ALZHEIMER'S DISEASE

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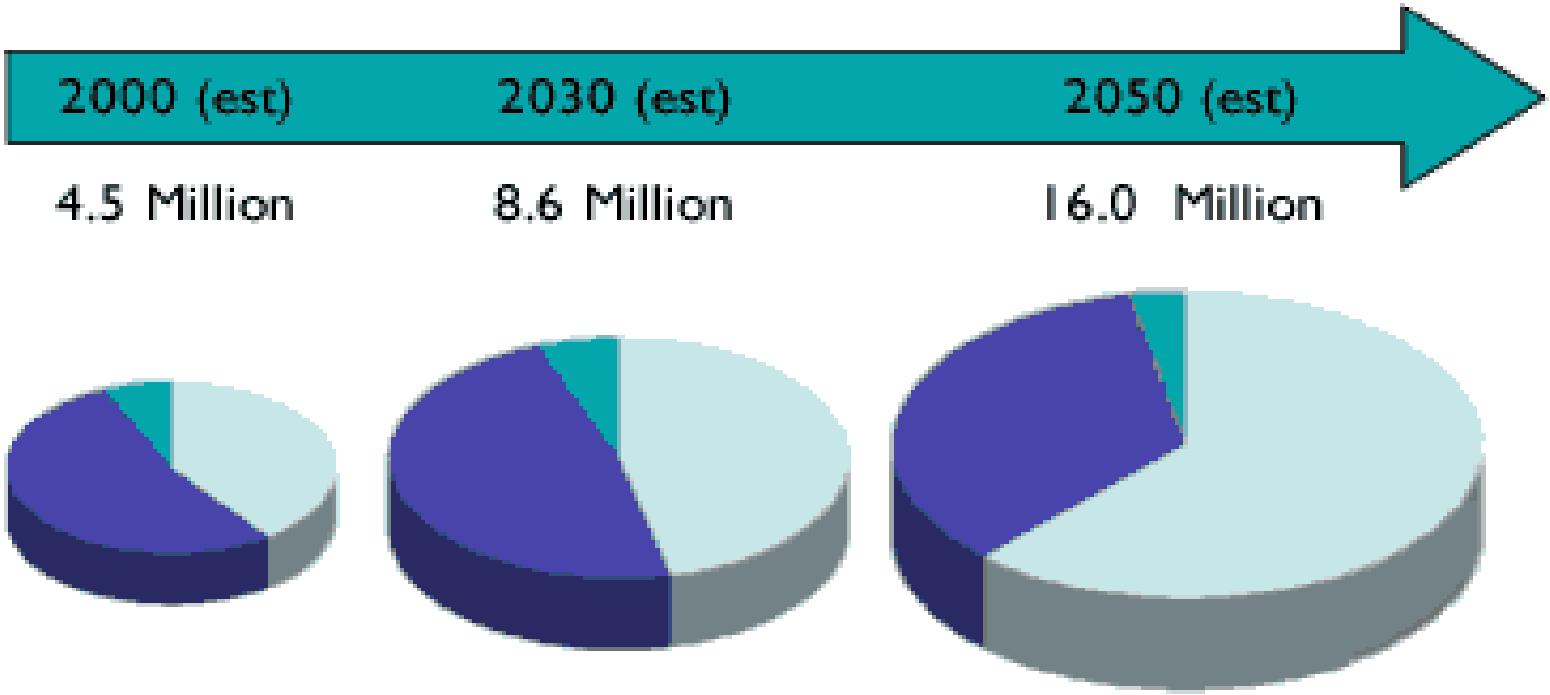
ALZHEIMER'S DISEASE (AD)

- Chronic, progressive, neurodegenerative brain disease
- One of the most feared disorder of modern times due to catastrophic consequences
  - Most common form of dementia
  - ~5.4 million Americans suffer from AD
  - 11% people over age 65 have AD
  - ~33% of those over age 85 have AD
  - 6th leading cause of death in the U.S.

Forecast of Alzheimer's Disease Prevalence in the US



Source: Hebert LE et al. Arch Neurol.2003;60:1119-1122.

ALZHEIMER'S DISEASE ETIOLOGY

- **Exact etiology is unknown but likely due to multiple factors**
  - **Greatest risk factors is age**
    - Most diagnosed at or after age 65
    - Not a normal part of aging
    - Age alone is not sufficient to cause AD
  - **Family history**
    - Those with a 1st degree relative with dementia
    - Even higher risk with > 1 relative
    - Not necessary for an individual to develop AD

ALZHEIMER'S DISEASE ETIOLOGY

- **Familial Alzheimer's disease (FAD)**
  - Clear pattern of inheritance
  - Onset before age 60
  - Rapid disease discourse
- **Sporadic Alzheimer's disease**
  - No familial connection
- **Genetic Link**
  - Significant role in how brain process β-amyloid protein
  - ↑ β-amyloid protein → ↑ risk

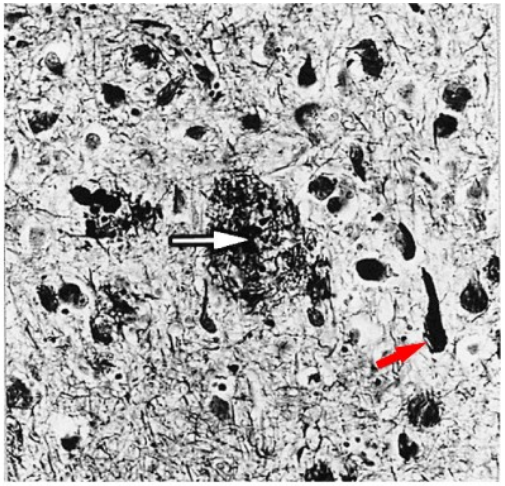
ALZHEIMER'S DISEASE RISK FACTORS

- **Cardiovascular factors**
  - Health of brain closely related to health of the heart & blood vessels
  - Hypertension, obesity, stroke, hyperlipidemia
- **Diabetes**
  - Chronic high levels of insulin & glucose may be toxic to brain
  - Insulin resistance interfere with ability to breakdown amyloid
- **Head Trauma**

ALZHEIMER'S DISEASE PATHOPHYSIOLOGY

- **Changes in brain structure and function**
  - **Genetic Factors**
    - β-amyloid protein production
  - **Amyloid plaques**
    - Plaques 1st develop in areas of brain used for memory and cognitive function
  - **Neurofibrillary tangles**
  - **Loss of connections between neurons**
  - **Neuron death**

ALZHEIMER'S DISEASE PATHOPHYSIOLOGY



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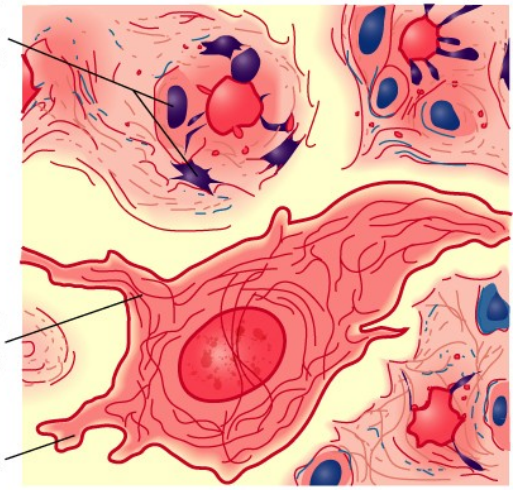

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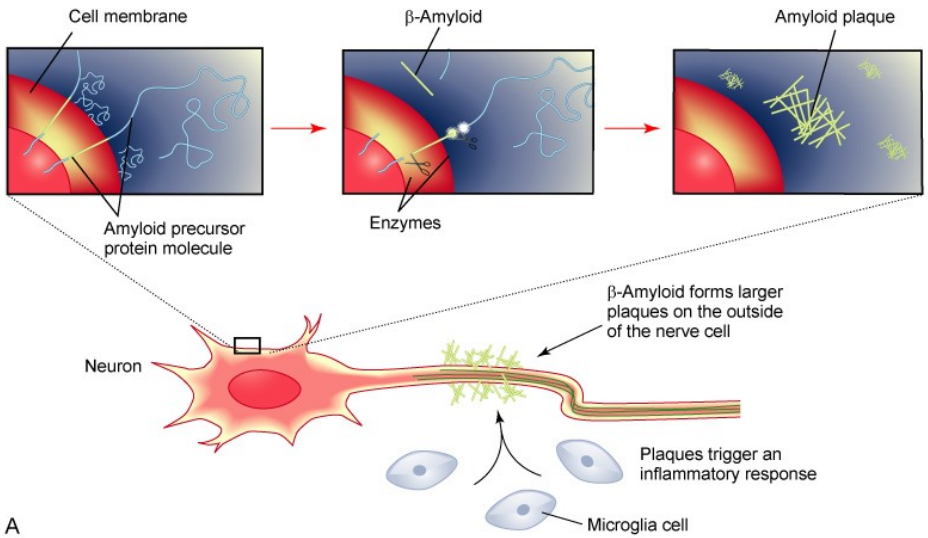
ALZHEIMER'S DISEASE PATHOPHYSIOLOGY



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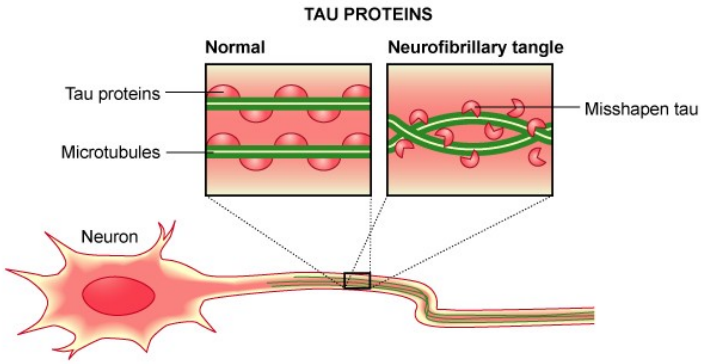

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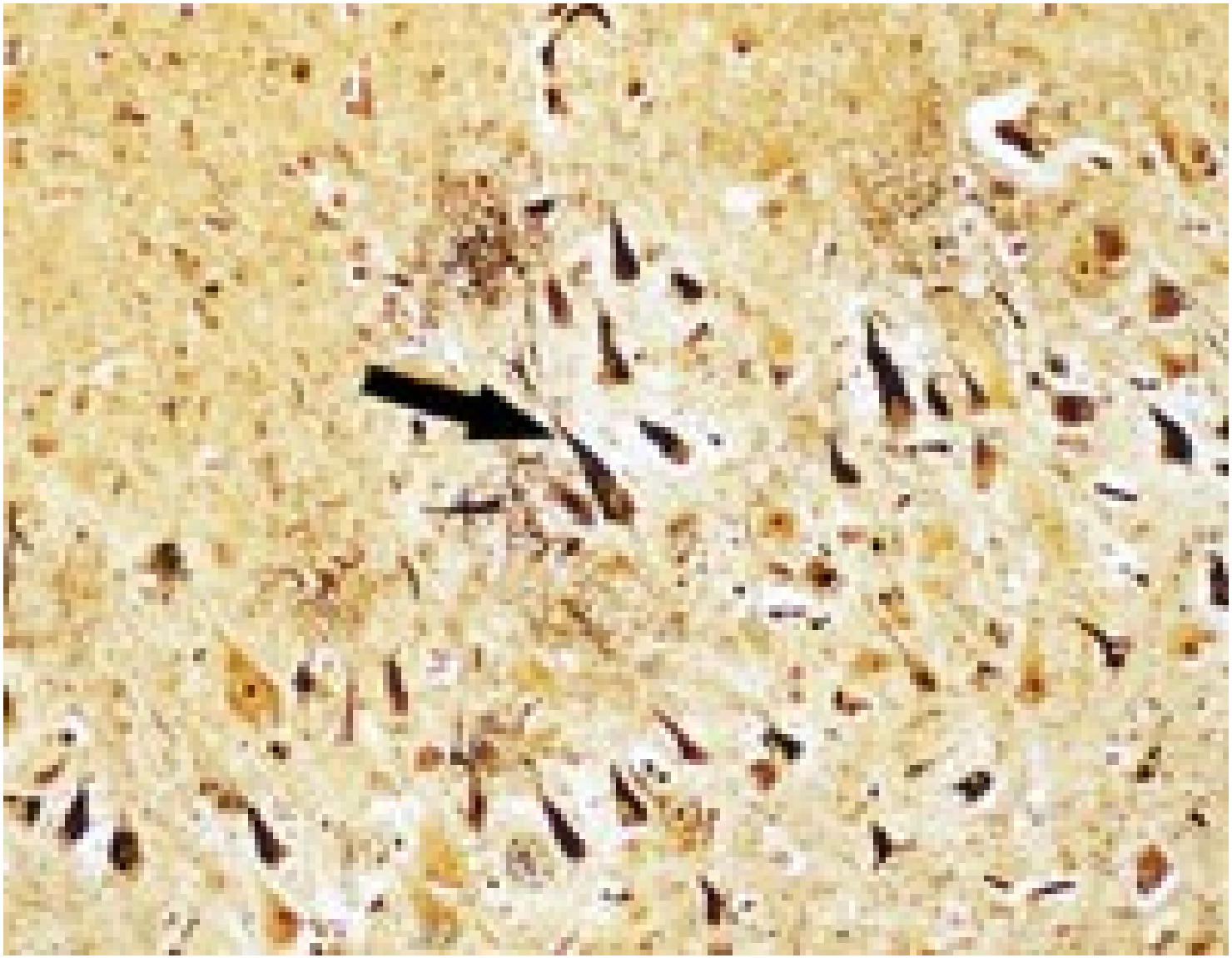
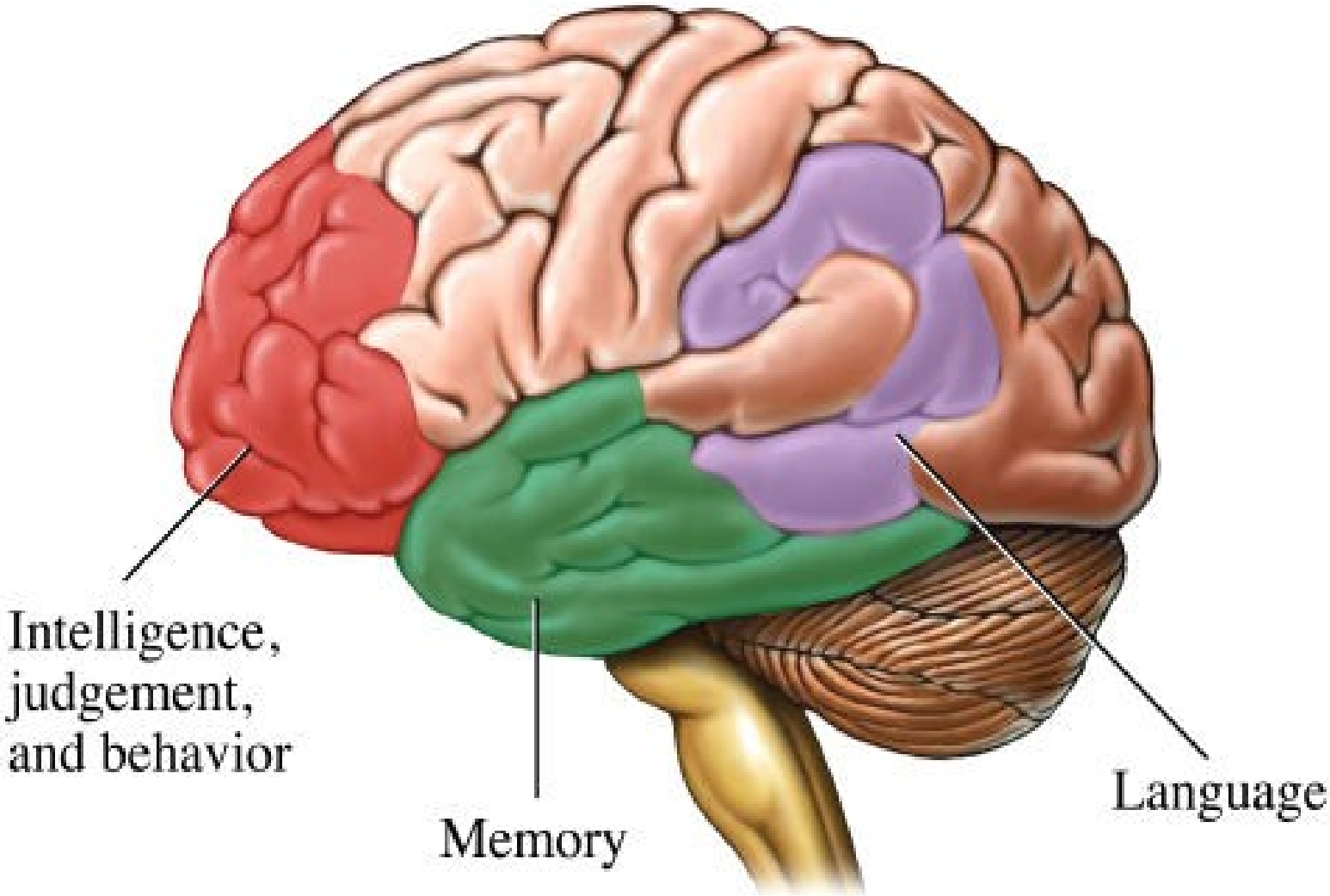
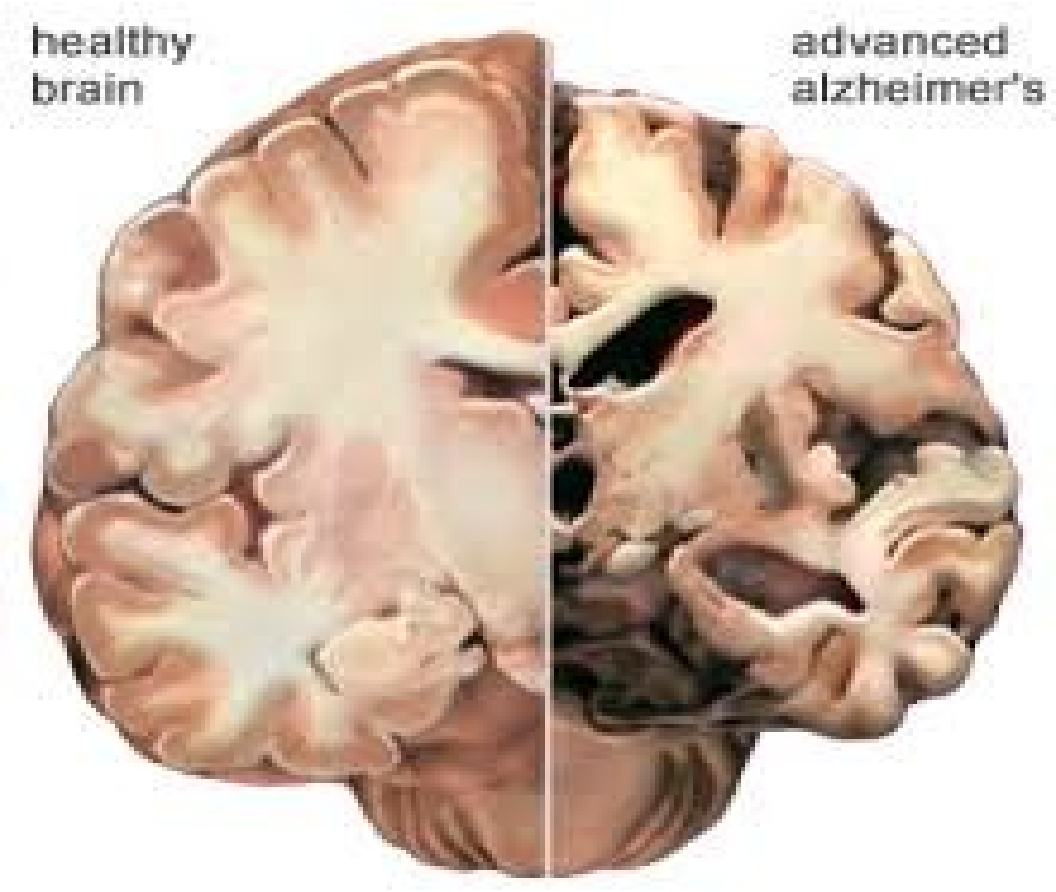


Areas of the Brain Affected by Alzheimer's Disease



EFFECT OF ALZHEIMER'S DISEASE ON BRAIN



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AD: CLINICAL MANIFESTATIONS

10 Warning Signs

1. Memory loss
2. Difficulty performing familiar tasks
3. Problems with language
4. Disorientation to time and place
5. Poor or decreased judgment
6. Problems with abstract thinking
7. Misplacing things
8. Changes in mood or behavior
9. Changes in personality
10. Loss of initiative

Alzheimer's Disease symptoms	Normal age-related memory changes
Forgets entire experience	Forgets part of an experience
Rarely remembers later	Often remembers later
Gradually unable to follow written/spoken direction	Usually able to follow written/spoken direction
Gradually unable to use notes as reminders	Usually able to use notes as reminders
Gradually unable to care for self	Usually able to care for self

Stage	Alzheimer's Disease	Reisberg Stage*	Developmental Age	Diversion/Distraction Activities
Mild	No difficulty at all	1		
	Some memory trouble begins to affect job/home. Forgets familiar names.	2		
	Much difficulty maintaining job performance. Withdrawal from difficult situations.	3	12+ yr	Can function with understanding. Enjoy things previously enjoyed—watch TV, play and listen to music, play games.
	Can no longer hold a job, plan and prepare meals, handle personal finances, etc. Driving becomes difficult although can drive to familiar places.	4	8-12 yr	Can still enjoy simple games, watch TV and videos. Enjoys family photos and memories.
Moderate	Can no longer select proper clothing for occasion or season. Needs help to remain safe in home. Forgets to bathe.	5	5-7 yr	Needs age appropriate toys and games.
	Requires assistance with dressing.	6a	4-5 yr	Enjoy many of the same activities as preschoolers.
	Requires assistance with bathing.	6b	4-5 yr	
	Can no longer use toilet without assistance.	6c	4 yr	
	Urinary incontinence	6d	3-4.5 yr	
	Fecal incontinence	6e	2-3 yr	
Severe	Speech now limited to about words per day.	7a	15 mo	Enjoys infant toys, mobiles, dangling ribbons.
	Speech now limited to one word per day.	7b	1 yr	
	Can no longer walk without assistance.	7c	1 yr	
	Can no longer sit up without assistance.	7d	6-10 mo	
	Can no longer smile.	7e	2-4 mo	
	Can no longer hold up head.	7f	1-3 mo	

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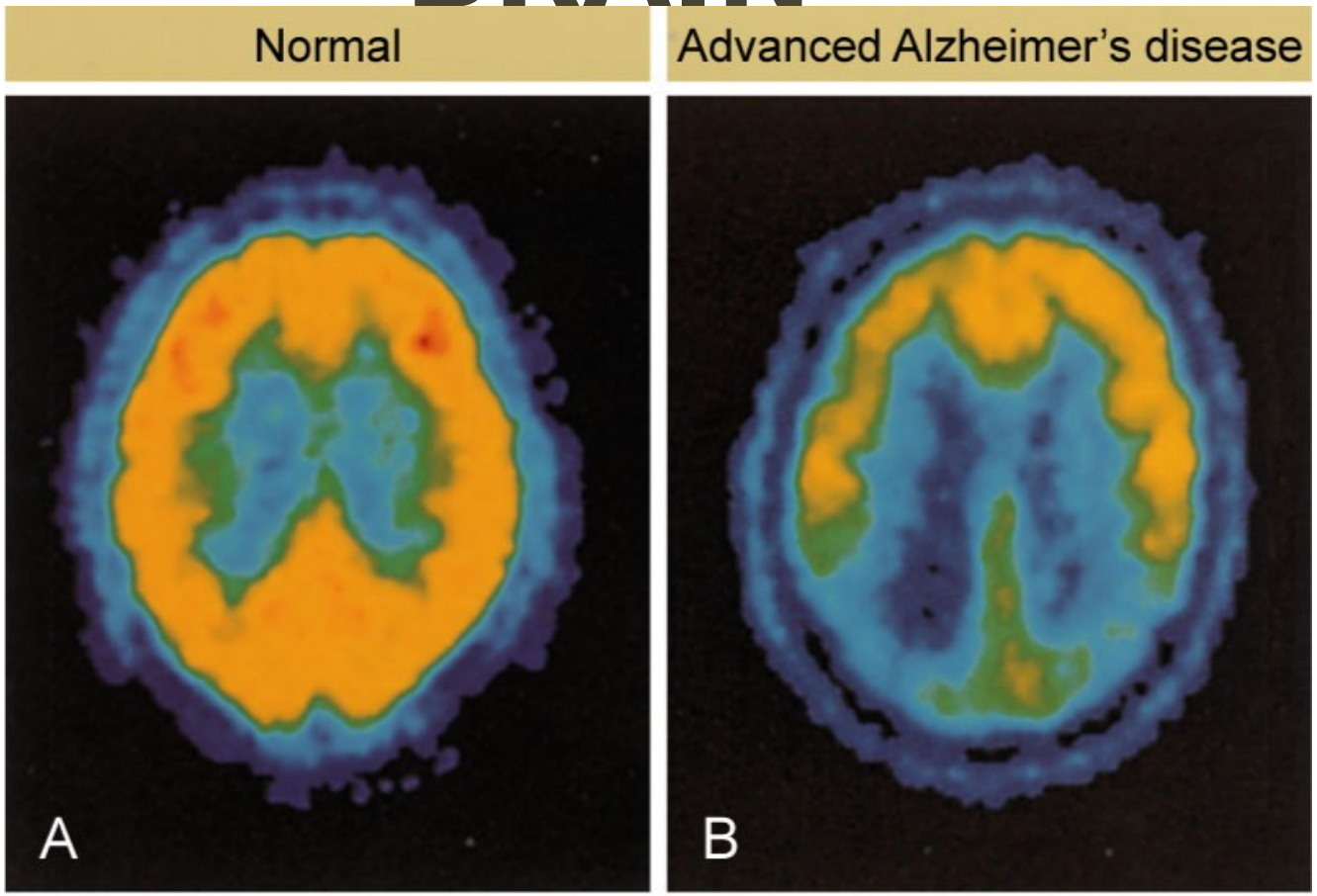
ALZHEIMER'S DISEASE DIAGNOSTIC STUDIES

- **No definitive diagnostic test exist for AD**
  - Diagnosed by exclusion
  - Definitive diagnosis requires an autopsy
- **Comprehensive patient evaluation**
  - Complete health history: Physical, neurologic & mental assessment, laboratory test
- **Brain Imaging Tests**
  - CT,MRI,PET
- **Neuropsychologic testing**
  - Mini-Cog
  - Mini-Mental State Exam (MMSE)

PET SCAN FOR NORMAL AND AD BRAIN



From Roberts GS: *Neuropsychiatric disorders*, London, 1993, Mosby-Wolfe.

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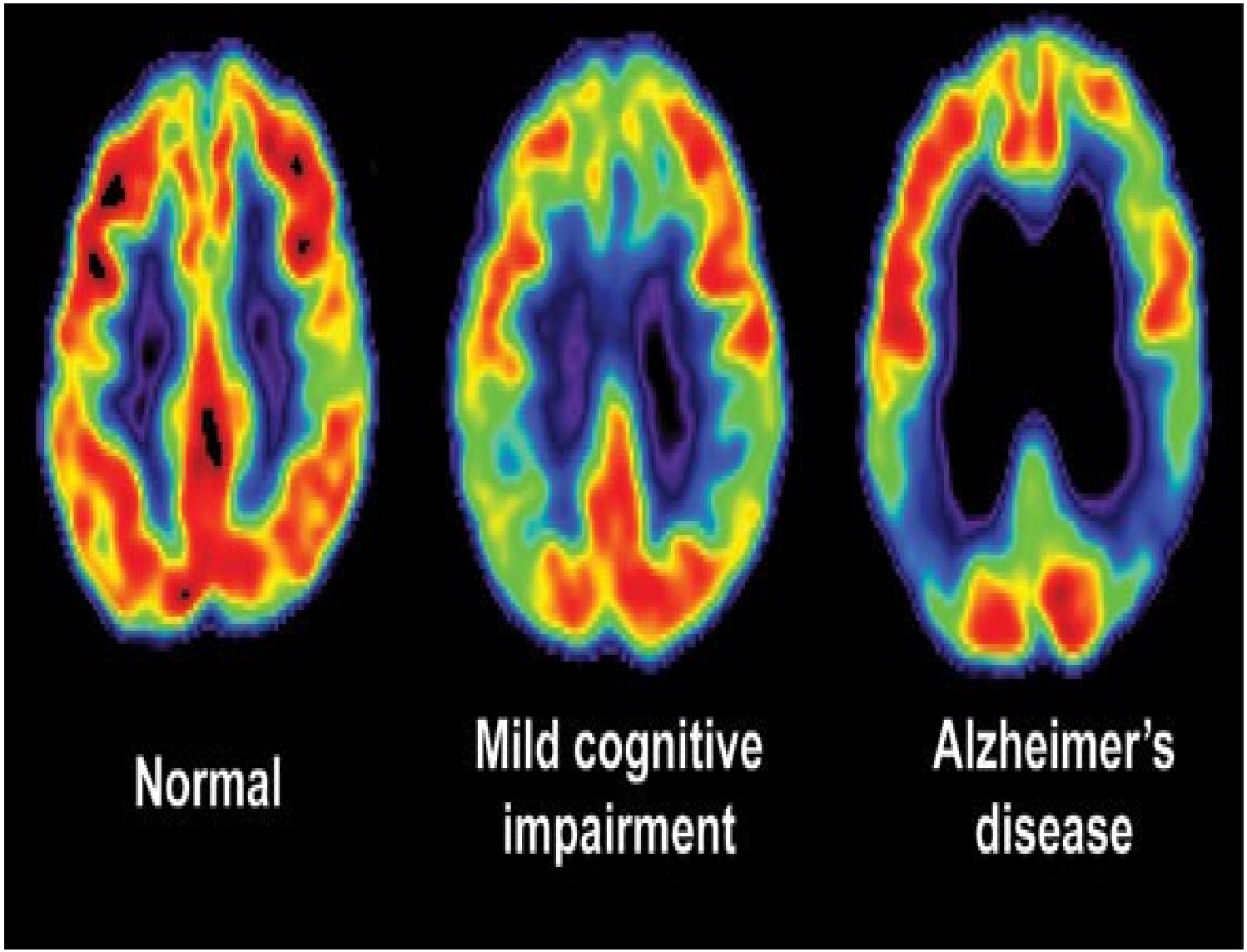
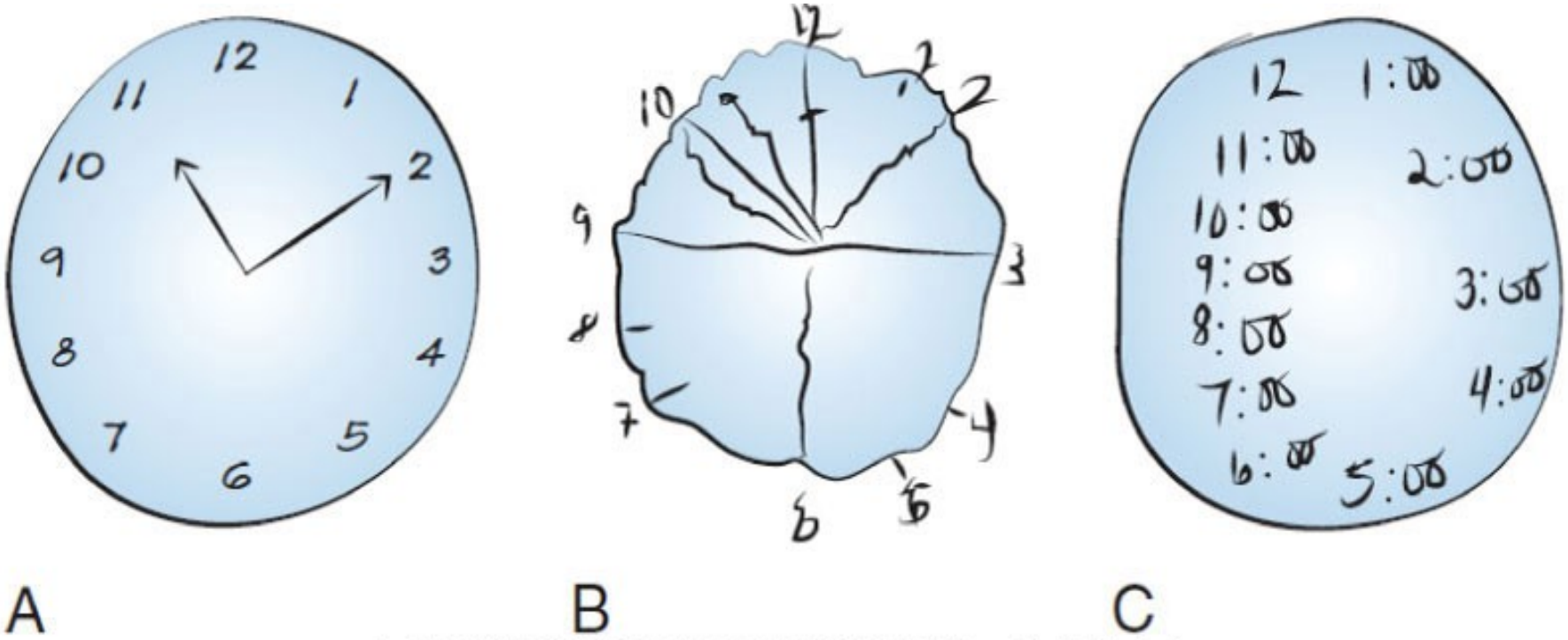

Normal
Mild cognitive impairment
Alzheimer's disease

AD: DIAGNOSTIC STUDIES



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MINI-MENTAL STATE EXAM (MMSE)

TABLE 59-10 Mini-Mental State Examination (MMSE)

Sample Items

Orientation to Time

"What is the date?"

Registration

"Listen carefully, I am going to say three words. You say them back after I stop. Ready? Here they are . . . HOUSE (pause), CAR (pause), LAKE (pause). Now repeat those words back to me." (Repeat up to five times, but score only the first trial.)

Naming

"What is this?" (Point to a pencil or pen.)

Reading

"Please read this and do what it says." (Show examinee the words CLOSE YOUR EYES on the stimulus form.)

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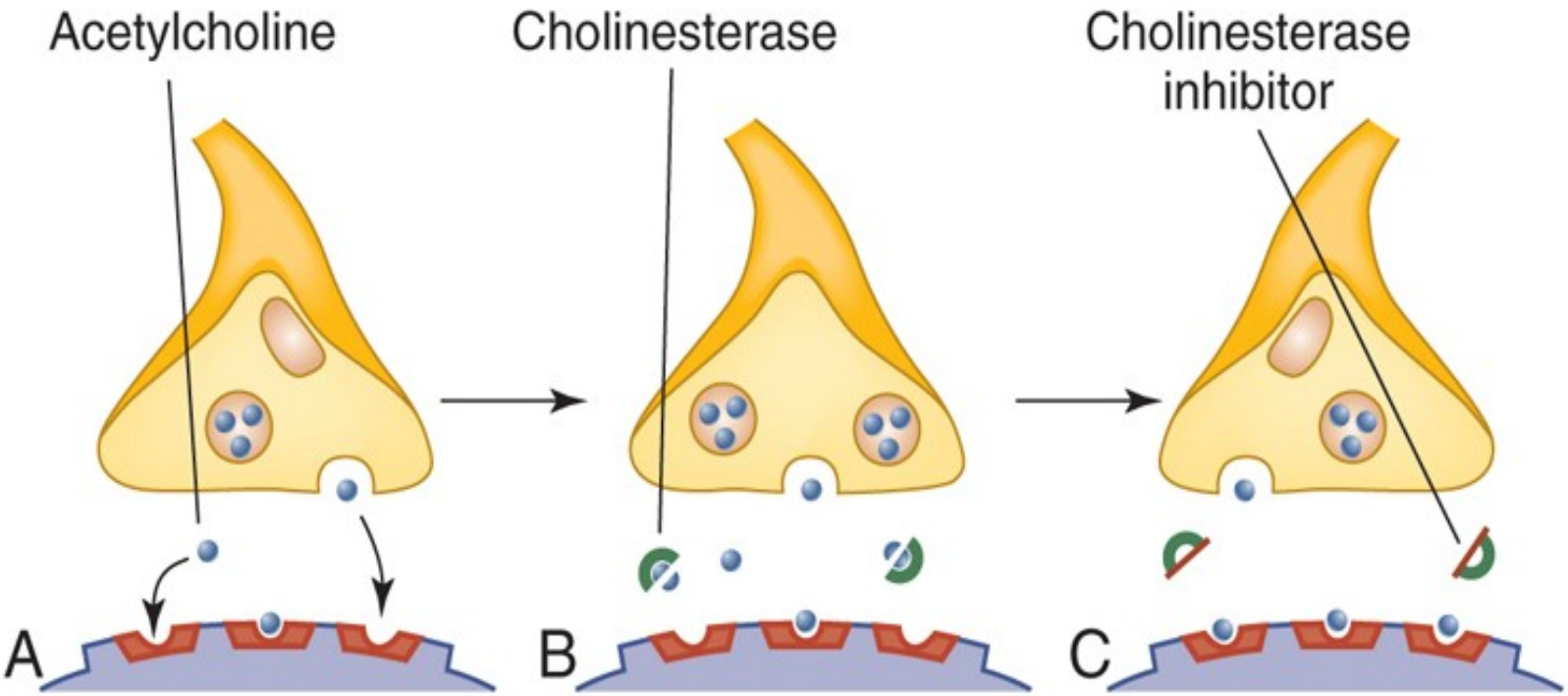
AD: INTERPROFESSIONAL CARE

- **No cure**
  - No treatment exists to stop the deterioration of brain cell in AD
- **Interprofessional care aimed at**
  - Controlling undesirable behavioral manifestations
  - Providing support for family caregiver

AD: DRUG THERAPY



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AD: DRUG THERAPY

- **Memantine (Namenda)**
  - NMDA receptor agonist: protects nerve cell against excess amounts of glutamate
- **Cholinesterase Inhibitors**
  - Donepezil (Aricept), rivastigmine (Exelon)
- **Antidepressants**
  - Sertraline (Zoloft), citalopram (celexa), fluoxetine (Prozac)
- **Antipsychotic drugs**
  - Haloperidol (Haldol), risperidone (Risperdal)

AD: NURSING MANAGEMENT

- Support cognitive function
- Promote physical safety
- Promote independence in self-care
- Reduce anxiety & agitation
- Improve communication
- Provide socialization
- Promote adequate nutrition
- Promote balanced activity & rest
- Educate on home & community based assistance

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An Alzheimer's Poem

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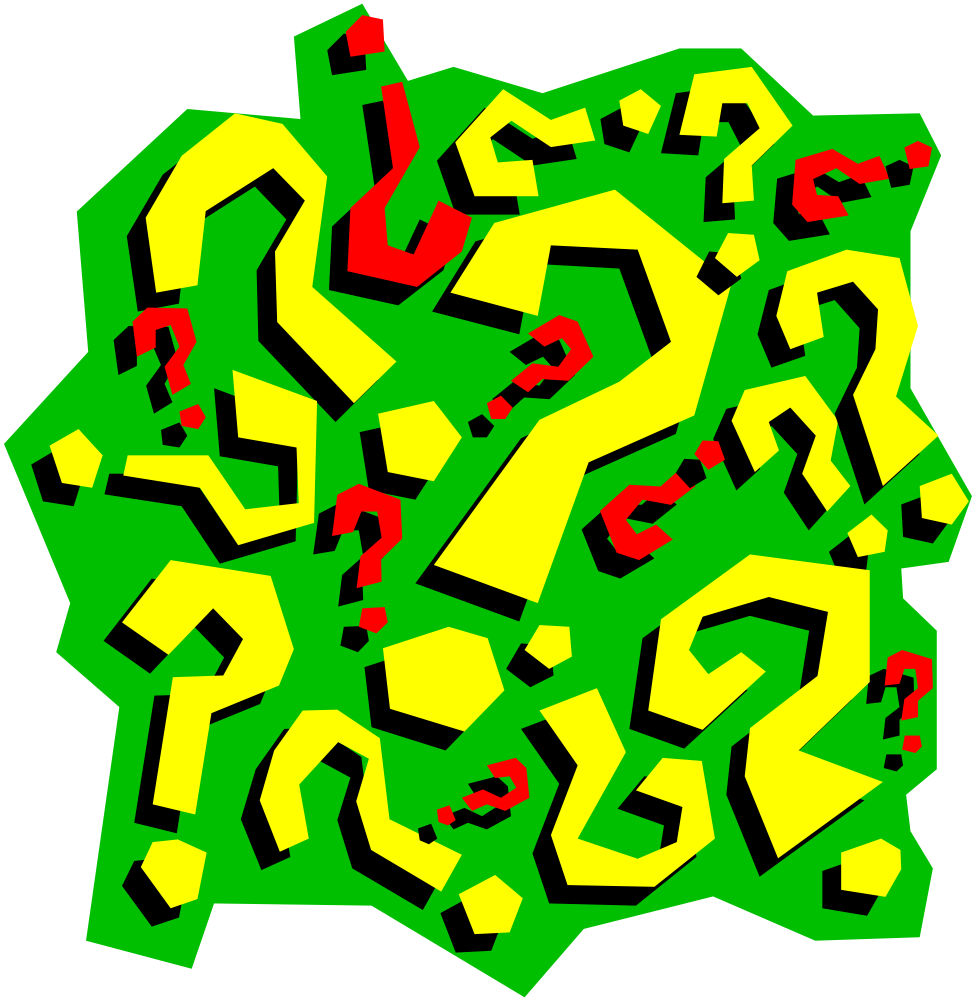
Do not ask me to remember.
Don't try to make me understand.
Let me rest and know you're with me.
Kiss my cheek and hold my hand.
I'm confused beyond your concept.
I am sad and sick and lost.
All I know is that I need you to be
With me at all cost.
Do not lose your patience with me.
Do not scold or curse or cry.
I can't help the way I'm acting,
Can't be different though I try.
Just remember that I need you,
That the best of me is gone.
Please don't fail to stand beside me,
Love me 'til my life is done.

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