

# Dementia

## Overview of Dementia

Dementia is a progressive syndrome characterized by a decline in cognitive function beyond what is expected from normal aging, affecting memory, thinking, behavior, and the ability to perform daily activities. It is not a single disease but a collective term for various conditions, primarily affecting older adults, though early-onset forms exist. Dementia has significant medical, social, and ethical implications, requiring a multidisciplinary approach in the hospital setting. This guide provides an in-depth look at the causes, diagnosis, treatment, management, complications, social and ethical impacts, and hospital duties related to dementia, with tables and clinical scenarios for practical application.

## Causes of Dementia

### Primary Causes:

- **Alzheimer's Disease (AD):** The most common cause (60-80% of cases), characterized by amyloid plaques and tau tangles in the brain.
- **Vascular Dementia (VaD):** 10-20% of cases, caused by reduced blood flow to the brain (e.g., post-stroke, small vessel disease).
- **Lewy Body Dementia (LBD):** 10-15% of cases, associated with Lewy bodies (alpha-synuclein deposits), often overlapping with Parkinson's disease.
- **Frontotemporal Dementia (FTD):** 5-10% of cases, affects frontal and temporal lobes, leading to personality changes and language deficits.
- **Mixed Dementia:** Combination of AD, VaD, or LBD (common in older adults).

### Secondary Causes:

#### Reversible Causes:

- **Vitamin B12 Deficiency:** Leads to cognitive decline, reversible with supplementation.
- **Hypothyroidism:** Slows metabolism, causing memory issues; treatable with levothyroxine.
- **Normal Pressure Hydrocephalus (NPH):** Triad of dementia, gait disturbance, urinary incontinence; treatable with shunt placement.

- **Depression (Pseudodementia):** Mimics dementia, improves with antidepressants.
- **Medication Side Effects:** Anticholinergics (e.g., diphenhydramine), benzodiazepines.

#### Irreversible Causes:

- **Traumatic Brain Injury (TBI):** Chronic traumatic encephalopathy (CTE) from repeated head trauma.
- **HIV-Associated Neurocognitive Disorder (HAND):** Cognitive decline in advanced HIV.
- **Creutzfeldt-Jakob Disease (CJD):** Rare, rapidly progressive prion disease.
- **Alcohol-Related Dementia:** Chronic alcohol use causing brain damage.

#### Risk Factors:

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- **Age:** Risk doubles every 5 years after 65.
- **Genetics:** APOE ε4 allele (AD), familial FTD mutations.
- **Cardiovascular:** Hypertension, diabetes, smoking, obesity.
- **Lifestyle:** Sedentary behavior, poor diet, social isolation.

## Clinical Presentation and Diagnosis

#### Symptoms:

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- **Cognitive:** Memory loss (recent > remote), difficulty with problem-solving, language (aphasia), visuospatial skills (e.g., getting lost).
- **Behavioral:** Agitation, aggression, apathy, depression, hallucinations (common in LBD).
- **Functional:** Impaired activities of daily living (ADLs) like dressing, bathing, or managing finances.
- **Motor:** Gait disturbances (VaD, NPH), parkinsonism (LBD), myoclonus (CJD).

#### Diagnostic Workup:

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#### History and Exam:

- **Cognitive Assessment:** Mini-Mental State Exam (MMSE, score <24/30 indicates dementia) or Montreal Cognitive Assessment (MoCA, score <26/30).
- **Neurological Exam:** Look for focal deficits (VaD), parkinsonism (LBD), gait issues (NPH).

Labs:

- **CBC, CMP:** Rule out anemia, infection, metabolic issues.
- **Thyroid Function:** TSH to exclude hypothyroidism.
- **Vitamin B12/Folate:** Deficiency can mimic dementia.
- **HIV, Syphilis Serology:** If risk factors present.

Imaging:

- **CT/MRI Brain:** Atrophy (AD: medial temporal lobe), white matter changes (VaD), hydrocephalus (NPH).
- **PET Scan:** Amyloid imaging for AD, hypometabolism in frontal/temporal lobes (FTD).

Other Tests:

- **CSF Analysis:** Amyloid-beta, tau (AD), 14-3-3 protein (CJD).
- **EEG:** Diffuse slowing (AD), periodic sharp waves (CJD).
- **Genetic Testing:** APOE ε4 (AD risk), PSEN1/2 mutations (familial AD).

## Treatment Options

### Symptomatic Treatment:

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- **Cholinesterase Inhibitors:** Donepezil 5-10 mg PO daily, rivastigmine 1.5-6 mg PO BID (AD, LBD). Boosts acetylcholine to improve memory.
- **NMDA Receptor Antagonist:** Memantine 5-20 mg PO daily (moderate-severe AD). Reduces glutamate excitotoxicity.
- **Antipsychotics:** Low-dose risperidone 0.25-1 mg PO daily or quetiapine 25-100 mg PO daily (for agitation, hallucinations). Avoid in LBD (worsens parkinsonism).
- **Antidepressants:** Sertraline 50-200 mg PO daily (depression, apathy). Avoid tricyclics (anticholinergic effects worsen cognition).
- **Sleep Aids:** Melatonin 1-5 mg PO at bedtime (sleep disturbances). Avoid benzodiazepines (increase fall risk, worsen cognition).

### Disease-Modifying Therapies (Emerging):

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- **Aducanumab:** Anti-amyloid antibody (AD), 10 mg/kg IV monthly. Reduces amyloid plaques, FDA-approved 2021, controversial efficacy.
- **Lecanemab:** Anti-amyloid antibody (AD), 10 mg/kg IV every 2 weeks. Slows cognitive decline (CLARITY-AD trial, 2023).

## Supportive Care:

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- **Cognitive Therapy:** Memory aids, structured routines.
- **Lifestyle:** Mediterranean diet, regular exercise, social engagement.
- **Risk Factor Control:** BP <130/80 mmHg, HbA1c <7%, smoking cessation.

## Hospital Management of Dementia

### General Principles:

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- **Environment:** Minimize sensory overload (quiet room, familiar objects), avoid restraints.
- **Communication:** Use simple language, speak slowly, maintain eye contact.
- **Safety:** Fall precautions (bed alarms, low bed), monitor for wandering.
- **Delirium Prevention:** Avoid polypharmacy, ensure sleep, manage pain.

### Acute Management:

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- **Delirium:** Common in hospitalized dementia patients (30-50% incidence). Treat reversible causes (e.g., infection, dehydration), haloperidol 0.5-1 mg PO/IV for agitation (avoid in LBD).
- **Infections:** Broad-spectrum antibiotics (e.g., ceftriaxone 1 g IV daily + azithromycin 500 mg IV daily) for pneumonia, UTI.
- **Pain:** Acetaminophen 650 mg PO q6h (avoid NSAIDs, risk of GI bleed).
- **Nutrition:** Monitor for dysphagia (speech therapy consult), ensure adequate intake (calorie counts).

### Chronic Management:

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- **Medication Review:** Discontinue anticholinergics, benzodiazepines (worsen cognition).
- **Caregiver Support:** Social work consult, respite care, dementia education.
- **Advance Care Planning:** Discuss goals of care, DNR/DNI status, palliative care if end-stage.

## Complications of Dementia

### Medical:

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- **Infections:** Pneumonia, UTI (leading cause of hospitalization, 30% of cases).
- **Falls:** 2-3x higher risk due to gait instability, visuospatial deficits.

- o **Malnutrition:** Dysphagia, poor appetite (weight loss >10% in 6 months).
- o **Seizures:** 10-20% incidence in late-stage AD, LBD.

## Psychiatric:

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- o **Depression:** 40% prevalence, increases caregiver burden.
- o **Psychosis:** Hallucinations, delusions (common in LBD, 50-70% of cases).

## End-Stage:

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- o Aspiration pneumonia, decubitus ulcers, sepsis (median survival 6-12 months after onset of severe dementia).

## Social Implications

- **Caregiver Burden:** 60% of caregivers report high stress, 30% experience depression.
- **Financial Impact:** Annual cost per patient ~\$50,000 (2023 estimate, Alzheimer's Association).
- **Loss of Independence:** Patients often lose ability to drive, manage finances, or live alone (70% require long-term care within 5 years).
- **Stigma:** Social isolation due to misunderstanding of dementia (e.g., perceived as "crazy" or "childlike").
- **Family Dynamics:** Role reversal (children caring for parents), strained relationships.

## Ethical Impacts

- **Autonomy:** Patients may lose decision-making capacity; advance directives (e.g., living will, healthcare proxy) are critical.
- **Informed Consent:** Use surrogate decision-makers if patient lacks capacity (legal guardian, family).
- **End-of-Life Care:** Debate over feeding tubes in advanced dementia (no survival benefit, ASPEN guidelines); focus on comfort care.
- **Resource Allocation:** High cost of care vs. limited benefit in end-stage dementia (ethical dilemma in resource-limited settings).
- **Genetic Testing:** APOE ε4 testing (AD risk) raises ethical concerns (e.g., psychological impact, insurance discrimination).

# Hospital Duties for Dementia Patients

## Multidisciplinary Care:

- o **Neurology:** Confirm diagnosis, manage medications.
- o **Geriatrics:** Coordinate care, assess functional status.
- o **Social Work:** Arrange home care, caregiver support.
- o **Palliative Care:** Symptom management, end-of-life planning.

## Safety Protocols:

- o **Fall Risk:** Bed alarms, non-slip socks, 1:1 supervision if wandering.
- o **Delirium Screening:** CAM (Confusion Assessment Method) daily.

## Documentation:

- o **Capacity Assessment:** Document decision-making ability (e.g., unable to consent for procedures).
- o **Goals of Care:** Discuss with family, document DNR/DNI if appropriate.

## Discharge Planning:

- o **Home Safety:** Recommend grab bars, remove tripping hazards.
- o **Caregiver Education:** Teach medication management, warning signs (e.g., delirium, aspiration).
- o **Follow-Up:** Neurology, primary care within 1-2 weeks.

**Table:** Common Types of Dementia and Characteristics

Type	Cause	Key Features	Diagnostic Findings	Treatment
Alzheimer's Disease	Amyloid plaques, tau tangles	Memory loss, aphasia, apraxia	MRI: Medial temporal atrophy, CSF: ↓ Amyloid, ↑ tau	Donepezil 5-10 mg PO daily, memantine 5-20 mg PO daily
Vascular Dementia	Reduced cerebral blood flow	Step-wise decline, focal deficits	MRI: White matter changes, infarcts	Risk factor control (BP, diabetes), aspirin 81 mg PO daily
Lewy Body Dementia	Alpha-synuclein deposits	Hallucinations, parkinsonism, REM sleep disorder	DaTscan: Dopamine deficit	Rivastigmine 1.5-6 mg PO BID, avoid antipsychotics

Type	Cause	Key Features	Diagnostic Findings	Treatment
Frontotemporal Dementia	Frontal/temporal degeneration	Personality changes, language deficits	MRI: Frontal/temporal atrophy	Supportive, SSRIs for behavior

**Table:** Hospital Management Strategies for Dementia

Issue	Management	Monitoring	Consults
Delirium	Haloperidol 0.5-1 mg PO/IV, treat infection (e.g., ceftriaxone for UTI)	CAM daily, electrolytes q12h	Geriatrics, psychiatry
Infections	Antibiotics (e.g., ceftriaxone 1 g IV daily), fluids (NS 1 L bolus)	Cultures, WBC q24h	ID, pulmonology
Falls	Bed alarms, low bed, 1:1 supervision	Fall risk assessment qshift	Physical therapy
End-Stage Care	Palliative care, comfort measures, no feeding tube	Pain scale, family meetings	Palliative care, social work

## Clinical Scenarios

- Scenario 1: Elderly Female with Alzheimer's and Delirium
- **Presentation:** An 80-year-old female with AD (MMSE 18/30) presents with acute confusion, agitation, and fever. Exam shows T 38.5°C, BP 110/70 mmHg, HR 100 bpm, RR 20/min, GCS 13, disoriented, no focal deficits.
- **Diagnostic Workup:** Urinalysis: Pyuria, culture grows E. coli, CXR normal, CT head: Atrophy, no acute changes, labs: WBC 12,000/μL, normal CMP, B12 400 pg/mL.
- **Diagnosis:** Delirium secondary to UTI in AD → Acute confusion, infection, known dementia.
- **Management:** Admit to medicine (delirium, infection). Start ceftriaxone 1 g IV daily. Haloperidol 0.5 mg IV q8h for agitation. Quiet room, family at bedside. Monitor CAM daily, CBC q24h. Social work consult: Caregiver support. After 3 days, GCS 15, infection cleared, discharged with donepezil 10 mg PO daily, follow-up.
- Scenario 2: Middle-Aged Male with Vascular Dementia and Stroke
- **Presentation:** A 60-year-old male with hypertension and VaD (MoCA 20/30) presents with sudden right-sided weakness and slurred speech. Exam shows T 37°C, BP 160/90 mmHg, HR 80 bpm, RR 16/min, right hemiparesis, dysarthria.

- **Diagnostic Workup:** CT head: Acute left MCA infarct, MRI: Prior white matter changes, labs: HbA1c 7.5%, LDL 120 mg/dL, normal CMP.
- **Diagnosis:** Acute ischemic stroke in VaD → Focal deficits, new infarct, known VaD.
- **Management:** Admit to stroke unit (acute stroke). IV tPA (alteplase 0.9 mg/kg) within 3h window. Aspirin 325 mg PO after 24h. Control BP (lisinopril 10 mg PO daily, target <140/90 mmHg). Consult neurology: Optimize risk factors (atorvastatin 80 mg PO daily, metformin). Monitor for aspiration (speech therapy). After 5 days, weakness improved, discharged to rehab with follow-up.

- Scenario 3: Elderly Male with LBD and Hallucinations
- **Presentation:** A 75-year-old male with LBD presents with worsening hallucinations (seeing people who aren't there) and parkinsonism. Exam shows T 37°C, BP 120/80 mmHg, HR 70 bpm, RR 16/min, GCS 15, bradykinesia, rigidity, visual hallucinations.
- **Diagnostic Workup:** MoCA 22/30, DaTscan: Dopamine deficit, CT head: No acute changes, labs: Normal CMP, TSH, B12.
- **Diagnosis:** LBD with worsening psychosis → Hallucinations, parkinsonism, DaTscan findings.
- **Management:** Admit for evaluation. Start rivastigmine 1.5 mg PO BID (titrated to 3 mg BID). Quetiapine 25 mg PO at bedtime for hallucinations. Avoid haloperidol (worsens parkinsonism). Fall precautions (bradykinesia). Consult neurology: Monitor for REM sleep behavior disorder. After 4 days, hallucinations reduced, discharged with follow-up.

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