

Human Behavior Course 2004

Dementia

Charles C. Engel, MD, MPH
LTC, MC, USA
Associate Professor of Psychiatry
Uniformed Services University

HUMAN BEHAVIOR COURSE 2004

DEMENTIA - SLIDES

LEARNING OBJECTIVES AND STUDY QUESTIONS FOR DISCUSSION.

1. Know the meaning of the terms and concepts listed in slide one below.
2. List the defining features of dementia.
3. Know the clinical criteria for Alzheimer's disease.
4. List the different etiologies of dementia. Know which ones are "reversible". Know which ones are most common.
5. Describe the differential diagnosis and defining features of subcortical dementia.
6. Describe the differential diagnosis and defining features of cortical dementia.
7. Know the basic dementia work-up, and why each test is indicated.
8. Know the clinical stages of Alzheimer's disease and the characteristics of each stage (table 6-5).
9. What neurotransmitters and brain areas have been implicated in Alzheimer's disease?
10. What are the defining pathological lesions associated with Alzheimer's disease?
11. Name the "cognitive enhancers" sometimes used to ameliorate memory problems in Alzheimer's disease?
12. What is the difference between dementia and amnesic disorder?

Slide 1

Dementia - Terms & Concepts

- ★ Delirium versus dementia
- ★ Alzheimer's disease
- ★ Vascular dementia
- ★ Pseudodementia
- ★ Amnesic disorder
- ★ Confabulation
- ★ Head trauma
- ★ Orbitofrontal deficits
- ★ Dorsolateral frontal deficits
- ★ Transient global amnesia
- ★ Temporal lobectomy
- ★ Procedural memory
- ★ Declarative memory
- ★ Retrograde amnesia
- ★ Anterograde amnesia
- ★ Wernicke-Korsakoff syndrome
- ★ Alcohol-induced amnesic disorder
- ★ Wernicke's encephalopathy
- ★ Alcohol induced dementia
- ★ Structural neuroimaging
- ★ Functional neuroimaging
- ★ Positron emission tomography
- ★ Single photon emission tomography
- ★ Capgras syndrome
- ★ Neuritic plaques
- ★ Neurofibrillary tangles
- ★ Beta-amyloid
- ★ ApoE4
- ★ Dementia pugilistica
- ★ Dialysis dementia
- ★ Creutzfeldt-Jakob disease
- ★ Nucleus basalis of Meynert (substantia innominata)



Uniformed Services University

Dementia - Terms & Concepts 2

- ★ Acetyl choline
- ★ Glutamate
- ★ Stepwise decline
- ★ Parkinson's disease
- ★ Lewy body disease
- ★ Pick's disease
- ★ Huntington's disease
- ★ Subacute spongiform encephalopathies
- ★ Prion
- ★ Kuru
- ★ Bovine spongiform encephalopathy
- ★ Scrapie
- ★ Mini-mental status examination
- ★ Choline acetyltransferase
- ★ Acetylcholinesterase
- ★ Tacrine (Cognex)
- ★ Donepezil (Aricept)
- ★ Rivastigmine (Exelon)
- ★ Galantamine (Reminyl)
- ★ Vitamin E
- ★ L-deprenyl (selegiline)
- ★ Estrogen replacement



Uniformed Services University

What is Dementia? Dementia Consensus Conference

- ★ Affects the brain & is not mental retardation or psychosis.
- ★ Syndrome with many causes.
- ★ Characterized by sustained intellectual decline.
- ★ Usually long lasting; some types may be arrested or reversed.
- ★ No alteration in consciousness.
- ★ Almost always deficits in memory, language, orientation, judgment, or abstraction.
- ★ May be static or variably progressive.
- ★ Patient may lack insight into deficits.



Uniformed Services University

from JAMA 258(23):3411-3416; 1987

Delirium	Dementia
<i>Clouding of consciousness</i>	Loss of memory/intellectual ability
<i>Acute onset</i>	<i>Insidious onset</i>
Lasts 3 days to 2 weeks	Lasts months to years
Orientation impaired	Orientation often impaired
Immediate/recent memory impaired	Recent and remote memory impaired
Visual hallucinations common	Hallucinations less common
Symptoms fluctuate, often worse at night	Symptoms stable throughout day
Usually reversible	15% reversible
Awareness reduced	Awareness clear
EEG changes (fast waves or generalized slowing)	No EEG changes

Common Dementias & Their Relative Frequencies

Alzheimer's Dementia	50%
Vascular Dementia	10-15%
Alcoholic Dementia	5-10%
Pseudodementia	7%
NPH Dementia	6%
Intracranial Tumors	5%
Chronic Drug Intoxication	3%
Huntington's Chorea	3%
Other	7-10%
Undiagnosed	3%



Uniformed Services University

from Wells (ed): Dementia NY, Davis, 1977

Dementia Cortical vs Subcortical

Features	Cortical	Subcortical
Appearance	alert, healthy	disheveled, 'odd', ill
Motor activity	normal	slow
Posture	erect	stooped, twisted
Gait	normal or pacing	ataxic, festinating
Movements	normal	tremor, chorea, dystonia
Language	anomia, paraphasia	normal
Cadence	normal	dysarthric, hypophonic
Cognition	↓ use of facts	'dilapidated'
Memory	↓ register/learn	↓ retrieval (forgetful)
Visuospatial	↓ construction	sloppy (motor problem)
Emotions	unaware/concerned	apathetic, amotivated



Uniformed Services University

adapted from Beck, et al, Ann Intern Med 97:231; 1982

Dementia - Subtypes

Cortical Dementia

- Alzheimer's Disease
- Pick's Disease

Subcortical Dementia

- Parkinson's Disease
- Wilson's Disease
- Huntington's Disease
- AIDS Dementia Complex

Mixed Dementia

- Vascular Dementia
- Infectious Dementias



Uniformed Services University

Probable Alzheimer's Dementia Diagnostic Criteria

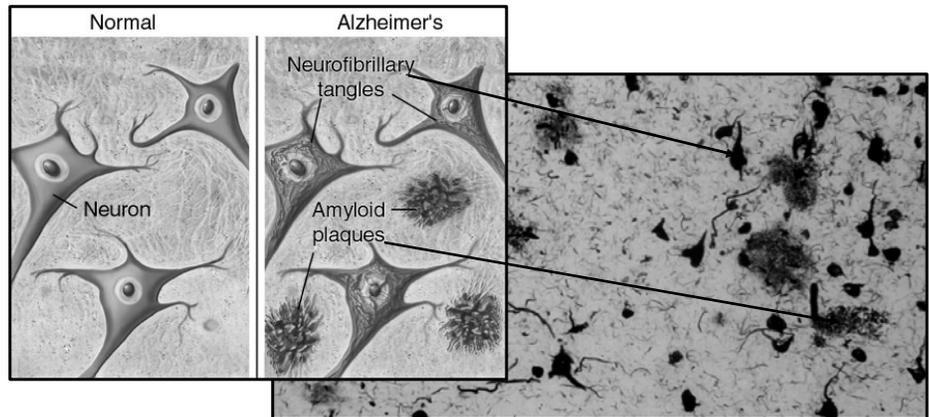
- ★ Dementia established by clinical examination & confirmed by neuropsychological testing
- ★ Deficits in 2 or more areas of cognition
- ★ Progressive worsening of memory & other cognitive functions
- ★ No disturbance of consciousness
- ★ Onset between ages 40 & 90 y/o
- ★ Absence of systemic or other brain diseases capable of producing a dementia syndrome



Uniformed Services University

Alzheimer's Dementia Pathological Diagnosis

Histopathological confirmation: neuritic plaques & neurofibrillary tangles in neocortex & hippocampus



Alzheimer's Dementia Clinical Course

★ Early Phase (1-3 years):

- Insidious onset.
- Short-term memory goes first, remote memory later.
- Behavior Changes: becomes disoriented in unfamiliar settings, forgets obligations, uses poor judgment, repetitious in conversations, etc.



Uniformed Services University

Alzheimer's Dementia Clinical Course

★ Middle Phase (2-10 years):

- Fluent aphasia, dysnomia
- Apraxia
- Apathy, paranoia, self-centered, dependent, labile

★ Late Phase (8-12 years):

- Pacing, disturbed sleep-wake cycle, unable to do ADLs, motor deficits, rigidity, bradykinesia



Uniformed Services University

Alzheimer's Dementia Prevalence

- ★ 4% in those older than age 65
- ★ 20% in those older than age 80
- ★ Evens, et al, 1989:
 - 10.3% (> 65)
 - 47% (> 85)
- ★ 2/3 of dementia due to AD



Uniformed Services University

Alzheimer's Dementia Pathophysiology

- ★ Pathogenesis Research
 - Genetics - trisomy 21, familial AD
 - Beta-amyloid - protein in neuritic plaques
 - Environmental toxins - aluminum, infection, head trauma implicated but evidence not compelling
- ★ Pathophysiology:
 - ↓ choline acetyl transferase in hippocampus & cortex
 - Damage to nucleus basalis of Meynert



Uniformed Services University

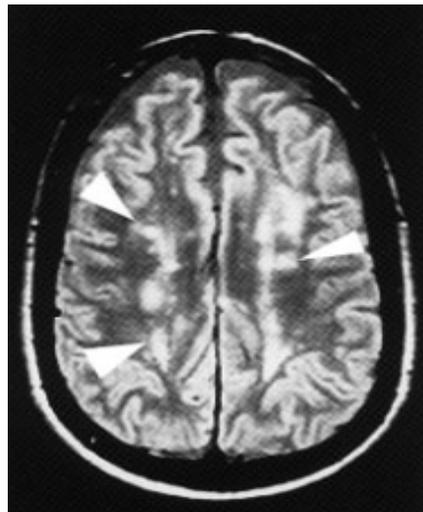
Vascular Dementia

- ★ “Binswanger’s Disease”
- ★ Diagnosis suggested by...
 - Stepwise deteriorating course
 - Patchy deficits early in course
 - Focal neurologic signs & symptoms
 - Evidence from history, physical, or labs of etiologically related cerebrovascular disease
- ★ Periventricular white matter changes on CT or MRI are characteristic but not always indicative of disease



Uniformed Services University

Classic “Binswanger’s Appearance” Magnetic Resonance Image



T2 axial view without contrast enhancement
Note the areas of increased signal bilaterally, known as periventricular hyperintensity (arrows).

Reversible Dementias

- ★ Depression
- ★ Intoxicants
meds, polypharmacy, alcohol, narcotics, glue, CO, CS2, lead, mercury, manganese
- ★ Infections: any involving brain
- ★ Metabolic disorders
diseases of thyroid, parathyroid, adrenals, pituitary



Uniformed Services University

from Consensus Conference, JAMA 258:3411-3416; 1987

Reversible Dementias 2

- ★ Nutritional disorders
thiamine deficiency, pernicious anemia (B12 deficiency), folate deficiency, pellagra (niacin deficiency)
- ★ Vascular dementias
- ★ Space-occupying lesions
- ★ Normal pressure hydrocephalus



Uniformed Services University

from Consensus Conference, JAMA 258:3411-3416; 1987

Other Dementias Alcoholic

- ★ True dementia of alcoholism
- ★ Korsakoff's
 - thiamine deficiency
 - partially reversible



Uniformed Services University

Other Dementias Pick's Disease

- ★ Resembles AD
- ★ Pathology shows Pick's bodies (cytoskeletal elements)
- ★ Frontotemporal degeneration
- ★ Excessive eating - Kluver-Bucy like?



Uniformed Services University

Other Dementias

Normal Pressure Hydrocephalus

- ★ Reversible by cerebroventricular shunting
- ★ Triad –
 - Dementia
 - Wide-based gait
 - Urinary incontinence
- ★ Ventricular dilatation without increased intracranial pressure



Uniformed Services University

Dementia

Indications for Neuropsychological Testing

- ★ To obtain a baseline for measuring future change when diagnosis is in doubt
- ★ Measure change before & after treatment
- ★ Suspected early dementia in a bright person
- ★ In cases with ambiguous imaging studies
- ★ To distinguish dementia from depression or delirium
- ★ To inform regarding nature & extent of impairment following focal brain injury



Uniformed Services University

from Consensus Conference, JAMA 258:3411-3416; 1987

1. Orientation	
What is the date, month, year?	5 points
Where are we (state, city, hospital)?	5 points
2. Registration	
Name three objects and repeat them.	3 points
3. Attention and calculation	
Serial 7s (subtract 7 from 100 and continue subtracting 7 from each answer) or spell "world" backward.	5 points
4. Recall	
Name the three objects above 5 minutes later.	3 points
5. Language	
Name a pen and a clock.	2 points
Say, "No ifs, ands, or buts."	1 point
Three-step command: Take a pencil in your right hand, put in your left hand, then put it on the floor.	3 points
6. Read and obey the following:	
Close your eyes.	1 point
Write a sentence.	1 point
Copy design.	1 point
TOTAL	30 points

**Dementia
Behavioral Management**

Environment

safe
secure
consistent
compensating



Uniformed Services University

Dementia

Pharmacological Management

Avoid polypharmacy!

★ Antidepressants:

- empiric trial is often warranted
- start with an SSRI to avoid anticholinergic & hypotensive effects of TCAs



Uniformed Services University

Dementia

Pharmacological Management

★ Neuroleptics: not a panacea

- high potency drugs (haloperidol) for agitation, psychosis, delirium, & behavioral dyscontrol
- avoid low potency agents (chlorpromazine, thioridazine)

★ Avoid CNS depressants:

- paradoxical disinhibition
- associated with falls



Uniformed Services University

TABLE 6–5. Clinical features differentiating pseudodementia from dementia

Pseudodementia	Dementia
Short duration	Long duration
Complaints of cognitive loss	Few complaints of cognitive loss
Complaints of cognitive dysfunction usually detailed	Complaints of cognitive dysfunction, usually imprecise
Communications of distress	Often appear unconcerned
Memory gaps for specific periods or events	Memory gaps for specific periods unusual
Attention and concentration usually well preserved	Attention and concentration faulty
“Don’t know” answer typical	Near-miss answers frequent
Little effort to perform simple tasks	Patients struggle to perform tasks
Patients highlight failures	Patients delight in trivial accomplishments
Early loss of social skills	Social skills often retained
Mood change pervasive	Affect shallow and labile
History of psychiatric illness common	History of psychiatric illness uncommon

Dementia

Caring for the Caregiver

- ★ Always empathically involve the caregiver in.
 - assessment & treatment planning.
 - encourage discussion of difficult end of life decisions.
- ★ Caregiver characteristics & well-being are best predictors of patient institutionalization.
- ★ Nation-wide Alzheimer’s Association Family Support Groups.
- ★ Literature: The 36-Hour Day & other books.



Uniformed Services University

Delirium	Dementia
<i>Clouding of consciousness</i>	Loss of memory/intellectual ability
<i>Acute onset</i>	<i>Insidious onset</i>
Lasts 3 days to 2 weeks	Lasts months to years
Orientation impaired	Orientation often impaired
Immediate/recent memory impaired	Recent and remote memory impaired
Visual hallucinations common	Hallucinations less common
Symptoms fluctuate, often worse at night	Symptoms stable throughout day
Usually reversible	15% reversible
Awareness reduced	Awareness clear
EEG changes (fast waves or generalized slowing)	No EEG changes