Executive				AD	VascD	
Global Rating				AD, VascD		
Effort	AD, VascD					
Mood			AD	VascD		
Personality/ Behavior	AD		VascD			

AD=Alzheimer's Dementia; VascD=Vascular Dementia

How is AD different from normal aging?

In normal aging, nerve cells in the brain are not lost in large numbers.

Brain Cross-Sections

Sulcus
Gyrus
Ventricle
Language
Memory
Normal

Sulcus
Gyrus
Language
Memory
Alzheimer's
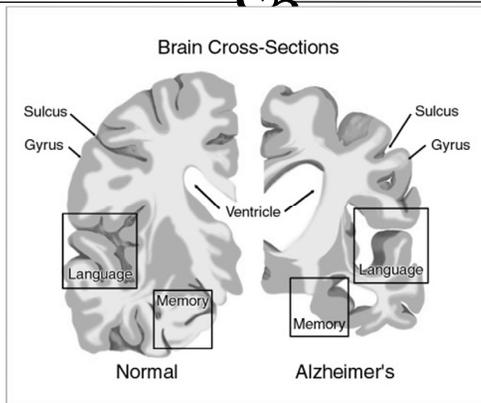
From http://www.ahaf.org/alzdis/about/cross_sectioncompareBorder.jpg

In contrast, AD causes many nerve cells to stop functioning, lose connections with other nerve cells, and die.

Hippocampus
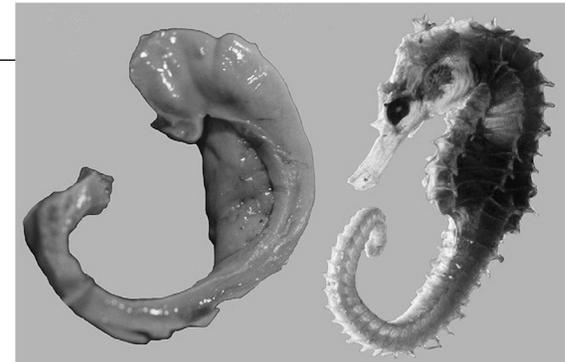
The name *hippocampus* is derived from the Greek *hippokampus* (*hippos*, meaning "horse," and *kampos*, meaning "sea monster"), since the structure's shape resembles that of a sea horse.

Measuring Hippocampal Function with Neuropsychological Tests

- ∞ Memory tests "tap into" the function of the hippocampi
  - ∞ For example, learn a list of 12 words over 4 learning trials
  - ∞ Recall them after a 20 minute delay
  - ∞ Recognize those words amongst a list of target and distractor words
- ∞ Alzheimer's patients have difficulty recalling and recognizing the words because the information has not been retained (the file has not been saved)
- ∞ Vascular dementia patients have difficulty learning the words, recall some of what they got in, and recognize most of the words accurately (the file has been misplaced)

Role Play of a Neuropsychological Exam

- ∞ We will demonstrate a few items from each of these tests
  - ∞ Attention/Working Memory: Digit Span Forwards and Backwards
  - ∞ Language: Boston Naming Test
  - ∞ Visual Spatial Ability: Block Design
  - ∞ Memory: Hopkins Verbal Learning Test-Revised; Rey Osterreith Complex Figure
  - ∞ Higher Level Executive Skills: Trailmaking Test B; Verbal Fluency (Animals)

What can you expect if referred for a neuropsychological exam?

- Exams take anywhere from 1.5 hours to 5 hours depending on the referral question and patient characteristics
- Exams usually begin with a 30-60 minute interview with the neuropsychologist, where family is encouraged to offer observations and concerns and history is gathered
- Formal tests are administered by the psychometrist (no family present)
- Mood and personality assessment may occur at the end
- Your patient will be tired! Help them get lots of rest and nourishment to prepare for the day

What to expect from the neuropsychologist

- A report will be generated approximately 2 weeks from the time of the exam and sent to the referring doctor, offering diagnostic impressions and recommendations
- Most if not all neuropsychologists offer patients the opportunity to meet with them to review the results in detail, in addition to getting results from the referring MD
- This is especially helpful if there are prominent psychiatric issues, psychosocial issues, or family members need significant time and support to adjust to a diagnosis

Recommendations and Referrals

- Medications. Discussion of treatment with anti-dementia drugs, antidepressants, mood stabilizing medications, or anxiolytics
- Behavioral strategies for mood and anxiety issues. Guided meditation, yoga, therapy, etc. (fragrantheart.com; CALM.com)
- BRAIN HEALTHY LIFESTYLE Mediterranean Diet, staying active!
- Cognitive Stimulation. Reading, writing, drawing, crossword puzzles, board games, playing musical instruments, web sites, apps (lumosity.com, brainhq.com)
- Physical activity / exercise. Increased physical activity for 20 - 30 minutes at least 3 or 4 times per week is encouraged
- Social engagement. Maintaining social connections, clubs, regularly scheduled outings, and volunteer work

Recommendations and Referrals

- Compensatory strategies Lists, calendars, use of a smart phone, alarms for taking medicines, meet with a Speech Therapist, etc.
- Support groups: Alzheimer's Association, Parkinson's Association, etc.
- Team Approach with finances, medical and legal matters.
- Medication administration. Use of a pill box to organize medications, supervision by family or staff
- Meal preparation. Minimize independent use of the stove top and oven
- Driving recommendations. Stop driving, have a driving evaluation with OT, etc.
- Overall level of supervision. Should level of care be increased? Assisted living to 24 hour memory care?