ASSESSMENT AND INVESTIGATIONS OF PATIENTS WITH DEMENTIA

INTRODUCTION

- Dementia is progressive cognitive impairment in clear consciousness
- Decline from a previous level of functioning
- Involves multiple cognitive domains

INTRODUCTION

- Significant impairment in social or occupational functioning
- Decreased ability to perform activities of daily living
- Development of behavioural disturbances

INTRODUCTION

- Alzheimer's disease: 50% - 60%
- Vascular dementia: 15%
- Mixed vascular and Alzheimer's dementia:15%
- Fronto-temporal dementias: 5%
- Other dementias: 10% (Lewy body dementia, Pick's disease, NPH etc)
- Reversible dementias: 5%

ASSESSMENT

- The assessment of patients for dementing conditions demands considerable focus in assessment & multifactorial approach.

- It include an understanding of the characteristics of normal aging process & the salient behavioral/cognitive characteristics of the dementias.

ASSESSMENT

- There are a number of things that it is important to establish at the beginning of the assessment:

1. Introduce yourself and make your role clear – some patients may not realise that they have been referred to a psychiatrist.

2. Try your best to put the patient at ease.

ASSESSMENT

3. Establish what the patient would like to be called (Name/Bhaiji/Mataji etc).

4. Make sure you know the names of people accompanying the patient and their relationship/roles.

5. Ask if the patient would like some time alone without relatives/carers listening.

ASSESSMENT

- Assessment serves a twofold purpose:

  -first to establish whether dementia is present, and

  -second, if dementia is present, to determine its cause

ASSESSMENT

BASIC DEMENTIA WORKUP

- History
- Physical Examination
- Mental status examination
- Assessment of everyday functioning
- Neuroimaging
- Laboratory investigations

ASSESSMENT

HISTORY

- Relevant aspects of the history include the -

-onset of cognitive impairment (insidious or sudden),

-course (gradual or stepwise, progressive or episodic, or fluctuating),

-and duration of impairment

ASSESSMENT

- An assessment of each cognitive domain is critical.
- For memory, inquire about short-term, long-term, and remote memory.
- For language, inquire about word-finding difficulties and remembering names of family members and friends.

ASSESSMENT

- For praxis, inquire about use of familiar tools or machines, maintenance of previously acquired skills & dressing or feeding.
- For agnosia, inquire about recognition of familiar objects and insight into their condition and limitations.
- Inquiring into executive function involves assessing ability to perform complex tasks or solve problems.

ASSESSMENT

- The degree of functional impairment should be ascertained.
- There may also be changes in social functioning & ADL.
- Patients should be evaluated for the behavioural and neuropsychiatric manifestations of dementia.
- Depression and anxiety symptoms may be common, particularly in early stages of dementia.

ASSESSMENT

- Medical and neurological history is relevant, especially any changes that may have a temporal relationship to the onset or worsening of cognitive dysfunction.
- Cerebrovascular events can coincide with the onset or worsening of vascular dementia or dementia of any etiology.
- Certain medical illnesses can contribute to the onset of dementia

ASSESSMENT

- Alcohol and substance abuse history should be ascertained.
- Family history of dementia, early-onset dementia, or Huntington's disease is important.
- Exposure to certain chemical agents may also be relevant

ASSESSMENT

PHYSICAL EXAMINATION

- A complete physical and neurological exam is necessary.
- The physical exam is targeted toward medical conditions that may cause dementia.
- The neurological exam is necessary to identify focal neurological signs that may point to specific brain lesions or pathology.

ASSESSMENT

- The purpose of the physical examination is to identify:

-Reversible causes

-Differential diagnoses

-Exacerbating factors

-Factors that may affect prescribing

-Physical impairments that will affect suitability of accommodation

- Unreported physical illness requiring attention.

ASSESSMENT

MENTAL STATUS EXAMINATION

- It is useful to assess

-self-care abilities (appearance and grooming),
-affect (apathy, depression, anxiety),
-speech (language function, fluency, comprehension),
-perception (hallucinations, paranoia, delusions).

ASSESSMENT

COGNITIVE ASSESSMENT

- Bedside cognitive testing is performed to characterize the pattern and extent of cognitive impairment.
- The most widely employed tool for basic screening and evaluation is the MINI-MENTAL STATE EXAM (MMSE).
- It was developed by Folstein et al(1975)

ASSESSMENT

- The MMSE is a 30-point test of basic cognitive skills that measures orientation, immediate recall, short-term memory, attention, and concentration.
- It features questions on basic language, reading, writing, and following directions.
- The patient is also given a figure of two overlapping pentagons to copy.
- Although relatively easy to learn and administer, the MMSE has some limitations.

ASSESSMENT

- LIMITATIONS OF MMSE-

1. The questions are limited to several cognitive domains and do not address ADL, neurovegetative symptoms, or behavioral aspects of dementia.

2. Patients who receive a similar score may actually have answered individual questions quite differently

ASSESSMENT

3. Highly intelligent or educated patients may continue to achieve a relatively high score despite having early dementia.

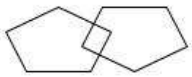
4. The MMSE is difficult to administer and interpret for individuals with limited education, language proficiency or motivation.

5. Vision or hearing deficits limit the effectiveness of this test. The MMSE may overestimate cognitive deficits in such patient.

Mini-Mental State Examination (MMSE)

Patient's Name: _____ Date: _____

***Instructions:* Ask the questions in the order listed. Score one point for each correct response within each question or activity.**

Maximum Score	Patient's Score	Questions
5		"What is the year? Season? Date? Day of the week? Month?"
5		"Where are we now: State? County? Town/city? Hospital? Floor?"
3		The examiner names three unrelated objects clearly and slowly, then asks the patient to name all three of them. The patient's response is used for scoring. The examiner repeats them until patient learns all of them, if possible. Number of trials: _____
5		"I would like you to count backward from 100 by sevens." (93, 86, 79, 72, 65, …) Stop after five answers. Alternative: "Spell WORLD backwards." (D-L-R-O-W)
3		"Earlier I told you the names of three things. Can you tell me what those were?"
2		Show the patient two simple objects, such as a wristwatch and a pencil, and ask the patient to name them.
1		"Repeat the phrase: 'No ifs, ands, or buts.'"
3		"Take the paper in your right hand, fold it in half, and put it on the floor." (The examiner gives the patient a piece of blank paper.)
1		"Please read this and do what it says." (Written instruction is "Close your eyes.")
1		"Make up and write a sentence about anything." (This sentence must contain a noun and a verb.)
1		"Please copy this picture." (The examiner gives the patient a blank piece of paper and asks him/her to draw the symbol below. All 10 angles must be present and two must intersect.) 
30		TOTAL

(Adapted from Rovner & Folstein, 1987)

ASSESSMENT

MODIFIED MINI-MENTAL STATE EXAM (3MS)

- Teng and Chui undertook an extensive modification of the MMSE in developing the Modified MMSE (3MS).

- Like the MMSE, the 3MS is based on an interview-style administration that takes about 5 min to complete.

ASSESSMENT

- It is a 15-item test
- It incorporates all of the components of the original MMSE plus four additional subtests (Date and Place of Birth, Word Generation, Similarities and a second Delayed Recall).
- The range of possible scores increased from 0–30 (for the MMSE) to 0–100 for the 3MS.

ASSESSMENT

CLOCK DRAWING TEST

- For the clock drawing test (Brodaty and Moore 1997), the patient is usually asked to draw the face of a clock including the numerals and hands to indicate a certain time.

- Several scoring methods are utilized.

ASSESSMENT

- Typically the scoring method-

0 - Poor- Given for nonrecognizable drawings or a gross distortion

1 – Fair- Given for moderate distortion or rotation of any of the drawings (the clock should contain an approximately circular face or the numbers 1 through 12)

2 – Good- Given for only mild distortions with adequate integration(the clock should contain two of the following: circular face, numbers 1 through 12)

3 – Excellent- Given for perfect (or near perfect) representations of the items with all appropriate components, placement, and perspective

ASSESSMENT

0

1

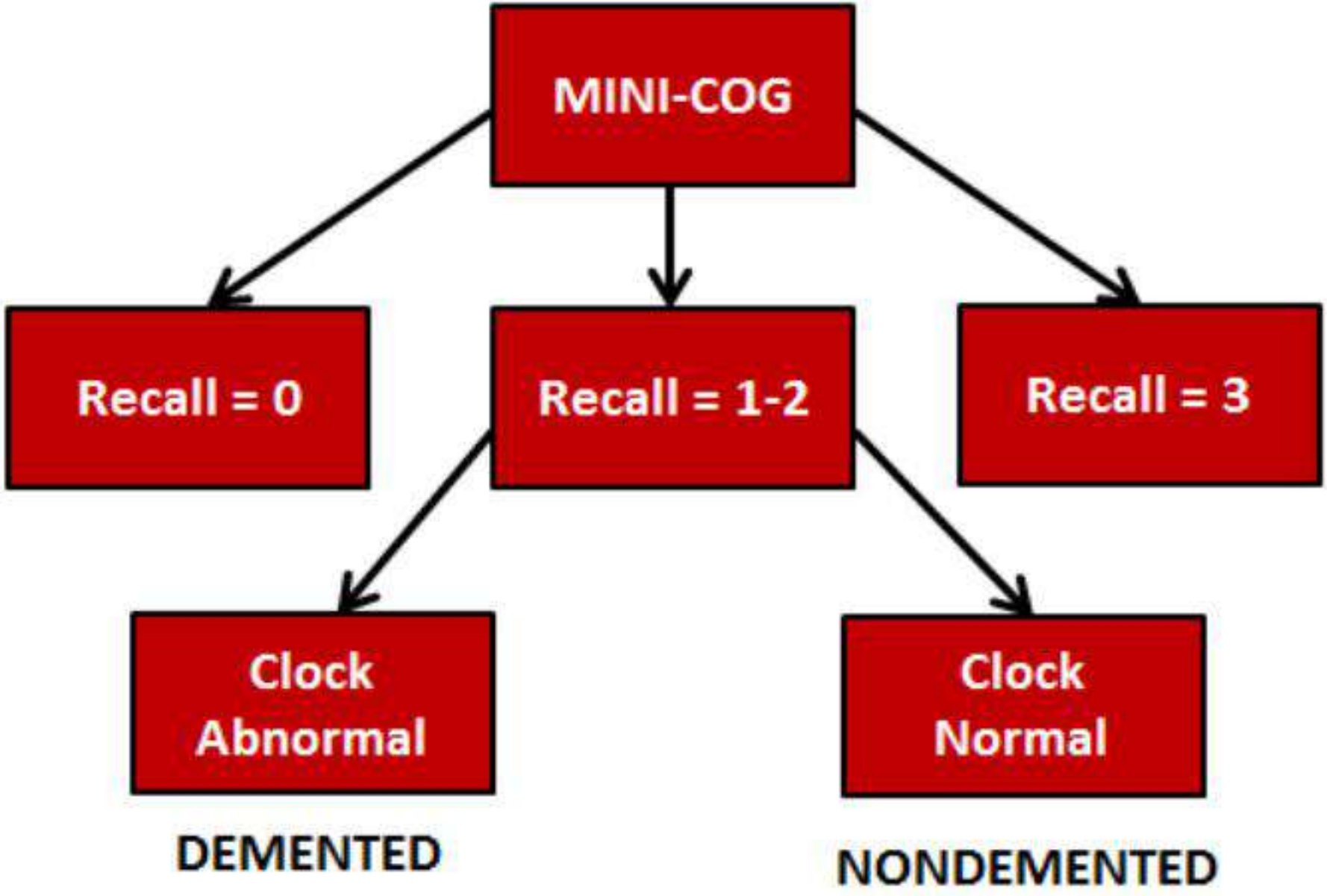
2

3

ASSESSMENT

THE MINI-COG TEST

- It also involves four possible points.
- The patient is given a three-item recall task as well as a clock. In this test, one point is received for each item correctly recalled and one point for a correct clock (Borson et al. 2000).



Borson, S., et al. (2000) *Int J Geriatr Psych* 15(11) 1021-1027.

ASSESSMENT

SEVERITY MEASURES

THE CLINICAL DEMENTIA RATING SCALE

- measures several domains of function including memory, orientation, judgment and problem solving, community affairs, home and hobbies and personal care.

ASSESSMENT

THE FUNCTIONAL ASSESSMENT STAGING (FAST)

- Barry Reisberg, MD and colleagues have developed the FAST scale.
- It allows professionals and caregivers to chart the decline of people with Alzheimer's disease.
- The FAST scale has 7stages and 16sub-stages

ASSESSMENT

- FAST has been developed to track the course of AD and is also useful for other dementias.

- Staging is based on the ability to perform certain skills or functions and is dependent on baseline skills, acquired deficits, and the social environment.

ASSESSMENT

THE NEUROPSYCHIATRIC INVENTORY (NPI)

-It is a useful tool that was developed to assess psychopathology in dementia patients and evaluates 12 neuropsychiatric disturbances:

Delusions, hallucinations, agitation, dysphoria, anxiety, apathy, irritability, euphoria, disinhibition, aberrant motor behavior, night-time behavior disturbance, and appetite and eating abnormalities.

ASSESSMENT

BEHAVIOURAL & PSYCHOLOGICAL SYPTOMS OF DEMENTIA

Assessment includes-

(a) a clear description of the target behaviour, including its antecedents and consequences

(b) a search for external (e.g. carer behaviour), physical (e.g. Pain) & mental (e.g. psychosis) precipitating factors

(c) an assessment of the risks

ASSESSMENT

Scales used-

- The Behavioral Pathology in Alzheimer's Disease Rating Scale (BEHAVE-AD)
- The Cohen-Mansfield Agitation Inventory (Cohen-Mansfield, 1986)
- Behaviour ratings and checklists-British health of nation outcome scale(HONOS)

ASSESSMENT TOOLS

- Current assessment tools are designed to evaluate several areas of function, including cognition, function, behavior, general physical health, and quality of life.

1. BRIEF SCREENING TESTS

-Mini Mental State Exam

-Montreal Cognitive Assessment

- Mini Cog

ASSESSMENT TOOLS

2. COGNITIVE TESTS

-Mini-Mental Status Examination (MMSE)

-Alzheimer's Disease Assessment Scale, cognitive subsection (ADAS-cog)

-Blessed Information-Memory-Concentration Test (BIMC)

ASSESSMENT TOOLS

3. FUNCTIONAL ASSESSMENT

-Progressive Deterioration Scale (PDS)

-Instrumental Activities of Daily Living (IADL)

ASSESSMENT

NON COGINITIVE ASSESSMENT SCALES IN DEMENTIA

PARAMETERS USED	SCALE	DESCRIPTION
Global severity	Clinical dementia rating scale (CDR)	Structured interview, 6 domains on a 5-point scale
Global change	Clinician's global impression of change (CGIC)	Very few guidelines, clinicians assessment of change on a 7-point scale
Depression	Cornell scale for depression in dementia	Validated for use in dementia
QoL	The Cornell Brown scale (CBS)	Semi-structured interview based on previous month
Carer Burden	Screen for caregiver burden	25-item self-report questionnaire

LABORATORY EVALUATION OF DEMENTIA

ASSESSMENTS	RATIONALE
Labs: Complete blood count, serum electrolytes, renal and hepatic function, glucose, albumin and protein, vitamin B_{12} and folate, rapid plasma reagin (syphilis), TSH, urinalysis.	Rule out other general medical causes of dementia including potentially reversible causes
Structural imaging: Computed tomography or magnetic resonance imaging	Rule out infarcts, mass lesions, tumors, NPH, SDH
Molecular and functional imaging: PET-amyloid imaging, SPECT, fluorodeoxyglucose-PET	Identifies certain pathological biomarkers (Aβ accumulation) or patterns of cerebral blood flow and/or metabolism
Cerebrospinal fluid	Detect altered levels of amyloid beta and tau protein in Alzheimer disease, or elevated 14-3-3 protein and neuron-specific enolase in Creutzfeldt–Jakob disease

NEUROIMAGING IN DEMENTIA

STRUCTURAL NEUROIMAGING

- The role of imaging in the diagnosis of dementia subtypes is important.
- Generally a CT scan is sufficient.

NEUROIMAGING IN DEMENTIA

- However, MRI is preferred if looking for small or deep brain infarcts as this imaging modality is better for visualizing vascular changes.

- An MRI with gadolinium contrast is useful if there is a high index of suspicion for tumour.

NEUROIMAGING IN DEMENTIA

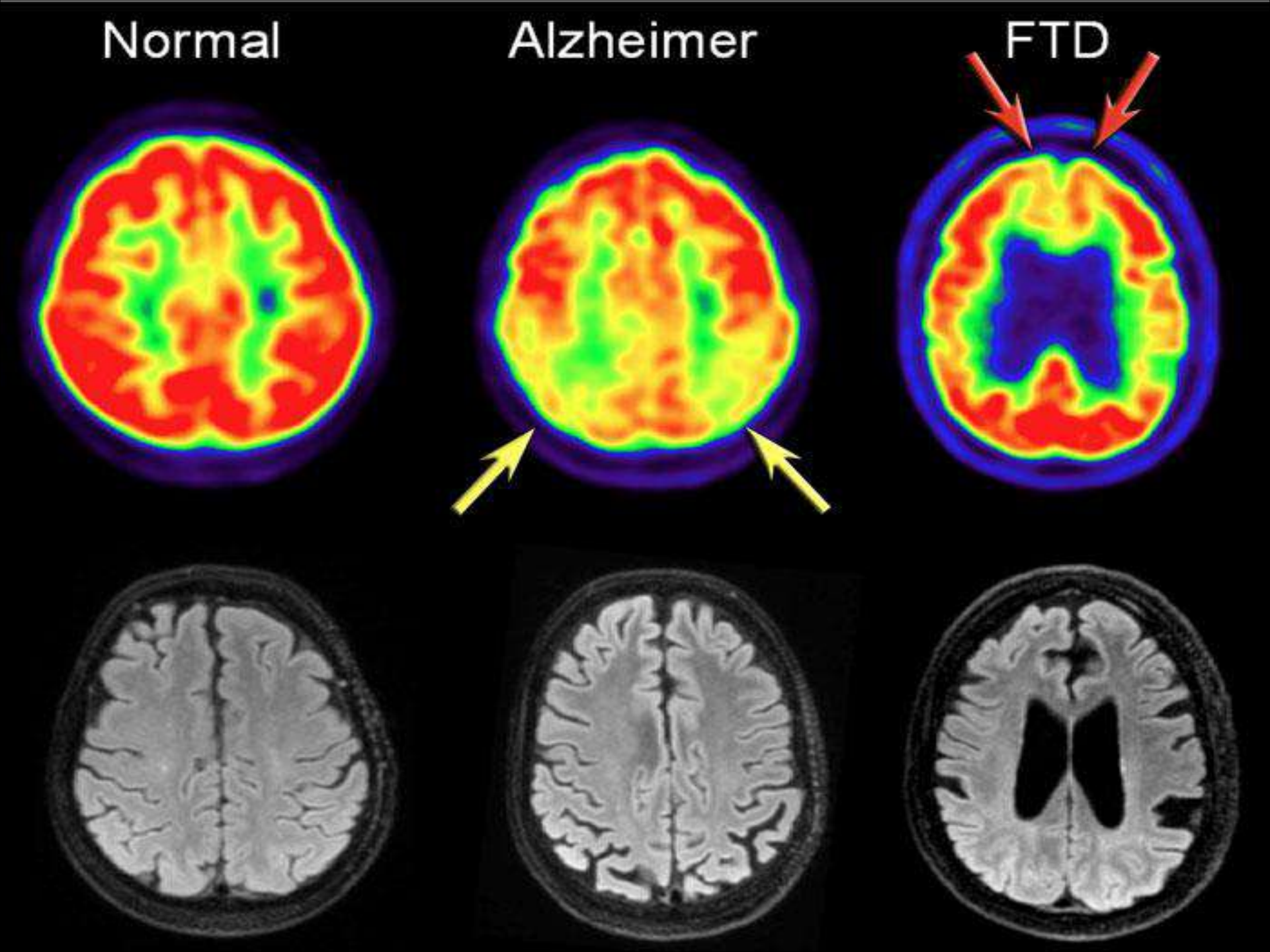
MOLECULAR NEUROIMAGING

- Positron emission tomography (PET) amyloid imaging can be used to identify Aβ accumulation.
- The absence of amyloid deposits indicates the dementia is not likely to be due to Alzheimer disease.

NEUROIMAGING IN DEMENTIA

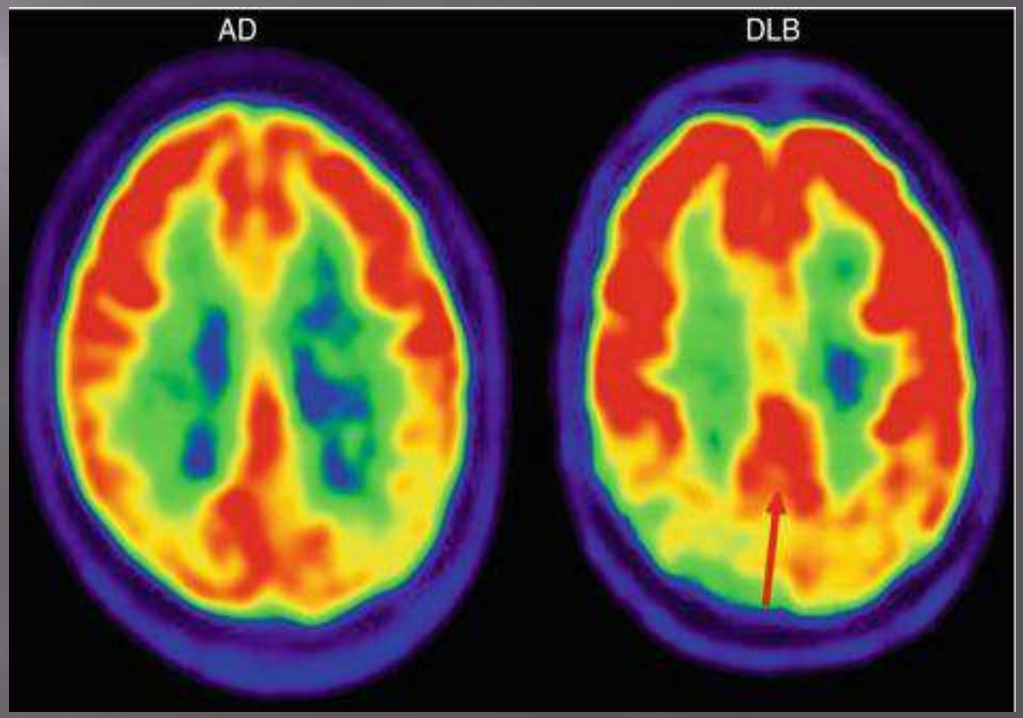
- Like FDG PET, SPECT (Single-photon emission computed tomography) measures of cerebral blood flow.

- In general, therefore, the results of SPECT studies are similar to those obtained with PET.


Normal
Alzheimer
FTD

NEUROIMAGING IN DEMENTIA

- In dementia with lewy body, there may be a pattern of occipital hypoperfusion.



NEUROIMAGING IN DEMENTIA

- Dopamine transporter imaging uses ligands specific for the dopamine transporter to examine the nigrostriatal dopamine system.

- And is abnormal in Parkinson disease, DLB, multisystem atrophy, and PSP.

ELECTROENCEPHALOGRAM

- EEGs may have a role in dementia evaluation if there is a concern about a seizure disorder or delirium.
- However, EEG is not necessary in the routine evaluation of dementia.

DEMNETIA TYPE	CT/MRI	SPECT	PET	EEG
AD (ALZHEIMER'S DISEASE)	Hippocampal atrophy, generalised cerebral atrophy, ventricular enlargement, widened sulci	↓perfusion of temporal & parietal lobes, 40%↓ perfusion of frontal lobes	Hypometabolism in temporal & parietal lobes	Usually abnormal Alpha waves Theta & beta waves
VASCULAR DEMENTIA	Variable, single infarct or multiple cortical lesions. If subcortical-periventricular & deep subcortical lesions	Patchy lesions	Patchy lesions	Maybe normal Focal abnormalities
DLB (DEMENTIA OF LEWY BODY)	Generalised cerebral atrophy, comparative sparing of medial temporal lobes	↓ Dopamine transporter (DAT) in putamen, ↓perfusion of temporal & parietal & occipital lobes	Reduced binding to Nigrostraital projections Hypometabolism in temporal & parietal & occipital lobes	Diffuse slowing Focal delta transients in temporal lobes in 50%
FTD (FRONTO TEMPORAL)	Focal temporal/frontal atrophy	Frontal hypoperfusion in 80%	Frontal hypometabolism	Usually normal
HUNTINGTON'S	Atrophy of frontal lobes and caudate which can be asymmetrical	Non specific changes	Hypometabolism in basal ganglia	Low amplitude waves
CJD (CREUTZFELD-JACOB DISEASE)	70% high signal intensity in caudate and putamen bilaterally	Non specific changes	Non specific changes	Typical periodic sharp wave complexes

CSF STUDIES

- Used to measure amyloid-β (Aβ) protein, tau protein, and phospho-tau, all of which may be altered in AD.

- In CJD, there may be elevations in total tau, or neuron-specific enolase.

NEUROPATHOLOGY

- A definitive diagnosis of dementia type can only be made with neuropathological investigation of the brain through either brain biopsy or autopsy.
- There is no clinical indication for brain biopsy.
- So postmortem evaluation of the brain is the only way to provide definitive diagnosis of dementia type.

NEUROPSYCHOLOGICAL ASSESSMENT

- It may be useful in elucidating the pattern of cognitive deficits in cases where the presentation is not typical of any one type of dementia.

- In AD- a pattern of early short-term memory and language impairment followed by development of executive dysfunction and then visuospatial dysfunction.

NEUROPSYCHOLOGICAL ASSESSMENT

- Vascular dementia- a pattern of patchy deficits depending on where vascular lesions have occurred in the brain.
- FTD show a pattern of predominantly executive dysfunction with relatively spared memory.

NEUROPSYCHOLOGICAL ASSESSMENT

Cognitive Functional Area	Neuropsychological tests
Attention/concentration	Trail Making Test Stroop Test Digit Span Continuous Performance Test
Executive functioning	Wisconsin Card Sorting Test Verbal Fluency
Visuospatial/visuomotor functioning	Block Design Picture completion

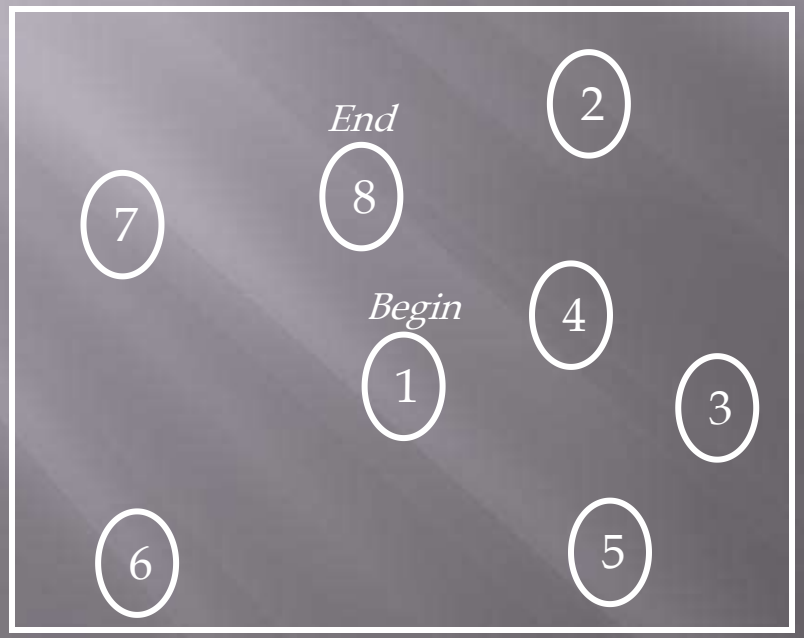
NEUROPSYCHOLOGICAL ASSESSMENT

Cognitive Functional Area	Neuropsychological tests
Memory and learning functioning	Word list learning Benton Visual Retention Test Spatial recognition test
Language function	Animal Fluency Boston Naming Test Western Aphasia Battery

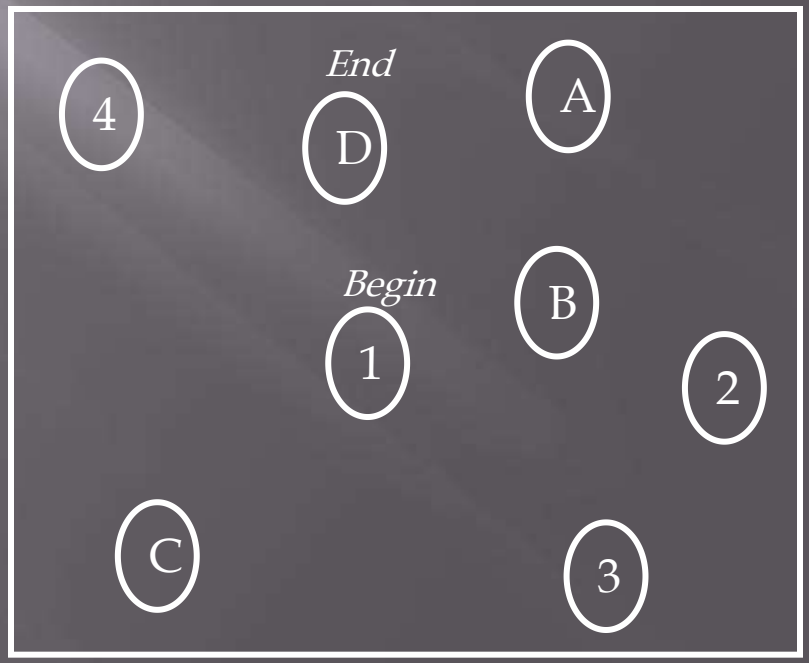
NEUROPSYCHOLOGICAL ASSESSMENT

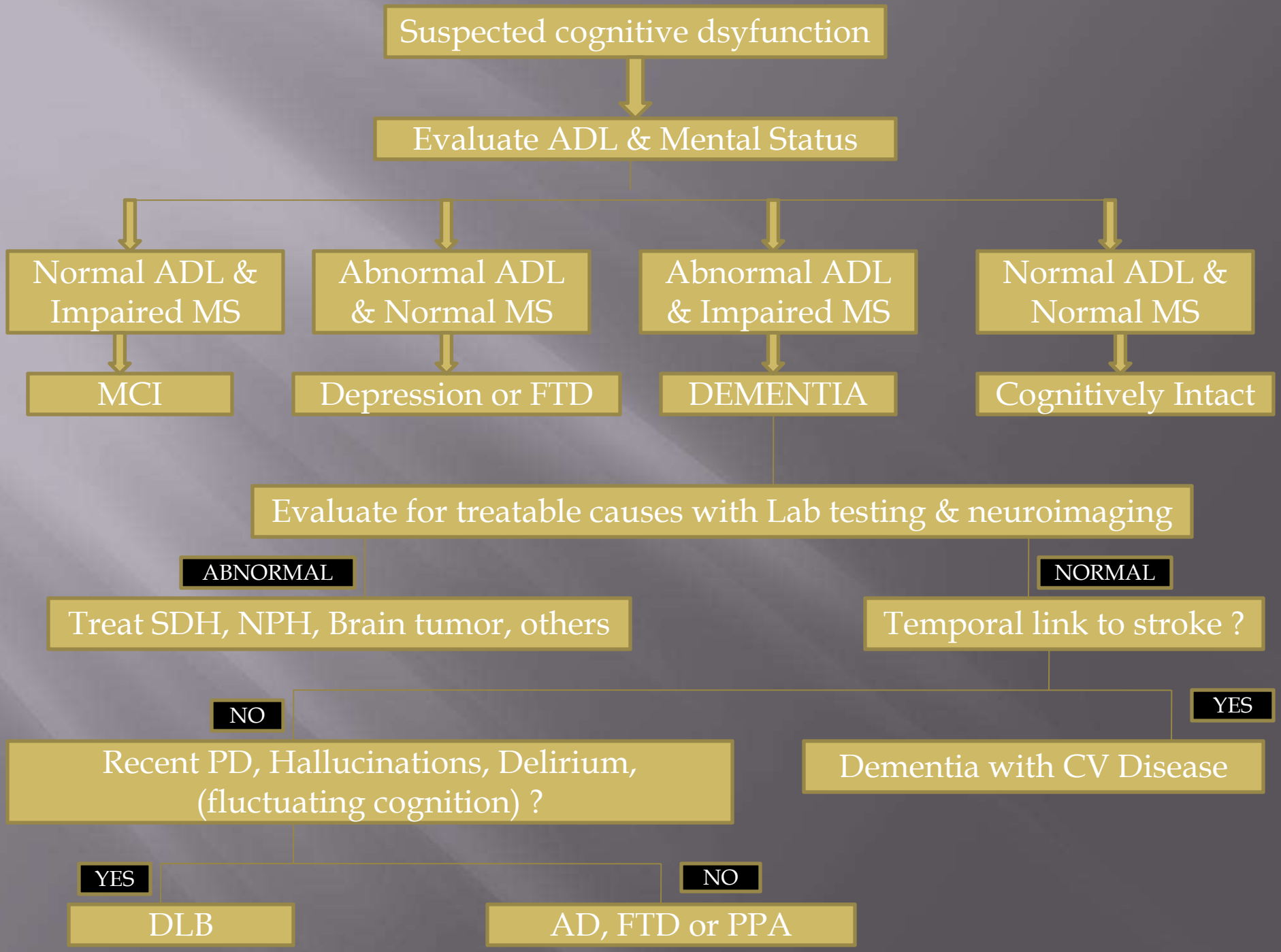
TRAIL MAKING TEST

PART A



PART B




Suspected cognitive dsyfunction
Evaluate ADL & Mental Status
Normal ADL & Impaired MS
Abnormal ADL & Normal MS
Abnormal ADL & Impaired MS
Normal ADL & Normal MS
MCI
Depression or FTD
DEMENTIA
Cognitively Intact
Evaluate for treatable causes with Lab testing & neuroimaging
ABNORMAL
NORMAL
Treat SDH, NPH, Brain tumor, others
Temporal link to stroke ?
NO
YES
Recent PD, Hallucinations, Delirium, (fluctuating cognition) ?
Dementia with CV Disease
YES
NO
DLB
AD, FTD or PPA

SUMMARY

- Psychiatrists must take a multifactorial approach in caring for the dementia patients.
- The evaluation process involves collecting information not only from the patient but also from other physicians, the medical record, and family members.

SUMMARY

- Alongwith the initial workup with lab investigations, neuroimaging plays an important role in assessment of dementia.

- A variety of alternatives to the MMSE have been devised in an effort to find a faster and more reliable measure, but any brief test of cognition involves some limitations.

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THANKYOU