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Diagnostics in cognitive disorders - Anamnesis & Clinical examination

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Disclosures
No competing interests

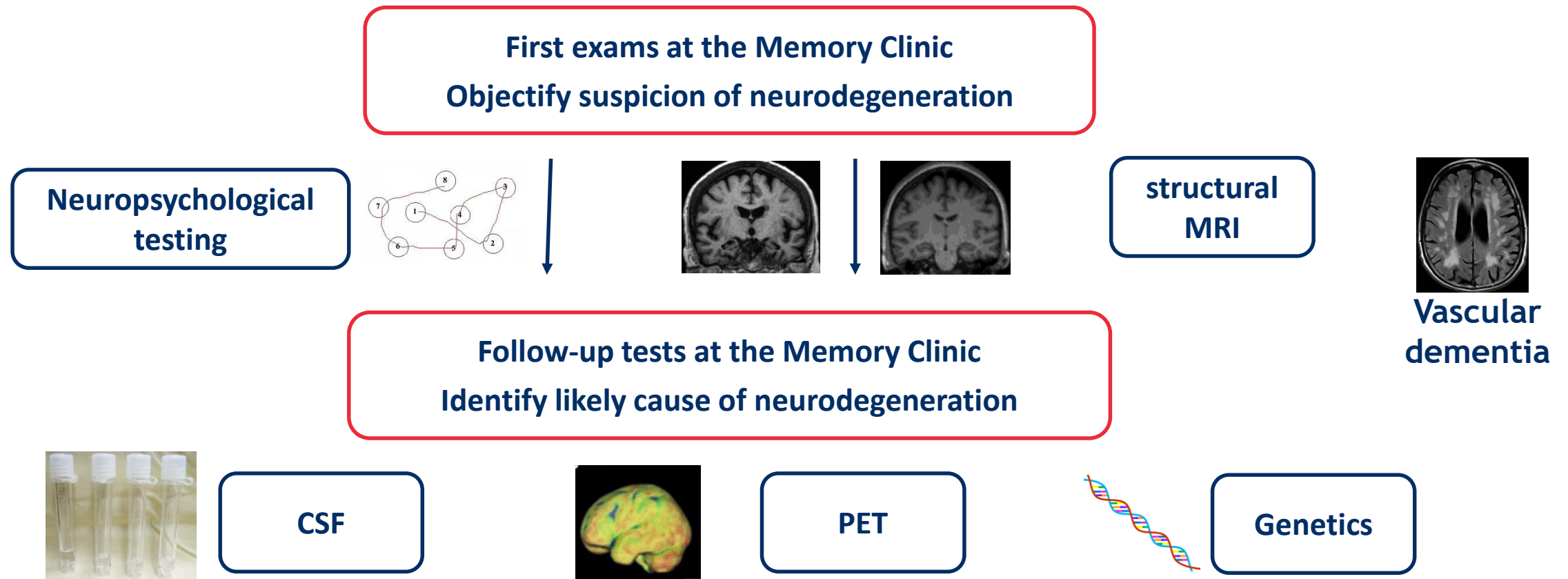


Overview

- **Key questions and importance of anamnesis & clinical exam**
- **Anamnesis**
 - Talking to the patient
 - Talking to the family
- **Clinical examination**
 - Cognitive screening
 - Neurological signs

Importance of anamnesis & clinical exam

■ Memory Clinic: diagnostic pathway

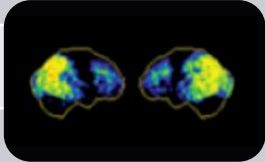
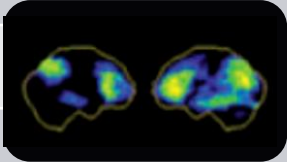
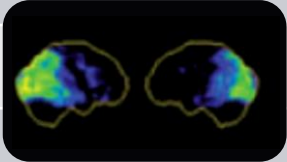


Importance of anamnesis & clinical exam

- **Unmet needs in the Memory Clinic**

- Up to 20% of patients receives an incorrect diagnosis!

Fisher et al., 2017

Differential diagnosis & key symptoms & hypometabolism					
Alzheimer's Disease		Frontotemporal Degeneration		Lewy Body Disease	
Memory		Behavior		Visuospatial	
Language		Language		Memory	
Behavior		Memory		Parkinsonism	

Mosconi et al., 2008

- Overlapping clinical presentations & neurobiological changes
- Neuropathologically different entities requiring different treatment

Importance of anamnesis & clinical exam

- **Good phenotyping is essential in the memory clinic**
 - Biomarkers without phenotyping lead to misdiagnosis
e.g. frequent amyloid deposits in the ageing brain
⇔ amyloid as the cause of the clinical phenotype
 - Misunderstood phenotypes lead to incorrect approach of the patient
e.g. patients with cortical visuoperceptual deficits are being operated on to correct cataracts, treat macular degeneration

Anamnesis of the patient

- **The clinical exam starts when the patient enters**

- Always start the anamnesis with the patient

Which changes did the patient notice (anosognosia)?

Do cognitive problems affect daily life?

How does the patient feel? Other physical or psychological complaints?

Medication, personal and familial history, incl professional history

- Benefits of this approach

Establish relationship with patient: better compliance, insight into understanding

Test of cognition: anosognosia, memory for medication/history

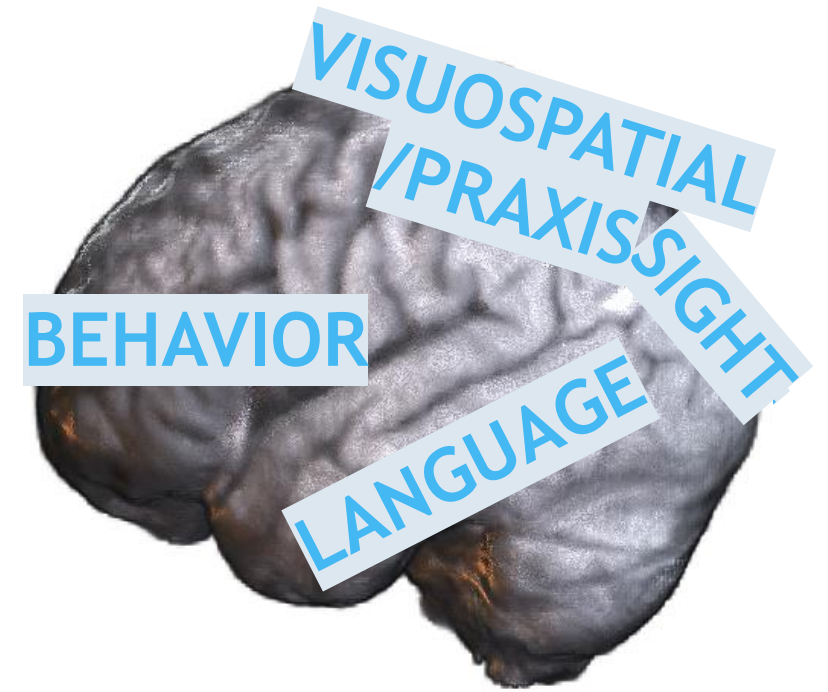
Test of language and speech production: technical assessment

Family gives indication of how to approach patient: verbal or nonverbal

Anamnesis of the patient

- **Topics to cover together with family member**

- Check all cognitive domains
- Check associated signs typical for Parkinson-plus (LBD: McKeith criteria)
 - REM sleep behavior disorder
 - Hallucinations: visual, auditory, tactile
 - Fluctuations/daytime somnolence
 - Frequent falls
 - Hypophonia
 - Dysautonomia
- Depressive symptoms? History of psychiatric disorder/medication?
- Alcohol use? When in doubt ask again one-on-one
- Full family history: age of death of parents, ALS/PD/"MS"/"atherosclerosis of the brain", siblings with psychiatric history

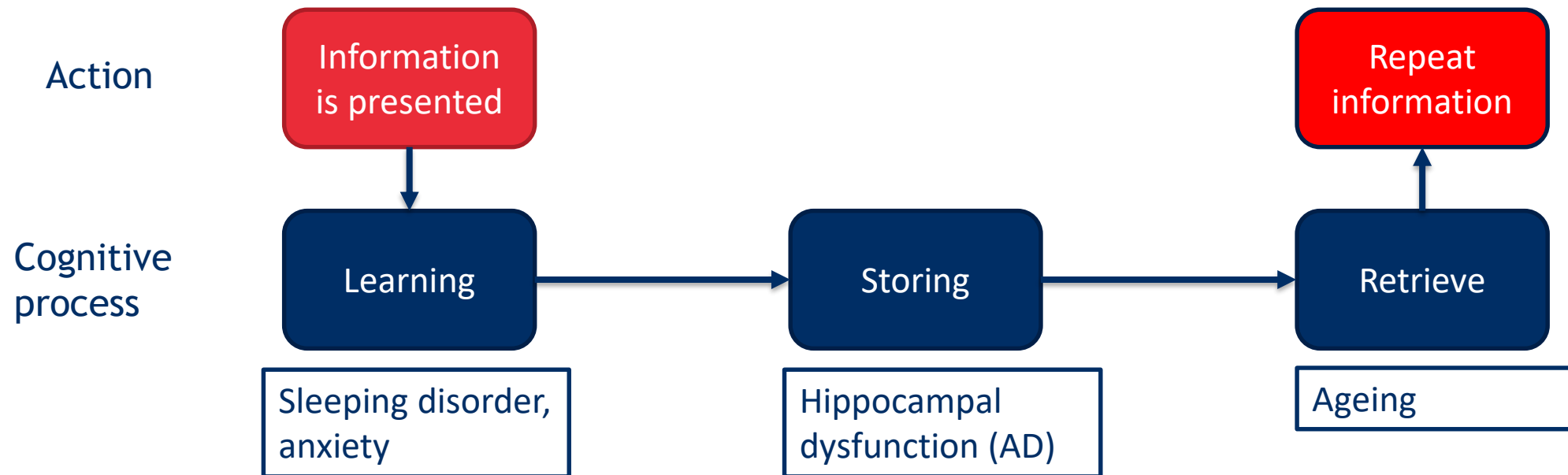


Complaints of “forgetting”

Alzheimer's: Hippocampus damage leads to a deficit in storing information

Note that this is only part of the “memory process”

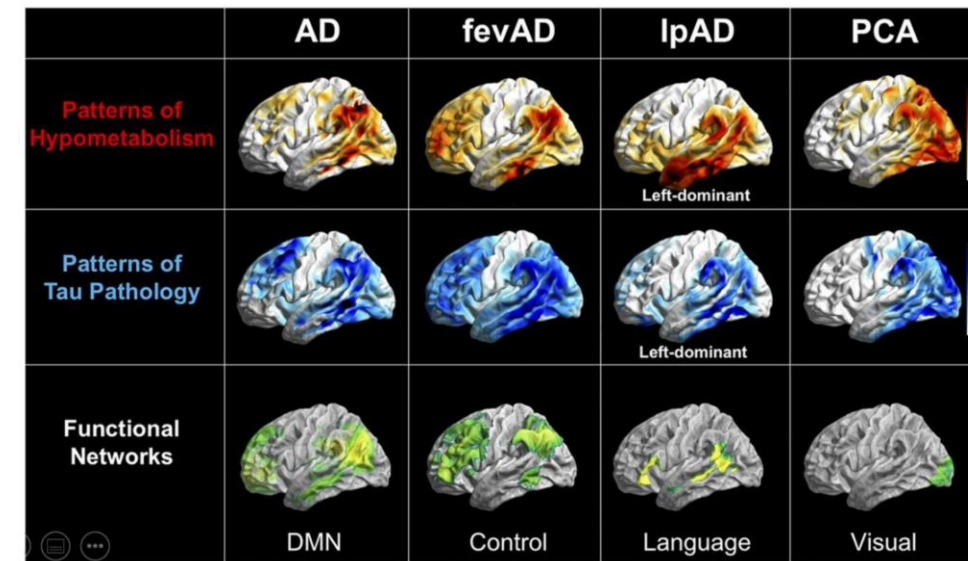
Differentiate through questions + extended neuropsychological testing



Many faces of Alzheimer's disease

Non-amnestic phenotypes are not rare

- Posterior cortical atrophy
Difficulty with finding objects in clutter, reading
Differentiate from CBS, CJD, LBD
 - Logopenic variant PPA
Abnormal latencies for naming and finding words in spontaneous speech
Mixed etiology: AD or TDP43
 - Frontal variant Alzheimer's disease
Early-on behavioral disturbances in the older population and FTD
(and LATE: limbic-predominant age-related TDP43-encephalopathy)
- ⇒ Alzheimer's disease can present without significant amnestic syndrome: check neuropsychological test results and FDG-PET/SPECT
- ⇒ On the other hand, amnestic syndrome does not preclude non-AD pathology: LBD, FTD



Herholz, 2022

Complaints of “word finding”

Primary progressive aphasia: in all types, “word finding difficulties” are an early complaint
Also a frequent complaint in early AD

⇔ Word findings difficulties in normal ageing: tip-of-the-tongue phenomenon, word retrieval delayed

PPA: functional communication is impacted + frequency effect in spontaneous speech
Differentiate through questions + active listening + neurolinguistic testing (latency/errors
Boston naming test)

Typical stimuli triggering
tip-of-the-tongue phenomenon

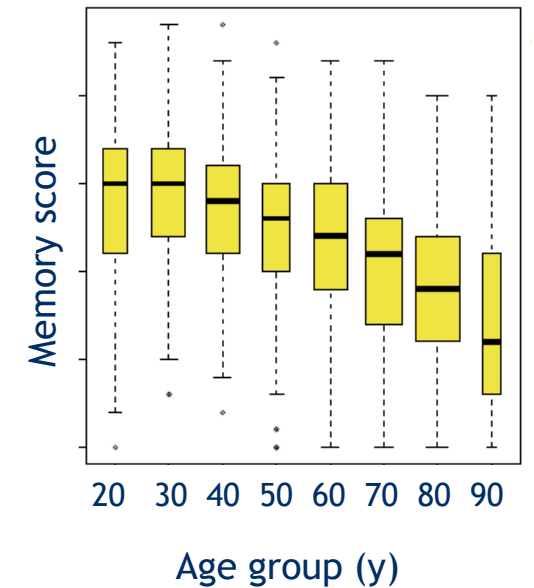


Knowledge of normal cognitive ageing

High-performing individuals can sense cognitive ageing themselves sometimes
Typically, patients consult alone, others don't notice decline, no impact on daily life
Sometimes: partner says other person declines "faster"

Ageing typically affects specific cognitive processes:

- Structure incoming information and working memory + speed
 - repeating a telephone number, complex calculations, mental list (groceries etc)
- Multitasking, with interrupted concentration
- Naming tasks: naming pictures, recalling people's names
 - ⇒ Syntax and vocabulary are spared
 - ⇒ Interindividual variability



Green et al, 2015

Neuropsychological testing, with norms corrected for age and education, is crucial (+ repeat if necessary)

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Anamnesis of the family member

- **Try to talk to the family member alone**
 - Timeline/progression: family usually has better estimate
 - Questions relating to frontotemporal degeneration (Rascovsky criteria)
Clear change in behavior, repeated abnormal behavior
 - Apathy
 - Empathy
 - Disinhibition
 - Obsessive-compulsive behavior
 - Changes in diet
 - Safety when driving car
 - Agression: hard to discuss for family, be sure not to miss! Main reason patients needs to be medicated/institutionalized
 - ! If abnormal behavior: check if only in relation to spouse or also others
Differentiate “don’t recognize spouse anymore” from anger on both sides
Differentiate FTD from primary psychiatric disorder/personality disorder

Anamnesis of the family member

- **“burn out”**

- Delayed diagnosis of neurodegeneration with middle aged onset because misdiagnosis of psychiatric disorder
- Try to find out if problem is really work-related
- Ask family member whether everyday function is spared + how proactive patient is at home
- Differentiate from apathy – early sign of FTD and PSP
If not triggered, patient does not contribute to household activity at all anymore (“like another child in the home”)
- Differentiate from trouble at work induced by comprehension problems, amnesic deficit, executive dysfunction

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Examination

■ Cognitive screening

- Objectify cognitive deficit
- Collect reference data for follow-up
- 1 screening test depending on anamnestic situation
MOCA when still high-functioning
MMSE in dementia stage or when moderate language barrier
Best to perform test during consultation – speed, error types
- Additional non-memory tests depending on complaints and time available + tolerance of patient

Examination

1. a. Welk jaar is het?
b. Welk seizoen is het?
c. Welke maand van het jaar is het?
d. Wat is de datum vandaag?
e. Welke dag van de week is het?

(0-5) _____

2. a. In welke provincie zijn we nu?
b. In welke plaats zijn we nu?
c. In welk ziekenhuis (instelling) zijn we nu?
d. Wat is de naam van deze afdeling?
e. Op welke verdieping zijn we nu?

(0-5) _____

3. Ik noem nu drie voorwerpen. Wilt u die herhalen nadat ik ze alle drie gezegd heb? Onthoud ze want ik vraag u over enkele minuten ze opnieuw te noemen. (Noem "appel, sleutel, tafel", neem 1 seconde per woord) (1 punt voor elk goed antwoord, herhaal maximaal 5 keer tot de patiënt de drie woorden weet)

(0-3) _____

4. Wilt u van de 100 zeven aftrekken en van wat overblijft weer zeven aftrekken en zo doorgaan tot ik stop zeg? (Herhaal eventueel 3 maal als de persoon stopt, herhaal dezelfde instructie, geef maximaal 1 minuut de tijd) Noteer hier het antwoord.

of
Wilt u het woord "worst" achterstevoren spellen? Noteer hier het antwoord.

(0-5) _____

5. Noemt u nogmaals de drie voorwerpen van zojuist. (Eén punt voor elk goed antwoord).

(0-3) _____

6. Wat is dit? En wat is dat? (Wijs een pen en een horloge aan. Eén punt voor elk goed antwoord).

(0-2) _____

7. Wilt u de volgende zin herhalen: "Nu eens dit en dan weer dat". (Eén punt als de complete zin goed is)

(0-1) _____

8. Wilt u deze woorden lezen en dan doen wat er staat? (papier met daarop in grote letters: "Sluit uw ogen")

(0-1) _____

9. Wilt u dit papiertje pakken met uw rechterhand, het dubbelvouwen en het op uw schoot leggen? (Eén punt voor iedere goede handeling).

(0-3) _____

10. Wilt u voor mij een volledige zin opschrijven op dit stuk papier? (Eén punt wanneer de zin een onderwerp en een gezegde heeft en betekenis heeft).

(0-1) _____

11. Wilt u deze figuur natekenen? (Figuur achterop dit papier. Eén punt als figuur geheel correct is nagetekend. Er moet een vierhoek te zien zijn tussen de twee vijfhoeken)

(0-1) _____

TOTALE TEST SCORE: (0-30) _____



MMSE

- Orientation /10
- Repetition /3
- Attention /5
- Delayed recall /3
- Naming /2
- Phon loop /1
- Reading /1
- Task /3
- Writing /1
- Praxis /1

Total /30
≤24/30 dementia

VISUOSPATIEEL/EXECUTIEF		Kopieer de kubus		Teken een KLOK (tien over elf) (3 punten)		PUNTEN
						___/5
BENOEMEN						
						___/3
GEHEUGEN		LEES DE WOORDEN HARDOP VOOR, DE PROEFPERSOON MOET ZE NAZEGGEN. NEEM DE TEST TWEE MAAL AF, OOK WANNEER DE EERSTE TEST SUCCESVOL IS. NEEM DE TEST NA 5 MINUTEN NOGMAALS AF.		1 ^{ste} TEST		GEEN PUNTEN
				2 ^{de} TEST		
AANDACHT		Lees de rij cijfers op (1 cijfer/sec.). De proefpersoon moet ze in dezelfde volgorde nazeggen. [] 2 1 8 5 4				___/2
		Lees de rij letters op. De proefpersoon moet bij elke letter A met zijn hand op de tafel tikken. Geen punten bij 2 fouten				___/1
		[] 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				___/3
TAAL		Zeg na: Ik weet alleen dat Jan vandaag geholpen zou worden. []				___/2
		De kat verstopte zich altijd onder de bank als er honden in de kamer waren. []				___/1
		Fluency: noem binnen één minuut zo veel mogelijk woorden die beginnen met de letter D. [] _____ (N ≥ 11 woorden)				___/2
ABSTRACT REDENEREN		Overeenkomst tussen bijv. banaan en sinaasappel = fruit [] trein-fiets [] horloge-liniaal				___/5
UITGESTELDE HERINNERING		Woorden moeten herinnerd worden ZONDER HINT				MIS = ___/15
Memory Index		X3				
Score (MIS)		X2				
		X1				
ORIËNTATIE		[] Datum [] Maand [] Jaar [] Dag [] Locatie [] Plaats				___/6
© Z. Nasreddine MD		www.mocatest.org		MIS: ___/15		TOTAAL ___/30
Afgelopen door: _____				(Normaal ≥ 26/30) Tel er 1 pt bij op indien ≤ 12 opleidingsjaren		
Om nauwkeurigheid te garanderen zijn training en certificering noodzakelijk MOCA - Netherlands/Dutch - Version of 15 Feb 2018 - Mapi. ID061021 / MOCA-E-1-Test_AU1_2_NIS-NL.doc						

MOCA

- Visuopercept/ executive /5
- Naming /3
- Attention /6
- Language /3
- Reasoning /2
- Delayed recall /5
- Orientation /6

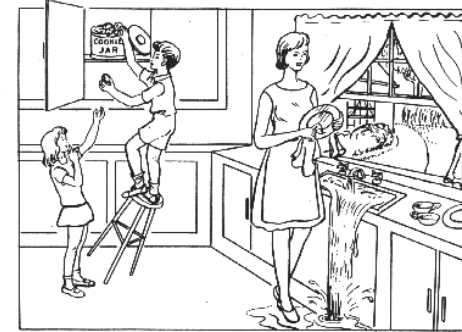
Total /30
≤25/30 MCI

Attention/aphasia => effect on other scores !

Examination

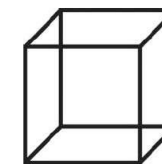
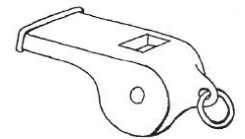
■ Cognitive screening

- Language screening tests
 - Cookie theft description (60 sec)
 - Boston naming test (15 item)
 - Animal verbal fluency (60 sec)
- Praxis tests
 - Drawing clock, cube, overlapping pentagrams
- Concentration
 - Digit span forward/backward
- Visuoperceptual tests
 - Boston naming test
 - Drawing clock, cube, overlapping pentagrams



Cookie theft

Boston naming test



cube



*overlapping
pentagrams*

Examination

■ Cognitive screening

■ Definitions

- MCI
 - single/multi-domain, (non)amnesic
 - Documented on neuropsychological testing without clear impact on daily life
- Dementia
 - Deficit in more than 1 domain => additional screening test when MMSE mostly memory↓

■ Referral for neuropsychological testing?

- Patient-tailored testing + percentiles corrected for age and education + timing information
- MCI or normal screening: needs systematic evaluation of all domains (unless very reassuring story in patient with normal screening)
- Dementia: only refer if MMSE is higher than 24/30 (reimbursement cholinesterase inhibitor)
- Two hours of testing, only refer motivated/suitable candidates
- Neuropsychologist is a good partner for evaluation of unusual behavior/unclear presentations

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Examination

- **Neurological signs**

- Full clinical exam on first consultation
- Eye movements
Frequently abnormal in neurodegenerative disorders, start early & correlates with stage
Square wave jerks (saccadic intrusions which interrupt fixation) – aspecific
Abnormal saccades – LBD

Vertical gaze palsy – PSP, CBD
(slight changes with age possible)
if you can see the eye movement,
it's abnormal

- Reduced blink frequency

Square wave jerks
[Eccles Health Sciences Library](#)



Vertical gaze palsy
[Eccles Health Sciences Library](#)

Examination

■ Neurological signs

- Other cranial nerves
 - Frontal dystonia/procerus sign – PSP/CBD
 - Oral apraxia – FTD
 - Abnormal oral movements (scrapping, coughing) – FTD/HD (⇔ tardive dyskinesia)
 - (Pseudo)bulbar weakness – FTD-ALS/PSP/CBD (rarely in LBD)
 - Dystonic cervical musculature – PSP/CBD/LBD
- Speech: listen to spontaneous speech during anamnesis
 - Prosody
 - Hypophonia
 - Fluency – apraxia of speech (distortions, groping speech, approximations)
 - Content: repetitions, stereotyped speech, vocabulary, circumlocutions, ...
 - Inappropriate topics: grandiosity, familiarity, aggression, inaccuracies, ...



Examination

- **Neurological signs**

- Apraxia
Ideomotor apraxia



Cassidy, 2015

- Primitive reflexes
Quite aspecific, but unusual if present in middle age
Masseter, glabella tap, grasp reflex, palmomental reflex
- Rigidity (Froment)
- Pyramidal signs – CBD/FTD-ALS/VAD

Examination

- **Neurological signs**

- **Abnormal movements**

(Armstrong criteria for CBD)

- Alien limb (hand, foot) - CBD
- Chorea – HD/FTD
- Utilisation behavior - FTD
- Tremor – LBD/FTD
- Myoclonus – CBD/LBD/CJD ⇔ startle response CJD
- Inappropriate touching/social distance/dress code - FTD

- **Gait**

- Extrapyraxidal gait
- Postural reflexes – LBD/PSP
- Apraxia of gait – NPH (but also needs other symptoms)
- Safety?



Take home message

- **First consultation is essential to determine phenotype**
 - Neurodegeneration vs ageing
 - Interpretation of subsequent technical exams
- **“Multimodal assessment”**
 - Anamnesis of family, clinical exam + technical listening give important clues
 - Work together with your neuropsychologist
- **When in doubt, check the research criteria for diagnosis**
 - AD IWG2, LBD McKeith criteria, FTD Rascovsky criteria, CBD Armstrong criteria
- **Involve the patient**
 - Think long-term: collaboration between clinician, patient & family for best compliance