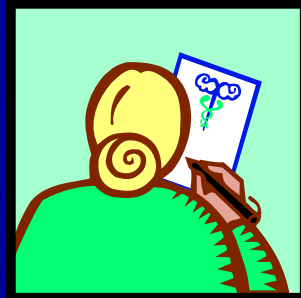




Neuropsychology Primer for the LTC Underwriter



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Outline of Talk

- Definition of Neuropsychology
- Professional Qualifications and Training
- Purpose of a Neuropsychological Evaluation
- Approaches and Methods
- Normative Data
- Deficit Measurement
- Components of an Evaluation
- Cognitive Domains

Outline Continued

- Neuropsychological Report
- Aging and Neuropsychology
- Mild Cognitive Impairment
- Dementia
- Depression-Related Cognitive Dysfunction

Definition of Neuropsychology

A clinical neuropsychologist is a professional within the field of psychology with special expertise in the applied science of brain-behavior relationships. Clinical neuropsychologists use this knowledge in the assessment, diagnosis, treatment, and/or rehabilitation of patients across the lifespan with neurological, medical, neurodevelopmental and psychiatric conditions, as well as other cognitive and learning disorders.

Definition cont.

The clinical neuropsychologist uses psychological, neurological, cognitive, behavioral, and physiological principles, techniques and tests to evaluate patients' neurocognitive, behavioral, and emotional strengths and weaknesses and their relationship to normal and abnormal central nervous system functioning. The clinical neuropsychologist uses this information and information provided by other medical/healthcare providers to identify and diagnose neurobehavioral disorders, and plan and implement intervention strategies. --
National Academy of Neuropsychology 2001

Professional Qualifications and Training

- Clinical Psychology Ph.D. (Psy.D., Ed.D)
- Graduate training in neurology, neuroanatomy, neuroscience in addition to clinical psych training
- Specialized training on internship
- 2-year postdoctoral fellowship
- Licensed as clinical psychologist (most states no specialized licensing in neuropsychology)
- Board certification not standard as in medicine (American Board of Professional Psychology/American Board of Clinical Neuropsychology; American Board of Professional Neuropsychology)

Purpose of Neuropsychological Evaluation

- Pattern of overall cognitive and behavioral functioning (strengths and weaknesses)
- Differential diagnosis (e.g., dementia v. depression)
- Cognitive change following neurologic disorder, head injury, or surgery
- Disability determination, competency, or other litigation
- Baseline for later comparison

Purpose of Neuropsychological Evaluation cont.

- Track progression of degenerative diseases
- Recommendations about placement, medications, other testing/diagnostic procedures, behavioral interventions, cognitive rehabilitation, and safety concerns

Approaches and Methods

- Fixed battery approach
- Flexible approach/Hypothesis Testing
- Process approach
- Most use a combined core battery with flexibility
- Battery vs. assembled tests

Normative Data

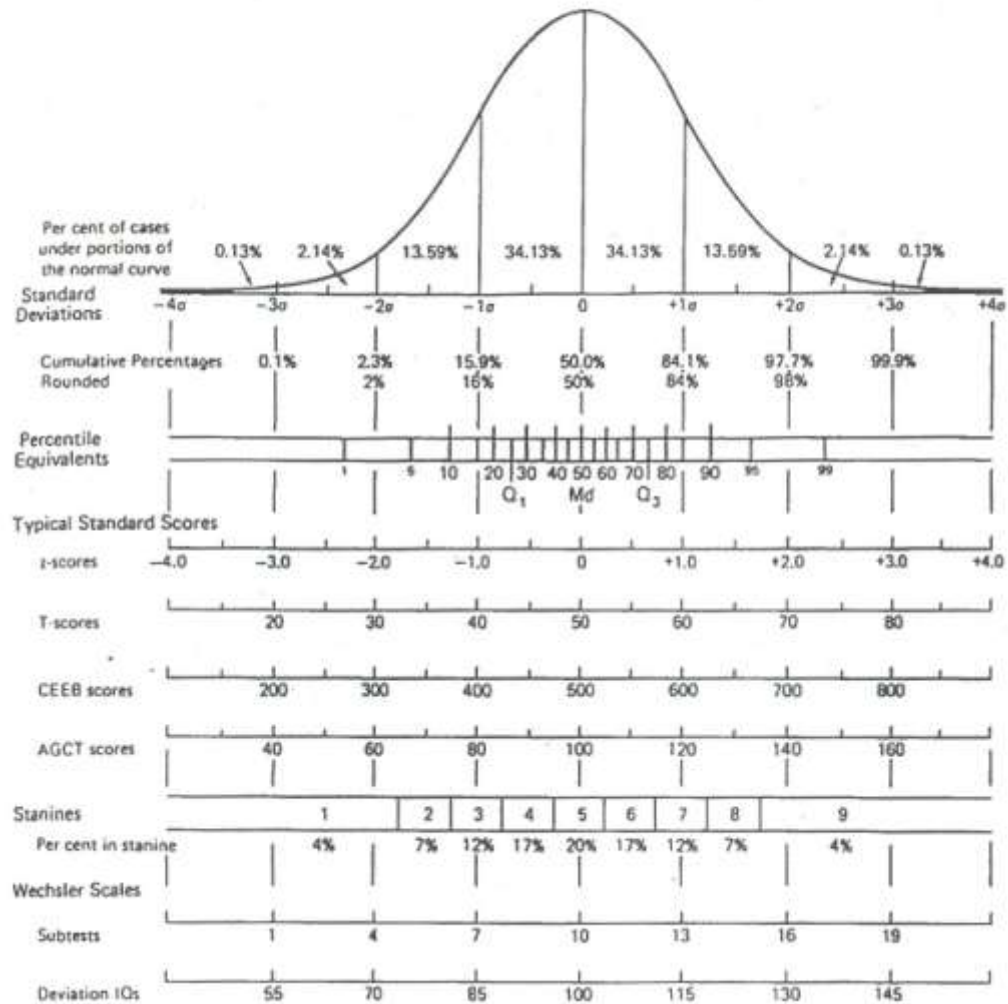
- To identify areas of impairment need a healthy reference group
- Need to consider demographics factors that can affect performance – age, education, gender, race
- Compare performance to normative data
- Premorbid ability estimation
 - Regression based (Barona equation)
 - Ability based (Wechsler Test of Adult Reading)

Deficit Measurement

- Different standard scores used (IQ, T-scores, z-scores, scaled scores, percentiles)
- Impairment defined by
 - 1-2 SD below mean (Mild)
 - 2-3 SD below mean (Moderate)
 - >3 SD below mean (Severe)
- Interpret in context of premorbid ability

Normal Distribution

THE NEUROPSYCHOLOGICAL EXAMINATION: INTERPRETATION



Components of Examination

- Medical record review
- Clinical interview – medical, social, psychological, educational history
- Collateral interview – especially important in dementia
- Behavioral observations/Mental status
- Motivational/Effort Testing

Motivation and Effort

- Detection of exaggeration and malingering is important when there is potential secondary gain
- Symptom validity testing – Test of Memory Malingering, Word Memory Testing
- Minnesota Multiphasic Personality Inventory – 2 (Validity Scales, Fake Bad Scale) – medical & psych malingering/exaggeration

Cognitive Domains

- Intellectual/Academic/Global Cognition
- Attention
- Processing Speed
- Executive Functioning
- Language & Related Functions
- Visuospatial
- Learning and Memory
- Mood and Behavior
- Sensory/Perceptual/Motor

Intellectual/Achievement Global Cognition

- IQ tests (Wechsler Scales) provide a measure of overall cognitive strengths and weaknesses
- Achievement testing (Math, Reading, Spelling) useful for learning disorders
- Global cognitive measures can be used for screening or tracking progression of disease
- MMSE (1-2 points per year in dementia)
- Mattis Dementia Rating Scale (14 points per year in dementia)

DRS-2™

Steven Mattis, PhD

Scoring Booklet

Name _____	Age _____	Gender _____	Date _____
Ethnicity _____	Occupation _____	Education _____	
Diagnosis _____			
Administrator _____			

Summary Table

Circle Appendix Table Used: A1 A2 A3 A4 A5 A6 A7 A8

	Raw score	AMSS	%ile range
Attention ATT-1 + ATT-2 + ATT-3 =	_____	_____	_____
Initiation/Perseveration I/P-1 + I/P-2 =	_____	_____	_____
Construction CONST =	_____	_____	_____
Conceptualization CONCEPT =	_____	_____	_____
Memory MEM-1 + MEM-2 =	_____	_____	_____
Total Score	_____	_____	_____

AEMSS (Appendix B) _____

Note: AMSS = Age-Corrected MOANS Scaled Score; AEMSS = Age- and Education-Corrected MOANS Scaled Score; MOANS = Mayo's Older Americans Normative Studies.

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Attention

- Capacity
- Sustained
- Selective
- Examples: Digit Span
- Disorders: Delirium, ADHD

Processing Speed

- Psychomotor
- Information Processing
- Examples: Trail Making Test, Paced Auditory Serial Addition Test
- Disorders: Multiple Sclerosis, Parkinson's dementia

Executive Functioning

- Problem solving & Judgment
- Organization/Planning
- Sequencing
- Inhibition
- Abstraction
- Initiation/Perseveration/Personality Change
- Examples: Similarities, Stroop Test
- Disorders: Frontotemporal Dementia, Traumatic brain injury

Stroop Color-Word Test



Red

Blue



Blue

Green



Green

Red

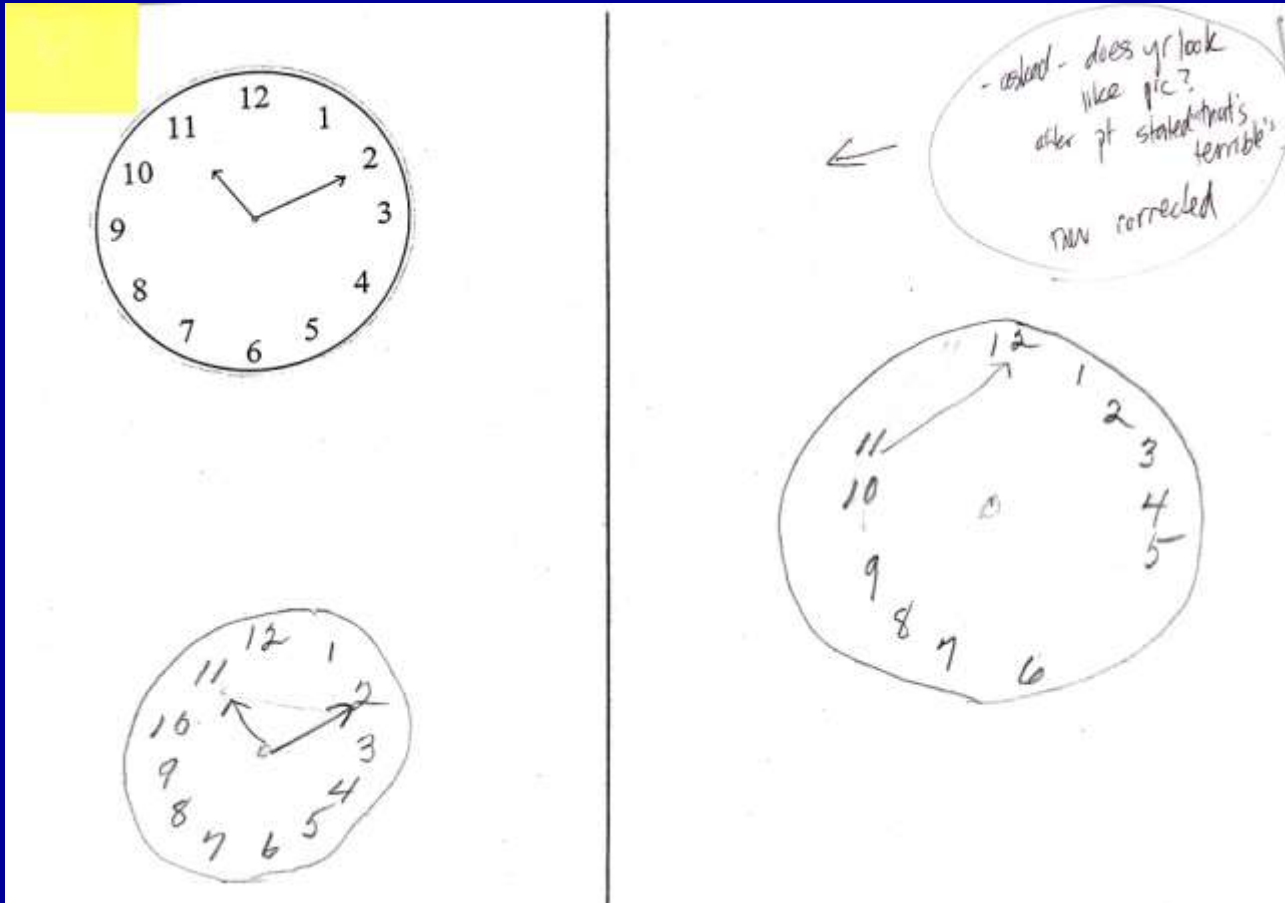
Language & Related Functions

- Comprehension
- Repetition
- Naming
- Reading
- Writing
- Arithmetic
- Examples: Boston Naming Test
- Disorders: stroke, primary progressive aphasia (Frontotemporal dementia)

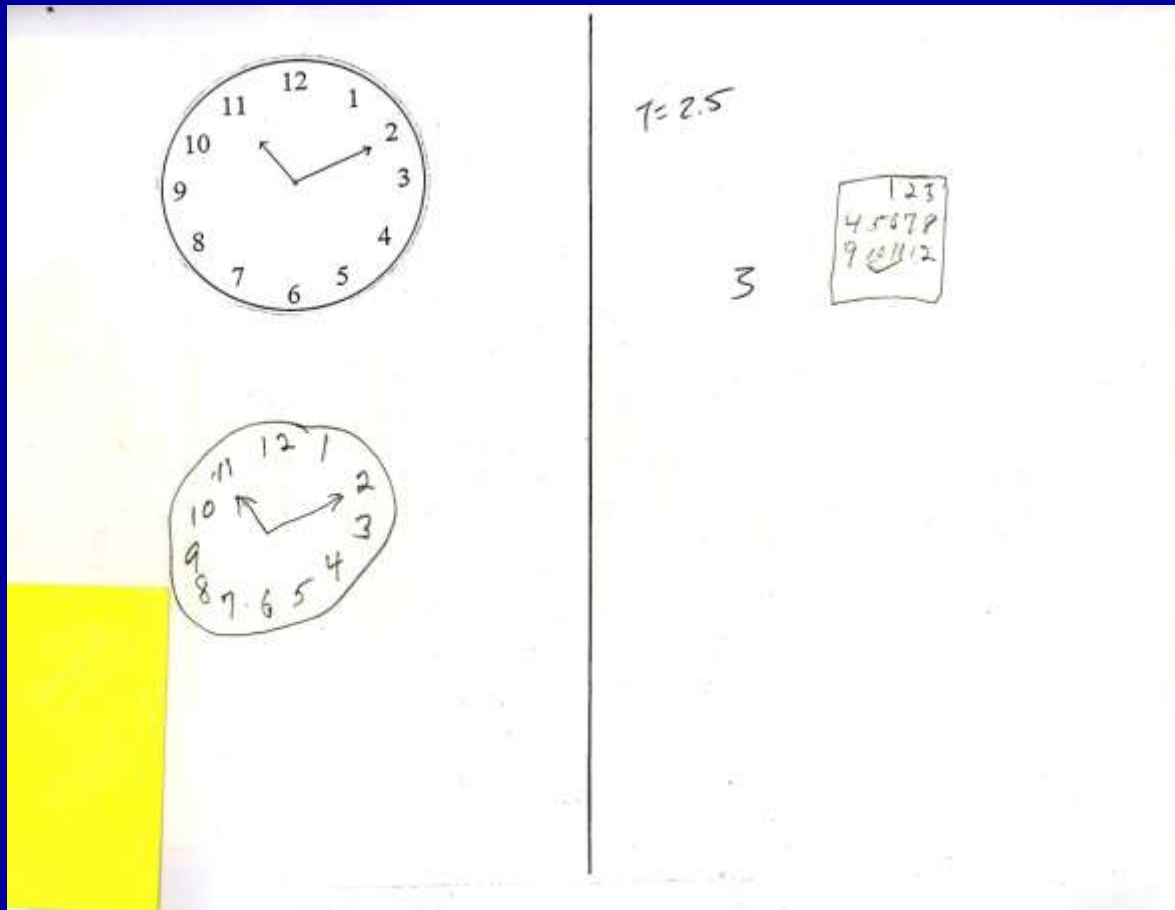
Visuospatial Skills

- Perception
- Construction
- Mental rotation
- Examples: clock drawing test
- Disorders: right hemisphere stroke

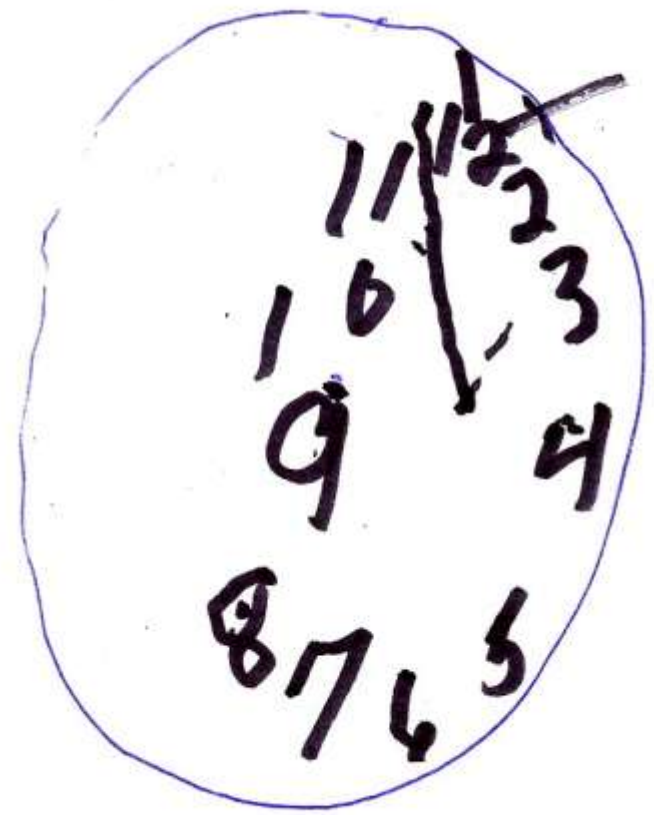
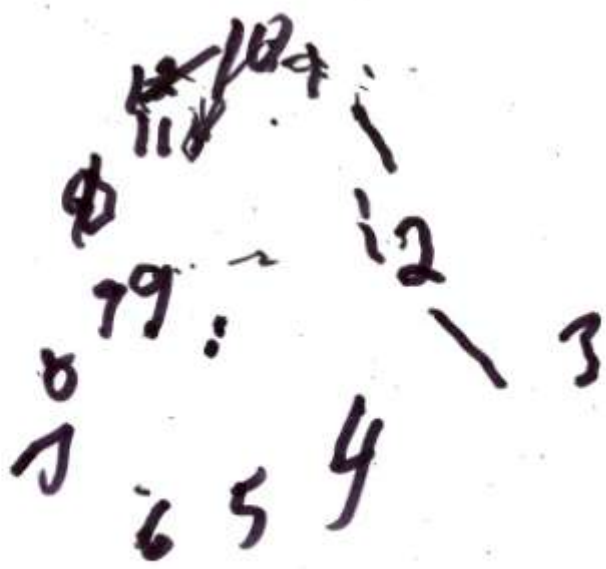
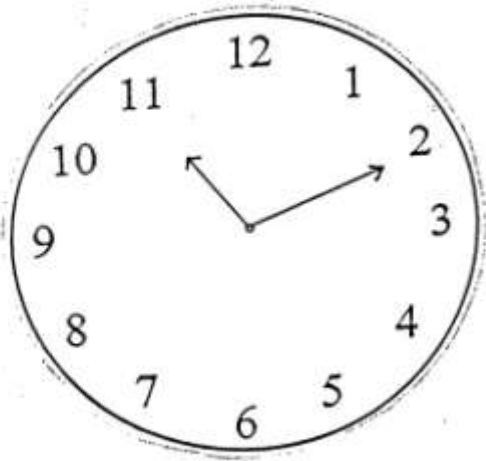
Mild Cognitive Impairment



Alzheimer's Disease



Lewy Body Dementia



Sensory/perceptual/motor

- Right-left orientation
- Neglect
- Grip strength/manual dexterity
- Examples: cancellation task
- Disorders: stroke

N X E A P W B V A Q H C N R K Y A G M Z L A O D G
A F Z R U A T B I L S C N K O X M A P Q V D A
Q I O B G A V K Y D U P A B A Z T F S J A L W V M C
B A L P K A R J O L Z H V X Q A F W U A H
T J S A F M Z V K A E I H M E A D P Z V A I O B X
F N Z X E O B A W C P J S Y A Z V A I O B X
I A U A Q D M H W G E F A V L R A S B X M I Q U R A H
O A K C U H T I G F S J S O R A D P H N R G O A E S
Y E A W H R I G F S A J U O R A D P H N R G O A E S
T A W L A K A S B W L U I B J A L D Q A T S Y I
R H P Y N K A S B W L U I B J A L D Q A T S Y I
J S I A L K G C A E P R P W U L D Q A T S Y I
D A I E N W F A J R E K A L I M D S H A K O F P C N
C Q T B A O S R M F B A R A L I M D S H A K O F P C N
A L I D A S F P Z V O R U E J Y A U I D A
S E G H A B W F G A H T T K A Y R C A M R Y

Learning & Memory

- Learning/encoding
- Free recall/retrieval
- Retention
- Recognition
- Examples: Logical Memory, Hopkins Verbal Learning Test
- Disorders: Alzheimer's disease, Alcohol-Induced Amnestic Disorder

Mood and Behavior

- Affect
- Personality
- Mood
- Behavior
- Examples: Beck Depression Inventory, Minnesota Multiphasic Personality Inventory
- Disorders: Frontotemporal dementia, Lewy body dementia

MMPI-2

N.L. Hathaway and J.C. McKinnis
Minnesota Multiphasic
Personality Inventory-2™

Profile for Basic Scales

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™MMPI-2™ and "Minnesota Multiphasic Personality Inventory-2™" are trademarks of The Regents of the University of Minnesota.

Name _____

Address _____

Occupation _____ Date Tested ____/____/____

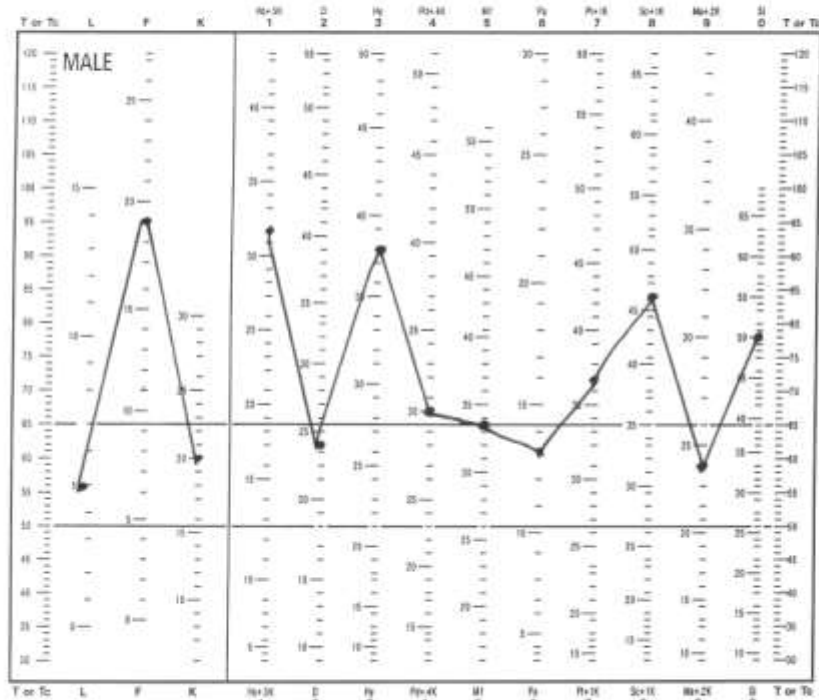
Education _____ Age _____ Marital Status _____

Referred By _____

MMPI-2 Code _____

Scorer's Initials _____

Factor of K			
1	2	3	4
22	15	12	10
21	13	11	9
20	12	10	8
19	11	9	7
18	10	8	6
17	9	7	5
16	8	6	4
15	7	5	3
14	6	4	2
13	5	3	1
12	4	2	0
11	3	1	0
10	2	0	0
9	1	0	0
8	0	0	0
7	0	0	0
6	0	0	0
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0



LEGEND

- L Lie
- F Infrequency
- K Correction
- Ma Hypochondriasis
- D Depression
- Hy Conversion Hysteria
- Pa Psychopathic Deviate
- Mf Masculinity-Femininity
- Pa Paranoia
- Ps Psychoasthenia
- Sc Schizophrenia
- Ma Hypomania
- Si Social Introversion

Raw Score _____

? Raw Score _____ K to be Added _____

Neuropsychological Report

- Serves as permanent record of patient's performance
- Differences among neuropsychologists
 - Length of report
 - History
 - Test scores
 - Diagnostic impressions
 - Recommendations

Aging & Neuropsychology

- Cognitive aging hypotheses
 - Right hemisphere
 - Frontal hypothesis
 - Fluid vs. Crystallized Intelligence
- Most changes are not dramatic
- Processing speed
- Stress, depression, medical illness, and medications can contribute

Pathology/Physiology in Normal Aging

- Decrease in brain weight/volume
- Selective loss of neurons
- Declines in oxidative metabolism/accrual of oxidative stress
- Changes in adrenal/hormonal levels
- Changes in cerebrovascular supply
- Presence of AD pathology

Charting the Course of Healthy Aging, MCI, and AD



Healthy Aging

Amnesic MCI

Clinically Diagnosed AD

Mild Cognitive Impairment

- Condition between normal aging and dementia
- Associated with an increased risk of developing dementia (10-15% per year)
- Healthy elderly (1-2% per year)
- 80% MCI may eventually develop dementia
- Decline in cognitive skills greater than 1.5 SDs below normative mean
- No impairment in ADLs - need good informant to establish functional ability
- Controversy about establishing diagnosis

Role of Neuropsychology in Mild Cognitive Impairment

- Establish level of impairment – Is it severe enough to meet the <1.5 SD threshold?
- Are there other problems (depression, medical illness) that explain problems?
- Identifying subtypes- amnestic, amnestic plus, single domain
- Monitor change at yearly intervals
- Evaluate the validity of informant report

Role of Neuropsychology in Dementia

- Helpful in identifying pattern
 - Memory < other functions – AD
 - Visuospatial < other functions – Lewy Body
 - Frontal/Executive < other functions – FTD
 - Executive/slowing - subcortical (e.g., Parkinson's)
- Establish severity and track progression
- Determine response to treatment

Depression-Related Cognitive Dysfunction

- Also referred to as pseudodementia or dementia syndrome of depression (may not be appropriate terms)
- Depression is common in adults over 65 (20%)
- Cognitive deficits associated with depression are variable – almost never meet criteria for dementia
- Deficits in visuospatial skills, executive functioning, & psychomotor speed

Depression-Related Cognitive Dysfunction cont.

- Depressed older adults with significant cognitive deficits may reflect a pre-dementia group
- Late-life-onset depression may be different than early-life-onset – could reflect brain change
- Deficits should improve with effective antidepressant treatment and/or psychotherapy

Cognition & ADL Performance

- Cognition is weakly to moderately associated with functional status (explains about 20% of variance)
- Medication management, finances, and telephone use have highest correlations with cognition
- Similar correlations between cognition and ADLs and IADLs
- Executive functioning has strongest relationship with functional status (3x memory)
- Screening tests (MMSE, Mattis DRS) have stronger relationships with functioning than most formal neuropsychological measures
- Behavior change also shows a strong relationship with functional status

When to Refer Older Adults for Neuropsychological Evaluation

- Dementia versus depression
- Perform below expectations on screening test
- Reports from patient and family member of repetitious speech or behavior
- Change in ADL performance

Conclusions

- Neuropsychology is the study of brain-behavior relationships
- Specialized training is necessary to be a neuropsychologist
- Neuropsychological evaluations offer a comprehensive analysis of cognitive functions
- Important component of work-up for MCI and dementia

Questions?

