

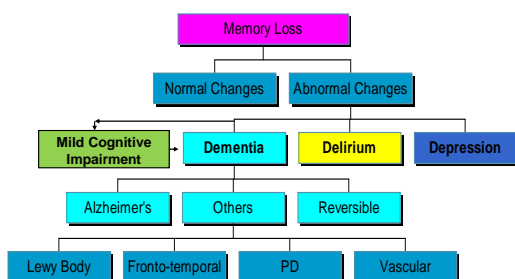
Neurobiology and Types of Dementia

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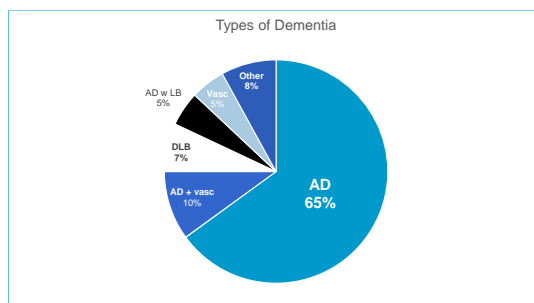
Objectives

- Distinguish mild cognitive impairment from dementia
- Describe the main causes of dementia
- Describe common communication impairments that accompany different types of dementia

The 3 D's



Types of Dementia



Dementia (DSM-5)

- Major Neurocognitive disorder
 - Significant cognitive decline in one or more domains
 - Complex attention, executive function, learning, memory, language, perceptions
 - Severe enough to affect everyday activities
 - Not delirious
 - No other explanation

Dementia (cont'd)

- Mild Neurocognitive Disorder (MCI)
 - Modest, measurable cognitive decline
 - Do not prevent everyday activities but greater compensatory strategies required
 - Not delirious
 - Not explained by something else (depression, other mental health problem)

Assess for Dementia

- Complete Hx & PE
- Neuro exam
- Functional exam – ADL, IADL
- MOCA (www.MOCAtest.org)
- Depression test
 - (PHQ-9 or Geriatric Depression Scale)
- Review (and D/C) meds
- Basic labs – CBC, TSH, Ca, electrolytes, glucose

MOCA SCORES

	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
Suggested cut-off score	≥26	<26	<26 ψ

ψ Although the average MoCA score for the AD group is much lower than the MCI group, there is overlap between them. The suggested MoCA cut-off score is thus the same for both. The distinction between AD and MCI is mostly dependent on the presence of associated functional impairment and not on a specific score on the MoCA test.

Types of Dementia

- Alzheimer's disease
- Vascular
- Dementia with Lewy Bodies
- Fronto-temporal
- Primary Progressive Aphasia
- Many others

AD - Sequential Losses

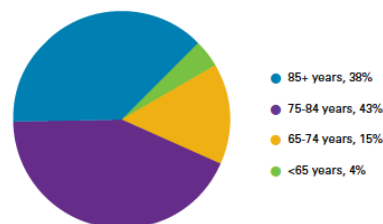
- Memory
- Complex tasks - work, driving to new place
- Simpler tasks - checkbook, baking
- Language - anomia, paraphrastic errors
- Apraxia - dressing, toileting mechanics
- ADLs - bathing, incontinence, transfers, walking

Importance of a good history!!

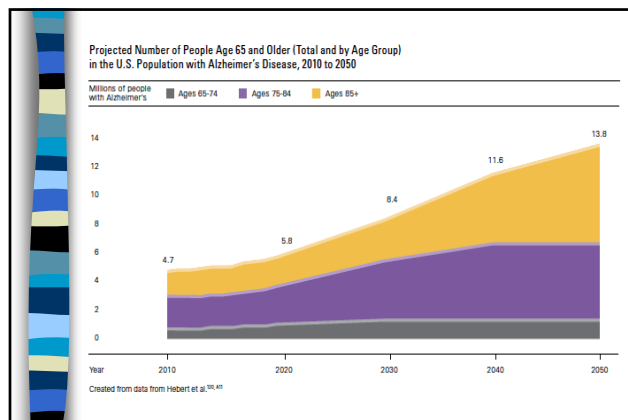
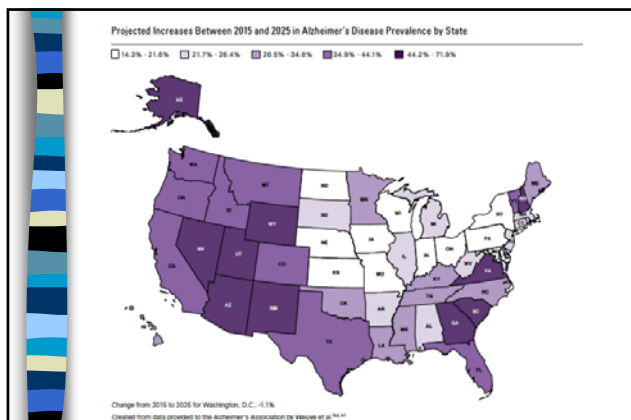
Risk Factors for Alzheimer's

- Age
- Educational level (SES?)
- Head trauma
- Cardiovascular disease
- Family history?
 - Late onset
 - Early onset (<50 y/o)
- APOE-e4

Ages of People with Alzheimer's Disease in the United States, 2015



Created from data from Hebert et al.^{100, A3}



- ### Pathology of Alzheimer's
- Neurofibrillary tangles (tau protein) - internal
 - Beta-Amyloid plaques - external
 - Controversies
 - Cause or effect?
 - Differing clinical and pathological findings
 - Synapse loss (100 trillion synapses)

PET Scan and AD

Alzheimer's disease Normal control

Not recommended for routine diagnosis – www.ncbi.nlm.nih.gov

- ### Speech Changes in AD
- Earliest changes are word-finding and anomia
 - Cortical type
 - Syntax and phonology maintained early to mid-stage
 - With advancement comprehension and pragmatic functions decline
 - "Transcortical sensory aphasia"

- ### Fronto-temporal Dementia
- Slow onset
 - Early cognitive impairment
 - Early loss of judgement
 - inappropriate behavior
 - impulsive
 - social withdrawal
 - hyperphagia, echolalia
 - Early social dysfunction
- Speech not a prominent component – if so, think PPA

Primary Progressive Aphasia

- Early changes in language
 - Nonfluent/agrammatic variant – hesitant, labored or ungrammatical speech
 - Semantic variant – can't understand or formulate words in a sentence
- Later changes in memory, executive function
- Men more than women
- Early onset (average age 52)

Dementia with Lewy Bodies

- Extraparamidal (parkinsonian) findings
- Fluctuating alertness/sleepiness
- Early visual hallucinations, delusions
- Syncope
- Unprovoked falls
- Sensitivity to antipsychotic drugs

Speech issues similar to PD

Vascular Dementia

- Abrupt onset (stroke)
- Stepwise deterioration
- Focal neurologic findings
- Risk Factors – HTN, cholesterol, smoking, diabetes
- Positive MRI (or CT) findings
- Speech changes depend on site of strokes
 - Dysarthria common

Parkinson's Dementia

- 30% to 75% develop dementia
- Cognitive decline must occur after the PD has been present
- Many other symptoms – apathy, depressed mood, delusions, hallucinations, personality changes
- Speech issues of PD