

Dementia: Etiology, Assessment & Management

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Course Overview

▶ “Dementia: Etiology, Assessment & Management” is a webinar for rehabilitation professionals that presents contemporary information about various forms of dementia including Alzheimer’s disease, Lewy body, and Frontotemporal dementia. This course includes discussion of pathogenesis, pharmacologic management and therapeutic considerations for patients with these conditions.

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Course Rationale

▶ The purpose of this course is to provide participants with contemporary information about the dementia. Rehabilitation professionals can use this information when implementing their treatment programs to address the specific needs of individuals effected by these conditions.

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Goals and Objectives

1. Identify normal cognitive processes involved in memory and decision making.
2. Distinguish characteristics of normal aging from dementia.
3. Identify the pathogenesis for common types of dementia.
4. Differentiate the clinical presentation for different types of dementia including cognitive and physical symptoms.
5. Identify contemporary treatment strategies for individuals with dementia.
6. Compare pharmacologic management for different types of dementia.
7. Compare various cognitive screening tests.
8. Identify strategies to employ when implementing rehabilitation programs for individuals with dementia.
9. Define the role of exercise for individuals with dementia.
10. Identify emerging trends in the management of dementia.

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Disclaimer

▶ Application of concepts presented in this webinar is at the discretion of the individual participant in accordance with federal, state, and professional regulations.

▶ No conflict of interest exists for the presenter or provider of this course.

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Course Outline and Schedule

Topic	Time
Cognition	0:00-0:15
Contributors to Brain Health	0:16-0:20
Mild Cognitive Impairment	0:21-0:25
Dementia vs. Normal Pressure Hydrocephalus	0:26-0:30
Vascular Cognitive Impairment and Dementia	0:31-0:40
Alzheimer’s Disease Pathogenesis	0:41-0:50
Interactive Discussion of Clinical Applications	0:51-0:60
Clinical Presentation	1:01-1:10
Management Strategies	1:11-1:20
Lewy Body Dementia	1:21-1:25
Dementia with Lewy Bodies vs. Parkinson’s Disease Dementia	1:26-1:35
Rehabilitation Considerations	1:36-1:40
Frontotemporal Dementia	1:41-1:50
Interactive Discussion of Clinical Applications	1:51-2:00
Assessment Tools for Individuals with Dementia	2:00-2:15
Rehabilitation Considerations and Strategies	2:16-2:30
Fall Risk Reduction and Safety	2:31-2:45
Emerging Research	2:46-2:50
Interactive Discussion of Clinical Applications	2:51-3:00

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Course Post Test

- ▶ Slides with “Consider This” icon in bottom right corner will be helpful in completing the post-test.

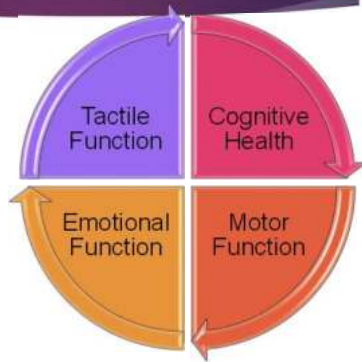


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Brain Health

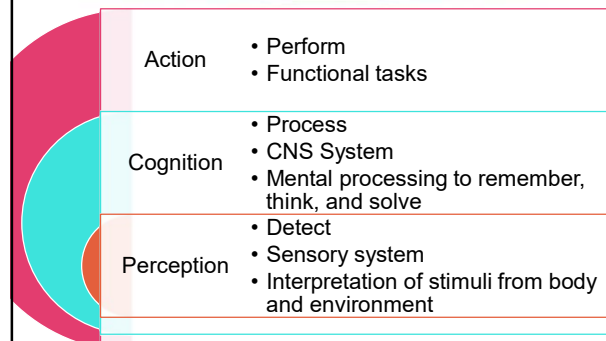
- ▶ How well an individual's brain functions across several areas that can be affected by age related changes, injury, disorders, and disease.



Copyright Jodi Gootkin 2023 National Institute on Aging, Cognitive health and older adults. <https://www.nia.nih.gov/health/cognitive-health-and-older-adults>

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Interacting With Our Environment



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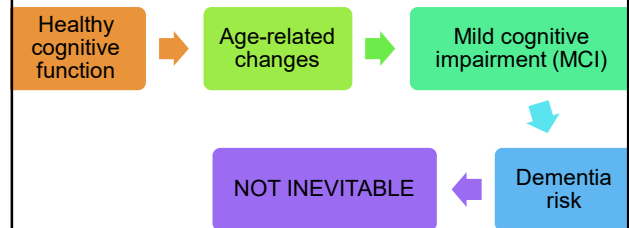
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Neurocognitive Domains

Complex attention	sustained attention, divided attention, selective attention, processing speed
Executive ability	planning, decision making, working memory, responding to feedback/error correction, overriding habits/inhibition, mental flexibility
Language	expressive and receptive
Learning and memory	immediate, recent, recognition, very long-term
Perceptual motor-perceptual ability	visual perception, visuoconstructional, perceptual-motor, praxis, gnosis
Social cognition	recognition of emotions, theory of mind

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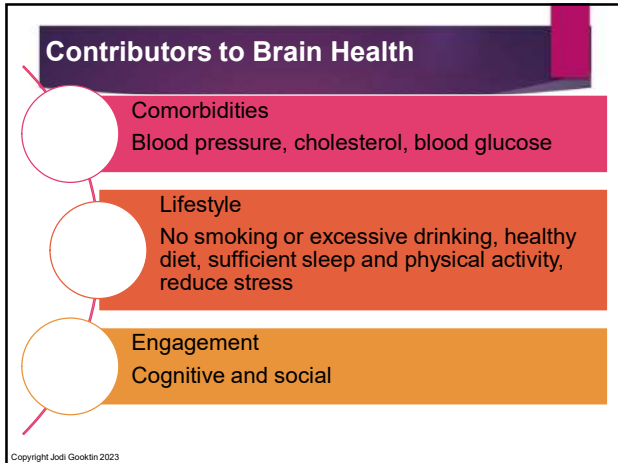
Cognition Across the Life Span



Copyright Jodi Gootkin 2023 CDC, Accelerating risk reduction and promoting brain health. <https://www.cdc.gov/aging/healthybrain/issue-maps/risk-reduction.html>

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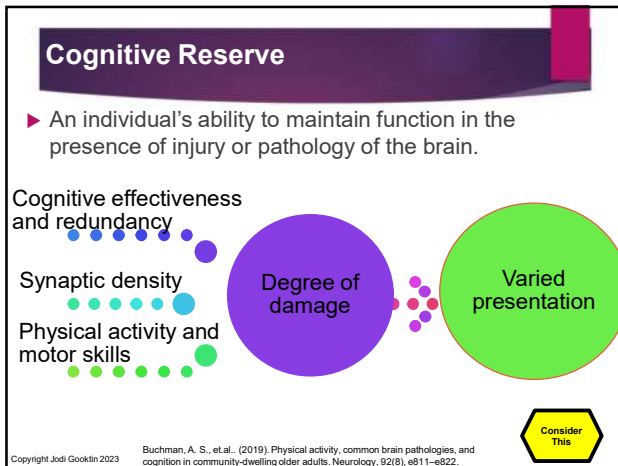
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Physical Activity Outcomes

Cohort	Intervention	Outcome
Mild cognitive impairment	Physical therapy including aerobic, strengthening, and balance interventions with dual-tasking and function	Improved gait, balance, and cognition
Vascular dementia		PDD not included
Alzheimer's disease		
Dementia with Lewy bodies		

Longhurst, J., et al. (2020). Physical Therapy for Gait, Balance, and Cognition in Individuals with Cognitive Impairment: A Retrospective Analysis, Rehabilitation research and practice, 2020.
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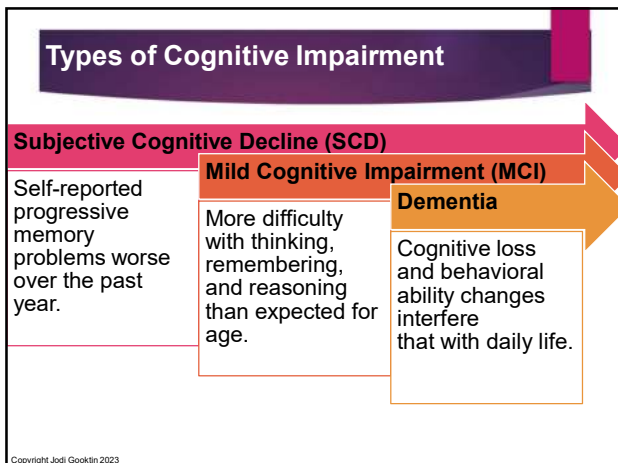
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Recreational Activity Outcomes

Cohort	Intervention	Outcome
Middle-aged females longitudinal study	Intellectual, artistic, manual, club, religious activities	Cognitive activity ↓ total dementia and Alzheimer's disease risk
	Inactive, light, regular, or intense physical activity participation	Physical activity ↓ mixed and vascular dementia risk

Najar, J., et al. (2019). Cognitive and physical activity and dementia: A 44-year longitudinal population study of women. *Neurology*, 92(12), e1322-e1330.
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Mild Cognitive Impairment (MCI)

- Mild but detectable cognitive difficulties that do not limit the individual's ability to function independently.
- Characterized by forgetfulness, difficulty concentrating, challenges with problem-solving that is more significant than expected for the individual's age.
- Compensatory strategies typically implemented by individual who is aware of deficits.

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MCI Management

- ▶ Healthy lifestyle strategies
- ▶ Exercise
- ▶ Socialization
- ▶ Cognitive interventions
- ▶ Pharmacologic management
 - ▶ Cholinesterase inhibitors

Petersen, R. C., et al. (2018). Practice guideline update summary: Mild cognitive impairment: Report of the Guideline Development, Dissemination, and Implementation Subcommittee of the American Academy of Neurology. Neurology, 90(3), 126-135.

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Dementia

- ▶ Collection of symptoms indicative of mental decline that interferes with an individual's daily functioning.
- ▶ Different than depression or delirium.

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Etiology of Dementia

Reversible	<ul style="list-style-type: none"> Normal pressure hydrocephalus Endocrine disorder, brain tumor, infection Medications, alcohol or drug abuse, toxins
Vascular	Vascular cognitive impairment and dementia
Secondary	<ul style="list-style-type: none"> Parkinson's disease dementia Huntington's disease Brain injury
Primary	<ul style="list-style-type: none"> Alzheimer's disease Dementia with Lewy bodies Fronto-temporal dementia

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Normal pressure hydrocephalus

- ▶ Cerebrospinal fluid accumulation in brain ventricles may be related to trauma, infection, or disease.
- ▶ Often misdiagnosed - symptoms similar to other disorders.
 - ▶ Progressive mental impairment, gait deviations, and incontinence
- ▶ Early diagnosis and shunt placement for good recovery.

National Institute of Neurological Disorders and Stroke. Normal pressure hydrocephalus information page. <https://www.ninds.nih.gov/disorders/Al-Disorders/Normal-Pressure-Hydrocephalus-Information-Page>

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Vascular Cognitive Impairment and Dementia (VCID)

- ▶ Dementia caused by vascular events in the brain.
- ▶ Can occur alone or alongside Alzheimer's disease.

Cerebrovascular Accident (CVA)	<ul style="list-style-type: none"> • Specific region damage • Sudden symptoms
Cardiovascular disease and diabetes	<ul style="list-style-type: none"> • White matter thinning • Amyloid angiopathy • Progressive symptoms

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VCID Clinical Presentation

- ▶ Impaired organization, attention, problem solving, and memory
- ▶ Slowed thinking
- ▶ Personality and behavior changes
- ▶ Difficulty with language

Alzheimer's Disease more memory loss

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VCID Management

▶ Treatment focus is on modifiable risk factors and medication to reduce stroke risk.

Control obesity
Treat cardiovascular disease and diabetes
Manage high blood pressure

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VCID Research

Intervention	Outcome
Intensive HTN management	Appears to reduce MCI risk Less white matter lesions
Midlife vascular risk assessment	Tobacco use, diabetes, prehypertension, HTN associated with higher incidence.

SPRINT MIND Research Group, Williamson, J., et al. (2019). Effect of Intensive vs Standard Blood Pressure Control on Probable Dementia: A Randomized Clinical Trial. JAMA, 321(6), 553-561.
Gottesman, R., et al. (2017). Associations between midlife vascular risk factors and 25-year incident dementia in the Atherosclerosis Risk in Communities (ARIC) cohort. JAMA neurology, 74(10), 1246-1254.

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Alzheimer's Disease

▶ Etiology of neurodegeneration leading to cognitive and functional impairment may include age-related changes in the brain, along with genetic, environmental, and lifestyle factors.

Late Onset
Mid-60s
APOE4

Early Onset
Between 30s and mid-60s
APP, PSEN1, PSEN2

National Institute on Aging. Alzheimer's disease genetics fact sheet. <https://www.nia.nih.gov/health/alzheimers-disease-genetics-fact-sheet>

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AD Pathogenesis

Beta Amyloid aggregation → Senile plaque → Self propagating neurotoxicity → Synaptic dysfunction / Brain atrophy

Tau protein phosphorylation → Neurofibrillary tangles → Self propagating neurotoxicity

Consider This

Koychev, I., Hofer, M., & Friedman, N. et al. (2020). Correlation of Alzheimer Disease Neuropathologic Staging with Amyloid and Tau Scintigraphic Imaging Biomarkers. Journal of Nuclear Medicine, 61(10), 1413-1418.
Guo, T., et al. (2020). Molecular and cellular mechanisms underlying the pathogenesis of Alzheimer's disease. Molecular neurodegeneration, 15(1), 1-37

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Synaptic Dysfunction Contributors

- ▶ Cholinergic system dysfunction
 - ▶ Decreased acetylcholine synthesis
- ▶ Neuroinflammation
- ▶ Mitochondrial dysregulation
- ▶ Oxidative stress
- ▶ Mutations of amyloid precursor APP
 - ▶ Individuals with Down's syndrome and familial AD

Consider This

Roberts, J. P., et al. (2021). Selective coactivation of α7- and α4β2-nicotinic acetylcholine receptors reverses beta-amyloid-induced synaptic dysfunction. Journal of Biological Chemistry, 296.
DeTure, M. A., & Dickson, D. W. (2019). The neuropathological diagnosis of Alzheimer's disease. Molecular neurodegeneration, 14(1), 1-18.

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AD Clinical Presentation

▶ Cerebrospinal fluid analysis and PET imaging assists with diagnosis.

Normal abilities • Pre-clinical stage

Amnestic MCI • Prodromal stage

Impaired function • Dementia

Vermunt, L., et al., ... ICTUS/ISA study groups (2019). Duration of preclinical, prodromal, and dementia stages of Alzheimer's disease in relation to age, sex, and APOE genotype. Alzheimer's & dementia : the journal of the Alzheimer's Association, 15(7), 888-898.

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Risk Reduction Behaviors

- ▶ Not smoking
- ▶ High level of physical activity
- ▶ Light-to-moderate alcohol consumption
- ▶ Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND) Diet
- ▶ Late-life cognitive engagement

Dhana, K., et al. (2020). Healthy lifestyle and the risk of Alzheimer dementia: Findings from 2 longitudinal studies. *Neurology*, 95(4), e374-e383.

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Stages of AD

- Early stage – Mild**
 - Independent functioning
 - Memory lapses, word finding, difficulty planning
- Middle stage – Moderate**
 - Assistance required, reasoning challenges
 - Behavior, sleep, bowel and bladder changes
 - Language and sensory impairment
- Late stage – Severe**
 - Unable to respond to environment
 - Progressive communication and mobility impairment

Alzheimer's Association. Stages of Alzheimer's. <https://www.alz.org/alzheimers-dementia/stages>
National Institute on Aging. Alzheimer's Disease Fact Sheet.

Copyright Jodi Gootkin 2023 <https://www.nia.nih.gov/health/alzheimers-disease-fact-sheet>

Consider This

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Four A's of Alzheimer's Disease

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Pharmacologic Management

- ▶ Cholinesterase inhibitors
 - ▶ Anticholinergic agents may counteract effectiveness
- ▶ NMDA antagonists
- ▶ Tau targeting agents
- ▶ Beta-amyloid-targeted agents
 - ▶ Modify deposition in preclinical stage
 - ▶ Limit future plaques
- ▶ Monitor patients taking antipsychotics for signs of stroke.

Dyer, A. H., et al. & NILVAD Study Group. (2020). Is Ongoing Anticholinergic Burden Associated with Greater Cognitive Decline and Dementia Severity in Mild to Moderate Alzheimer's Disease?. *The Journals of Gerontology: Series A*, 75(5), 987-994.

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Aducanumab

- ▶ Appears to reduce amyloid plaques
- ▶ Side effects
 - ▶ Amyloid-related imaging abnormalities (ARIA)
 - ▶ Headache
 - ▶ Falls
 - ▶ Allergic reaction

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Exercise and AD

- ▶ Physical activity may slow the disease progression and allow individuals to remain more independent for a longer period of time.

Greteman, M. (2021). Alzheimer's disease and exercise: A review of exercise protocols for use in AD treatment. Iowa State University Digital Repository.

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Aerobic Training

Intervention	Outcome
Early stage AD Aerobic exercise vs. strengthening and stretching	Equivalent cardiorespiratory gains Improved function No cognitive changes Reduced hippocampal atrophy
APOE4 gene carriers Human and animal studies	Improved memory and neuropsychiatric symptoms Reduced amyloid angiopathy Appears to improve cognition

Morris, J. K., et al. (2017). Aerobic exercise for Alzheimer's disease: A randomized controlled pilot trial. *PLoS one*, 12(2), e0170547.
Tokgoz, S., & Claassen, J. (2021). Exercise as Potential Therapeutic Target to Modulate Alzheimer's Disease Pathology in APOE ε4 Carriers: A Systematic Review. *Cardiology and therapy*, 10(1), 67–86.

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Resistance Training

Intervention	Outcome
Animal studies Weighted stair climbing	Improved cognitive performance Reduced frontal cortex and hippocampus pathologic changes
Mild Dementia strengthening and vigorous aerobic training	Increased peak VO2 Decreased neuropsychiatric symptoms Higher mental speed and attention

Liu, Y., et al. (2020). Short-term resistance exercise inhibits neuroinflammation and attenuates neuropathological changes in 3xTg Alzheimer's disease mice. *Journal of Neuroinflammation*, 17(1), 1-16.
Sobol, N. A., et al. (2018). Change in fitness and the relation to change in cognition and neuropsychiatric symptoms after aerobic exercise in patients with mild Alzheimer's disease. *Journal of Alzheimer's Disease*, 65(1), 137-145.

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Lewy Bodies

▶ Accumulation of alpha-synuclein in organs aggregates to create Lewy bodies leading to neurodegeneration.

Cortex	<ul style="list-style-type: none"> • Cognitive impairment • Executive, visuospatial, behavior
Brainstem	<ul style="list-style-type: none"> • Autonomic nervous system • Bowel/bladder, sleep, BP, mood
Substantia Nigra	<ul style="list-style-type: none"> • Extrapyramidal System • Motor impairment, tremors, rigidity
Gastrointestinal System and Heart	<ul style="list-style-type: none"> • Constipation

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Lewy Body Dementia (LBD)

▶ General term for dementia associated with alpha-synuclein pathology causing protein deposits in the brain called Lewy bodies.

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Dementia with Lewy Bodies (DLB) Pathogenesis

- ▶ Genetic and biologic factors
- ▶ Lewy body formation in brainstem and cortex
- ▶ Neurotransmitters diminished
 - ▶ Acetylcholine – memory and learning
 - ▶ Dopamine – motor and nonmotor symptoms

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DLB Clinical Presentation

Cognitive	Visual hallucinations Concentration, attention, alertness diminished Disorganized thinking and confusion Impaired memory Difficulty with language and numbers	Non-Motor	Incontinence Constipation Blood pressure Hyposmia Thermoregulation
		Motor	Parkinsonism Bradykinesia Micrographia Resting tremor Hypophonia

Consider This

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DLB Sleep Disturbance

- ▶ Sleep disorders may often go undiagnosed and can increase daytime confusion and behavioral symptoms.
 - ▶ Somnolence
 - ▶ Insomnia
 - ▶ REM sleep behavior disorder
 - ▶ Restless leg syndrome

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DLB Behavior and Mood Symptoms

▶ Multiple factors may contribute to the individual lashing out or resisting care.

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DLB Management

- ▶ Pharmacologic management of symptoms
 - ▶ Carbidopa-levodopa - Parkinsonism
 - ▶ Cholinesterase inhibitors – psychiatric symptoms
- ▶ Antipsychotic medication sensitivity
- ▶ Orthostatic hypotension
 - ▶ Diet, compression garments, sleep position

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Clinical Presentation Distinction

▶ The most prominent factor distinguishing DLB from PD is timing of when symptoms appear.

	LBD	
	DLB	PDD
Initial Symptoms	Cognitive	Motor
Progression	Rapid	Gradual
Hallucinations	Threatening	Pleasant

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PDD Clinical Presentation

Non-Motor	Incontinence	Cognitive	Impaired memory and decision making
	Constipation		Decreased reward signaling and motivation
Motor	Blood pressure	Concentration diminished	Hallucinations
	Hyposmia		Hypophonia
	Thermoregulation		
	Bradykinesia		
	Freezing		
	Micrographia		
	Resting tremor		

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LBD Rehabilitation Considerations

▶ Address aspects of frailty including intrinsic and extrinsic attentional strategies for motor impairments.

Intervention	
Static and dynamic balance, functional practice, resistance training	
Outcome	
Higher FIM, physical activity, muscle mass = better cognition	

Inskip, M., et al. (2019). Promoting independence in Lewy body dementia through exercise (PRIDE) study. Protocol for a pilot study. Contemporary clinical trials communications, 16, 100466. Copyright.Jodi Gootkin 2023

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Frontotemporal Dementia Pathogenesis

- ▶ A group of disorders with proteinopathy of the frontal and temporal lobes leading to neurodegeneration.
- ▶ Typically occurs in individuals younger than 60 years old.
- ▶ Family history of dementia and autosomal dominant inheritance pattern have been identified.

Tau MAPP Structural framework

Granulin GRN Growth and division

TDP43 RNA synthesis

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FTD Subtypes Clinical Presentation

Behavioral variant Disinhibition, apathy, diet changes	Semantic dementia Confrontation naming, single word comprehension
Memory spared Inappropriate social behavior Impaired empathy, emotion recognition, language, executive function	
Motor Amyotrophic lateral sclerosis Progressive supranuclear palsy Weakness, incoordination	Progressive non-fluent aphasia Agrammatism, halting speech, comprehension

Anshad, F., et al. (2020). Social Cognition Deficits Are Pervasive across Both Classical and Overlap Frontotemporal Dementia Syndromes. *Dementia and Geriatric Cognitive Disorders Extra*, 10(3), 115-126.
 Young, J. J., et al. (2018). Frontotemporal dementia: latest evidence and clinical implications. *Therapeutic advances in psychopharmacology*, 8(1), 33-48.

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FTD Rehabilitation Considerations

- ▶ Accept rather than challenge behavior
- ▶ Offer specific choices
- ▶ Maintain a regular schedule
- ▶ Address compulsive eating
- ▶ Implement communication strategies
 - ▶ Communication book and word lists
- ▶ Functional training and attention strategies for movement impairments.

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Assessment Tools for Individuals with Dementia

- ▶ Cognitive Screening
 - ▶ Clock Drawing Test
 - ▶ Memory Impairment Screen
 - ▶ Montreal Cognitive Assessment
 - ▶ Mini-Mental State Exam
 - ▶ Mini-Cog
- ▶ Disease Progression and Staging
 - ▶ Functional Assessment Staging Scale
 - ▶ Global Deterioration Scale
- ▶ Pain Assessment

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Clock Drawing Test (CDT)

- ▶ Asks patient to draw clock showing specific time followed by copying a pre-drawn clock.
- ▶ Assesses visuospatial and praxis abilities.
- ▶ Digital version (dCDT) may provide information on processing speed and working memory.

Dementia Care Central. (2020). Alzheimer's / Dementia Clock-Drawing Test: Everything Caregivers Need to Know. <https://www.dementiacarecentral.com/alzheimers-clock-test/>

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Memory Impairment Screen (MIS)

- ▶ Measures categorizing and recalling four items through free and/or cued recall.

5 – 8
No cognitive impairment

≤ 4
Possible cognitive impairment

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Montreal Cognitive Assessment (MoCA)

▶ Designed to detect mild cognitive impairment.

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Mini-Mental State Examination (MMSE) and Mini-Cognitive (Mini-Cog)

▶ MMSE assessed orientation, memory, language, attention and visuospatial thinking.

▶ Consider education level, age, language, and culture bias and ceiling effect.

▶ Mini-Cog includes individual recall objects and draw a clock with all 12 numbers.

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Functional Assessment Staging Scale (FAST)

▶ Basis for palliative interventions and care planning in advanced dementia.

1: No difficulty	6: Dressing, hygiene	7: Speech, locomotion, consciousness
2: Forgetful	6a: Putting on clothes	7a: Limited speech
3: Job, traveling	6b: Bathing	7b: Unintelligible
4: Complex tasks	6c: Toileting	7c: Non-ambulatory
5: Clothing selection	6d: Urinary incontinence	7d: Unable to sit up
Summary - Not complete scale	6e: Fecal incontinence	7e: Unable to smile
		7f: Unable to hold head

Consecutive Stage score + Non-consecutive scores = FAST Disability Score

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Global Deterioration Scale (GDS)

▶ Assesses the magnitude of cognitive, functional, and behavioral decline.

Age associated memory impairment
MCI
Dementia
Needs assistance

Florida Healthcare Association. The Global Deterioration Scale for Assessment of Primary Degenerative Dementia. <https://www.fhca.org/members/gid/admin/global.pdf>

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Pain Assessment

▶ Use synonyms and assessment during movement

▶ Pain vs. delirium

▶ Iowa pain thermometer, colored analogue scale, 21-point box scale, Pain Assessment in Advanced Dementia (PAINAD) Scale

CMS Measures Inventory Tool (2021). Pain assessment and follow-up for patients with dementia. https://cmit.cms.gov/CMIT_public/ViewMeasure?MeasureId=3469
Hadjistavropoulos, T., et.al. (2010). Practice guidelines for assessing pain in older persons with dementia residing in long-term care facilities. *Physiotherapy Canada*, 62(2), 104-113.

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Rehabilitation Considerations

▶ Involve the individual in decision making.

▶ Individuals may still find enjoyment in past hobbies and interests that can be incorporated into interventions.

▶ Communication and home environment adaptations should account for vision impairments.

- ▶ Narrow visual field, impaired depth perception, monocular vision.

▶ Position changes and devices to prevent pressure injuries and venous thromboembolism.

▶ Physical activity provides multiple benefits.

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Functional Training

- ▶ New learning can still occur.
- ▶ Frequent practice of meaningful tasks.
- ▶ Replicate performance environment.
- ▶ Use parallel visual cues.

Implicit Memory
Procedural
Not conscious recall
"How to"

Explicit Memory
Episodic
Conscious recall
Facts personal events

De Wit, L., et al. (2021). Procedural learning in individuals with amnesic Mild Cognitive Impairment and Alzheimer's dementia: A systematic review and meta-analysis. *Neuropsychology review*, 31(1), 103-114.
Karim, R. and Kneiss, J. (2017). Dementia clinical summary. <https://www.apta.org/patient-care/evidence-based-practice-resources/clinical-summaries/dementia#Ref45>
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Spaced Retrieval Technique (SR)

- ▶ Procedural memory trained by using repeated recall over expanding time periods to encourage retention and retrieval of a new skill.

Small, J. A., & Cochrane, D. (2020). Spaced Retrieval and Episodic Memory Training in Alzheimer's Disease. *Clinical interventions in aging*, 15, 519-536.
Jang, J. S., et al. (2015). Effects of spaced retrieval training with errorless learning in the rehabilitation of patients with dementia. *Journal of physical therapy science*, 27(9), 2735-2738. <https://doi.org/10.1589/jpts.27.2735>
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Patient and Caregiver Education

- ▶ Encourage
 - ▶ Management of comorbidities
 - ▶ Emergency preparedness
- ▶ Increase Awareness
 - ▶ Financial exploitation
- ▶ Provide resources to support
 - ▶ Behavioral health needs
 - ▶ Social stigma
 - ▶ Caregiver's health and well-being

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Dietary Supplements

- ▶ Polyphenols and cat's claw appear to reduce beta-amyloid fibrils and tau filaments.
- ▶ Consumers must remain vigilant as products may contain unapproved ingredients and/or be misbranded.

FDA. (2019). FDA takes action against 17 companies for illegally selling products claiming to treat Alzheimer's disease. <https://www.fda.gov/news-events/press-announcements/fda-takes-action-against-17-companies-illegally-selling-products-claiming-treat-alzheimers-disease>
Cohen, P. A., Avula, B., Wang, Y. H., Zakharevich, I., & Khan, I. (2021). Five unapproved drugs found in cognitive enhancement supplements. *Neurology: Clinical Practice*, 11(3), e303-e307.
Gregory, J., Vengaleselli, Y. V., Brodeur, D. E., & Rao, R. V. (2021). Neuroprotective herbs for the management of Alzheimer's disease. *Biomolecules*, 11(4), 543.
Snow, A. D., et al. (2021). In vitro comparison of major memory-support dietary supplements for their effectiveness in reduction/inhibition of beta-amyloid protein fibrils and tau protein tangles: key primary targets for memory loss. *Scientific Reports*, 11(1), 1-23.
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Communication Strategies

- ▶ The condition is progressive; forgiveness and not taking interactions personally is important.

Do's	Don'ts
Comprehension time	Open ended questions
Brief Repeat	Remind of losses
Suggest Distract	Remember when...?
Physical contact	Scold Insist

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Agitation

- ▶ Shift perspective to consider agitation as unmet need or lack of understanding.

Intervention and Outcome

Severe dementia – sedentary associated with agitation/aggression

Horticulture decreased agitation, increased engagement and activity level.

Effective: Music therapy and dementia care mapping

Not effective: therapeutic touch, aromatherapy, light therapy

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Hallucinations

- ▶ Hallucination: hearing, seeing, smelling, or feeling things that are not really there.
- ▶ Delusion: false beliefs that the person thinks are real.
- ▶ Paranoia: belief others are mean, lying, "out to get me."
- ▶ Rule out another illness or medicine causing symptoms.

<ul style="list-style-type: none"> • Don't argue - comfort • Ensure safety • Remove upsetting stimuli • Change of environment 	<ul style="list-style-type: none"> • Try not to react • Reassure safety • Gentle touch • Engagement distraction
Hallucinations and Delusions	Paranoia

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Fall Risk Reduction Strategies

- ▶ Simplify the home
- ▶ Contrasting colors edging
- ▶ Non-skid strips on floor
- ▶ Label rooms
- ▶ Avoid overstimulation
- ▶ Vestibular assessment

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Safety

- ▶ Signs with simple written instructions and safety cues.
- ▶ Childproof plugs/latches, automatic shut off stove, color code faucets, disconnect garbage disposal.
- ▶ Secure cleaning alcohol, medications, weapons.
- ▶ Check for food spoilage, limit access to anything that can be mistaken for food.

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Sundowning

- ▶ Restlessness, agitation, or confusion as daylight begins to fade in the evening.
- ▶ Plan activities and exercise during this time as distractions.
- ▶ Make early evening a quiet time.
- ▶ Close blinds at dusk to minimize shadows.

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Wandering

- ▶ Lapping, random, pacing patterns of locomotion associated with disorientation and eloping.
- ▶ Person should have ID on them.
- ▶ MedicAlert® + Alzheimer's Association Safe Return® Program
- ▶ Limit situations that cause disorientation or agitation.
- ▶ Ensure basic needs are met.

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Strategies to Limit Wandering

- ▶ Keep signs of departure out of sight.
- ▶ Locked doors and doorknob covers should be used only when a caregiver is present.
- ▶ Simple door signs and visual stop cues to deter exit.
- ▶ Pictures, curtains, dark rug on light floor, mirror, murals.

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Early Diagnosis Emerging Research

- ▶ Biofluid based biomarkers
 - ▶ Amyloid
 - ▶ PDGFR β may indicate compromised blood brain barrier
- ▶ Computer-based self-administered assessment of multiple cognitive domains.
- ▶ Neuroimaging to distinguish involved brain regions.

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Gait Analysis Predictive Value

- ▶ Gait analysis with wearable technology may identify gait variances with predictive value for mild AD.
- ▶ Gait alterations may be evident years before diagnosis.
- ▶ Consider including cognitive assessment for patients being evaluated for fall risk.

Dementia	Gait Characteristics
AD or FTD	Larger step width with counting backward Varied cycle time with animal reciting
VCID or LBD	Gait at usual speed wider steps Slower gait speed with animal reciting

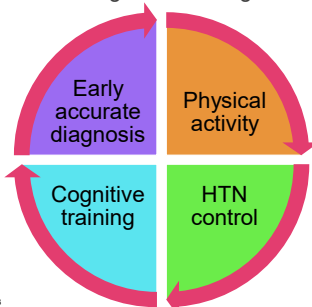
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Future Research

- ▶ Exploration of lifestyle changes to prevent or delay Alzheimer's and age-related cognitive decline.



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Conclusion

- ▶ Several disease processes lead to cognitive impairments associated with dementia. Distinguishing the presentations and implementing appropriate physical activity, communication, and environmental modification strategies can enhance quality of life for individuals and their caregivers.

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1. Physical activity can help improve _____ which is the ability to maintain function in the presence of brain injury or pathology.

- Spaced retrieval
- Mild cognitive impairment
- Cognitive reserve
- Self efficacy

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2. Which of the following biologic factors is NOT associated with the pathogenesis of Alzheimer's disease?

- Decreased acetylcholine synthesis
- Aggregation of beta-amyloid
- Tau neurofibrillary tangles
- Lewy bodies

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3. An individual demonstrating word finding challenges, planning difficulty, and misplacing things in odd places would be considered in what stage of Alzheimer's disease?

- A. Pre-clinical
- B. Mild
- C. Moderate
- D. Severe

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4. What condition impacting memory and thinking also presents with movement symptoms of parkinsonism?

- A. Mild cognitive decline
- B. Frontotemporal dementia
- C. Alzheimer's disease
- D. Dementia with Lewy bodies

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5. What characteristics are common among the subtypes of frontotemporal dementia?

- A. Forgetfulness and memory impairment
- B. Inappropriate social behavior and impaired empathy
- C. Tremors and bradykinesia
- D. Hallucinations and paranoia

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6. A score of _____ on the Mini-Mental State Examination is related to severe dementia.

- A. 25 and above
- B. 20-24
- C. 13-20
- D. Less than 12

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7. What tool assesses level of disability as the basis for palliative interventions and care planning for individuals with advanced dementia?

- A. GDS
- B. FAST
- C. PAINAD
- D. MoCA

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8. Hearing, seeing, smelling, or feeling things that are not really there defines what symptom?

- A. Hallucination
- B. Paranoia
- C. Delusion
- D. Persecution

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9. What is the term for restlessness, agitation, irritability, or confusion that worsens during the evening?

- A. Sundowning
- B. Wandering
- C. Daylight decline
- D. Delusional reactivity

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10. Which of the following is NOT a strategy to employ to limit wandering?

- A. Hang scenic posters on doors
- B. Use doorknob covers when caregiver is present
- C. Hang simple instructions on how to open exit doors
- D. Keep keys, suitcases, coats, and signs of departure out of sight

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Resources

CDC - Survey Data and Statistics- Infographics on Subjective Cognitive Decline and Caregiving
<https://www.cdc.gov/aging/data/index.htm>

CDC - Alzheimer's Disease and Healthy Aging - Resources for Professionals, Patients, and Caregivers
<https://www.cdc.gov/aging/index.html>

National Institute on Aging - Alzheimer's and related Dementias Education and Referral Center (ADEAR) - Free publications and referrals to local support services
<https://www.nia.nih.gov/health/about-adear-center>

National Institute on Aging - Alzheimer's and dementia resources for professionals
<https://www.nia.nih.gov/health/alzheimers-dementia-resources-for-professionals>

FDA Warning Letters
<https://www.fda.gov/inspections-compliance-enforcement-and-criminal-investigations/compliance-actions-and-activities/warning-letters>

FDA Advisory Letters
<https://www.fda.gov/inspections-compliance-enforcement-and-criminal-investigations/compliance-actions-and-activities/advisory-letters>

Department of Health and Human Services – Alzheimers.gov Clinical Trials - Volunteers with dementia/memory problems, caregivers, at-risk and healthy individuals.
<https://www.alzheimers.gov/clinical-trials>

National Institute of Neurological Disorders and Stroke – Vascular Cognitive Impairment and Dementia Initiatives - Research advances, clinical trials and patient education resources
<https://www.ninds.nih.gov/Current-Research/Focus-Disorders/Alzheimers-Related-Dementias/Focus-Vascular-Contributions-Cognitive>

MedicAlert® + Alzheimer's Association Safe Return® Program
<https://www.medicalert.org/alz>

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Association for Frontotemporal Dementias - Caregiver resources, trainings, clinical trials, and helpline
<https://www.theaftd.org/>

Functional Assessment Staging Scale (FAST) and Global Deterioration Scale (GDS)
https://www.mirecc.va.gov/visn21/pdf/gds_basic_package.pdf

Clock Drawing Test
<https://www.psychdb.com/cognitive-testing/clock-drawing-test>

Memory Impairment Screen (MIS)
<https://www.alz.org/media/Documents/memory-impairment-screening-mis.pdf>

Montreal Cognitive Assessment (MoCA)
https://www.mocatest.org/wp-content/uploads/2015/tests-instructions/MoCA-Test-English_7_1.pdf

Mini-Mental State Examination
<http://www.fammed.usouthal.edu/Guides&JobAids/Geriatric/MMSE.pdf>

Mini-Cog
<https://mini-cog.com/>

Pain Assessment in Advanced Dementia Scale (PAINAD)
<http://dementiapathways.ie/filecache/04a/ddd/98-painad.pdf>

Iowa Pain Thermometer
<https://geriatricpain.org/pain-thermometer-scale>

National Institute for Health and Care Excellence. (2018). NICE guideline [NG97]
Dementia: assessment, management and support for people living with dementia and their careers
<https://www.nice.org.uk/guidance/ng97>

Agency for Healthcare Research and Quality- Care Interventions for People Living with Dementia and Their Caregivers
<https://effectivehealthcare.ahrq.gov/sites/default/files/pdf/cer-231-dementia-interventions-final.pdf>

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