Advanced Clinical Assessment and Diagnosis

11th week
Neurocognitive Disorders

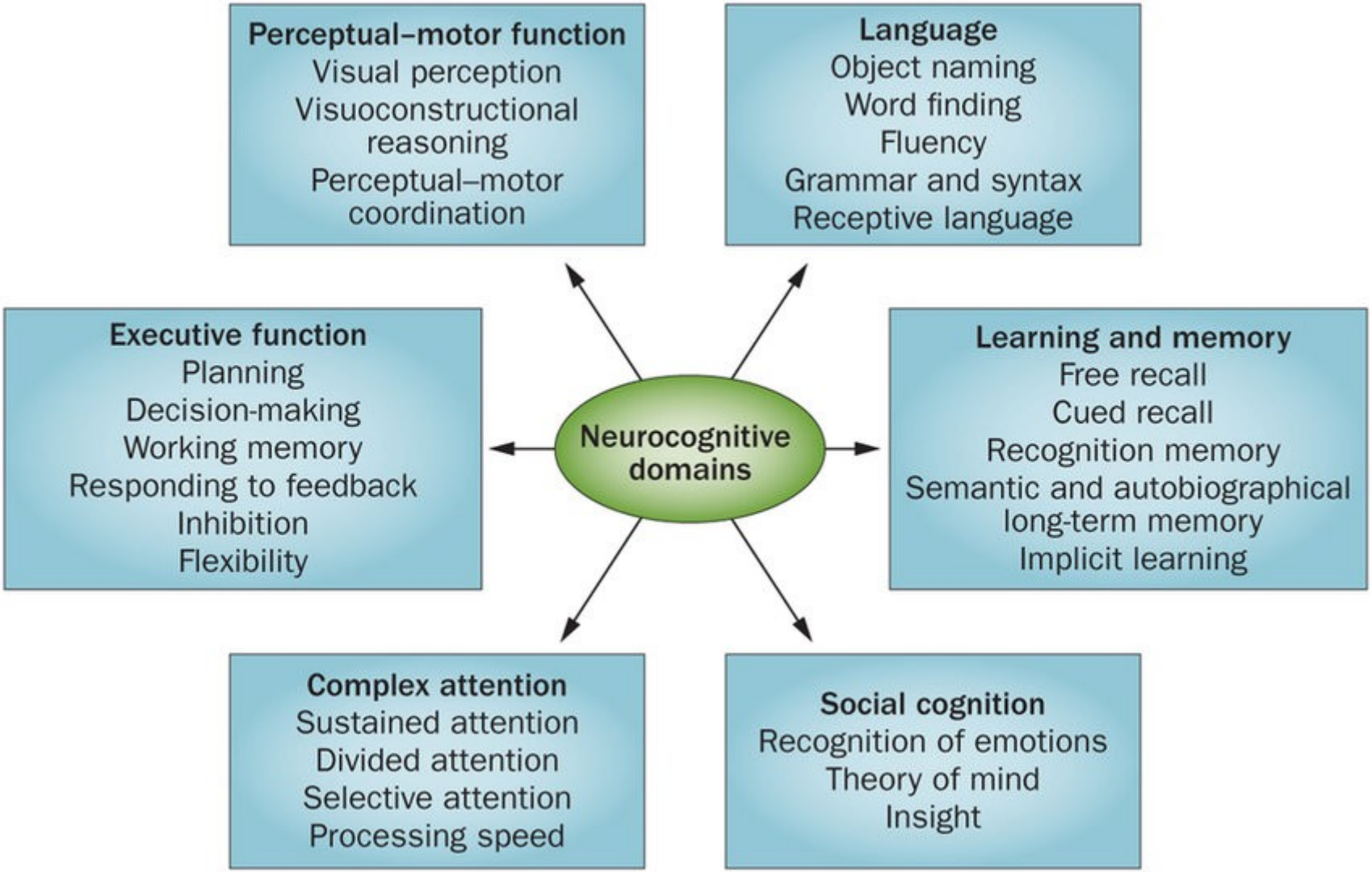
NEUROCOGNITIVE DISORDERS in DSM-5

- These disorders involve cognitive decline acquired in life in one or more domains out of 6 cognitive domains.
  - It is diagnosed based upon concerns of the **client** or significant person who knows the client well, and performance on objective assessment measures.

- In *DSM-5,* the term *neurocognitive disorder (NCD)* replaces ***dementia***
  - Refers to a form of cognitive impairment in which individuals experience progressive loss of cognitive functions severe enough to interfere with their normal daily activities and social relationships.

  - Clinicians still use the term “dementia,” and the *DSM-5* work group considered dementia to be useful in settings where medical personnel are familiar with the term.

Cognitive Domains in DSM-5



Classification of NCDs in DSM-5

1) Delirium
   - Substance intoxication delirium, Substance withdrawal delirium, Medication-induced delirium, due to another medical condition, due to multiple etiologies
2) Major neurocognitive disorders

   due to
   - Alzheimer's disease, Frontotemporal labor degeneration, Lewy body disease, Vascular Disease, Traumatic brain injury, substance/medical use, HIV infection, Prion diseases, Parkinson's disease, and Huntington's disease, Another medical condition, Multiple etiologies, Unspecified
3) Mild neurocognitive disorders

   due to
   - Alzheimer's disease, Frontotemporal labor degeneration, Lowy body disease, Vascular Disease, Traumatic brain injury, substance/medical use, HIV infection, Prion diseases, Parkinson's disease, Huntington's disease, Another medical condition, Multiple etiologies, Unspecified

Differential Diagnosis between Delirium and NCD (Dementia in DSM-IV)

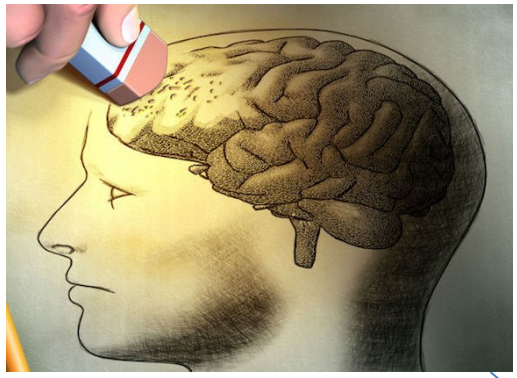
Features	Delirium	NCD
Onset	Acute	Insidious
Reversibility	Reversable	Rarely (almost irreversible)
Course	Fluctuating	Progressive
Consciousness	Altered	Rarely alters
Awareness	Decreased awareness of self	Decreased awareness of self
Perceptions	Illusions, hallucinations common	Hallucinations not common
Speech	Slow, incoherent	Repetitive, difficulty finding words
Orientation	Disoriented- time, person, place	Disoriented- time, person, place
Cognition	Cognitive dysfunction	Cognitive dysfunction; Memory impairment
Prognosis	Excellent if treated early	Poor

Epidemiology

- Global prevalence in 2010 in 60+ year olds: 4.7% (35.6 million)
- By 2050, there maybe 115.4 million people will have dementia in the world.
- US population is “graying”- By 2030, there may be 70 million elderly in the US (currently around 35 million)
- Prevalence of dementia in 65+ year olds: 6-8%
- Prevalence of dementia in 80+ year olds: 30%
- Most common type of dementia is Alzheimer’s: 5.2 million Americans have Alzheimer’s as of 2013

1) Delirium – Course of Delirium

- Acute illness
- Injury
- Surgery
- Effects of drugs



Acute affects on the brain

Acute confusion
Drowsiness and/or agitation
Hallucinations & delusions

= Delirium

1) Delirium

A. Disturbance of consciousness (i.e., reduced clarity of awareness of the environment) occurs, with reduced ability to focus, sustain, or shift attention.

B. Change in cognition (e.g., memory deficit, disorientation, language disturbance, perceptual disturbance) occurs that is not better accounted for by a preexisting, established, or evolving dementia.

C. The disturbance develops over a short period (usually hours to days) and tends to fluctuate during the course of the day.

D. Evidence from the history, physical examination, or laboratory findings is present that indicates the disturbance is caused by a direct physiologic consequence of a general medical condition, an intoxicating substance, medication use, or more than one cause.

1) Delirium

- Specify whether
  - Substance intoxication delirium, Substance withdrawal delirium, Medication-induced delirium, due to another medical condition, due to multiple etiologies
- Specify if
  - Hyperactive- Agitation or otherwise increased level of activity
  - Hypoactive- Reduced level of activity
  - Mixed level of activity- Normal or fluctuating activity levels
- Specify duration
  - Acute- lasts hours to a few days
  - Persistent- lasts weeks or longer

1) Causes of Delirium

- It is developed from various reasons
  - Substance intoxication
  - Substance withdrawal
  - Head injury
  - Vitamin deficiency
  - A medical condition, such as a stroke, heart attack, worsening lung or liver disease, or an injury from a fall
  - Metabolic imbalances, such as low sodium or low calcium
  - Severe, chronic or terminal illness
  - Fever and acute infection, particularly in children
  - Urinary tract infection, pneumonia or the flu, especially in older adults
  - Exposure to a toxin, such as carbon monoxide, cyanide or other poisons
  - Malnutrition or dehydration
  - Sleep deprivation or severe emotional distress
  - Pain
  - Surgery or other medical procedures that include anesthesia
  - Pain drugs, Sleep medications, Medications for mood disorders, such as anxiety and depression, Allergy medications (antihistamines), Asthma medications, Steroid medicines called corticosteroids, Parkinson's disease drugs

2) Major Neurocognitive disorder

A. Evidence of **significant cognitive decline** from a previous level of performance in one or more cognitive domains — such as complex attention, executive function, learning, memory, language, perceptual-motor or social cognition.
   1. Concern of the individual, a knowledgeable informant (such as a friend or family member), or the clinician that there's been a significant decline in cognitive function; and
   2. A substantial impairment in cognitive performance, preferably documented by standardized neuropsychological testing, or if neuropsychological testing isn't available, another type of qualified assessment.

B. The cognitive deficits interfere with independence in everyday activities (e.g., at a minimum, requiring assistance with complex instrumental activities of daily living, such as paying bills or managing medications).

C. The cognitive deficits don't occur exclusively in context of a delirium, and are not better explained by another mental disorder.

3) Minor Neurocognitive disorder

A. Evidence of **modest cognitive decline** from a previous level of performance in one or more cognitive domains — such as complex attention, executive function, learning, memory, language, perceptual-motor or social cognition.
   1. Concern of the individual, a knowledgeable informant (such as a friend or family member), or the clinician that there's been a mild decline in cognitive function; and
   2. A modest impairment in cognitive performance, preferably documented by standardized neuropsychological testing. Of if neuropsychological testing isn't available, another type of qualified assessment.

B. The cognitive deficits do not interfere with capacity for independence in everyday activities (e.g., complex instrumental activities of daily living such as paying bills or managing medications are preserved, but greater effort, compensatory strategies, or accommodation may be required).

C. The cognitive deficits don't occur exclusively in context of a delirium, and are not better explained by another mental disorder.

Major NCD VS Minor NCD

Major NCD	Minor NCD
• Significant Cognitive Decline • Interfere with independence • Not due to delirium • Not due to other mental disorder	• Moderate Cognitive Decline • NOT interfere with independence • Not due to delirium • Not due to other mental disorder • Previously: cognitive disorder Not otherwise specified

Specifiers

- Possible (0% -100%) vs Probable (50%-100%) for Major NCD due to Alzheimer's disease, Frontotemporal Lobar Degeneration, Lewy bodies or Vascular disease
  - Ex. Possible Major NCD due to Alzheimer's disease
- Behavioral Disturbance:
  - With: e.g. psychosis, mood, agitation
  - Without (not clinically significant)
- Severity (level of disability)- only for Major NCD
  - Mild: Instrumental ADL's are preserved
  - Moderate: Basic ADL's affected
  - Severe: Fully dependent

Coding in DSM-5

TABLE 16.1a. Coding for Major and Mild NCDs: Five Etiologies

Etiology[a]	Major NCD due to {probable}{possible} [etiology][b]		Mild NCD {with} {without} behavioral disturbance[c]
	With behavioral disturbance	Without behavioral disturbance	
Alzheimer's disease	G30.9 [331.0] Alzheimer's disease		(No medical disorder code)
	F02.81 [294.11]	F02.80 [294.10]	
Frontotemporal lobar degeneration	G31.09 [331.19] Frontotemporal disease		—
	F02.81 [294.11]	F02.80 [294.10]	G31.84 [331.83] Mild NCD due to [etiology]
Lewy body disease	G31.83 [331.82] Lewy body disease		
	F02.81 [294.11]	F02.80 [294.10]	State whether {probable} or {possible} and whether the NCD is {with} {without} behavioral disturbance
Parkinson's disease	G20 [332.0] Parkinson's disease		
	F02.81 [294.11]	F02.80 [294.10]	
Vascular disease	—		
	F01.51 [290.40]	F01.50 [290.40]	

G30.9, G31.09, G31.83 and G20 are ICD-10 codes for physical illnesses; codes starting with F are for neurocognitive disorders

Coding in DSM-5

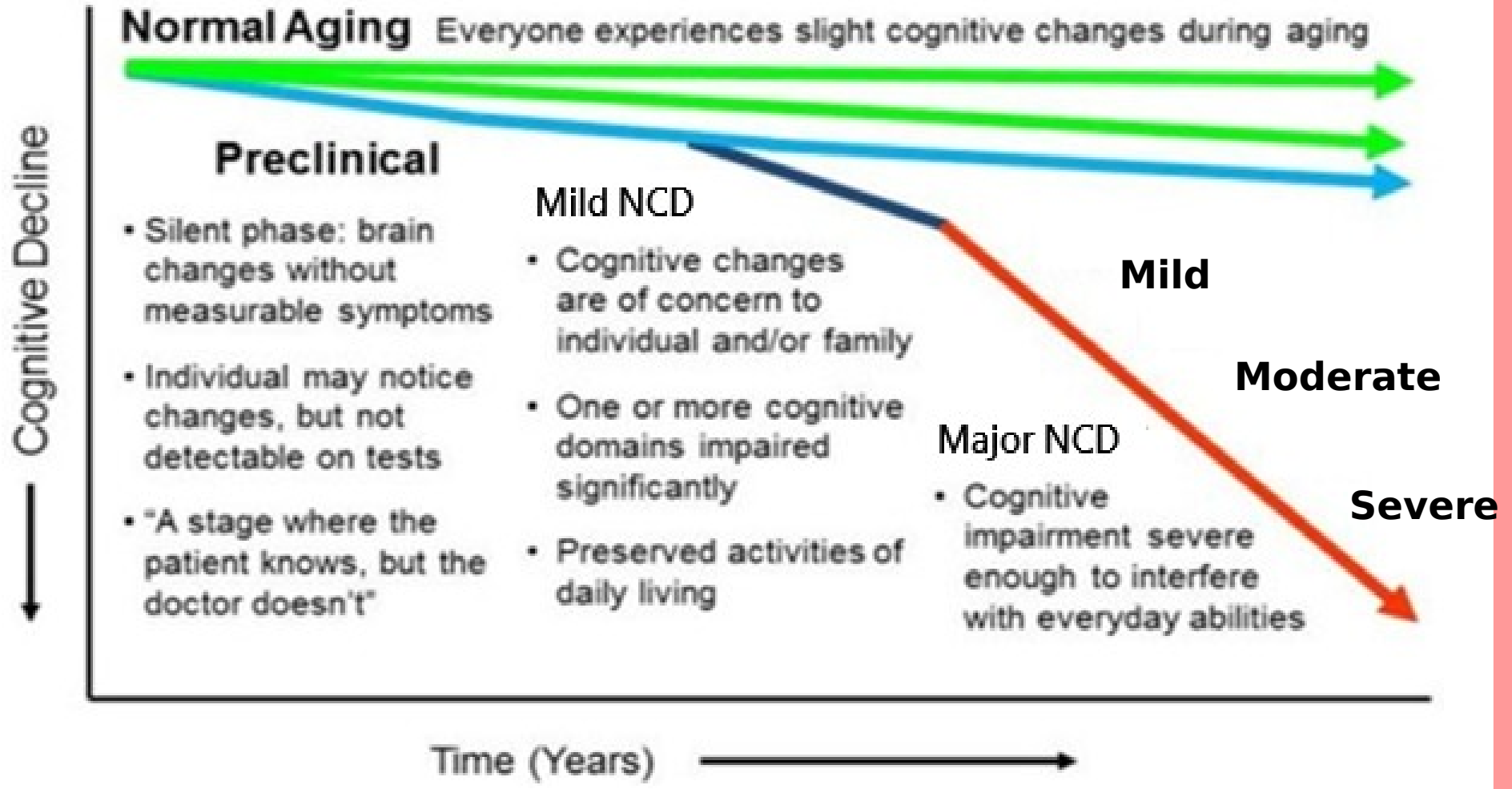
TABLE 16.1b. Coding for Major and Mild NCDs: All Other Etiologies

Etiology	Major NCD		Mild NCD[c]
	With behavioral disturbance	Without behavioral disturbance	
Traumatic brain injury	S06.2X9S [907.0][d]		(No medical disorder code) — G31.84 [331.83] Mild NCD due to [etiology] No statement of {probable}{possible.} You can state {with}{without} behavioral disturbance.
	F02.81 [294.11]	F02.80 [294.10]	
HIV disease	B20 [042] HIV infection		
	F02.81 [294.11]	F02.80 [294.10]	
Huntington's disease	G10 [333.4] Huntington's disease		
	F02.81 [294.11]	F02.80 [294.10]	
Prion disease	A81.9 [046.79] Prion disease		
	F02.81 [294.11]	F02.80 [294.10]	
Other medical condition	## [##] ICD-10 name [ICD-9 name]		
	F02.81 [294.11]	F02.80 [294.10]	
Substance/medication-induced	See Table 15.2 (p. 465)		
Multiple etiologies[e]	(Multiple sets of numbers and names)		
	F02.81 [294.11]	F02.80 [294.10]	

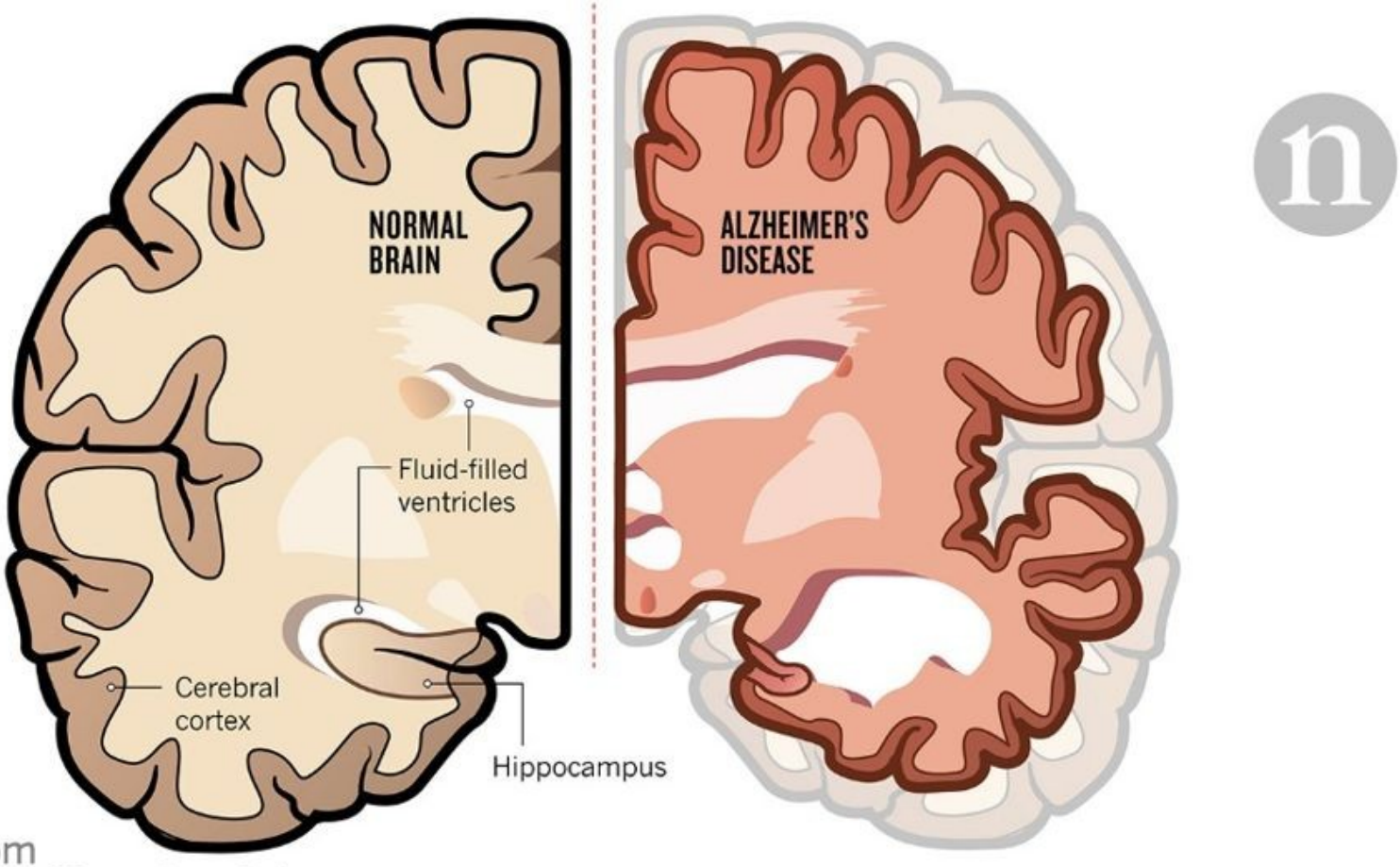
1) NCD due to Alzheimer's

	Major NCD due to Alzheimer's		Mild NCD due to Alzheimer's	
	Probable	Possible	Probable	Possible
	Meets criteria for {major}{mild} NCD			
	Insidious onset, gradual progression of disability			
# domains affected	Two or more		One or more	
Positive genetic evidence (testing or family history) for Alzheimer's disease	Major NCD due to probable Alzheimer's disease	—	Mild NCD due to probable Alzheimer's disease	—
Steady, gradual decline; no extended plateaus	All three factors present: Major NCD due to probable Alzheimer's disease	If any of these 3 is missing: Major NCD due to possible Alzheimer's disease		All three factors present: Mild NCD due to possible Alzheimer's disease
No evidence of mixed causes[a]				
Decline in memory and learning				

Progression from Normal Aging to Alzheimer's Disease or Another Dementia



Alzheimer brain VS Normal Brain

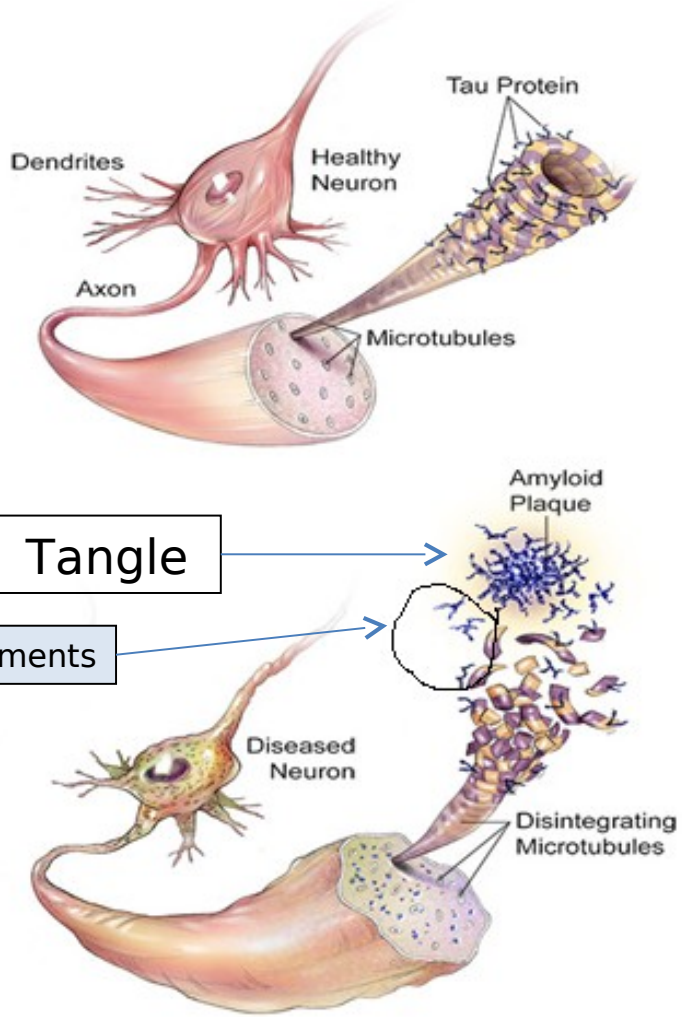


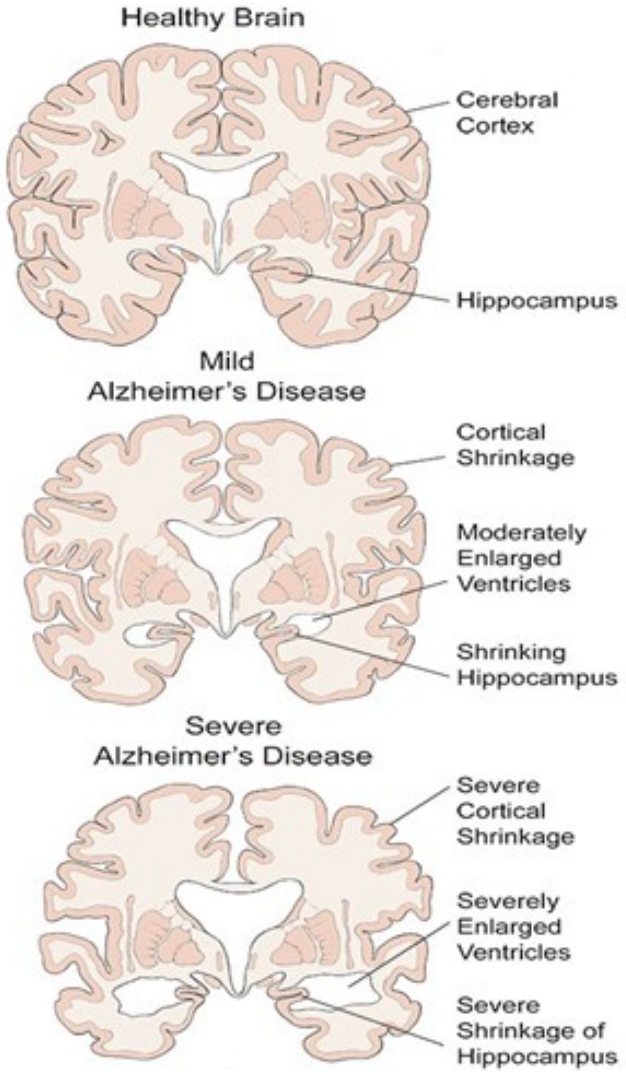
Adapted from illustration by Stacy Jannis/ Alzheimer's Association

Alzheimer’s Disease

- All theories regarding the cause of Alzheimer’s disease focus on biological abnormalities involving the nervous system.
  - Neurofibrillary tangles
  - Tau
  - Amyloid plaques

The Progression of Alzheimer's





Risk Factors for Alzheimer's Disease

1) Genetic/Biological
   - Age
   - Family history
   - Genetic
   - Down syndrome
   - History of head trauma
   - Female gender
   - Small strokes or cerebrovascular disease
   - High cholesterol
   - High blood pressure
   - Diabetes
   - Lack of exercise
   - African American or Hispanic
   - Diet
   - Environmental toxins
   - Smoking cigarettes
   - Heavy alcohol use
2) Psychological
   - Depression
   - Stress
3) Social
   - Low educational status
   - Higher occupational staus

2)NCD due to Lewy bodies

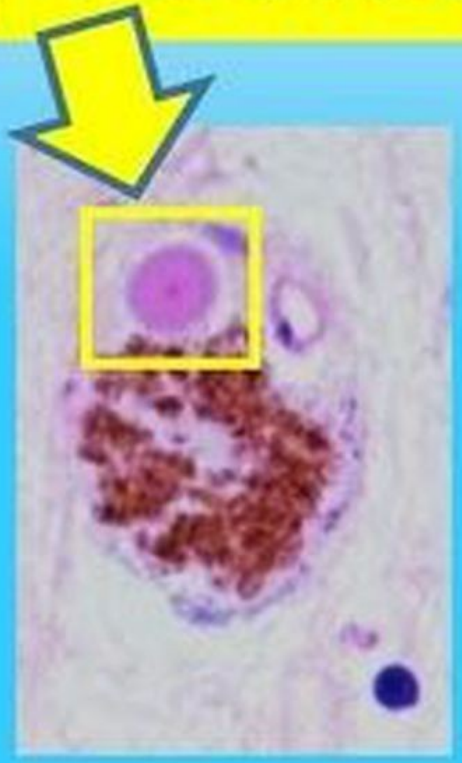
- A form of neurocognitive disorder with progressive loss of:
  - Memory
  - Language
  - Calculation
  - Reasoning and higher mental functions

- Results from the accumulation of abnormalities called Lewy bodies throughout the brain.

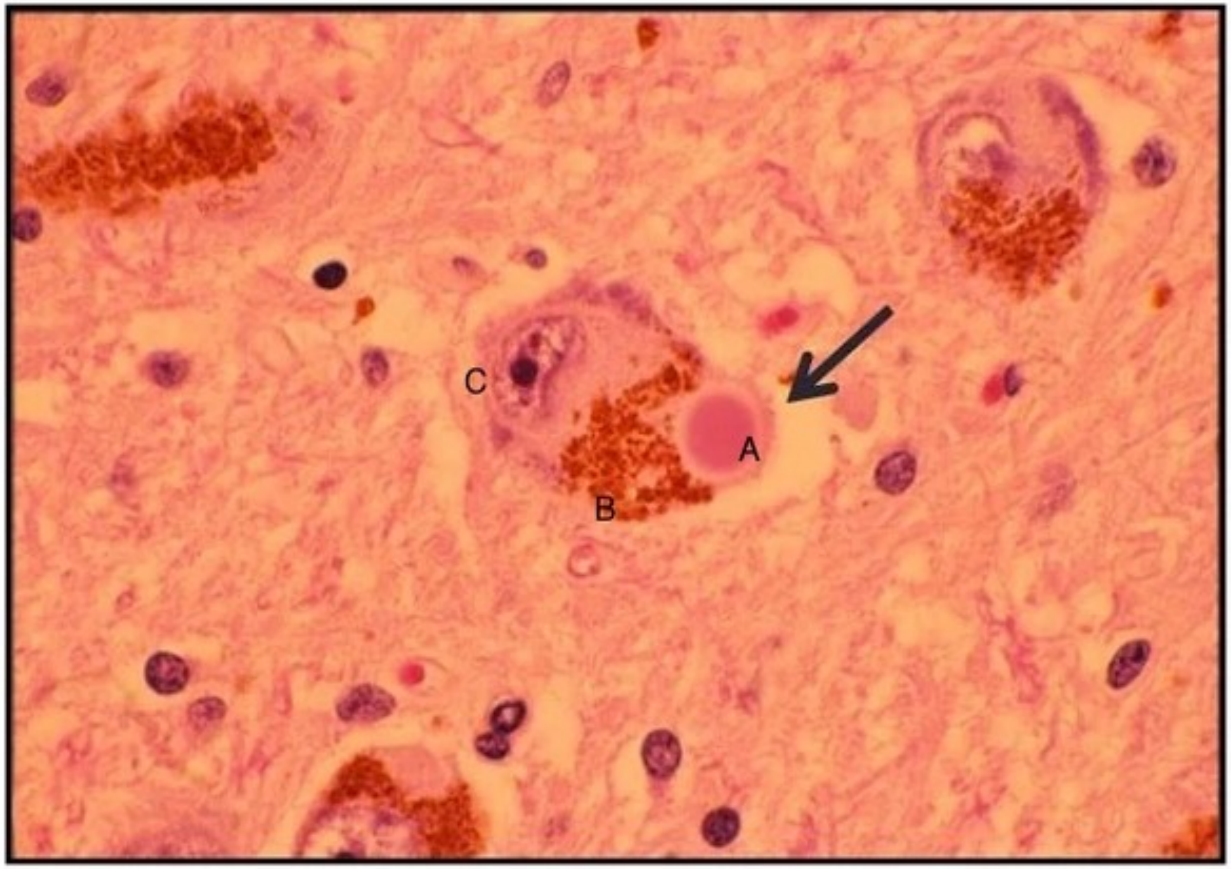
2) NCD due to Lewy Bodies

		Probable NCD with Lewy bodies	Possible NCD with Lewy bodies
Core features	Fluctuating alertness and attention	One core feature plus one or more core or suggestive feature yields a diagnosis of {mild} {major} NCD with probable Lewy bodies	One core or suggestive feature is enough for a diagnosis of {mild} {major} NCD with possible Lewy bodies
	Repeated, vivid, detailed hallucinations		
	Parkinsonism that begins only *after* the cognitive decline		
Suggestive features	REM sleep behavior disorder		
	Exquisite sensitivity to neuroleptics		

Dementia with Lewy Bodies

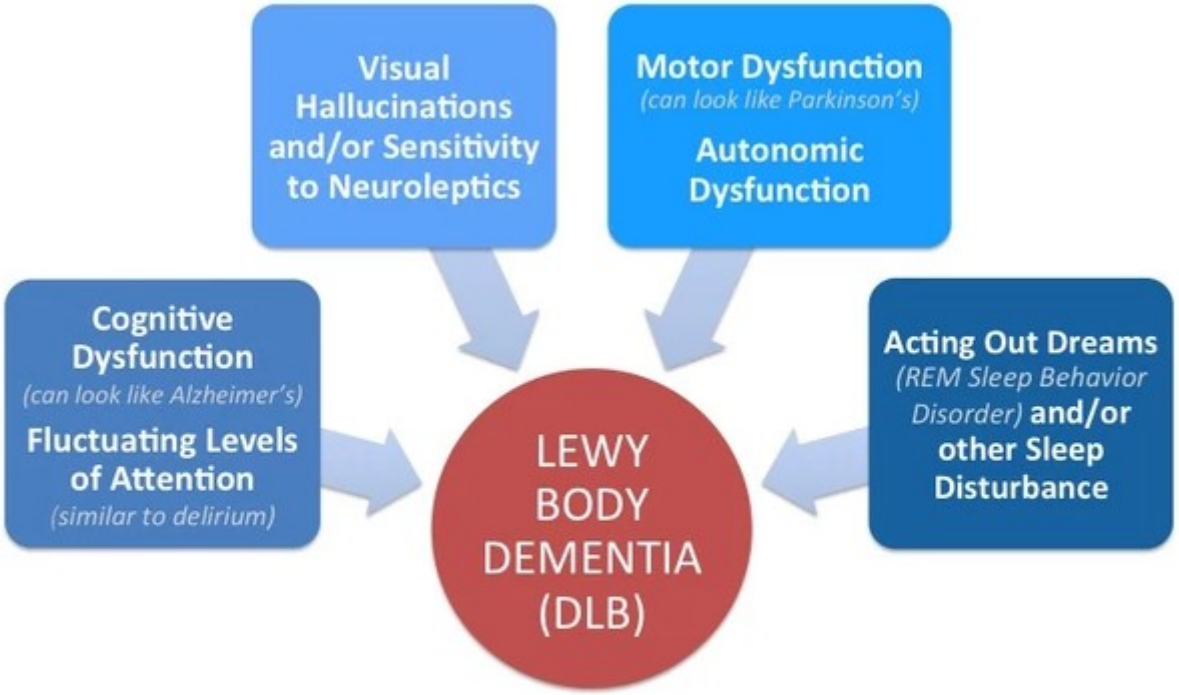


Lewy Body Pathology: H&E Stain



(A) The large pink Circle is a Lewy Body within a Brain Cell. (B) The brown section to the left of the Lewy Body is normal brain pigmentation. (C) The nucleus, the cell's control center is to the far left of the cell.

Symptoms of Lewy Bodies



https://www.dementiaaide.com/blogs/tips-for-dementia/the-basics-of-lewy-body-dementia

3) NCD due to Vascular Disease

- a vascular disease that causes deprivation of the blood supply to the brain.
  - **multi-infarct dementia (MID)**, caused by transient attacks in which blood flow to the brain is interrupted by a clogged or burst artery.
- Although each infarct is too small to be noticed at first, over time the progressive damage caused by the infarcts leads the individual to lose cognitive abilities

https://www.youtube.com/watch?v=GdkU5vCIpaU

4) NCD due to Frontotemporal labor degeneration

- Symptoms are reflected in personality changes:
  - Apathy, lack of inhibition, obsessiveness, and loss of judgment.

- Neglect of personal habits and loss of the ability to communicate

  eventually occurs.

- The onset of the disorder is slow and insidious.

5) NCD due to Parkinson's disease

- A neurocognitive disorder that involves degeneration of neurons in the subcortical structures that control motor movements.
  - At rest, hands, ankles, or head may shake involuntarily
  - **Akinesia**: Muscular rigidity, difficulty initiating movement
  - **Bradykinesia**: General slowing of motor activity
    - Loss of fine motor coordination
    - Slowed, shuffling gait
    - Difficulty starting or stopping movement like walking
    - Signs of cognitive deterioration
    - Expressionless and speech becomes stilted
- Many cognitive functions, such as attention, concentration, and immediate memory, remain intact.

NCD due to Alzheimer's Disease VS. Vascular Disease

Onset	Gradual	Sudden or gradual
Progression	Progressive decline of memory deficit and other cognitive functions (e.g., language, motor skills, perception) without focal lesions	Slow decline
Memory	Early, pronounced deficit	Mild impairment
Executive dysfunction	Late appearance	Early, pronounced
Neurologic findings	None or subtle	Focal neurologic symptoms (e.g., visual disturbances, brainstem abnormalities, sensory or motor symptoms) and signs (e.g., hemiparesis, visual-field defects, extrapyramidal signs)
Neuroimaging	Hippocampal, temporal, and parietal atrophy most common	Lacunes, WML, infarcts
Cardiovascular history	Less common	TIA, CVA, vascular risk factors

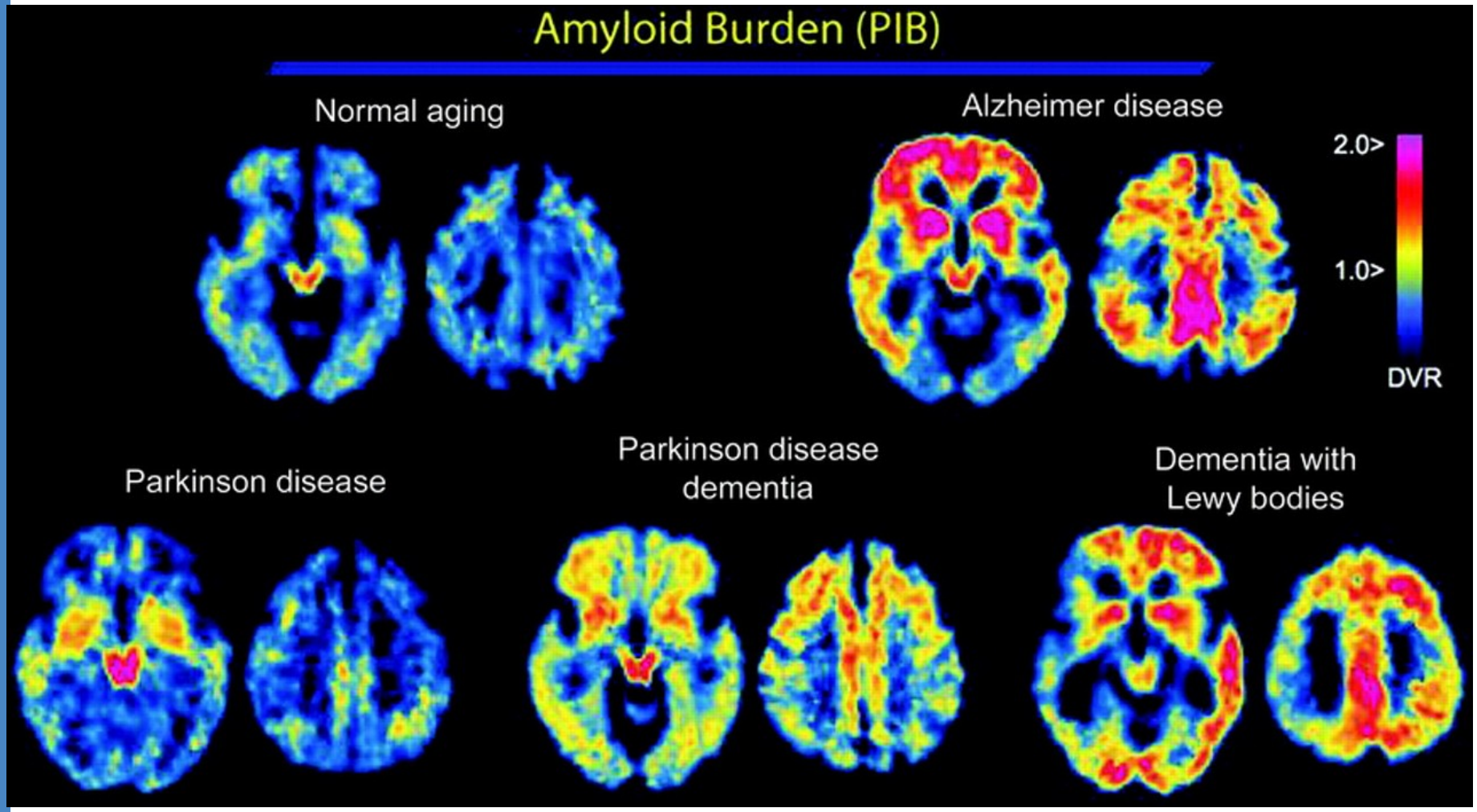
CVA: cerebrovascular accident; TIA: transient ischemic attack; WML: white-matter lesions.
Source: Reference 5.

https://www.uspharmacist.com/article/vascular-dementia

NCD due to Lewy Body VS. Parkinson's Disease VS. Alzheimer's Disease

Early Symptom Comparison	Lewy Body Dementia (LBD)	Parkinson's Disease (PD)	Alzheimer's Disease (AD)
Decline in thinking abilities that interfere with everyday life	Always	Possible Years After Diagnosis	Always
Significant Memory Loss	Possible	Possible Years After Diagnosis	Always
Planning or Problem Solving Abilities	Likely	Possible	Possible
Difficulty with sense of direction or spatial relationships between objects	Likely	Possible	Possible
Language Problems	Possible	Possible	Possible
Fluctuating Cognitive Abilities	Likely	Possible	Possible

(**Source:** *Lewy Body Dementia Association*)



https://n.neurology.org/content/71/12/903/tab-figures-data

How do we find Neurocognitive Disorder (NCD)?

With cognitive decline, when behaviors below are witnessed by family members

- Perceptual disturbances (delusions, hallucinations and the misidentification of others)
- Mood disturbances
- Wandering and other dangerous behaviors
- Agitation or rage
- Sleep disturbances
- Distressing repetitive behavior (e.g., rechecking, packing and unpacking, preoccupation with certain ideas)
- Inappropriate sexual behavior)
- Incontinence
- Refusal to eat

Assessment

- Finding cognitive impairment in 6 cognitive domains
- A mental status assessment
- A comprehensive medical history
- A physical examination
- Blood tests- assessing cholesterol levels, thyroid function, full blood count, folate levels, and possible diabetes
- Magnetic resonance scan (MRI)- brain changes arising from cardiovascular events (strokes); can help differentiate VD and AD

Assessment tools

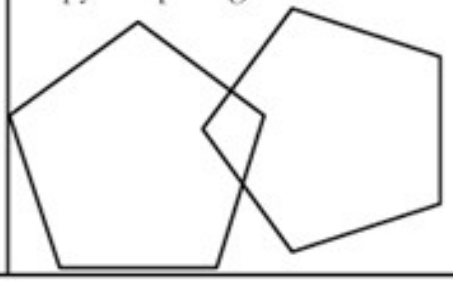
Examples of cognitive assessment tools

Symptoms	Examples within cognitive tests
Immediate memory	3-word recall (MMSE)
Recent memory (including free recall, cued recall and recognition memory)	5-word recall (MoCA)
Very long-term memory (semantic, autobiographical)	
Expressive language (naming, word finding, fluency)	Recognizing pen or watch (MMSE)
Grammar and syntax	Animals (MoCA)
Receptive language (comprehension)	
Sustained attention	Serial 7s, numbers backward
Selective attention	
Divided attention	
Planning	Mini trials (MoCA)
Decision making	
Working memory (ability to hold information briefly and to manipulate it)	
Feedback/error correction	
Overriding habits	
Mental flexibility (ability to shift between 2 concepts, tasks or response rules)	
Visual perception	Pentagons, cube, trails, clock face
Visuoconstructional	Blowing candle, waving goodbye
Perceptual-motor (integrating perception with purposeful movement)	
Praxis (integrity of learning movements, such as ability to imitate gestures)	
Gnosis (perceptual integrity of awareness and recognition)	

MMSE = Mini-Mental State Exam (MMSE); MoCA = Montreal Cognitive Assessment.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5384525/

Picture 1 – Mini mental state examination (MMSE)

Temporal orientation (5 points)	What is the approximate time?
	What day of the week is it?
	What is the date today?
	What is the month?
	What is the year?
Spatial orientation (5 points)	Where are we now?
	What is this place?
	In what district are we or what is the address here?
	In which town are we?
	In which state are we?
Registration (3 points)	Repeat the following words: CAR, VASE, BRICK
Attention and calculation (5 points)	Subtract: 100-7 = 93-7 = 86-7 = 79-7 = 72-7 = 65
Remote memory (3 points)	Can you remember the 3 words you have just said?
Naming 2 objects (2 points)	Watch and pen
REPEAT (1 point)	"NO IFS, ANDS OR BUTS"
Stage command (3 points)	"Take this piece of paper with your right hand, fold it in half, and put it on the floor"
Writing a complete sentence (1 point)	Write a sentence that makes sense
Reading and obey (1 point)	Close your eyes
Copy the diagram (1 point)	Copy two pentagons with an intersection 

Fonte: Brucki SMD, Nitrini R, Caramelli P, Bertolucci PHF, Okamoto IH. Sugestões para o uso do mini-exame do estado mental no Brasil. Arq Neuropsiquiatr. 2003; 61(3B):777-81.

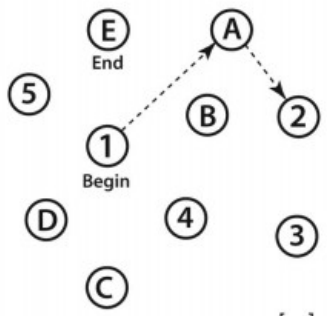
MONTREAL COGNITIVE ASSESSMENT (MOCA)

Version 7.1 Original Version

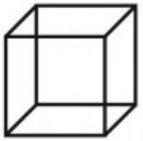
Education : Sex :

Date of birth : DATE :

VISUOSPATIAL / EXECUTIVE



Copy cube



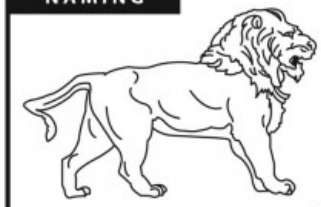
[ ] [ ]

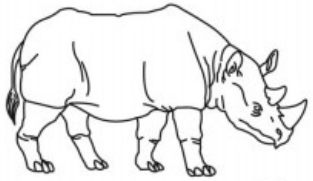
Draw CLOCK (Ten past eleven) (3 points)

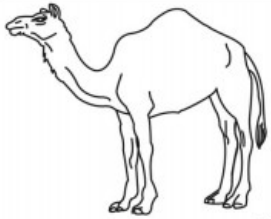
[ ] Contour [ ] Numbers [ ] Hands

POINTS __/5

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
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

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

__/1

Serial 7 subtraction starting at 100 [ ] 93 [ ] 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

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

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

__/1

ABSTRACTION

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

__/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						

__/5

ORIENTATION

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

__/6

www.mocatest.org

Normal ≥ 26 / 30

TOTAL __/30

Add 1 point if ≤ 12 yr edu

Administered by: _____

Neuropsychological Test Battery

Cognitive Index	Task Name	Norms	Measure Description	Additional Details
Working Memory	Digit Span[15]	[15]	Immediate recall of digit strings (forwards & backwards)	Total Score (sum of DS-F, DS-B)
Long Term Memory	Logical Memory[16]	[16]	Immediate and delayed recall of short stories	Total Score (sum of LM-I and LM-D)
	Visual Reproduction [16]	[16]	Immediate and delayed reproduction of line drawings	Total Score (sum of VR-I and VR-D)
Processing Speed	BMIPB SOIP[13]	[13]	Speeded cancellation of second highest of five two-digit numbers	Total Correct (adjusted for SOIP-M)
	Digit Symbol[15]	[15]	Speeded transcoding task	Total Correct
	Grooved Pegboard [17]	[18]	Pick-up, rotation and placement of small pegs.	Time Taken (best of L/R hand trials)
Executive Function	Trail Making Test[19]	[20]	Pen and paper sequencing task: alternating letters and numbers	Time to Complete Part B
	SL-Verbal Fluency [21]	[21]	Timed generation of words beginning with letter: FAS/ BHR	Total Correct (all letters)
	mWCST[22]	[22]*	Card Sorting Test involving flexible shifting from learned dimensions.	Categories Completed & Perseverative Errors+
Global Cognition	All tasks listed above			

https://www.researchgate.net/figure/Neuropsychological-Test-Battery_fig3_280986494

Assessment tools

Tools	Total scores	Time to administer	Areas of assessment
Mini-Mental State Examination (MMSE)[4,28,33]	30	5-10 min	Orientation, registration, recall, attention and calculation, language
Abbreviated Mental Test Score (AMTS)[4,34,35]	10	5 min	Orientation, attention, memory, general knowledge
Montreal Cognitive Assessment (MoCA)[4,29]	30	10-15 min	Memory, attention and concentration, executive functions, language, visuoconstructional skills, conceptual thinking, calculations and orientation
Mini-Cog[4,36]	5	3 min	Recall of memory, clock drawing
Clock-Drawing Test (CDT)[4,37]	6	3 min	Clock drawing
General Practitioner Assessment of Cognition (GPCOG)[4,38]	9	6 min	Recall, time orientation, clock drawing, information
7-minute screen (7MS)[39]		6-10 min	Memory, orientation, verbal frequency, visuoconstruction
Memory Impairment Screen (MIS)[4,40]	8	5 min	Recall

Interventions

Intervention	Description
Behavioral intervention	1. Clarify the target behavior, breaking it down into steps if necessary 2. Identify the relevant antecedent cues and consequent reinforcers of the target behavior 3. Enlist the assistance of caregivers in developing new environmental conditions (antecedents) that will increase the likelihood of the desired behavior 4. Teach caregivers how to reinforce client performance of desired behaviors (with praise, hugs, or a reward activity)
Reminiscence therapy	Stimulate the client's memory and mood by systematically discussing events in his or her life history
Reality orientation	Provide factual information (day, date, weather, time, names) to orient client to current circumstances
Cognitive stimulation therapy	Use information processing rather than facts to orient the client Promote goal-directed tasks

Interventions

Intervention	Description
Sensory enhancement	Music therapy, hand massage, and the like, as well as environmental modulation
Music therapy	Focus on the person's expression through musical means
Aromatherapy	Use essential oils to promote relaxation
Brain-activating rehabilitation	Initiate enjoyable activities based on errorless learning to offer clients social roles that tap into their strengths, involve mutual communication, and elicit praise from the provider.
Functional analysis	Use the practitioner's understanding of the clients' behavior as a basis for developing individualized strategies to relieve distress caused by negative behaviors

Table

Medications for neurocognitive disorders

Medication	Class	FDA indication	Dosing
Donepezil	Cholinesterase inhibitor	Mild to severe cognitive impairment	5 mg/d for 4 to 6 weeks, titrate to 10 mg/d. Limited evidence supports 23 mg/d for patients who have been taking 10 mg/d for 3 months
Galantamine	Cholinesterase inhibitor	Mild to moderate memory impairment	IR: 4 mg twice a day with meals, titrate to 8 to 12 mg twice a day as tolerated ER: 8 mg/d with meal for 4 weeks, then titrate to 16 mg/d for 4 weeks, then titrate to 24 mg/d
Rivastigmine	Cholinesterase inhibitor	Mild to moderate memory impairment	1.5 mg twice a day for 2 to 4 weeks. Titrate by 1.5 mg twice a day every 2 to 4 weeks to 3 to 6 mg twice a day
Memantine	NMDA receptor agonist	Moderate to severe memory impairment	5 mg at bed, titrate by 5 mg at weekly intervals until reaching 10 mg twice daily XR: 7 mg/d, titrate by 7 mg at weekly intervals to 28 mg/d

Source: References 6-10

ER: extended release; FDA: Food and Drug Administration; IR: immediate release; NMDA: *N*-methyl-D-aspartate; XR: extended release

References

- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders. *Arlington: American Psychiatric Publishing*.
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- Stokin, G. B., Krell-Roesch, J., Petersen, R. C., & Geda, Y. E. (2015). Mild neurocognitive disorder: an old wine in a new bottle. *Harvard review of psychiatry*, *23*(5), 368.