



# Alzheimer's Disease

BEHOLD!  
THE MOST COMPLEX  
STRUCTURE IN THE  
KNOWN UNIVERSE.



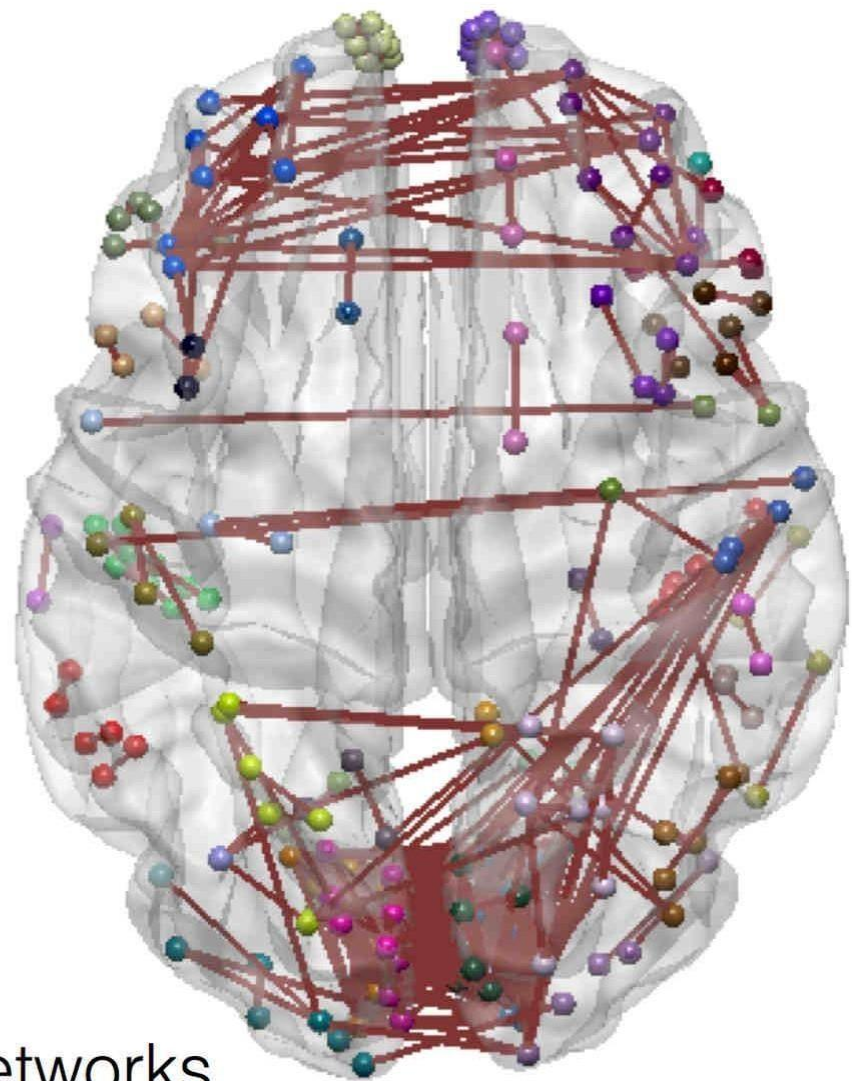
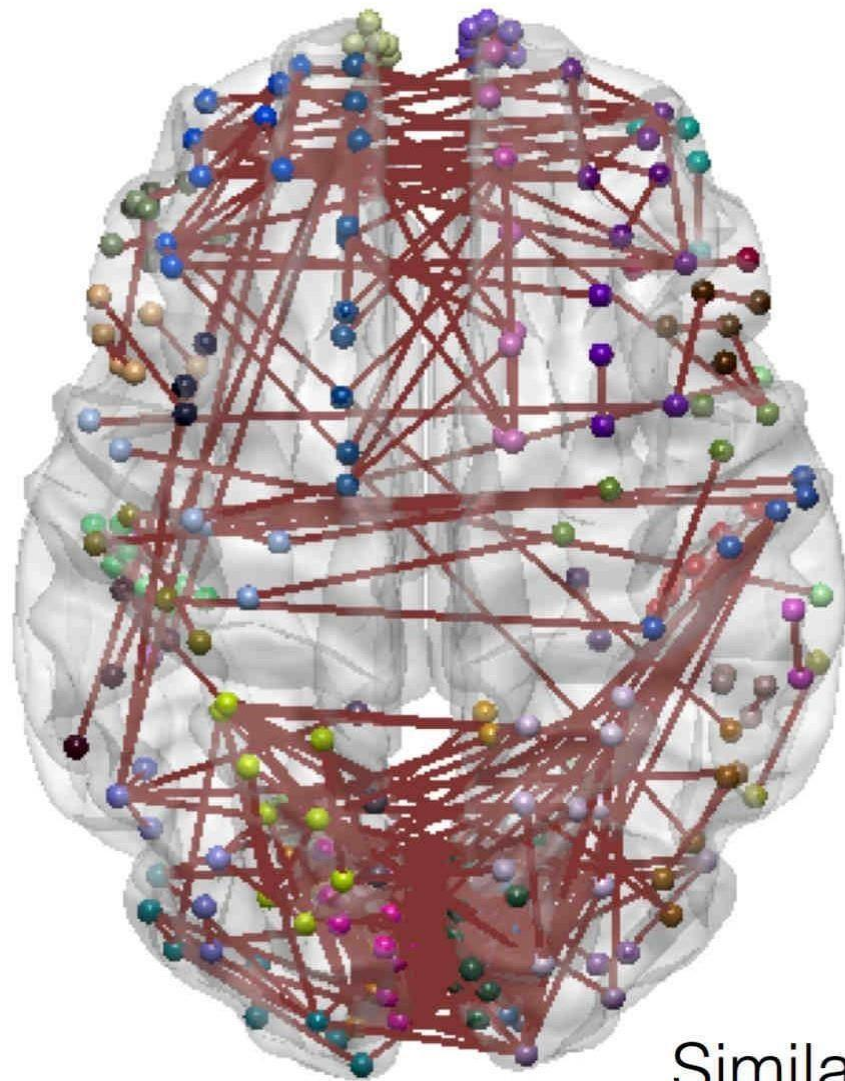


Alzheimer's disease is an **irreversible, progressive** brain disease that slowly destroys **memory** and disorders **cognitive** function



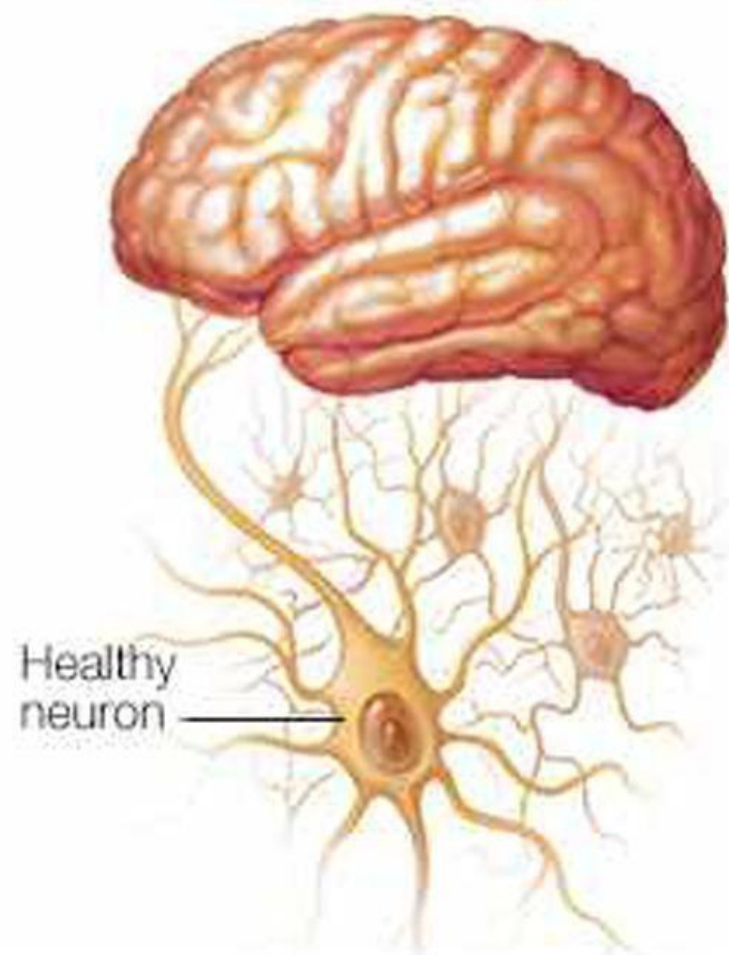
# Healthy

# Alzheimer's

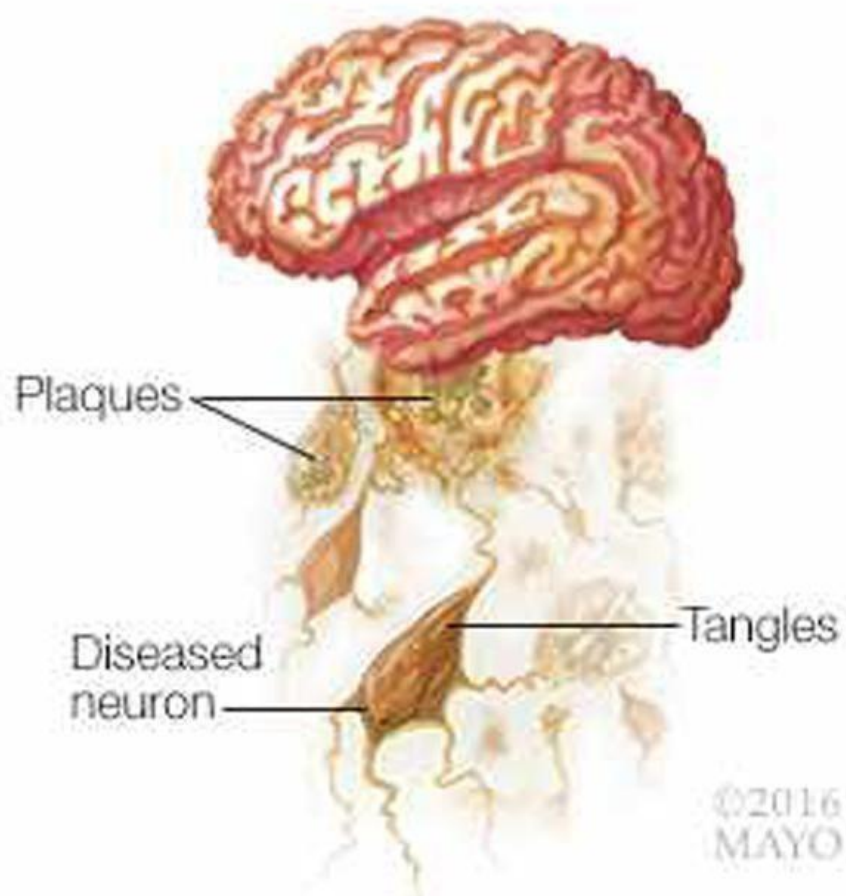


Similarity Networks

Healthy brain



Alzheimer's brain





Although the risk of developing AD increases with age – in most people with AD, symptoms first appear after age 60 (5% incidence) AD is not a part of normal aging.





More than 5 million Americans are living with the disease.



Every 67 seconds someone in the United States develops Alzheimer's.



Alzheimer's disease is the 6th leading cause of death in the United States.



There are approximately 500,000 people dying each year because they have Alzheimer's.



1 in 3 seniors dies with Alzheimer's or another dementia.



In 2013, 15.5 million caregivers provided an estimated 17.7 billion hours of unpaid care valued at more than \$220 billion.

# WOULD YOU WANT TO KNOW YOUR RISK OF **ALZHEIMER'S?**

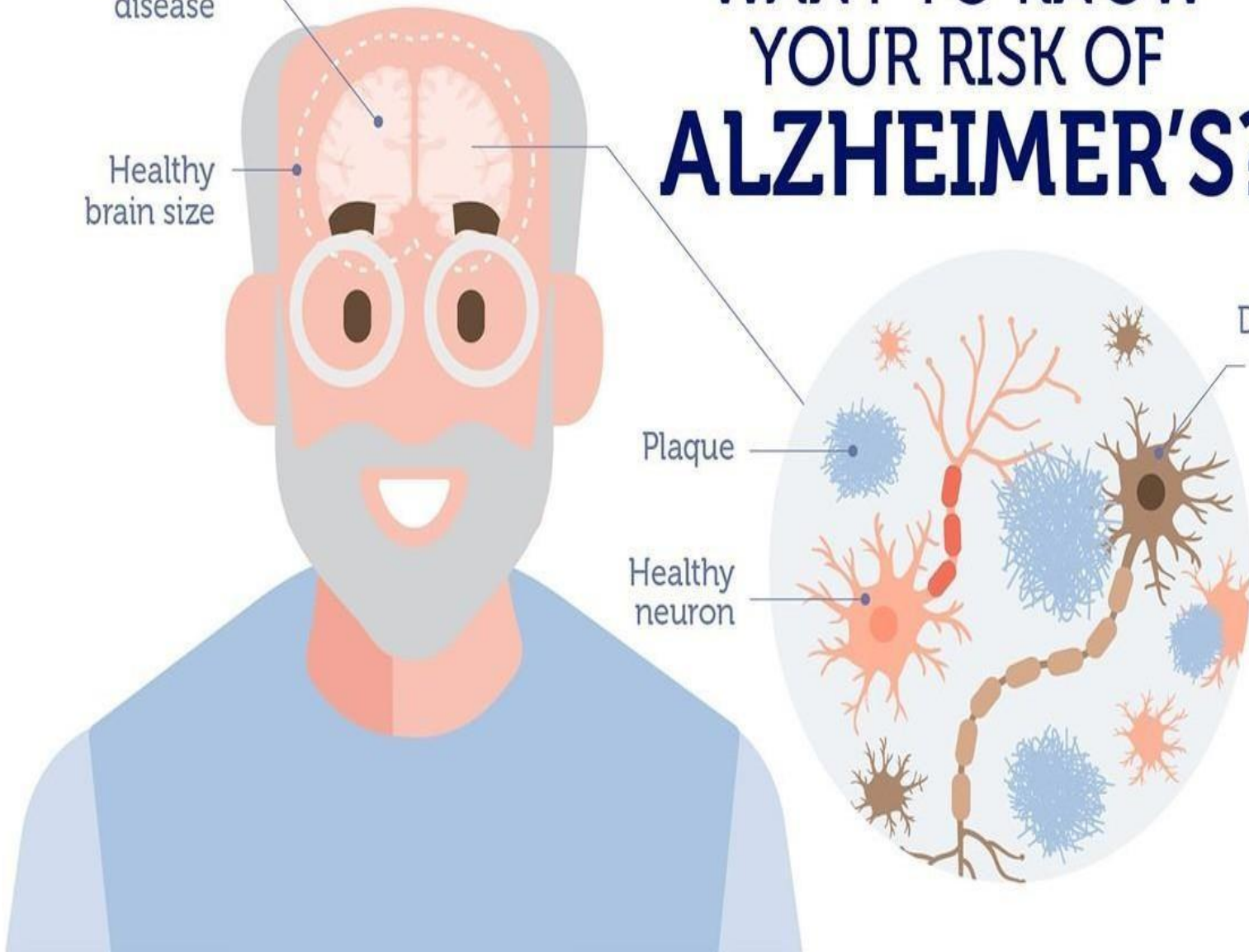
Shrunken brain  
with Alzheimer's  
disease

Healthy  
brain size

Plaque

Healthy  
neuron

Dying neuron  
with tangles





# Pathophysiology and Etiology

Gross pathophysiologic changes:

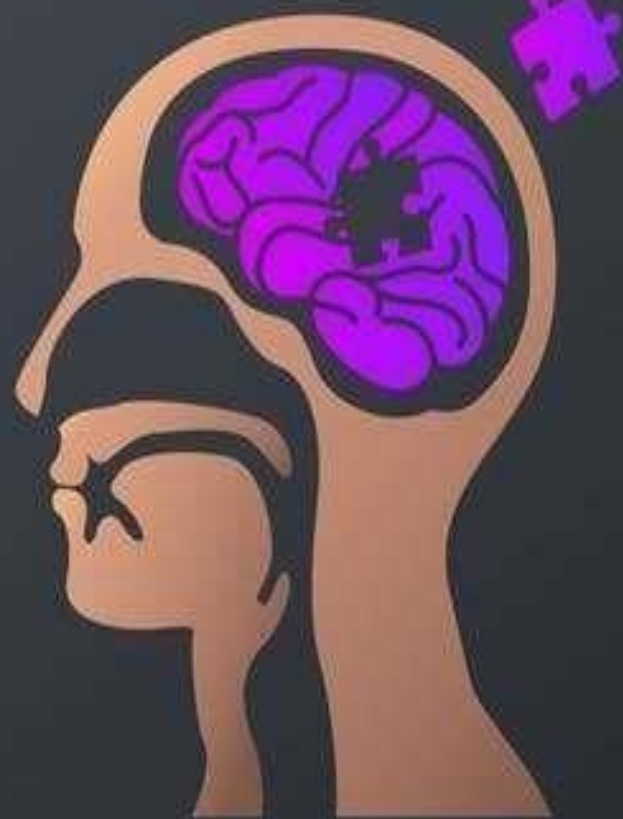
- ✓ cortical atrophy
- ✓ enlarged ventricles
- ✓ basal ganglia wasting

## Microscopically:

- Changes in the proteins of the nerve cells of the cerebral cortex
- accumulation of neurofibrillary tangles and neuritic plaques (deposits of protein and altered cell structures on the interneuronal junctions)
- granulovascular degeneration
- loss of cholinergic nerve cells (important in memory, function, cognition)

- Biochemically: neurotransmitter systems are impaired
- Cause: unknown





# RISK FACTORS FOR **ALZHEIMER'S** DISEASE



BEING OLDER THAN 65



A FAMILY HISTORY OF THE DISEASE



INHERITING GENES FOR THE DISEASE  
FROM YOUR PARENTS



EXISTING MILD COGNITIVE IMPAIRMENT



DOWN SYNDROME



UNHEALTHY LIFESTYLE



PREVIOUS HEAD TRAUMA



BEING SHUT OFF FROM A COMMUNITY  
OR HAVING POOR ENGAGEMENT WITH  
OTHER PEOPLE FOR EXTENDED PERIODS OF TIME

## Mild Cognitive Impairment

*Duration: 7 years*

*Disease begins in Medial Temporal Lobe*



*Symptom:*  
Short-term  
memory loss

## Mild Alzheimer's

*Duration: 2 years*

*Disease spreads to Lateral Temporal and Parietal Lobes*



*Symptoms include:*  
Reading problems  
Poor object recognition  
Poor direction sense

## Moderate Alzheimer's

*Duration: 2 years*

*Disease spreads to Frontal Lobe*



*Symptoms include:*  
Poor judgment  
Impulsivity  
Short attention

## Severe Alzheimer's

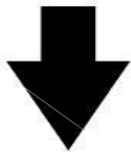
*Duration: 3 years*

*Disease spreads to Occipital Lobe*

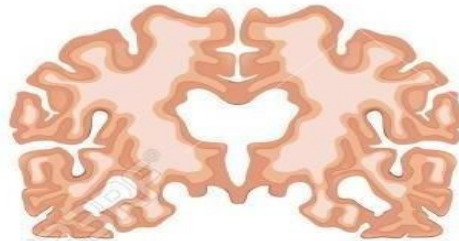


*Symptoms include:*  
Visual problems

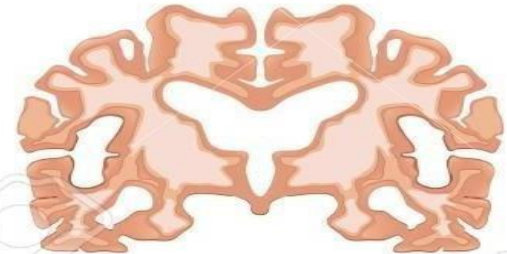
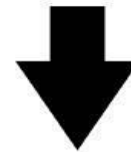
# Progression of Alzheimer's Disease



**Healthy Brain**



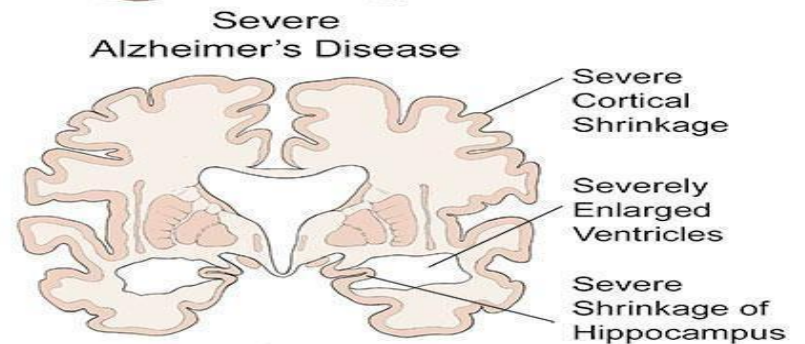
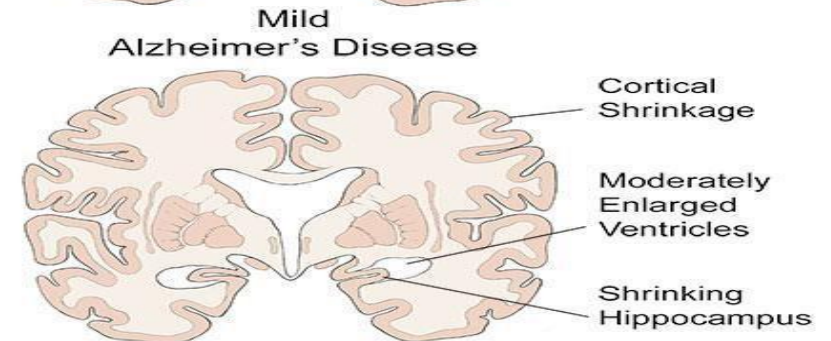
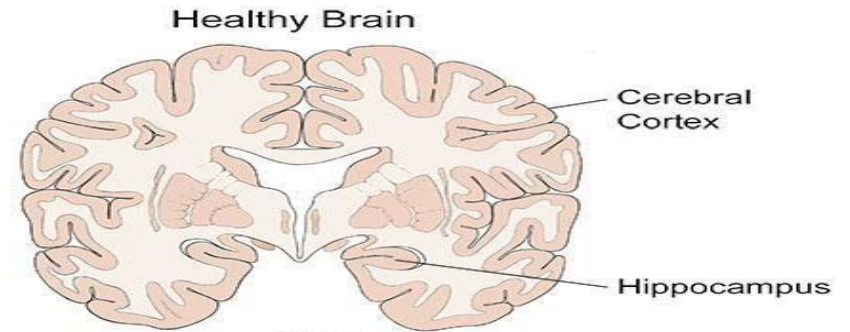
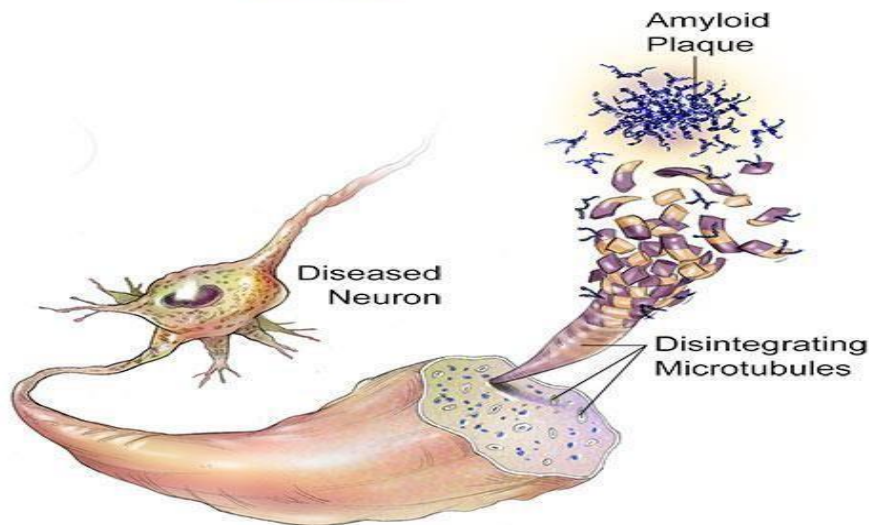
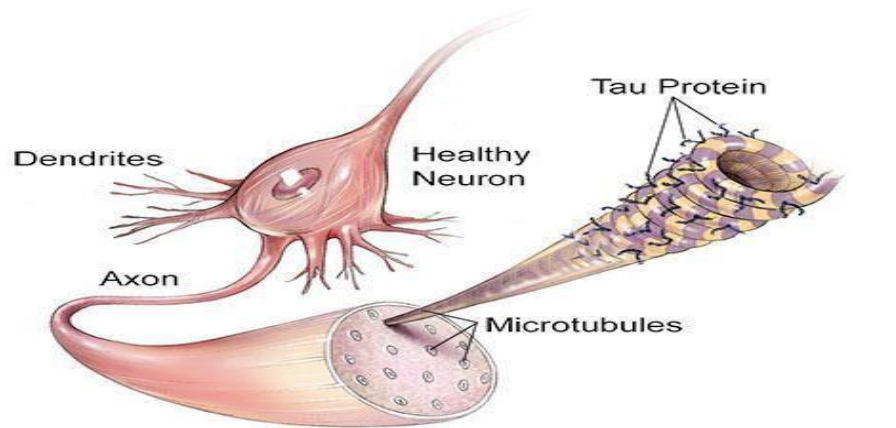
**Mild Alzheimer's Disease**



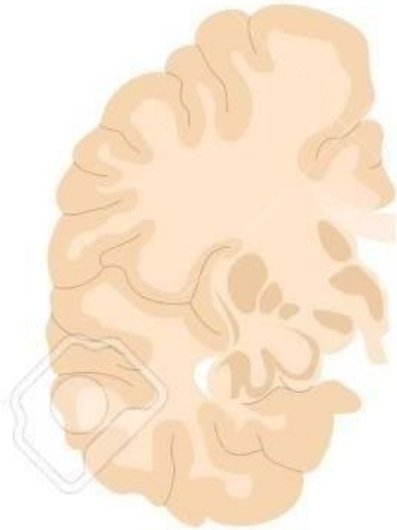
**Severe Alzheimer's Disease**



# The Progression of Alzheimer's



# SYMPTOMS OF ALZHEIMER'S



HEALTHY BRAIN



ALZHEIMER'S BRAIN



CONFUSION WITH  
TIME OR PLACE



TROUBLE FOLLOWING  
CONVERSATION



MEMORY LOSS



TROUBLE WITH  
FAMILIAR TASKS



MISPLACING THINGS



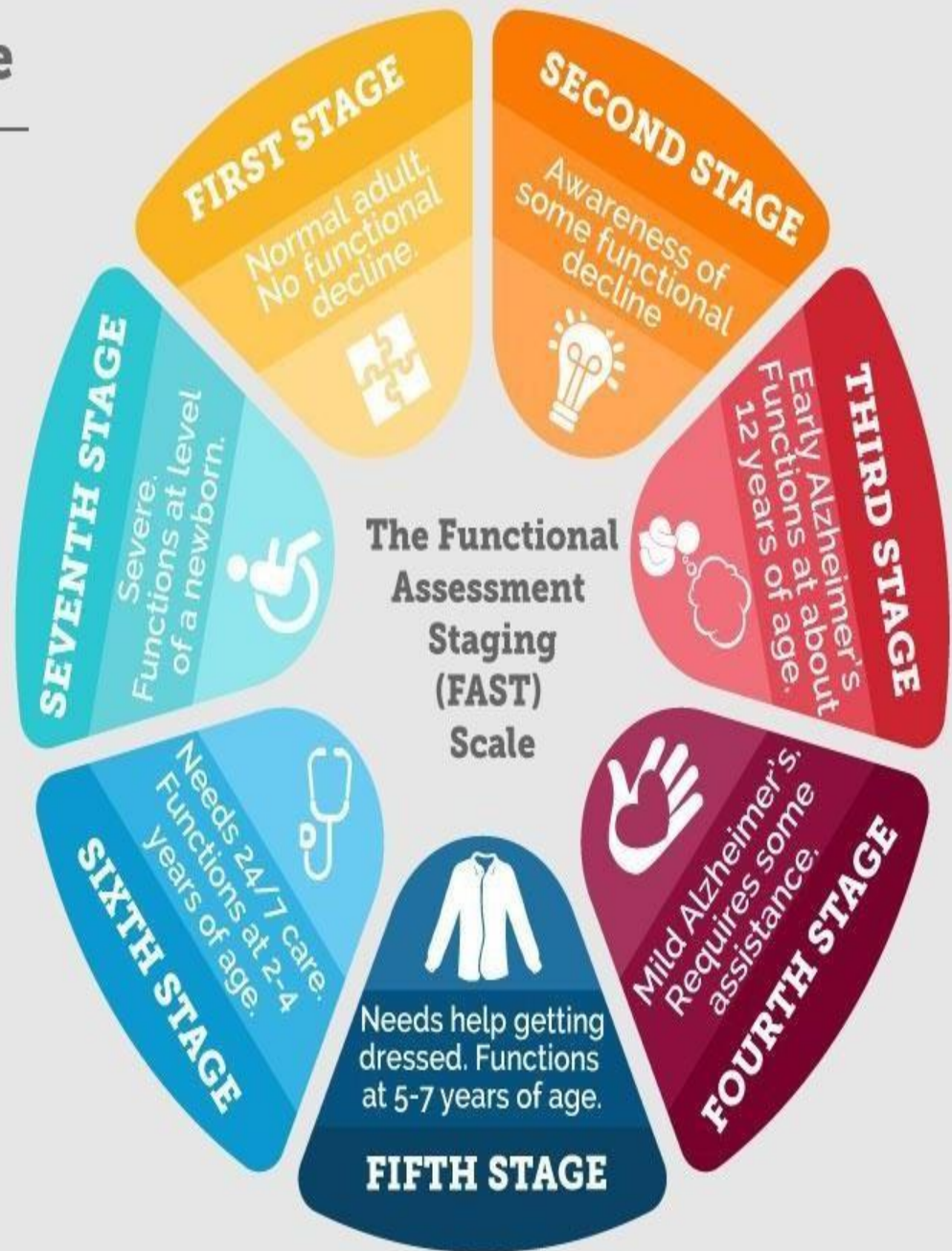
CHANGES IN MOOD  
OR PERSONALITY



# The Stages of Alzheimer's Disease

To better understand how Alzheimer's disease affects the Hypothalamus and other regions of the brain, it's helpful to first have an understanding of the seven primary stages of this progressive disease.

*The FAST scale was developed at the New York University Medical Center's Aging and Dementia Research Center.*





## THE ALZHEIMER'S TIMELINE



1

Early brain  
changes



2

Subtle decline  
in thinking



3

Memory changes,  
confusion



4

Inability to  
bathe, dress or  
eat without help



5

Loss of ability to  
communicate and  
recognize loved ones

# Diagnosis



# Diagnosis

- Medical history, history from relatives, and behavioural observations.
- Neurological Examination and MSE
- CT, MRI, SPECT, PET can be used to help exclude other cerebral pathology

# Lab diagnosis

- complete blood count, sedimentation rate, chemistry panel, thyroid-stimulating hormone, test for syphilis, urinalysis, serum B12, folate level, and test for HIV
- to rule out infectious or metabolic disorders



- cerebrospinal fluid (CSF) - tau protein and beta-amyloid

### Genetic testing

In families with a history of Alzheimer's disease, test to confirm AD or to provide information to at-risk family members regarding their likelihood for development of AD

# How is Alzheimer's Disease managed at present?

- Ideally, management should involve an interdisciplinary approach for assessment, treatment & education
- The roles of nutritionists, caregivers, nurses, social workers and patients associations can be vital for the long term care
- Pharmacological treatment
  - Cholinesterase inhibitors
  - Memantine

# The 3 targets for Pharmacotherapy

- *Cognitive decline*: memory, language, orientation, concentration, etc.
- *Behavioral abnormalities*: delusions, aggressiveness, anxiety, depression, psychosis etc..
- *Activities of Daily Living*: dressing, bathing, feeding, use of household appliances, etc

## CHOLINESTERASE INHIBITORS

- Rivastigmine
- Galantamine
- Donepezil



Nicotine is a cholinergic agonist that acts both postsynaptically and pre-synaptically to release acetylcholine

Melatonin - This neurohormone prevents neuronal death caused by exposure to the amyloid beta protein

# Donepezil (Aricept)

- Widely used in mild to moderate cases because it can be given once daily and is well tolerated
- Starting at 5 mg hs and increased to 10 mg after 4 to 6 weeks

# Galantamine

- Given with food in dosage of 4 to 12 mg bid  
Should be restarted at 4 mg bid if interrupted for several days
- Dose should be reduced in cases of renal or hepatic impairment

# Rivastigmine

- Given 1.5 mg bid with meals and increased up to 6 to 12 mg per day

# Memantine

- NMDA-receptor antagonist
- The first of a new class approved for moderate to severe Alzheimer's
- Dosage is 10 mg bid
- Can be used with a cholinesterase inhibitor



- Patients with depressive symptoms should be considered for antidepressant therapy
- Behavioral disturbances may require pharmacologic treatment anxiolytics, antipsychotics, anticonvulsants

Nonpharmacologic treatments used to improve cognition:

- Environmental manipulation that decreases stimulation
- Aromatherapy, Massage, Music therapy, Exercise

# Drug Alert

- Cholinesterase inhibitors initially aimed at improving memory and cognition seem to have an important impact on the behavioral changes that occur in patients with cognitive impairment
- improves the apathy, disinhibition, pacing, and hallucinations commonly noted in dementia
- Be alert for drug interactions with NSAIDs, succinylcholine-type muscle relaxants, cholinergic and anticholinergic agents, drugs that slow the heart, and other drugs

# Nursing assessment

- Perform cognitive assessment
- Orientation, insight, abstract thinking, concentration, memory, verbal ability
- Assess for changes in behavior and ability to perform adls
- Evaluate nutrition and hydration
- Check weight, skin turgor, meal habits
- Assess motor ability, strength, muscle tone, flexibility

# Nursing diagnoses

- Self-care deficit
- Constipation
- Disabled family coping
- Disturbed thought
- Imbalanced nutrition: Less than body requirements
- Impaired verbal communication



- Ineffective coping
- Interrupted family processes
- Risk for infection
- Risk for injury

# Interventions

- Establish an effective communication system with the patient and his family to help them adjust to the patient's altered cognitive abilities
- Provide emotional support to the patient and his family
- Encourage them to talk about their concerns
- Listen carefully to them

- Use a soft tone and a slow, calm manner when speaking to him Because the patient may misperceive his environment
- Allow the patient sufficient time to answer your questions his thought processes are slow, impairing his ability to communicate verbally

# Intervention

- Administer ordered medications to the patient and note their effects
- If the patient has trouble swallowing, check with a pharmacist to see if tablets can be crushed or capsules can be opened and mixed with a semi-soft food
- Protect the patient from injury
- Provide a safe, structured environment
- Provide rest periods between activities because these patients tire easily

- Encourage the patient to exercise to help maintain mobility
- Encourage patient independence allow ample time for the patient to perform tasks
- Encourage sufficient fluid intake and adequate nutrition Provide assistance with menu selection allow the patient to feed himself as much as he can
- Provide a well-balanced diet with adequate fiber
- Avoid stimulants, such as coffee, tea, cola, and chocolate



- Give the patient semisolid foods if he has dysphagia
- Insert and care for a nasogastric tube or a gastrostomy tube for feeding as ordered
- Because the patient may be disoriented or neuromuscular functioning may be impaired, take the patient to the bathroom at least every 2 hours
- Assist the patient with hygiene and dressing as necessary
- Many patients with Alzheimer's disease are incapable of performing these tasks

# Complication

- Aspiration
- Pneumonia and other infections
- Falls
- Fractures
- Bedsores
- Malnutrition or dehydration

# Prevention

It is not a preventable condition.

Lifestyle risk factors for Alzheimer's can be modified.

Changes in diet, exercise and habits — steps to reduce the risk of cardiovascular disease — may also lower your risk of developing Alzheimer's disease

Heart-healthy lifestyle choices that may reduce the risk of Alzheimer's include the following:

- Exercise regularly
- Eat a diet of fresh produce, healthy oils and foods low in saturated fat
- Follow treatment guidelines to manage high blood pressure, diabetes and high cholesterol
- Quit smoking

# ALZHEIMER'S DISEASE

## Treatment

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## Factors risk



heredity



alcoholism and drug addiction



diabetes



women are more likely to get Alzheimer's

## Prevention

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reading of books



game of chess



playing musical instruments



physical exercise



no smoking



no alcohol

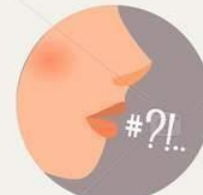
## Symptoms



headache



dizziness



speech impairment



memory decline



trouble sleeping



apathy



olfactory disturbance



orientation problems