

# Beyond the MMSE: Modern Brief Neurobehavioral and Capacity Assessment

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# What we are going to cover

- ▶ Need for Neurobehavioral Assessment
- ▶ Normal Aging and Decline
- ▶ Executive Functioning
- ▶ Mild & Major NCD
- ▶ Neurobehavioral Assessment (NB Testing)
- ▶ Executive Functioning Measures
- ▶ MMSE, Cognistat, MoCA
- ▶ Capacity Evaluation
- ▶ MoCA: Clinical Examples

# Typical ED Case

- ▶ Robert Olsen is 89 years old and lives alone.
- ▶ One day he calls 911 because he feels ill and has fallen on the floor. The emergency medical personnel transport him to the hospital, noting that he is confused, unbathed, and his home is dirty, with spoiled food, urine, and feces in the house. They also found medications in disarray and empty beer bottles.
- ▶ Mr. Olsen is hospitalized for treatment for acute renal failure with malnutrition and dehydration. With medical intervention, his cognition clears considerably

## ED Case 2

- ▶ However, there are residual problems with memory and reasoning. A brain scan shows no acute problems but a mild degree of cerebrovascular disease.
- ▶ Mr. Olsen reports anxiety in the hospital. He asks to be discharged and assures the team he can manage his medications, personal care, and meals. He expresses discomfort with home care services. Mr. Olsen values his independence and wants to return to his home of 63 years.
- ▶ The medical team asks the psychologist “is he competent?” (“Does he have capacity to make this judgment?”)

# What would you do with this patient?

- ▶ Patient shows up in the emergency room with crushing chest pain.
- ▶ After basic assessment and EKG, patient is informed that he needs a cardiac catheterization.
- ▶ Patient refuses – says he is leaving.
- ▶ Does the Psych On Call staff let him leave?
- ▶ (CJV at midnight with Japanese-American 83 yo)

# Neurobehavioral Assessment Characteristics

- ▶ Brief: Interview is often 1 hour; 10-20 minutes for testing; ideally less than 10 minutes
- ▶ Observational: trust your perception
- ▶ Behavioral descriptions
- ▶ NB Screening tests are negatively correlated with:
  - ▶ age
  - ▶ lower education (need to know education level)
  - ▶ severe depression
  - ▶ poor effort
- ▶ Evaluation for decision making capacity for self-care and finances or decision making
- ▶ NB Testing is first step only; Raises the need for formal neuropsychological or neurological evaluation

# Classic Mental Status Domains

- ▶ Level of Consciousness: alert/awake/lethargic
- ▶ Mood: depressed, manic, flat, inappropriate
- ▶ Language: fluency, comprehension
- ▶ Thought Content: hallucinations, delusions

# Mental Status Domains: Cognitive

- ▶ Memory:

  - New learning

- ▶ VisualSpatial:

  - Figure Copy, clock drawing

- ▶ Executive Functioning:

  - Problem solving, judgment, self awareness, set shifting, disinhibition



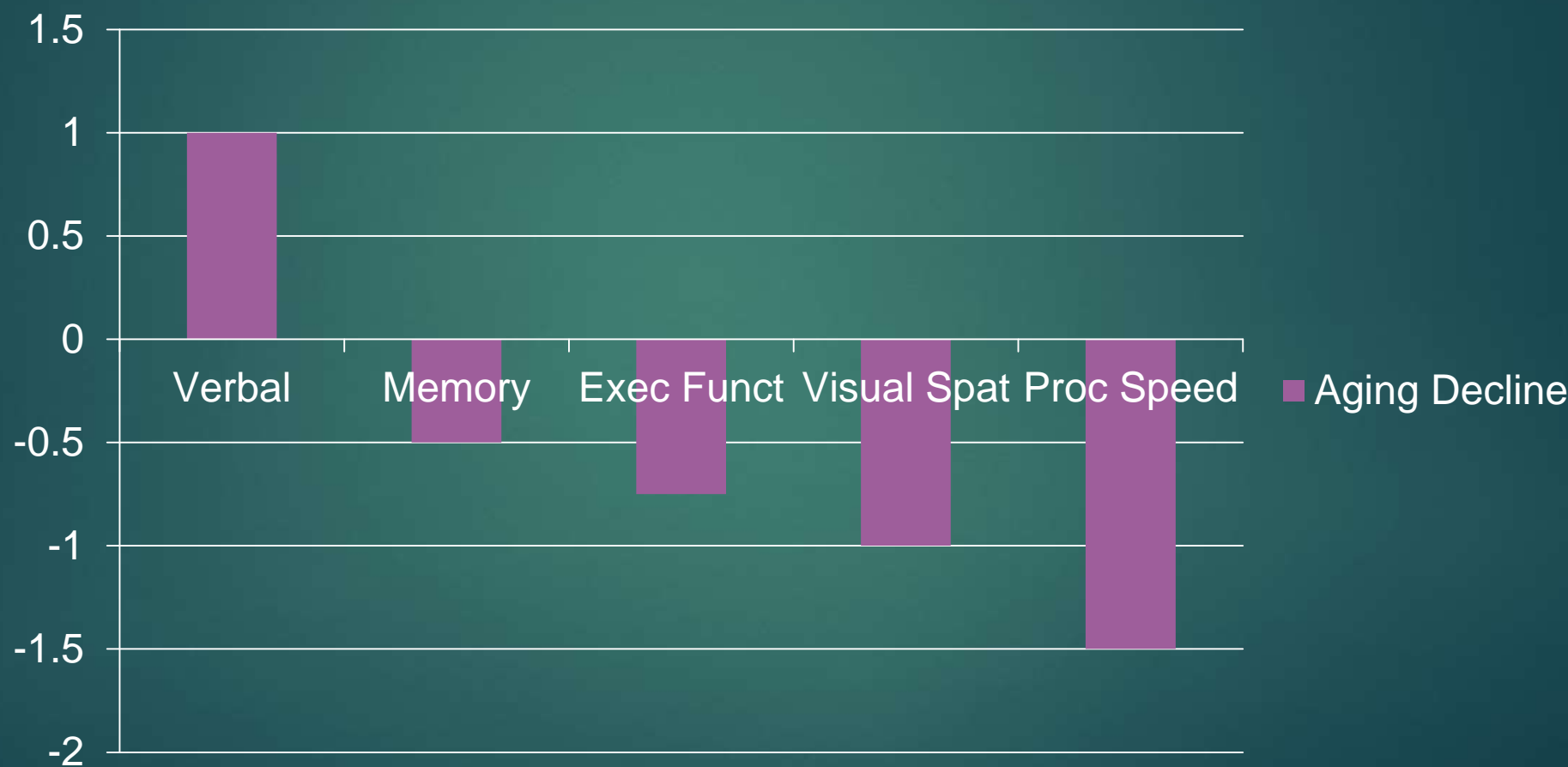
# Brief review of Intellectual Ability in Normal Aging

# Normal Age-Related Changes in Cognitive Abilities

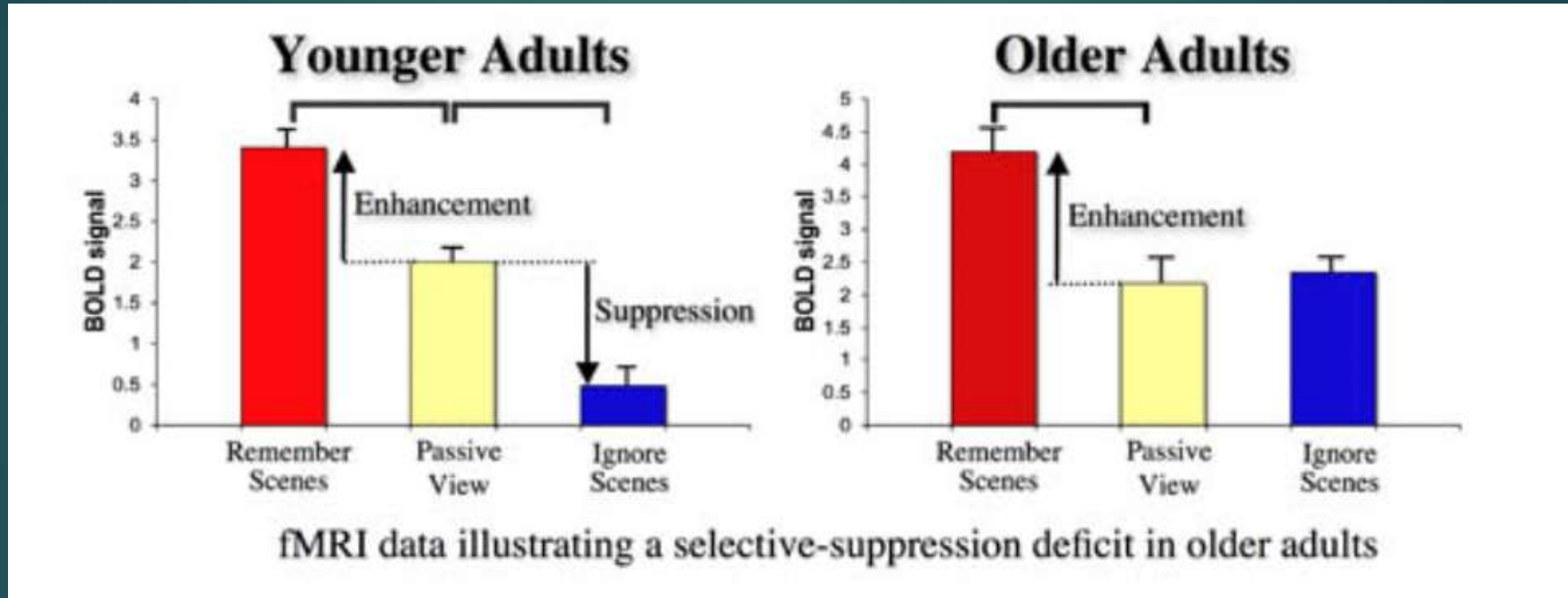
## Seattle Longitudinal Study: After age 65:

- ▶ Verbal Knowledge intact; difficulty with name retrieval, particularly the names of those we've not seen in a while
- ▶ Memory Ability =  $\frac{1}{2}$  s.d. decrease ↓
- ▶ Spatial Ability = 1 s.d. decrease ↓ ↓
- ▶ Perceptual speed =  $1 \frac{1}{2}$  s.d. decrease ↓ ↓ ↓

# Normal Aging Cognitive Decline in the absence of brain pathology



## EF decline: Older Adults are more distractible



While healthy older adults (above 60 y.o.) were as effective at enhancing activity for relevant information in visual brain regions as young adults, they were unable to successfully suppress activity for irrelevant information;

Some older have normal suppression; are less distractible.

# 5 Types of Memory

- ▶ Explicit (Factual/what) Memory
- ▶ Episodic (Personal) Memory
- ▶ Working (Brief, Temporary) Memory
- ▶ Prospective Memory
- ▶ Procedural (How to...) Memory

## Decline in Spontaneous Verbal Free Recall: 12 items at age 20, 7 items at 80



Number of items learned in 1 attempt

# Types of age-related cognitive changes

- ▶ Three patterns of age-related change in cognitive behavior
  - ▶ Life-long cognitive declines
  - ▶ Cognitive declines that occur late in life
  - ▶ Abilities with relative stability across life

# Life-long Cognitive Declines

- ▶ Processing speed, working memory and encoding of information into episodic memory, tend to decline across the adult lifespan
- ▶ These abilities (PS, WM, & M) show linear life-long declines with no evidence for accelerated decline in the later decades
- ▶ Acceleration of cognitive decline that begins 3–6 years before death. This acceleration indicates that pathology influences age-related cognitive changes in advanced age,



# Life Long Stability

- ▶ Cognitive abilities unchanged throughout life:
  - ▶ Autobiographical memory
  - ▶ Theory of mind tasks (attribution of mental states to other individuals)
  - ▶ Emotional processing
  - ▶ Behavioral memory
  - ▶ Recognition/Familiarity memory

# Late life cognitive declines

- ▶ Well-practiced tasks or tasks that involve knowledge show no decline in performance until very late in life.
- ▶ Vocabulary and semantic knowledge are also stable until late in life
- ▶ Any accelerated declines are probably due to the influence of disease processes.

# Prefrontal Cortex begins to atrophy

- ▶ Lower volumes of PFC grey matter from lower synaptic densities
- ▶ Prefrontal Cortex undergoes the largest age related volumetric changes in adulthood:
  - ▶ decline of about 5% per decade after the age of 20.
  - ▶ In healthy older adults, the largest declines in volume are in lateral regions of the PFC (vs. inferior PFC in AD).

# Frontal steady life long decline; Hippocampal late life decline

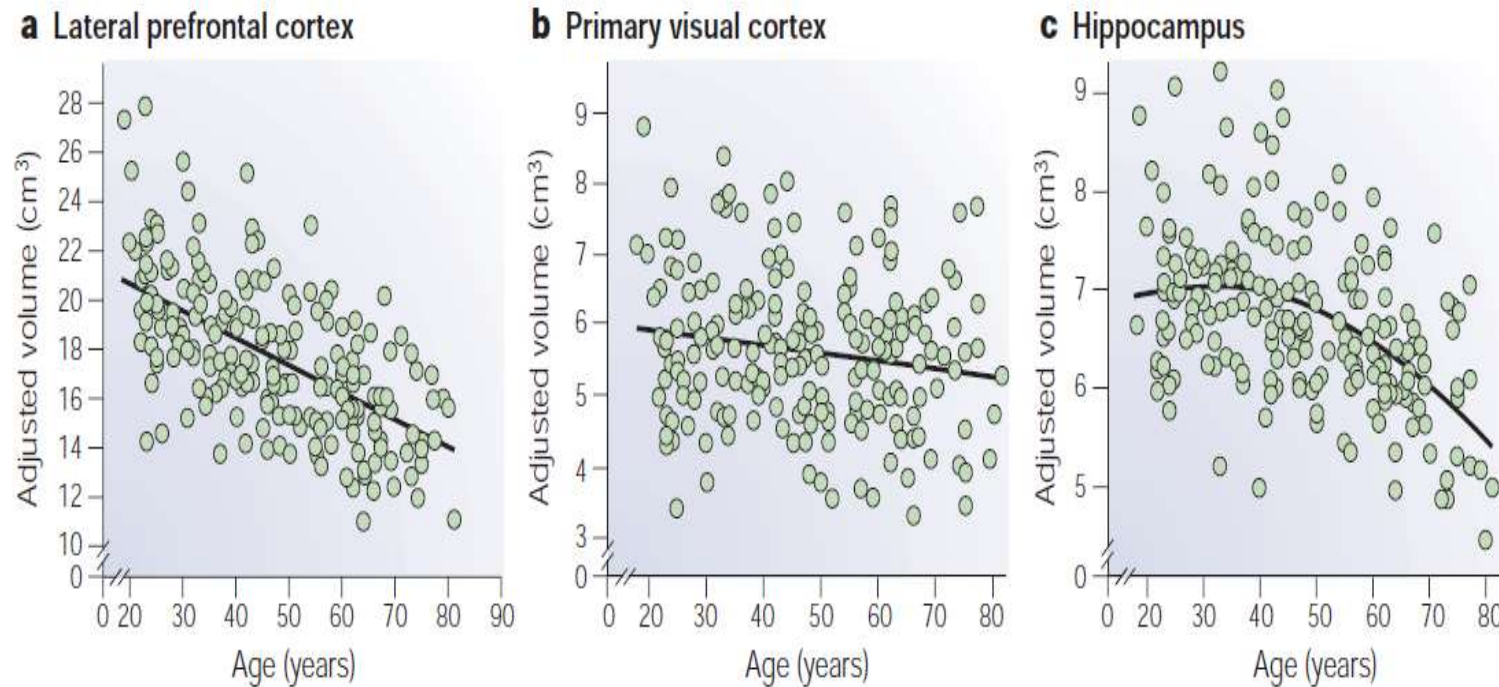


Figure 2 | **Cross-sectional estimates of age-related volumetric change in lateral prefrontal cortex, visual cortex and hippocampus measured with magnetic resonance imaging.** Points on each scatterplot indicate volumetric estimates from individuals, and the line of best fit is shown. Lateral prefrontal cortex volume declines steadily across the adult lifespan, while hippocampal volume has a curvilinear slope, with its largest declines occurring after age 60. Other areas, such as primary visual cortex, have only slight age-related volume declines. Data from REF. 25; figure courtesy of N. Raz.

# White matter in PFC & ACC atrophies

- ▶ Greatest age-related white matter changes are in the PFC and the anterior corpus callosum
- ▶ White matter abnormalities effect:
  - ▶ processing speed,
  - ▶ executive function
  - ▶ immediate and delayed memory

# EF in elderly brains

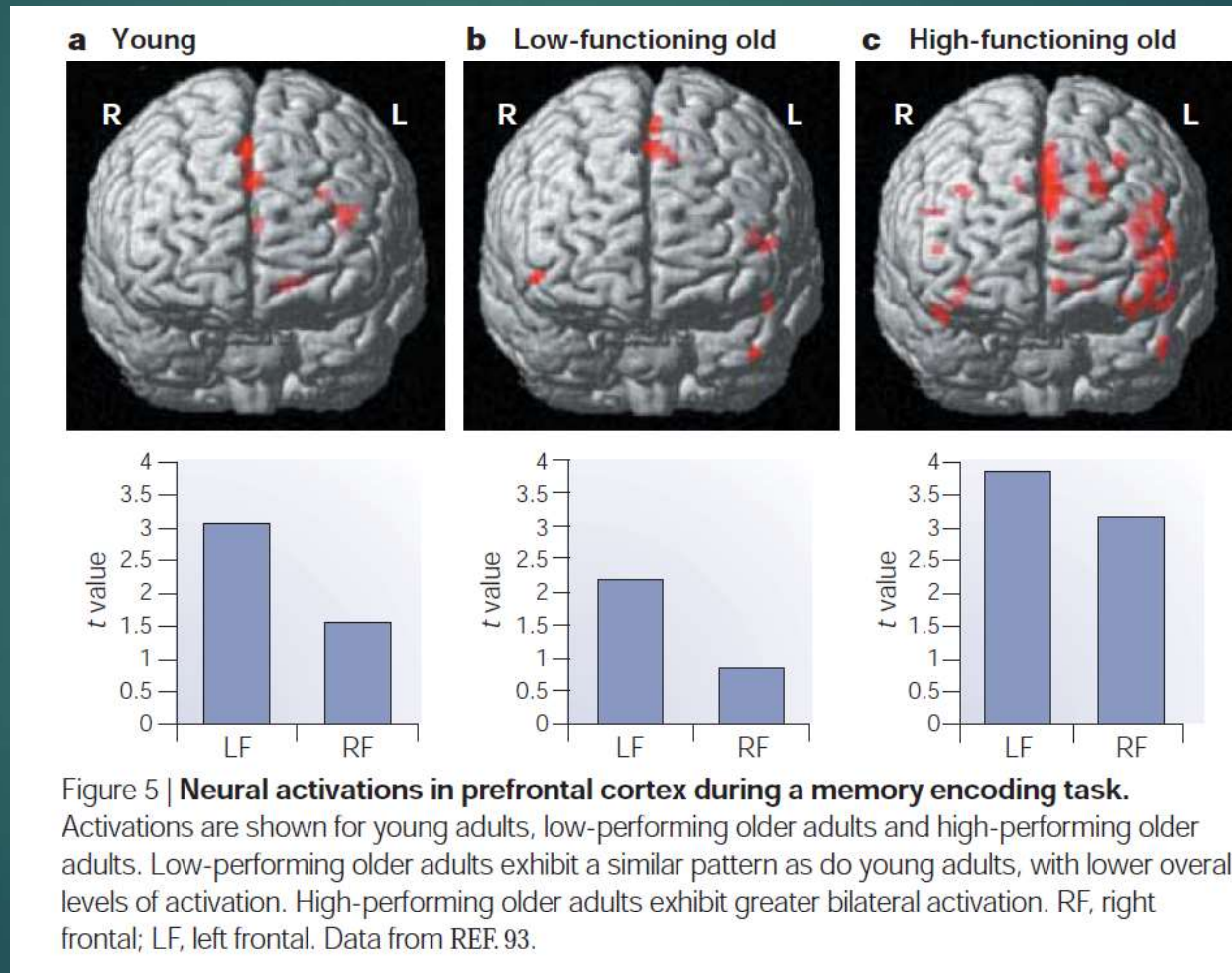
- ▶ Older adults experience greater difficulty than younger adults in performing executive processes:
- ▶ Two theories:
- ▶ Failure to activate PFC regions
- ▶ Increased recruitment of PFC regions under relatively easy conditions

# Older people use more frontal lobe resources

- ▶ The aging brain: higher levels of neural activity in prefrontal regions.
- ▶ Older adults often
  - ▶ show more bilateral prefrontal activations on both working memory and long-term memory tasks
  - ▶ younger adults show primarily left-lateralized prefrontal activations
- ▶ Compensatory recruitment of additional neural resources that maintain cognitive performance
- ▶ Physical exercise has robust effects for executive-control processes.



# More cognitively intact elderly use more bilateral areas





# Two Different Aging Populations

- ▶ Age Unimpaired:
  - ▶ Optimally healthy and higher SES:
    - ▶ Fewer cognitive changes due to Cognitive Reserve
- ▶ Age Impaired:
  - ▶ Typically health (DM↑, HTN↑, cardiac↓): More cognitive deficits
  - ▶ More likely to be seen for NB testing

Ageist Stereotypes affect Performance: “Don’t worry. You are older & will make more errors”.

- ▶ Simply reminding older adults about ageist ideas actually exacerbates their memory performance:
  - ▶ 70% of older adults met diagnostic criteria for Major NCD when examined under stereotype threat; score about 20% worse than ability level
- ▶ If confronted with negative stereotypes about a group with which they identify, they tend to self-handicap and perform worse than they would under typical circumstances, confirming the negative stereotype.

# Stereotypes

- ▶ Older adults respond to stereotype threat by changing their motivational priorities and focusing more on avoiding mistakes.
- ▶ Stereotype loads working memory rather than task.
- ▶ If they believe they will lose money with mistakes, they do better.
- ▶ Women who write a different name on a math test do better

# Countering stereotype threat

- ▶ Spend 5 minutes writing about a time when you felt powerful.
- ▶ Spend 5 minutes writing about what you are anxious about.

# Age and Memory Decline

## ▶ Preserved:

- ▶ Semantic memory (factual and conceptual knowledge),
- ▶ procedural memory
- ▶ language abilities

## ▶ Begin to decline in your 20s:

- ▶ Episodic memory (recall of experiences and events)
- ▶ spontaneous recall (of names)
- ▶ working memory
- ▶ processing speed
- ▶ selective attention
- ▶ ability to multitask

# Older think better in morning

- ▶ Older people are more focused and better able to ignore distraction in the morning than in the afternoon.
- ▶ Do more "idling" -- showing activations in the default mode network in the afternoon
- ▶ Better to test older pts in the morning.

# If Significant Cognitive Reserve, need harder NB testing

- ▶ Difference between amount of brain pathology & actual cognitive function
- ▶ If cognitive reserve is high, may need harder NB assessment
- ▶ Benefit: **Protective** (can have more pathology before cognitive decline):
  - ▶ Bigger brain/head circumference
  - ▶ Higher IQ
  - ▶ Higher education
  - ▶ Higher occupation
  - ▶ More leisure activity
  - ▶ Higher literacy

# NB testing in those with more cognitive reserve, higher IQs

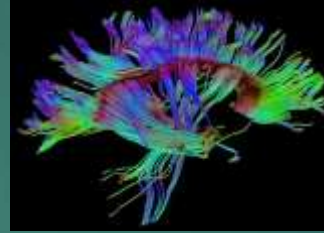
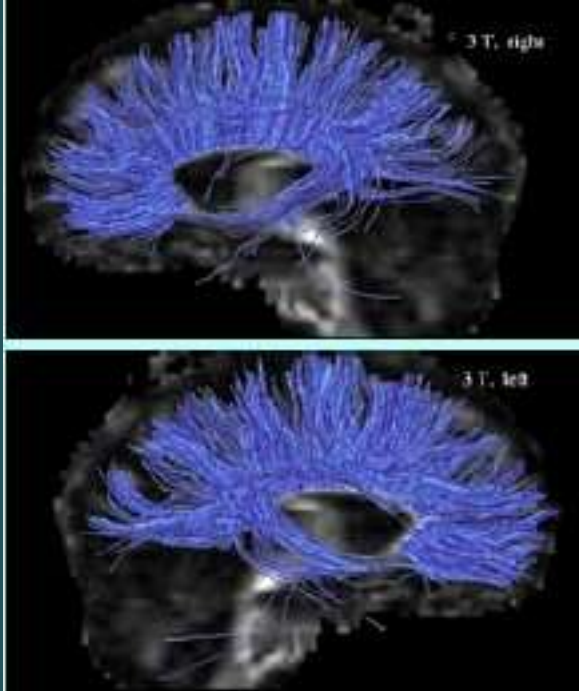
- ▶ Case:
- ▶ **KP physician**: 3 years of normal MMSE; wife, a pediatrician, stated he was impaired
- ▶ On NP testing, showed significant decline on the WAIS.
- ▶ If individual has high IQ or high educational or occupational achievement, must use more difficult NB testing.
- ▶ MMSE (& probably MOCA) is clearly inadequate.



## Normal Language: Need to test other NP domains

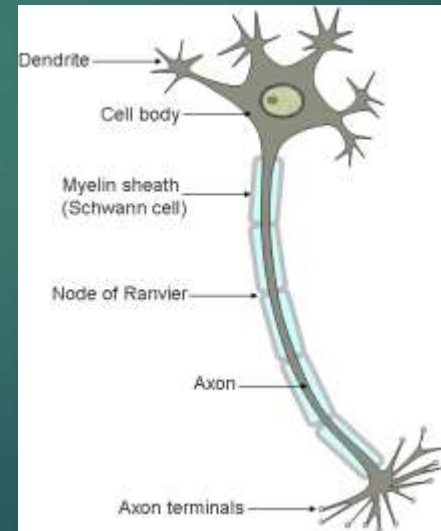
- ▶ Advise to Post Docs on Hospital Consults: Do not necessarily believe what patients tell you. All elderly want to go home and believe they are normal.
- ▶ Language functions are well preserved in elderly
- ▶ Vocabulary continues to increase (or may decline slightly)
- ▶ Word finding declines (longer to search; due to processing speed)

# Older are Centrally Slowed: Processing Speed Decreases

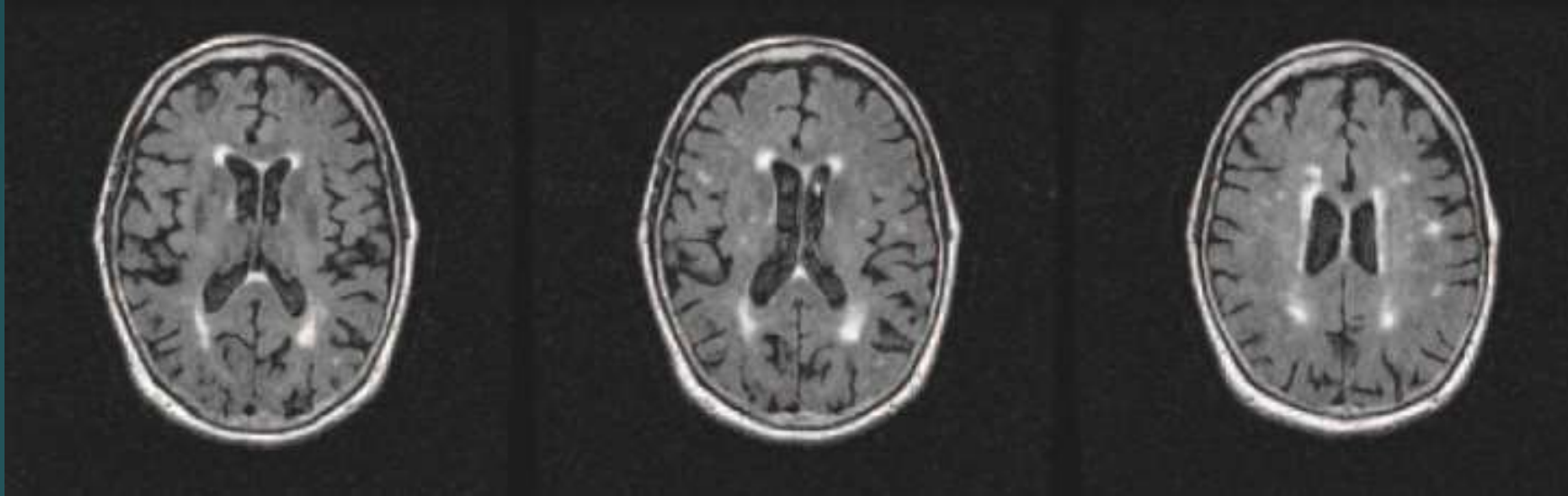


Diffuse Tensor Images of axonal tracts

One of reasons naming  
ability decreases



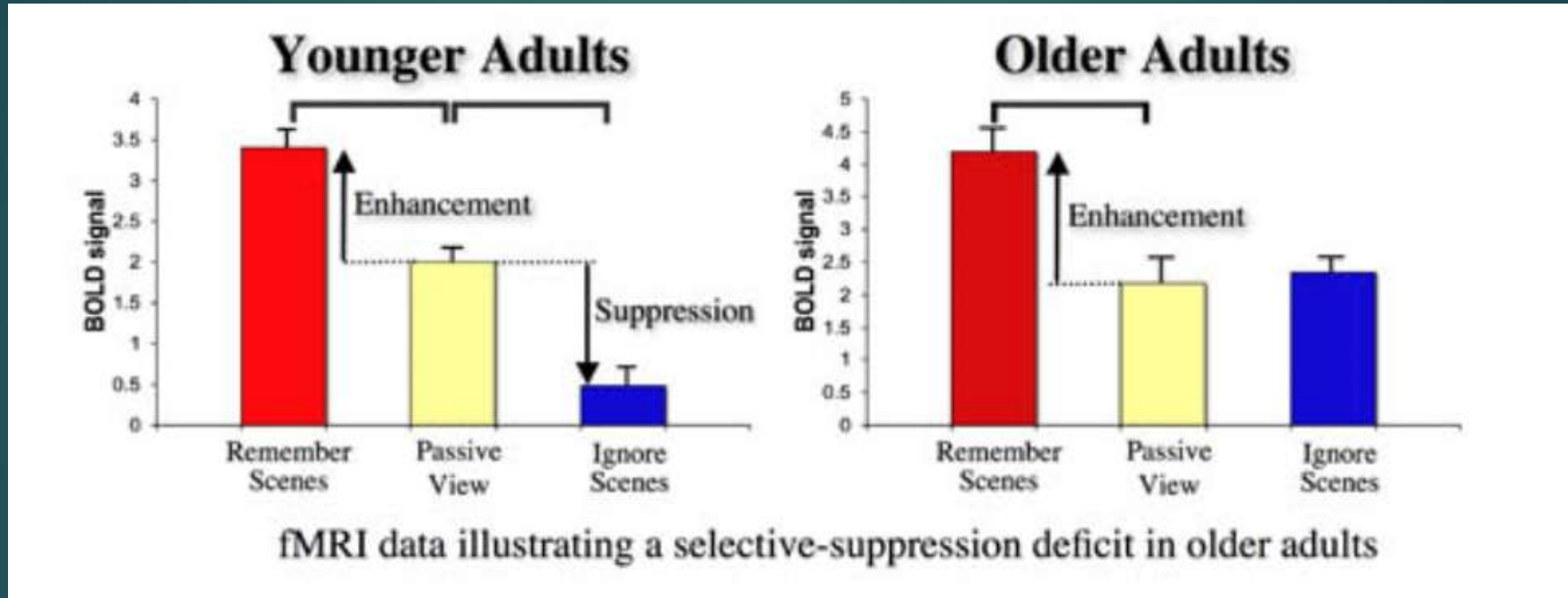
# White Matter Hyperintensities on MRIs: Small blood vessel damage



Processing speed declines as white matter hyperintensities increase

Strong associations between vascular risk factors and vascular disease  
when WMH volumes are extensive.

# Older Adults are more distractible



While healthy older adults (above 60 y.o.) were as effective at enhancing activity for relevant information in visual brain regions as young adults, they were unable to successfully suppress activity for irrelevant information;

Some older have normal suppression; are less distractible.

## Decline in Spontaneous Verbal Free Recall:

12 items at age 20, 7 items at 80



Number of items learned in 1 attempt

# Mild Memory Decline in normal elderly

- ▶ Mild difficulty with new learning (memory encoding); but can learn new things
- ▶ Impaired free recall (less fast access to memories)
- ▶ Normal recognition and familiarity
- ▶ Cuing Helps
- ▶ Better gist memory

# Word memory in elderly

- ▶ Normal adults older than 65: slight but reliable difficulties in retrieving lexical information learned decades earlier, difficulties that become progressively more severe with aging.
- ▶ Words become irretrievable if these words are rarely spoken, seen or heard.

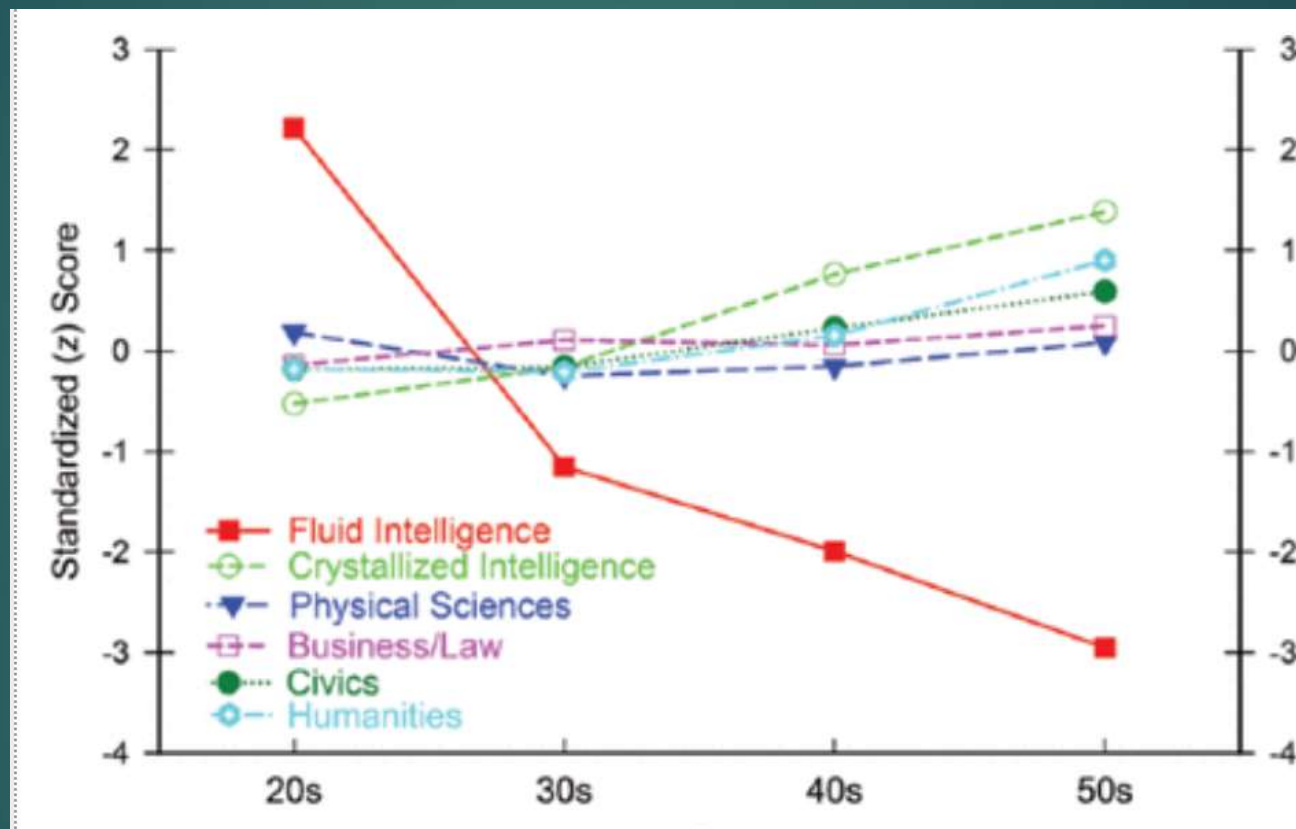
## 2 Types of Intelligence

- ▶ Crystallized abilities: Your Knowledge/Expertise - Stable
  - ▶ Vocabulary
  - ▶ Your fund of knowledge
  - ▶ Product (of earlier processing)
  - ▶ i.e. you are good at Trivial Pursuits or Jeopardy
- ▶ Fluid ability: Your Problem Solving Ability - Declines
  - ▶ Solving new problems
  - ▶ Ability to generate and manipulate information
  - ▶ New processing ability



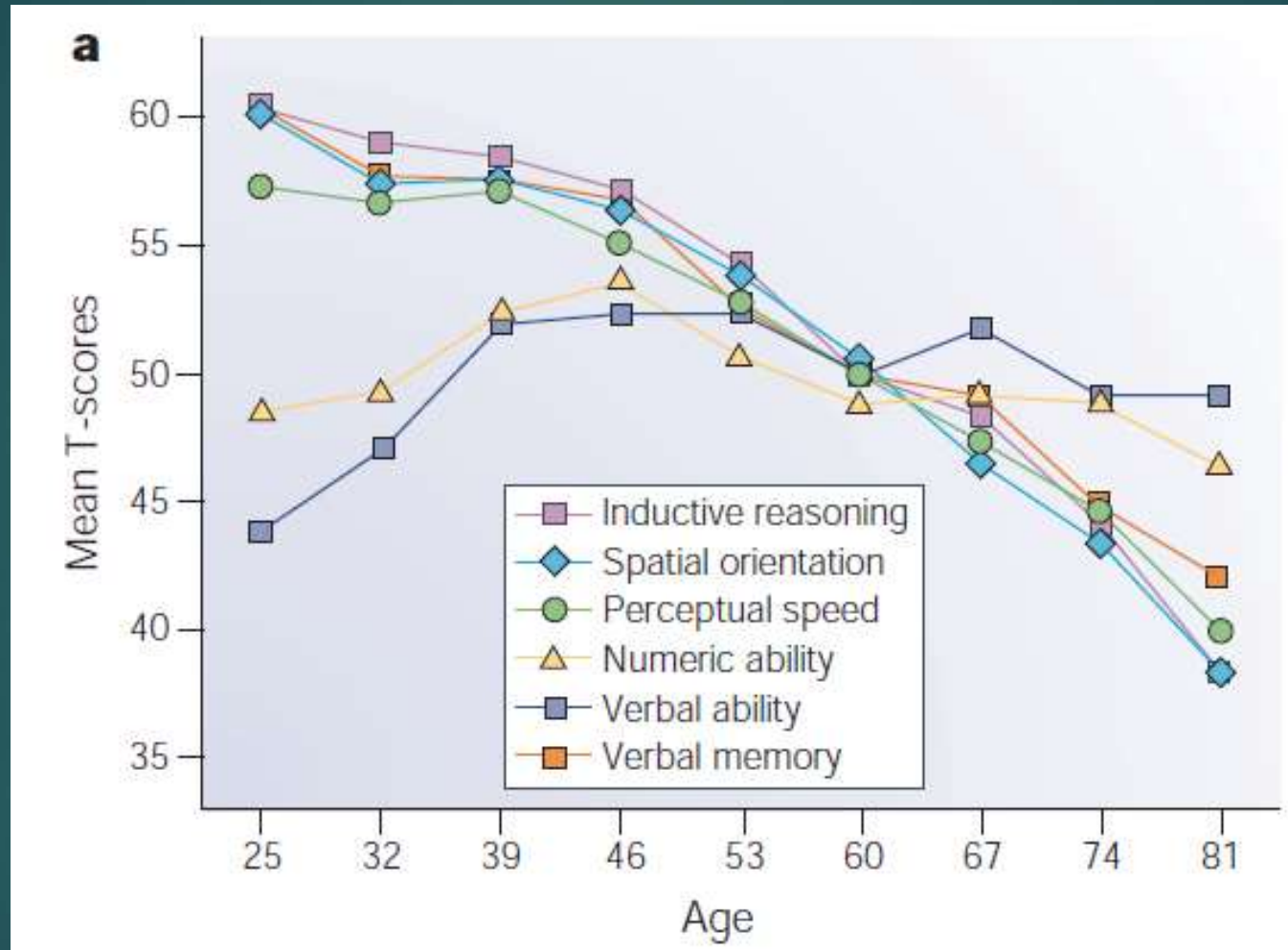
# Fluid IQ (Problem Solving) declines, Experience Knowledge does not

All had  
a B.A.



In contrast to performance on process measures, middle-aged adults performed as well as or better than young adults on nearly all domain-knowledge tests

## Seattle Long. Study: Verbal Ability ok vs. All Else ↓↓



Independent living ability normal

# Best preserved...

- ▶ Verbal ability
- ▶ Experiential Knowledge
- ▶ Procedural/behavioral memory
- ▶ Prospective memory in naturalistic settings

# Lothian Study of Scotland



# Scottish IQ study:

## Brain you are born with

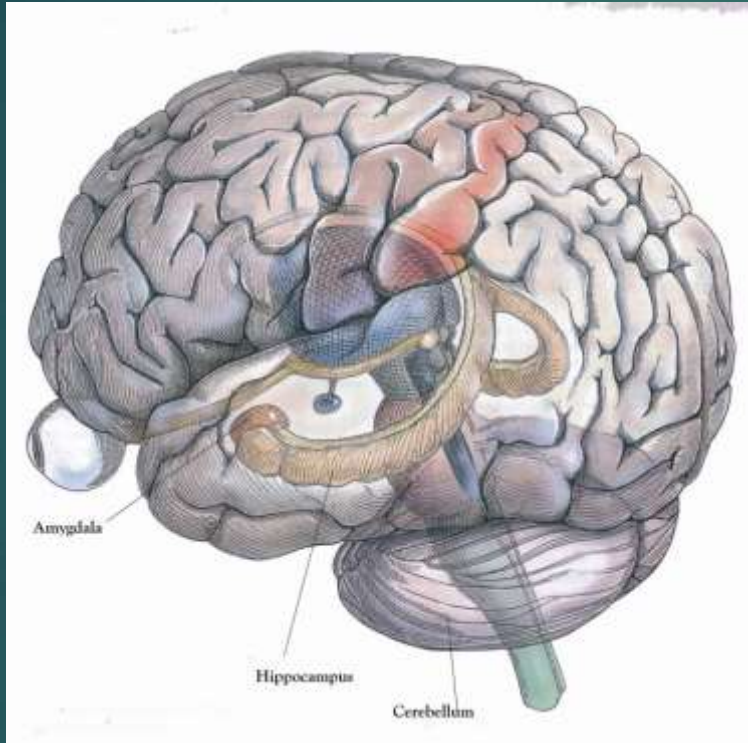
- ▶ Scottish Mental Survey: 1932 & 1947: all 160,000 (now 70,000) eleven year olds in Scotland took IQ test
- ▶ 50% of the variance at age 77 is explained by IQ at age 11
- ▶ Early IQ is more powerful predictor than: alcohol, coffee, BMI, diet, social & intellectual ability
- ▶ But those who did not smoke, were physically fit, bilingual, more educated had higher scores at age 77
- ▶ Abstract problem solving, fast thinking & reaction time, & ability to quickly sample sensory info declined in all.
- ▶ Those born with a better brain have initial advantage



# Water tank theory: CR vs NCD

- ▶ Best current science: **Your brain is like a filled water tank.**
- ▶ The better your brain is to start with (due to good genes & early environment & IQ), the more cognitive reserve (water in your tank) you have to lose to neurodegeneration.
- ▶ The more you start out with in your tank, the longer it takes to empty it.
- ▶ Your original brain is 50% of tank: your lifestyle choices related to cognitive decline control determine the other 50%.

# Hippocampus & Prefrontal Cortex



Hippocampus is index to your memory database. It connects anything new you experience to what you already know.

Prefrontal Cortex makes you a rational adult (reasoning, problem solving, behavioral inhibition)

Is Memory or EF  
more important in daily functioning?

Memory



# TOTS: Tip-of-the-tongue = recall of proper nouns

- ▶ Tip-of-the-tongue experiences (TOTs): a name is known but cannot be immediately retrieved from memory
- ▶ Only weakly related: Age-related increase in TOTs (semantic memory) and age-related declines of episodic memory (episodic memory).

# Naming is not as important as memory recognition



- ▶ What is name of this person?
- ▶ Princess Diana
  
- ▶ State several facts about this person
- ▶ Married Prince Charles
- ▶ Mother of William & Harry
- ▶ Died in car crash

# Normal Aging: Typical Memory patterns

- ▶ Explicit/Declarative/Factual Memory:  
Spontaneous delayed free recall ↓ (hippocampal)  
Recall declines more than recognition  
Recall shows a steeper decline after the age of 85
- ▶ Source memory (for when and where I learned something) is very vulnerable to aging
- ▶ Behavioral/Procedural (“How to”) memory better preserved

# Rate of Forgetting (how quickly you forget) does not increase in normal aging

- ▶ Rate of forgetting in recognition/recall is not faster in older vs. younger adults.
- ▶ In AD, faster rate of forgetting (2-10 minutes)
- ▶ Amount of Acquisition is lower:
  - ▶ 12 items learned at age 20 vs. 7 at age 80

# Old vs. New Memory



AD pt can talk for 3 hours about high school,  
but does not know what they had for breakfast 1 hour ago

## Memory worry in normal elderly

- ▶ A memory glitch does not mean you have a memory disorder
- ▶ Most Alzheimer's patients rarely know they have a memory disorder; due to its insidious onset

# Most functioning in life is behavioral memory

- ▶ We live ordinarily in behavioral memory: all repetitive behavior (remembering to close garage door or feed the dog)
- ▶ We need EF only for what is different, new, or challenging (medication change, whether to sign a check)

# Normal Memory vs. Real Memory Deficit Types

- ▶ Normal:
- ▶ Tape recorder works fine for input & output
- ▶ Given 16 new words 5 times, you recall 12 at half an hour
- ▶ New & old memories are equally accessible



## Encoding Failure: Tape recorder is off

- ▶ Tape recorder: no new input or output
- ▶ Poor spontaneous recall and recognition
- ▶ Cueing does not help
- ▶ Types: TBI, Alzheimer's, Down's

## Retrieval Failure: Trouble retrieving your memory

- ▶ Tape recorder works fine, but is slow; **output of memories that exist is slower**
- ▶ **Poor spontaneous recall**: poor 1-3 items on spontaneous recall,
- ▶ **Normal recognition (cueing helps)**
- ▶ **Subcortical pattern**: Normal aging, depression, Major NCDs (Korsakoff syndrome, chronic alcohol abuse, Parkinson's, HIV)

# Healthy Aging vs. Cognitive decline

## ▶ Risk Factors

- ▶ HTN
- ▶ Heart Disease
- ▶ Diabetes
- ▶ Poor Nutrition
- ▶ Family Hx of Major NCD
- ▶ Stress, Depression

## • Protective Factors

- Not smoking
- Exercise
- Routine Medical care
- Good CV health:
  - what is good for heart is good for the brain
- Good social support

# Executive Functioning

# Executive Functioning: not 1 process

- ▶ Executive functioning consists of numerous self-regulatory processes
  - ▶ novel problem solving,
  - ▶ modification of behavior in response to new information
  - ▶ regulating inappropriate behavior
  - ▶ planning and generating of strategies for complex actions.

# Frontal prosthesis: Acting as someone else's frontal lobe

- ▶ Being Frontal: When another person directs an activity, sets the pace, starts and stops the activity, makes all major decisions, i.e.
  - ▶ Neuropsychologist during testing
  - ▶ Parent supervising kid's homework
  - ▶ Home visit nurse setting up pill box
- ▶ All represent forms of external frontal prosthesis: assuming other person has normal executive functioning while we act as their external executive monitor
- ▶ We need to be aware of when we are doing the executive work for someone else

# The frontal lobe problem:

## Executive dysfunction and anosognosia

- ▶ Nothing insures that a person who knows how to do something is capable of doing it on their own.
- ▶ Anosognosia: The person whose frontal lobes are impaired cannot tell you what the problem is or that they even have a problem because normal frontal lobes are what give you the ability to be aware of the problems you are having.
- ▶ Examples: Addiction, BPD, TBI, Stroke, NCD, FTD, most severe Psychiatric diagnoses

# Classic Neuropsych Testing vs. Real World

- ▶ Patients with frontal lobe deficits tended to do normally on classic structured NP tests of memory, spatial ability, language, etc.
- ▶ What they can do in testing room (quiet, unemotional, frontal prosthesis) is often very different from their real world performance.
- ▶ Listen to collaterals: People in their lives or family, rather than doctors in their office, see the real EF disabilities.



# Real world EF complaints of families

- ▶ poor or unreliable judgment/decision making,
- ▶ carelessness,
- ▶ apathy,
- ▶ poor adaptability to new situations,
- ▶ blunted affect,
- ▶ being stimulus bound,
- ▶ poor delayed responses,
- ▶ poor abstraction,
- ▶ poor flexibility,
- ▶ perseveration

# Executive Dysfunction dissociation

- ▶ Executive Dysfunction dissociates the Capacity (knowing how) to perform the elements of a complex task from its orchestration and the Actual Execution (when and how).
- ▶ Difference between what they say they can do in hospital and what they can actually do at home
- ▶ How to do it vs. when and whether to do it

# Executive Functioning

- ▶ EF is distinct from more automatic cognitive processes that have been overlearned by repetition.
- ▶ EFs allow us to respond flexibly to the environment
- ▶ EF is essential for successfully navigating nearly all of our daily activities.
- ▶ Impairments in EF thus have very serious consequences

# Executive Dysfunction

- ▶ Neurogenic denial of deficit: Do not know they have a problem (“I can drive; I can live alone”)
- ▶ Poor Self Monitoring leads to inability to understand the consequences of one’s actions.
- ▶ Executive dysfunction **associated with**:
  - ▶ Functional decline
  - ▶ Increased need for care
- ▶ Executive ↓ correlates with decline in IADLS (inability to use phone, letter, finances, meal prep)

# Executive Deficit Predicts:

- ▶ Decline in
  - ▶ Functional autonomy
  - ▶ Money management
  - ▶ Medication management
- ▶ Poor geriatric orthopedic & stroke rehabilitation outcome

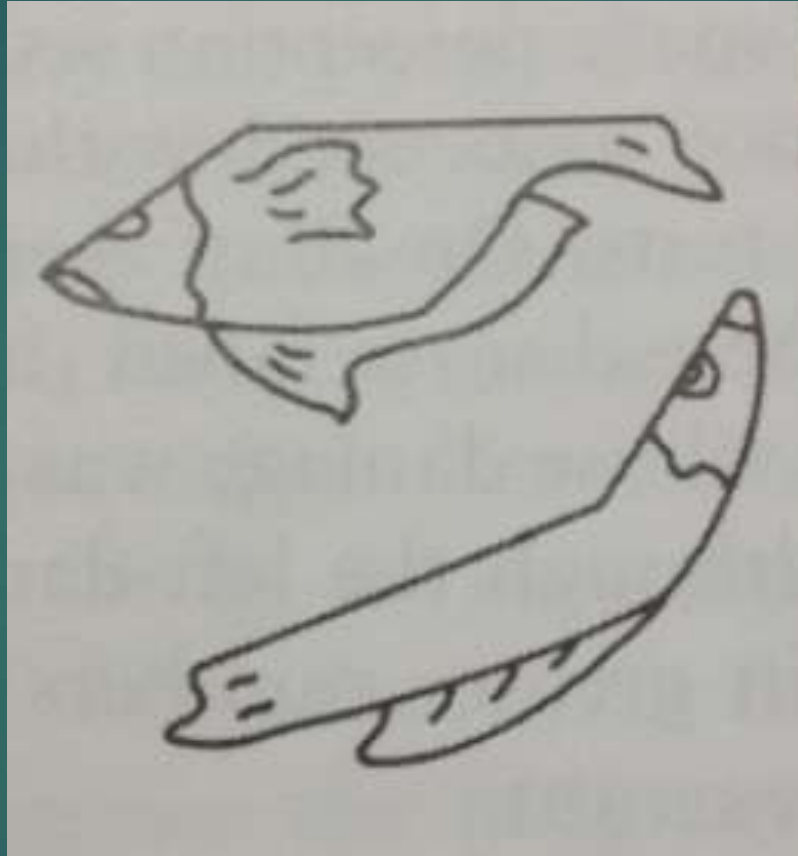
# Executive Dysfunction in Major NCD

- ▶ Associated with impairment of prefrontal and frontal-subcortical circuits
- ▶ Executive ↓ can be independent of Memory ↓
- ▶ New changes in behavior:  
personality changes, dysinhibition, hypomania, apathy

# Executive Functioning Measures

- ▶ TMT B
- ▶ WCST
- ▶ Clock Drawing
- ▶ Stroop
- ▶ Category (Animal) Naming
- ▶ Behavioral Dyscontrol Scale (BDS)
- ▶ EXIT25
- ▶ Action Fluency
- ▶ EF items on MoCA

What is this if you put 2 parts together?



Duck or Fish?



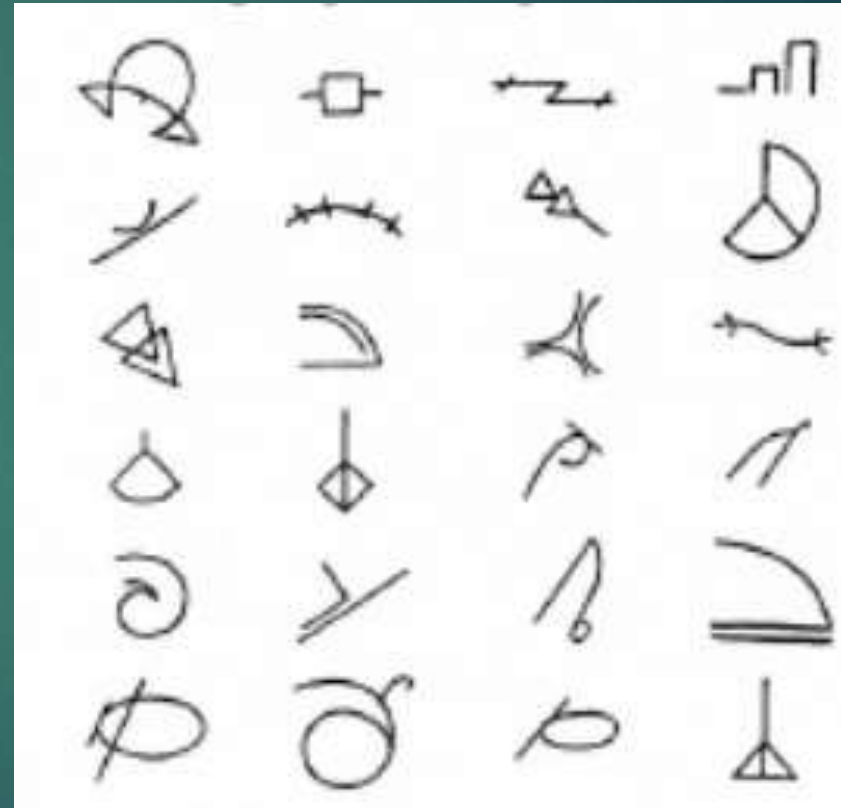
# Fluency Tests

## Verbal

Words beginning with S:

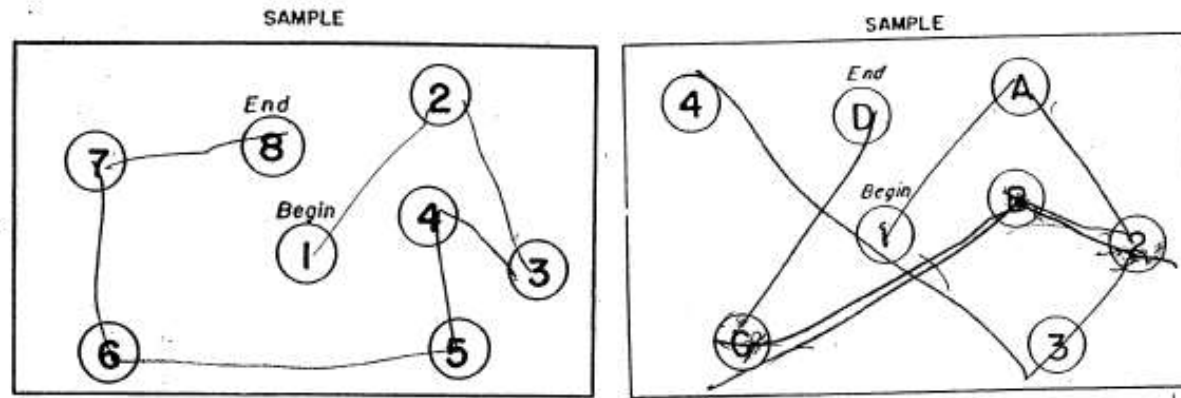
Small  
Similar  
Single  
Sound  
Semi  
Soldier  
Sat  
Swim  
Sing

## Design



# Mental Flexibility: Trail Making

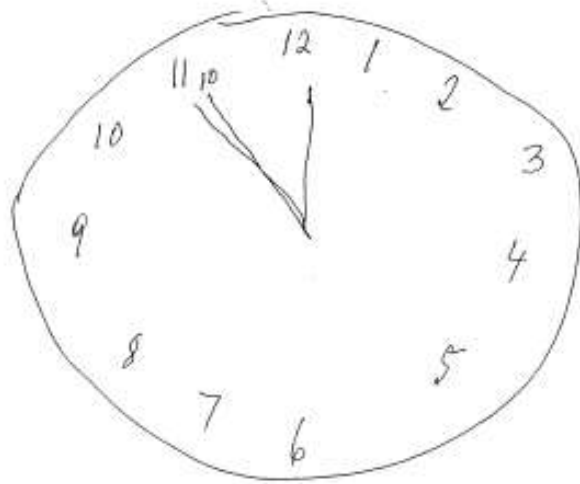
## Mental Flexibility



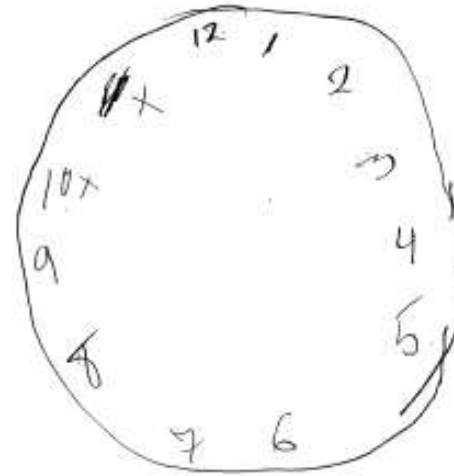
Example: Trails A & B of patient with early stage AD

# Executive Function: Clock Drawing

Executive Function  
Draw A Clock: “10 after 11”



79 year old right handed male  
Mild Vascular Dementia



79 year old right handed male  
Mild Vascular Dementia

**Stroop**: Read the color of ink not the word

**BLUE**

**GREEN**

**YELLOW**

**PINK**

**RED**

**ORANGE**

**GREY**

**BLACK**

**PURPLE**

**TAN**

**WHITE**

**BROWN**

Cognitive Inhibition

# Frontal Intrusions & False Positives on a memory test

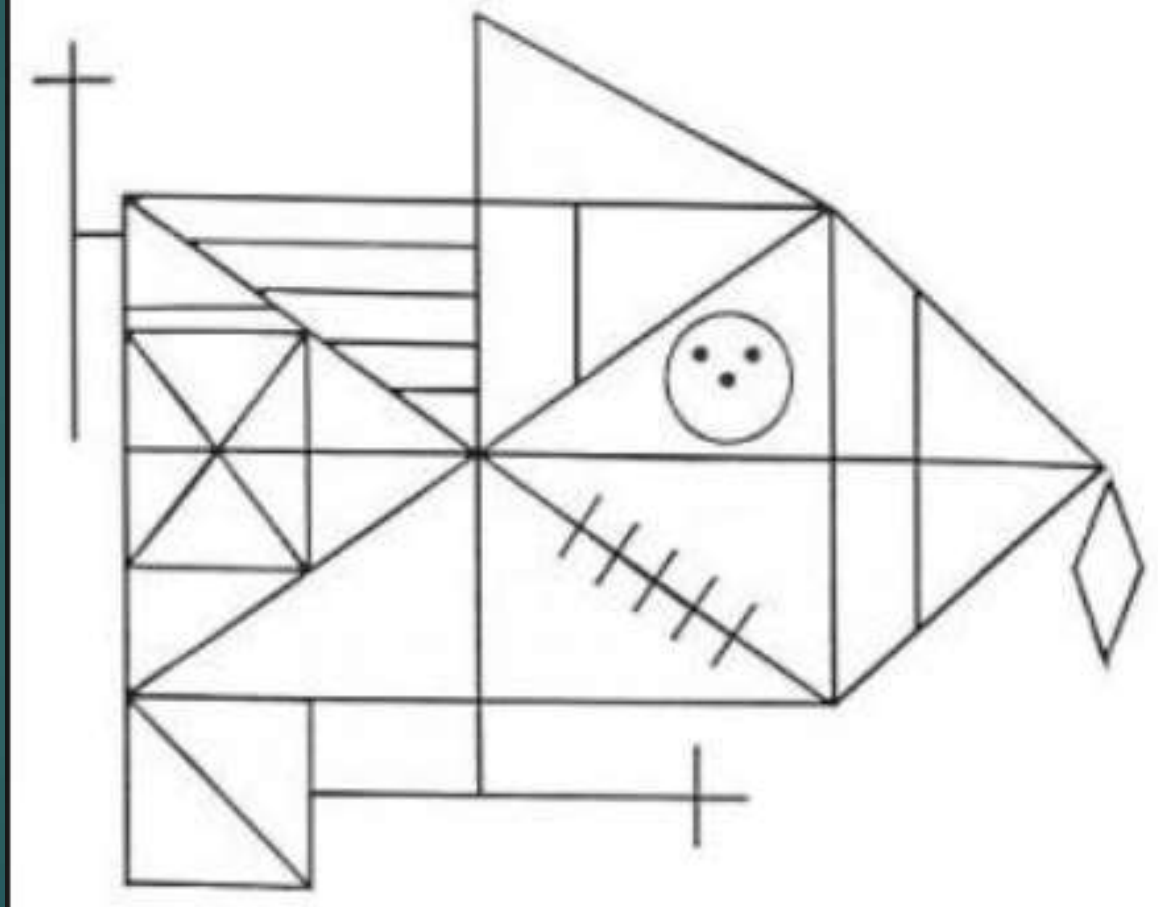
- ▶ Original list: dog, cat, window, hat, red
- ▶ Increased **intrusions**: adds cow, yellow
- ▶ Increased **false positives on cued recall**: Was the word cow on the original list?
  - ▶ Answer: yes
  - ▶ = source memory failure

**Fluency Test:** Tell me as many words beginning with the letter F; no proper nouns

- ▶ Fang
- ▶ Fuss
- ▶ Finger
- ▶ Fabulous
- ▶ Fuck
- ▶ Fever
- ▶ Famous

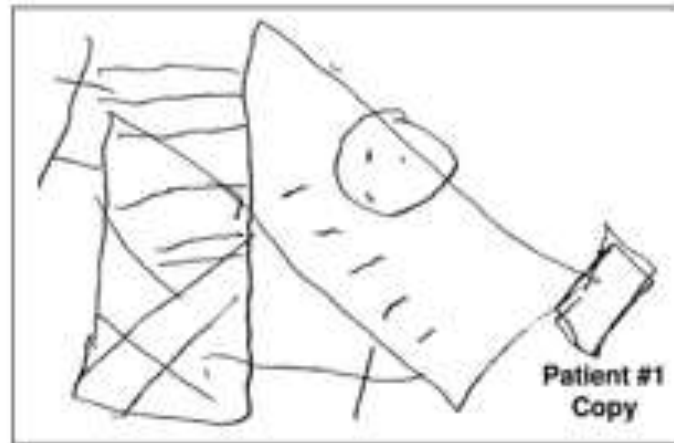
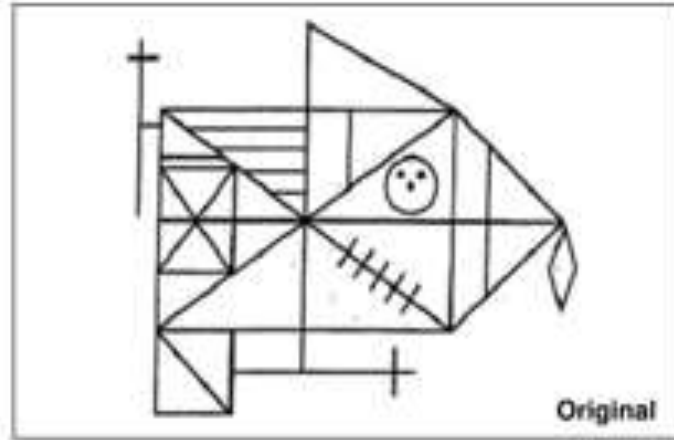
Lack of inhibition: only found in FTD & psychopaths

Copy this (then recall it in 30 minutes)



Drawing strategy is EF

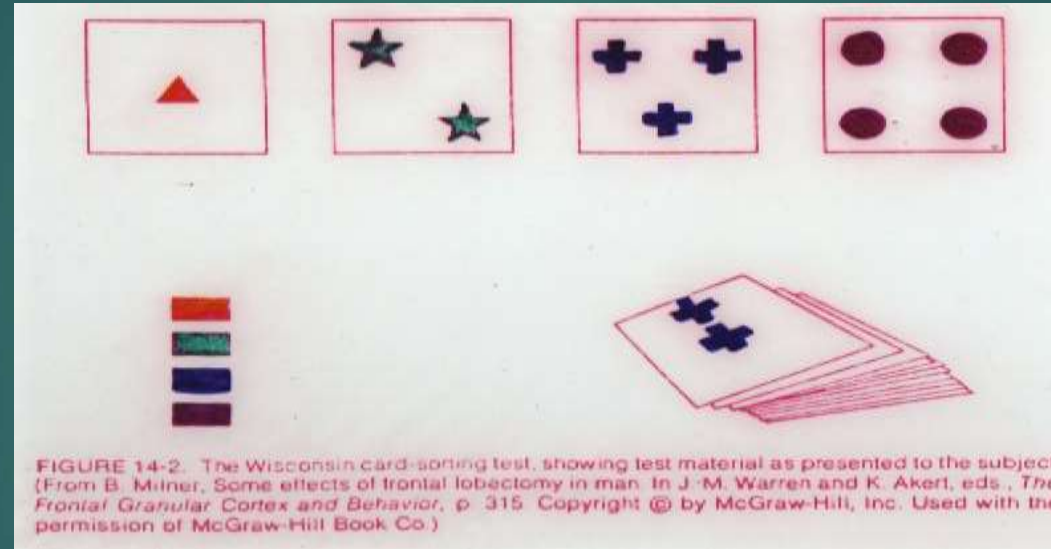
# 3 months after an ICU stay





# WCST: Wisconsin Card Sort Test

## The Gold Standard



EF failure: Guessing color again as the sort principle after 3 errors

Opinion: Nonverbal executive function tests are superior to verbal tests in predicting real world independence capability.

# Examples of Executive Functioning in the Real World

# Phishing email sent to me



Dear Bank of America Customer,

We recently have determined that different computers have tried to log in to your account.  
Multiple password failures automatically places your account on hold.  
We now need you to re-confirm your account information to us.

We strongly recommend that you visit the Customer Central below and confirm your payment:

[ [Login to Customer Central](#) ]

If payment is not completed by [ June 22, 2014 ] - we will be forced to suspend your account indefinitely. We are currently investigating this issue, if it is a system error, you may disregard this message.  
We appreciate your prompt attention to this important online security notice.

Hitting login: sends you to "B of A" site which asks for your  
Information: logon, password, email address, identity items.

# Pill Box



How do they manage medications?

# Signing a check for a telephone man at the door

2400

Nov. 27, 2012 91-548/1221

PAY TO THE ORDER OF XYZ, Inc \$ 100-10

ONE HUNDRED AND 10/100 DOLLARS

FOR PHONE BILL X S L

⑆ 1 22105278⑆ 6724301068⑆ 2400⑆

Appropriate decision making

Dialing a wrong number 4 times



Error correction

# Transferring your home to your pastor

Confidential information removed. P. 1

Assignment of Beneficial Interest in the Security Deed from MERS electronic registry to Wells Fargo recorded just before the sale date

MERS cannot assign because it does not hold the underlying note. MERS has no beneficial interest in the Security Deed it could transfer to another party (Wells Fargo).

Judge in recent California case: "Any attempt to transfer the beneficial interest of a trust deed without ownership of the underlying note is void under California law."

Other states have had similar rulings: example: Kansas, Ohio, Nevada, Arkansas, among others.

Our File No.:  
Debt:  
Sale Date: 07/07/2009

Dec: Book  
Filed and Recorded June 2009 0002016

J.C. Stephenson  
Clerk of Superior Court Cobb Cty. Ga.

Return to:  
Roswell, GA 30076

ASSIGNMENT

STATE OF  
COUNTY OF

For value received, Mortgage Electronic Registration Systems, Inc. has this day transferred, sold, assigned, conveyed and set over to Wells Fargo Bank, N.A. d/b/a America's Servicing Company, whose address is PO Box 10128, Des Moines, IA 50306-0328, as Assignee, its successors, representatives and assigns, all its right, title and interest in and to a certain Security Deed (or Deed to Secure Debt) executed by as Mortgage Electronic Registration Systems, Inc., dated December 1, 2006, recorded in Deed Book Page , Cobb County, Georgia Records.

Property Address:

The Assignor herein specifically transfers, sells, conveys and assigns to the above Assignee, its successors, representatives and assigns, the aforesaid Security Deed, the property described therein, the indebtedness secured thereby together with all the powers, options, privileges and immunities therein contained.

The Assignor herein has this day sold and assigned to the Assignee herein the note secured by the aforesaid Security Deed and this transfer is made to secure the Assignee, its successors, representatives and assigns, in the payment of said note.

IN WITNESS WHEREOF, the Assignor has hereunto set its hand and seal this April 4, 2009.

Signed, sealed and delivered  
in the presence of:

Unofficial Witness  
Notary Public  
My Commission Expires:

MORTGAGE ELECTRONIC REGISTRATION  
SYSTEMS, INC.

By:  
Printed Name:  
Title: Assistant Secretary

By:  
Printed Name:  
Title: Vice President  
(Corporate Seal)

These signatures are believed not to be the actual signatures of the signing parties. In addition, they are not officers of MERS.

In this example the names (above the titles) have been erased by us. Always research (Google) names on your documents to determine where the signers are actually employed. They can be employees of the Clerks, employees of other companies unrelated, and even foreclosing attorneys.

This Notary could not have officially witnessed signatures because the seal is outside the required 4 years. Each commission is for a term of four years (see ENGL). There is also a question as to the validity of the Notary's signature. The Unofficial Witness is unknown.

There is no Corporate Seal

NOTARY PUBLIC  
GEORGIA  
APR 14, 2009  
CHRYSLER WILDER  
GWINNETT COUNTY

Responding to undue influence:  
Decision making in the face of emotional coercion



# Dr. Michal Weber Sign: EF failure

- ▶ Hospitalist requested consult on 88 yo woman who wanted to sign over her house to a friend.
- ▶ 88 year old KP hospitalized woman was asked by Dr. Vella to sign over her house to his resident Dr. Michal Weber, whom he described as “a very trustable person”.
- ▶ She said “yes”



# Staring out a window for hours



## Apathy, Loss of initiation

# Watching TV for 8 hours at a time



## Loss of initiation

# Lack of impulse control or empathy



Unlike Hannibal Lecter,  
FTD pts often cannot be  
empathic

# Favorite repetitive response in hospitalized elderly:

- ▶ “I am fine. There is nothing wrong with me.”
- ▶ “I can take care of myself”
- ▶ “I can live by myself

= Anosognosia

# Ability to keep track of your money



Complex EF

# Hoarding Beanie Babies



Loss of impulse control



# Mild NCD: Mild Cognitive Impairment

1. Modest Cognitive decline from previous level of performance in 1 or more cognitive domains
  1. Concern of person, informant, or clinician of a mild cognitive decline
  2. Modest cognitive impairment on NP testing

2.

Deficits do not interfere in independent functions

Specify due to what (AD, FTD, LBD, VD, etc.)

- ▶ Some with MCI go on to develop Major NCD.
- ▶ Some with MCI do not progress to Major NCD,
- ▶ Some with MCI at one point in time later revert to normal cognitive status.

Petersen et al., 1999, 2008; DSM-5

# Amnestic Mild NCD Outcomes

- Amnestic Mild NCD
  - Hippocampal volume reduction
  - 30% develop Alzheimer's disease within 5 years
  - 30% dead within 5 years
  - But not all go on to Major NCD



# Risk Factors for Cognitive Decline: Correlation not Causation

- ▶ Think of these when doing NB assessment:
- ▶ Age: greatest risk factor
- ▶ TBI: 2 x if moder-severe; WWII soldiers – 10x
- ▶ Hypertension, any cardiac condition
- ▶ Gender: women (live longer) > men
- ▶ Strokes
- ▶ Obesity or rapid weight loss
- ▶ Not finishing high school (80 % greater risk vs. completion)
- ▶ Prolonged stress = more fibrillary tangles

## Risk Factors 2

- ▶ Diabetes: 2 x risk; esp. if mid-life start
- ▶ Smoking
- ▶ Low vitamin D (older need 1000 IUs/day)
- ▶ Poor Diet: low fish, high dairy, high meat
- ▶ Physical frailty: 2x
- ▶ PTSD
- ▶ Recurrent major depressive episodes
- ▶ Physical inactivity
- ▶ Low cognitive stimulation in real life

# Delirium & Anticholinergics

# Delirium

- ▶ Delirium is the most common complication in hospitalized older people
- ▶ 50% of older patients postoperatively, and even higher in elderly patients admitted to intensive care units
- ▶ Meta-analysis provides evidence that delirium in elderly patients is associated with an increased risk of death, institutionalization, and Major NCD

# Delirium

- ▶ 80 percent of patients in intensive care units experience delirium
- ▶ Delirium is unrecognized in 60 percent of patients
- ▶ Statistically having delirium = having a heart attack.
- ▶ Once delirium occurs, the same percentage of individuals die from it as die from a heart attack

# Delirium

- ▶ Delirium is the most frequent reason for psychiatric consultation, especially of patients 65 and over, and particularly those who are post-op.
- ▶ General anesthesia used in surgery is a common culprit
- ▶ Treatment:
  - ▶ Lorazepam (Ativan) is \*\*0.25 to 0.5 mg every four to six hours prn (as needed) for agitation.
  - ▶ Haloperidol used is \*\*0.25 – 0.50 mg every four to six hours prn for severe agitation/acute psychosis.

# Delirium Sxs

- ▶ Disturbance of consciousness (attention/awareness)
- ▶ Fluctuation in sleep/wake cycle
- ▶ Direct physiological consequence of medical condition
- ▶ Amnestic
- ▶ Cognitive/perceptual changes (hallucinations, paranoia)
- ▶ Psychomotor ↓↑

# Postsurgical Delirium

- ▶ Persons 50 years and older with planned postoperative intensive care unit (ICU) admission following an elective operation
- ▶ Delirium occurred in 43%;
  - ▶ 68% hypoactive
  - ▶ 31%mixed,
  - ▶ 1.4% hyperactive: agitated, psychotic, aggressive





# Medication effect on Cognition

- ▶ Negative effect of medications:
  - ▶ central processing
  - ▶ motor functioning speed,
  - ▶ concentration,
  - ▶ memory
- ▶ Need to know what medications patient has taken in last few hours, esp. pain meds, antihistamines, etc.

## Medication effect on Cognition 2

- ▶ Alcohol: Memory, EF, motor decline
- ▶ Benzodiazepines: all produce sedative, psychomotor, concentration, and memory deficits
- ▶ Opioids: impaired attention, memory and motor
- ▶ Sedative antihistamines: negatively impact psychomotor function, vigilance, adaptive measures, such as driving and memory,
- ▶ When doing NB testing, check for: benzos, pain meds, stimulants

## Anticholinergic Syndrome: Mad as a hatter

- ▶ hot as a hare = high temperature
- ▶ red as a beet = vasodilation
- ▶ dry as a bone = decreased mucus, dry mouth, constipation
- ▶ blind as a bat = blurred vision
- ▶ mad as a hatter = hallucinations, delirium

Medications (Beer's List) : urinary meds, atrophine, tricyclics, anti-parkinsonian, antihistamines, haldol, digoxin

# Anticholinergic effects 2

Mad as a Hatter: CNS effects resemble those associated with delirium, and may include:

- ▶ Confusion
- ▶ Disorientation
- ▶ Agitation
- ▶ Euphoria or dysphoria
- ▶ Respiratory depression
- ▶ Memory problems
- ▶ Inability to concentrate
- ▶ Wandering thoughts; inability to sustain a train of thought
- ▶ Incoherent speech
- ▶ Wakeful myoclonic jerking
- ▶ Unusual sensitivity to sudden sounds
- ▶ Illogical thinking
- ▶ Photophobia

# Anticholinergic effects 3

- ▶ All bladder cholinergic drugs (i.e., oxybutynin, tolterodine) are anticholinergic.
- ▶ Beers List (online): Potentially Inappropriate Drugs for the Elderly
- ▶ Drugs with anticholinergic effects can worsen the cognitive status of patients with Alzheimer disease and may blunt the effects of cholinesterase inhibitors.
- ▶ Association of concurrent use of cholinesterase inhibitors (Aricept) and bladder cholinergic drugs (oxybutynin, tolterodine): higher rates of long-term functional decline

# Anticholinergic effects 4

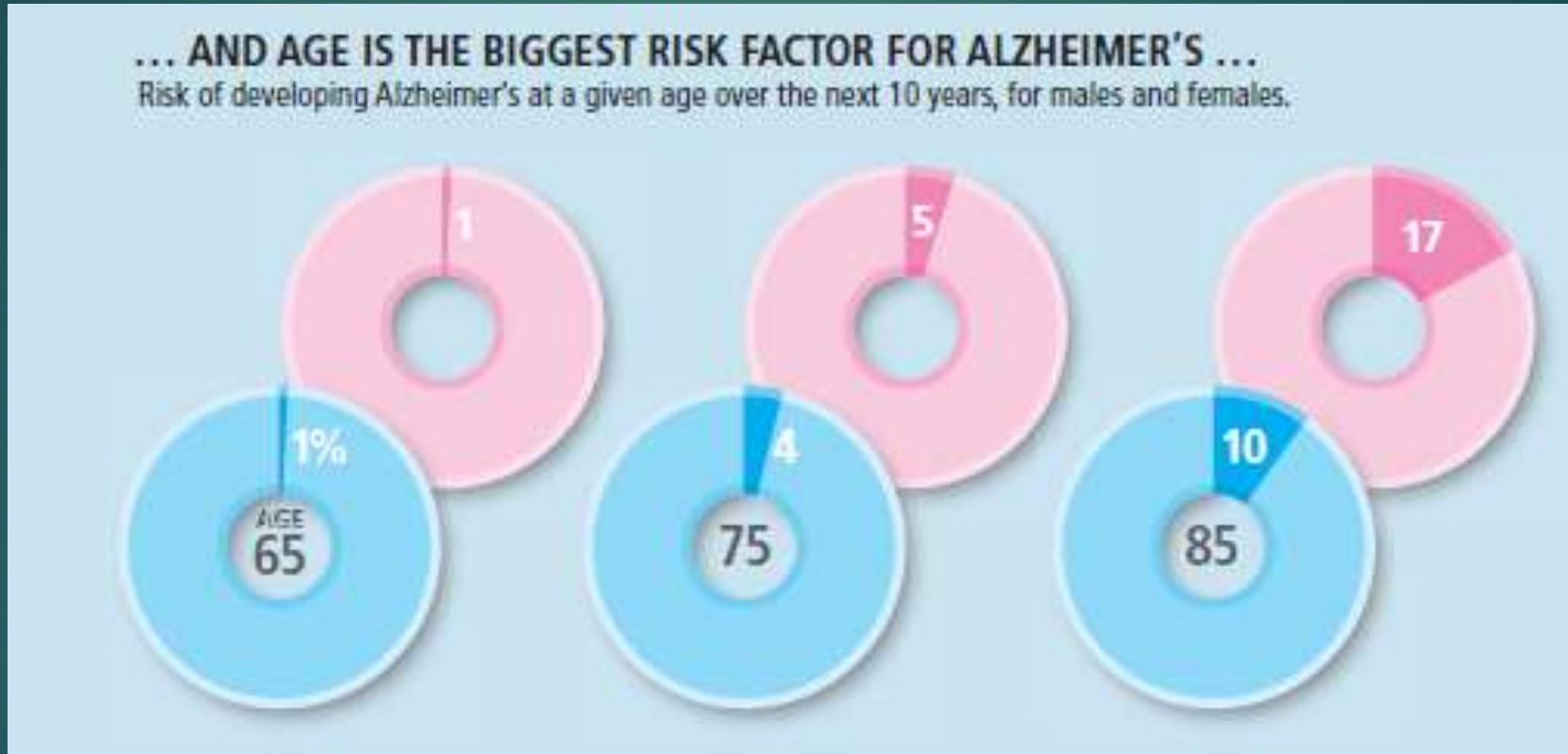
- ▶ Study: Elderly people taking anticholinergic drugs had:
  - ▶ significant deficits in cognitive functioning
  - ▶ but not at increased risk for Major NCD.
- ▶ 80 % of the continuous users were classified as having mild cognitive impairment

# AD Underdiagnosed

- ▶ Early Alzheimer's disease is subtle and often undiagnosed
- ▶ Less than half of AD patients are diagnosed
  - ▶ PCPs miss up to 91% of mild AD
  - ▶ Only 10-15% receive acetylcholinesterase inhibitors

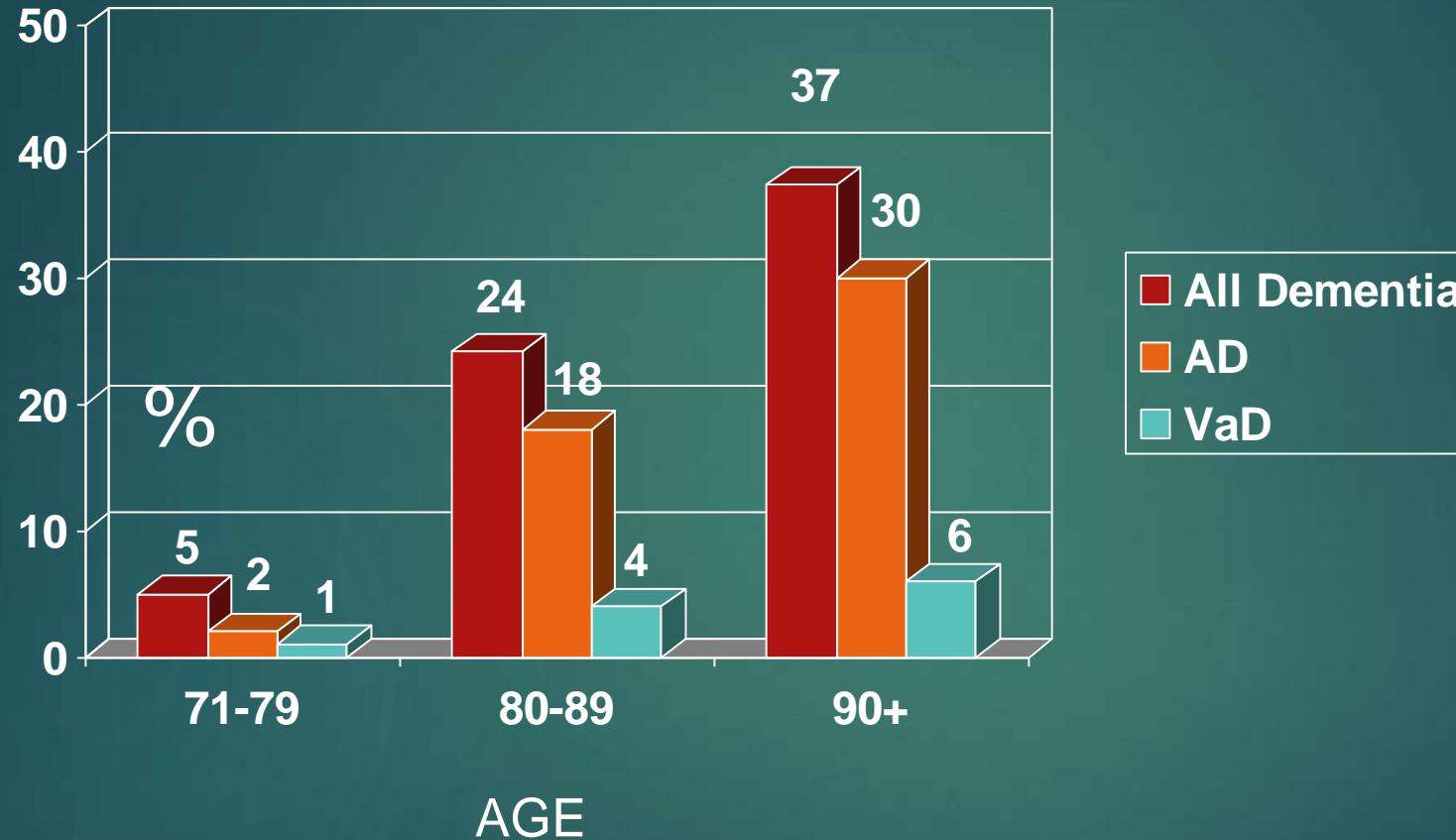
# Age is greatest risk factor for AD

Major NCD doubles every 5 years after 65





# Prevalence of Major NCD in 2002 in USA



Executive measures: TMT, COWAT

# When to expect Major NCD

- ▶ Major NCD increases with age:
  - ▶ 5% of people aged 71 to 79 years,
  - ▶ 24% of people aged 80 to 89 years: 1 in 4
  - ▶ 37-42% of aged 90 years and older:
    - ▶ 1 in 3;
    - ▶ 60% women

# Higher NCD Risk & Ethnicity: Life experience factors

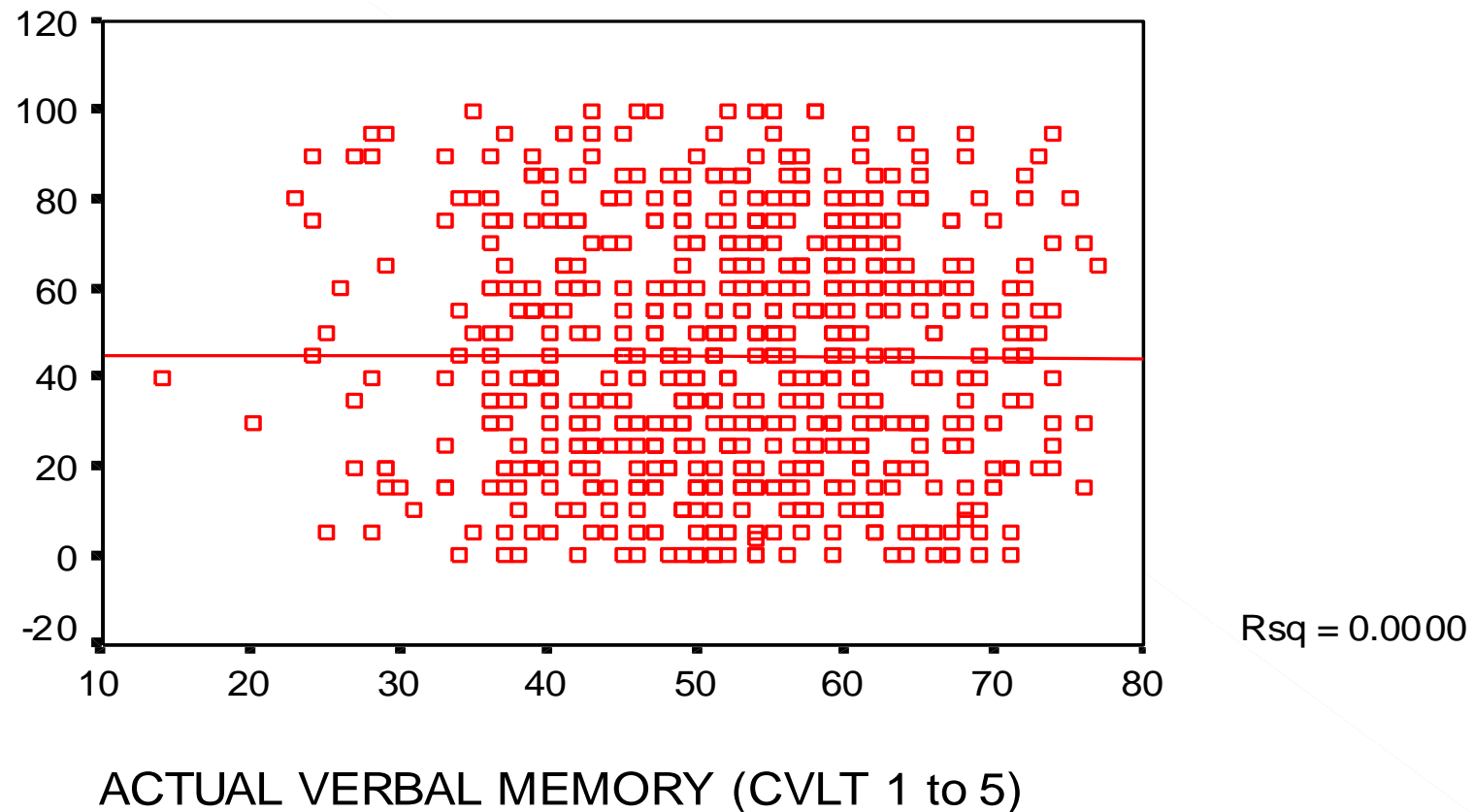
- ▶ ADAMS & WHICAP studies : Age 65+ African Americans & Hispanics had 2 x higher rate of AD
- ▶ Higher rates of hypertension, diabetes
- ▶ Newer Studies: Higher Major NCD risk accounted for by low childhood SES, low adult literacy, and low exercise

# What to expect of MDs and AD dx

- ▶ 70 percent of surveyed physicians: newly Major NCD diagnosed patients have mild-to-moderate Alzheimer's disease
- ▶ Only 52% prescribed an acetylcholinesterase inhibitor (AChEI).
- ▶ 28% percent prescribed only an antidepressant.
- ▶ Only 35% of patients begin treatment for the disease within a year of their first diagnosis..

# Verbal memory complaints versus verbal memory test scores

Zero correlation in 995 cases



# Memory Complaints

- ▶ Tell us nothing about brain disease
- ▶ Chronic pain cases have more memory complaints than any other group
- ▶ Depressed patients often complain about memory
- ▶ There is no correlation between memory complaints and performance on actual memory tests

# Memory Deficit Rate In Healthy Adults

- ▶ Mild memory impairment:
  - ▶ 28% of a sample of healthy community-dwelling older adults.
- ▶ Memory-impaired individuals do not recognize the extent of their memory and cognitive difficulties
- ▶ Does not impact on their participation in life activities

# Memory Worries

- ▶ Worried well (Attention vs. Memory):
  - ▶ If you forget where you put your car keys, don't worry.
  - ▶ If you forget you own a car, worry.
- ▶ Many “memory” problems are attention glitches: where are the keys
- ▶ Have never seen an Alzheimer’s patient come alone and voluntarily to my office
- ▶ Note the normal use of partners as external memory prostheses. Head turning sign.



# Very Quick Review of Neurodegenerative Diseases

# Major Neurocognitive Disorder

1. Evidence of significant cognitive decline from prior level of performance in 1 or more cognitive domains
  1. Concern of person, informant, or clinician of a significant cognitive decline
  2. Significant cognitive impairment on NP testing
2. Deficits interfere in independence in everyday activities

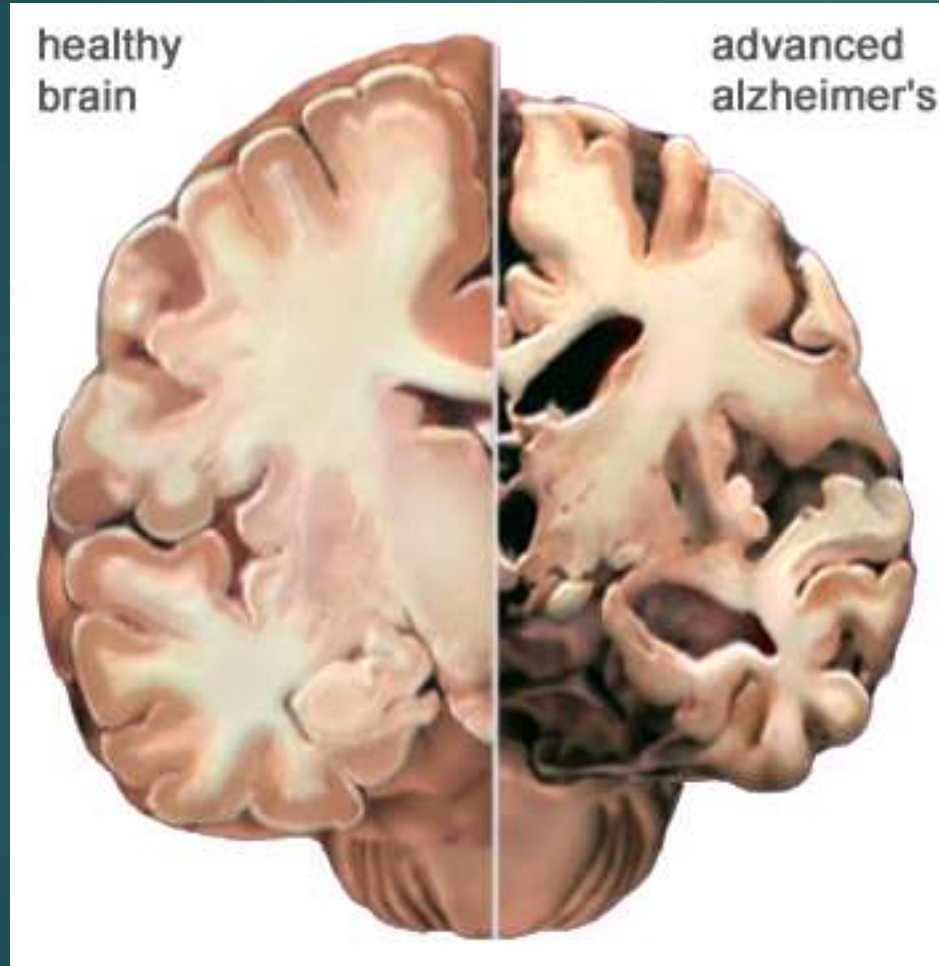
Specify due to what (one of 13: AD, FTD, LBD, VD, etc.)

Specify severity (Mild (IADLS), Moderate (ADLS), Severe (full dependence))

# The Major NCDs

- ▶ Alzheimer's Disease
- ▶ Lewy-Body Disease
- ▶ Vascular Disease
- ▶ Frontal Temporal Disease

# Neuropathology of Alzheimer's



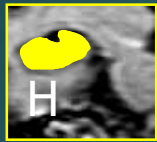
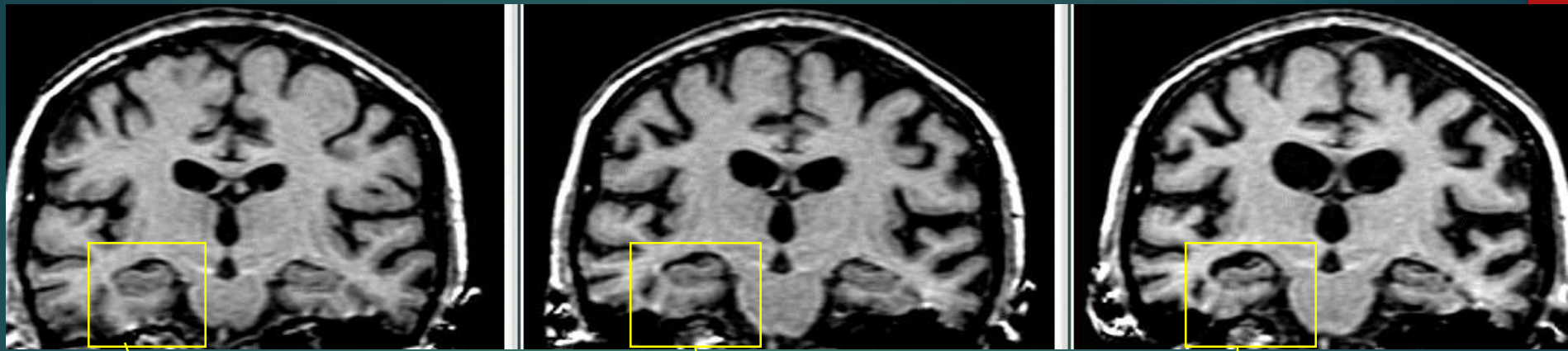
1 Atrophy

2 Enlarged  
Ventricles

3 Reduced  
Hippocampal  
Volume

## Core AD issue: No new memory; EF decline later

- ▶ Encoding Deficit: tape recorder does not work
- ▶ People with AD no longer have the ability to remember what's new now; they do **not have the ability to remember new life experiences.**
- ▶ Their brain has stopped recording
- ▶ The record machine is permanently broken.



Time 0



18 months



36 months

**Hippocampal Atrophy:** Serial coronal MRI of an individual with initially mild AD

# Neuropsychology of AD 1

- ▶ Memory deficit (hallmark): encoding ↓, rapid forgetting ↑, intrusions ↑ (esp. on cued recall), false + ↑; yes response bias;
- ▶ Impaired recognition memory is major differentiation from other Major NCDs
- ▶ Semantic knowledge ↓: confrontation naming > category naming (semantic (animal, categorical naming) worse than phonemic)
- ▶ Impaired executive function later: problem solving ↓ (TMT-B, WCST, CAT)

## Neuropsychology of AD 2

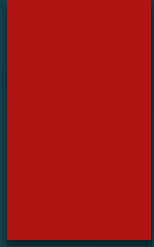
- ▶ Impaired visuospatial skills (5-10% first symptom)
- ▶ Depression in mild level; delusions later
- ▶ Intact procedural memory until late; social skills spared (hallmark)
- ▶ Lack of insight, blandness, passivity
- ▶ Psychiatric: delusions (19%), paranoia, hallucinations (14%)
- ▶ Later: aphasia, agnosia, apraxia



## Lewy Body Variant NCD: Visual hallucinations & EF decline

- ▶ Alzheimer's cognitive + Parkinson's motor systems (no tremor)
- ▶ Cortical LBD: fastest Major NCD decline
- ▶ Visual Spatial deficits
- ▶ Visual hallucinations (fully formed), lucid periods, movement disorders, falls or syncope

# NP Profile in LBD



- Attention ↓↓
- Executive function ↓↓
- Visuoperceptual/visuoconstructional ↓↓
- Memory not affected early on (but recognition cuing does not help)
- Nonverbal memory worse than verbal
- Mental fluctuations: good days, bad days
- Severely impaired verbal fluency (both semantic & phonemic)
- Relatively intact memory: poor retrieval rather than rapid forgetting
- Later global cognitive decline

What is bad for the heart  
is bad for the brain.



# Vascular Disease

- ▶ Series of mini strokes & chronically damaged brain blood vessels.
- ▶ Processing speed & EF deficits
- ▶ May or may not include memory deficit
- ▶ Often mixed pathology with Alzheimer's

## Frontal Temporal NCD: ACC & OFC atrophy

- ▶ ACC & OFC atrophy: Psychiatric Sxs precede Neurological presentation
- ▶ Social behavior/Personality changes precede memory deficit: disinhibition, agitation, delusion, hallucinations, apathy
- ▶ Cognitive Executive Dysfunction later: poor judgment

# FTD: Social Disease

1<sup>st</sup>

Third

- ▶ Apathy, social withdrawal
- ▶ Loss of empathy
- ▶ Inappropriate touch, familiarity
- ▶ 50% arrested or do antisocial behavior
- ▶ Silly antisocial: take off clothes, urinate in public
- ▶ At work: Embezzlement, insults
- ▶ Compulsions: need to touch, shoplift, counting
- ▶ Alienation from family
- ▶ Divorce
- ▶ Legal & financial problems
- ▶ Addiction

# FTD: Clinical features

- ▶ Decline in personal hygiene and grooming,
- ▶ Mental rigidity and inflexibility,
- ▶ Distractibility and Impersistence,
- ▶ Hyperorality and dietary changes,
- ▶ Perseverative and stereotyped behavior,
- ▶ Utilization behavior (difficulty resisting their impulse to "utilize" objects which are in their visual field and within reach; confabulate reasons for their actions)

# First Symptoms of FTD to appear commonly

## Symptom

- ▶ Behavioral Disinhibition
- ▶ Apathy
- ▶ Loss of empathy
- ▶ Perseveration
- ▶ Hyperorality
- ▶ EF deficits

## Examples

- ▶ Rudeness, hypersexuality, hoarding
- ▶ New “coach potato” habit
- ▶ Insensitivity to others
- ▶ New obsessions, grinding teeth, humming
- ▶ Craving for sweets
- ▶ Disorganized at work



# Subcortical NCDs:

## Parkinson's, Huntington's, HIV, MS

- ▶ White Matter & Prefrontal Disorders:
- ▶ Motor problems
- ▶ Slow processing speed
- ▶ Executive Dysfunction
  
- ▶ Memory Retrieval:
  - ▶ Impaired free recall, but normal recognition
  - ▶ Cueing helps

# Apathy = Atrophy

- ▶ N = 4,354 older persons without dementia, aged 76 +/- 5 years, 49% had apathy (no depression)
- ▶ Had significantly smaller gray matter volumes, particularly in the frontal and temporal lobes; smaller white matter volumes, mainly in the parietal lobe;
- ▶ In this older population without dementia, apathy symptoms are associated with a more diffuse loss of both gray and white matter volumes, independent of depression.

# Differential Diagnosis of Neurodegenerative Disorders:

## First Symptom

- ▶ AD – Memory (no encoding)
- ▶ VaD – Apathy, EF deficits
- ▶ DLB – Visual hallucinations, Visual Spatial deficits, EF deficits
- ▶ FTD – Behavior, EF deficits, language
- ▶ Sub-Cortical – EF, PS deficits

## Depression vs. NCD

Test Feature	Depression	NCD
Frequent task reminder	Unusual	Needed
Memory complaint	Extreme *	Infrequent
Rate of forgetting	Normal	Rapid
Incidental Memory	Intact	Impaired
Task effort	Poor *	Good
Memory cueing	Helpful	Unhelpful
“Don’t Know” comment	Usual *	Unusual
Recognition Memory	Intact	Impaired *
Digit Span	>5 *	<5

# Red Flags in the Elderly:

Neurological until proven otherwise

- ▶ Any sudden changes in mental status
- ▶ First onset depression, psychosis, or mania
- ▶ Visual hallucinations
- ▶ Self-care changes (grooming, hygiene)
- ▶ Sudden decisions to change beneficiaries in will; giving away money inappropriately
- ▶ Significant personality or moral character changes

# Quick Clues to Major NCD

- ▶ Difficult to obtain clear history of patient complaints
- ▶ Content-empty speech
- ▶ Spouse checking: Neck Turn Sign
- ▶ Slovenly appearance
- ▶ Loss of IADL function

# Clues

- ▶ Patient forgets appointments
- ▶ Poor compliance with treatment
- ▶ Patient is always accompanied by family member
- ▶ Patient drops favored activities
- ▶ Poor hygiene

# Hospital Consult Clues with Elderly

- ▶ APS involved
- ▶ Failure to thrive
- ▶ Inability to name medical conditions & meds
- ▶ Medication non-compliant; what's their medication reminder method
- ▶ House: smell, garbage, feces
- ▶ Denial of deficit



# NB Assessment Cautions

- ▶ Never to be used alone; need history; medical data; your clinical expertise
- ▶ Be careful with cutoff scores; may be misleading
- ▶ Always combine with a functional ability assessment via collateral

# Dissociations in NB Testing

- ▶ Shorter the test, the larger the clinical knowledge base needed to interpret the results; multifactorial causation
- ▶ Principle 1: We do not see what we are not looking for;
  - ▶ if you do not test EF you won't find the deficit
  - ▶ i.e. executive functioning impairment

# Dissociations

- ▶ Principle 2: What patients say can be different from what they can do
- ▶ Dissociations of abilities common:
  - ▶ verbal ok, memory ↓
  - ▶ verbal ok, nonverbal ↓
  - ▶ executive ok, memory ↓
  - ▶ memory ok, executive ↓
  - ▶ know how to (can do behavior) ok, but know when ↓

# Mental Status Test Cautions

- ▶ Need to know premorbid IQ estimate; higher IQ, harder the test:  
(use vocational, educational history, or reading level)
- ▶ Severely ill and dysphasic patients may be untestable using a verbal test
- ▶ Cognitive tests have poor cross-cultural portability
- ▶ May need serial testing
- ▶ If delirious (severely impaired attention or arousal), can test later

# How to choose NB Test



# The status of computerized cognitive testing in aging:

## A systematic review; K. Wild, et al., 2008

- ▶ A systematic review of currently available **computerized test batteries** for the detection of cognitive change in the elderly.
- ▶ **18 test batteries identified**; 11 appropriate to cognitive testing in the elderly; 5 for the elderly; great variability in administration (from fully examiner administered to fully self-administered); **all had at least minimal reliability and validity data; level of rigor of validity testing varied widely**. Often use **memory recognition, rather than delay recall**.
- ▶ Basic indices of psychometric properties were typically addressed, sufficient variability exists that currently available computerized test batteries must be judged on a case by case basis.



Test	Age Range	Largest Sample	Administration	Domains <sup>*</sup>
ANAM	22 – 77	191	Mouse/keyboard; self-admin.	Memory, attention, psychomotor speed, language, RT
CANS-MCI	51 – 93	310	Touchscreen; self-admin.	Memory, language, executive function
CANTAB	8 – 80	771	Touchscreen/keyboard; tech. admin.	Working memory, attention, visuospatial memory
CNS Vital Signs	7 – 90	1069	Keyboard; self-admin.	Memory, psychomotor speed, processing speed, cognitive flexibility, sustained attention
CNTB	21 – 87	209	Keyboard; tech-admin.	Language, information-processing, motor speed, attention, spatial, memory
COGDRAS-D	67 – 103	190	Yes/no button; tech admin.	Memory, attention, RT <sup>†</sup>
CogState	18 – 40; 46 – 82	113	Keyboard; self-admin.	Working memory, executive function, attention, RT
CSI	18 – 89	284	Keyboard; self-admin.	Memory, attention, response speed, processing speed
MCIS	> 65	215	Tech records responses, or via telephone.	Memory, executive function, language
MicroCog	18 – 89	810	Keyboard/# pad; self-admin.	Memory, attention, RT, spatial ability, reasoning/calculation,
Mindstreams	> 50	213	Mouse/#pad; tech admin.	Memory, executive fx, visuospatial, verbal fluency, attention, motor skills, information processing

## Variable Validity: 1 = no data; 3 = comprehensive

Test Battery	Subtests	Normative Data	Reliability	Validity	Factor Analysis	Admin/Interface
ANAM	2	2	1	3	3	2
CANS-MCI	2	3	3	3	3	3
CANTAB	3	3	2	3	3	2
CNS Vital Signs	3	3	2	3	1	2
CNTB	3	1	3	3	1	2
COGDRAS-D	2	2	2	3	3	2
CogState	3	2	2	2	1	2
CSI	2	2	3	3	3	2
MCIS	1	3	2	2	3	2
MicroCog	3	3	2	3	1	3
Mindstreams	3	2	1	2	1	2

Normative data in 50% judged inadequate



# 10 Minute NB Tests

- MMSE (published articles since 2013: 1800+)
  - PAR - \$1 per use
- S-MMSE
- 3MS (84)
  - 0-100
- MoCA (480)
  - <http://www.mocatest.org/>
- SLUMS
- Clock Drawing (240)
- Mini-Cog (33) - 3 memory words + clock
- Memtrax – online visual memory recognition
- Memory Impairment Screen – 4 words
- General Practitioner Assessment of Cognition (21)
  - <http://gpcog.com.au/>

# 20 Minute Tests

- ▶ Mattis Dementia Rating Scale (DRS)
- ▶ Addenbrooke's Cognitive Assessment (ACE)
- ▶ Cognistat (Neurobehavioral Cognitive Status Exam)
- ▶ CAMCOG

# 40 minute tests

- ▶ NIH Toolbox
- ▶ NIH Examiner
- ▶ RBANS
- ▶ UCSF MAC Beside Cognitive Screen

### *What are the Most Commonly Used Brief Cognitive Tests? <sup>5</sup>*

- Mini Mental State Examination
- Clock Drawing Test
- Delayed Word Recall
- Verbal Fluency Test
- Similarities
- Trail Making Test

Effectiveness and ease of administration were most highly predictive of frequency of use

# Major NCD

## *Dementia Screening Tests<sup>11,13-28</sup>*

<b><u>Test</u></b>	<b><u>Sensitivity (%)</u></b>	<b><u>Specificity (%)</u></b>	<b><u>Time (Mins)</u></b>
DemTect <sup>13</sup>	83–100	70–92	8
Montreal Cognitive Assessment <sup>14</sup>	100	87	10
7-minute Screen <sup>15</sup>	90–92	92–96	7
Mini-Cog <sup>16,17</sup>	75–99	81–93	3
Mini-Mental State Examination <sup>11</sup>	71–95	76–100	8
Memory Impairment Screen <sup>18</sup>	80–86	96–97	5
Short Test of Mental Status <sup>19</sup>	95	91	10
Abbreviated Mental Test <sup>20</sup>	42–77	79–93	1-3
6 Item Screener <sup>21</sup>	89–94	86–88	2
Hopkins Verbal Learning Test <sup>22</sup>	83–96	80–98	5
6-Item Cognitive Impairment Test <sup>23</sup>	79–90	100	5
Clock Drawing Test <sup>24</sup>	45–77	81–91	2



# Mild NCD

## SLIDE 3

### *MCI Screening Tests<sup>7,13,14,21,25,26</sup>*

<b><u>Test</u></b>	<b><u>Sensitivity</u> <u>(%)</u></b>	<b><u>Specificity</u> <u>(%)</u></b>	<b><u>Time</u> <u>(Mins)</u></b>
Montreal Cognitive Assessment <sup>14</sup>	90	87	10
DemTect <sup>13</sup>	80	92	8
6 Item Screener <sup>21</sup>	50	97	2
Short Test of Mental Status <sup>25</sup>	.74 (AUC)	.74 (AUC)	10
Mini-Cog <sup>7</sup>	55	83	3
Mini-Mental State Examination <sup>13,14</sup>	18–71	85–100	
Clock Drawing Test <sup>26</sup>	20–75	76–88	2




# MMSE now Copyrighted

## Mini Mental Status Exam

The Mini-Mental State Examination (MMSE)  
Practice Tool - Assessment tool (PAT-002)

Informant: 13 minutes

Patient Name: \_\_\_\_\_ Date: \_\_\_\_\_

	Score	Maximum Score
<b>Orientation</b> What is the (date) (day) (month) (year) (season)? 1 point for each correct.		5
Where are we: (country) (state) (town) (building) (floor)? 1 point for each correct.		5
<b>Registration</b> Name 3 unrelated objects (e.g. apple, table, penny). Allow one second to say each. Then ask the patient to repeat all three after you have said them. 1 point for each correct. Repeat them until he/she learns all three. Count and record trials.		3
<b>Attention and Calculation</b> Either: Ask the patient to count backwards from 100 by sevens (93, 86, 79, 72, 65). 1 point for each correct. Stop after 5 answers. Or: spell "world" backwards; 1 point for each letter in correct order.		5
<b>Recall</b> Ask the patient to recall the three objects previously stated. 1 point for each correct.		3
<b>Language</b> Show the patient a wrist watch; ask them what it is. Repeat for a pencil. 1 point for each correct.		2
Ask the patient to repeat the following: "No ifs, ands, or buts." 1 point if correct.		1
Ask the patient to follow a 3 stage command: "Take a piece of paper in your right hand, fold it in half, and put it on the floor." 1 point for each stage correct.		3
Ask the patient to read and obey the following sentence, which you have written on a piece of paper: "Close your eyes." 1 point if correct.		1
Ask the patient to write a sentence. 1 point if correct.		1
Ask the patient to copy a design. E.g.  1 point if correct.		1
<b>Total Score</b>		30

Assess level of consciousness along a continuum:

Alert \_\_\_\_\_ Drowsy \_\_\_\_\_ Stupor \_\_\_\_\_ Coma \_\_\_\_\_

Psychological Assessment Resources (PAR), Inc.

# MMSE

- ▶ Most widely used tool to measure cognitive status
- ▶ Available in more than 50 foreign translations
- ▶ Scored on **30-point scale**:  
25–30 = Normal aging or borderline cognitive impairment
- ▶ **Perfect score does not exclude MCI or mild AD**  
24 or less = High likelihood of cognitive impairment

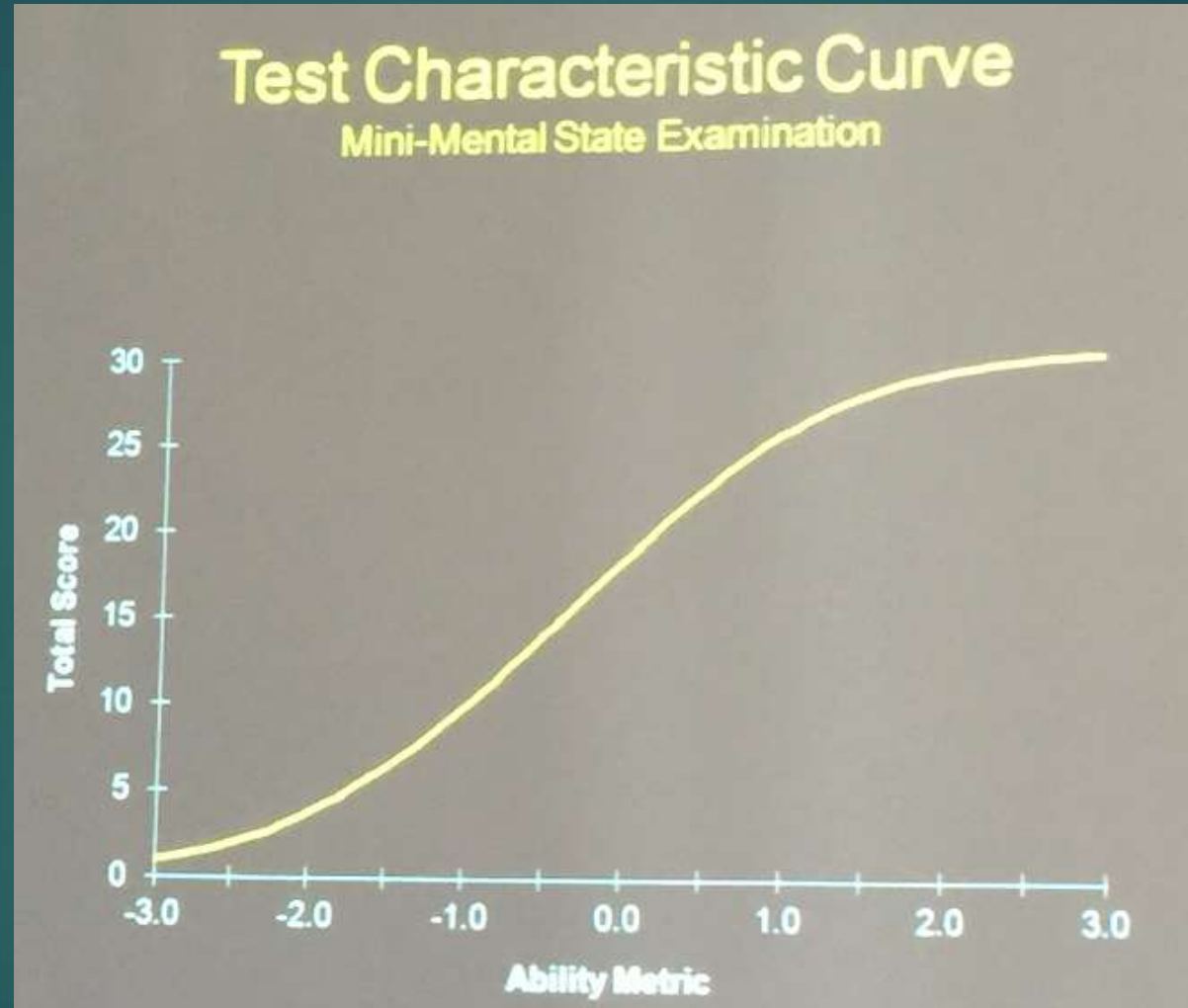
1Folstein MF, et al. J Psychiatr Res. 1975;12:189-198; 2Shulman KI, et al. Int Psychogeriatr. 2006;Feb 8:1-14; 3Morris JC. Clin Geriatr Med. 1994;10:257-276



# MMSE & MoCA

- ▶ MoCA differs from the MMSE mainly by including tests of executive function and abstraction, and by putting less weight on orientation to time and place.
- ▶ Ten of the MMSE's 30 points are scored solely on the time-place orientation test, whereas the MoCA assigns it a maximum of six points.

# MMSE: Precision of measurement

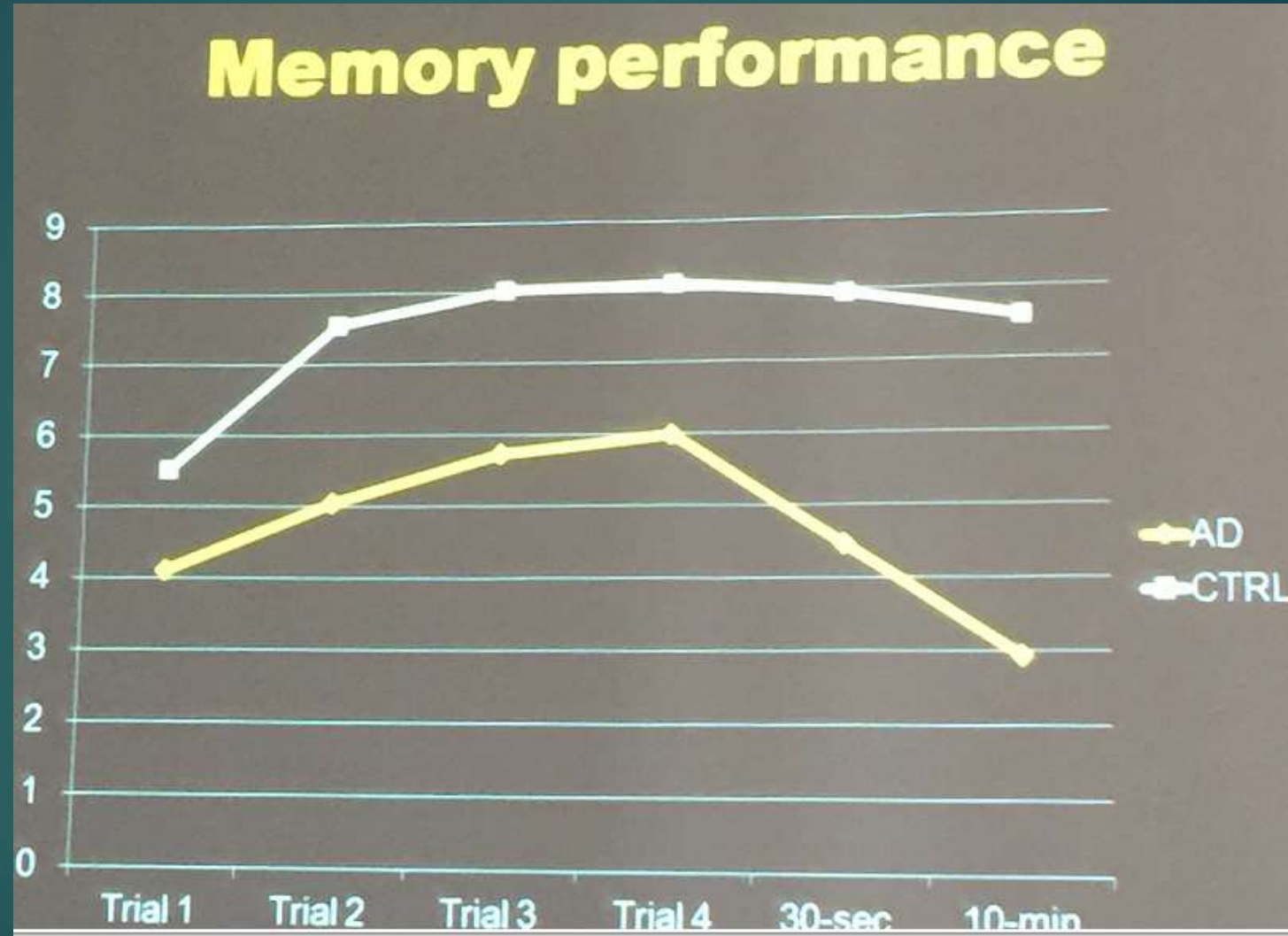


Reduced sensitivity in ceiling and floor; significant loss of information, except in midrange

# 24 patients with AD

- ▶ Age: 72.5 +/-9
- ▶ Education: 17 +/- 3
- ▶ Trails: 64.6
- ▶ Fluency: 13 d-words;16 animals
- ▶ Boston Naming: 13/15
- ▶ Visual memory: 5.5/17
  
- ▶ MMSE: 29/30

# AD Memory Performance: Rapid Forgetting



Note dramatic drop-off between Trial 4 and 30 sec.

# MMSE: Be careful

- ▶ 30 years clinical use as screening tool
- ▶ Limited diagnostic utility
- ▶ Scoring influenced by age and education
- ▶ Insensitive to mild cognitive impairments
- ▶ Inadequate executive fxn measurement
- ▶ Copyrighted by Psychological Assessment Resources = 50 for \$58  
+tax+ S&H

Folstein MF et al. J Psychiatr Res. 1975(Nov);12(3):189-198; Crum RM, Anthony JC, Bassett SS, Folstein MF. JAMA. 1993(May 12);269(18):2386-2391

# MMSE and Education: What score is normal

Age	18-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-75	75-79	80-84
4 <sup>th</sup> grade	22	25	25	23	23	23	23	22	23	22	22	21	20
8 <sup>th</sup> grade	27	27	26	26	27	26	27	26	26	26	25	25	25
High School	29	29	29	28	28	28	28	28	28	28	27	27	25
College	29	29	29	29	29	29	29	29	29	29	28	28	27

If 4<sup>th</sup> grade education, normal cutoff = 22

# Ethnicity and MMSE: Over-diagnosis of Major NCD

- ▶ Mexican Americans were 2.2 times more likely than European Americans to have MMSE scores <24 (Espino, 2001). Due to acculturation effects (barrio↓ vs. suburban) and lower education.
- ▶ African Americans and Hispanics more likely to be erroneously identified as demented (Mulgrew, 1999)
- ▶ Blacks significantly lower than Whites after demographic corrections (Shadlen, et al., 1999);
- ▶ Health ABC study, n=3075, 42% black, 3MS: blacks scored lower; SES, income, reading level, & education explain 86% of difference (Mehta, et al., 2004)
- ▶ CV Health Study, n=2786, 10% black, 3MS: low education (<10y); blacks had 5x Major NCD risk; being black associated with higher Major NCD rates after demographic corrections; higher DM, HTN not associated with higher Major NCD in blacks; lower base rate 3MS (Shadlen, et al., 2006)

# MMSE Research

- ▶ **Items most sensitive to Alzheimer's (most errors):**
  - ▶ 3 word delayed recall \*\*
  - ▶ time orientation
  - ▶ visual construction (pentagon)
  - ▶ Serial 7s/WORLD
  - ▶ (these 4 outperform the entire test; esp. recall)
- ▶ Poor at differentiation types of Major NCDs
- ▶ Correlated with subjective memory loss; but SML is not sensitive to Major NCD



# MMSE vs MOCA: Both 30 points

	MMSE	MOCA
Memory	5-word recall	3-word recall
Orientation	Place and time	Place and time
Spatial	Clock; cube	Pentagons
Language	Naming, repetition	Naming, repetition
Attention	Vigilance; digits forward	3-word registration
Working Memory/EF	Digits backwards, Trails, fluency	WORLD backward

# Mild vs. Moderate-Severe Major NCD Neurobehavioral Assessment

## ▶ Mild

- ▶ MoCA
- ▶ SLUMS
- ▶ Cognistat
- ▶ Executive measures

## ▶ Moderate to Severe

- ▶ MMSE

## Loss of Executive Control Affects Many Functional Domains



# Functional Status (IADLs) correlates with Executive Function

- ▶ The **Freedom House Study**, n = 547 normal elderly retirees, mean age 77, over 3 years
- ▶ Rate of change in self-reported IADL's best predicted by Executive Functioning (Trails test and Exit25) (but not memory scores).
- ▶ Conclusion: executive functioning, rather than memory impairment, is better predictor of elderly functional status and level of care need

# High prevalence of **executive impairment in medical inpatients**

- ▶ **Among medical inpatients**, the prevalence of impairment of executive function referred for psychiatric consultation:
  - ▶ 30% failed the MMSE,
  - ▶ But 72% failed a measure of executive function
- ▶ **63% of pts who failed EF test were considered normal** by consulting psychiatrists
- ▶ **Impairment of executive function is common among inpatients referred for psychiatric consultation**

# Medication compliance

- ▶ Adherence is defined as taking a prescribed medication at the appropriate time in the correct amount and manner (e.g., with food).
- ▶ Noncompliance of antihypertensive medication is associated with increased doctor office visits, increased ER visits, and increased hospitalizations with longer stays

# Executive Deficit Behaviors in NCD

- ▶ Noncompliance with meds, TX, etc. = lack of executive ability
- ▶ Apathy (lack of spontaneity)
- ▶ Wandering (environmental cuing by “door” to elicit “door opening” behavior; not attempt to escape)

# Medication noncompliance & EF

- ▶ Study: Association between EF and medication adherence among community-dwelling older adults: study of 78 yo, on once or twice a day medication
- ▶ Over 8 weeks for only one prescribed medicine
- ▶ Executive function and working memory tasks were the only significant predictors for medication compliance. Memory did not predict.



# Medication self management

- ▶ Adhering to medicines requires the recruitment of executive function, because taking medicines consistently involves EF:
  - ▶ developing and implementing a plan to adhere;
  - ▶ remembering to adhere, (prospective memory) &
  - ▶ remembering whether the medicine was taken as desired (source monitoring).
- ▶ Source monitoring: “Did I do it today or do I just think I did it because I’ve been taking the same medication everyday for the past 2 years?”

# “Cognitively intact” elders

- ▶ Study: “cognitively intact” elderly sample
  - ▶ 29% had a different understanding of medication administration than the written label.
  - ▶ Only 22% of their sample demonstrated correct administration knowledge of the instruction “take one tablet every 6 h.”
- ▶ Study: 38% of individuals from a large, urban general medical clinic were unable to identify all of their medications in spite of being able to look at the bottle, label, and pills themselves.
- ▶ Increased reliance on routine, resistance to change, poor insight into one’s abilities, and environmental dependency/indifference negatively contribute to medication compliance

# Executive Function Measures

Pillbox Test

Action Fluency Test

Trail Making Test

Problem Solving Questions

Spontaneous Clock Drawing

IFS: INECO Frontal Screening

NAB Judgment

MIST (Memory for Intentions Test)

All on: [www.charlesjvellaphd.com](http://www.charlesjvellaphd.com)

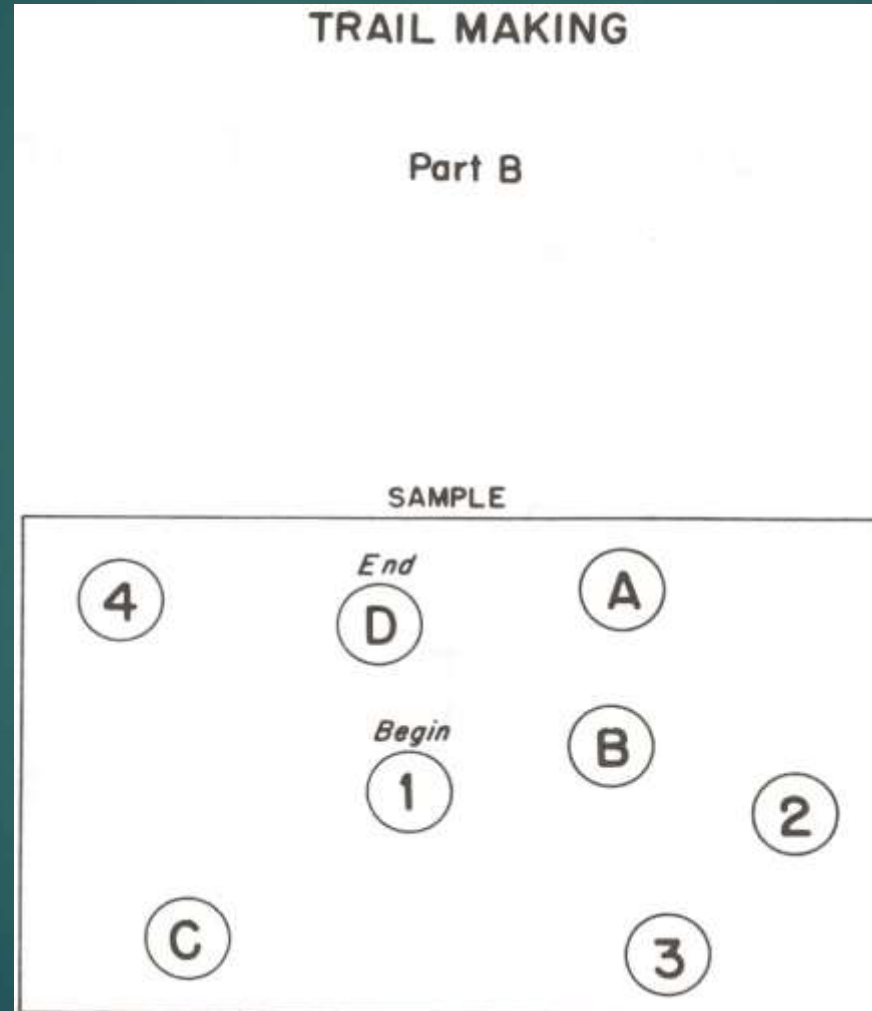
# Pillbox Test

- ▶ The Pillbox Test consists of a pillbox and five pill bottles.
- ▶ The pillbox contains four rows labeled as “Breakfast,” “Lunch,” “Dinner,” and “Bedtime” and seven columns labeled for each day off the week, “Sunday” through “Saturday.”
- ▶ The five pill bottles have standardized administration labels and contain colored beads resembling the approximate size of common aspirin or antihypertensive medications as these were the two most commonly prescribed types of medications
- ▶ Executive dysfunction on NP tests was highly correlated with performance on the Pillbox Test

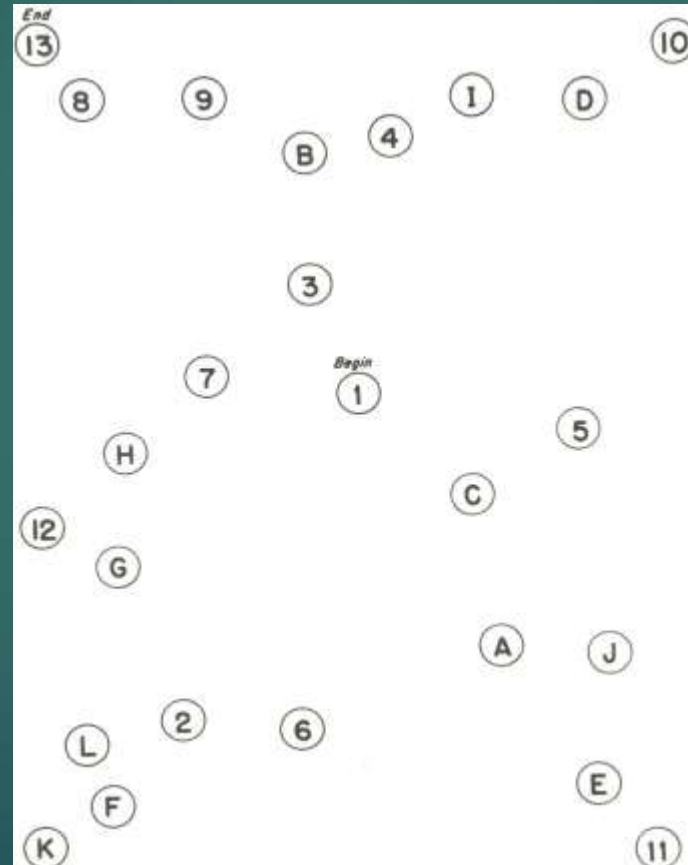
# Action Fluency Test: “things that people do” = number of verbs in 1 minute

- ▶ *I'd like you to tell me as many different things as you can think of that people do. I do not want you to use the same word with different endings, like eat, eating, and eaten. Also, just give me single words such as eat, or smell, rather than a sentence or phrase. Can you give me an example of something that people do?*
- ▶
- ▶ If the response was unacceptable, participants were asked to provide another example of an action word (any verb response is acceptable). If the response was acceptable, the examiner stated:
- ▶
- ▶ *“That’s the idea. Now you have one minute to tell me as many different things as you can think of that people do.*
- ▶
- ▶ Answer page has 1-21 lines on it
- ▶ Generated in 60 s): \_\_\_\_\_ Total number of perseverations: \_\_\_\_\_ Total number of intrusions: \_\_\_\_\_

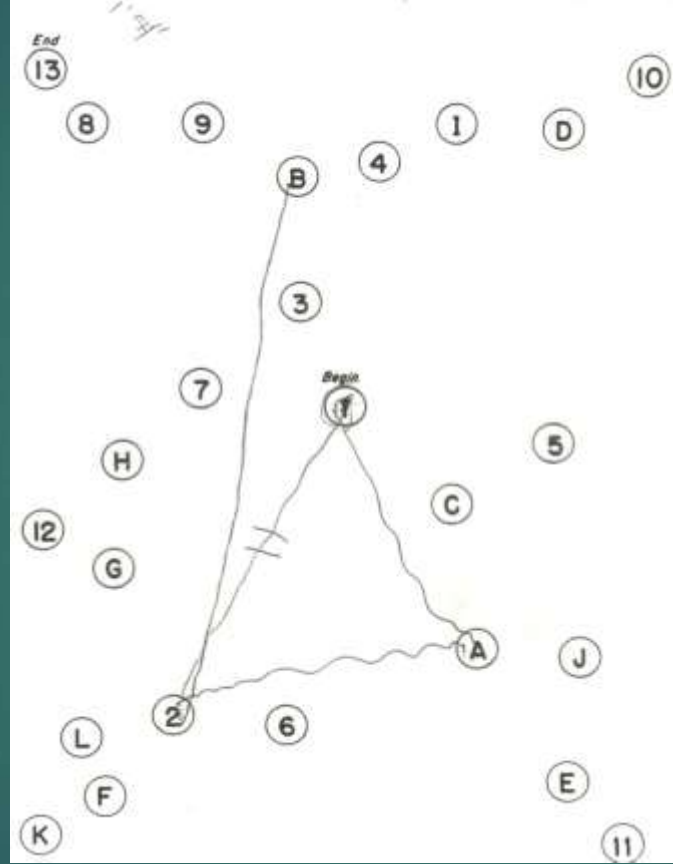
# Trail Making Test



# TMT-B



## TMT-B: Alzheimer's



# AD pts rarely make it past “3-C”



# Problem Solving Questions

(Cognistat):

- ▶ You are stranded in the Denver Airport with \$1 in your pocket. How do you get home?
- ▶ You are walking along a lake. You see a 2 year old child at the end of the pier. No one else in sight. What do you do?
- ▶ If Jane has an ulcer, and 85% of people are helped with this medicine, 10% stay the same, and 5% get worse, is this medicine likely to help Jane?

## Higher IQ problems: Test abstraction, not memory

- ▶ A golden hammer breaks the iron door.
- ▶ (Virtue conquers all; money gets results)
  
- ▶ Hot coal burns; Cold coal blackens.
- ▶ (Extremes can be detrimental)

# NAB Judgment

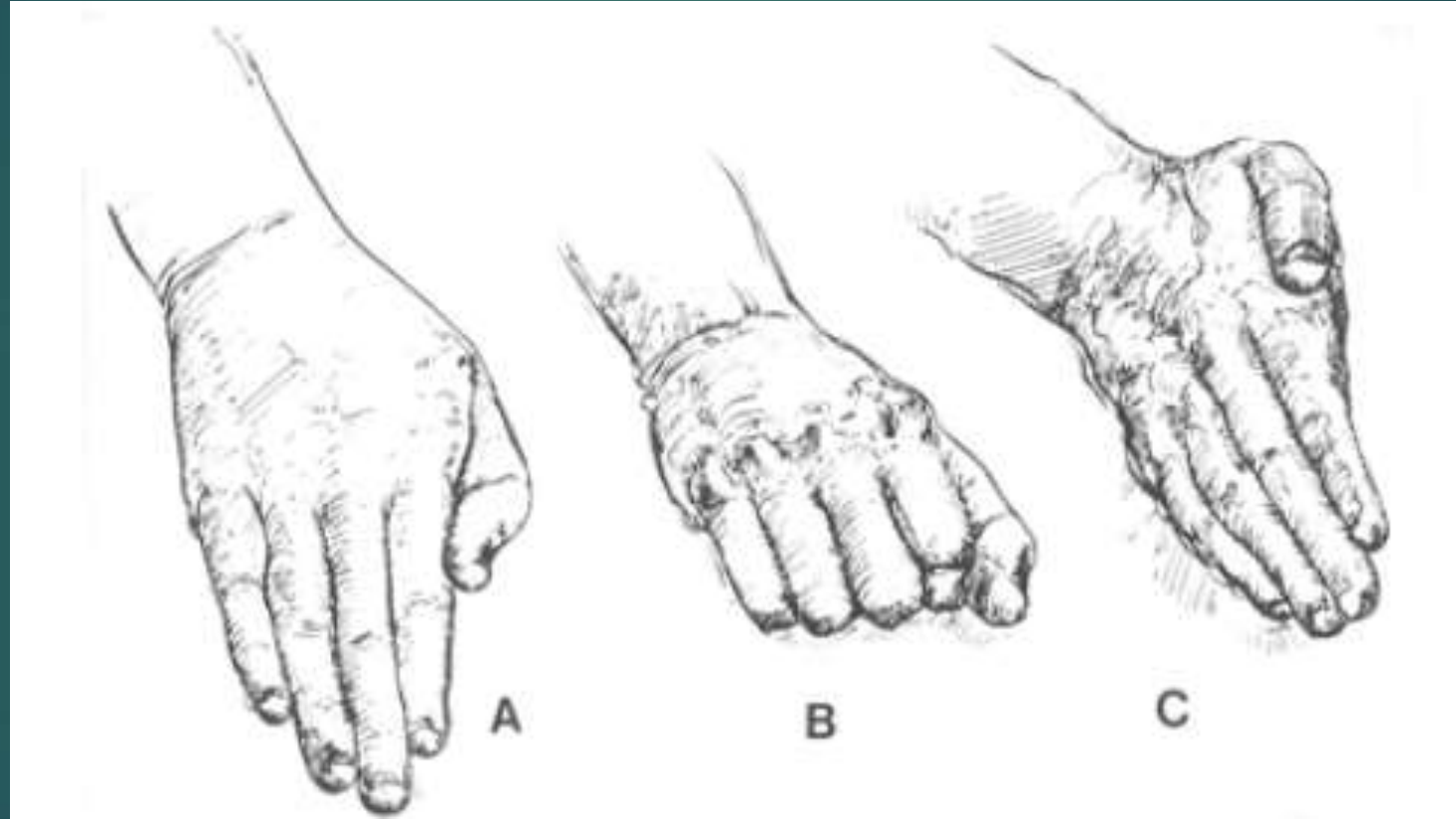
2. Judgment	
Recording	Scoring
Record responses verbatim. If examinee is queried to say more, place a Q in brackets [Q] at that point in examinee's response.	See criteria on page 7.
<b>Discontinuation</b> Administer entire task.	
<b>Administration Instructions</b> Say, I am going to ask you a few questions. I want you to answer each question as fully as possible. Questions may be repeated up to three times at examinee's request. If response is very brief or includes only a general concept (e.g., "For safety," "For health," or "It's dangerous") with no specific reference to the question, query by saying, Tell me more.	
Question	Response
1. Why should you blow out candles before going to bed?	
2. Why should you not leave a young child alone at home?	
3. Why should you replace the batteries in a smoke detector regularly?	
4. What should you do if you take too much of a prescription medication?	
5. Why should you not unplug electrical appliances while your hands are wet?	
6. Why are certain foods marked with an expiration date?	
7. Why is it important for people to brush their teeth?	
8. Why is it important to tell your doctor all the medications that you are taking?	
9. Why should you wash your hands before eating?	
10. What does it mean when your doctor says that there is a 25% chance of having serious side effects from a treatment?	

Go to page 8 →

# Executive Tasks

- ▶ **Clock drawing:**
  - ▶ Poor strategy
  - ▶ Perseveration
- ▶ **Motor programming tasks (Premotor strip is frontal)**
  - ▶ Serial hand sequences
  - ▶ Alternating programs

# Serial Hand Sequences



# Hayling subtest in IFS: frontal inhibition

- ▶ **Initiation:** "Listen carefully to these sentences and as soon as I am done reading them, you must tell me, as quickly as possible, what word completes the sentence."
  - ▶ I put my shoes on, and I tie my ... (laces)
  - ▶ It was raining cats and ... (dogs).
- ▶ **Inhibition:** "This time, I want you to tell me a word that makes no sense whatsoever in the context of the sentence, and it must not be related to the word that actually completes the sentence."

"For example: Daniel hit the nail with a ... rain."

- ▶ 1. John bought candy at the .....
- ▶ 2. An eye for an eye, a tooth for a .....
- ▶ 3 . I washed my clothes with water and .....

# Prospective Memory is the best predictor of ability to function independently in the real world

- ▶ Prospective Memory is a predictor of:
  - ▶ everyday functioning,
  - ▶ medication adherence,
  - ▶ unemployment,
  - ▶ declines in instrumental activities of daily living
- ▶ Use items from MIST (Memory for Intentions Test)

# Memory for Intentions Test (MIST):

2 of 8 questions

1. In 15 minutes, tell me it is time to take a break.
2. When I show you a red pen, sign your name on your paper



# Score Dali's Clock



# Spontaneous Clock Drawing requires executive functioning

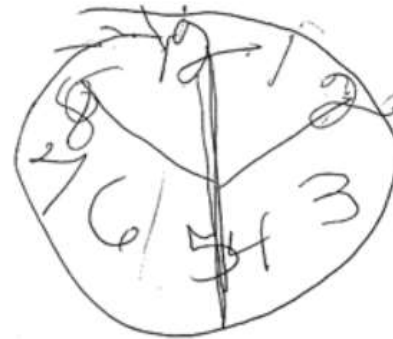
- ▶ Complex executive task:
  - ▶ Initiation
  - ▶ Abstract conceptualization
  - ▶ Numerical ability
  - ▶ Verbal memory
  - ▶ Sequencing
- Clox1 detected 28% more Major NCD than MMSE.

# Clock Drawing in Medically Ill Patients

HIV



38-year-old with HIV



53-year-old after a  
cerebrovascular accident

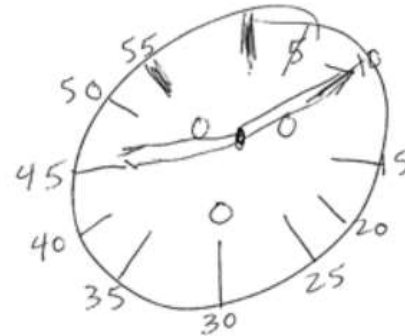
Stroke

ESRD



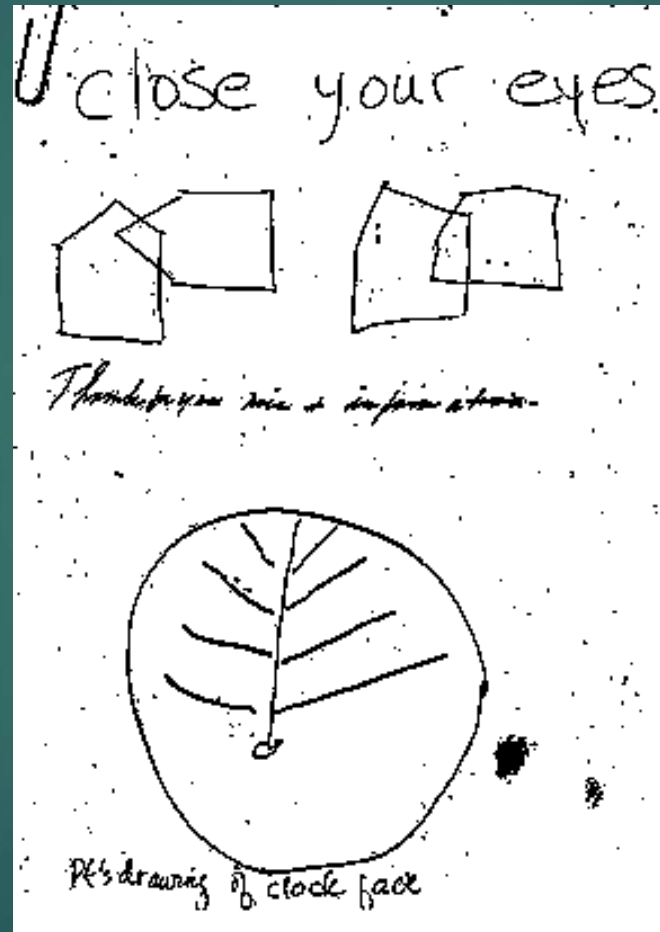
23-year-old with  
end-stage renal disease

HIV

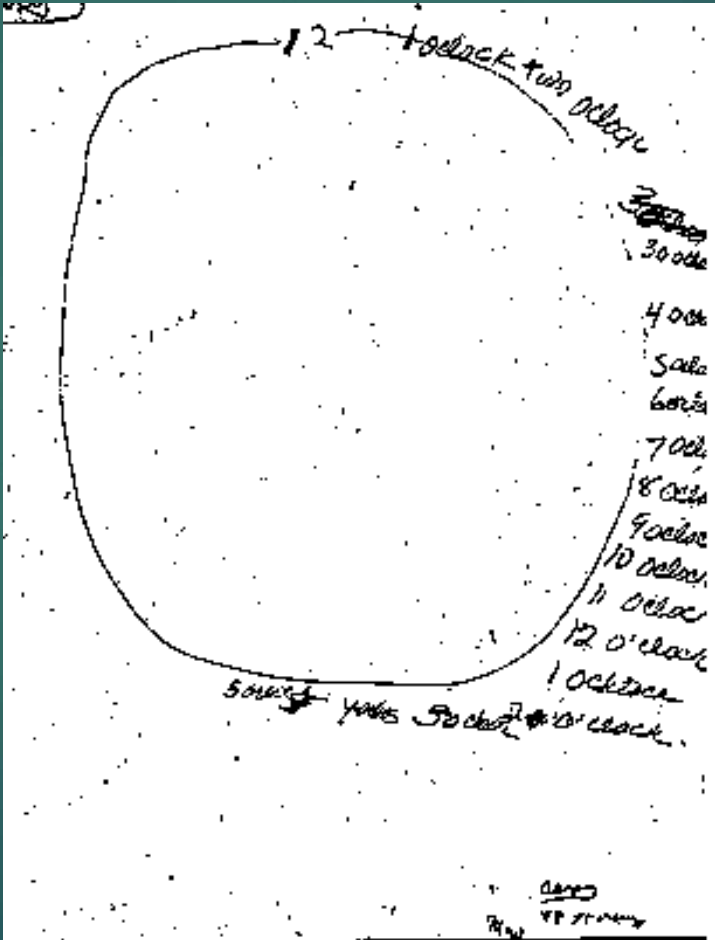


37-year-old with HIV

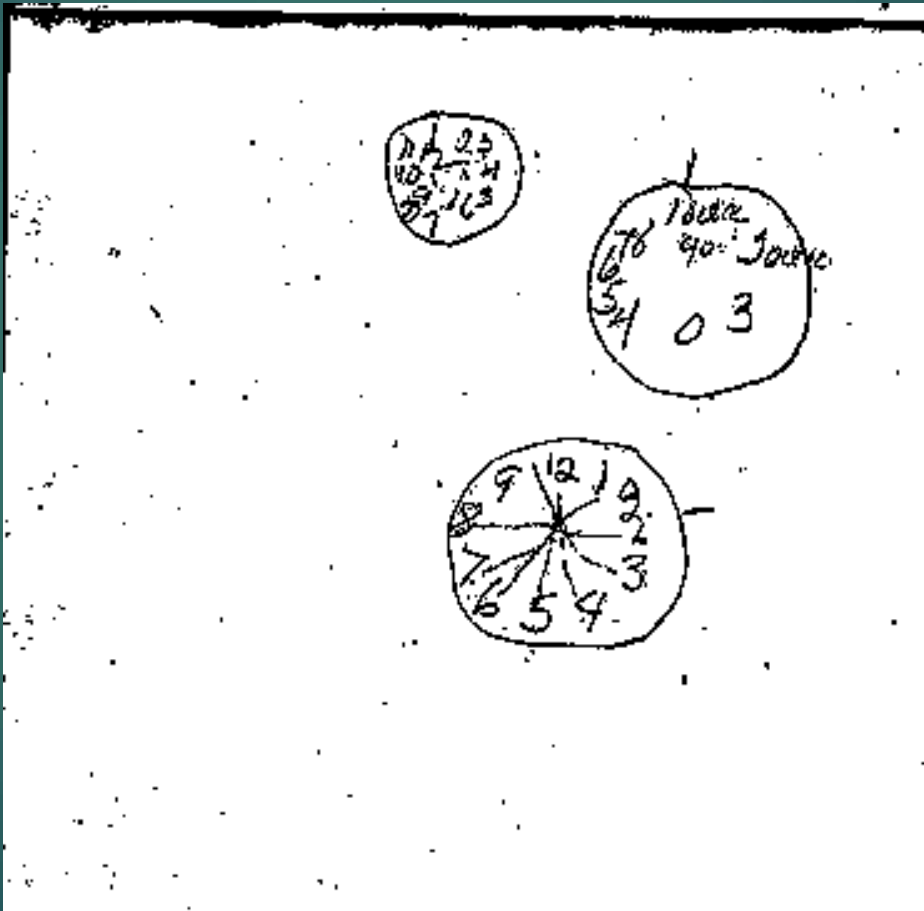
# Clock 1



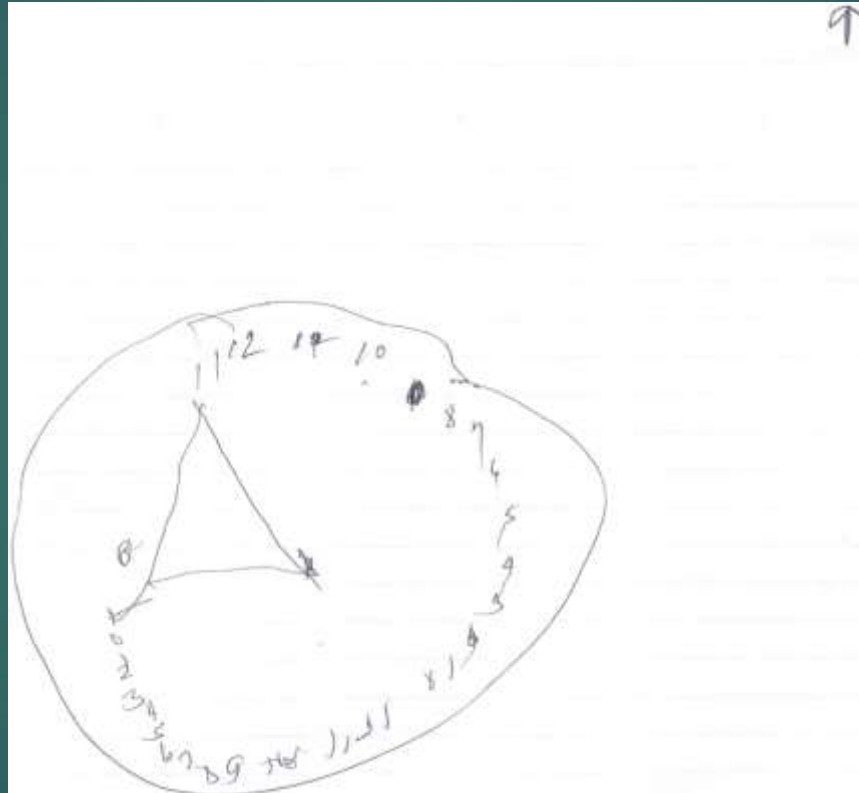
# Clock 2



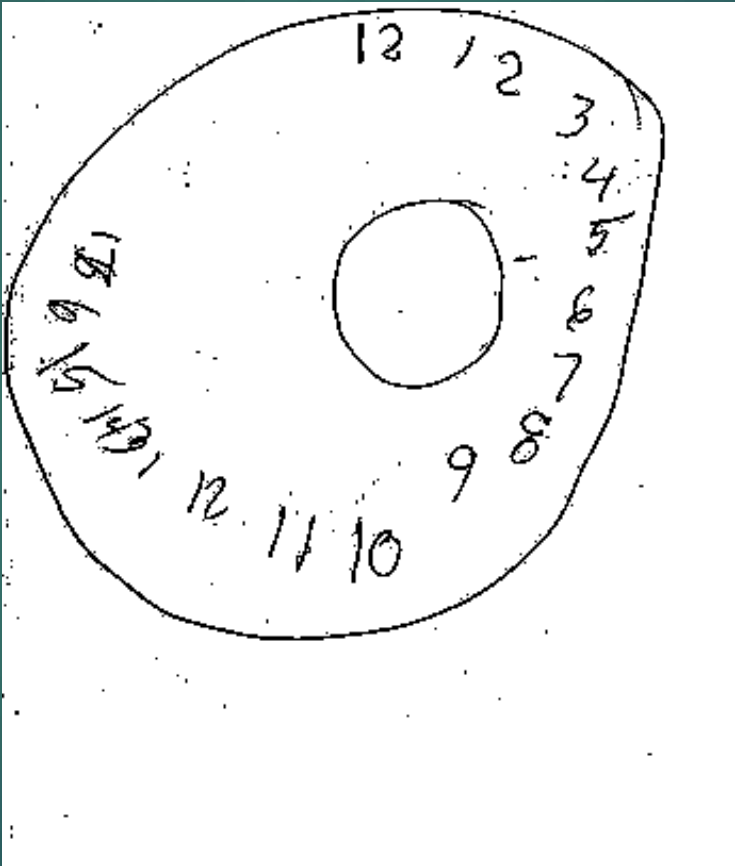
# Clock 3



# Clock 4



# Clock 5

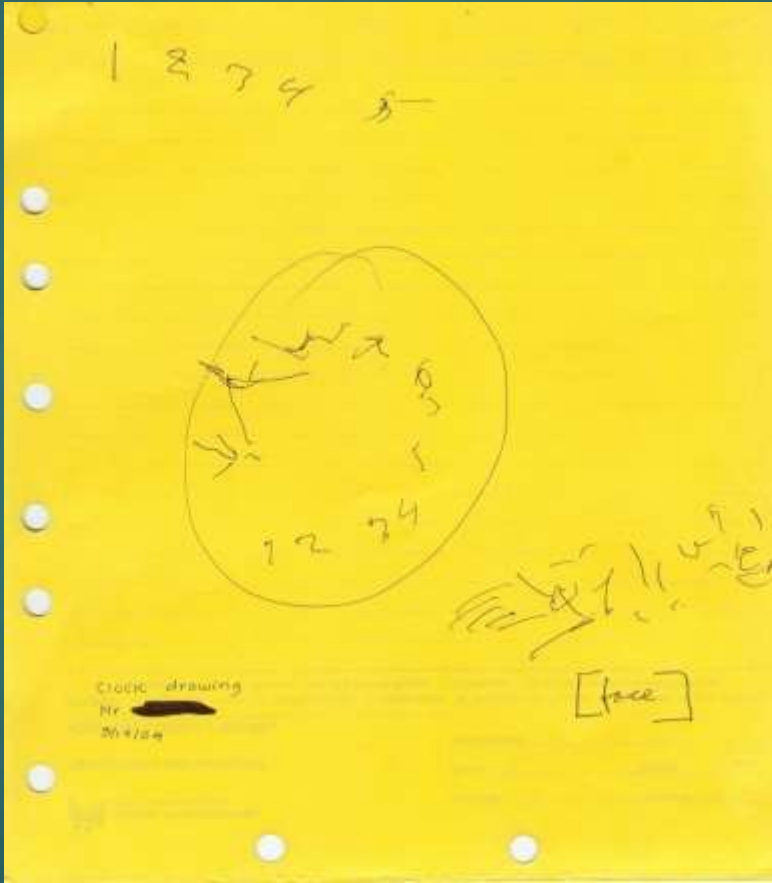




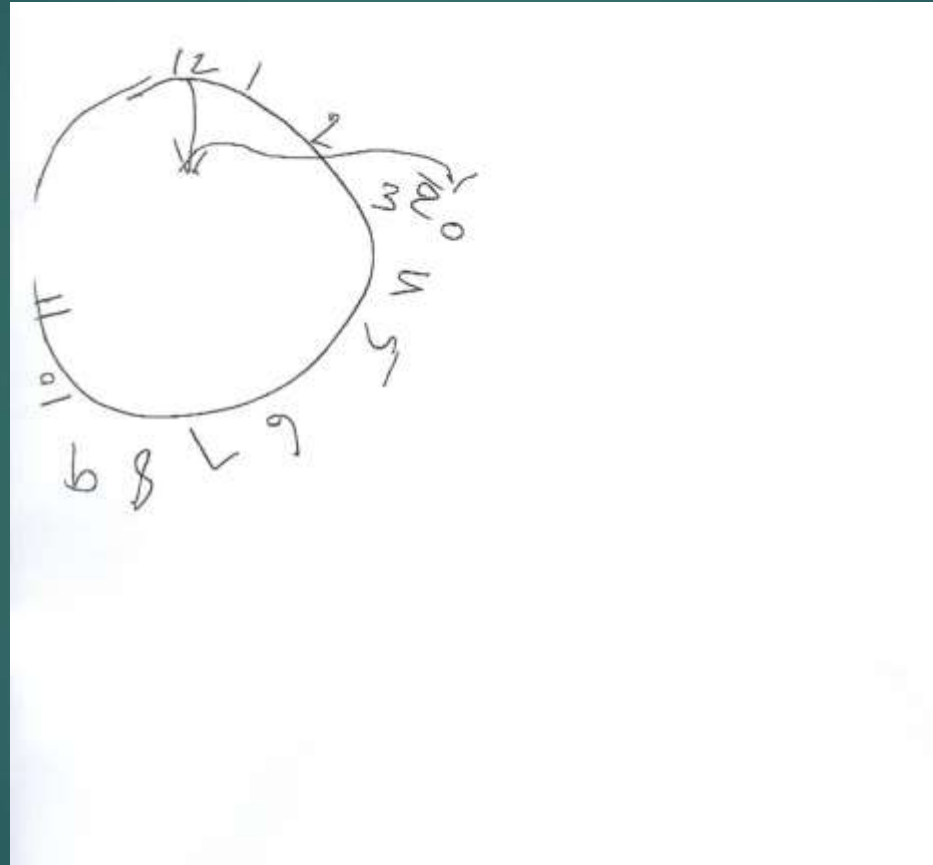
# Clock 6

[illegible]

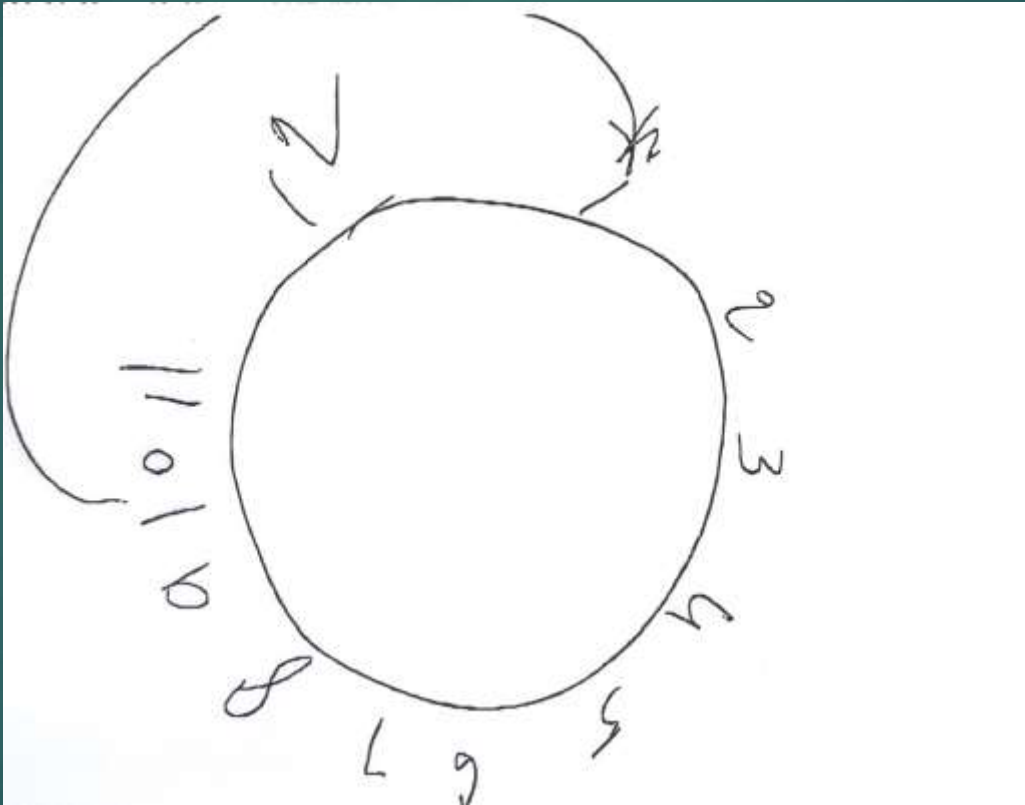
# Clock 7



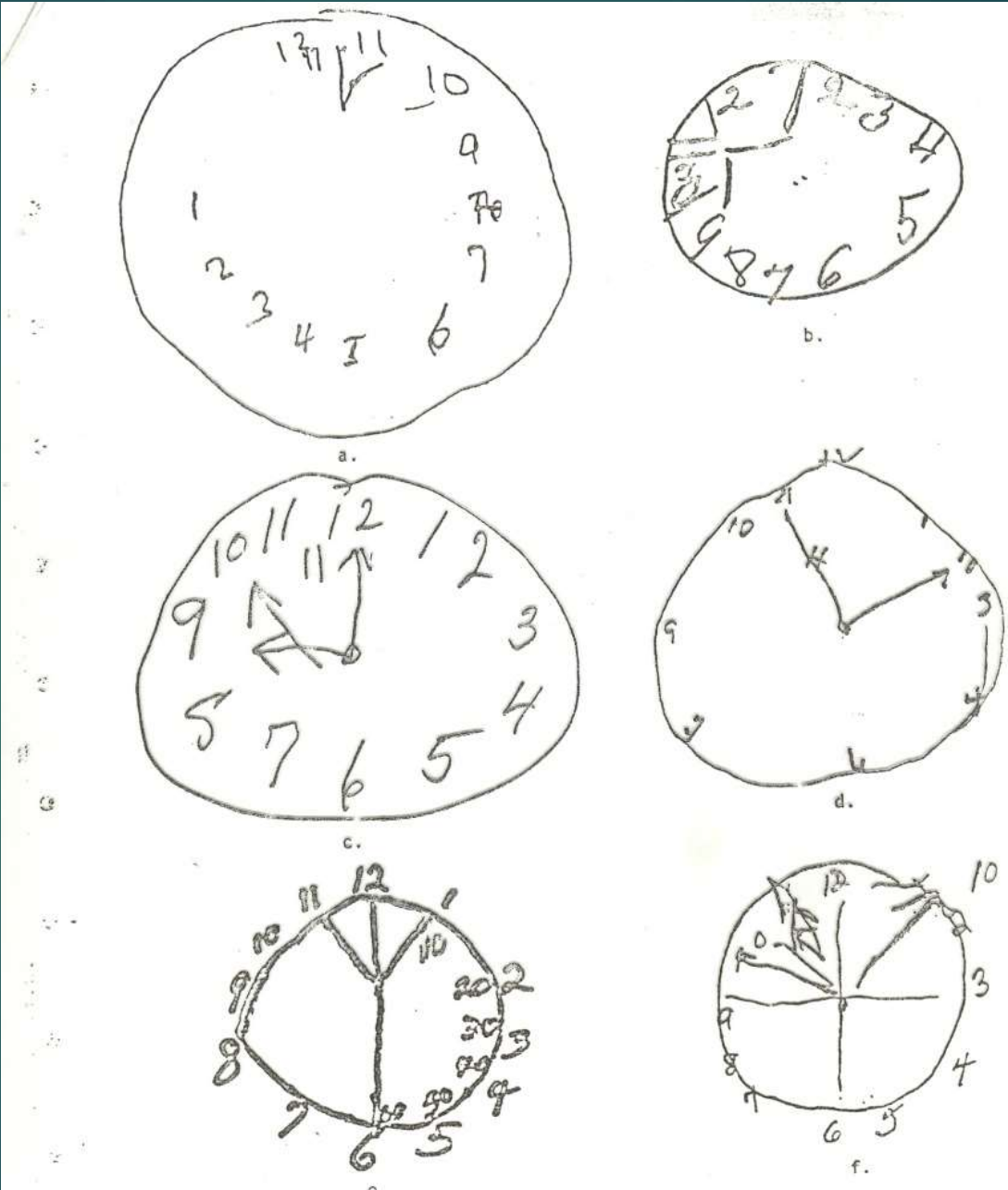
# Clock 8



# Clock 9



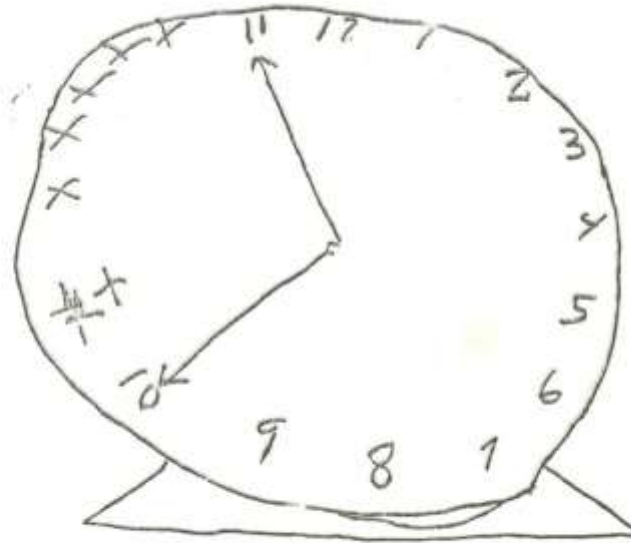
# Clock 10



# Clock 11

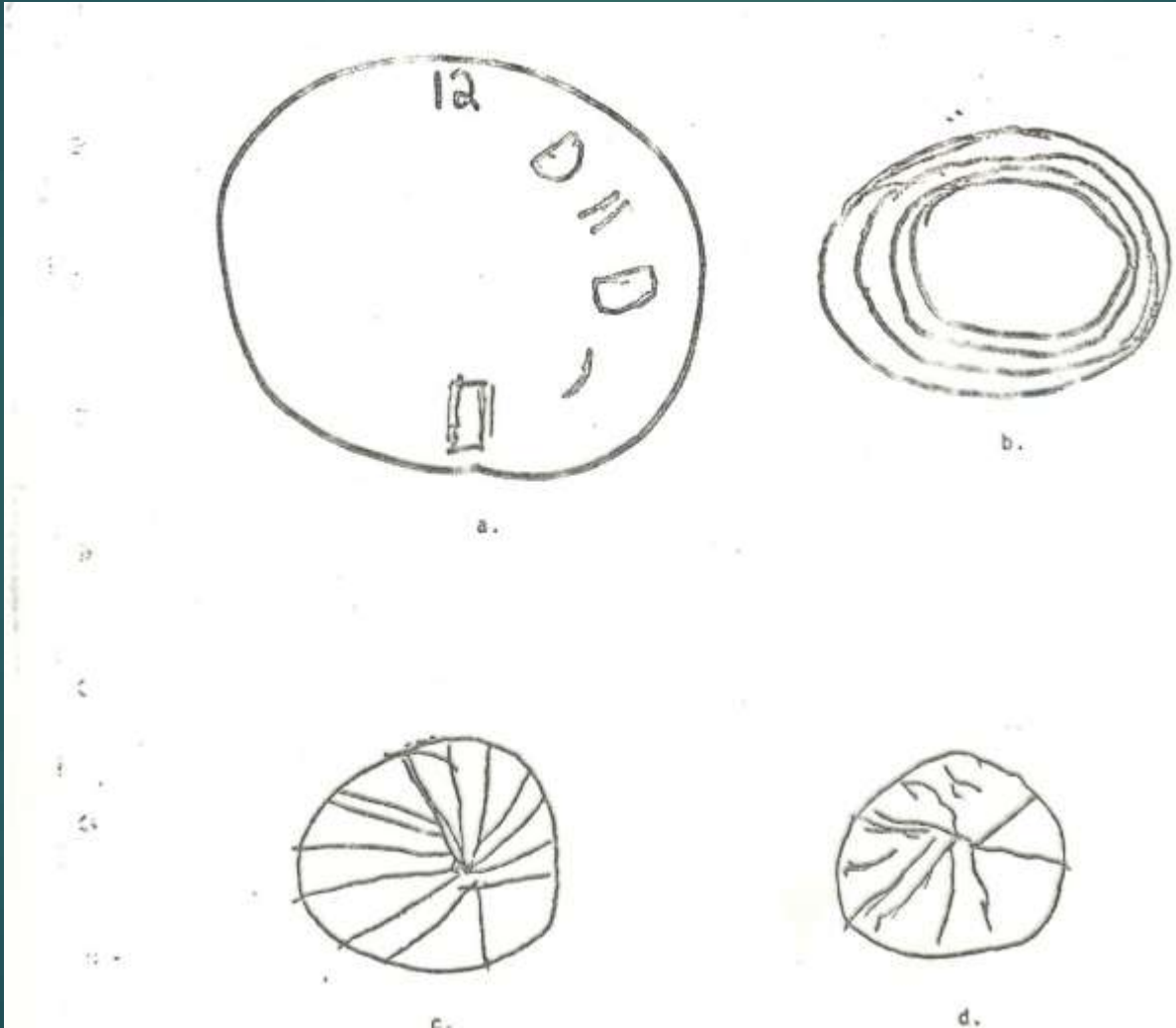


a.

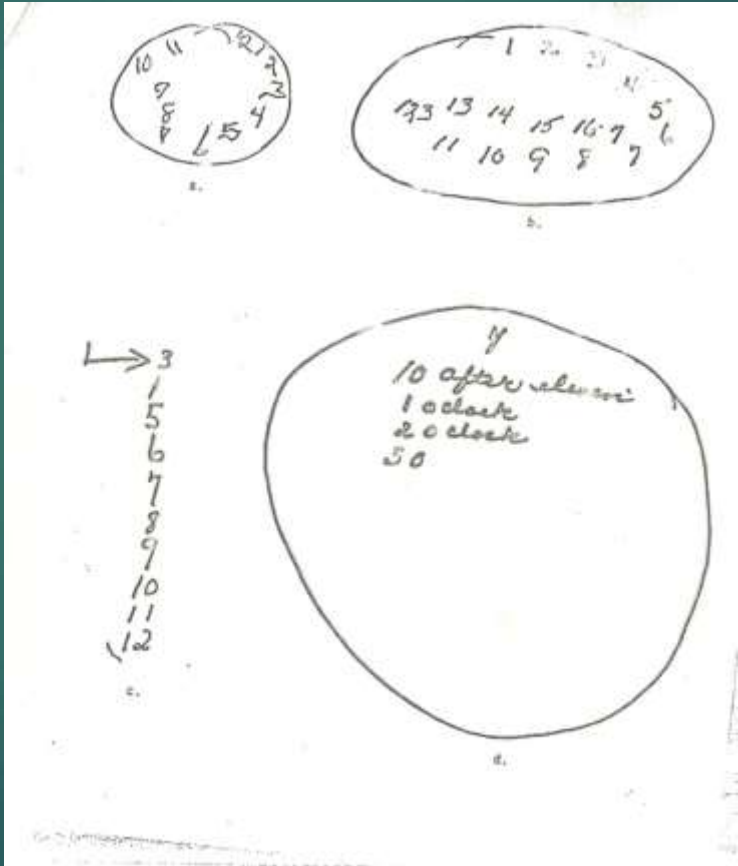


b.

# Clock 12

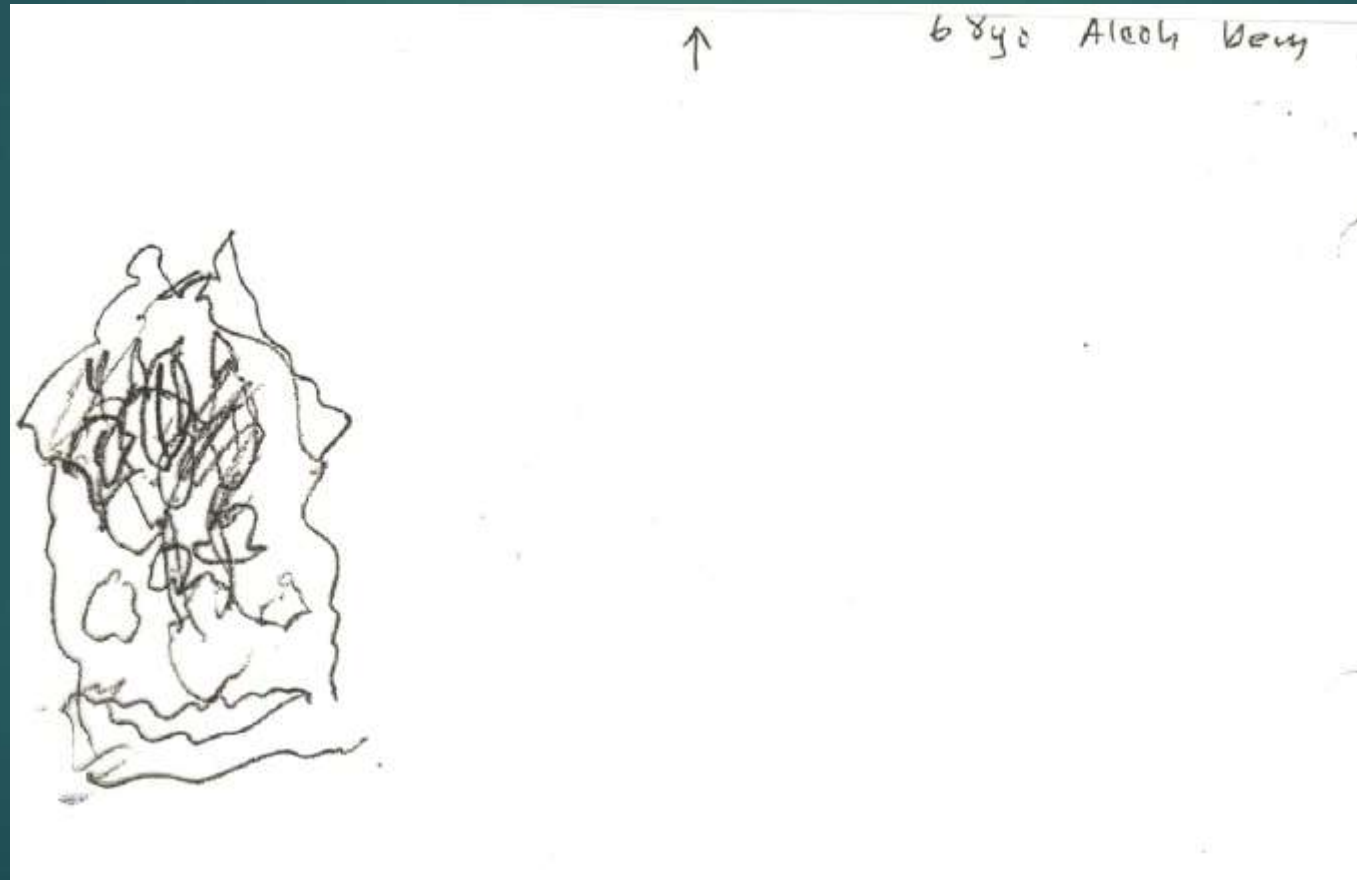


# Clock 13

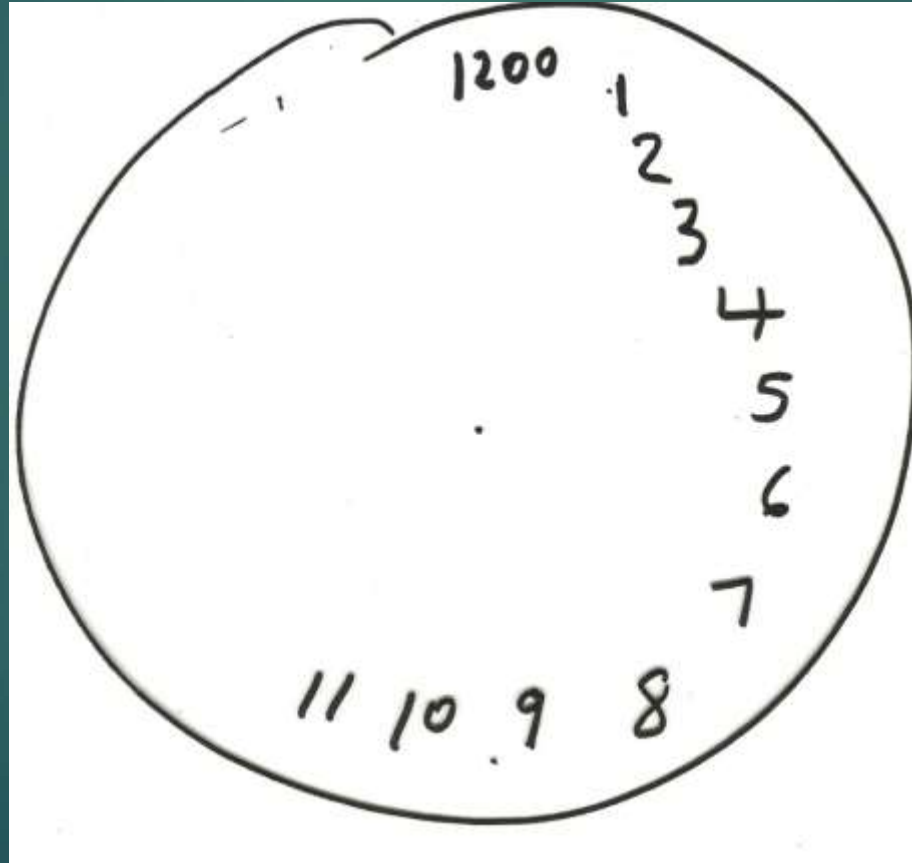




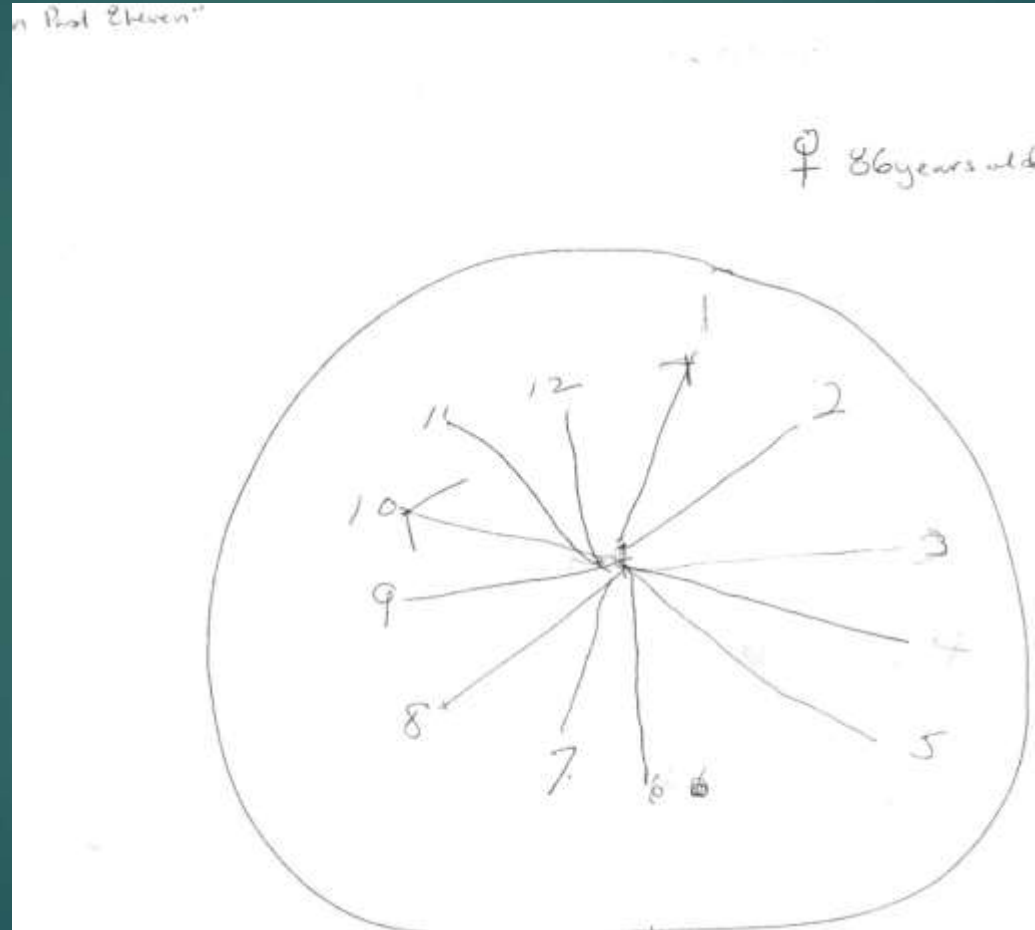
# Clock 14



# Clock 15



# Clock 16



# Executive Dysfunction

- ▶ Executive Dysfunction dissociates the Capacity to perform the elements of a complex task from its orchestration and the Actual Execution.
- ▶ Difference between what you see in hospital and what they can do at home
- ▶ How to do it vs. when and whether to do it

# Behavioral Dyscontrol Scale

BDS-2	
Name: _____	Score <input type="text"/>
Birthdate: _____	
Date of exam: _____	
Education: _____	Handedness: R L Mixed

- 1. Tap twice with the right hand and once with the left in a series.** (10 reps after allowing practice.)  
3 - No errors. Task learned quickly and performed rapidly, smoothly, automatically, with little effort.  
2 - Generally smooth performance, but with 1 or 2 errors.  
1 - Three or 4 perseverative errors, or poor timing and slow, effortful performance with fewer errors.  
0 - Poor performance, 5 or more errors, or unable to perform the task despite recalling instructions.
- 2. Tap twice with the left hand and once with the right in a series.** (10 reps after allowing practice.)  
3 - No errors. Task learned quickly and performed rapidly, smoothly, automatically, with little effort.  
2 - Generally smooth performance, but with 1 or 2 errors.  
1 - Three or 4 perseverative errors, or poor timing and slow, effortful performance with fewer errors.  
0 - Poor performance, 5 or more errors, or unable to perform the task despite recalling instructions.
- 3. If I say "red," squeeze my hand. If I say "green," do nothing.** (15 repetitions)  
3 - No errors, and rapid responses to verbal stimuli.  
2 - Rapid responses to stimuli and no more than 1 error, or slow responses (~ 1-1.5 sec) and no errors.  
1 - Two to 4 errors, including errors on which patient catches him/herself, or response time > 2 sec.  
0 - More than 4 errors of either inhibition or initiation.
- 4. If I tap twice, you tap once. If I tap once, you tap twice.** (10 repetitions)  
3 - No errors, and rapid responses to stimuli.  
2 - Rapid responses to stimuli and no more than 1 error, or slow responses (~ 1-1.5 sec) and no errors.  
1 - Two or 3 errors, or fewer errors and response time > 2 seconds.  
0 - More than 3 errors.
- 5. Alternate touching of thumb and fingers.** (5 full repetitions after allowing practice.)  
3 - No errors. Task learned quickly and performed rapidly, relatively automatically, with little effort.  
2 - Learns task with at most a few errors. Movements become relatively automatic with practice.  
1 - Difficulty learning task. Patient makes many errors, or best performance remains deliberate and effortful. Improvement observed, but performance is never really automatic even after practice.  
0 - Failure to learn the task, or no improvement with practice unless examiner models task constantly.

Behavioral Dyscontrol Scale © Copyright 1997-2006, J. Gregory, K. Kaye, & D. Bowerbank. All rights reserved.

Motor Control &  
Inhibition

Tap 2x with RH,  
1x with LH

If I say "red" squeeze,  
If "green" do nothing

## 6. Fist - Edge - Palm

- 3 - No errors. Task learned quickly and performed rapidly, relatively automatically, with little effort.
- 2 - Learns task with at most a few errors. Movements become relatively automatic with practice.
- 1 - Difficulty learning task. Patient makes many errors, or best performance remains deliberate and effortful. Improvement observed, but performance is never really automatic even after practice.
- 0 - Failure to learn the task, or no improvement with practice unless examiner models task constantly.

## 7. Head's Test (Correct first mirroring error, but count it as an error. Examiner and subject should return their hands to their laps and pause 2-3 seconds after copying each hand position to avoid mimicry.)

- ☐ Left fist beside head    ☐ Right index finger points to right eye    ☐ Left hand vertical, right hand horizontal, forming a "T"    ☐ Right hand with bent fingers under chin    ☐ Left hand to left ear

- 3 - No errors.
- 2 - One error.
- 1 - Two or 3 errors.
- 0 - More than 3 errors.

## 8. Alphanumeric Sequencing

1	a	2	b	3	c	4	d	5	e	6	f	7	g	8	h	9	i	10	j	11	k	12	l
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	----	---	----	---	----	---

- 3 - Completes task with no errors in 20 seconds or less.
- 2 - Completes task with no errors in more than 20 seconds.
- 1 - One to 3 errors.
- 0 - More than 3 errors, or complete failure to finish the task.

Time:

## 9. Insight rating

- 3 - Awareness of (in)accuracy of performance, and of its severity and significance, if performance is deficient.
- 2 - Awareness of errors, but limited understanding of their severity or significance.
- 1 - Partial and/or inconsistent awareness of deficient aspects of performance.
- 0 - Completely lacking in ability to assess performance accurately and critically.

# Only 1 Study of Prevalence & Incidence of EF Impairment

- ▶ Prevalence of EF impairment: n=1,145 CO community, mean age = 73; mean educ = 10; Hispanics & NHW; **BDS as measure of ECF**
- ▶ 33.7% showed mildly impaired EF;  
50% of these had normal MMSE; 16.4% showed moderately to severely impaired ECF.
- ▶ **Prevalence of EF deficits increased with age:** 7% in their 60s, 15.6% in their 70's, 31.5% in their 80s, and 44.7% in their 90's being moderately to severely impaired.
- ▶ **BDS was a stronger predictor of impaired functional status than MMSE**

Grigsby, et al., Neuroepidemiology, 2002

# EXIT25: 25 item EF screener

- ▶ 1 Number-Letter (1-A, 2-B)
- ▶ 2 Word Fluency (A)
- ▶ 3 Design Fluency
- ▶ 4 Anomalous Sentence Repetition
- ▶ 5 Thematic Perception
- ▶ 6 Three Word Memory/Distraction
- ▶ 7 Interference Task
- ▶ 8 Automatic Behavior
- ▶ 9 Automatic Behavior II
- ▶ 10 Grasp Reflex
- ▶ 11 Social Habit
- ▶ 12 Motor Impersistence
- ▶ 13 Snout Reflex

- 14 Finger Nose Finger
- 15 Go No Go
- 16 Echopraxia
- 17 Luria Hand Sequence
- 18 Luria Hand Sequence II
- 19 Grip task
- 20 Echopraxia II
- 21 Complex Command Task
- 22 Serial Order Reversal
- 23 Counting Task
- 24 Utilization Behavior
- 25 Imitation Behavior

Measures that are often impaired in F lesions



# Clox1: Executive Clock Drawing Task – 1:45 on the back 1st

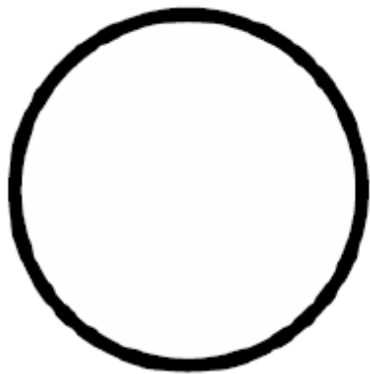
## CLOX: An Executive Clock Drawing Task

Copyright Royal, 1995

**STEP 1:** Turn this form over on a light colored surface so that the circle below is visible. Have the subject draw a clock on the back. Instruct him or her to "Draw me a clock that says 1:45. Set the hands and numbers on the face so that a child could read them." Repeat the instructions until they are clearly understood. Once the subject begins to draw, no further assistance is allowed. Rate this clock in the CLOX 1 column.

**STEP 2:** Return to this side and let the subject observe you draw a clock in the circle below. Place 12, 6, 3, and 0 first, then fill in the rest of the numbers. Set the hands again to "1:45". Make the hands into arrows. Make the hour hand shortest. Invite the subject to copy your clock in the lower right corner. Rate this clock in the CLOX 2 column.

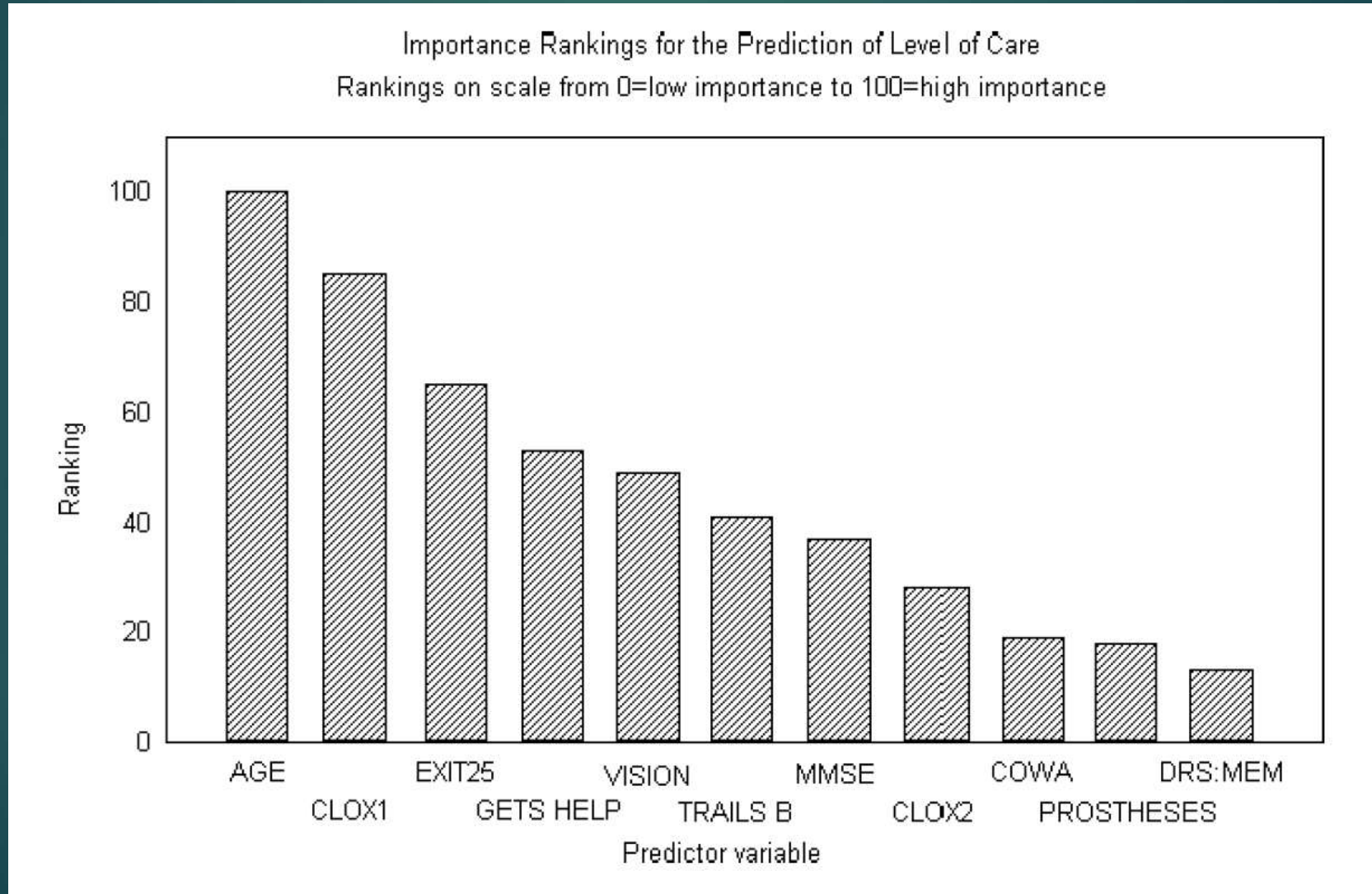
ORGANIZATIONAL ELEMENTS	Point Value	CLOX 1	CLOX 2
Does the figure resemble a clock?	1		
Circular face present?	1		
Dimensions > 1 inch?	1		
All numbers inside the perimeter?	1		
No sectoring or tic marks?	1		
12, 6, 3, & 9 placed first?	1		
Spacing intact? (Symmetry on either side of 12 and 6 o'clock?)	1		
Only Arabic numerals?	1		
Only numbers 1 — 12 among the numerals present?	1		
Sequence 1 — 12 intact? (No omissions or intrusions)	1		
Only two hands present? (Ignore sectoring/tic marks)	1		
All hands represented as arrows?	1		
Hour hand between 1 and 2 o'clock?	1		
Minute hand obviously longer than the hour hand?	1		
None of the Following 1) hand point to 4 or 5 o'clock 2) "1:45" present? 3) Any other notations (e.g. "9:00")? 4) Any arrows point inward? 5) Intrusions from "hand" or "face" present? 6) Any letters, words, or pictures? 7) Any intrusions from circles below?	1		
TOTAL:			



# Clox & EXIT25 correlations

- ▶ Executive control function appears to be most responsible for the effect of cognition on level of care.
- ▶ CLOX 1 correlates well with the EXIT25 ( $r = -0.83$ ).
- ▶ CLOX2 correlates well with the Mini Mental State Exam ( $r = 0.85$ ).
- ▶ MacCAT-T (MacArthur Competency Assessment) correlates  $-.66$  with EXIT25
- ▶ Cognitive screening tasks inform decision making capacity evaluations. THEY DO NOT REPLACE THEM!!!

# Level of Care prediction: Age, Clox1, EXIT25



# Executive function in self-neglecting *adult protective services*(APS) referrals

- ▶ 49% of APS subjects passed the MMSE of which:
  - ▶ 55% failed CLOX1
  - ▶ 83% failed EXIT25
- ▶ No client who passed CLOX1 or the EXIT25 failed the MMSE.
- ▶ There were no differences in cognitive performance between squalor dwelling (n=27) and non-squalor dwelling (n=28) self-neglectors.
- ▶ Conclusions: Cognitive screens sensitive to executive function evidence more impairment than screens sensitive to other cognitive domains. Elders suffering self-neglect have worse cognitive performance than victims of exploitation. Squalor dwelling status is mediated by more than cognition.

## BDS (EF dysfunction) Predicts:

- ▶ Functional autonomy ↓
- ▶ Impulsivity & apathy ↑
- ▶ ADLs and IADLs ↓
- ▶ Money management ↓
- ▶ Medication management ↓
- ▶ Poor geriatric orthopedic & stroke rehabilitation outcome

# General NB Tools

- ▶ Slums
  - ▶ [http://medschool.slu.edu/agingsuccessfully/pdfsurveys/slumsexam\\_05.pdf](http://medschool.slu.edu/agingsuccessfully/pdfsurveys/slumsexam_05.pdf)
- ▶ Mini-Cog
- ▶ AD8
- ▶ Late Life Dementia Risk Index
- ▶ Sweet 16 (3-item recall with 8 items of orientation, & a backward digit span. no EF; PAR copyright infringement; uses MMSE items)
- ▶ ADLS
- ▶ Cognistat
  - ▶ <http://www.cognistat.com/>
- ▶ MOCA
  - ▶ <http://www.mocatest.org>

# SLUMS: St. Louis University Mental Status Test

VAMC  
SLUMS Examination

Questions about this assessment tool? E-mail [aging@slu.edu](mailto:aging@slu.edu).

Name\_\_\_\_\_ Age \_\_\_\_\_

Is patient alert? \_\_\_\_\_ Level of education \_\_\_\_\_

/1

/1

/1

/3

/3

/5

/2

/4

/2

/8

1. What day of the week is it?

2. What is the year?

3. What state are we in?

4. Please remember these five objects. I will ask you what they are later.  
Apple Pen Tie House Car

5. You have \$100 and you go to the store and buy a dozen apples for \$3 and a tricycle for \$20.  
How much did you spend?  
How much do you have left?

6. Please name as many animals as you can in one minute.  
0-4 animals 5-9 animals 10-14 animals 15+ animals

7. What were the five objects I asked you to remember? 1 point for each one correct.


8. I am going to give you a series of numbers and I would like you to give them to me backwards.  
For example, if I say 42, you would say 24.  
87 649 8537


9. This is a clock face. Please put in the hour markers and the time at ten minutes to eleven o'clock.  
Hour markers okay  
Time correct

10. Please place an X in the triangle.  
Which of the above figures is largest?

11. I am going to tell you a story. Please listen carefully because afterwards, I'm going to ask you some questions about it.  
Jill was a very successful stockbroker. She made a lot of money on the stock market. She then met Jack, a devastatingly handsome man. She married him and had three children. They lived in Chicago. She then stopped work and stayed at home to bring up her children. When they were teenagers, she went back to work. She and Jack lived happily ever after.  
What was the female's name?  
When did she go back to work?  
What work did she do?  
What state did she live in?

Department of Veterans Affairs

SAINT LOUIS UNIVERSITY



SCORING

High School Education		Less than High School Education
27-30	Normal	25-30
21-26	MNCD*	20-24
1-20	Dementia	1-19

\* Mild Neurocognitive Disorder

5H Tariq, N Tumosa, JT Chibnall, HM Perry III, and JE Morley. The Saint Louis University Mental Status (SLUMS) Examination for Detecting Mild Cognitive Impairment and Dementia is more sensitive than the Mini-Mental Status Examination (MMSE) - A pilot study. Am J Geriatr Psychiatry 14:900-910, 2006.



# Steps in the Mini-Cog

- ▶ Have patient repeat and remember 3 words:

- ▶ banana, sunrise, chair
- ▶ (3-Word Registration)

+

- ▶ Instruct patient to draw a clock showing the time 11:10

- ▶ (Clock Drawing)

+

- ▶ Ask patient to repeat the words
- ▶ (3-Word Recall)



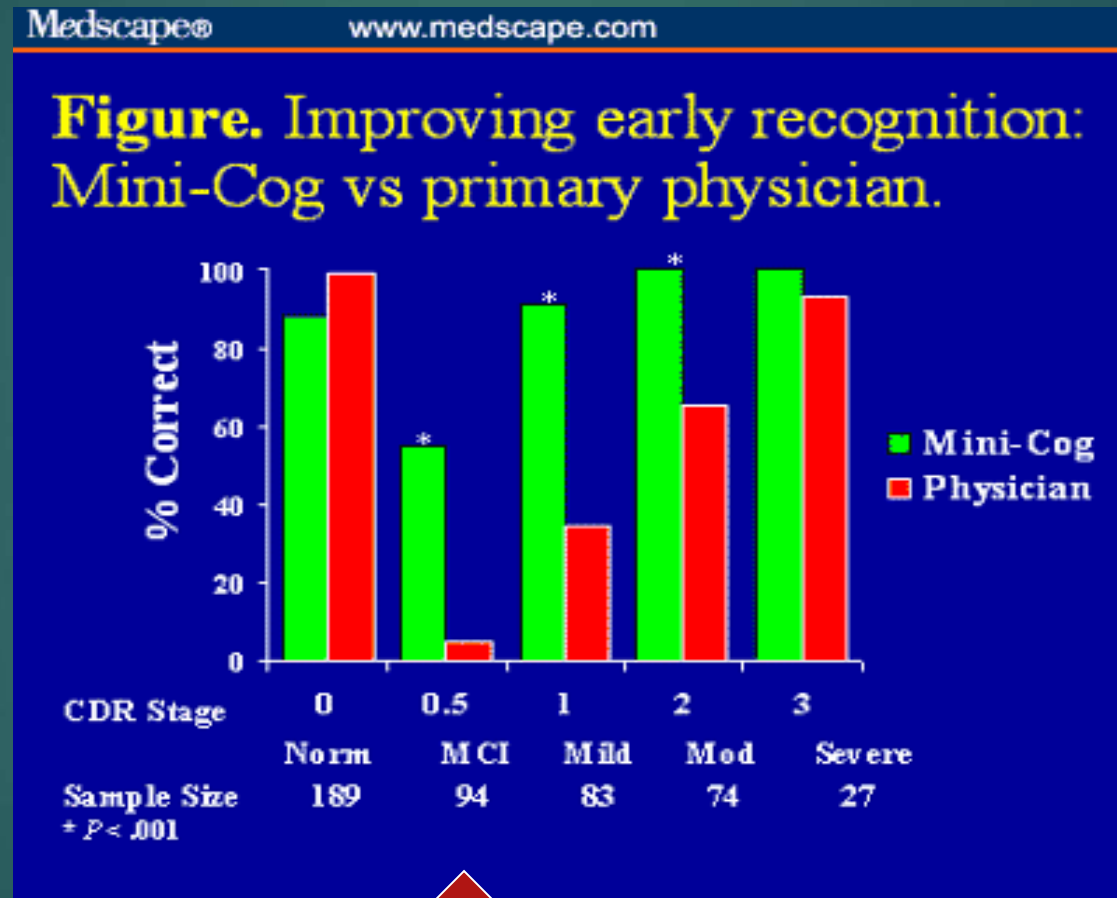
# Mini-Cog: 3 word recall + Clock

- ▶ 3 minute test, as sensitive as MMSE, better at mild NCD
- ▶ Combines the most sensitive parts of the MMSE and the Clock Drawing test
- ▶ If no mistakes, the probability of no Major NCD is >95%
- ▶ Using algorithm, 99% sensitivity, 93% specificity in original study of n =249; 75% & 90% in study with n= 1000, but performed as well as MMSE

# Mini-Cog vs. MMSE

- ▶ Mini-Cog meets or exceeds accuracy of MMSE in screening for cognitive impairment
- ▶ **Simpler and faster than MMSE** (3-5 minutes versus 5-10 minutes)
- ▶ Other benefits of Mini-Cog:
  - ▶ **Relatively unbiased by ethnicity, literacy, education**
  - ▶ Detects AD and non-AD Major NCDs, including MCI

# Mini-Cog vs. Primary Physician recognition of MCI and Major NCD



# AD8 for caregivers: 2 or more = Impaired

Remember, "Yes, a change" indicates that there has been a change in the last several years caused by cognitive (thinking and memory) problems.	YES. A change	NO. No change	N/A. Don't know
1. Problems with judgment (e.g., problems making decisions, bad financial decisions, problems with thinking)			
2. Less interest in hobbies/activities			
3. Repeats the same things over and over (questions, stories, or statements)			
4. Trouble learning how to use a tool, appliance, or gadget (e.g., VCR, computer, microwave, remote control)			
5. Forgets correct month or year			
6. Trouble handling complicated financial affairs (e.g., balancing checkbook, income taxes, paying bills)			
7. Trouble remembering appointments			
8. Daily problems with thinking and/or memory			
<b>TOTAL AD8 SCORE</b>			

Adapted from Galvin JE et al, The AD8, a brief informant interview to detect dementia, Neurology 2005;65:559-564

For Caregivers; AD8 score fits with amount of brain amyloid imaging.

**Table 2** The late-life dementia risk Index

Characteristic	Points
Age 75-79 y*	1
Age 80-100 y*	2
Low 3MS*	2
Low DSST*	2
BMI <18.5	2
≥1 APOE ε4 allele	1
MRI white matter disease (grade ≥3)	1
MRI enlarged ventricles (grade ≥4)	1
Internal carotid artery thickness ≥2.2 mm	1
History of coronary bypass surgery	1
Time to put on and button shirt >45 s	1
Lack of alcohol consumption	1
Possible range	0 to 15
c Statistic (95% CI)	0.81 (0.79-0.83)

\*In comparison to those aged 65 to 74 years.

\*Low 3MS: ≤87 (all white subjects and black subjects with ≥12 years education) or ≤70 (black subjects with <12 years of education). Low DSST: ≤33 (white subjects with ≥12 years education) or ≤22 (white subjects with <12 years education and all black subjects).

# Cognistat



# Cognistat

- ▶ Screen & Metric approach (but do all), 20 minutes, Kit required
  - ▶ Orientation
  - ▶ Attention
  - ▶ Language
  - ▶ Construction (Block Design)
  - ▶ Memory
  - ▶ Calculation
  - ▶ Reasoning, Judgment
- Variety of cognitive domains relative to MMSE
- Few large normative studies; education effects

# Cognistat 1

COGNISTAT										
(THE NEUROBEHAVIORAL COGNITIVE STATUS EXAMINATION)										
NAME: _____					OCCUPATION: _____					
AGE: _____ DATE OF BIRTH: _____					DATE LAST WORKED: _____					
HANDEDNESS (circle):      Left      Right					DATE OF INJURY (if any): _____					
NATIVE LANGUAGE: _____					EXAM LOCATION: _____					
TOTAL YEARS EDUCATION: _____					DATE: _____ TIME: _____					

COGNITIVE STATUS PROFILE											
	LOC	ORI	ATT	LANGUAGE			CONST	MEM	CALC	REASONING	
				COMP	REP	NAM				SIM	JUD
AVG. RANGE											
	ALERT	--12--	--(5)8--	--(5)6--	--(5)--	--(5)--	--(5)5--	--12--	--(5)4--	--(5)6--	--(5)5--
		--10--	--6--	--5--	--11--	--7--	--4--	--10--	--3--	--5--	--4--
MILD	IMP	--8--	--5--	--4--	--9--	--5--	--3--	--8--	--2--	--4--	--3--
MODERATE		--6--	--3--	--3--	--7--	--3--	--2--	--6--	--1--	--3--	--2--
SEVERE		--4--	--1--	--2--	--5--	--2--	--0--	--4--	--0--	--2--	--1--
Write in lower scores											

ATT	-	Attention	JUD	-	Judgment	ORI	-	Orientation
CALC	-	Calculations	LOC	-	Level of Consciousness	REP	-	Repetition
COMP	-	Comprehension	MEM	-	Memory	S	-	Screen
CONST	-	Constructions	NAM	-	Naming	SIM	-	Similarities
IMP	-	Impaired						

The validity of this examination depends on administration in strict accordance with the Cognistat Manual.

For patients over the age of 65 the average range extends to the "mild impairment" level for Constructions, Memory and Similarities.

Note: Not all brain lesions produce cognitive deficits that will be detected by Cognistat. Normal scores, therefore, cannot be taken as evidence that brain pathology does *not* exist. Similarly, scores falling in the mild, moderate, or severe range of impairment do not *necessarily* reflect brain dysfunction (see section of the Cognistat Manual entitled "Cautions in Interpretations").

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Telephone: (800) 922-5840

Revised 5/2005



3/2/07  
 TBI on 2/11/07

# COGNISTAT

(THE NEUROBEHAVIORAL COGNITIVE STATUS EXAMINATION)

---

NAME: Mark B. OCCUPATION: \_\_\_\_\_  
 AGE: 39 DATE OF BIRTH: \_\_\_\_\_ DATE LAST WORKED: \_\_\_\_\_  
 HANDEDNESS (circle): Left Right DATE OF INJURY (if any): \_\_\_\_\_  
 NATIVE LANGUAGE: \_\_\_\_\_ EXAM LOCATION: \_\_\_\_\_  
 TOTAL YEARS EDUCATION: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

---

## COGNITIVE STATUS PROFILE

	LOC	ORI	ATT	LANGUAGE			CONST	MEM	CALC	REASONING	
				COMP	REP	NAM				SIM	JUD
TAVG. RANGE }	10	10	10	10	10	10	10	10	10	10	10
	10	10	10	10	10	10	10	10	10	10	10
MILD	IMP	8	5	4	9	3	3	8	2	4	3
MODERATE		6	3	3	7	3	2	6	1	3	2
SEVERE		4	1	2	5	2	0		0	2	1
Write in lower scores											

**ABBREVIATIONS**

ATT - Attention	JUD - Judgment	ORI - Orientation
CALC - Calculations	LOC - Level of Consciousness	REP - Repetition
COMP - Comprehension	MEM - Memory	S - Screen
CONST - Constructions	NAM - Naming	SIM - Similarities
IMP - Impaired		

\* The validity of this examination depends on administration in strict accordance with the Cognistat Manual.

† For adolescents and individuals older than 65, see normative information on pages 12 and 13 of the Cognistat Manual (updated edition from 2001).

**Note:** Not all brain lesions produce cognitive deficits that will be detected by Cognistat. Normal scores, therefore, cannot be taken as evidence that brain pathology does not exist. Similarly, scores falling in the mild, moderate, or severe range of impairment do not necessarily reflect brain dysfunction (see section of the Cognistat Manual entitled "Cautions in Interpretations").

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The Northern California  
Neurotrauma Center

## Be Careful about diagnosis

- ▶ Mental Status tests are evidence for cognitive dysfunction, not necessarily diagnosis or etiology.
- ▶ Need to carefully consider testing context: amount of sleep, alcohol, medications, effort level of pt, attitude of pt toward you

Monday, December 31st, 2012

## Welcome to the Montreal Cognitive Assessment

The MoCA<sup>®</sup> is a cognitive screening test designed to assist Health Professionals for detection of mild cognitive impairment

TEST

INSTRUCTIONS

MoCA<sup>®</sup> NEWS

NORMATIVE DATA

REFERENCES

PERMISSION TO USE THE MoCA<sup>®</sup>

Receive UPDATES on MoCA<sup>®</sup>

For more information or feedback on MoCA<sup>®</sup> contact Dr Z. Nasreddine at [info@mocatest.org](mailto:info@mocatest.org)  
Copyright© Dr Z. Nasreddine 2003 to 2013 - *The Montreal Cognitive Assessment* - MoCA<sup>®</sup> - All rights reserved



# MoCA: Montreal Cognitive Assessment

- ▶ Free of charge, 75 languages, downloadable
- ▶ Designed to separate normals from MCI
- ▶ 10 minutes
- ▶ 30 points
- ▶ Limitations: No studies on ethnicity and education effects
- ▶ Best substitute for MMSE with higher educated patients
- ▶ <http://www.mocatest.org/>
- ▶ MoCA© may be used, reproduced, and distributed **WITHOUT** permission.  
The test should be made available free of charge to patients. Send a request for permission at [info@mocatest.org](mailto:info@mocatest.org) stating for what purposes you wish to use the MoCA.

# Different Cognitive Domains Measured by MoCA

- ▶ Executive functions
- ▶ Visuoconstructional skills
- ▶ Language
- ▶ Memory
- ▶ Attention and concentration
- ▶ Calculations
- ▶ Conceptual thinking, abstraction
- ▶ Orientation.

# 75 Languages

English (Original)	Dutch (Additional version 7.2)	Malayalam	Serbian
English (Additional version 2)	Dutch (Additional version 7.3)	Kannada	Sinhalese
English (Additional version 3)	Estonian	Korean	Slovak
English (Singapore)	Filipino	Korean (K2-Chuncheon)	Slovenian
Arabic	Finnish	Latvian	Spanish
Afrikaans	French	Lithuanian	Spanish (Additional version 7.2)
Bengali	French (Additional version 7.2)	Malay (Bahasa-Malaysia)	Spanish (Additional version 7.3)
Bulgarian	French (Additional version 7.3)	Malay (Singapore)	Swahili
Chinese (Beijing)	German	Marathi	Swedish
Chinese (Cantonese)	German (Additional version 2)	Norwegian	Tamil
Chinese (Changsha)	German (Additional version 3)	Persian	Telugu
Chinese (Hong Kong)	Greek	Polish	Thai
Chinese (Singapore)	Hebrew	Polish (Alternate version)	Turkish
Chinese (Taiwan)	Hindi	Portuguese	Ukrainian
Croatian	Hungarian	Portuguese (Additional version 7.2)	Urdu
Croatian (Additional version 2)	Hungarian (Additional version 7.2)	Portuguese (Additional version 7.3)	Uyghur
Czech	Hungarian (Additional version 7.3)	Portuguese (Brazil)	Vietnamese
Danish	Italian	Romanian	Welsh
Dutch	Japanese	Russian	

# MoCA

- ▶ 2 points should be added to the total MoCA© score for subjects with 4-9 years of education, 1 point for 10-12 years of education.
- ▶ MoCA Mini in development: 5 minute version, memory & EF
- ▶ A training and certification program is currently being developed.
- ▶ MoCA© for Blind: without the visual elements has been validated for the blind (in English & Spanish)
- ▶ A tablet version: automatically calculating item, total scores, and the newly devised Memory Index Score. It will also assess processing speed as each cognitive task will be automatically timed. It can also be uploaded to an EMR or sent by e-mail.
- ▶ Ace study: normative data for the MoCA© across ages, education levels, in 10 languages and cultures in progress
- ▶ Clinical judgment, based on thorough clinical evaluation, is important in interpreting MoCA test results and correctly diagnosing patients who present with cognitive complaints.



MONTREAL COGNITIVE ASSESSMENT (MOCA)		NAME :		Date of birth :		POINTS	
Version 7.1 Original Version		Education :		DATE :			
<b>VISUOSPATIAL / EXECUTIVE</b>							
				Draw CLOCK (Ten past eleven) (3 points)		<input type="checkbox"/> /5	
<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/> Contour <input type="checkbox"/> Numbers <input type="checkbox"/> Hands			
<b>NAMING</b>							
						<input type="checkbox"/> /3	
<b>MEMORY</b>							
Read list of words, subject must repeat them. Do 2 trials, even if 1st trial is successful. Do a recall after 5 minutes.		FACE	VELVET	CHURCH	DAISY	RED	No points
1st trial							
2nd trial							
<b>ATTENTION</b>							
Read list of digits (1 digit/ sec.). Subject has to repeat them in the forward order		<input type="checkbox"/> 2 1 8 5 4					<input type="checkbox"/> /2
Subject has to repeat them in the backward order		<input type="checkbox"/> 7 4 2					
Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors							
<input type="checkbox"/> FBACMNAAJ KLBFAFAKDEAAAAJAMOF AAB							<input type="checkbox"/> /1
Serial 7 subtraction starting at 100 <input type="checkbox"/> 93 <input type="checkbox"/> 86 <input type="checkbox"/> 79 <input type="checkbox"/> 72 <input type="checkbox"/> 65							<input type="checkbox"/> /3
4 or 5 correct subtractions: <b>3 pts</b> , 2 or 3 correct: <b>2 pts</b> , 1 correct: <b>1 pt</b> , 0 correct: <b>0 pt</b>							
<b>LANGUAGE</b>							
Repeat : I only know that John is the one to help today. <input type="checkbox"/>							<input type="checkbox"/> /2
The cat always hid under the couch when dogs were in the room. <input type="checkbox"/>							
Fluency / Name maximum number of words in one minute that begin with the letter F <input type="checkbox"/> _____ (N ≥ 11 words)							<input type="checkbox"/> /1
<b>ABSTRACTION</b>							
Similarity between e.g. banana - orange = fruit <input type="checkbox"/>		train - bicycle <input type="checkbox"/>		watch - ruler <input type="checkbox"/>		<input type="checkbox"/> /2	
<b>DELAYED RECALL</b>							
Has to recall words: <b>WITH NO CUE</b>		FACE	VELVET	CHURCH	DAISY	RED	Points for UNCUED recall only
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Optional</b>							
Category cue							
Multiple choice cue							
<b>ORIENTATION</b>							
<input type="checkbox"/> Date <input type="checkbox"/> Month <input type="checkbox"/> Year <input type="checkbox"/> Day <input type="checkbox"/> Place <input type="checkbox"/> City							<input type="checkbox"/> /6
© Z.Nasreddine MD <a href="http://www.mocatest.org">www.mocatest.org</a> Normal ≥ 26 / 30		<b>TOTAL</b>		<input type="checkbox"/> /30			
Administered by: _____		Add 1 point if ≤ 12 yr edu					

EF functions:

TMT



Clock

Fluency

Abstraction

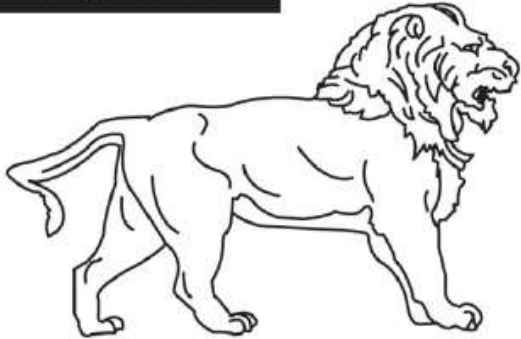
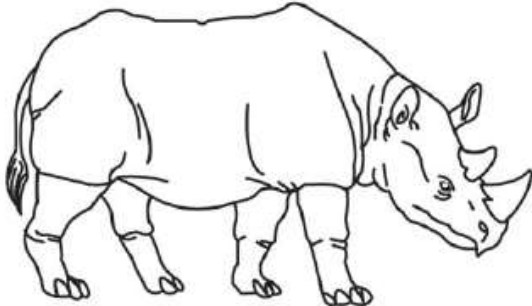
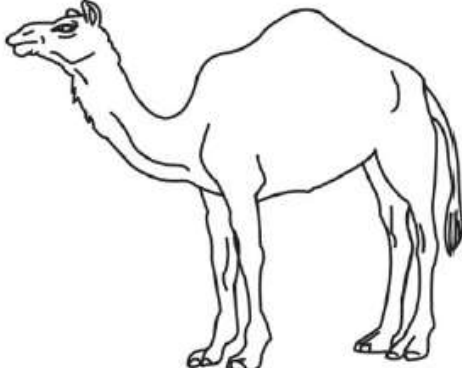


# MoCA 1

<b>MONTREAL COGNITIVE ASSESSMENT (MOCA)</b> Version 7.1 Original Version		<b>NAME :</b> Education : Sex :	<b>Date of birth :</b> DATE :
<b>VISUOSPATIAL / EXECUTIVE</b>		<b>POINTS</b>	
		Copy cube  Draw CLOCK (Ten past eleven) ( 3 points )	
[   ]	[   ]	[   ] Contour	[   ] Numbers
[   ]		[   ] Hands	___/5

Nasreddine ZS, et al., *J. Am Geriatr Soc* 53:695–699, 2005.

# MoCA 2

NAMING										
								___/3		
		[ ]		[ ]		[ ]				
MEMORY		Read list of words, subject must repeat them. Do 2 trials, even if 1st trial is successful. Do a recall after 5 minutes.			FACE	VELVET	CHURCH	DAISY	RED	No points
		1st trial								
		2nd trial								
ATTENTION		Read list of digits (1 digit/ sec.).		Subject has to repeat them in the forward order		[ ] 2 1 8 5 4				___/2
				Subject has to repeat them in the backward order		[ ] 7 4 2				
		Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors				[ ] FBACMNAAJKLBAFAKDEAAAJAMOF AAB				___/1
Serial 7 subtraction starting at 100		[ ] 93	[ ] 86	[ ] 79	[ ] 72	[ ] 65			___/3	
		4 or 5 correct subtractions: <b>3 pts</b> , 2 or 3 correct: <b>2 pts</b> , 1 correct: <b>1 pt</b> , 0 correct: <b>0 pt</b>								

# MoCA 3

<b>LANGUAGE</b>	Repeat : I only know that John is the one to help today. [ ]						___/2	
	The cat always hid under the couch when dogs were in the room. [ ]							
	Fluency / Name maximum number of words in one minute that begin with the letter F [ ] ____ (N ≥ 11 words)						___/1	
<b>ABSTRACTION</b>	Similarity between e.g. banana - orange = fruit [ ] train - bicycle [ ] watch - ruler						___/2	
<b>DELAYED RECALL</b>	Has to recall words WITH NO CUE	FACE [ ]	VELVET [ ]	CHURCH [ ]	DAISY [ ]	RED [ ]	Points for UNCUED recall only	___/5
<b>Optional</b>	Category cue							
	Multiple choice cue							
<b>ORIENTATION</b>	[ ] Date [ ] Month [ ] Year [ ] Day [ ] Place [ ] City						___/6	
© Z.Nasreddine MD		www.mocatest.org		Normal ≥ 26 / 30		TOTAL ___/30		
Administered by: _____						Add 1 point if ≤ 12 yr edu		

# Cued Recall: Not Optional!!

## Optional:

Following the delayed free recall trial, prompt the subject with the semantic category cue provided below for any word not recalled. Make a check mark ( ✓ ) in the allocated space if the subject remembered the word with the help of a category or multiple-choice cue. Prompt all non-recalled words in this manner. If the subject does not recall the word after the category cue, give him/her a multiple choice trial, using the following example instruction, *“Which of the following words do you think it was, NOSE, FACE, or HAND?”*

Use the following category and/or multiple-choice cues for each word, when appropriate:

FACE:	<u>category cue</u> : part of the body	<u>multiple choice</u> : nose, face, hand
VELVET:	<u>category cue</u> : type of fabric	<u>multiple choice</u> : denim, cotton, velvet
CHURCH:	<u>category cue</u> : type of building	<u>multiple choice</u> : church, school, hospital
DAISY:	<u>category cue</u> : type of flower	<u>multiple choice</u> : rose, daisy, tulip
RED:	<u>category cue</u> : a colour	<u>multiple choice</u> : red, blue, green

Scoring: **No points are allocated for words recalled with a cue.** A cue is used for clinical information purposes only and can give the test interpreter additional information about the type of memory disorder. For memory deficits due to retrieval failures, performance can be improved with a cue. For memory deficits due to encoding failures, performance does not improve with a cue.

# MoCA-B: illiterate & low education

## MONTREAL COGNITIVE ASSESSMENT (MOCA-B)

### BASIC

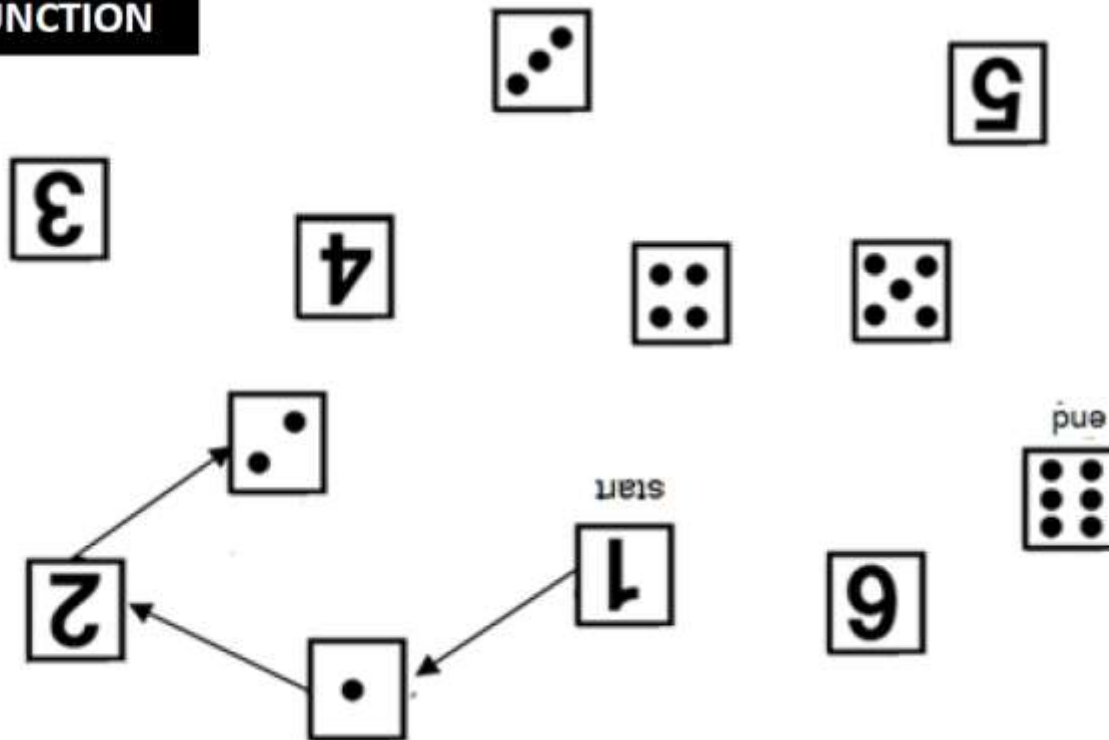
Name \_\_\_\_\_

Sex \_\_\_\_\_ Age \_\_\_\_\_

Education \_\_\_\_\_ Date of exam \_\_\_\_\_

Administered by \_\_\_\_\_

#### EXECUTIVE FUNCTION



#### SCORE

START  
TIME

(   /1)

# MoCA-B

<b>IMMEDIATE RECALL</b>		ROSE	CHAIR	HAND	BLUE	SPOON	No point
Perform 2 trials even if 1 <sup>st</sup> trial is successful	1 <sup>st</sup> trial						
	2 <sup>nd</sup> trial						
<b>FLUENCY</b>	Name maximum numbers of <b>FRUITS</b> in 1 minute						( /2)
	1.....	2.....	3.....	4.....	5.....	6.....	2 points if N = 13 or more 1 point if N = 8-12 0 point if N = 7 or less
	7.....	8.....	9.....	10.....	11.....	12.....	
	13.....	14.....	15.....	16.....	17.....	18.....	
<b>ORIENTATION</b>	<input type="checkbox"/> time (± 2 hr) <input type="checkbox"/> day <input type="checkbox"/> month <input type="checkbox"/> year <input type="checkbox"/> place <input type="checkbox"/> city						( /6)
<b>CALCULATION</b>	Provide 3 ways to pay using 1 dollar coins, 5 dollar and 10 dollar bills for an object that costs exactly <b>"13 Dollars"</b> (3 points if 3 ways, 2 points if 2 ways, 1 point if 1 way, 0 point if no correct way)						( /3)
	<input type="checkbox"/> 1..... <input type="checkbox"/> 2. .... <input type="checkbox"/> 3. ....						
<b>ABSTRACTION</b>	To what category these objects belong to ? ( e.g. orange - banana = fruit ) <input type="checkbox"/> train - boat <input type="checkbox"/> north - south <input type="checkbox"/> drum - flute						( /3)



# MoCA-B

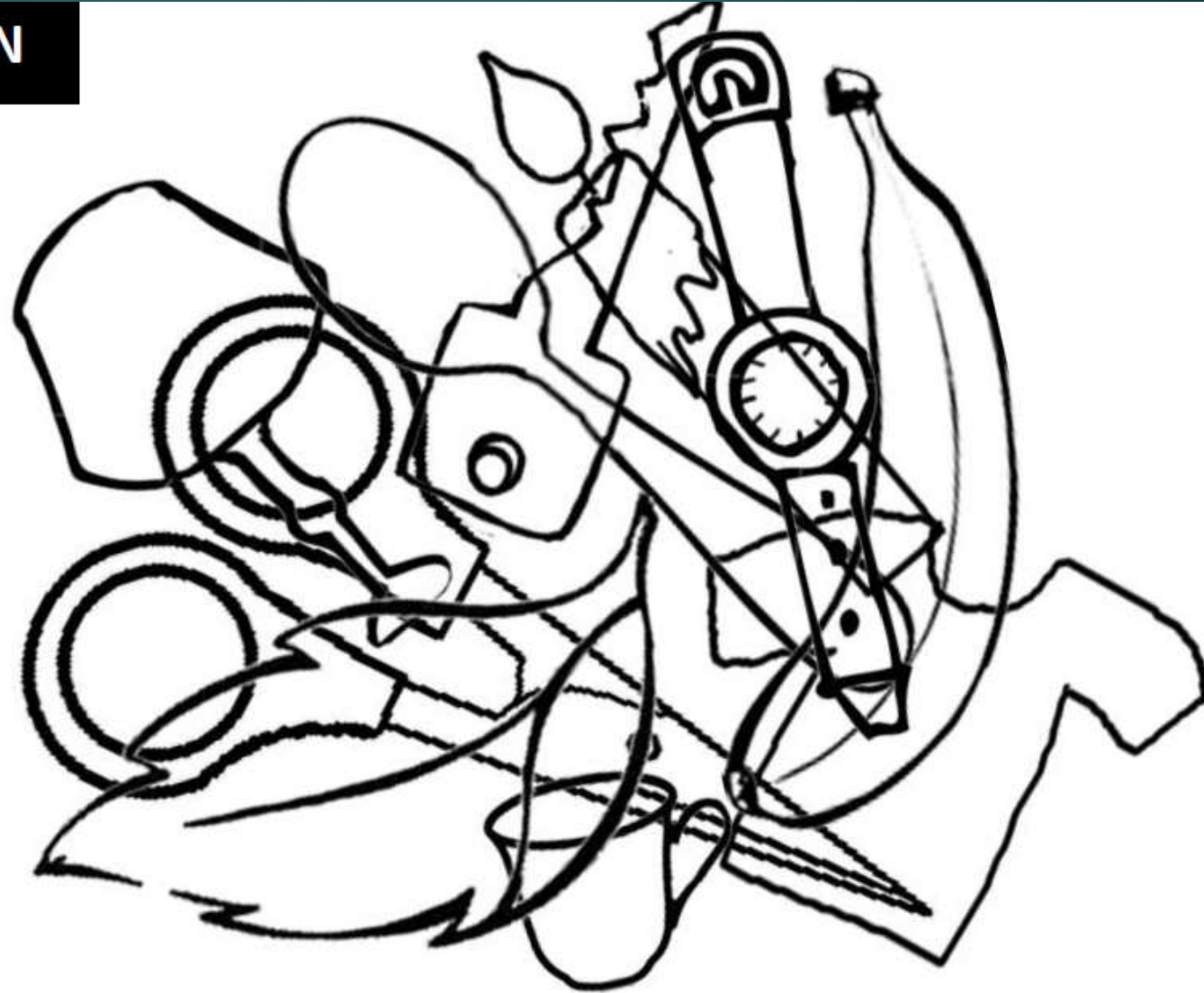
<b>DELAYED RECALL</b>  Points are awarded for recall with No cue (1point for each item)	Recall with No cue	ROSE [ ]	CHAIR [ ]	HAND [ ]	BLUE [ ]	SPOON [ ]	( /5)										
	Recall with category cue	[ ]	[ ]	[ ]	[ ]	[ ]											
	Recall with multiple choice cue	[ ]	[ ]	[ ]	[ ]	[ ]											
<b>VISUOPERCEPTION</b>  Identify drawings. No more than 60 seconds. See complementary sheet.	<table border="1"> <tr> <td>scissors</td> <td>T-shirt</td> <td>banana</td> <td>lamp</td> <td>candle</td> </tr> <tr> <td>watch</td> <td>cup</td> <td>leaf</td> <td>key</td> <td>spoon</td> </tr> </table>					scissors	T-shirt	banana	lamp	candle	watch	cup	leaf	key	spoon	3 points if N = 9-10 2 points if N = 6-8 1 point if N = 4-5 0 point if N = 0-3    N __	( /3)
	scissors	T-shirt	banana	lamp	candle												
watch	cup	leaf	key	spoon													
<b>NAMING</b>	Identify animals. See complementary sheet.    [ ] zebra    [ ] peacock    [ ] tiger    [ ] butterfly						( /4)										
<b>ATTENTION</b>	Name the numbers in circles. See complementary sheet. <b>1 5 8 3 9 2 0 3 9 4 0 2 1 6 8 7 4 6 7 5</b> ERROR __N No point if 2 errors or more						( /1)										
	Name the numbers in circles & squares:    3 <b>8</b> 5 1 <b>3</b> 0 <b>2</b> <b>9</b> 2 <b>0</b> <b>4</b> <b>9</b> 7 <b>8</b> 6 <b>1</b> <b>5</b> 7 6 4 See complementary sheet. <b>1 5 8 3 9 2 0 3 9 4 0 2 1 6 8 7 4 6 7 5</b> ERROR __N 2 points if 2 errors or less 1 point if 3 errors 0 point if 4 errors or more						( /2)  END TIME _____										
Adapted by : Parunyou Julayanont MD Copyright : Z. Nasreddine MD Final Version June 04, 2014							<b>TOTAL SCORE ( /30)</b> Add 1 point if education < 4 year AND add 1 point if illiterate <b>TOTAL TIME</b> _____ min _____ sec										

# MoCA-B: Cued Memory

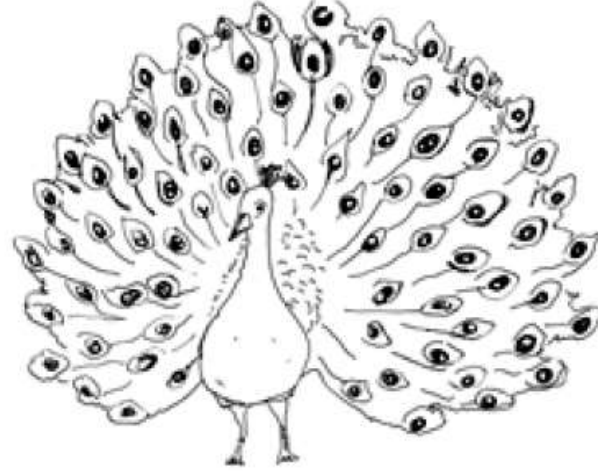
ROSE:	<u>category cue:</u> type of flower	<u>multiple choice:</u> rose, daisy, tulip
CHAIR:	<u>category cue:</u> type of furniture	<u>multiple choice:</u> table, chair, bed
HAND:	<u>category cue:</u> body part	<u>multiple choice:</u> foot, hand, knee
BLUE:	<u>category cue:</u> colour	<u>multiple choice:</u> blue, brown, red
SPOON:	<u>category cue:</u> kitchen instrument	<u>multiple choice:</u> fork, knife, spoon



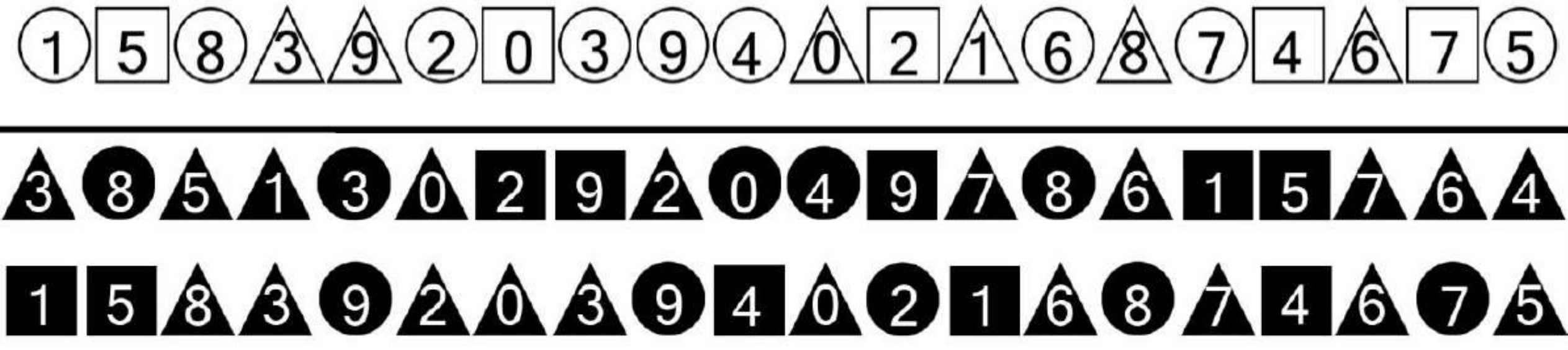
## VISUOPERCEPTION



# MoCA-B: Naming



# MoCA-B: Attention



# MoCA and MMSE: Sensitivity & Specificity

MOCA AND MMSE

Cut-off	$\geq 26$	$< 26$	$< 26$
Group (n)	Normal Controls (90)	Mild Cognitive Impairment (94)	Alzheimer disease (93)
MoCA	87	90	100
MMSE	100	18	78



# Norms

	Normal Controls (NC)	Mild Cognitive Impairment (MCI)	Alzheimer's Disease (AD)
Number of subjects	90	94	93
MoCA average score	27.4	22.1	16.2
MoCA standard deviation	2.2	3.1	4.8
MoCA score range	25.2 - 29.6	19.0 - 25.2	21.0 - 11.4
<b>Suggested cut-off score</b>	<b><math>\geq 26</math></b>	<b><math>&lt; 26</math></b>	<b><math>&lt; 26</math> *<math>\psi</math></b>

\* Nasreddine et al. J Am Geriatr Soc 53:695-699, 2005.





## MoCA Items Average scores

	NC		MCI		AD	
	AVG	SD	AVG	SD	AVG	SD
Trails	0.87	0.34	0.56	0.50	0.27	0.45
Cube	0.71	0.46	0.46	0.50	0.25	0.43
Clock	2.65	0.65	2.16	0.82	1.56	0.98
Naming	2.88	0.36	2.64	0.58	2.19	0.82
Memory	3.73	1.27	1.17	1.47	0.52	1.03
Digit span	1.82	0.44	1.83	0.43	1.49	0.62
Letter A	0.97	0.18	0.93	0.26	0.67	0.47
Serial 7	2.89	0.41	2.65	0.65	1.82	1.12
Sentence rep	1.83	0.37	1.49	0.71	1.37	0.80
Fluency F	0.87	0.34	0.71	0.45	0.32	0.47
Abstraction	1.83	0.43	1.43	0.68	0.99	0.80
Orientation	5.99	0.11	5.52	0.84	3.92	1.73
Total *	27.37	2.20	22.12	3.11	16.16	4.81

SD=Standard Deviation. AVG=Average

\*Total is adjusted for education

# MMSE vs MoCA



# MMSE and MOCA

- Using a cutoff score of 26:
  - MMSE: sensitivity of 18% to detect MCI
  - MoCA: sensitivity of 90% to detect MCI
- For the mild AD patients, the sensitivity was 78% and 100% respectively.
- Specificity excellent for both screening tests (100% and 87% respectively).



# How well do they work

## Relationship with functional severity as measured by the Clinical Dementia Rating Scale (CDR)

	0	.5	1
MMSE (20k)	28.8	26.2	20.9
MOCA (800)	26.5	22.3	15.7

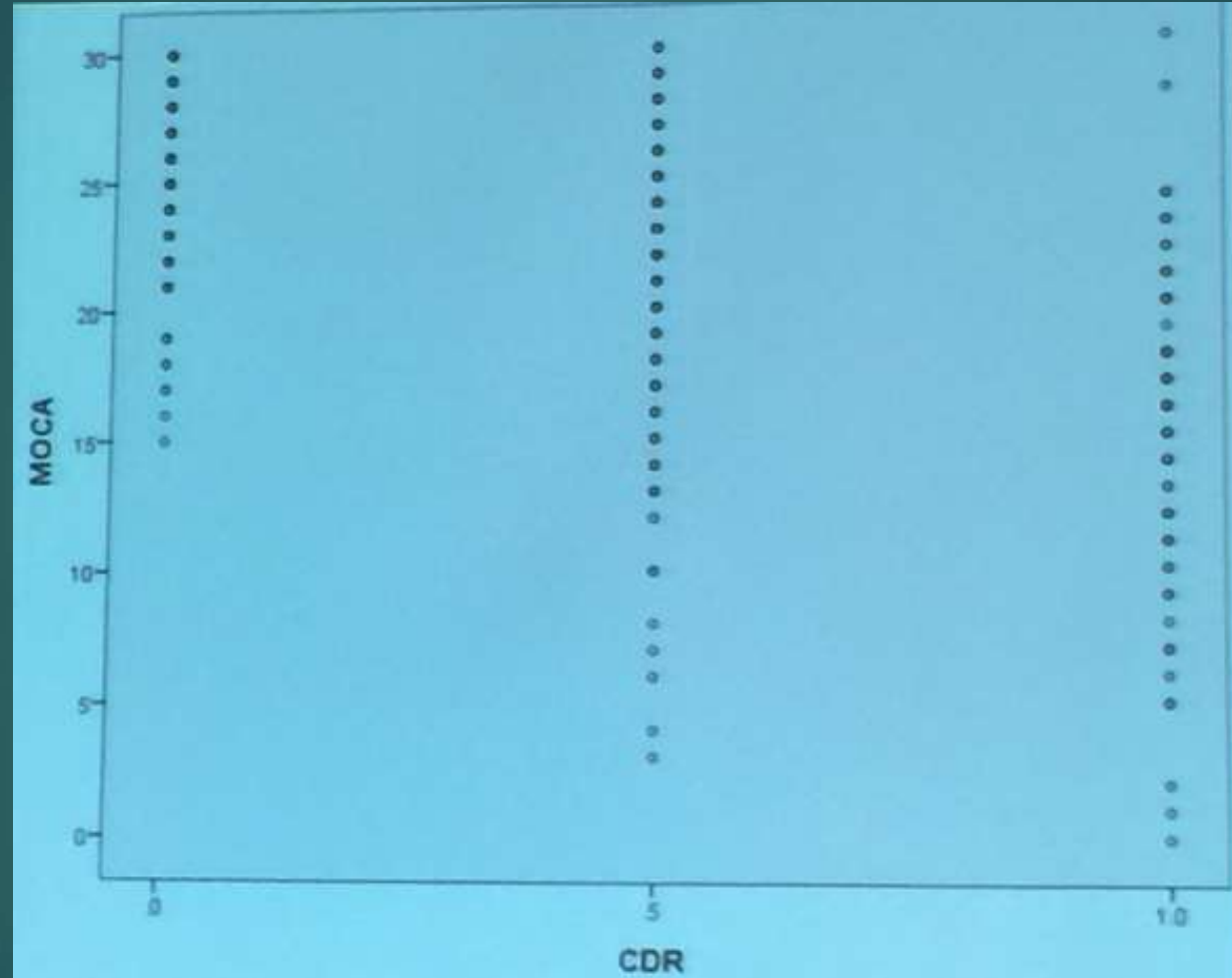
## CDR

Composite Rating	Symptoms
0	none
0.5	very mild
1	mild
2	moderate
3	severe

Both good for differential of Moderate- Severe dementia

# Distribution of MoCA scores

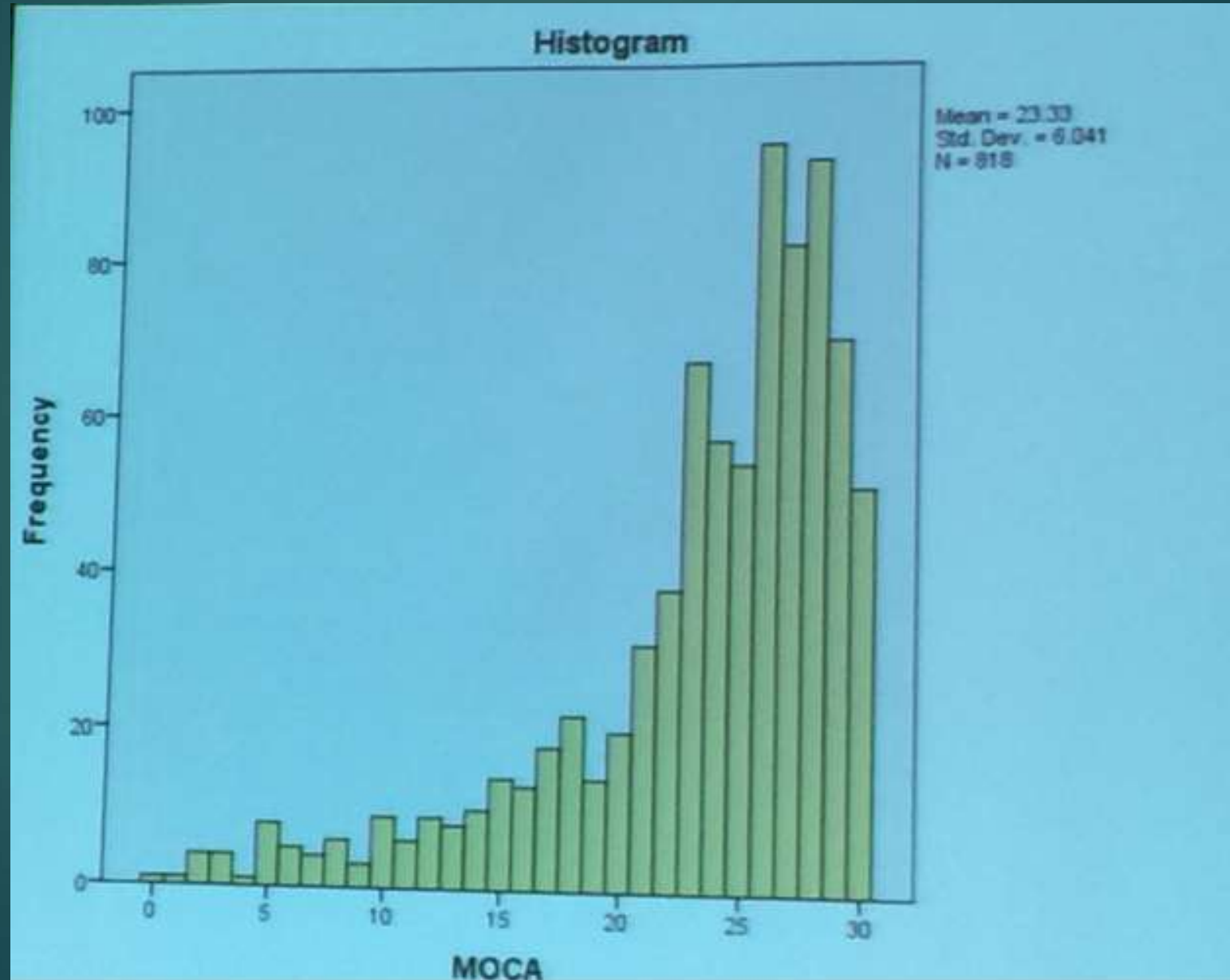
Note overlap  
from 25-15



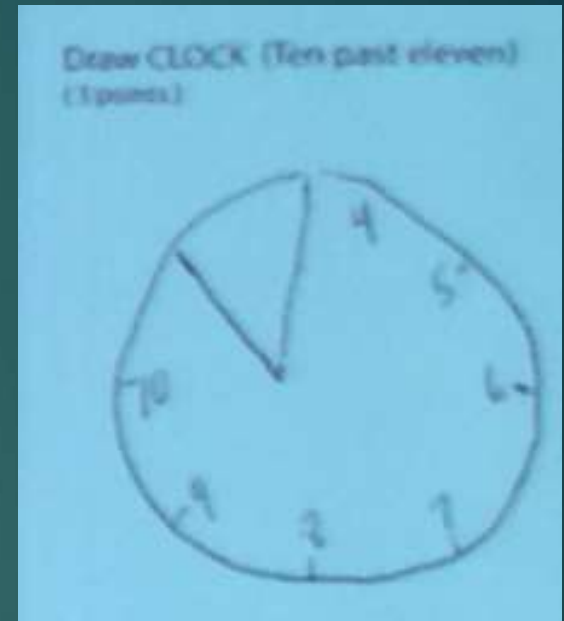
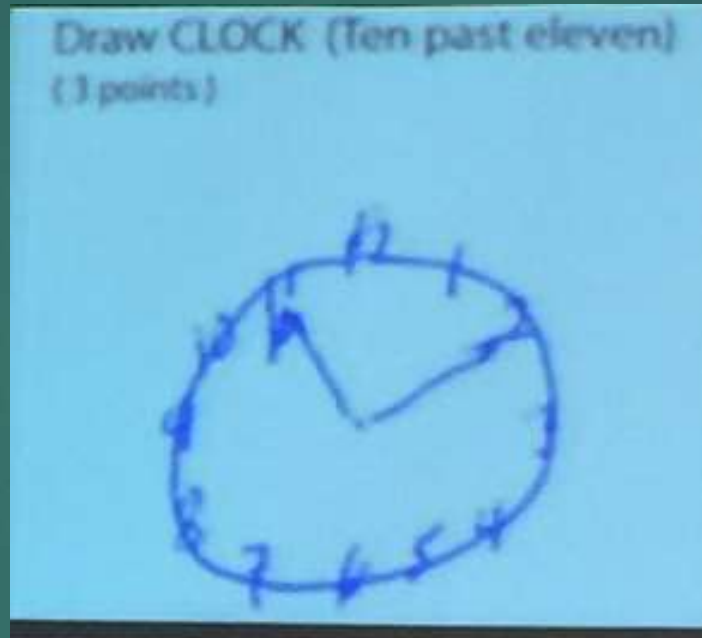
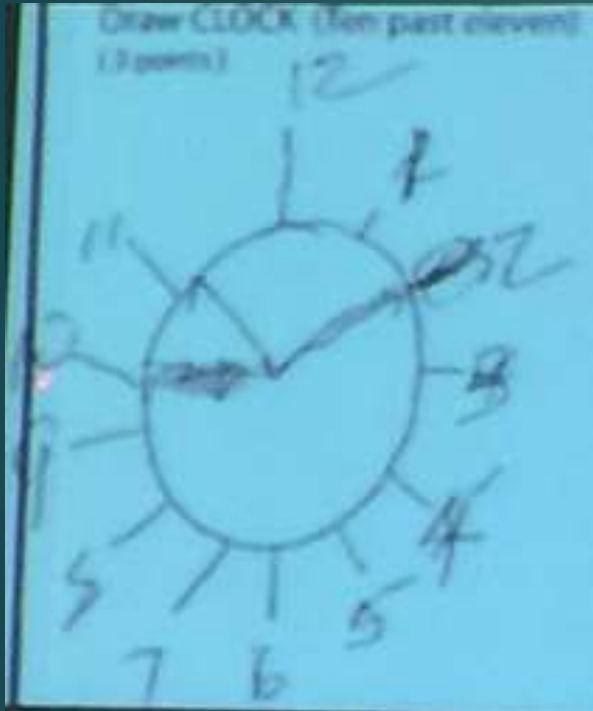
Lesson about  
cutoff scores  
in isolation

Score of 25 means what?

# MoCA score distribution: n = 818



# Reliability?



# MMSE vs MoCA

- ▶ MMSE and MoCA correlate .83

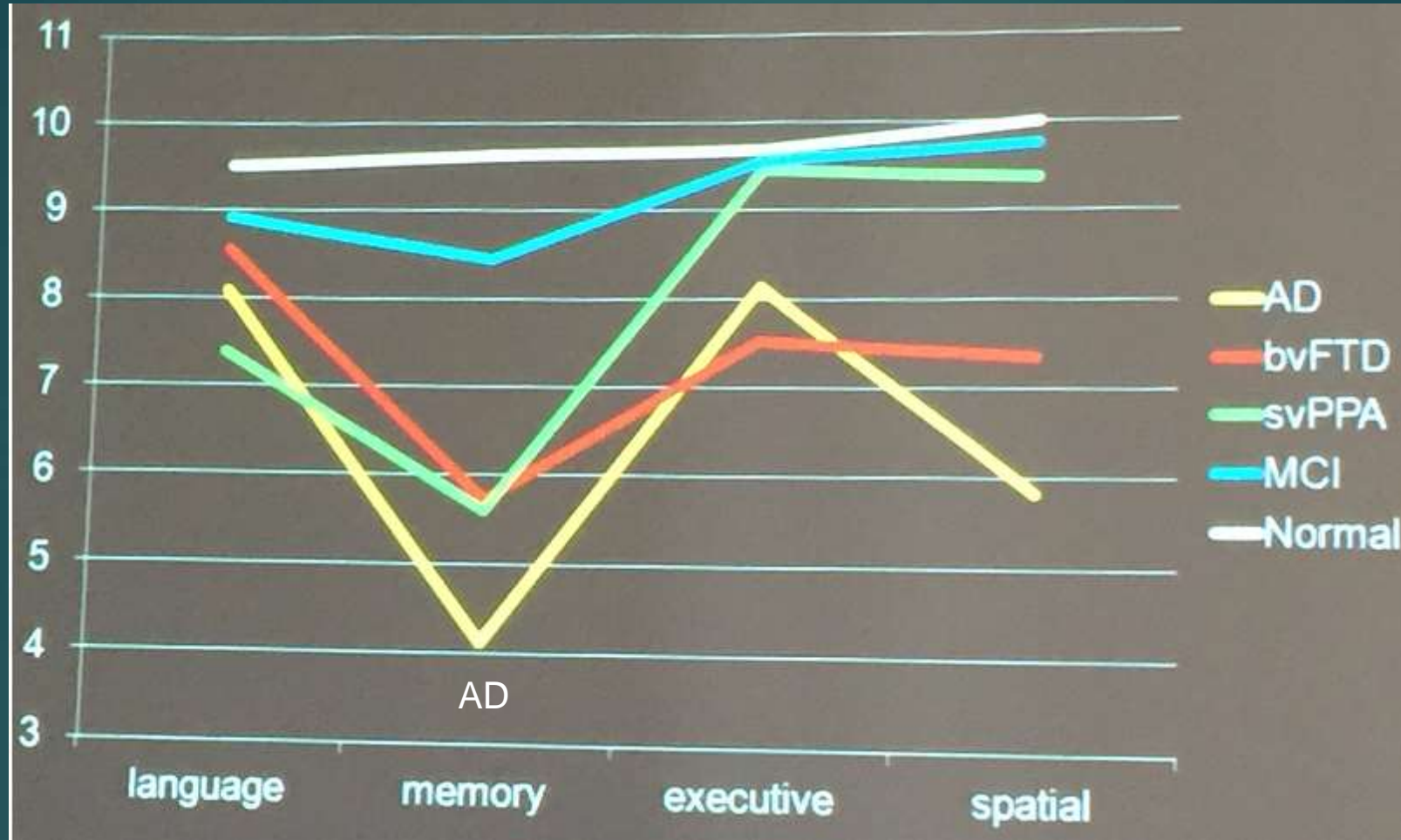
Correlations with other tests	CDR sum of boxes	FAQ	Trails	Complex Figure copy	Delayed recall
MoCA	-.67	-.60	.63	.52	.59
MMSE	-.63	-.51	.60	.54	.53

Group data does well, but with  $n=1$ ?  
Discrimination poorer, more disagreements

# Predicting CDR

- ▶ Predicting normal (cdr=0) from MCI (cdr=.5)
- ▶ In discriminant function and regression analyses, MoCA contributes more than MMSE.
- ▶ MoCA adds 4.6% of the variance over MMSE
- ▶ MMSE adds 0.7% more variance over MoCA
- ▶ Predicting MCI (cdr=.5) from demented (cdr=1) yields a similar pattern

# MMSE Scores by diagnosis



“World”

Clear differential between normal & AD



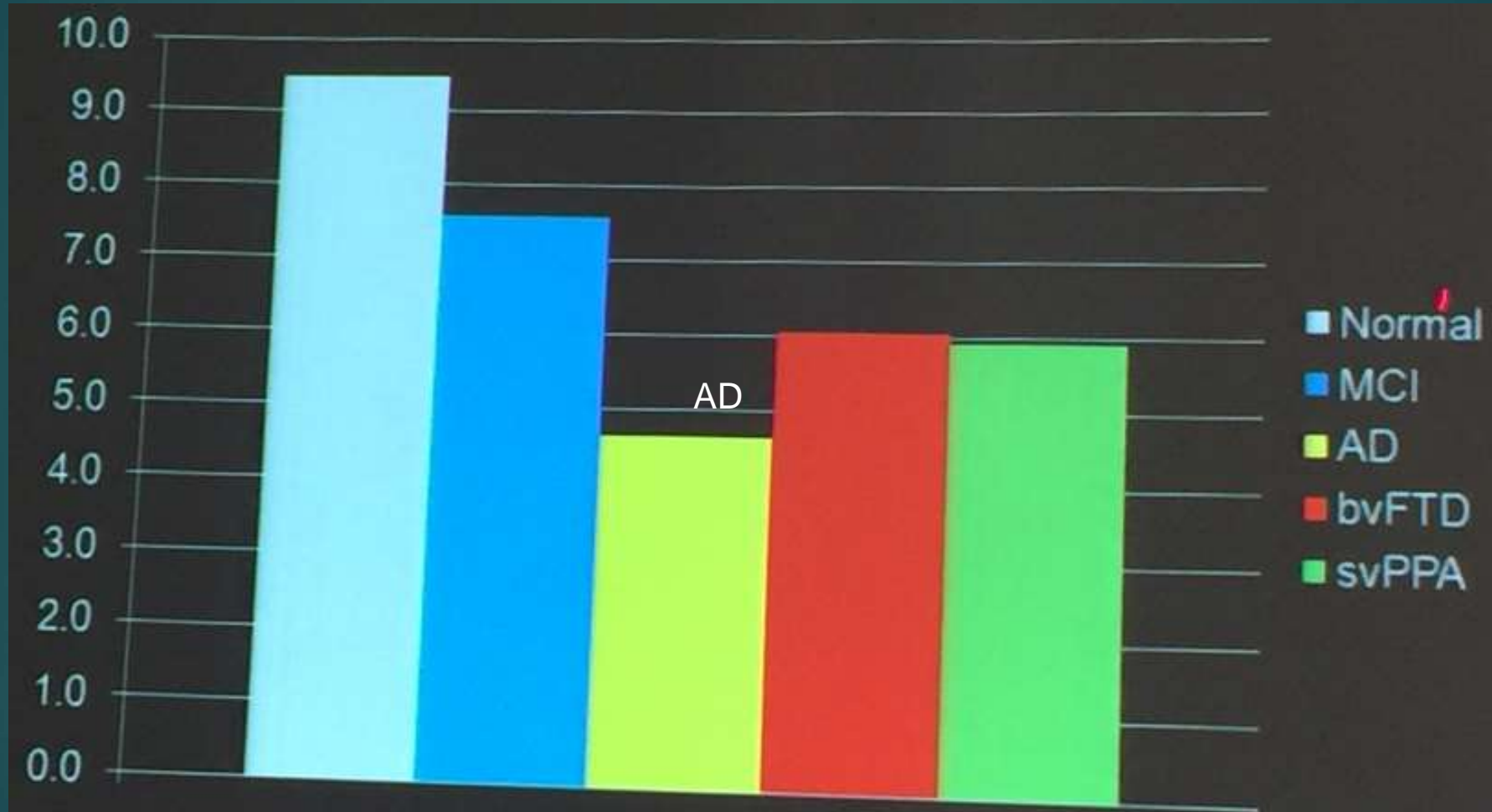
## MMSE by diagnosis: AD vs bvFTD vs svPPA

	AD	bvFTD	svPPA
n	329	91	65
Age	69.1	61.8	66.1
Gender (% female)	54	30	37
MMSE	22.2	22.6	22.6

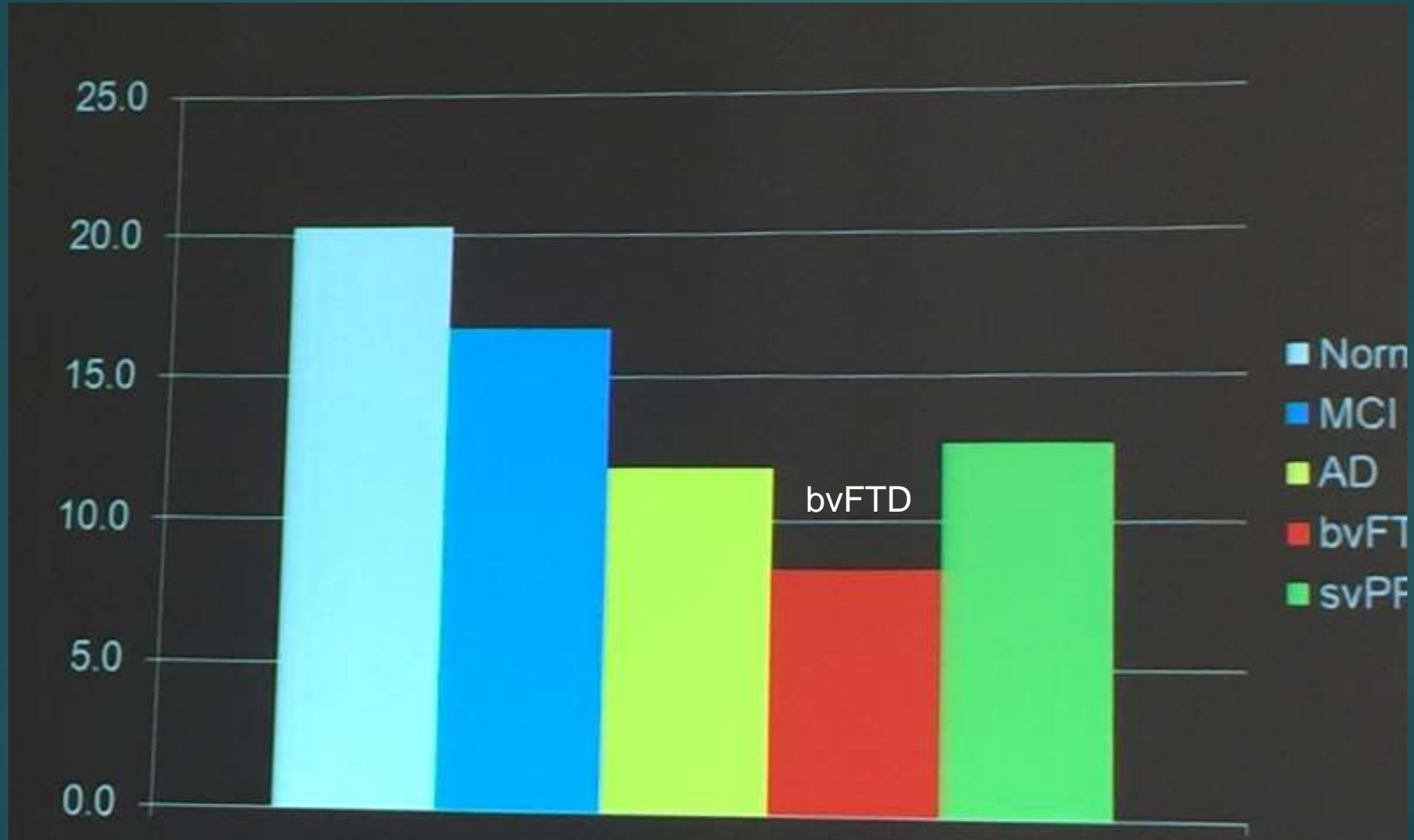
MMSE scores identical; no discrimination between AD & FTD



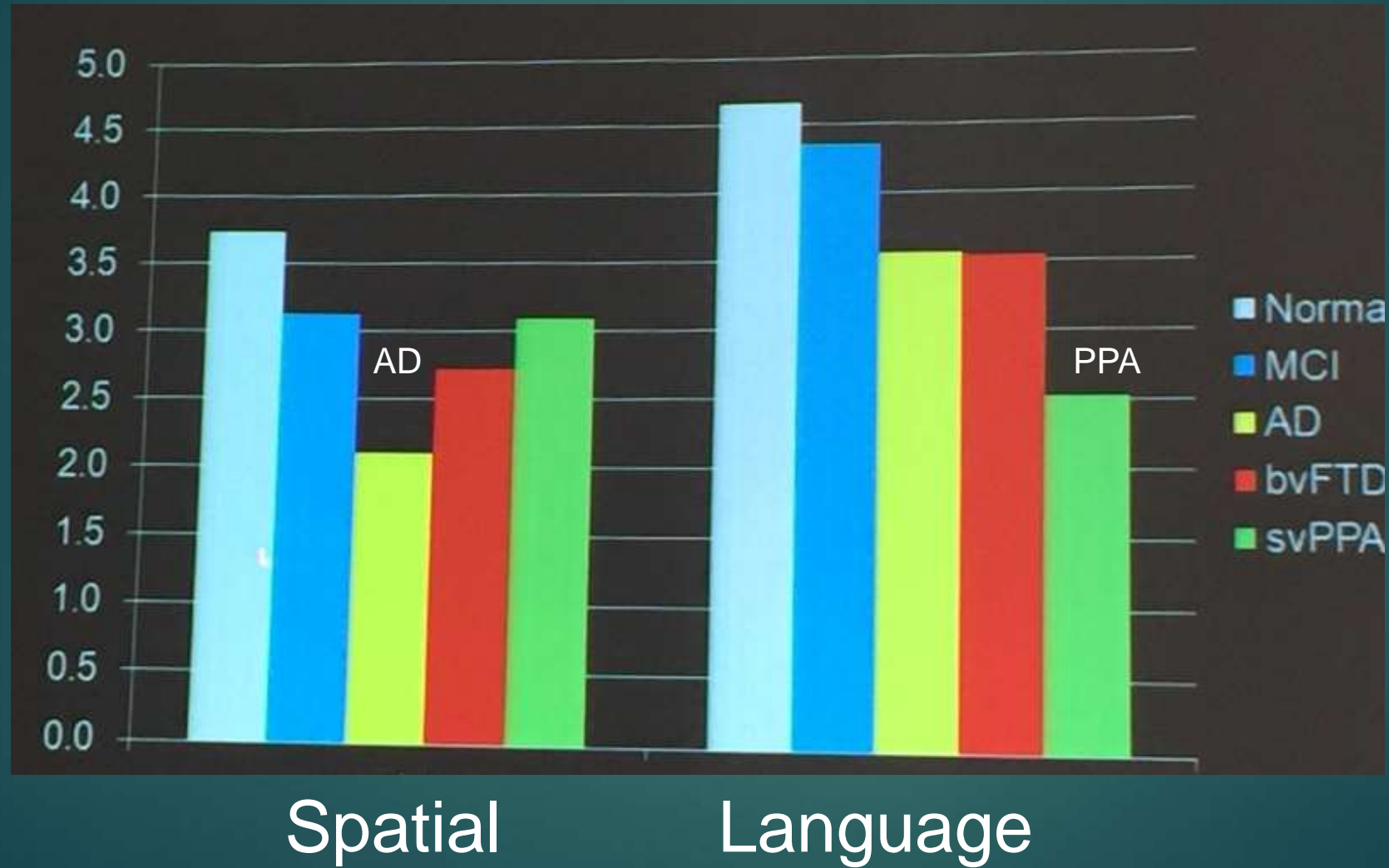
# MoCA: Memory



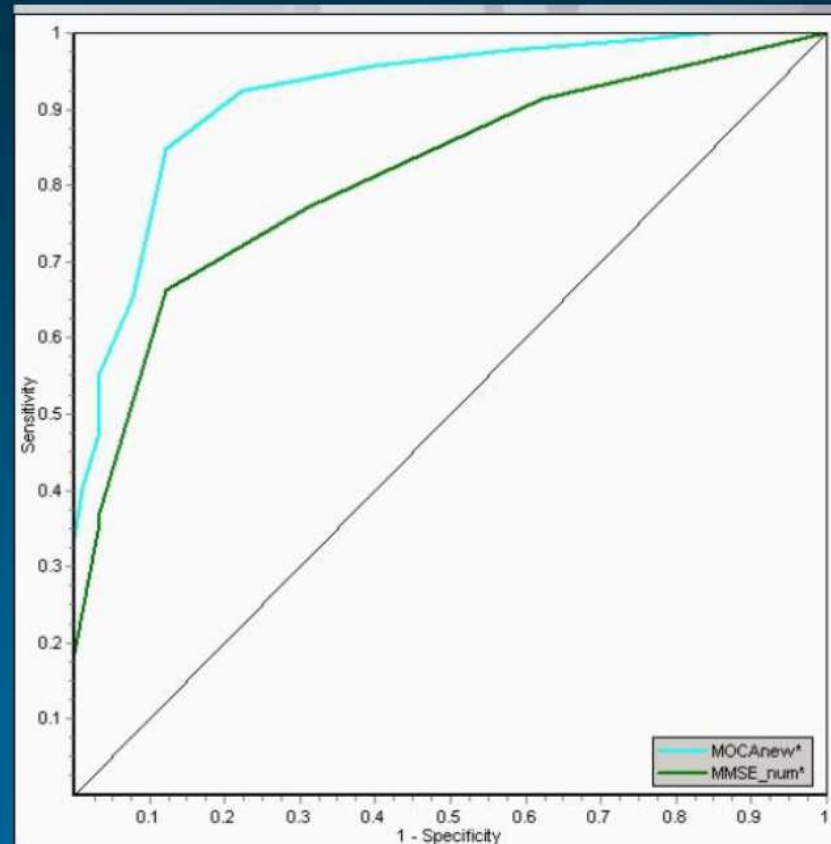
# MoCA: Executive



# MoCA by diagnosis: Spatial & Language



## Moca superior to MMSE for MCI detection



**ROC curves showing MoCA superiority to MMSE in distinguishing Normal Controls from MCI.**

«The areas under ROC curves were compared with the method of Delong, Delong and Clarke-Pearson (1988) for correlated curves. The difference was statistically significant  $\chi^2(1, N=182)=11.66$ ,  $p<0.001$ .»

2<sup>nd</sup>  
Third

MoCA has better mild NCD determination

# MMSE vs MoCA of mild NCD in ADNI

- ▶ MoCA was better than the MMSE at teasing out subtle differences in cognitive performance among mildly impaired individuals
- ▶ **N= 555**: patients with varying degrees of cognitive impairment participating in ADNI, ranging from mild to full-blown dementia, those with MMSE scores near the upper end of its 30-point range showed a much **broader spread of MoCA scores**, suggesting that the latter may be more useful for detecting changes over relatively short periods of time
- ▶ In **422 patients** classified as mildly impaired, MMSE scores started at 21, whereas **MoCA scores ranged from 13 to 30**; A similar spread of MoCA scores, ranging from 17 to 30, was seen in **283 individuals** identified as healthy controls in ADNI
- ▶ These data suggest that the **MoCA, using a cutoff of  $\geq 17$ , may be more useful than the MMSE to detect a range of mild cognitive impairment cases**
- ▶ MoCA can help classifying patients in the borderline area between mild impairment and dementia. Another use for which the MoCA may be better suited than the MMSE is in **detecting the earliest stages of impairment**.

# MMSE vs MoCA in ADNI

	MMSE	MoCA
AD dementia	21 (SD 4.4)	16 (SD 5)
Mild cognitive impairment	28 (SD 1.9)	24 (SD 3)
Healthy controls	29 (SD 1.2)	26 ((SD2.7)

The MoCA is less useful than the MMSE in patients with overt dementia.

Ten of the 122 dementia patients had MoCA scores above cutoff of 17, but MMSE scores less than 22. MMSE scores below 22 would generally be interpreted as at least moderate impairment.

# MMSE & MoCA overall: Use the MoCA

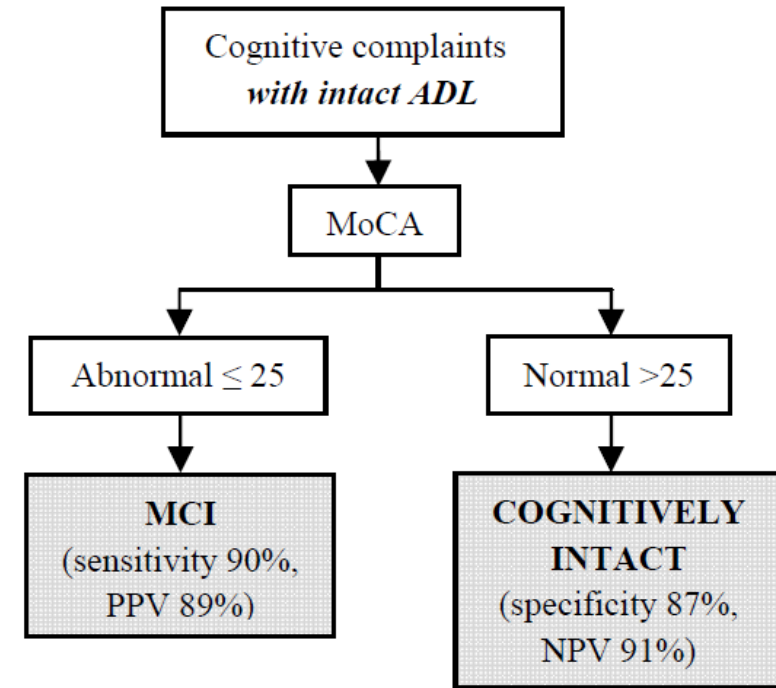
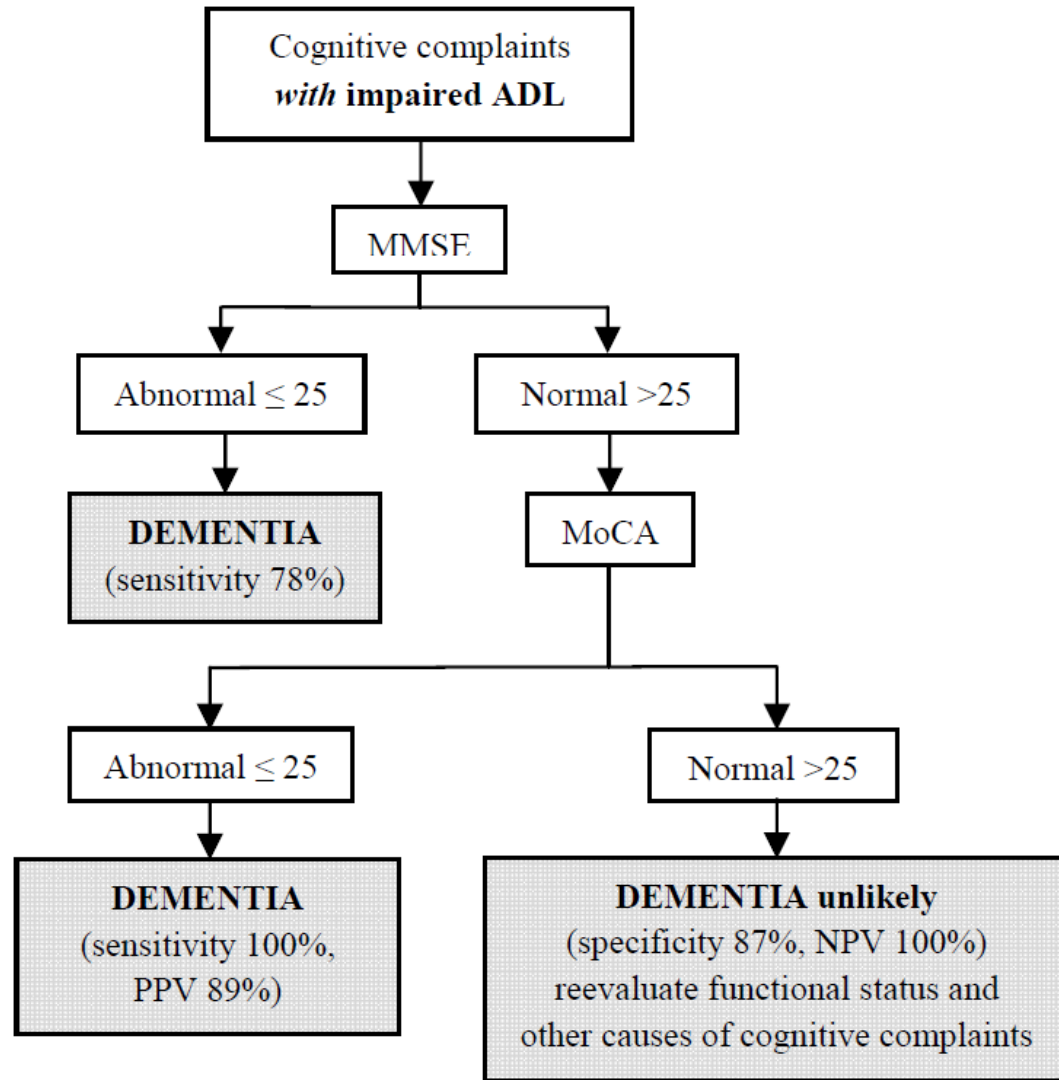
	MMSE	MoCA
Copyright		√√
Sensitivity to mild decline		√√
Strength	Memory	Executive Functioning
Breadth		√√
Empirical foundation	√√	

# Severity Level

- ▶ The following ranges may be used to grade severity:
  - ▶ 27-30 = normal
  - ▶ 18-26 = mild cognitive impairment,
  - ▶ 10-17= moderate cognitive impairment
  - ▶ less than 10= severe cognitive impairment.
- ▶ However, research for these severity ranges has not been established yet.
- ▶ The cut-off score of 18 is usually considered to separate MCI from AD but there is overlap in the scores since, by definition, AD is determined by the presence of cognitive impairment in addition to loss of autonomy.
- ▶ The average MoCA score for MCI is 22 (range 19-15) and the average MoCA score for Mild AD (11-21).



# Strategy for use of MoCA



**Figure 2:** Practical approach to evaluate patients who present with cognitive complaints, adapted from Nasreddine et al. (2005) (1). ADL= Activities of Daily Living. NPV= Negative Predictive Value. PPV=Positive Predictive Value. MCI=Mild Cognitive Impairment

# Add NAB Judgment Scale if fail Executive items on MoCA

2. Judgment		
Recording	Scoring	Discontinuation
Record responses verbatim. If examinee is queried to say more, place a Q in brackets (Q) at that point in examinee's response.		
See criteria on page 7.		
Administer entire task.		
Administration Instructions		
Say, I am going to ask you a few questions. I want you to answer each question as fully as possible. Questions may be repeated up to three times at examinee's request. If response is very brief or includes only a general concept (e.g., "For safety," "For health," or "It's dangerous") with no specific reference to the question, query by saying, Tell me more.		
Question	Response	
1. Why should you blow out candles before going to bed?		
2. Why should you not leave a young child alone at home?		
3. Why should you replace the batteries in a smoke detector regularly?		
4. What should you do if you take too much of a prescription medication?		
5. Why should you not unplug electrical appliances while your hands are wet?		
6. Why are certain foods marked with an expiration date?		
7. Why is it important for people to brush their teeth?		
8. Why is it important to tell your doctor all the medications that you are taking?		
9. Why should you wash your hands before eating?		
10. What does it mean when your doctor says that there is a 25% chance of having serious side effects from a treatment?		

Go to page 8

1. Why should you blow out candles before going to bed?

10 – What does it mean when your doctor says that there is a 25% chance of having serious side effects from a treatment?

# Poor MoCA Abstraction (TMT, Clock, Similarities)

- ▶ Consider executive processing deficit.
- ▶ Verbal abstraction can be normal, while nonverbal is impaired (WCST). Latter is more important.

# MoCA Patterns

- ▶ Attention and Language most commonly normal
- ▶ If language impaired, aphasic?
- ▶ If attention impaired, delirium?
- ▶ Poor executive processing and memory are the most serious deficits.

# MoCA Patterns 2

- ▶ Beside MoCA score, are there functional deficits in ability to care for themselves? Check with collaterals.
- ▶ bill paying, memory deficits, medication noncompliance, etc.
- ▶ latter less common in MCI, more common in Major NCD of Alzheimer's type.

## MAC bedside

- 45 minutes
- Evolved to improve differential diagnosis
- Episodic memory (verbal & visual), with capacity to measure decay over time
  - Predicts CDR better than MoCA or MMSE
- Semantic, phonological, and syntactic elements of language
- Broad array of executive & spatial abilities
- Behavior and emotion processing
- 96% of AD, 86% of bvFTD, & 81% of svPPA correctly classified (Kramer et al., 2003)

# Choosing sensitive cognitive domains

- ▶ NACC database: 8678 normals vs 8646 MCI (CDR = .5)
- ▶ Goal: determine which measures of memory, language, executive function, and speed/working memory best separated those two groups?

Measure	Variance explained
Memory	26%
Processing speed/Executive function	3%
Fluency	1%
Set-shifting, working memory, naming	<1%

# UCSF- Tablet-based Cognitive Assessment Tool



- ▶ **TabCAT: Tablet-based Cognitive Assessment Tool - administered on an iPad or other tablet.**
- ▶ TabCAT is pure HTML5, so it can, in theory, run in any modern browser. TabCAT is designed with [HIPAA](#) compliance in mind. By default, it does not store any [PHI](#) at all, though it can be configured to store limited dataset PHI (e.g. dates) or full PHI (which can be stripped)
- ▶ UCSF-Quest Screen to be programmed in TabCAT
  - ▶ A programming framework developed for tablet-based cognitive tests
  - ▶ Cross platform
  - ▶ Automated and secure scoring, upload, and interpretation
  - ▶ Open source, freely available to other researchers and clinicians

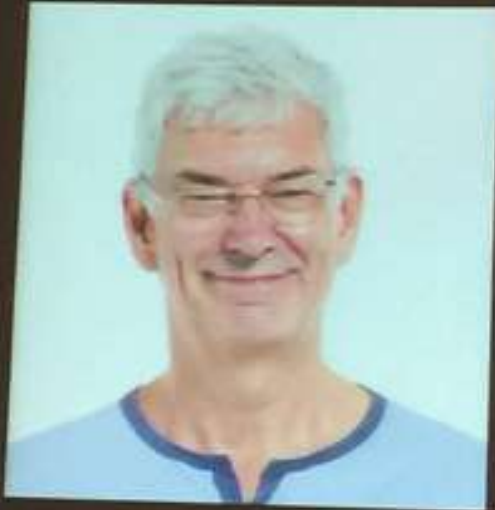


# TabCAT: Memory example

## Memory Test - Example

You will see pictures of people. Please remember each person's favorite **food** and favorite **animal**.

For example, remember his favorite food is:



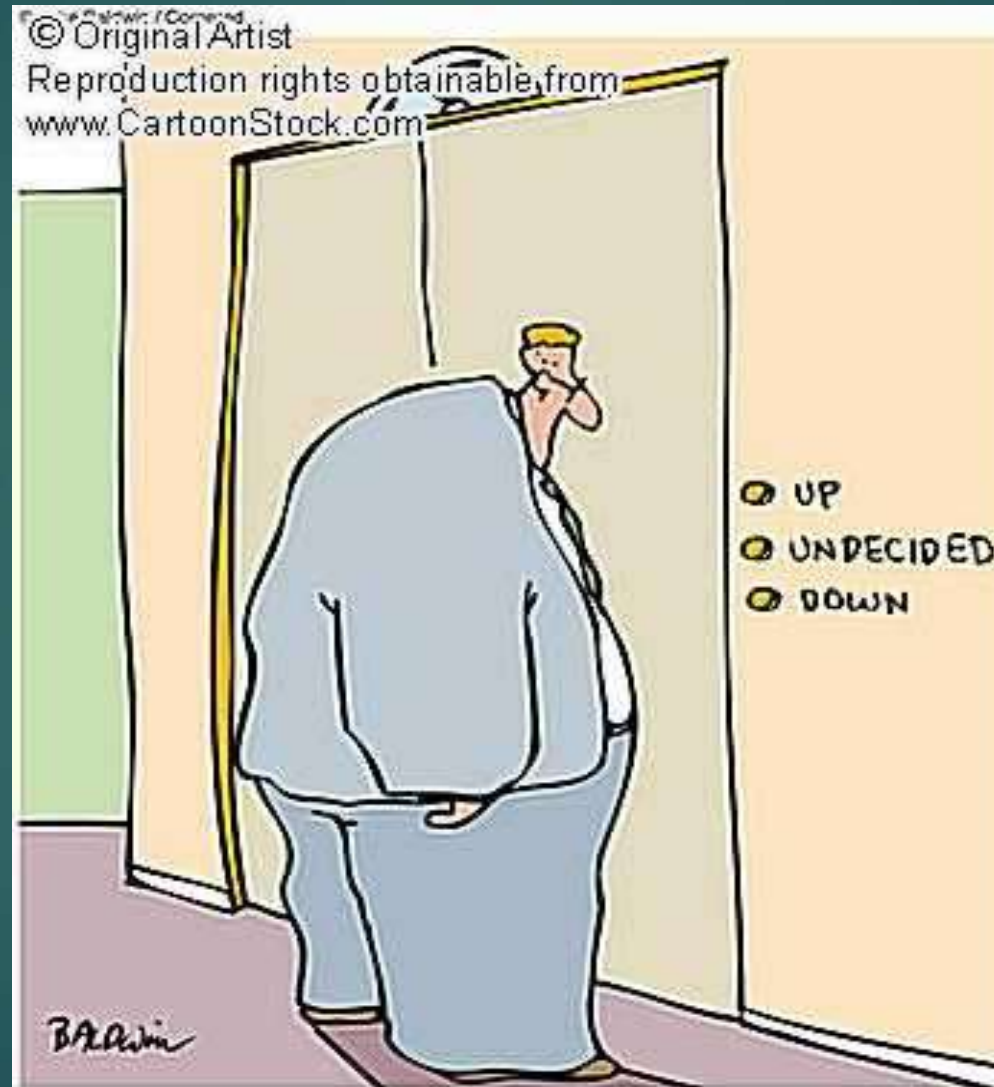
apple

Next

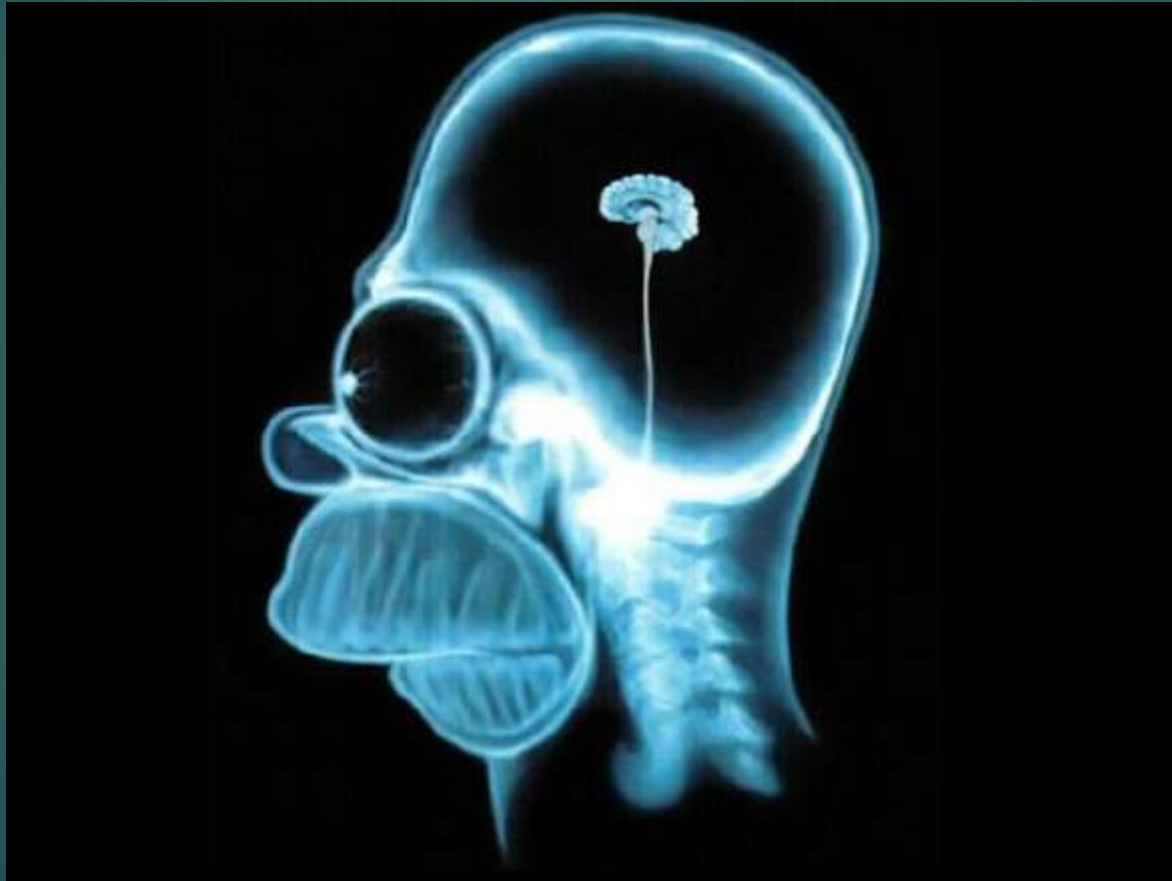
# Cautions in all NB testing

- ▶ Level of effort
- ▶ Context: Hospital, Clinic, ER
- ▶ Presence of Psychiatric Disorder
- ▶ Amount of Sleep, medications
- ▶ Did they come in voluntarily or were they brought in with AMS
- ▶ Executive ↓ more important than Memory ↓
- ▶ Have hearing aide and glasses

# Decision Making



Does this individual have the capacity to make decisions?



# What is “Decision Making Capacity”?

## California Health Care Decisions Law:

“...a person’s ability to understand the nature and consequences of a decision and to make and communicate a decision, and includes in the case of proposed health care, the ability to understand its significant benefits, risks and alternatives.”

California Health Care Decisions Law  
AB 1278, 2002 revisions

# Capacity vs Competency

- ▶ **Competence**: a legal term, in part, based upon capacity, and is determined by someone in a court of law.
- ▶ It is the ability to make decisions by yourself.
  - ▶ The revocation of this ability can deprive an individual of rights and autonomy (self determination). Either present or absent
- ▶ **Capacity**: clinical status determined by a health care professional.
  - ▶ It is a clinical term regarding the integrity of mental functions.
  - ▶ Probate Code 810: Assumed to have capacity
  - ▶ Present in more or less ability & can vary over time
  - ▶ Tangible evidence is key - this can be clinical observations, a mental status exam, and/or formal test results.
  - ▶ Documentation of the reasoning behind the compromised capacity is critical.

# Capacity $\neq$ Competency

- ▶ Clinical judgment
  - ▶ Can be assessed by physician or psychologist
  - ▶ Usually question-specific, time-specific, short-term
  - ▶ Surrogate decision-makers, if necessary
- ▶ Legal concept
  - ▶ Can only be adjudicated by a court
  - ▶ Usually more global, long-term
  - ▶ Judge designates a decision-maker

# Capacity is the Presumption

- ▶ A person is assumed to have capacity unless proven otherwise. In all states, the law starts with the presumption of capacity.
- ▶ Generally, a **competent adult patient has the right to refuse treatment**. Even if it means that he/she may die.
- ▶ The burden of proof is on the party bringing the petition to establish sufficient diminished capacity to justify the appointment of a guardian or conservator.



# Capacity

- ▶ A person has capacity in a variety of areas:
  - ▶ Estate (testamentary (will), contractual (trust) – low threshold
  - ▶ Person
  - ▶ Marry – low threshold
- ▶ Need evidence of a deficit; a diagnosis of a disorder is insufficient to prove lack of capacity
- ▶ Need description of deficit and how it connects to incapacity to make decisions
- ▶ Deficit must impair one or more of 4 basic abilities: understanding, appreciation, ability to reason, ability to communicate

# Decision Making Capacity: 4 criteria

- ▶ 1. Ability to understand information relevant to decision
- ▶ 2. Appreciation: Ability to understand how information applies to their situation (vs. overvalued ideas, delusions)
- ▶ 3. Ability to reason: Ability to weigh information in a rationally defensible way.

# Decision Making Capacity 2

- ▶ 4. Ability to communicate decision
- ▶ People are allowed to make decisions that are contrary to their physician's best advice, as long as all 4 of these criteria are met.
- ▶ Informed Consent requires Decision Making Capacity; without DMC, there is no capacity for informed consent

# 1. Understanding Relevant Information

- ▶ Patients must be fully informed of options before capacity can be determined
- ▶ The doctor should provide information that a “reasonable person” would want to know in order to decide whether to accept or refuse the proposed treatment.
- ▶ Pts must understand what they are being asked and that they are being asked

## Understanding the relevant information

- ▶ Demonstrate a factual understanding of the medical issues at hand, including the risks and benefits of the treatment and any reasonable alternatives.
- ▶ “Tell me in your own words what your understanding is of
  - ▶ the nature of your condition,
  - ▶ the recommended treatments,
  - ▶ the benefits and risk of those treatments?
  - ▶ How likely are the benefits and risks to occur?”

## Understanding the relevant information

- ▶ Limits: memory impairment, as well as impaired conceptualization, and comprehension, low intelligence, attentional problems
- ▶ It is acceptable for physicians to exercise therapeutic privilege and withhold certain information at their discretion if they deem that the information would pose a serious psychological threat by cognitively overwhelming the patient or causing panic.

## 2. Appreciating Situation & Consequences

- ▶ Show comprehension of the situation as it applies to them and the consequences of their decisions. This implies that the patient has psychological insight into his illness and need for treatment.
- ▶ Does patient understand what the information means for them?
- ▶ Limits:
  - ▶ Denial or lack of understanding on basis of cognitive/affective impairment
  - ▶ Delusion



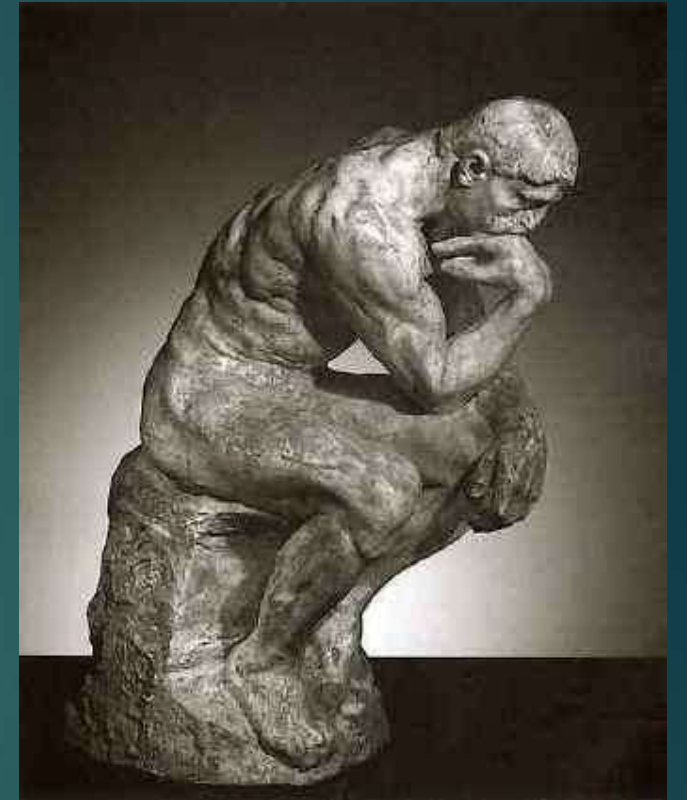
# Does the patient appreciate the situation and its consequences

- ▶ What do you really believe is wrong with your health?
- ▶ Do you believe that you need some kind of treatment?
- ▶ What is the treatment likely to do for you?
- ▶ What do you believe will happen if you are not treated?
- ▶ Why do you think your doctor recommended this treatment?
- ▶ Do you believe the doctor is trying to harm you?
  
- ▶ Test: “Do the risks your doctor told you apply to you?”
  
- ▶ Note: If a patient fails to acknowledge his illness he cannot make a valid decision about treatment.
  
- ▶ i.e. Dr. Weber gets a free house; Depressive Psychosis patient

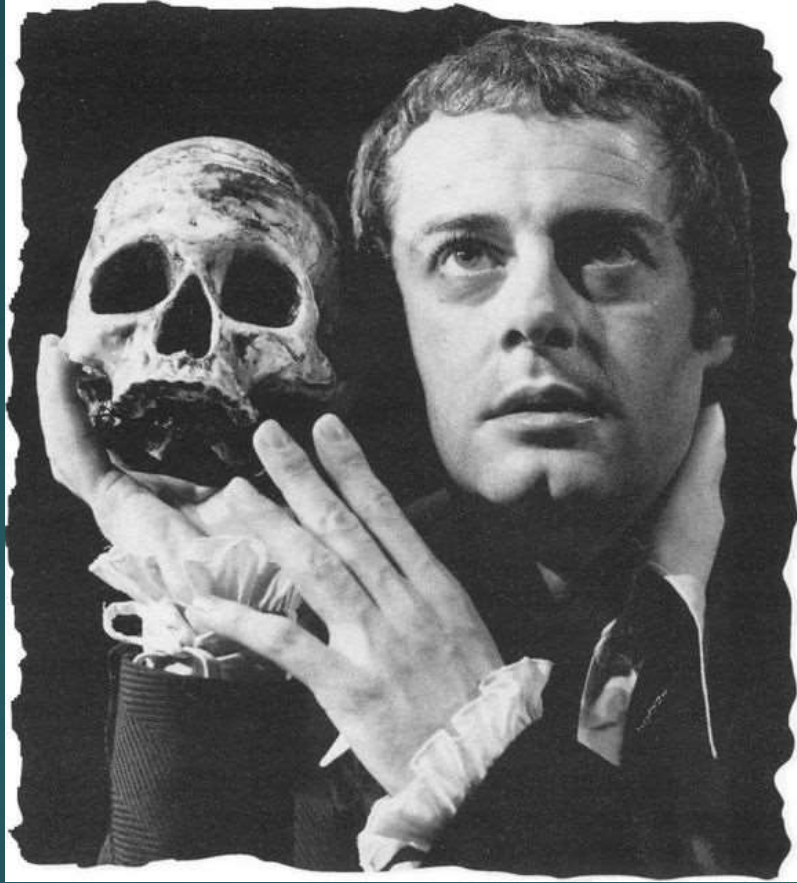


### 3. Manipulating Information Rationally

- ▶ Display a rational manipulation of the information presented with a coherent and logical thought process in analyzing the various courses of action
- ▶ Their process of thinking (process by which the decision is reached), not decision itself, is important
- ▶ Requires executive abilities, such as attention, mental flexibility, and the ability to recall information after a delay.
- ▶ Limits: psychotic thought disorder, dementia, delirium



## 4. Communicating Choices



- ▶ Communicate a clear choice without vacillating significantly.
- ▶ Can they tell you their decision
- ▶ Maintain and communicate a choice long enough to be implemented

# Can the patient communicate a choice

- ▶ “Have you decided whether to go along with your doctor’s suggestions for treatment?”
- ▶ Can you tell me what you decided?
- ▶ Test: repeat question after several minutes or hours
- ▶ Requires auditory comprehension and confrontation naming
- ▶ Potential limiting factors:
  - ▶ Language impairment (aphasia, monolingual)
  - ▶ Impaired consciousness
  - ▶ Thought disorder
  - ▶ Memory impairment
  - ▶ Severe ambivalence
- ▶ Stability of choice: Frequent flip-flopping may indicate lack of capacity due to memory deficit

# DOCUMENTATION OF THE ASSESSMENT-

## “U-ARE.....”

- ▶ U= understanding. The patient is able to express in their own words the information regarding the risks and benefits of the situation.
- ▶ A=appreciation. The patient accepts that the facts presented apply to them, and they know the benefits of the treatment.
- ▶ R=reasoning. The patient can compare options, infer how a choice will impact them, and can offer logical consistency
- ▶ E=expressing a choice. The patient can communicate a consistent decision about treatment.

# Assessment of Capacity

- ▶ Rule out a delirium
- ▶ Evaluate cognition: NB testing
- ▶ Need to get relevant information at hand (need to know their finances if judging capacity for financial ability)
- ▶ Interview the patient: focus on issues relevant to capacity question
- ▶ Interview medical staff and collaterals
- ▶ Provide a diagnosis and clarify the cognitive deficits
- ▶ Reassess if necessary

# Who makes decisions for incompetent patients?

- ▶ Guardian (if one exists).
- ▶ Direction in an Advance Health Directive.
- ▶ Health care agent (an individual identified in a Health Care Power of Attorney).
- ▶ Health care representative (such as a close family member, as determined by the statute).
- ▶ Provider, if evidence of incapacity

# Not all or nothing

- ▶ A patient may be legally “competent”, i.e. not determined to be incompetent, but still have impaired decision making capacity due to illness or other acute event, i.e. being drunk
- ▶ Patients may be legally incompetent in some areas, e.g. finances, but still retain medical decision making capacity

# Got Capacity? Capacity for what? Not a Yes or No Question!

Decision making capacity is specific to a specific task

- a patient may be able to make some decisions but not others (buy groceries, but not buy a house)

Diagnosis does not equal incapacity

- a patient may be demented or mentally ill, and retain some capacity

Capacity is not necessarily a stable, permanent state

- a patient's ability to make decisions may vary with acuity, and may be regained even when previously inadequate



# Many Types of Capacities

- ▶ \*\*Ability to leave hospital AMA
- ▶ \*\*Medical decision making/consent capacity
- ▶ \*\*Capacity to live independently
- ▶ \*\*Consent to treatment (informed consent)
- ▶ Refusal of Medications
- ▶ Financial capacity
- ▶ Testamentary capacity (to make a will)
- ▶ Contractual Capacity: durable power of attorney or a health care directive
- ▶ Sexual consent capacity (MR; Major NCD)
- ▶ Capacity to drive

\*\* = common referral ? at Kaiser

# When should you assess DMC?

- ▶ A) Always
- ▶ B) Never
- ▶ C) Whenever the patient disagrees with you

# It's really "A"

We usually assess DMC spontaneously and automatically on every encounter; in most cases the result is clear

Certain circumstances should trigger a more deliberate and formal evaluation:

- 1) An abrupt change in mental status, which may be caused by an acute medical or psychiatric process.

## When to assess DMC formally...

- 2) When patients refuse recommended treatment, especially if they are unable or unwilling to explain why, or if the reason seems irrational or due to misinformation or misunderstanding
- 3) When a patient gives overly hasty consent, and it seems apparent that he has not given thoughtful consideration to the risks and benefits
- 4) When their physician asks for a consult

# Groups at high risk for decisional incapacity

- Diagnoses or treatment that compromises cognition (delirium, sedation, etc.)
- Mild-moderate Alzheimer's; universal with severe Major NCD.
- Schizophrenia > depression.
- Symptomatic bipolar disorder.
- Patients in ICU and Extended Care Facilities.
- Incapacity correlates with measures of NP impairment.
- Decision making impairment correlates with increasing age and fewer years of education
- Low IQ
- Hospice patients

(Walaszek, 2009).

# Prevalence

- 25% of psychiatric consultations in hospitals involve patients' capacity to make treatment-related decisions.
- Study: 48% of patients lacked capacity to consent to medical treatment although only 25% were identified as such.

Appelbaum, PS. Assessment of patients' competence to consent to treatment.  
N Engl J Med 2007,357:1834-40

# Risk Assessment

- Capacity evaluations in the hospital are at heart a risk assessment.
- Similar to 5150 decision regarding grave disability.
- Do not hesitate to use your clinical decision making capacity

# How dangerous is the decisional consequence

- ▶ The most stringent standard of capacity is reserved for those decisions that are very dangerous and fly in the face of both professional and public rationality.
- ▶ When diagnostic uncertainty is minimal, the available treatment is effective and death is likely to result from treatment refusal (and treatment is refused) then competency in this context requires a capacity to *appreciate the nature and the consequences of the decision being made*.



# Sliding Scale

- ▶ Many medical practitioners rely on a sliding scale approach to setting thresholds for accepting a patient's treatment decisions.
- ▶ For consent to a low-risk, high-benefit intervention, a relatively lower standard of capacity is used.
- ▶ Can consent to low-risk, high-benefit treatment, such as an antidepressant, as long as they can communicate a choice.

# When patient refuses

- ▶ Capacity is typically only called into question when a patient refuses the proposed treatment.
- ▶ Patients who oppose treatment are routinely held to higher standards of capacity because they run the risk of physical harm, which goes against the right to treatment and the ethical principle of beneficence.

# Who can evaluate for capacity

What California law says:

...explicitly designates the physician with “primary responsibility for the patient’s health care” as the person to determine capacity

What the research says:

Comparing the judgments of psychiatrists to other physicians shows “they are no better at assessing capacity in practice.”

In real practice: Physicians and psychiatrists often totally dependent on psychologists/and neuropsychologists to determine capacity.

# Specific Decisions

- ▶ Capacity to consent to the specific treatment at a particular time in the course of his illness.
- ▶ Patients with severe and chronic Major NCD, those with an MMSE score of less than 16, have a high likelihood of being unable to consent to treatment.
- ▶ One study of 98 patients with Alzheimer-type Major NCD found that only 11% of the patients with MMSE scores of less than 16 retained decision-making capacity.
- ▶ Those with mild cognitive impairment are also more likely to have impaired decision-making capacity.

# Capacity is not static

- ▶ Decision-making capacity must be evaluated for each medical decision, because it is neither static nor broad-based.
- ▶ A patient may lack the capacity at one time and later have that capacity restored.
- ▶ Some common factors that can temporarily and reversibly cause a person to lack medical decision-making capacity include: delirium, depression, psychosis, NCD, polypharmacy, nonadherence to medication, or an acute medical illness or infection.

# Incapacity may not be permanent

- ▶ Capacity is task specific, not global.
- ▶ Capacity can fluctuate.
- ▶ Capacity is situational. (Is there outside support?)
- ▶ Capacity is contextual. (Undue influence?)
  
- ▶ Capacity status can fluctuate over time and a capacity that was initially lost (e.g., as a result of a head injury, transient acute psychosis, delirium, severe depression that later remits with treatment) can be recovered.
- ▶ If not permanent, need to reassess later.

# Factors to remember

- ▶ Focus on decisional abilities, not cooperativeness or friendliness.
- ▶ Pay attention to changes over time; history is important.
- ▶ Beware of ageist stereotypes.
- ▶ Consider whether mitigating factors could explain the behavior  
(delirium, medications, no hearing aides, etc.)

# Factors to Remember 2

- ▶ Remember eccentric or risky choices in and of themselves are not grounds for incapacity.
- ▶ Sickness, eccentricity, and old age do not, of themselves, amount to incapacity.
- ▶ People have the right to make foolish or eccentric decisions and to govern their own affairs, unless they lack decision-making capacity and cannot understand the consequences of their decisions.



## Don't be afraid to make clinical judgment about patient's DMC

- ▶ Capacity evaluations help physicians, nursing treatment, and placement decisions
- ▶ Except for Major NCD placements, most capacity cases never reach the courts
- ▶ If they do, the court's legal “determination of competency” usually agrees with the provider's overall “assessment of capacity.”

# Elements of a Capacity Assessment

- ▶ Who requested the evaluation?
- ▶ Why was the evaluation requested?
- ▶ What specific capacity has been called into question?
- ▶ What medical or cognitive condition is the lack of capacity related to?  
(e.g.: delirious state, mental illness, cognitive decline).

# Influencing factors to consider

- ▶ Medical conditions/history:  
Clinical examples:  
Stroke victims:
  - L CVA affects ability to communicate,
  - R CVA affects insight.
- ▶ Current Medications
- ▶ What is the prognosis of the medical condition?  
\* Clinical example: TBI, stroke, Major NCD

## Influencing factors to consider

- ▶ History of cooperation with treatment-if not cooperative, why not? (e.g.: inability, anosognosia, resistance, defiance?)
- ▶ Is there support network?
- ▶ Home evaluation? (e.g.: stairs, hand rails, trip hazards, cleanliness)

## Many Potential Sources of Incapacity

- ▶ Comatose
- ▶ Intoxication
- ▶ Agitation
- ▶ Delirium
- ▶ Major NCD
- ▶ Medications
- ▶ Hallucinations, Delusions
- ▶ Absence of Hearing aides, Glasses
- ▶ Stress, grief, severe depression, recent events
- ▶ Reversible medical factors
- ▶ Normal fluctuations in mental ability and fatigue
- ▶ Education
- ▶ Socio-economic background; Cultural and ethnic traditions

# Consent & HIPAA

- ▶ If evaluation is for crucial medical decision, you do not need consent to evaluate if you suspect they lack capacity.
- ▶ An effort should be made to obtain informed consent or assent to the evaluation.
- ▶ A warning of the potential risks of participating in the evaluation should be provided, namely, that information will not remain confidential.

## Don't get rejected by the Court

- ▶ The more serious the consequences of clinically deciding someone has lack of capacity, the more you need to use quantitative measures to backup your clinical decision.
- ▶ Connect the cognitive deficit to lack of capacity
- ▶ Good Documentation

# Clinical Judgment

- ▶ A clinical judgment about capacity of an older adult is exactly that—a professional clinical decision.
- ▶ There is no equation, cookbook, or test battery for the assessment of capacity.



# Aid to Capacity Evaluation (ACE)

- ▶ Developed by U. of Toronto Joint Centre for Bioethics
- ▶ Takes ~ 10-15 minutes to administer (maybe...)
- ▶ Is in the public domain and on the web:
  - ▶ <http://www.utoronto.ca/jcb>
- ▶ Has a form for administering, and instructions for scoring
- ▶ Uses increasingly specific, then leading questions to establish patient's level of knowledge and understanding

What can they do at home:

## ADLS & IADLS

ADLS	IADLS
Dressing	Grocery shopping & meal preparation
Bathing	Driving
Toileting	Housework
Eating	Managing money
Walking	Managing medication
Transferring between bed/chair	Using telephone & mail

Can they do to command vs. do by themselves when needed

# Measure Functional Ability

- ▶ If possible, use a measure of ADLs or IADLs
- ▶ Use all sources of data regarding functioning:
  - ▶ Functional observations,
  - ▶ Collateral interviews,
  - ▶ Multidisciplinary team input

# Incapacity and Guardianship Need

- ▶ Four incapacity requirements under state guardianship law:
- ▶ 1 - Presence of disabling condition.
- ▶ 2 - Functional behavior: inability to meet essential needs.
- ▶ 3 - Cognitive dysfunction.
- ▶ 4 - Finding that guardianship is necessary and is “least restrictive alternative.”

# Capacity Declarations: Request for conservatorship

- ▶ CAP DEC's (aka Capacity Declaration Forms) are legal documents that are completed once an individual has been determined to lack capacity and a conservatorship process is in process.
- ▶ The CAP DEC's are to be completed by a licensed physician or licensed psychologist with at least 2 years of experience diagnosing Major NCD.

# Self Neglect: Incapacity to live independently

- ▶ Is an individual a **significant danger to her or himself due to**
  - ▶ limited functional abilities, or
  - ▶ cognitive or psychiatric disturbances
  - ▶ And cannot accept or appropriately use assistance that would allow him or her to live independently.

## Reporting duty

- ▶ A report to APS is required by state law if you conclude there is self neglect in a patient if it has not already been done by medical social workers

# Context of Decision Making Capacity 1

- ▶ Possible dissociation of Verbal ability and the rest of cognitive functioning
- ▶ Information from collateral sources: status of home (mold, leaking roof), refrigerator, food, bathroom
- ▶ Level of cleanness of apartment, mold, garbage
- ▶ Method for remembering medications
- ▶ Presence of paranoia or hallucinations

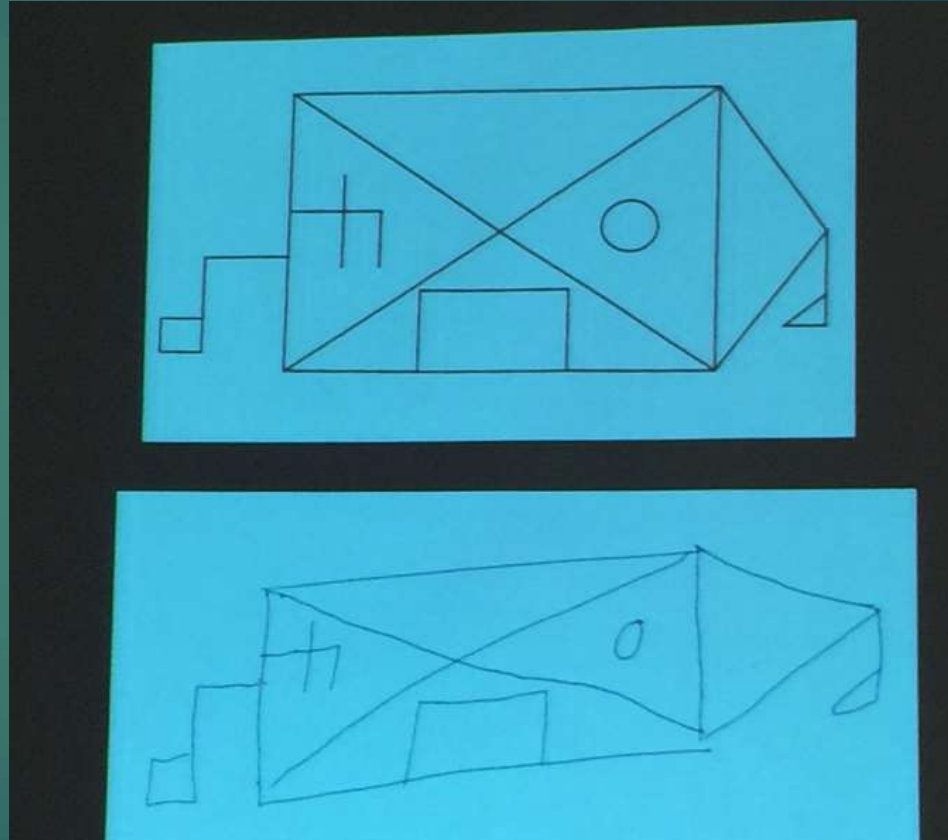
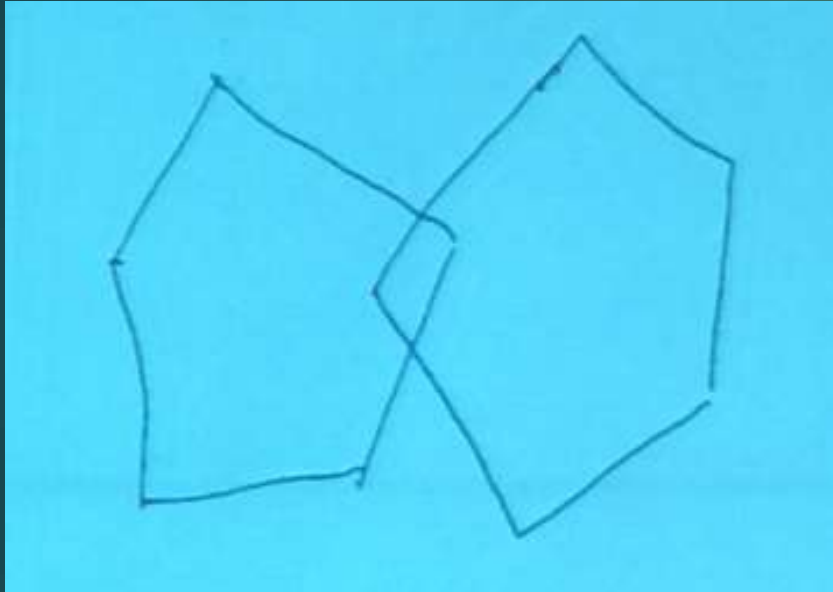


## Context of Decision Making Capacity 2

- ▶ Evidence of burning pots, not paying bills
- ▶ Presence, or lack thereof, of supervision by family members (who does finances)
- ▶ APS involvement
- ▶ Executive function level
- ▶ Anosognosia (denial of deficits): including toward testing deficits
- ▶ Major NCD on NB Testing: Cognitive ↓, not etiology

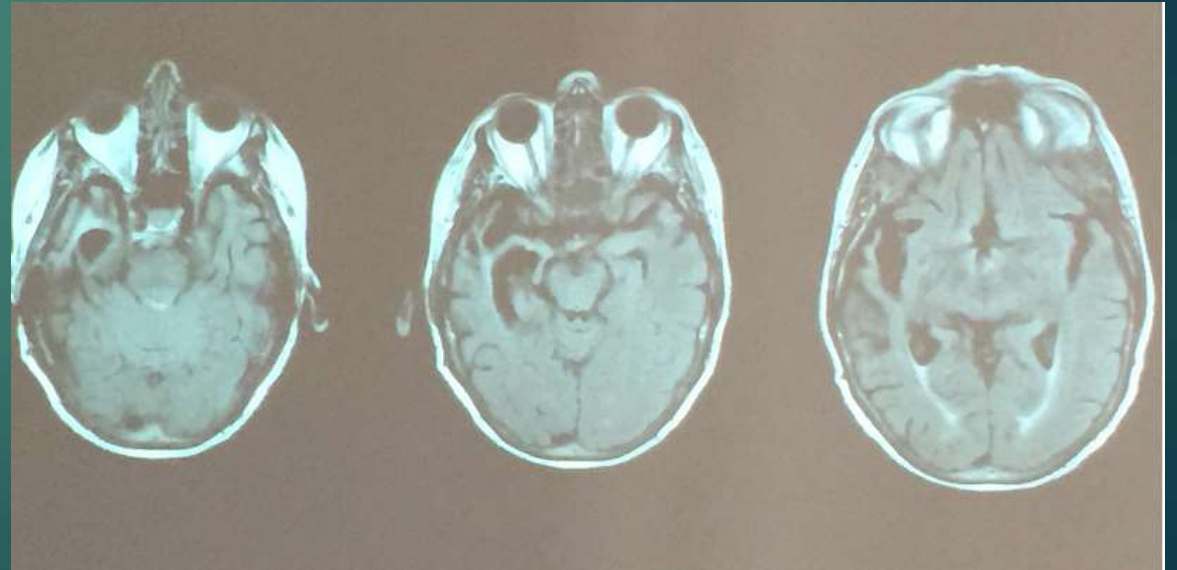
# Case Examples

# Case 1



# Case 1

- ▶ 74 y o woman
- ▶ 5 years of cognitive decline
- ▶ Family says memory and word finding decline
- ▶ Neuro exam: WNL
- ▶ MMSE: 5
- ▶ Diagnosis ?
- ▶ Semantic variant PPA (R>L)



5890 Empire  
129, 304 Academy

**MONTREAL COGNITIVE ASSESSMENT (MOCA)**

NAME: D. V. Education:  Date of birth:   
Sex:  AGE:

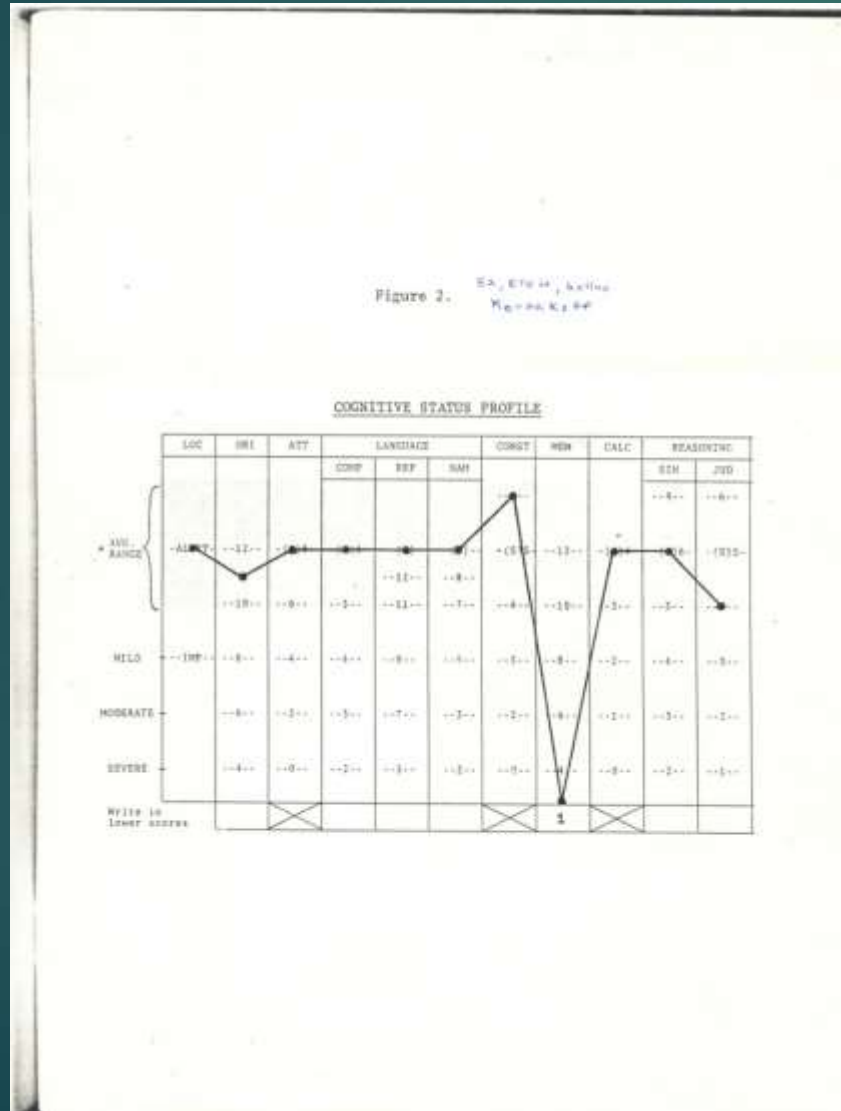
VISUOSPATIAL / EXECUTIVE		Copy cube		Draw CLOCK (Ten past eleven)		POINTS		
<p style="text-align: center;">[1]</p>	<p style="text-align: center;">[10]</p>	<p style="text-align: center;">[1] Contour [10] Numbers [1] Hands</p>	3/5					
NAMING								
<p style="text-align: center;">[1]</p>	<p style="text-align: center;">[1]</p>	<p style="text-align: center;">[1]</p>	3/3					
MEMORY								
Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.		FACE	VELVET	CHURCH	DAISY	RED	No points	
		1st trial	1	2	3	4		5
		2nd trial	1	2	3	4	5	
ATTENTION								
Read list of digits (1 digit/sec). Subject has to repeat them in the forward order				[0] 2 1 8 5 4		1/2		
Subject has to repeat them in the backward order				[1] 7 4 2				
Read list of letters. The subject must tap with his hand at each letter A. No points if > 2 errors				[ ] FBACMNAAJKLBAFAKDEAAJAMOFAB		2/1		
Serial 7 subtraction starting at 100				[4] 93 [4] 86 [4] 79 [4] 72 [4] 65				
				4 or 5 correct subtractions: 3 pts, 2 or 3 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pt		3/3		
LANGUAGE								
Repeat: I only know that John is the one to help today. [4]				[4]		2/2		
Fluency / Name maximum number of words in one minute that begin with the letter F				F words: 4 (N ≥ 2 words)		2/1		
ABSTRACTION								
Similarity between e.g. banana - orange = fruit		[ ] train - bicycle		[1] watch - ruler		2/2		
DELAYED RECALL								
Has to recall words WITH NO CUE		FACE	VELVET	CHURCH	DAISY	RED	5/5	
Category cue		[1]	[2]	[3]	[4]	[5]		
Optional								
Multiple choice cue								
ORIENTATION								
[4] Date 30/1 [4] Month [4] Year 2009 [4] Day Fri [4] Place [4] City SF						6/6		

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Administered by: Kaiga

# DX: WNL

52 yo, Alcoholic woman, dressed and ready to leave hospital and return to work



- Normal Cognition
  - Amnesia,
- No memory encoding
- Importance of doing NB Testing
  - Classic profile: Korsakoff Syndrome

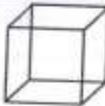


# RG: 68 yo, homeless alcoholic

Montreal Cognitive Assessment (MOCA)

Name: \_\_\_\_\_ Education: \_\_\_\_\_ Sex: \_\_\_\_\_ Date of birth: \_\_\_\_\_ DATE: \_\_\_\_\_


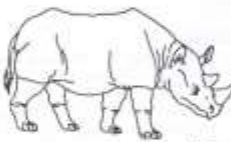

VISUOSPATIAL / EXECUTIVE

Copy cube: 

Draw CLOCK (Ten past eleven) (1 point)

Points: 2/3

NAMING

Points: 3/3

MEMORY

Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2nd trial	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

No points

ATTENTION

Read list of digits (1 digit/sec). Subject has to repeat them in the forward order. 1 2 1 8 5 4  
 Subject has to repeat them in the backward order. 4 2 1 8 5

Read list of letters. The subject must tap with his hand at each letter A. No points if 2 or more. 1 7 4 2

Serial 7 subtraction starting at 100: 100 93 86 79 72 65 58  
 4 or 3 correct subtractions: 3 pts, 2 or 1 correct: 2 pts, 0 correct: 0 pt

Points: 2/3

LANGUAGE

Repeat: I only know that John is the one to help today. I  
 The cat always hid under the couch when dogs were in the room. I

Fluency / Name maximum number of words in one minute that begin with the letter F: 1 (N 2 n words)

Points: 2/2

ABSTRACTION

Similarity between e.g. banana - orange = fruit: train - bicycle watch - ruler

Points: 1/1

DELAYED RECALL

	FACE	VELVET	CHURCH	DAISY	RED
Has to recall words WITH NO CUE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Category cue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multiple choice cue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Points for UNCLUED recall only: 0/3

ORIENTATION

Date: 5 / 11 / 2004  
 Month: 11 Year: 2004 Day: 5 Place: City

Points: 0/6

TOTAL: 14/30  
 Add 1 point if  $\leq 12$  yr old

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Hx: hosp. s/p seizure,  
RH-TBI (concave skull)

Score: 17/30\*

Executive↓

## Language, Attention ↑

Spontaneous Memory ↓: 0\*\*

## Normal Recognition: all 5↑\*\*

## Conclusion:

## Cognitive Disorder due to alcoholism

## Conclusion:

# ELM: 72 yo, college educ., APS involved

**APS Conserve** **ELM**

**MONTREAL COGNITIVE ASSESSMENT (MOCA)**

NAME: ELM Education: college Date of birth: 1/24/40 Sex: 7

**VISUOSPATIAL / EXECUTIVE**

Copy cube ☐ Draw CLOCK (Ten past eleven) ☐ (1 point)

Points: ☐ Contour ☐ Numbers ☐ Hands 1/5

**NAMING**

☐ ☒ ☒ 2/3

**MEMORY**

Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAJSY	RED
1st trial					
2nd trial					

No points

**ATTENTION**

Read list of digits (1 digit/ sec.). Subject has to repeat them in the forward order ☐ 2 1 8 5 4

Subject has to repeat them in the backward order ☐ 7 4 2 2/2

Read list of letters. The subject must tap with his hand at each letter A. No points if 2 or more errors ☐ FBACMNAAJKLBFAFAKDEAAAJAMOF AAB 1/1

Serial 7 subtraction starting at 100 ☐ 93 ☐ 86 ☐ 79 ☐ 72 ☐ 65 0/3

a or 5 correct subtractions: 3 pts, 2 or 3 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pts

**LANGUAGE**

Repeat: I only know that John is the one to help today. ☐ The cat always hid under the couch when dogs were in the room. ☐ 2/2

Fluency / Name maximum number of words in one minute that begin with the letter F ☐ (N ≥ 11 words) 2/1

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit ☐ train - bicycle ☒ watch - ruler 1/2

**DELAYED RECALL**

Has to recall words WITH NO CUE ☐ ☐ ☐ ☐ ☐ Points for UNCUED recall only 0/5

Optional: Category cue ☐ Multiple choice cue ☐

**ORIENTATION**

☒ Date ☒ Month ☒ Year ☒ Day ☐ Place ☒ City 5/6

© Z. Nasreddine MD Version November 7, 2004 Normal ≥ 26 / 30 TOTAL 14/30

www.mocatest.org Add 1 point if ≤ 15 yr edu

Score: 14/30

Executive: 1/5

Memory: 0/5

Conclusion:  
Major NCD





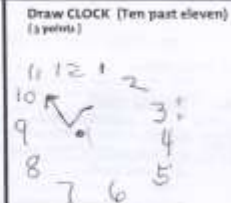
TK: 38 yo AA woman, “Pray to God”

MONTREAL COGNITIVE ASSESSMENT (MOCA)




NAME: H9 Education: Date of birth: Sex: DATE: 2004

**VISUOSPATIAL / EXECUTIVE**

Copy cube:  ☐  ☐

Draw CLOCK (Ten past eleven) (3 points):  ☐ ☒ ☐

**NAMING**

 ☐  ☐  ☐

**MEMORY**

Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial					
2nd trial					

**ATTENTION**

Read list of digits (1 digit/sec). Subject has to repeat them in the forward order. Subject has to repeat them in the backward order.

Read list of letters. The subject must tap with his hand at each letter A. No points if 2 or more errors.

Serial 7 subtraction starting at 100: ☐ 93 ☐ 86 ☐ 79 ☐ 72 ☐ 65

**LANGUAGE**

Repeat: I only know that John is the one to help today. ☐ The cat always hid under the couch when dogs were in the room. ☐

Fluency / Name maximum number of words in one minute that begin with the letter F: ☐ (N2: 11 words)

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit ☐ train - bicycle ☐ watch - ruler ☐

**DELAYED RECALL**

Has to recall words WITH NO CLUE: ☒ FACE ☒ VELVET ☒ CHURCH ☒ DAISY ☒ RED

Optional: Category cue: ☐ Multiple choice cue: ☐

**ORIENTATION**

☐ Date ☐ Month ☐ Year ☐ Day ☐ Place ☐ City

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TOTAL: 13/30

Hx: CVA 2 y ago + MS dx; mild receptive aphasia

Woke her daughter at 5 AM; “Pray to God”; amnestic for this at 5 PM

Score: 13/30\*

Executive: 1/5

Language: ↓↓↓

Memory: 5/5

Conclusion:  
Aphasia, Partial Complex Seizures

MRI: 2 RT MS lesions

# TO time 1 (2004): 41 yo, AIDS

Scoring sheet for the Montreal Cognitive Assessment (MoCA).

4/10, 4/10/2010

Scoring sheet for the Montreal Cognitive Assessment (MoCA)

Date of birth :   
 Education :   
 Sex :   
 NAME :   
 DATE :

**VISUOSPATIAL / EXECUTIVE**

Copy cube   
 Draw CLOCK (Ten past eleven) (1 point)

1-5 POINTS

1-5 POINTS

**NAMING**

1-3 POINTS

**MEMORY**

Read list of words, subject must repeat them. Do 3 trials. Do a recall after 5 minutes.

1-5 POINTS

**ATTENTION**

Read list of digits (1 digit/sec). Subject has to repeat them in the forward order. Subject has to repeat them in the backward order.

1-5 POINTS

**LANGUAGE**

Repeat: I only know that John is the one to help today. The cat always hid under the couch when dogs were in the room.

1-5 POINTS

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit

1-5 POINTS

**DELAYED RECALL**

Has to recall the words

1-5 POINTS

**ORIENTATION**

Date Month Year Day Place

1-5 POINTS

TOTAL

Score: 15/30\*

## Memory Register: 4x

## Executive: 2/5

Memory: 0/5, 2 cue

## Conclusion:

# AIDS related Major NCD

# TO time 2 (2008): AIDS, CD4=40

034 NO

**MONTREAL COGNITIVE ASSESSMENT (MOCA)**

NAME: TO Education: TO Date of birth: 2-27-04  
Sex: TO DATE: 2-27-04

**VISUOSPATIAL / EXECUTIVE**

Copy cube [ ] Draw CLOCK (Ten past eleven) [ ]

Points: [ ] [ ]

**NAMING**

Points: [ ] [ ] [ ]

**MEMORY**

Read list of words, subject must repeat them. Do 3 trials. Do a recall after 5 minutes.

FACE VELVET CHURCH DAISY RED

1st trial [ ] [ ] [ ] [ ] [ ]

2nd trial [ ] [ ] [ ] [ ] [ ]

**ATTENTION**

Read list of digits (5 digit/ sec). Subject has to repeat them in the forward order [ ] 2 1 8 5 4

Subject has to repeat them in the backward order [ ] 4 5 8 1 2

Read list of letters. The subject must tap with his hand at each letter A. No points if 2 errors [ ] F B A C M N A A J K L B A F A K D E A A A J A M O F A A B

Serial 7 subtraction starting at 100 [ ] 93 [ ] 86 [ ] 79 [ ] 72 [ ] 65

4 or 3 correct subtractions: 2 pts, 2 or 1 correct: 1 pt, 0 correct: 0 pt

**LANGUAGE**

Repeat: I only know that John is the one to help today. [ ]

The cat always hid under the couch when dogs were in the room. [ ]

Fluency / Name maximum number of words in one minute that begin with the letter F [ ] (N ≥ 11 words)

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit [ ] train - bicycle [ ] watch - ruler [ ]

**DELAYED RECALL**

Has to recall words WITH NO CUE [ ] [ ] [ ] [ ] [ ]

Category cue [ ] [ ] [ ] [ ] [ ]

Multiple choice cue [ ] [ ] [ ] [ ] [ ]

Points for UNCLUED recall only

**ORIENTATION**

[ ] Date [ ] Month [ ] Year [ ] Day [ ] Place [ ] City

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Administered by: 1/27/08 where are you? NO

TOTAL Add 1 point if ≤ 12 yr old 2/30

- ▶ Score: 3/30\*\*
- ▶ Executive: 1/5
- ▶ Memory: 0/5
- ▶ Conclusion:  
HIV Major NCD





# 66 yo, pelvic mass is “food, not cancer”

NAME: [redacted] CH: [redacted]

Montreal Cognitive Assessment (MOCA)

NAME: [redacted] Education: [redacted] Date of birth: [redacted] Sex: [redacted] DATE: 4/9/08

**VISUOSPATIAL / EXECUTIVE**

Copy cube: [redacted] Draw CLOCK (Ten past eleven): [redacted]

Points: 3/5

**NAMING**

Images: [redacted] [redacted] [redacted]

Points: 2/3

**MEMORY**

Read list of words, subject must repeat them. Do 3 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial	1	2	3	4	5
2nd trial	1	2	3	4	5

Points: 0/5

**ATTENTION**

Read list of digits (1 digit/sec). Subject has to repeat them in the forward order. Subject has to repeat them in the backward order.

Forward: 1 2 1 8 5 4  
Backward: 4 5 8 1 2 1

Points: 0/5

**LANGUAGE**

Repeat: I only know that John is the one to help today. [redacted]  
The cat always hid under the couch when dogs were in the room. [redacted]

Points: 0/2

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit [redacted] train - bicycle [redacted] watch - ruler [redacted]

Points: 0/2

**DELAYED RECALL**

Has to recall words WITH NO CUE: [redacted] [redacted] [redacted] [redacted] [redacted]

Points: 0/5

**ORIENTATION**

Date: 4/9/08 Month: [redacted] Year: [redacted] Day: [redacted] Place: [redacted] City: [redacted]

Points: 6/6

TOTAL: 16/30

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66 yo female, prior colon CA 2 y ago

Had bowel obstruction

Now Pelvic Mass, believes its food,  
refuses Tx for CA

Tangential

Long hx of untreated delusional disorder  
(NASA, government conspiracy vs. her)

Score: 16/30

Memory: 0/5 – 4 + cueing

NAB Judgment Scale: 7/20

Recommendation:  
Delusional Disorder  
Cognitive Disorder

Lacks DMC (no Appreciation)

Family supports surgery

# 57 yo, maggots in wound

57 yo, maggots in wound

57 yo retired IRS auditor, MA educ  
Medical noncompliance with wound  
Physician aversion: prior amputation  
of toe 7 m before, claimed no prior  
negative med experience

Wife:  
Sore became malodorous; found  
maggots 2 m before; Childhood  
cerebral palsy, months in hospital;  
cured; traumatized by toe amputation

Score: 24/30

Executive: 3/5  
Memory: 2/5 + 3 cue

Conclusion:  
MCI, Psych issues  
Full NP testing recom

57 yo retired IRS auditor, MA educ  
Medical noncompliance with wound  
Physician aversion: prior amputation  
of toe 7 m before, claimed no prior  
negative med experience

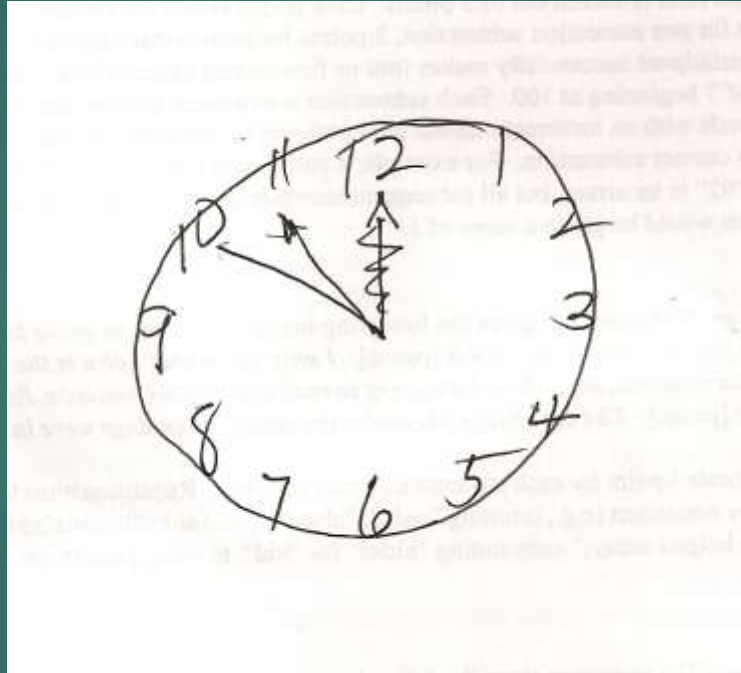
Wife:  
Sore became malodorous; found  
maggots 2 m before; Childhood  
cerebral palsy, months in hospital;  
cured; traumatized by toe amputation

Score: 24/30

Executive: 3/5  
Memory: 2/5 + 3 cue

Conclusion:  
MCI, Psych issues  
Full NP testing recom

# Her Clock



LCA: 64 yo AA woman, ESRD, dialysis combative

ESRD 2A 64yo

MONTREAL COGNITIVE ASSESSMENT (MOCA)

NAME: Education: 54 Date of birth: 7/8/0 Sex: F DATE: 7/8/0

**VISUOSPATIAL / EXECUTIVE**

Copy cube [ ] Draw CLOCK (Ten past eleven) (3 points) [ ]

Points: 2/4

**NAMING**

[ ] [ ] [ ] 3/3

**MEMORY**

Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

FACE VELVET CHURCH DAISY RED

1st trial [ ] [ ] [ ] [ ] [ ] No points

2nd trial [ ] [ ] [ ] [ ] [ ]

**ATTENTION**

Read list of digits (5 digit sec.). Subject has to repeat them in the forward order [ ] 2 1 8 5 4 1

Subject has to repeat them in the backward order [ ] 1 4 2 3 2 1

Points: 0/2

Serial 7 subtraction starting at 100 [ ] 93 [ ] 88 [ ] 79 [ ] 74 [ ] 65

Points: 0/3

**LANGUAGE**

Repeat: I only know that John is the one to help today. I [ ] John

the cat always hid under the couch when dogs were in the room. [ ]

Points: 0/2

Fluency / Name maximum number of words in one minute that begin with the letter F [ ] (N 2 in words)

Points: 1/1

**ABSTRACTION**

Similarity between e.g. banana - orange - fruit [ ] train - bicycle [ ] watch - ruler [ ]

Points: 2/2

**DELAYED RECALL**

Has to recall words WITH NO CLUE [ ] [ ] [ ] [ ] [ ]

Category cue [ ] [ ] [ ] [ ] [ ]

Multiple choice cue [ ] [ ] [ ] [ ] [ ]

Points for UNCLUE recall only [ ]

**ORIENTATION**

[ ] Date [ ] Month [ ] Year [ ] Day [ ] Place [ ] City [ ]

Points: 3/6

TOTAL 10/29

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Consult ? : combative during

Dialysis, “I am 64, AA, activist;  
I have the right...”

Score: 10/29\*

Executive: 2/4

Memory: 2/5, 0 with cue

Conclusion:  
Personality Disorder  
Major NCD





# AC 1<sup>st</sup> : 67 yo male; started Nortriptyline

Montreal Cognitive Assessment (MOCA)

NAME: [redacted] Education: [redacted] Date of birth: 5/16/40 Sex: M DATE: 11/31/08

**VISUOSPATIAL / EXECUTIVE**

Copy cube [1] Draw CLOCK (Ten past eleven) (3 points) [1] [2] [0] 4/5

**NAMING**

Lion [1] Rhinoceros [1] Camel [1] 3/3

**MEMORY**

Read list of words, subject must repeat them. Do 3 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial					
2nd trial	/	/	/	/	/

**ATTENTION**

Read list of digits (1 digit/sec). Subject has to repeat them in the forward order [0] 2 1 8 3 4 [1] 7 4 2

Subject has to repeat them in the backward order [1] 7 4 2

Read list of letters. The subject must tap with his hand at each letter A. No points if 2 or more [ ] F B A C H N A A K L B A F A K D E A A A J A M O F A A B

Serial 7 subtraction starting at 100 [✓] 98 [ ] 86 [ ] 79 [ ] 72 [ ] 65

3 or 5 correct subtractions: 3 pts, 2 or 3 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pt

**LANGUAGE**

Repeat: I only know that John is the one to help today. [ ] I know the one to help

The cat always hid under the couch when boys were in the room. [✓]

Fluency / Name maximum number of words in one minute that begin with the letter F [ ] 2 (N = 11 words)

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit [ ] train - bicycle [✓] watch - ruler

**DELAYED RECALL**

Has to recall words WITH NO CUE

	FACE	VELVET	CHURCH	DAISY	RED
Category cue	[✓]	[✓]	[ ]	[ ]	[ ]
Multiple choice cue			✓	✓	6

**ORIENTATION**

[B] Date [✓] Month [✓] Year [X] Day [✓] Place [✓] City

TOTAL 26/30

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Hx: bugs everywhere,  
then collapse with balance↓,  
SOB, vomiting

Score: 17/30\*

Executive: 4/5

Fluency: 2

Memory: 2/5, 2 with cue

Conclusion:

Delirium due to  
Increase in Nortriptyline;  
anticholinergic effect



AC 2<sup>nd</sup> : 67 yo male, delirium, next day

AC 67 yo male, delirium, next day

MONTREAL COGNITIVE ASSESSMENT (MOCA)

NAME: [redacted] Education: 13 Date of birth: [redacted] Sex: M DATE: 2/1/08

**VISUOSPATIAL / EXECUTIVE**

Copy cube: [drawing of a cube] 3 points

Draw CLOCK (Ten past eleven): [drawing of a clock face with hands at 10:10] 3 points

**NAMING**

[drawing of a lion] 1 point [drawing of a rhinoceros] 1 point [drawing of a camel] 1 point

**MEMORY**

Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial	✓	✓	✓	✓	✓
2nd trial	✓	✓	✓	✓	✓

**ATTENTION**

Read list of digits (1 digit/sec.). Subject has to repeat them in the forward order. Subject has to repeat them in the backward order.

Forward: 1 2 8 5 4 2 points

Backward: 4 2 5 8 1 2 points

Serial 7 subtraction starting at 100

	93	86	84	79	74	71	65
1st trial	✓	✓	✓	✓	✓	✓	✓
2nd trial	✓	✓	✓	✓	✓	✓	✓

**LANGUAGE**

Repeat: I only know that John is the one to help today. I [unclear] the cat always hid under the couch when dogs were in the room.

Fluency / Name maximum number of words in one minute that begin with the letter F

[unclear] (N 2 in words) 0/2

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit

train - bicycle watch - ruler 0/2

**DELAYED RECALL**

Has to recall words WITH NO CUE

	FACE	VELVET	CHURCH	DAISY	RED
1st trial	✓	✓	✓	✓	✓
2nd trial	✓	✓	✓	✓	✓

**ORIENTATION**

Date: 2/1/08 Month: 1 Year: 67 Day: 1 Place: [unclear] City: [unclear] 6/6

TOTAL 24/30

Normal > 26 / 30

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Hx: Nortrip ↑↑

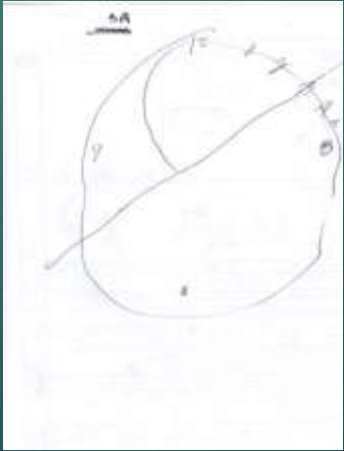
Score: 24/30\*

Executive: 4/5

Fluency: 8

Memory: 5/5

Conclusion:  
WNL, resolved delirium



2nd



BM: 54 yo, DM, cardiac arrest for 20 min.

Hx: security guard,  
visual halluc. of bees, visual field cut

Score: 14/30\*

Executive: 2/5

Fluency: 4 words

Memory: 0/5, 0 with cue\*

Conclusion:

Major NCD due to

Anoxic Encephalopathy

His conclusion: "I'm screwed."

MONTREAL COGNITIVE ASSESSMENT (MOCA)

Birth: 2-8-08 NAME: BM  
Education: Sex: DATE: 54

**VISUOSPATIAL / EXECUTIVE**

Copy cube: [ ]  
Draw CLOCK (Ten past eleven): [ ]  
Points: 2/5

**NAMING**

Images: Lion, Rhino, Camel  
Points: 3/3

**MEMORY**

Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial	✓	✓	✓	✓	✓
2nd trial	✓	✓	✓	✓	✓

Points: 0/5

**ATTENTION**

Read list of digits (1 digit/sec.). Subject has to repeat them in the forward order. [ ] 2 1 8 5 4  
Subject has to repeat them in the backward order. [ ] 4 5 8 1 2

Points: 2/5

Read list of letters. The subject must tap with his hand at each letter A. No points if 2 or more errors. [ ] FRACMNAALKBFAKDEAAJAMOFAB

Points: 1/1

Serial 7 subtraction starting at 100. [ ] 93 [ ] 86 [ ] 79 [ ] 70 [ ] 63 [ ] 56 [ ] 49 [ ] 42 [ ] 35 [ ] 28 [ ] 21 [ ] 14 [ ] 7

Points: 2/3

**LANGUAGE**

Repeat: I only know that John is the one to help today. [ ]  
The cat always hid under the couch when dogs were in the room. [ ]

Points: 2/3

Fluency / Name maximum number of words in one minute that begin with the letter F. [ ] 4 (N 2-11 words)

Points: 0/1

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit. [ ] train - bicycle [ ] watch - ruler

Points: 0/2

**DELAYED RECALL**

Has to recall the words: FACE [ ] VELVET [ ] CHURCH [ ] DAISY [ ] RED [ ]

Points: 0/5

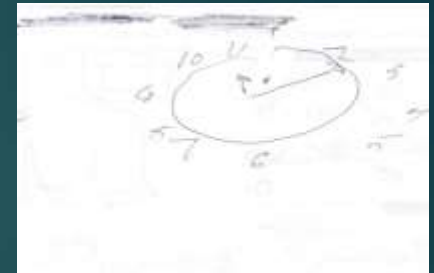
**ORIENTATION**

Date: [ ] Month: [ ] Year: [ ] Day: [ ] Place: [ ] City: [ ]

Points: 2/6

TOTAL: 14/30

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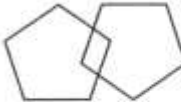


# MD time 1: 72 yo physician, Normal MMSE 2006

**The Mini-Mental State Exam**

Patient [redacted] Examiner [redacted] Date 8/31/06

Maximum	Score	
5	(5)	<b>Orientation</b> What is the (year) (season) (date) (day) (month)?
5	(5)	Where are we (state) (country) (town) (hospital) (floor)?
3	(3)	<b>Registration</b> Name 3 objects: 1 second to say each. Then ask the patient all 3 after you have said them. Give 1 point for each correct answer. Then repeat them until he/she learns all 3. Count trials and record. Trials _____
5	(5)	<b>Attention and Calculation</b> Serial 7's. 1 point for each correct answer. Stop after 5 answers. Alternatively spell "world" backward.
3	(3)	<b>Recall</b> Ask for the 3 objects repeated above. Give 1 point for each correct answer.
2	(2)	<b>Language</b> Name a pencil and watch.
1	(1)	Repeat the following "No ifs, ands, or buts"
3	(3)	Follow a 3-stage command: "Take a paper in your hand, fold it in half, and put it on the floor."
1	(1)	Read and obey the following: CLOSE YOUR EYES
1	(1)	Write a sentence.
1	(1)	Copy the design shown.

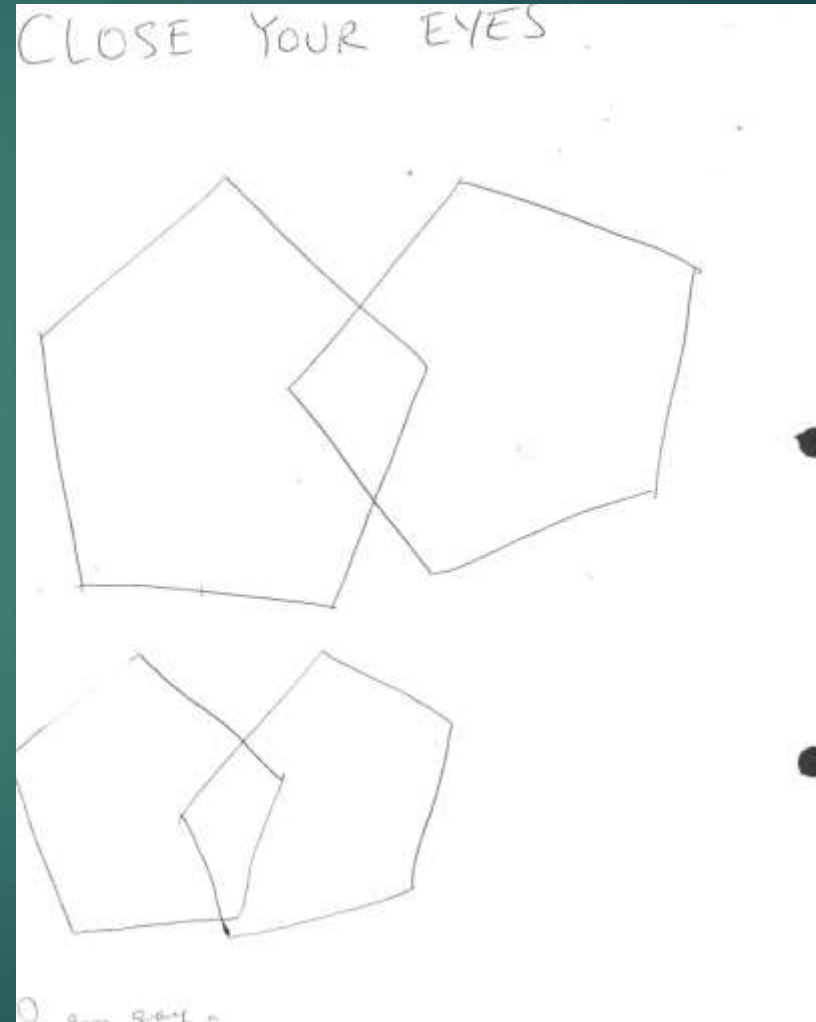


Total Score 30/30

ASSESS level of consciousness along a continuum  
Alert Drowsy Stupor Coma

"MINI-MENTAL STATE," A PRACTICAL METHOD FOR GRADING THE COGNITIVE STATE OF PATIENTS FOR THE CLINICIAN.  
Journal of Psychiatric Research, 12(3): 189-198, 1975. Used by permission.

A series provided by  
The Hartford Institute for Geriatric Nursing  
hartford.gn@yale.edu  
www.hartfordgn.org



# MD time 2: 72 yo M.D., 2007, cautionary tale

Revised 11/07

NAME: [REDACTED] Date of birth: 6/8/1935  
 Education: [REDACTED] Sex: [REDACTED] DATE: 5/8/07

### MONTREAL COGNITIVE ASSESSMENT (MOCA)

**VISUOSPATIAL / EXECUTIVE**

Copy cube [ ] [ ]

Draw CLOCK (Ten past eleven) (3 points)

**NAMING**

Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial					
2nd trial					

**ATTENTION**

Read list of digits (5 digits) sec. Subject has to repeat them in the forward order [ ] 2 1 8 5 4

Read list of letters. The subject must tap with his hand at each letter A. No points if 2 or more [ ] FBACMNAAJKBFAKDEAAAJAMOFAB

Serial 7 subtraction starting at 100 [ ] 93 [ ] 86 [ ] 79 [ ] 72 [ ] 65

**LANGUAGE**

Repeat: I only know that John is the one to help today. [ ]

The cat always hid under the couch when dogs were in the room. [ ]

Fluency / Name maximum number of words in one minute that begin with the letter F [ ] 115 (9 & 11 words)

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit [ ] train - bicycle [ ] watch - ruler [ ]

**DELAYED RECALL**

	FACE	VELVET	CHURCH	DAISY	RED
Has to recall words WITH NO CUE					
Optional Category test					
Multiple choice test					

**ORIENTATION**

[ ] Date [ ] Month [ ] Year [ ] Day [ ] Place [ ] City

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Normal ≥ 26 / 30

TOTAL 26 / 30

Add 3 points if ≥ 13 yr old

Score: 26/30\*

Executive: 2/5\*\*

Memory: 4/5

Conclusion: MCI (Executive ↓)

Follow-up:

NP testing: failed WCST, Category test

Spent \$700,000 in 6 months

Conclusion: Frontotemporal Dementia



GSH: 68 yo male, 12 y educ

**MONTREAL COGNITIVE ASSESSMENT (MOCA)**

NAME: [redacted] Education: 12 y Date of birth: 2/6/54 Sex: MA DATE: 2/6/18

**VISUOSPATIAL / EXECUTIVE**

Copy cube [0] Draw CLOCK (Ten past eleven) [1] Points: 3/5

**NAMING**

1. [0] 2. [1] 3. [1] Points: 3/3

**MEMORY**

Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial	✓	✓	✓		✓
2nd trial	✓	✓	✓		✓

No points

**ATTENTION**

Read list of digits (1 digit each). Subject has to repeat them in the forward order. [0] 2 8 5 4

Subject has to repeat them in the backward order. [0] 7 4 2

Points: 0/2

Read list of letters. The subject must tap with hand at each letter A. Six points if 2 errors.

[ ] FBACMNAAIKLBFAKDEAAAIAIMOFAAB

Points: 0/6

Serial 7 subtraction starting at 100

	89	86	80	79	72	65
1st trial	✓	✓	✓	✓	✓	✓
2nd trial	✓	✓	✓	✓	✓	✓

Points: 0/13

**LANGUAGE**

Repeat: I only know that [redacted] is the one to help today. [1]

The cat always [redacted] under the couch when dogs were in the room. [1]

Points: 2/2

Fluency / Name maximum number of words in one minute that begin with the letter F

[0] (N 2 or words)

Points: 0/1

**ABSTRACTION**

Similarity between e.g. banana - orange - fruit [0] train - bicycle [0] watch - rules

Points: 0/2

**DELAYED RECALL**

Now to recall words

	FACE	VELVET	CHURCH	DAISY	RED
WITH NO CUE	[ ]	[ ]	[ ]	[ ]	[ ]
Optional					

Points for UNCLUED recall only

Points: 0/5

**ORIENTATION**

[1] Date [1] Month [1] Year [1] Day [1] Place [1] City

Points: 6/6

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Administered by: [redacted]

TOTAL: 14/29

Hx: failure to thrive, medication non-compliant, house (horrific odor, garbage, roof leak, mold everywhere), denied any problems

Score 14/29\*

Memory Register: 4

Executive: 3/5; TMT = 0

Memory: 0/5, 1 cue\*

NAB Judgment: 16/20

Conclusion:

Major NCD

(executive dissociation)

MR: 75 yo, male, Board & Care, combative there

3/25/2010 ER 75 yo, 46 kg, 5' 10" male name [redacted] Date of birth: [redacted] Education: [redacted] Sex: [redacted] NAME: [redacted] DATE: [redacted]

**MONTREAL COGNITIVE ASSESSMENT (MOCA)**

**VISUOSPATIAL / EXECUTIVE**

Copy cube: [redacted] Draw CLOCK (Ten past eleven) (3 points): [redacted]

**NAMING**

1 [redacted] 2 [redacted] 3 [redacted]

**MEMORY**

Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

1st trial: FACE VELVET CHURCH DAISY RED 2nd trial: [redacted]

**ATTENTION**

Read list of digits (5 digit/ sec). Subject has to repeat them in the forward order: [redacted] 3 1 8 5 4 Subject has to repeat them in the backward order: [redacted] 7 4 2

Read list of letters. The subject must tap with his hand at each letter A. No points if 2 or more errors: [redacted] F B A C M N A A / X L B A F A K D E A A A / A M G F A A R

Serial 7 subtraction starting at 100: [redacted] 102 98 94 90 86 82 78 74 70 66 62 58 54 50 46 42 38 34 30 26 22 18 14 10 6 2

**LANGUAGE**

Repeat: I only know that John is the one to help today. [redacted] The cat always hid under the couch when dogs were in the room. [redacted]

Fluency / Name maximum number of words in one minute that begin with the letter F: [redacted] (N 2 H words)

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit: [redacted] train - bicycle: [redacted] watch - ruler: [redacted]

**DELAYED RECALL**

Has to recall the words: FACE VELVET CHURCH DAISY RED [redacted]

**ORIENTATION**

[redacted] Date: [redacted] Month: [redacted] Year: [redacted] Day: [redacted] Place: [redacted] City: [redacted]

**TOTAL**

5/30

► Score: 5/30\*

► Memory Register: 2

► Executive: 0/5

► Memory: 0/5

► NAB Judgment: 10/20

► Conclusion:  
Major NCD

# NL: Status Epilepticus

*refused to talk*  
*Status Epilepticus*  
*? 4 years, ? 4 years*

**MONTREAL COGNITIVE ASSESSMENT (MOCA)**

NAME: *[redacted]* Education: *[redacted]* Date of birth: *[redacted]*  
Sex: *[redacted]* DATE: *[redacted]*

**VISUOSPATIAL / EXECUTIVE**

Copy cube *[1]* Draw CLOCK (Ten past eleven) *[3 points]* *[1]* *[0]* *[0]* *1/5*

**NAMING**

*[1]* *[1]* *watch* *[1]* *2/3*

**MEMORY**

Read list of words, subject must repeat them. Do 3 trials. Do a recall after 5 minutes.

*Pt add words not given*

	FACE	VELVET	CHURCH	DAISY	RED
1st trial					
2nd trial					

*No points*

**ATTENTION**

Read list of digits (5 digit/ sec.). Subject has to repeat them in the forward order *[1] 2 1 8 5 4*  
Subject has to repeat them in the backward order *[6] 7 4 2* *1/2*

Read list of letters. The subject must tap with his hand at each letter A. No points if 2+ errors *keep tapping* *[0] FBACMNAAJKLBAFAKDEAAAJAMOFAB* *0/1*

Serial 7 subtraction starting at 100: *[0] 93* *[0] 86* *[0] 79* *[0] 72* *[0] 65* *1/3*

**LANGUAGE**

Repeat: I only know that John is the one to help today. *[1]*  
The cat always hid under the couch when dogs were in the room. *[1]* *2/2*

Fluency / Name maximum number of words in one minute that begin with the letter F *[10]* (N ≥ 15 words) *0/1*

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit *[0] train - bicycle* *[0] watch - ruler* *0/2*

**DELAYED RECALL**

	FACE	VELVET	CHURCH	DAISY	RED
Has to recall words WITH NO CUE	<i>[1]</i>	<i>[1]</i>	<i>[1]</i>	<i>[1]</i>	<i>[1]</i>
Optional					

*NO MEMORY recall* *0/5*

**ORIENTATION**

*[1]* Date *[1]* Month *[1]* Year *[1]* Day *[1]* Place *[1]* City *6/6*

*There are 3 weeks*  
*& there are 2 weeks*

**TOTAL** *12/30*  
Add 1 point if ≤ 12 yr edu

Score: 12/30\*

Executive: ↓↓↓, note TMT, clock

Attention: ↓↓

Memory: Amnesia

Conclusion:  
Major NCD

# RL: Alcoholism, End Stage Renal Disorder, failure to thrive

*alcoholism*  
*ESLO*  
*believe to know*

**MONTREAL COGNITIVE ASSESSMENT (MOCA)**

NAME: Robert Education: HS Date of birth: 1-1  
Sex: M DATE: 3/07

VISUOSPATIAL / EXECUTIVE		Copy cube		Draw CLOCK (Ten past eleven)		POINTS																				
						1/5																				
		[ ]		[ ] [ ] [ ] [ ] [ ]																						
NAMING																										
[ ] [ ] [ ]																										
MEMORY																										
Read list of words, subject must repeat them, Do 3 trials, Do a recall after 5 minutes.		<table border="1" style="width: 100%; text-align: center;"> <tr> <th></th> <th>FACE</th> <th>VELVET</th> <th>CHURCH</th> <th>DAISY</th> <th>RED</th> </tr> <tr> <td>1st trial</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2nd trial</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>						FACE	VELVET	CHURCH	DAISY	RED	1st trial						2nd trial						No points	
			FACE	VELVET	CHURCH	DAISY	RED																			
		1st trial																								
2nd trial																										
ATTENTION																										
Read list of digits (1 digit/ sec).  Read list of letters. The subject must tap with his hand at each letter A. No points if 2 errors.		Subject has to repeat them in the forward order: <u>1 2 1 8 5 4</u> Subject has to repeat them in the backward order: <u>1 7 4 2</u>					2/2																			
		Serial 7 subtraction starting at 100: <u>100</u> <u>93</u> <u>86</u> <u>79</u> <u>72</u> <u>65</u> <u>58</u>																								
LANGUAGE																										
Repeat: I only know that John is the one to help today. [ ] The cat always hid under the couch when dogs were in the room. [ ]		[ ] F B A C M N A A J K L B A F A K D E A A A J A M O F A A B					0/1																			
		4 or 3 correct subtractions: 3 pts, 2 or 2 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pt																								
Fluency / Name maximum number of words in one minute that begin with the letter F: <u>2</u> (N 2-11 words)							0/1																			
ABSTRACTION																										
Similarity between e.g. banana - orange = fruit: <u>train - bicycle</u> watch - ruler <u>DK</u>							1/2																			
DELAYED RECALL																										
Has to recall words WITH NO CUE		FACE	VELVET	CHURCH	DAISY	RED	Points for UNCUED recall only																			
		[ ]	[ ]	[ ]	[ ]	[ ]																				
Optional	Category cue																									
	Multiple choice cue																									
ORIENTATION																										
[ ] Date <u>3/7</u> [ ] Month <u>March</u> [ ] Year <u>2007</u> [ ] Day <u>7</u> [ ] Place <u>NY</u> [ ] City <u>NY</u> [ ]							1/6																			
© E. N. R. Redding MD Version November 7, 2004 www.mocatest.org						Normal ≥ 28 / 30 <b>TOTAL</b> <u>12/30</u> Add 1 point if ≤ 12 yr edu																				

Score: 12/30\*

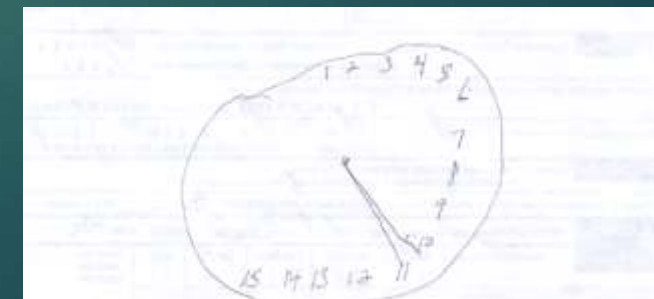
Executive: ↓↓↓

Attention: ↓↓

## Memory: Amnesia (cuing did not help)

## NAB Judgment: 11/20

Conclusion:  
Major NCD





# RF: 85 male, failure to thrive, DM

MONTREAL COGNITIVE ASSESSMENT (MOCA)

Date of birth: *1938*  
Education: *High School*  
Sex: *Male*  
NAME: *John*  
DATE: *10/10/10*

**VISUOSPATIAL / EXECUTIVE**

Copy cube: *[Hand-drawn cube]*

Draw CLOCK (Ten past eleven): *[Hand-drawn clock]*

Points: *0/5*

**NAMING**

*[Hand-drawn lion]* *[Hand-drawn rhinoceros]* *[Hand-drawn camel]*

Points: *2/3*

**MEMORY**

Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2nd trial	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Points: *No points*

**ATTENTION**

Subject has to repeat them in the forward order: *[Handwritten: 2 1 8 5 4]*

Subject has to repeat them in the backward order: *[Handwritten: 4 7 4 2]*

Points: *2/2*

Read list of letters. The subject must tap with his hand at each letter A. No points if 2 or more errors.

*[Handwritten: FBACMNAAJKLBAFAKDEAAJAMOFAA8]*

Points: *0/1*

Serial 7 subtraction starting at 100

	93	86	79	72	65
1st trial	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2nd trial	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Points: *0/3*

**LANGUAGE**

Repeat: I only know that John is the one to help today. *[Handwritten: I]*

The cat always hid under the couch when dogs were in the room. *[Handwritten: I]*

Points: *2/2*

Fluency / Name maximum number of words in one minute that begin with the letter F: *[Handwritten: 16]* (14-21 words)

Points: *2/1*

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit *[Handwritten: I]* train - bicycle = *[Handwritten: vehicle]* watch - ruler = *[Handwritten: tool]*

Points: *1/2*

**DELAYED RECALL**

	FACE	VELVET	CHURCH	DAISY	RED
Has to recall the words	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Points: *0/5*

**ORIENTATION**

Date: *10/10/10* Month: *10* Year: *2010* Day: *10* Place: *NY* City: *NY*

Points: *4/6*

**TOTAL**

*11/30*

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www.mocatest.org  
Normal 0-26/30  
Add 1 point if < 12 yrs old

APS, caregiver took over Apt. (undue influence),  
“states good memory, can care for self”

Score: 11/30\*\*

Executive: 0/5

Attention: ↓↓

Memory: 0/5 spont.

0/5 Recog.\*\*

NAB Judgment: 6/20

Conclusion:

Major NCD of Alzheimer's Type

AA: 85, AMS, episodic delirium, colon CA

MONTREAL COGNITIVE ASSESSMENT (MOCA)

Date of birth: Education: Sex: NAME: DATE:

**VISUOSPATIAL / EXECUTIVE**

Copy cube: [ ]

Draw CLOCK (Ten past eleven) (3 points): [ ]

**NAMING**

FACE: [ ] VELVET: [ ] CHURCH: [ ] DAISY: [ ] RED: [ ]

**MEMORY**

Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

1st trial: [ ] 2nd trial: [ ]

**ATTENTION**

Subject has to repeat them in the forward order: [ ] 2 1 8 5 4

Subject has to repeat them in the backward order: [ ] 7 4 2

Read list of letters. The subject must tap with his hand at each letter A. No points if 2 errors.

[ ] FBACMNAAJKBFAKDEAAAAJAMQFAAB

Serial 7 subtraction starting at 100: [ ] 93 [ ] 86 [ ] 79 [ ] 72 [ ] 65

**LANGUAGE**

Repeat: I only know that John is the one to help today. [ ]

The cat always hid under the couch when dogs were in the room. [ ]

Fluency / Name maximum number of words in one minute that begin with the letter F: [ ] 5 (N 3 or words)

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit [ ] train - bicycle [ ] watch - ruler [ ]

**DELAYED RECALL**

Has to recall the words: [ ] [ ] [ ] [ ] [ ]

**ORIENTATION**

[ ] Date: [ ] Month: [ ] Year: [ ] Day: [ ] Place: [ ] City: [ ]

TOTAL: [ ] 10/30

MMSE: 17/30\*

MoCA Score: 10/30

Executive: 0/5

Fluency: ↓↓

Memory: 0/5\*

Conclusion:  
Major NCD of Alzheimer's  
Type

JM: 36 yo, 2 y college

MONTREAL COGNITIVE ASSESSMENT (MOCA)

Date of birth: NAME: DATE: 1/16/69

Education: Sex:

**VISUOSPATIAL / EXECUTIVE**

Copy cube [ ]

Draw CLOCK (Ten past eleven) (3 points) [ ]

**NAMING**

1. Lion [ ]

2. Rhino [ ]

3. Camel [ ]

**MEMORY**

Read list of words, subject must repeat them. Do 3 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial	1/5	2/5	3/5	4/5	5/5
2nd trial	1/5	2/5	3/5	4/5	5/5

**ATTENTION**

Read list of digits (1 digit/sec). Subject has to repeat them in the forward order [ ] 2 1 8 5 4

Read list of letters. The subject must tap with his hand at each letter A. No points if 2 errors [ ] FBACMNAAJKBFAKDEAAJAMOFAB

Serial 7 subtraction starting at 100 [ ] 100 [ ] 95 [ ] 90 [ ] 85 [ ] 80

**LANGUAGE**

Repeat: I only know that John is the one to help today. [ ]

The cat always hid under the couch when dogs were in the room. [ ]

Fluency / Name maximum number of words in one minute that begin with the letter F [ ] 11 (N ≥ 10 words)

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit [ ] Pain - bicycle [ ] watch - ruler [ ]

**DELAYED RECALL**

	FACE	VELVET	CHURCH	DAISY	RED
Has to recall the words	[ ]	[ ]	[ ]	[ ]	[ ]

**ORIENTATION**

Date [ ] 1/16/69

Month [ ] 1

Year [ ] 69

Day [ ] 16

Place [ ]

City [ ]

**TOTAL**

36/30

Add 1 point if ≥ 12 yr edu

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36 yo male, hx alcohol abuse  
Hosp: AMS, multifactorial  
Encephalopathy: morbid obesity  
(360),  
hypothermia, septic shock,  
2 week coma, liver & renal failure  
Binges on weekends: 12 x 24oz  
? Anoxia

Score: 25/30

Memory: 3/5 + 1 cue

Conclusion:

WNL  
Alcohol Abuse

59 yo, WNL, Cognistat, Paranoid ideation

TEST BOOKLET  
for  
THE NEUROBEHAVIORAL  
COGNITIVE STATUS EXAMINATION  
(NCSE)

Addressograph

NAME: MS OCCUPATIONAL STATUS: \_\_\_\_\_  
AGE AND DATE OF BIRTH: 59 DATE: 4/10/09 HS  
NATIVE LANGUAGE: \_\_\_\_\_ TIME: \_\_\_\_\_  
HANDEDNESS (circle): L R EXAMINER: \_\_\_\_\_  
LEVEL OF EDUCATION: single, 1st grade, 1980 EXAMINATION LOCATION: \_\_\_\_\_

COGNITIVE STATUS PROFILE

	LOC	ORI	ATT	LANGUAGE			CONST	MEM	CALC	REASONING	
				COMP	REP	NAM				SIM	JUD
AVL RANGE	ALERT	-12-	-5X	-5X	-5X	-5X	-5X	-12-	-5X	-5X	-5X
		X			-12-	-5X					
		-10-	-6-	-3-	-11-	-7-	X	X	-3-	-5-	-1-
MILD	IMP	-8-	-4-	-4-	-8-	-5-	-3-	-6-	-2-	-4-	-3-
MODERATE		-4-	-2-	-3-	-7-	-3-	-2-	-6-	-1-	-3-	-2-
SEVERE		-4-	-0-	-2-	-5-	-2-	-0-	-6-	-0-	-2-	-1-
Write in lower scores			X				X		X		

ABBREVIATIONS

ATT - Attention	JUD - Judgment	ORI - Orientation
CALC - Calculations	LOC - Level of Consciousness	REP - Repetition
COMP - Comprehension	MEM - Memory	S - Screen
CONST - Constructions	NAM - Naming	SIM - Similarities
IMP - Impaired		

59 yo female, BA educ  
Mild Stroke 6 y previous

Brief delirium with paranoid  
Ideation following abdominal surgery

Prior MoCA = 23/30 days bef

Cognistat: WNL

Conclusion:

Resolved delirium



# Male, age 94, with 79 yo gf

MONTREAL COGNITIVE ASSESSMENT (MOCA)						NAME : _____		Date of birth : _____	
						Education : _____		DATE : _____	
VISUOSPATIAL / EXECUTIVE						Copy cube		Draw CLOCK (Ten past eleven) (3 points)	
[ ]						[ ]		[ ] Contour    [ ] Numbers    [ ] Hands	
NAMING									
[ ]						[ ]		[ ]	
MEMORY						FACE		VELVET	
Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.						CHURCH		DAISY	
						RED			
						1st trial		No points	
						2nd trial			
ATTENTION						FACE		VELVET	
Read list of digits (1 digit/ sec).						CHURCH		DAISY	
Subject has to repeat them in the forward order						RED			
Subject has to repeat them in the backward order						1st trial		2/2	
Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors						2nd trial			
						[ ] FBACMNAAJKLBFAKDEAAAAJAMOFAAAB		1/1	
Serial 7 subtraction starting at 100						[ ] 86		[ ] 79	
						[ ] 72		[ ] 65	
						4 or 5 correct subtractions: 3 pts, 2 or 3 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pt		3/3	
LANGUAGE						FACE		VELVET	
Repeat : I only know that John is the one to help today. [X]						CHURCH		DAISY	
The cat always hid under the couch when dogs were in the room. [X]						RED			
Fluency / Name maximum number of words in one minute that begin with the letter F						[ ] 13 (N ≥ 11 words)		1/1	
ABSTRACTION						FACE		VELVET	
Similarity between e.g. banana - orange = fruit						CHURCH		DAISY	
[ ] train - Bicycle						RED			
[ ] watch - ruler						1st trial		2/2	
[ ]						2nd trial			
DELAYED RECALL						FACE		VELVET	
Has to recall words WITH NO CUE						CHURCH		DAISY	
						RED			
						Category cue		Points for UNCUE recall only	
						Multiple choice cue			
Optional						1st trial		2/5	
[ ]						2nd trial			
ORIENTATION						FACE		VELVET	
[ ] Date						CHURCH		DAISY	
[ ] Month						RED			
[ ] Year						1st trial		1/6	
[ ] Day						2nd trial			
[ ] Place						[ ] City			
[ ]						TOTAL		25/30	
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Age 94  
Therapist: ?  
Memory

Score: 25/30

Executive 3/5,  
TMT = 0  
Memory 2/5 + 1

## Recommendation:

# Full NP testing

# 60 yo, schizophrenia, delirium

## MONTREAL COGNITIVE ASSESSMENT (MOCA)

NAME : P. [redacted] alt 9/10/48  
 Education : [redacted] Date of birth : 1/2/09  
 Sex : [redacted] DATE : 1/2/09

### VISUOSPATIAL / EXECUTIVE

Copy cube

Draw CLOCK (Ten past eleven) (3 points)

[ ] Contour
[ ] Numbers
[ ] Hands

POINTS

25

### NAMING

[ ]

[ ]

[ ]

POINTS

3

### MEMORY

Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial			4	3	5
2nd trial	1	2	5	3	4

No points

2

POINTS

2

### ATTENTION

Read list of digits (1 digit/ sec.). Subject has to repeat them in the forward order. Subject has to repeat them in the backward order.

Read list of letters. The subject must tap with his hand at each letter A. No points if 2 or more errors.

Serial 7 subtraction starting at 100

[ ] FBACMNAAJKIBAFKDEAAAJAMOFAB

93 86 79 72 66 61 55

POINTS

2

### LANGUAGE

Repeat : I only know that John is the one to help today. The cat always hid under the couch when dogs were in the room.

Fluency / Name maximum number of words in one minute that begin with the letter [ ] (N=11 words)

[ ]

[ ]

POINTS

2

### ABSTRACTION

Similarity between e.g. banana - orange = fruit [ ] train - bicycle [ ] watch - ruler measuring

[ ]

[ ]

POINTS

2

### DELAYED RECALL

How to recall words WITH NO CUE

	FACE	VELVET	CHURCH	DAISY	RED
Category cue					
Multiple choice cue					

Points for UNCLUED recall only

4/5

POINTS

5

### ORIENTATION

[ ] Date 2/1/09 [ ] Month 1 [ ] Year 2009 [ ] Day 1 [ ] Place [redacted] [ ] City [redacted]

POINTS

5

POINTS

5

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[www.mocatest.org](http://www.mocatest.org)

Normal 3.26 / 30

TOTAL 15 / 30

Add 1 point if 5-12 yr old

60 yo female, 1 y college  
Schizophrenia, 30 y work

# Delirium

## Paranoid perceptions

Prior Moca 15/30;  
Mem 0/5 +4 cue

Score: 15/30  
Memory 0/5 + 4 cue

## Conclusion:

### Unresolved delirium

Name: Mediana Date of birth: 1/1/2000  
 Education: 7 Sex: M DATE: 1/1/2000

## MONTREAL COGNITIVE ASSESSMENT (MOCA)

### VISUOSPATIAL / EXECUTIVE

[ ]

[ ]

Copy cube

Draw CLOCK (Ten past eleven) (3 points)

[ ] [ ] [ ]

Contour      Numbers      Hands

POINTS

5/5

### NAMING

[ ] [ ] [ ]

### MEMORY

Read list of words, subject must repeat them. Do 3 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial					
2nd trial					

No points

### ATTENTION

Read list of digits (5 digit/ sec.). Subject has to repeat them in the forward order [ ] 3 1 8 5 4  
 Subject has to repeat them in the backward order [ ] 7 4 2

Read list of letters. The subject must tap with his hand at each letter A. No points if 2 or more errors

[ ] FBACMNAAJKLBAFAKDEAAAJAMOFBAAB

Serial 7 subtraction (starting at 100)

100	93	86	79	72	65
-----	----	----	----	----	----

2/2

### LANGUAGE

Repeat: I only know that John is the one to help today. [ ]  
 The cat always hid under the couch when dogs were in the room. [ ]

Fluency / Name maximum number of words in one minute that begin with the letter F [ ] (N ≥ 10 words)

### ABSTRACTION

Similarity between e.g. banana - orange = fruit [ ] train - bicycle [ ] watch - ruler

### DELAYED RECALL

Has to recall words WITH NO CUE

	FACE	VELVET	CHURCH	DAISY	RED
1st trial					
2nd trial					

Points for UNCLUE recall only

### ORIENTATION

Date [ ]/ [ ]/ [ ] Month [ ] Year [ ] Day [ ] Place [ ]

TOTAL: 23/30

Add 1 point if 2 or 3 of abc

www.mocotest.org

Referral made for N. Patel - case if you don't think appropriate

Memory: 0/5, no cue help

## Recommendation:

# MCI

## Full NP testing

# 77yo, attended Lowell HS, Vicodin Overdose or not?

77yo, 08/18/30, 187cm, 80kg, Mar - Sep, 50lb/55lb  
HS Lowell - 41, off work

## COGNISTAT

(THE NEUROBEHAVIORAL COGNITIVE STATUS EXAMINATION)

NAME: [REDACTED] OCCUPATION: [REDACTED]  
AGE: 77 DATE OF BIRTH: 2/18/30 DATE LAST WORKED: [REDACTED]  
HANDEDNESS (circle): Left Right DATE OF INJURY (if any): [REDACTED]  
NATIVE LANGUAGE: [REDACTED] EXAM LOCATION: [REDACTED]  
TOTAL YEARS EDUCATION: [REDACTED] DATE: 4/9/07 TIME: [REDACTED]

### COGNITIVE STATUS PROFILE

	LOC	ORI	ATT	LANGUAGE			CONST	MEM	CALC	REASONING	
				COMP	REP	NAM				SIM	JUD
† AVG. RANGE	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20
	20	20	20	20	20	20	20	20	20	20	20
	10	10	10	10	10	10	10	10	10	10	10
	0	0	0	0	0	0	0	0	0	0	0
MILD	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10
MODERATE	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20
SEVERE	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30

Write in lower scores

ABBREVIATIONS

ATT - Attention	JUD - Judgment	ORI - Orientation
CALC - Calculations	LOC - Level of Consciousness	REP - Repetition
COMP - Comprehension	MEM - Memory	S - Screen
CONST - Constructions	NAM - Naming	SIM - Similarities
IMP - Impaired		

\* The validity of this examination depends on administration in strict accordance with the Cognistat Manual.  
† For adolescents and individuals older than 65, see normative information on pages 12 and 13 of the Cognistat Manual (updated edition from 2001).  
Note: Not all brain lesions produce cognitive deficits that will be detected by Cognistat. Normal scores, therefore, cannot be taken as evidence that brain pathology does not exist. Similarly, scores falling in the mild, moderate, or severe range of impairment do not necessarily reflect brain dysfunction (see section of the Cognistat Manual entitled "Cautions in Interpretations").  
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The Northern California  
Neurobehavioral Group, Inc.  
P.O. Box 460  
Emeryville, CA 94608

Cognistat: Impaired

Repetition  
Block Design  
Memory \*\*\*  
Similarities  
Judgment

Conclusion:  
Major NCD

Supervision of  
Medication



# 71 yo AA male, 2 MAs

*Name - don't see shot*

## TEST BOOKLET

for  
THE NEUROBEHAVIORAL  
COGNITIVE STATUS EXAMINATION  
(NCSE)

---

NAME: J D ADDRESSOGRAPH: \_\_\_\_\_  
 AGE AND DATE OF BIRTH: 71 OCCUPATIONAL STATUS: \_\_\_\_\_  
 NATIVE LANGUAGE: \_\_\_\_\_ DATE: \_\_\_\_\_  
 HANDEDNESS (circle): L R TIME: \_\_\_\_\_  
 LEVEL OF EDUCATION: 2 MAs EXAMINER: \_\_\_\_\_  
 EXAMINATION LOCATION: \_\_\_\_\_

---

### COGNITIVE STATUS PROFILE

	LOC	ORI	ATT	LANGUAGE			CONST	MEM	CALC	REASONING	
				COMP	REP	NAM				SIM	JUD
Avg. Range	-10	-10	-10	-5	-5	-5	-5	-12	-14	-8	-8
MILD	-10	-10	-10	-5	-5	-5	-5	-10	-10	-5	-5
MODERATE	-10	-10	-10	-5	-5	-5	-5	-10	-10	-5	-5
SEVERE	-10	-10	-10	-5	-5	-5	-5	-10	-10	-5	-5

*can't do T*

Write in lower scores

ATT - Attention	JUD - Judgment	ORI - Orientation
CALC - Calculations	LOC - Level of Consciousness	REP - Repetition
COMP - Comprehension	MEM - Memory	S - Screen
CONST - Constructions	NAM - Naming	SIM - Similarities
IMP - Impaired		

\*The validity of this examination depends on administration in strict accordance with the NCSE Manual.  
 †For patients over age 65 the average range extends to the "mild impairment level" for Constructions, Memory and Similarities.  
 Note: Not all brain lesions produce cognitive deficits that will be detected by the NCSE. Normal scores, therefore, cannot be taken as evidence that brain pathology does not exist. Similarly, scores falling in the mild, moderate, or severe range of impairment do not necessarily reflect brain dysfunction (see the section of the NCSE Manual entitled "Cautions in Interpretation").  
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The Northern California

71 yo AA male, retired teacher, ESRD

Fell out of bed, trapped

Between dialysis machine & bed  
x 2 days; ants; wife downstairs

Prior MoCAs: 16/29; 20/30; Mem 3/5  
? Can he do peritoneal (at home) dialysis alone

Cognistat:

Comprehension: 2 step only

Block Design: 0/3

Memory: 0/4 + 3 cueing

Visual memory: poor

Similarities: 2/4

Conclusion:

MCI

No peritoneal dialysis

# 56 yo male, post CABG

*Motipara, Singh*

# MONTREAL COGNITIVE ASSESSMENT (MOCA)

<b>VISUOSPATIAL / EXECUTIVE</b>		NAME: <u>L.A.</u> Education: <u>Ho</u> Sex: <u>M</u> Date of birth: <u>3/13/09</u> DATE: <u>3/13/09</u>		points
 End Begin		Copy cube (3 points)	Draw CLOCK (last past eleven) (3 points)	4/5
<b>NAMING</b>		Contour Numbers Hands		
 [ ]	 [ ]	 [ ]		3/3
<b>MEMORY</b>		FACE VELVET CHURCH DAISY RED		
Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.		list trial		No points
2nd trial		✓ ✓ ✓ ✓ ✓		
<b>ATTENTION</b>		Subject has to repeat them in the forward order Subject has to repeat them in the backward order		
Read list of digits (4 digit/sec).		[ ] 2 1 8 5 4 [ ] 7 4 2		2/2
Read list of letters. The subject must tap with his hand at each letter A. No points if 2 or more errors. <i>the very hard</i>		[ ] T B A C M N A A I K L B A F A K D E A A A J A M O F A A B		11/1
Serial 7 subtraction starting at 100		[ ] 99 [ ] 86 [ ] 79 [ ] 72 [ ] 65		3/5
<b>LANGUAGE</b>		Repeat : Only know that John is the one to help today. [ ] I know that [ ] is true I to keep [ ] The cat always hid under the couch when dogs were in the room. [ ] [ ] (N ≥ 11 words)		5/1
<b>ABSTRACTION</b>		Similarity between e.g. banana - orange > fruit [ ] train - bicycle [ ] watch - ruler [ ] nose - eye		6/9
<b>DETAILED RECALL</b>		FACE VELVET CHURCH DAISY RED		5/5
Recall words without cue		[ ] [ ] [ ] [ ] [ ]		
Cueing cue		[ ] [ ] [ ] [ ] [ ]		
Multiple choice cue		[ ] [ ] [ ] [ ] [ ]		
<b>ORIENTATION</b>		[ ] Date [ ] Month [ ] Year [ ] Day [ ] Place [ ] City		6/6

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*Singh Motipara*

56 yo male, sp CABG, episode of agitation  
req restraints; anx disorder; hx alcohol  
abuse; hoarder; odd & eccentric; tax work

Prior MoCA: 23/30; Exec 2/5; Mem 4/5

Current Score: 27/30, WNL

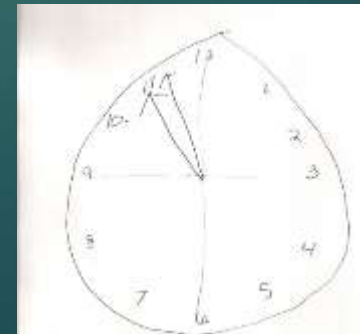
Executive: 4/5 (clock)

## Fluency: 1/3

Memory: 5/5

## Conclusion: Cognition OK;

## Psychiatric follow up



# 70 yo, computers, cardiovascular

TEST BOOKLET  
for  
THE NEUROBEHAVIORAL  
COGNITIVE STATUS EXAMINATION  
(NCSE)

NAME: CH ADDRESS: 70 yo CV  
AGE AND DATE OF BIRTH: 70 yo OCCUPATIONAL STATUS: \_\_\_\_\_  
NATIVE LANGUAGE: \_\_\_\_\_ DATE: \_\_\_\_\_  
HANDEDNESS (circle): L R TIME: \_\_\_\_\_  
LEVEL OF EDUCATION: \_\_\_\_\_ EXAMINER: \_\_\_\_\_  
EXAMINATION LOCATION: \_\_\_\_\_

COGNITIVE STATUS PROFILE

	LOC	ORI	ATT	LANGUAGE			CONST	MEM	CALC	REASONING	
				COMP	REF	NAM				SIM	JUD
ALL	-12-	-12-	-12-	-12-	-12-	-12-	-12-	-12-	-12-	-12-	-12-
MILD	-12-	-12-	-12-	-12-	-12-	-12-	-12-	-12-	-12-	-12-	-12-
MODERATE	-12-	-12-	-12-	-12-	-12-	-12-	-12-	-12-	-12-	-12-	-12-
SEVERE	-12-	-12-	-12-	-12-	-12-	-12-	-12-	-12-	-12-	-12-	-12-

Write in lower scores

ABBREVIATIONS

ATT - Attention	JUD - Judgment	ORI - Orientation
CALC - Calculations	LOC - Level of Consciousness	REF - Repetition
COMP - Comprehension	MEM - Memory	S - Screen
CONST - Constructions	NAM - Naming	SIM - Similarities
IMP - Impaired		

70 yo male, gifted computer career “genius”  
CV hx: CAD with stent, MI, afib, SOB,  
fluid in lungs, old CVA, renal insuff, DM,  
SI, “not worth living”, no plan, irritable  
Lives alone

Cognistat:

Memory: 0/4, no cueing help  
Judgment: 0/3

Partial MoCA:  
OK clock, poor trails  
Fluency: 5 in 1 min

Conclusion:  
Cognitive Disorder  
Needs Assisted Living

72 yo, college educ., APS

**APS Conserve** **ELM**

**MONTREAL COGNITIVE ASSESSMENT (MOCA)** NAME: College Education: College Date of birth: 11/1/07  
Sex: Male DATE: 11/1/07

**VISUOSPATIAL / EXECUTIVE**

Copy cube ☐ Draw CLOCK (Ten past eleven) (3 points) ☐

Points: 1/5

**NAMING**

☐ ☐ ☐

Points: 2/3

**MEMORY**

Read list of words, subject must repeat them. Do 3 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial					
2nd trial					

No points

**ATTENTION**

Read list of digits (1 digit/sec). Subject has to repeat them in the forward order ☐ 2 1 8 5 4  
Subject has to repeat them in the backward order ☐ 7 4 2

Points: 2/2

Read list of letters. The subject must tap with his hand at each letter A. No points if a 2 error ☐ FBACMNAAJKLBFAKDEAAAAJAMOFAB

Points: 1/1

Serial 7 subtraction starting at 100 ☐ 99 ☐ 86 ☐ 79 ☐ 72 ☐ 65

4 or 5 correct subtractions: 3 pts, 3 or 4 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pt

Points: 0/3

**LANGUAGE**

Repeat: I only know that John is the one to help today. ☐

The cat always hid under the couch when dogs were in the room. ☐

Points: 2/2

Fluency / Name maximum number of words in one minute that begin with the letter P ☐ (N 2 n words) 1

Points: 1/1

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit ☐ train - bicycle ☒ watch - ruler

Points: 1/2

**DELAYED RECALL**

Has to recall words WITH NO CUE ☐ FACE ☐ VELVET ☐ CHURCH ☐ DAISY ☐ RED ☐

Points for UNCLUED recall only

Optional: Category cue ☐ Multiple choice cue ☐

**ORIENTATION**

☒ Date ☒ Month ☒ Year ☒ Day ☒ Place ☒ City

Points: 6/6

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Normal 28 / 30  
TOTAL 14/30  
Add 1 point if < 12 yr edu

Score: 14/30

Executive: 1/5

Memory: 0/5

Conclusion:  
Major NCD



# 70 yo, HS ESL teacher, Vietnamese

Vietnamese, Stroke

Tên: \_\_\_\_\_ Ngày sinh: \_\_\_\_\_  
Trình độ học vấn: \_\_\_\_\_ Giới tính: Phụ Ngày: \_\_\_\_\_

**Đề Án Thần Định về sự nhận thức Montreal (MOCA)**

Khả năng thực hiện	Điểm
 Chấm dứt Bắt đầu [ ]	[ ]
 Vẽ hình khối [ ]	[ ]
 Vẽ đồng hồ (11 giờ 10 phút) (3 điểm) Đường vòng [ ] Cây kim [ ]	[ ]

**Đặt tên**

Đặt tên	Điểm
 [ ]	[ ]
 [ ]	[ ]
 [ ]	2/3

**Trí nhớ**

Trí nhớ	Điểm
Đọc 1 loạt chữ, bạn hãy lặp lại. Có thể thử hai lần. Lần thứ hai chờ 5 phút.	[ ]
Khuôn mặt [ ]	[ ]
Nhung [ ]	[ ]
Nhà thờ [ ]	[ ]
Bóng cục [ ]	[ ]
Màu đỏ [ ]	[ ]
Không Co điểm	[ ]

**Sự chú ý**

Hãy đọc danh sách (của) những chữ số [L] chữ mỗi giây đồng hồ. [ ] 2 1 8 5 4  
Đề tài phải lặp lại họ trong mệnh lệnh ngược lại. [ ] 7 4 2  
Đọc danh sách (của) những chữ này. Vẽ nhẹ với bút tay tại mỗi chữ A. Không cho điểm nếu sai hơn 2 câu.  
[ ] P B A C M N A A J K L B A F A K O E A A A J A M O F A A B

Tuần tự 7 chữ đi bắt đầu tại 100 [ ] 93 [ ] 85 [ ] 79 [ ] 72 [ ] 65  
Trình 4 hay 5: cho 3 điểm, 2 hay 3: cho 2 điểm, 1: cho 1 điểm, 0: cho 0 điểm

**Ngôn ngữ**

Vấn nạn: Tôi chỉ biết rằng tôi là 1 người giúp đỡ hơn nay [ ]  
Con nào luôn luôn trốn dưới gầm giường khi có chó trong phòng [ ]  
Lưu loát: trong 3 phút, xin vẽ chữ mà bắt đầu với chữ F [ ] (Nó 11 câu)

**Ý niệm**

Sự đồng nhất chống lại nếu giữa chuỗi và cam [ ] Xe bus - Xe đạp [ ] Đồng hồ - Cây thước [ ]

**Cặp lại Trí hoàn**

Cặp lại Trí hoàn	Điểm
Phải nhớ lại những chữ không có âm điệu	[ ]
Khuôn mặt [ ]	[ ]
Nhung [ ]	[ ]
Nhà thờ [ ]	[ ]
Bóng cục [ ]	[ ]
Màu đỏ [ ]	[ ]
Điền chỉ những câu mà không có âm điệu	[ ]

**Để cho chọn**

Để cho chọn	Điểm
Âm điệu một lần	[ ]
Âm điệu nhiều lần	[ ]

**Sự định hướng**

Sự định hướng	Điểm
[ ] Ngày [ ] Tháng [ ] Năm [ ] Ngày trong tuần [ ]	[ ]
Chỗ [ ] Thành phố [ ]	[ ]

**Tổng cộng**

Tổng cộng [ ]/30

Tham 3 điểm nếu học dưới 12

www.mocatest.org

4/20

70 yo Vietnamese, BA educ  
HS ESL teacher  
Cerebellar CVA

Score: 4/20

Motor weakness  
Memory: 0/5 + 1 cue

Conclusion:

Vascular Major NCD

51 yo, dropped off in ED by wife, who then disappeared

F.A.

**MONTREAL COGNITIVE ASSESSMENT (MOCA)**

**VIOSPATIAL / EXECUTIVE**

Date of birth : 1/15/57  
 Education : 6  
 Sex : M

NAME :  
 DATE : 5/23/08

Copy cube

Draw CLOCK (Ten past eleven)  
 (5 points)  
 Four:30

End (E) → A → 2 → B → Y → D → C → 4 → 3

Begin (Y)

Contour Numbers Hands

1/5

**NAMING**

lion rhino camel

1/3

**MEMORY** Read list of words, subject must repeat them. Do 3 trials. Do a recall after 5 minutes.

FACE	VELVET	CHURCH	DAISY	RED
1st trial				
2nd trial				

Picture

No points

**ATTENTION**

Subject has to repeat them in the forward order [ ] 2 1 8 4

Read list of digits (1 digit/sec.) Subject has to repeat them in the backward order [ ] 7 4 2

Read list of letters. The subject must tap with his hand at each letter A. No pauses if 2 = errors

[ ] F B A C M N A A I K L B A F A K D E A A A A I A M O F A A B

Serial 7 subtraction starting at 100 [ ] 93 [ ] 84 [ ] 75 [ ] 71 [ ] 65

4 or 5 correct subtractions: 3 pts, 3 or 4 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pt

0/2  
0/1  
X/3

**LANGUAGE** Repeat : I only know that John is the one to help today. [ ]

The cat always hid under the couch when dogs were in the room. [ ]

Fluency / Name maximum number of words in one minute that begin with the letter F [ ] 1 (N ≥ 2 in words)

X/3  
0/1

**ABSTRACTION** Similarity between e.g. banana - orange = fruit [ ] train - bicycle [ ] watch - ruler

0/2

**DELAYED RECALL** AM FACE VELVET CHURCH DAISY RED

Has to recall the words [ ] [ ] [ ] [ ] [ ]

0/5

**ORIENTATION** [ ] Date [ ] Month [ ] Year [ ] Day [ ] Place [ ] City

2/6

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 www.mocatest.org

How to score = 6/4  
 M told forget + wife

Normal ≥ 26 / 30

**TOTAL** 4/30

Add 1 point if ≤ 12 yrs old

May to try;

51 yo, Phil male, janitor, 6<sup>th</sup> grade

Dxs: MS, LF CVA, atrial fib,  
vascular Major NCD,  
pseudobulbar,  
spastic hemiplegia  
Claims: no med ill, no klg

Score: 4/25

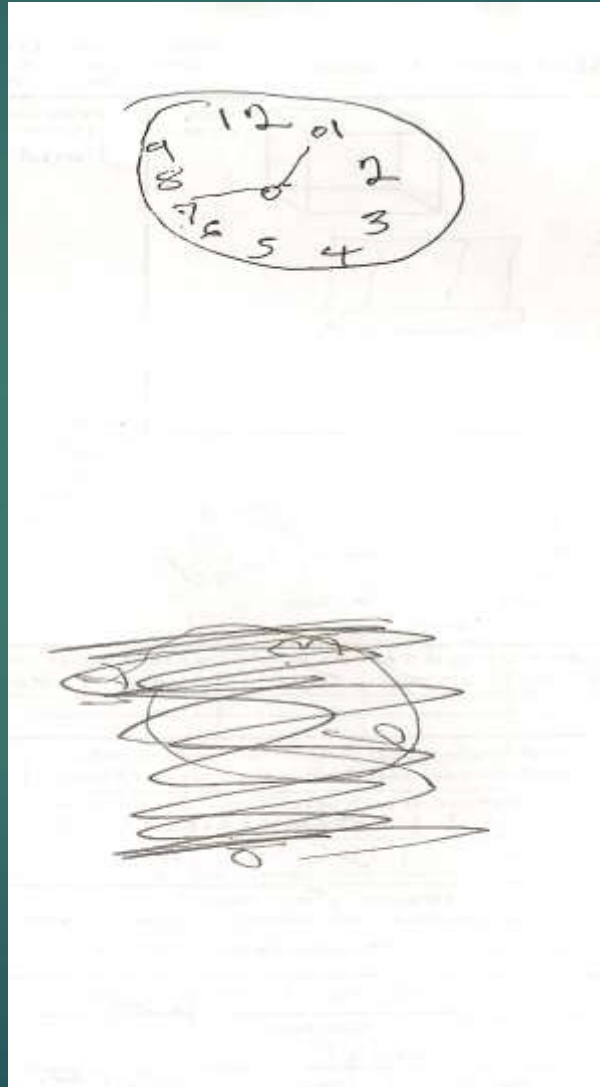
Executive: 1/5

Memory 0/5

## Conclusions:

## Vascular Major NCD Lacks capacity

# His Clock



AS: age 33, pregnant, delirium

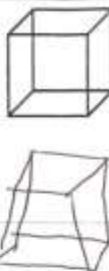
Name: Math & Fredrick - Robin Date of birth: 7/5 Education: Grade 3


**MONTREAL COGNITIVE ASSESSMENT (MOCA)**

Sex: Male DATE: 2/8/8

---

**VISUOSPATIAL / EXECUTIVE**



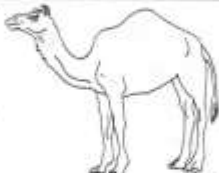
Copy cube: 

Draw CLOCK (Ten past eleven) (3 points): 

Points: 5/5

---

**NAMING**

Points: 3/3

---

**MEMORY**

Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2nd trial	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

No points

---

**ATTENTION**

Subject has to repeat them in the forward order: 2 1 8 5 4  
 Subject has to repeat them in the backward order: 4 7 4 3

Read list of digits (1 digit/sec).

Read list of letters. The subject must tap with his hand at each letter A. No points if > 2 errors: FBACMNAAIKLBFAFAKDEAAALAMQFAAB

Serial 7 subtraction starting at 100: 95 87 84 86 78 77 75 (6 correct subtractions: 3 pts, 5 or 6 correct: 2 pts, 4 correct: 1 pt, 0 correct: 0 pts)

Points: 2/2

---

**LANGUAGE**

Repeat: I only know that John is the one to help today. [ ]  
 The cat always hid under the couch when dogs were in the room. [ ]

Fluency / Name maximum number of words in one minute that begin with the letter F: 5 (N > 11 words)

Points: 0/2

---

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit [ ] train - bicycle [ ] watch - ruler [ ]

Points: 2/2

---

**DELAYED RECALL**

	FACE	VELVET	CHURCH	DAISY	RED
Has to recall the words	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Points: 3/3

---

**ORIENTATION**

Date: 2/8 Month: 1/7 Year: 1/7 Day: 1 Place: City

Points: 3/6

---

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Normal < 36 / 30  
 44/reading

TOTAL: 23/30  
 Add 1 point if < 12 yr old

4/10/2010

- ▶ Hx: pregnant, methadone (for Crohn's) addiction + prednisone
- ▶ Score: 22/30\*
- ▶ Poor fluency & sentence repetition
- ▶ Executive: 5/5
- ▶ Memory: 3/5, 5 with cue
- ▶ Conclusion:

# Resolved Delirium

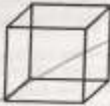


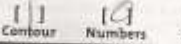
XX: 79 yo physician, intubed

MONTREAL COGNITIVE ASSESSMENT (MOCA)




NAME : \_\_\_\_\_ Education : \_\_\_\_\_ Date of birth : \_\_\_\_\_  
Sex : \_\_\_\_\_ DATE : \_\_\_\_\_

**VISUOSPATIAL / EXECUTIVE**

Copy cube:  ☐ [ ]

Draw CLOCK (Ten past eleven) (3 points):  ☐ [ ]

**NAMING**

 ☐ [ ]  ☐ [ ]  ☐ [ ] 3/3

**MEMORY**

Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial					
2nd trial					

**ATTENTION**

Read list of digits (1 digit/sec). Subject has to repeat them in the forward order. ☒ 2 1 8 5 4

Subject has to repeat them in the backward order. ☐ 7 4 2

Read list of letters. The subject must tap with his hand at each letter A. No points if 2 or more errors. ☐ F B A C M N A A J K L B A F A K D E A A A J A M O F A A B

Serial 7 subtraction starting at 100. ☒ 93 ☐ 86 ☐ 79 ☐ 72 ☐ 65

4 or 3 correct subtractions: 3 pts, 2 or 3 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pt. 4/3

**LANGUAGE**

Repeat: I only know that John is the one to help today. ☐ [ ]

The cat always hid under the couch when dogs were in the room. ☐ [ ]

Fluency / Name maximum number of words in one minute that begin with the letter F. ☐ [ ] (N=2 in words)

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit. ☐ train - bicycle ☐ watch - ruler 2/2

**DELAYED RECALL**

Has to recall words WITH NO CUE. ☐ FACE ☒ VELVET ☐ CHURCH ☐ DAISY ☒ RED

Optional: Category cue ☐ Multiple choice cue ☒ Points for UNCLUED recall only 2/5

**ORIENTATION**

Date: ☐ / ☐ / ☐ Year: ☐ Day: ☐ Place: ☐ City: ☐ 2/2

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Normal > 26 / 30 TOTAL: 26 / 30

Add 1 point if < 18 yr old.

79 yo MD, Parkinsonism  
Intubed; testy written  
responses

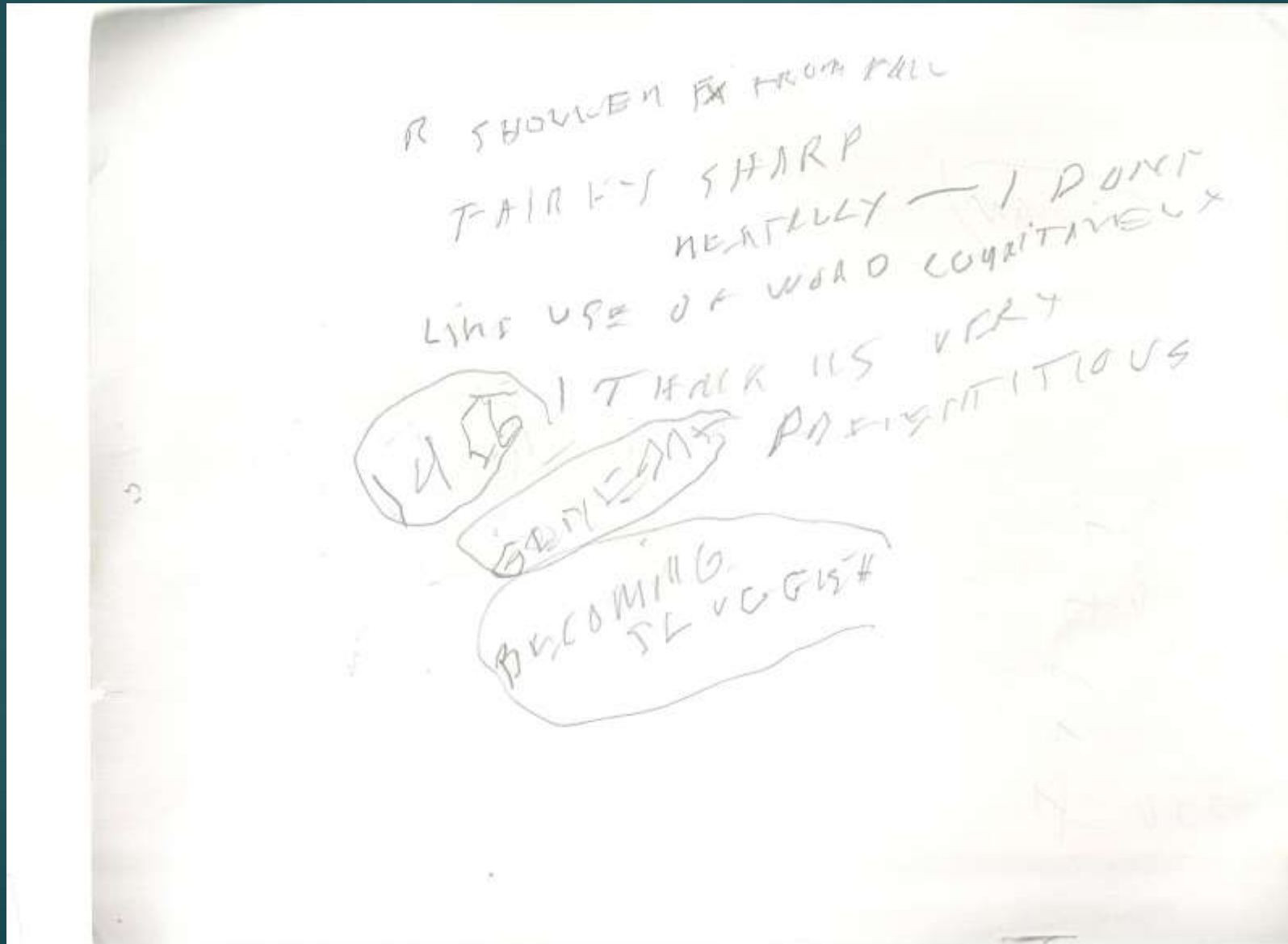
Delirium, Paranoid Prior  
? Capacity for medical  
decisions

Memory 2/5 +3 cue

Conclusion:

Resolved Delirium  
Cognitive Disorder  
Has Capacity  
Full NP testing recom

XX: His writing: My use of word "Cognitive" = Pretentious



# 72 yo, MA in history

**MONTREAL COGNITIVE ASSESSMENT (MOCA)**

Date of birth: 72 Education: MA NAME: Sex: DATE:

**VISUOSPATIAL / EXECUTIVE**

Copy cube: [ ]

Draw CLOCK (Ten past eleven): [ ]

Points: 1/5

**NAMING**

1. [ ] 2. [ ] 3. [ ]

Points: 3/3

**MEMORY**

Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

1st trial: FACE VELVET CHURCH DAISY RED

2nd trial: [ ]

Points: No points

**ATTENTION**

Read list of digits (1 digit/sec). Subject has to repeat them in the forward order.

1 2 3 4 5 6 7 8 9 10

Points: 3/2

Read list of letters. The subject must tap with his hand at each letter A. No points if 2 or more.

[ ] FBACMNAAILKLBATKDEAAAAJAMQFAAB

Points: 0/1

Serial 7 subtraction starting at 100. [ ] 93 [ ] 86 [ ] 79 [ ] 72 [ ] 65

Points: 0/3

**LANGUAGE**

Repeat: I only know that John is the one to help today. [ ]

Points: 0/2

Fluency / Name maximum number of words in one minute that begin with the letter F. [ ] (N=10 words)

Points: 0/1

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit. [ ] train - bicycle = watch - ruler

Points: 1/2

**DELAYED RECALL**

FACE VELVET CHURCH DAISY RED

Points: 1/5

**ORIENTATION**

Date: [ ]/ [ ]/ [ ]

Month: [ ]

Year: [ ]

Day: [ ]

Place: [ ]

City: [ ]

Points: 4/6

**TOTAL**

12/29

Normal > 26/30

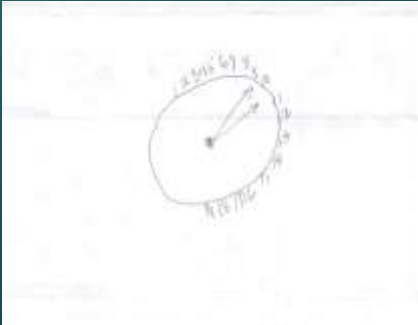
Man

Kawee SF

Score: 12/29\*

Executive: 1/5 – Note  
Serial Sevens  
Memory: 1/5

Conclusion:  
Major NCD



1<sup>st</sup> : BG: 62 yo AA woman, Total Global Amnesia?

Sudden AMS at work,  
Hotel room supervisor,  
5 hours total amnesia,  
MRI -, EEG -

Score: 6/30\*

Executive: 1/5

Language: ↓

Memory: 0/5 spont.

0/5 Recog\*

Orientation: 2/6

Conclusion:  
TGA, Major NCD?

**MONTREAL COGNITIVE ASSESSMENT (MOCA)**

NAME: [redacted] Education: [redacted] Date of birth: 03/11/55  
Sex: F DATE: 11/19/08

**VISUOSPATIAL / EXECUTIVE**

Copy cube [0] Draw CLOCK (Ten past eleven) [1] Points: 1/5

**NAMING**

1/1 1/1 1/1 3/3

**MEMORY**

	FACE	VELVET	CHURCH	DAISY	RED	No. points
1st trial						
2nd trial						

**ATTENTION**

Read list of digits (5 digits inc.) Subject has to repeat them in the forward order [0] 2 1 8 5 4 [0/2]  
Subject has to repeat them in the backward order [0] 7 4 2 [0/2]

Read list of letters. The subject must tap with his hand at each letter A. No point if 0 is correct [0] FBACMNAAJKBFAFANDEAAAAJAMOTFAAB [0/1]

Serial 7 subtraction starting at 100 [0] 98 [0] 86 [0] 79 [0] 71 [0] 65 [0/3]  
4 or 5 correct subtractions: 3 pts, 3 or 2 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pt

**LANGUAGE**

Repeat: I only know that John is the one to help today. [0] The cat always hid under the couch when dogs were in the room. [0] [0/2]

Fluency / Name machines in number of words in one minute that begin with the letter F [0] 5 (N 2 or words) [0/1]

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit [0] train - bicycle [0] watch - ruler [0/2]

**DELAYED RECALL**

	FACE	VELVET	CHURCH	DAISY	RED	Points for UNCLUED recall only
1st trial						
2nd trial						

Optional: Category cue: [0] Multiple choice: [0]

**ORIENTATION**

[0] Date [0] Month [0] Year [0] Day [1] Place [1] City [0/6]

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Add 1 point if ≥ 12 yr old

2<sup>nd</sup> : BG: 4 days later

TEST BOOKLET  
for  
THE NEUROBEHAVIORAL  
COGNITIVE STATUS EXAMINATION  
(NCSE)

36 1/19/09

Addressograph: 6290 AA

NAME: \_\_\_\_\_ OCCUPATIONAL STATUS: \_\_\_\_\_  
AGE AND DATE OF BIRTH: \_\_\_\_\_ DATE: \_\_\_\_\_  
NATIVE LANGUAGE: \_\_\_\_\_ TIME: \_\_\_\_\_  
HANDEDNESS (circle): L R EXAMINER: \_\_\_\_\_  
LEVEL OF EDUCATION: \_\_\_\_\_ EXAMINATION LOCATION: \_\_\_\_\_

COGNITIVE STATUS PROFILE

45-74

	LOC	ORI	ATT	LANGUAGE			CONST	MEM	C-IC	REASONING	
				COMP	REP	NAM				SIM	JUD
TALENT RANGE											
MILD	IMP	4	5	X	3	3	3	3	3	X	3
MODERATE		3	3	3	3	3	3	3	3	3	3
SEVERE	4	4	4	3	3	3	3	3	3	3	3

Write in lower scores

ABBREVIATIONS

ATT	Attention	JUD	Judgment	C-IC	Orientation
C-IC	Calculation	LOC	Level of Consciousness	REP	Repetition
COMP	Comprehension	MEM	Memory	S	Scenes
CONST	Concentration	NAM	Naming	SIM	Similarities
IMP	Impaired				

\*The validity of this examination depends on administration in strict accordance with the NCSE Manual.

†The patient's score on the average range should be the "mild impairment" level for Comparison to Memory and Similarities.

Note: Not all brain lesions produce cognitive deficits that will be detected by the NCSE. Some lesions, therefore, cannot be taken as evidence that brain pathology does not exist. Similarly, scores falling in the mild, moderate, or severe range of impairment do not necessarily reflect brain dysfunction (see the section of the NCSE Manual entitled "Cautions in Interpretation").

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The Northern California  
Neurobehavioral Comp. Inc.  
P.O. Box 460  
Fairfax, CA 94978  
Tel. (415) 433-6000

2 days later:

MoCA 12/30  
(executive & memory)

4 days later:

Cognistat:

Memory: ↓↓

Math: ↓↓

Conclusion:  
Cognitive Disorder  
(Amnesia)



# 72 yo woman, no pants

**COGNISTAT**  
(THE NEUROBEHAVIORAL COGNITIVE STATUS EXAMINATION)

NAME: A. [REDACTED] A. [REDACTED] OCCUPATION: \_\_\_\_\_  
AGE: 72 DATE OF BIRTH: \_\_\_\_\_ DATE LAST WORKED: \_\_\_\_\_  
HANDEDNESS (circle): Left Right DATE OF INJURY (if any): \_\_\_\_\_  
NATIVE LANGUAGE: \_\_\_\_\_ EXAM LOCATION: \_\_\_\_\_  
TOTAL YEARS EDUCATION: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

**COGNITIVE STATUS PROFILE**

	LOC	ORI	ATT	LANGUAGE			CONST	MEM	CALC	REASONING	
				COMP	REF	NAM				SIM	JUD
†AVG RANGE	10-12	10-12	10-12	10-12	10-12	10-12	10-12	10-12	10-12	10-12	10-12
MILD	-10-	-8-	-5-	-10-	-9-	-1-	-3-	-8-	-1-	-4-	-3-
MODERATE	-6-	-6-	-3-	-3-	-7-	-3-	-2-	-6-	-1-	-3-	-2-
SEVERE	-4-	-1-	-1-	-2-	-3-	-2-	-4-	-6-	-6-	-4-	-1-

Write in lower scores

ABBREVIATIONS

ATT	=	Attention	JUD	=	Judgment	ORI	=	Orientation
CALC	=	Calculations	LOC	=	Level of Consciousness	REF	=	Repetition
COMP	=	Comprehension	MEM	=	Memory	S	=	Screen
CONST	=	Constructions	NAM	=	Naming	SIM	=	Similarities
IMP	=	Impaired						

\* The validity of this examination depends on administration in strict accordance with the Cognistat Manual.  
† For adolescents and individuals older than 65, see normative information on pages 12 and 13 of the Cognistat Manual (updated edition from 2001).  
Note: Not all brain lesions produce cognitive deficits that will be detected by Cognistat. Normal scores, therefore, cannot be taken as evidence that brain pathology does not exist. Similarly, scores falling in the mild, moderate, or severe range of impairment do not necessarily reflect brain dysfunction (see section of the Cognistat Manual entitled "Cautions in Interpretations").  
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The Northern California  
Neurobehavioral Group, Inc.  
P.O. Box 460  
Fairfax, CA 94978  
Telephone: (415) 652-5100

Hx: Earlier RP stroke,  
Apt had rotten food, feces  
Human services → clerk  
2 y ago

Cognistat:

Block Design: ↓↓

Memory: ↓↓

Judgment: ↓↓

Conclusion:  
Major NCD

87 yo, AA male

4373740 AA  
MONTREAL COGNITIVE ASSESSMENT (MOCA)  
Date of birth: [redacted] Education: [redacted] NAME: [redacted]  
Sex: [redacted] DATE: [redacted]

**VISUOSPATIAL / EXECUTIVE**  
Copy cube: [ ]  
Draw CLOCK (Ten past eleven): [ ]  
Points: [ ]

**NAMING**  
Lion: [ ]  
Rhino: [ ]  
Camel: [ ]  
Points: [ ]

**MEMORY**  
Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.  
1st trial: [ ]  
2nd trial: [ ]  
Points: [ ]

**ATTENTION**  
Read list of digits (1 digit/sec). Subject has to repeat them in the forward order [ ] 2 1 8 5 4  
Subject has to repeat them in the backward order [ ] 4 5 2 1 8  
Points: [ ]

**LANGUAGE**  
Repeat: I only know that John is the one to help today. [ ]  
The cat always hid under the couch when dogs were in the room. [ ]  
Points: [ ]

**ABSTRACTION**  
Similarity between e.g. banana - orange - fruit [ ] train - bicycle [ ] watch - ruler [ ]  
Points: [ ]

**DELAYED RECALL**  
Has to recall the words: [ ]  
Points: [ ]

**ORIENTATION**  
Date: [ ] Month: [ ] Year: [ ] Day: [ ] Place: [ ] City: [ ]  
Points: [ ]

**TOTAL**  
Add 1 point if  $\geq 75$  yr old  
Score: 8/30

Score: 8/30\*\*

Executive: 2/5

Language: ↓↓

Memory: 0/5 spont.

0/5 Recog\*\*

Orientation: 3/6

Conclusion:  
Major NCD of Alzheimer's  
Type

50 yo Male, 20 y Schizophrenia, Suicidal

50 years old 20y Schiz  
Date of birth: Education: NAME: Sex: M DATE: 5/11/18

MONTREAL COGNITIVE ASSESSMENT (MOCA)

**VISUOSPATIAL / EXECUTIVE**

Copy cube [0] Draw CLOCK (Ten past eleven) (3 points) 3/5 X  
[1] Contour [1] Numbers [1] Hands

**NAMING**

[1] [1] [1] 3/3

**MEMORY** Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial	✓	2	3	3	6
2nd trial	1	2	3	11	5

**ATTENTION** Subject has to repeat them in the forward order [ ] 2 1 8 5 4  
Subject has to repeat them in the backward order [ ] 7 4 2  
Read list of digits (1 digit/ sec.) 2/2  
Read list of letters. The subject must tap with his hand at each letter A. No points if 2 or more errors [ ] FBACMNAA/KLBFAFAKDEAAA/AMOFAA 1/1  
Serial 7 subtraction starting at 100 [ ] 93 91 86 84 79 7 [ ] 72 [ ] 65 1/3  
4 of 5 correct subtractions: 3 pts, 3 or 4 correct: 2 pts, 2 correct: 1 pt, 0 correct: 0 pt

**LANGUAGE** Repeat: I only know that John is the one to help today. [1]  
The cat always hid under the couch when dogs were in the room. [1] 1/2  
Fluency / Name maximum number of words in one minute that begin with the letter F [ ] 10 (N ≥ 10 words) 0/1 X  
**ABSTRACTION** Similarity between e.g. banana - orange = fruit [ ] train - bicycle [ ] watch - ruler 0/2

**DELAYED RECALL** Has to recall the words [ ] [ ] [ ] [ ] [ ] 2/5 X  
FACE VELVET CHURCH DAISY RED

**ORIENTATION** [ ] Date [ ] Month [ ] Year [ ] Day [ ] Place [ ] City 4/6  
2 days 2 m ago

© E. Nasreddine MD - Version July 2, 2004 www.mocatest.org Normal ≥ 26 / 30 TOTAL 18/30 Add 1 point for 14 pts

Executive: 3/5

Similarities: 0/2

Memory: 2/5 +2

Conclusion:  
Suicidal  
Schizophrenia

5150d



# 77 yo, refuses to leave hospital

**COGNISTAT**  
(THE NEUROBEHAVIORAL COGNITIVE STATUS EXAMINATION)

NAME:                      **C** OCCUPATION:                       
AGE:              DATE OF BIRTH:              DATE LAST WORKED:               
HANDEDNESS (circle): Left Right DATE OF INJURY (if any):               
NATIVE LANGUAGE:              EXAM LOCATION:               
TOTAL YEARS EDUCATION:              DATE:              TIME:             

**75-84** COGNITIVE STATUS PROFILE

	LOC	ORI	ATT	LANGUAGE			CONST	MEM	CALC	REASONING	
				COMP	REP	NAM				SIM	JUD
Level Range											
ALERT											
MILD	IMP	-4-	-3-	-4-	-4-	-3-	-3-	-2-	-2-	-4-	-3-
MODERATE		-6-	-3-	-3-	-3-	-1-	Mild -2-	-1-	-1-	-1-	-2-
SEVERE		-4-	-1-	-2-	-3-	-2-	Mild -4-	-4-	-4-	-2-	-1-
Write in lower scores											

**ABBREVIATIONS**

ATT - Attention	JUD - Judgment	ORI - Orientation
CALC - Calculations	LOC - Level of Consciousness	REP - Repetition
COMP - Comprehension	S - Screen	
CONST - Constructions	MEM - Memory	SIM - Similarities
IMP - Impaired	NAM - Naming	

\* The validity of this examination depends on administration in strict accordance with the Cognistat Manual.  
+ For patients over the age of 65 the average range extends to the "mild impairment" level for Constructions, Memory and Similarities.

Note: Not all brain lesions produce cognitive deficits that will be detected by Cognistat. Normal scores, therefore, cannot be taken as evidence that brain pathology does not exist. Similarly, scores falling in the mild, moderate, or severe range of impairment do not necessarily reflect brain dysfunction (see section of the Cognistat Manual entitled "Cautions in Interpretation").

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The Northern California  
Neurobehavioral Group, Inc.  
P.O. Box 461  
Fairfax, CA 94978  
Telephone: (800) 922-5840

77 yo female, hosp SOB, refused to leave hospital

APS, failure to care for self  
5150d grave disability  
Prior MoCA = 26/30, Mem 1/5  
Recom selling house & assisted living  
3 y college, office work  
Names her meds  
States can't care for self

Assessment:  
Cognistat WNL (Mem 1/5 +3)  
Not psychotic  
Fears selling house  
Good insight, bad judgment  
Needs counseling

# 73 yo, Anxiety

Toronto 10/23/4, 73 | 45 + source | office, furniture, parking - volume at diff, newspaper, focus & day to read book, day to fol plot, basic behavior, less of gas

## MONTREAL COGNITIVE ASSESSMENT (MOCA)

VISUOSPATIAL / EXECUTIVE		NAME : Education : Sex :                  Date of birth : DATE :																				
 [ ]	 Copy cube [ ]	 Draw CLOCK (Ten past eleven) (3 points) [ ]      [ ]      [ ]	<b>POINTS</b>																			
			<b>5/5</b>																			
<b>NAMING</b> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  [ ]             </div> <div style="text-align: center;">  [ ]             </div> <div style="text-align: center;">  [ ]             </div> </div>																						
<b>3</b>																						
<b>MEMORY</b> Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>FACE</th> <th>VELVET</th> <th>CHURCH</th> <th>DAISY</th> <th>RED</th> </tr> </thead> <tbody> <tr> <td>1st trial</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> </tr> <tr> <td>2nd trial</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> </tr> </tbody> </table>				FACE	VELVET	CHURCH	DAISY	RED	1st trial	✓	✓	✓	✓	✓	2nd trial	✓	✓	✓	✓	✓	No points
	FACE	VELVET	CHURCH	DAISY	RED																	
1st trial	✓	✓	✓	✓	✓																	
2nd trial	✓	✓	✓	✓	✓																	
<b>ATTENTION</b> Read list of digits (1 digit/sec.). Subject has to repeat them in the forward order [✓] 2 1 8 5 4 Subject has to repeat them in the backward order [✓] 4 2 8 1 5																						
<b>2/2</b>																						
Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors [ ] F B A C M N A A J K L B A F A K D E A A A J A M O F A A B																						
<b>1/1</b>																						
Serial 7 subtraction starting at 100 [✓] 93    [✓] 86    [✓] 79    [✓] 72    [✓] 65    [✓] 58 <small>4 or 5 correct subtractions: 3 pts, 3 or 2 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pt</small>																						
<b>3/3</b>																						
<b>LANGUAGE</b> Repeat : I only know that John is the one to help today. [✓] The cat always hid under the couch when dogs were in the room. [ ]																						
<b>1/2</b>																						
Fluency / Name maximum number of words in one minute that begin with the letter <u>f</u> [ ] (N ≥ n words)																						
<b>1/1</b>																						
<b>ABSTRACTION</b> Similarity between e.g. banana - orange = fruit [ ] train - bicycle [ ] watch - ruler [ ]																						
<b>2/2</b>																						
<b>DELAYED RECALL</b> Has to recall words WITH NO CUE <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>FACE</th> <th>VELVET</th> <th>CHURCH</th> <th>DAISY</th> <th>RED</th> </tr> </thead> <tbody> <tr> <td>Category cue</td> <td style="text-align: center;">✓</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Multiple choice cue</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>					FACE	VELVET	CHURCH	DAISY	RED	Category cue	✓					Multiple choice cue						
	FACE	VELVET	CHURCH	DAISY	RED																	
Category cue	✓																					
Multiple choice cue																						
<b>2/5</b>																						
<b>ORIENTATION</b> Date [✓] Month [✓] Year [✓] Day [✓] Place [✓] City [✓]																						
<b>6/6</b>																						
© Z.Nazareddine MD. Version November 7, 2004 <a href="http://www.mocatest.org">www.mocatest.org</a> <i>frank buy fresh feathery fly, frankfurter, herring, farm, frankies from, farthing, funds</i>			<b>TOTAL</b> Add 1 point if ≤ 12 yr edu <b>25/30</b>																			

73 yo female, ED, anxiety  
Can't take care of self at home  
Lexapro  
Sober 4 months

Score: 26/30

# Memory 2/5 +1

Recommendation:  
Released to son

## Full NP recom

## MCI

DR. ALAN MONTREAL  
 MONTREAL COGNITIVE ASSESSMENT (MOCA)

NAME: \_\_\_\_\_ Education: MA Date of birth: \_\_\_\_\_  
 Sex: M DATE: 9/12/08

VISUOSPATIAL / EXECUTIVE		POINTS	
 Copy cube: Draw CLOCK (Ten past eleven) (5 points):	[ ] [ ] [ ] [ ] [ ]	4/5	
<b>NAMING</b> 		[ ] [ ] [ ]	3/3
<b>MEMORY</b> Read list of words, subject must repeat them. Do 3 trials. Do a recall after 5 minutes.	FACE VELVET CHURCH DAISY RED	No points	
<b>ATTENTION</b> Read list of digits (4 digit/sec). Subject has to repeat them in the forward order [ ] 2 1 8 5 4 Subject has to repeat them in the backward order [ ] 7 4 2	[ ] FBACMNAAJKBFAKDEAAAJAMOFAB	2/2	
Serial 7 subtraction starting at 100	100 93 86 79 72 65	3/3	
<b>LANGUAGE</b> Repeat: I only know that John is the one to help today. [ ] The cat always hid under the couch when dogs were in the room. [ ]	Fluency / Name maximum number of words in one minute that begin with the letter F [ ] IN 20 words	2/2	
<b>ABSTRACTION</b> Similarity between e.g. banana - orange = fruit [ ] train - bicycle [ ] watch - ruler	[ ] [ ] [ ]	2/2	
<b>DELAYED RECALL</b> Has to recall words WITH NO CUE	FACE VELVET CHURCH DAISY RED	0/5	
<b>ORIENTATION</b> Date Month Year Day Place City	1/1 1/1 1/1 1/1 1/1 1/1	6/6	

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TOTAL 24/30  
 Add 3 points if 2 (2 or less)



79, male

MONTREAL COGNITIVE ASSESSMENT (MOCA)

Date of birth: 1/2/60 Education: NAME: Sex: DATE:

**VISUOSPATIAL / EXECUTIVE**

Copy cube [ ]

Draw CLOCK (Ten past eleven) (1 point) [ ]

2/5

**NAMING**

[ ] [ ] [ ] 3/3

**MEMORY**

Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial	[ ]	[ ]	[ ]	[ ]	[ ]
2nd trial	[ ]	[ ]	[ ]	[ ]	[ ]

No points

**ATTENTION**

Subject has to repeat them in the forward order [ ] 2 1 8 5 4

Subject has to repeat them in the backward order [ ] 7 4 2

2/2

Read list of letters. The subject must tap with his hand at each letter A. No points if 2 errors [ ] F B A C M N A A J K L B A F A K D E A A A / A M O F A A B

1/1

Serial 7 subtraction starting at 100 [ ] 93 [ ] 86 [ ] 79 [ ] 72 [ ] 65 [ ] 58 [ ] 51 [ ] 44 [ ] 37 [ ] 30 [ ] 23 [ ] 16 [ ] 9 [ ] 2

6 or 5 correct subtraction: 3 pts, 4 or 3 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pt

3/3

**LANGUAGE**

Repeat: I only know that John is the one to help today. [ ]

The cat always hid under the couch when dogs were in the room. [ ]

1/2

Fluency / Name maximum number of words in one minute that begin with the letter F [ ] (N 2 n words)

0/1

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit [ ] train - bicycle [ ] watch - ruler [ ]

2/2

**DELAYED RECALL**

	FACE	VELVET	CHURCH	DAISY	RED
Has to recall the words	[ ]	[ ]	[ ]	[ ]	[ ]

1/5

**ORIENTATION**

Date: 1/2/60 Month: 1/ Year: 1/ Day: 1/ Place: 1/ City: 1/

5/6

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Normal: 26 / 30

TOTAL 20 / 30

Add 1 point if 0-12 pt edu

fail fear figure finance  
low fore fibres fabulous

Score: 20/30

Executive: 2/5

Attention: ↑↑

Memory: 1/5

Conclusion:  
MCI → Major NCD

75 y o, 2 y educ, sound tech

**MONTREAL COGNITIVE ASSESSMENT (MOCA)**

NAME: PE Education: 2 y Date of birth: 4/17/08 Sex: M DATE: 4/17/08

**VISUOSPATIAL / EXECUTIVE**

Copy cube [✓] Draw CLOCK (Ten past eleven) [✓] 5/5

**NAMING**

[ ] [ ] [ ] 3/3

**MEMORY**

Read list of words, subject must repeat them. Do 3 trials. Do a recall after 3 minutes.

	FACE	VELVET	CHURCH	DAISY	RED	No points
1st trial	✓		✓			
2nd trial	✓	✓	✓	✓	✓	

**ATTENTION**

Read list of digits (1 digit/ sec.). Subject has to repeat them in the forward order. [✓] 2 1 8 5 4  
Subject has to repeat them in the backward order. [✓] 7 4 2 2/2

Read list of letters. The subject must tap with his hand at each letter A. No points if 3 or more errors. [ ] FBACMNAAJXLBFAKDEAAAJAMOFAB 1/1

Serial 7 subtraction starting at 100 92 11 93 16 11 86 80 11 79 1 11 72 11 65 0/3

**LANGUAGE**

Repeat: I only know that John is the one to help today. [✓] The cat always hid under the couch when dogs were in the room. [X] 1/2

Fluency / Name maximum number of words in one minute that begin with the letter P. [ ] P. (N ≥ 11 words) 1/1

**ABSTRACTION**

Similarity between e.g. banana - orange = fruit [✓] train - bicycle [ ] watch - ruler [✓] 2/2

**DELAYED RECALL**

Has to recall words WITH NO CLUE [ ] [ ] [ ] [ ] [ ] [ ] 0/5

Optional: Category cue [ ] Multiple choice cue [ ]

**ORIENTATION**

[ ] Date [ ] Month [ ] Year [ ] Day [ ] Place [ ] City [ ] 6/6

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Normal ≥ 26 / 30

TOTAL 21 / 30

Add 1 point if ≤ 12 yr edu

no fear bx

Score: 21/30

Executive: 5/5

Memory 0/5 +2 cue

Conclusion:  
MCI

NP testing

# 83 yo, memory

**COGNISTAT**  
(THE NEUROBEHAVIORAL COGNITIVE STATUS EXAMINATION)

NAME: M. [redacted], [redacted] OCCUPATION: \_\_\_\_\_  
AGE: 82 DATE OF BIRTH: \_\_\_\_\_ DATE LAST WORKED: \_\_\_\_\_  
HANDEDNESS (circle): Left Right DATE OF INJURY (if any): \_\_\_\_\_  
NATIVE LANGUAGE: \_\_\_\_\_ EXAM LOCATION: SP Kaiser  
TOTAL YEARS EDUCATION: \_\_\_\_\_ DATE: 3/2/08 TIME: 11am

**COGNITIVE STATUS PROFILE**

	LOC	ORI	ATT	LANGUAGE			CONST	MEM	CALC	REASONING	
				COMP	REP	NAM				SIM	JUD
★ AVG. RANGE	AD RT	-12-	-8-	-86-	-5-	-8-	-85-	-12-	-5-	-86-	-5-
					-12-	-8-					
					-5-	-11-					
MILD	IMP	-8-	-5-								
MODERATE		-6-	-3-								
SEVERE		-4-	-1-								

Write in lower scores

**ABBREVIATIONS**

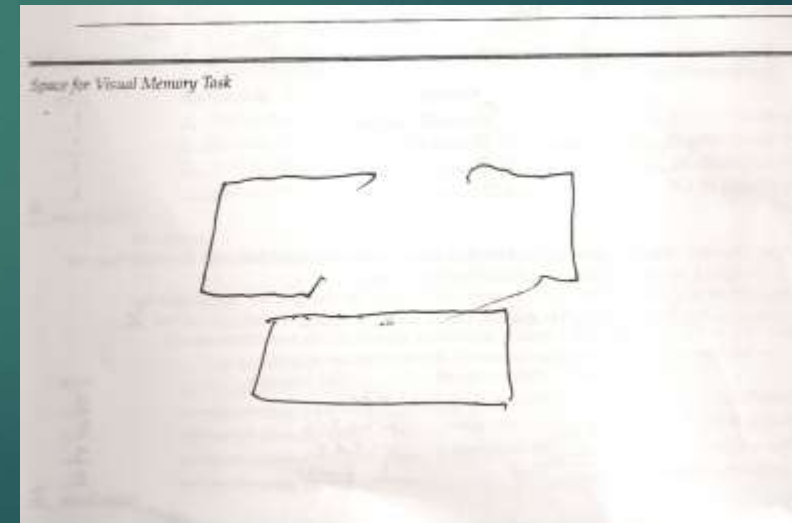
ATT - Attention	JUD - Judgment	ORI - Orientation
CALC - Calculations	LOC - Level of Consciousness	REP - Repetition
COMP - Comprehension	MEM - Memory	SIM - Similarities
CONST - Constructions	NAM - Naming	
IMP - Impaired		

THE VALIDITY OF THIS EXAMINATION DEPENDS ON ADMINISTRATION IN STRICT ACCORDANCE WITH THE COGNISTAT MANUAL.

★ For adolescents and individuals older than 65, see normative information.

## Cognistat

Memory: 0/4 +2 cue  
Comprehension: 1 step only  
Similarities: 1 / 4

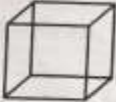


# 60 yo schizophrenic in ED

MONTREAL COGNITIVE ASSESSMENT (MOCA)

Date of birth: 60 yo schiz  
Education:  
Sex:  
NAME:  
DATE:




**VISUOSPATIAL / EXECUTIVE**

Copy cube:  [ ]

Draw CLOCK (Ten past eleven) (3 points): [ ]

Points: 0/5

**NAMING**

 [ ]  [ ]  [ ]

Points: 3/3

**MEMORY** Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial	Spoke		Leaf		
2nd trial					

No points

**ATTENTION**

Read list of digits (1 digit/sec). Subject has to repeat them in the forward order [ ] 2 1 8 5 4

Subject has to repeat them in the backward order [ ] 4 5 8 1 2

Read list of letters. The subject must tap with his hand at each letter A. No points if 2 errors [ ] FBACMNAAIKLBFAKDEAAAJAMOFAB

Serial 7 subtraction starting at 100 [ ] 93 [ ] 86 [ ] 79 [ ] 72 [ ] 65

4 or 5 correct subtractions: 3 pts, 3 or 2 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pt

Points: 3/3

**LANGUAGE** Repeat: I only know that John is the one to help today. [ ]

The cat always hid under the couch when dogs were in the room. [ ]

Fluency / Name maximum number of words in one minute that begin with the letter F [ ] (N ≥ 11 words)

Points: 1/2

**ABSTRACTION** Similarity between e.g. banana - orange = fruit [ ] train - bicycle [ ] watch - ruler [ ]

Points: 2/2

**DELAYED RECALL**

	FACE	VELVET	CHURCH	DAISY	RED
Has to recall the words	[ ]	[ ]	[ ]	[ ]	[ ]

Points: 1/5

**ORIENTATION**

Date: [ ]/ [ ]/ [ ] Month: [ ] Year: [ ] Day: [ ] Place: [ ] City: [ ]

Points: 5/6

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www.mocotest.org  
Normal ≥ 28 / 30  
TOTAL: 23  
Add 1 point if ≤ 12 yr edu

*prob = being in school - do fishing*

60 yo female, schizophrenic, homeless

“Zen on a Jew...Judaism doesn't belong  
In SF...Muslims trying to kill me”

Score: 16/23

Memory: 1/5 +2 cue

Conclusion:

Schizophrenia

5150d



WNL: MoCA score 28/30, Mem 3/5 +1 cue

VISUOSPATIAL / EXECUTIVE		POINTS					
 [ ]	 [ ]	Copy cube Draw CLOCK (Ten past eleven) (3 points) [ ] Contour [ ] Numbers [ ] Hands	5/5				
<b>NAMING</b>							
 [ ]	 [ ]	 [ ]	3/3				
<b>MEMORY</b> Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.		FACE	VELVET	CHURCH	DAISY	RED	No points
	1st trial	✓	✓	✓	✓	✓	
	2nd trial	✓	✓	✓	✓	✓	
<b>ATTENTION</b> Read list of digits (1 digit/ sec.). Subject has to repeat them in the forward order Subject has to repeat them in the backward order					2 1 8 5 4		2/2
					7 4 2		
Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors [ ] FBACMNAAJKLBAFAKDEAAAJAMOFAB							1/1
Serial 7 subtraction starting at 100 [ ] 93 [ ] 86 [ ] 79 [ ] 72 [ ] 65							3/3
<b>LANGUAGE</b> Repeat : I only know that John is the one to help today. [ ] The cat always hid under the couch when dogs were in the room. [ ]							2/2
Fluency / Name maximum number of words in one minute that begin with the letter F [ ] 13 (N ≥ 11 words)							1/1
<b>ABSTRACTION</b> Similarity between e.g. banana - orange = fruit [ ] train - bicycle [ ] watch - ruler							2/2
<b>DELAYED RECALL</b> Has to recall words WITH NO CUE	FACE	VELVET	CHURCH	DAISY	RED		2/5
	[ ]	[ ]	[ ]	[ ]	[ ]		
Optional Category cue Multiple choice cue							
<b>ORIENTATION</b> [ ] Date [ ] Month [ ] Year [ ] Day [ ] Place [ ] City							6/6
© Z. Nasreddine MD Version November 7, 2004 www.mocatest.org							TOTAL 28/30 Add 1 point if ≤ 12 yr edu



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## Mental Status Examinations – Wes Burgess

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The End

“Happiness is nothing more than good health and a bad memory”

**Albert Schweitzer (1875-1965)**

## Case: 56 year old woman

- ▶ College educated, technical writer
- ▶ Relocated to new town: no job search, community activities decreased, poor hygiene, home neglect, less emotional expression
- ▶ Lived off of savings, stopped paying bills; stopped babysitting grandkids
- ▶ Denied anything wrong; Antidepressants did not work
- ▶ Large bilateral meningioma, near OFC

# My Graduate school, 1970

- ▶ Neurologist comment: “You can remove a tablespoon or 2 of brain from either the right or left frontal lobes, and it will make no difference in their IQ or behavior.”
- ▶ We have come a long way in last 40 years in our understanding of executive functioning and other functions of the frontal lobe

# How important are the frontal lobes?



Walter Freeman & 40 K lobotomies

Only Nobel Prize in Medicine:  
António Egas Moniz, 1949;  
Also shot 4 x by a patient

Jack Nicholson:  
One Flew Over the Cuckoo's Nest



# 3 Major Divisions of Frontal Lobes

- ▶ 1 Dorsolateral Frontal: Cognitive Control  
(Attention, memory strategies, planning, organization)
- ▶ 2 Orbital frontal: Social Regulation & emotional control
- ▶ 3 Ventromedial: Inhibition of emotional responses, and decision making



# Frontal Functions

- ▶ Controls all non-automatic behavior
- ▶ Analysis and decision making about everything new, challenging, or different
- ▶ Attention, vigilance, inhibition of distraction, divided attention
- ▶ Task switching (TMT)
- ▶ Maintaining set, focus
- ▶ Intelligence
- ▶ Problem solving
- ▶ Intentions

# Executive Functioning

- ▶ Controls highest level behaviors; even with impaired EF, other cognitive functions can be totally intact (i.e. memory)
- ▶ Controls:
  - ▶ contextual decisions (whether to do something; context assessment)
  - ▶ organization,
  - ▶ plans to achieve goals (how),
  - ▶ correct temporal application of skills (when),
  - ▶ correction of errors,
  - ▶ evaluation of success

# Types of Executive Dysfunction

- ▶ Poor decision making capacity (lack of capacity to make financial, medical, treatment decisions)
- ▶ Do not learn from negative feedback
- ▶ Inability to live without supervision
- ▶ Inability to use psychotherapy or rehabilitation
- ▶ Need behavioral management
- ▶ Often will require Adult Protective Services, Public Guardianship, Need for Conservatorship

# Dorsolateral Prefrontal

- ▶ Prospective Memory: remember to remember, time awareness & monitoring, when to do things (deficit: know what to do but not when) i.e. buy milk
- ▶ Source memory (context of a memory) i.e. who were you with when 9/11 attack happened.
  - ▶ If impaired, more false memories; why eye witness memory is horrible

# Dorsolateral PC

- ▶ Executive control of memory processing:
  - ▶ Not location of memory
  - ▶ Left F:
    - ▶ retrieval strategies for general klg (semantic memory) &
    - ▶ unique events memory encoding
- ▶ Right F: episodic memory retrieval (Where were you when 9-11 happened?)

# Medial Prefrontal

- ▶ Social behavior control
- ▶ Motivation: low drive, initiation
- ▶ Emotional capacity and control
- ▶ Attention to internal states

# Anterior Cingulate

- ▶ ACC = Default Network hub: subjective, self referential cognitive processes; network is highly active when we are at cognitive rest
- ▶ Self reference: self-knowledge, autobiographic memory retrieval, self face recognition, first person perspective taking, mind wandering, future thinking

# Anterior Cingulate

- ▶ Error Monitoring and conflict resolution
- ▶ Adaptive changes in attention that enhance performance
- ▶ Appropriate response selection
- ▶ Mind reading
- ▶ Impairment: poor decision making, hoarding, lack of empathy, FTD central



# Executive Functioning

- ▶ EF = Applying knowledge toward real world goal directed behavior
- ▶ Executive functioning examples:
  - ▶ Self monitoring behavior
  - ▶ Anticipate consequence of action
  - ▶ Disregard erroneous strategies
  - ▶ Inhibit automatic but inappropriate response
  - ▶ Comply with treatment
  - ▶ Do something when needed (not just know how to do it)