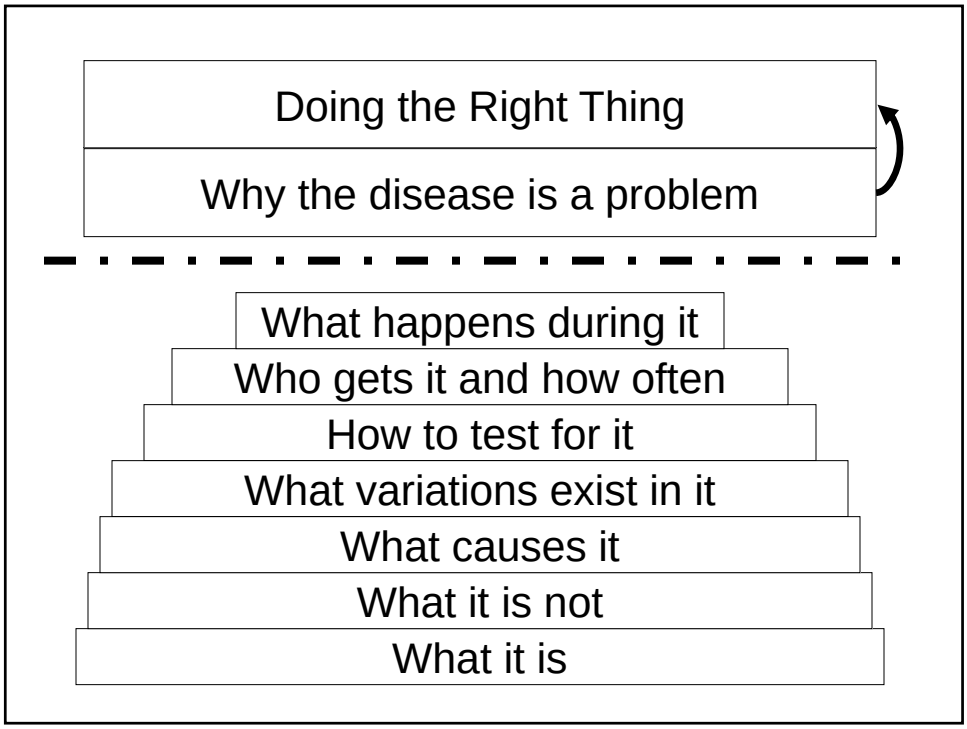
The Whole Person in Dementia

Stephen Thielke
sthielke@u.washington.edu

HRSA Dementia Resources

https://bhw.hrsa.gov/grants/geriatrics/alzheimers-curriculum

Or search for ”HRSA dementia”



Scenario #1

One of your parents develops memory problems, cannot remember which pills she/he took, gets lost in the car, and is paranoid about neighbors stealing things. He/She left the stove on and almost burned the house down.

-Practically, what do you do?

-What are your main needs?

-How can medical care help you?

Scenario #2

Your parent requires assistance with dressing, eating, bathing, and toileting. He/She cannot remember your name. You are the only one available to care for them.

-Practically, what do you do?

-What are your main needs?

-How can medical care help you?

Scenario #3

You live with your parents, aunts, uncles, and cousins in a large multigenerational household. Someone is always home, and there are kids underfoot. People are flexible in their schedules. Your parent needs assistance with dressing, eating, bathing, and toileting. He/She cannot remember anyone's name.

-Practically, what do you do?

-What are your main needs?

-How can medical care help you?

Definition of Dementia (#1)

A **significant**
chronic
loss
in **memory and/or mental functions**,
involving **structural damage** to the brain.

Definition of Dementia (#2)

A progressive neurodegenerative condition with functional consequences.

NOT
-Lifelong
-Abrupt or acute
-Normal aging
-Insignificant

NOT NECESSARILY
-A problem with memory
-Alzheimer's
-Disturbed behavior
-Age-related
-Fatal

DSM-5 Criteria for Major Neurocognitive Disorder (Dementia) [Definition #3]

- -Significant cognitive decline in one or more domains
- -The impairments interfere with independence (i.e. cause **FUNCTIONAL** problems)
- -The symptoms are not due to delirium or another mental disorder
- -Domains of cognition:
  - -Complex attention (multitasking)
  - -Executive function (complex tasks)
  - -Learning and memory
  - -Language
  - -Perceptual-motor (coordinated activities)
  - -Social cognition (appropriateness)

Major Neurocognitive Disorder (Dementia) Descriptors

- -Possible vs probable
- -With or without behavioral disturbance (psychosis, mood problems, agitation)
- -Severity: based on **FUNCTIONING**
  - -Mild: Instrumental activities of daily living (ADLs) are affected
  - -Moderate: Basic ADLs affected
  - -Severe: Fully dependent in ADLs

Delirium, Dementia and Depression

	Common Features	Hallmarks
Delirium	Subjective confusion Difficulty performing tasks "Not right" on interview Loved ones are worried	• Confusion / Impaired attention • Rapid onset; waxing and waning • Due to a medical cause
Dementia		• Problems in specific domains • Chronic and progressive, slow onset • Functional decline
Depression		• Decreased concentration and interest • Sensorium is clear

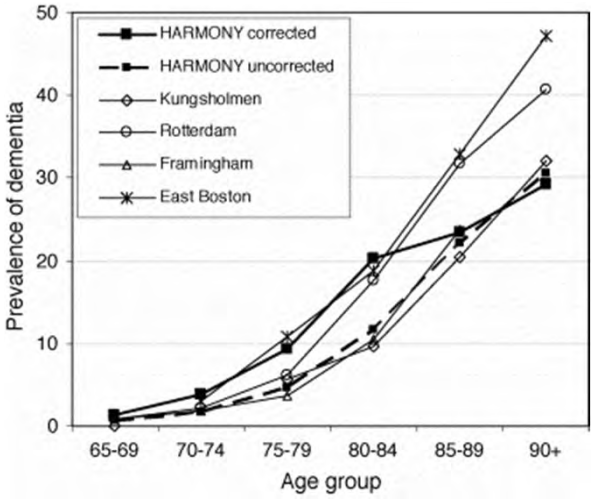
Dementia Prevalence

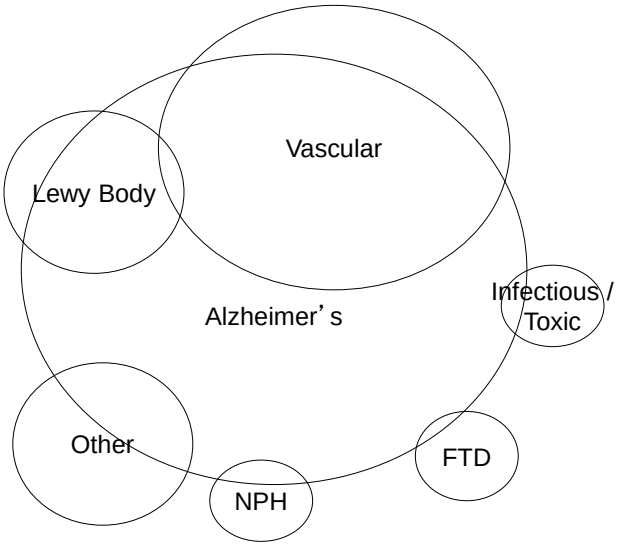
About 1% at age 65

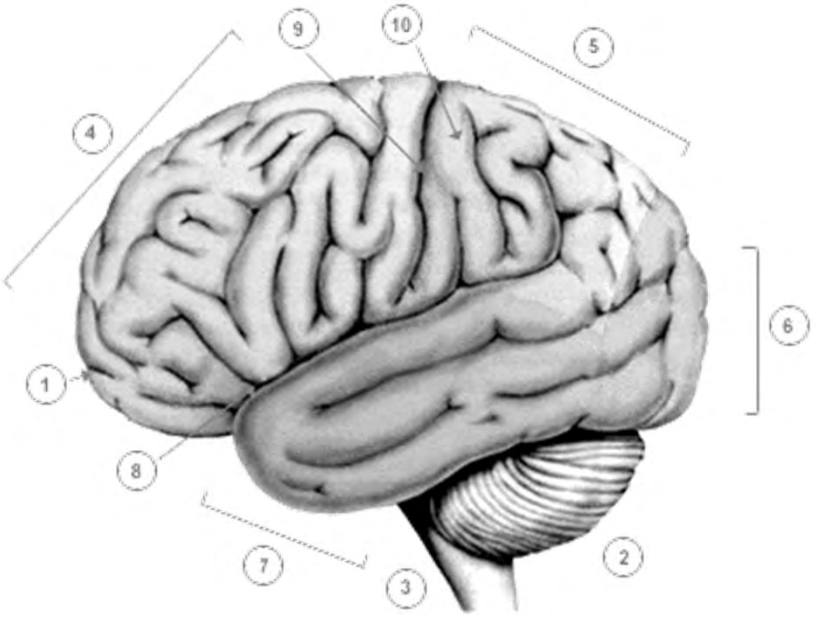
6-8% if older than 65

30% if older than 80

Frequency of Dementia



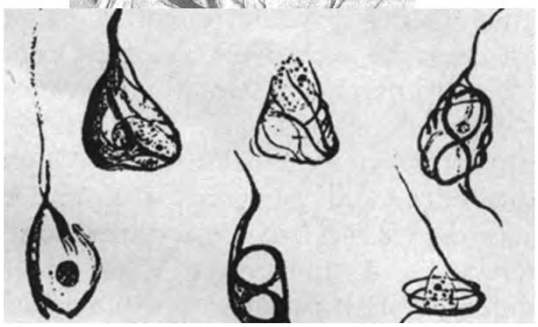


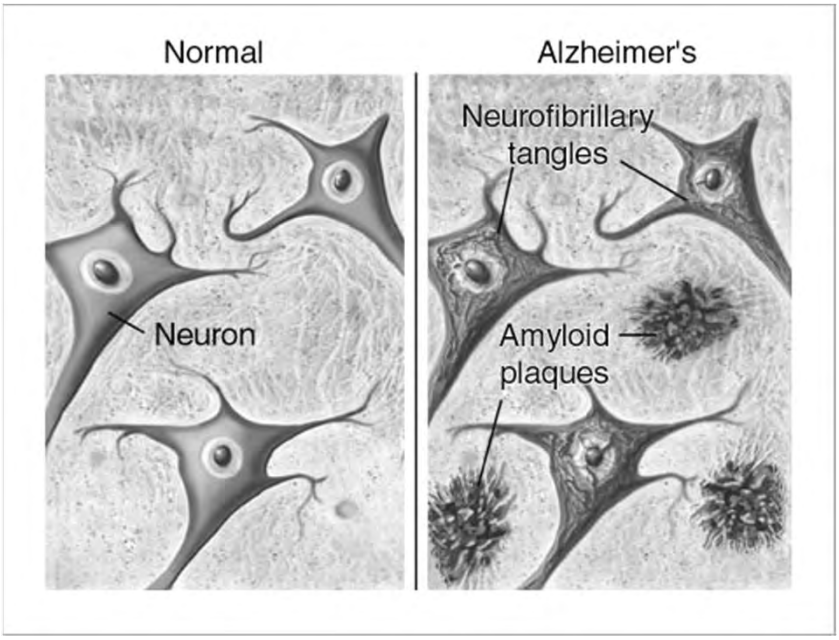


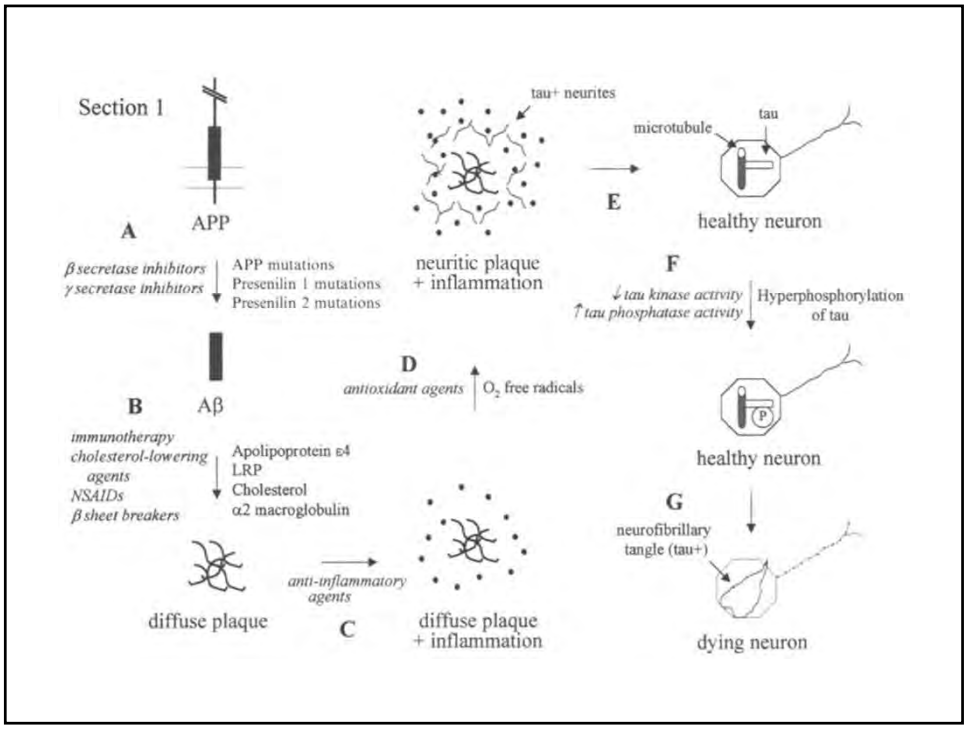
Types of Dementia:

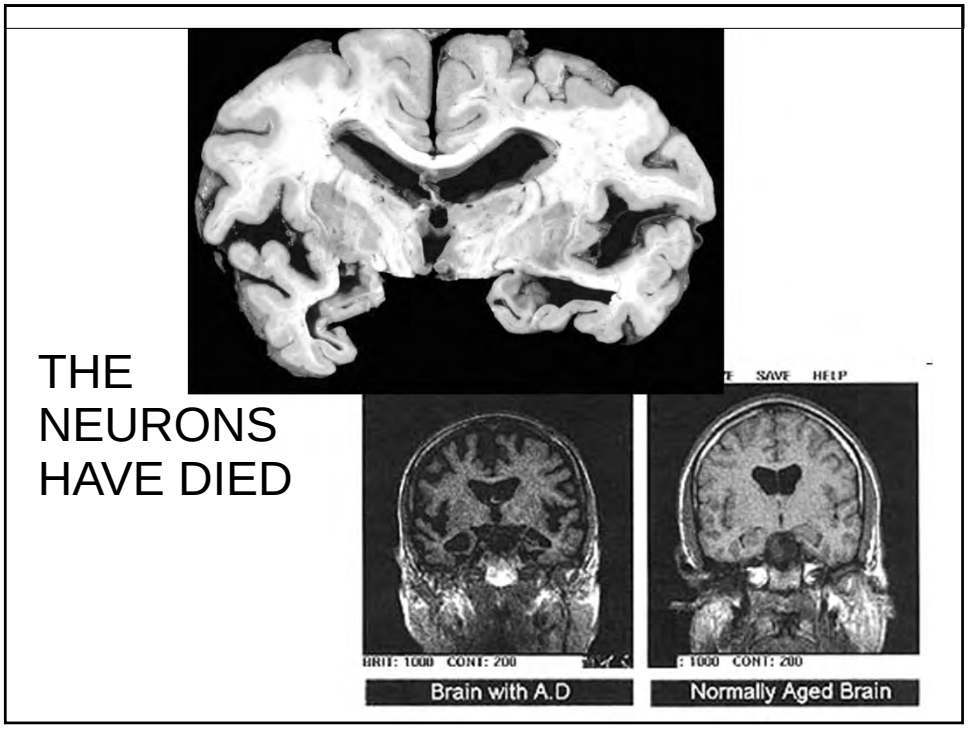
- Alzheimer's
- Vascular
- Lewy Body
- Frontotemporal
- "Reversible"

Alzheimer's Disease






Section 1
APP
A
β secretase inhibitors
γ secretase inhibitors
APP mutations
Presenilin 1 mutations
Presenilin 2 mutations
Aβ
B
immunotherapy
cholesterol-lowering agents
NSAIDs
β sheet breakers
Apolipoprotein ε4
LRP
Cholesterol
α2 macroglobulin
diffuse plaque
anti-inflammatory agents
C
diffuse plaque + inflammation
tau+ neurites
neuritic plaque + inflammation
D
antioxidant agents
O2 free radicals
E
microtubule
tau
healthy neuron
F
↓ tau kinase activity
↑ tau phosphatase activity
Hyperphosphorylation of tau
healthy neuron
G
neurofibrillary tangle (tau+)
dying neuron


THE NEURONS HAVE DIED
Brain with A.D
Normally Aged Brain

Alzheimer's Disease

Memory impairment + one of the following:

-Aphasia (speech problem)

-Apraxia (motor activity problem)

-Agnosia (recognition problem)

-Executive dysfunction

Functional impairment secondary to cognition

Not another cause

Other Common Causes of Cognitive Problems

Delirium (including medication side effects and poorly managed medical conditions)

Sleep apnea

Vision and hearing problems

Mental health issues, especially PTSD

Clinical Hallmarks of Alzheimer's

Slow, steady decline over **years**
Generally impaired insight into disease process
Generally a late presentation for medical care
Little waxing and waning
Death typically from medical causes in about 8-10 years

Mild Alzheimer's

- MMSE 20-24
- Usually during the first 2-3 years after diagnosis
- Primarily memory and visual-spatial deficits
- Mild difficulty with day-to-day functioning, decision-making

Moderate Alzheimer's

- MMSE 11-20
- 3-6 years following diagnosis
- Speech and coordinated action decline
- Loss of IADLS and increased need for assistance with ADLs
- May show psychiatric symptoms such as paranoia

Severe Alzheimer's

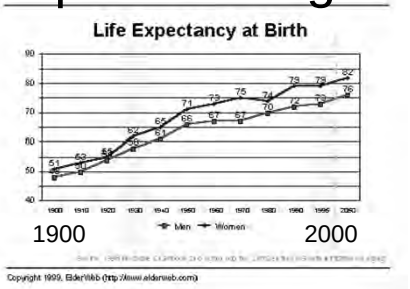
- Usually 6-10 years following diagnosis
- Severe language disturbances
- May show pronounced behavioral symptoms such as agitation and aggression (not necessarily worsening)
- Very late in the course can see muscle rigidity, gait disturbances, incontinence, swallowing problems

"When you've seen one case of Alzheimer's, you've seen one case of Alzheimer's."

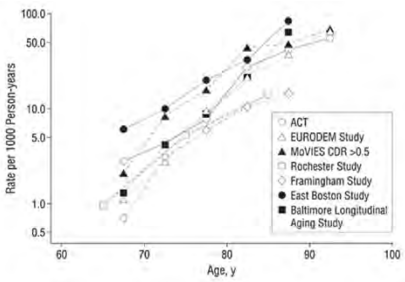
Genetics of Alzheimer's

- Early age of onset (< 60 years) is more likely "familial"
- Most Alzheimer's starts after age 70 and is "sporadic"
- Having a relative with "sporadic" Alzheimer's does not increase risk very much
- The presence of a gene (apolipoprotein $\varepsilon 4$) increases risk, but is no guarantee
- Most Alzheimer's is a consequence of multiple random brain changes that accumulate over time

Why is there more Alzheimer's? Because people live longer!



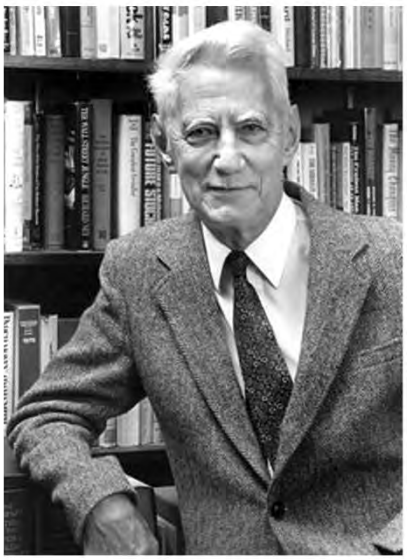
Incidence of Alzheimer's Disease by Age



Prevention of Alzheimer's?

Conclusion

"Currently, firm conclusions cannot be drawn about the association of any modifiable risk factor with cognitive decline or Alzheimer's disease. Evidence is insufficient to support the use of pharmaceutical agents or dietary supplements to prevent cognitive decline or Alzheimer's disease."



Vascular Dementia

MICROVASCULAR pathology (different than strokes)

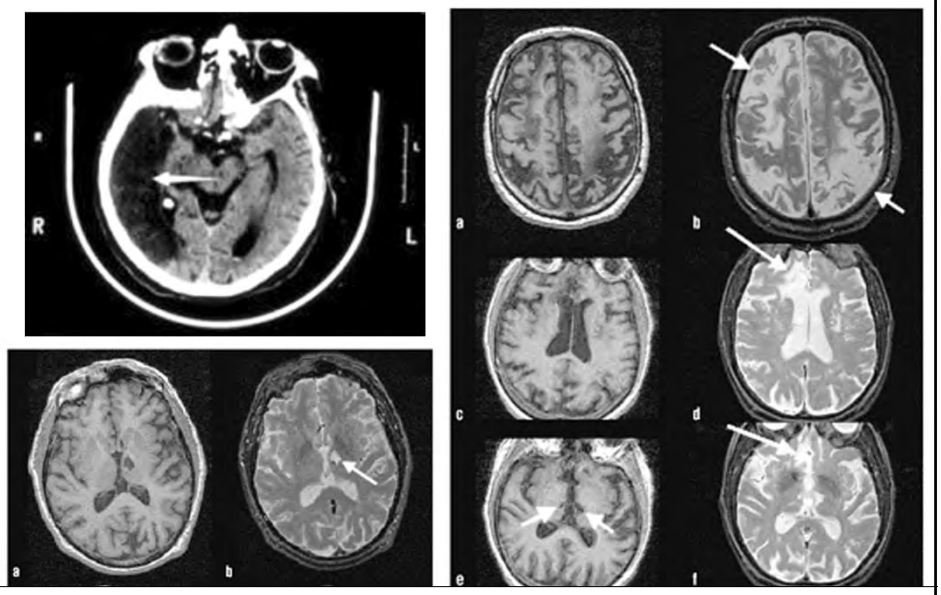
Clinically very similar to Alzheimer's

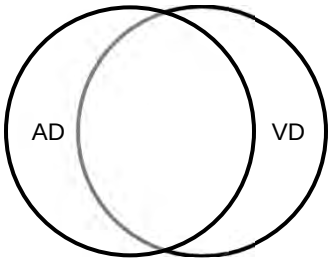
Vascular + Alzheimer's more common than either alone

Risk factors: **hypertension**; smoking; hypercholesterolemia; diabetes; cardiovascular disease

Not necessarily definitive findings on neuroimaging

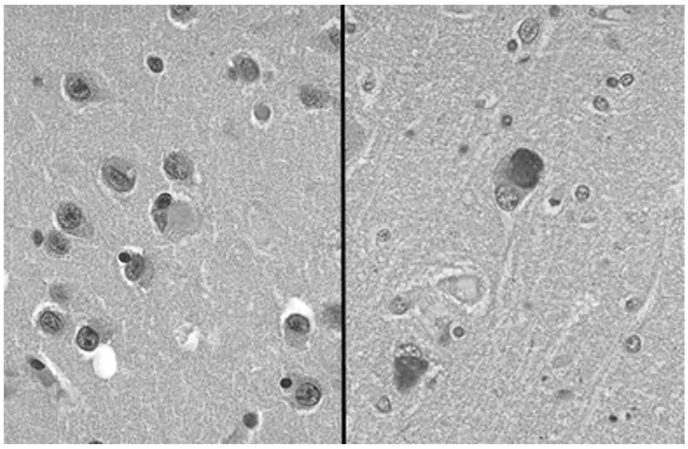
Vascular Dementia





Lewy Body Dementia:

Occurs throughout the brain
(Alzheimer's is mainly in the outer layers)



Dementia with Lewy Bodies

Overall incidence 7-26% of dementia cases

More often with Alzheimer's than by itself

"Parkinsonism" (stooped posture, shuffling gait, cogwheeling, masked facies)

Visual hallucinations (usually not scary)

Waxing and waning

Memory impairment may come AFTER these other symptoms

Negative sensitivity to antipsychotics

Frontotemporal Dementia

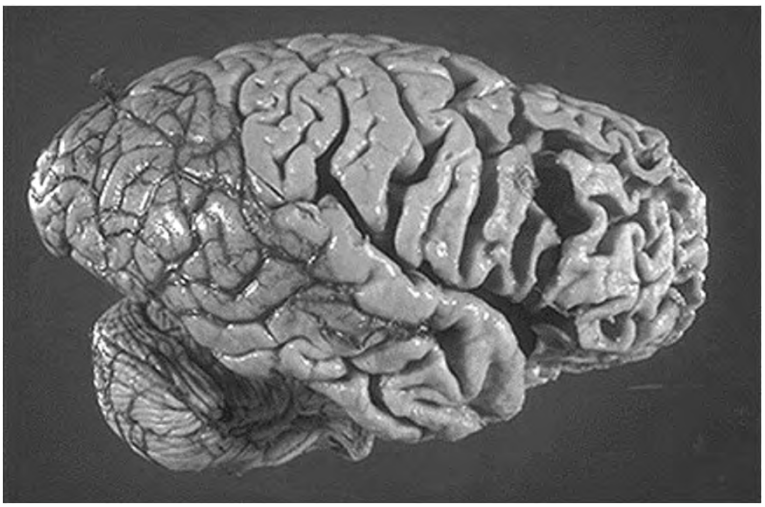
Frontal atrophy: can usually be seen on brain imaging

Personality changes, disinhibition, executive dysfunction

Later memory and basic cognitive impairment

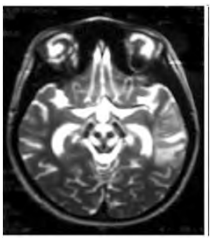
Earlier age of onset than Alzheimer's or vascular dementia

Frontotemporal changes



"Reversible" Dementias

Normal pressure hydrocephalus
Alcohol-related
B12 deficiency
Folate deficiency
Electrolyte abnormalities
Thiamine deficiency (Korsakoff)
HIV/AIDS
Advanced Lyme disease
Neurosyphilis
Carbon monoxide
Heavy metals
Wilson disease
Severe endocrinopathies
Creutzfeldt-Jakob disease
Autoimmune disease
Lipid storage diseases
Mass lesions or trauma



None of these happen commonly or go a long time without being identified

General Workup

Take a good history

Do a good physical exam

Rule out delirium

Rule out reversible causes

Symptom-Diagnosis mismatch:

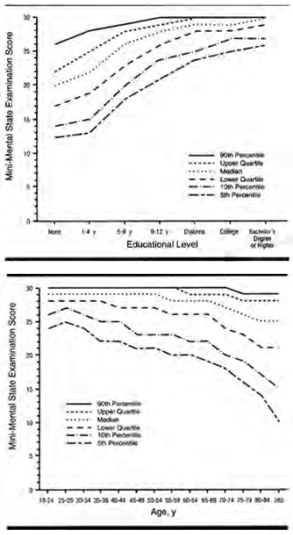
- Low → less workup
- High → more workup

Basic tests: CBC, Chem-7, B12, folate, thyroid, calcium

Imaging not routinely indicated

MMSE Norms

Age	Education				
	0-4y	5-8y	9-12y	>=12y	Total
18-24	23	28	29	30	29
25-29	23	27	29	30	29
30-34	25	26	29	30	29
35-39	26	27	29	30	29
40-44	23	27	29	30	29
45-49	23	27	29	30	29
50-54	23	27	29	29	29
55-59	22	27	29	29	29
60-64	22	27	28	29	28
65-69	22	28	28	29	28
70-74	21	26	28	29	27
75-79	21	26	27	28	26
80-84	19	25	26	28	25
>=85	20	24	26	28	25
Total	22	26	29	29	29



During dementia: about 3 POINT DROP PER YEAR

Clock drawing (MiniCog)

- "Remember these 3 words: apple, table, penny"
- (Back to #1 until able to repeat all 3 items)
- "Draw a clock face"
- "Put on the numbers"
- "Put on hands to make the time be ELEVEN-TEN"
- "What were the 3 items?"

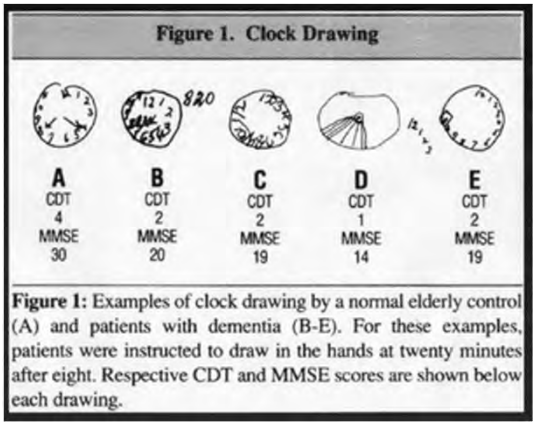


Figure 1: Examples of clock drawing by a normal elderly control (A) and patients with dementia (B-E). For these examples, patients were instructed to draw in the hands at twenty minutes after eight. Respective CDT and MMSE scores are shown below each drawing.

Scoring:

Clock drawing: 2 if no errors – ***NO PARTIAL CREDIT!!***

Each delayed recall item: 1

Interpretation:

0-2: Positive screen

3-5: Negative screen

Screening for Dementia?

New blood test predicts Alzheimer's, dementia

Researchers have developed a new blood test that can predict with 90% accuracy whether a healthy person will develop Alzheimer's or cognitive decline within 3 years. They report how they identified and validated the 10 biomarkers that form the basis of the test in a study published in *Nature Medicine*.

Screening for dementia

- Test predicts with 90% accuracy
- → if you have the disease, you will get a positive test 9 out of 10 times
- → if you do not have the disease, you will get a negative test 9 out of 10 times

Screening math

1000 people aged 70-80

40 of them have dementia (4%); 960 do not (96%)

Of the 40 who do have dementia, 36 will have a positive test → 4 (0.4% overall) will wrongly be told they do not have dementia

Of the 960 who do not have dementia, 96 will have a positive test → **96 (10% overall) will wrongly be told they do have dementia**

More screening math

- If you get a negative test (868 people did), your likelihood of **having dementia is 0.4% (false negative)**
- If you get a positive test (132 did), your likelihood of **not having dementia is 73% (false positive)**
- **Two in three** people who are told they have dementia by this test will **not** in fact have it

Screening

- Given this math, routine screening for dementia is <u>not</u> recommended
- It works better to wait until people observe that they are having concerns or problems

The truly important issues:

Why is dementia a problem?

How can we help people with dementia?

Caring for the Whole Patient, the Family, and the Environment

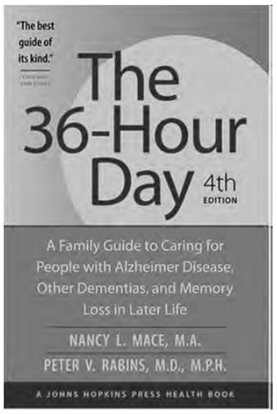
Listen

Don’t make assumptions about what is easy or difficult

Screen caregivers and family members for depression

Focus on aggregate quality of life for the whole family unit

Recommend the Alzheimer’s Association, County Senior Services, private social workers



Agitation

Figure out what is going on **before** turning to medications

Main reasons for agitation:

- -Delirium
- -Unmet needs
- -Conditioning
- -Natural response

Antipsychotics have a **black box** warning for dementia (about double risk of death)

Stephen Thielke
sthielke@u.washington.edu
(206) 764-2815