

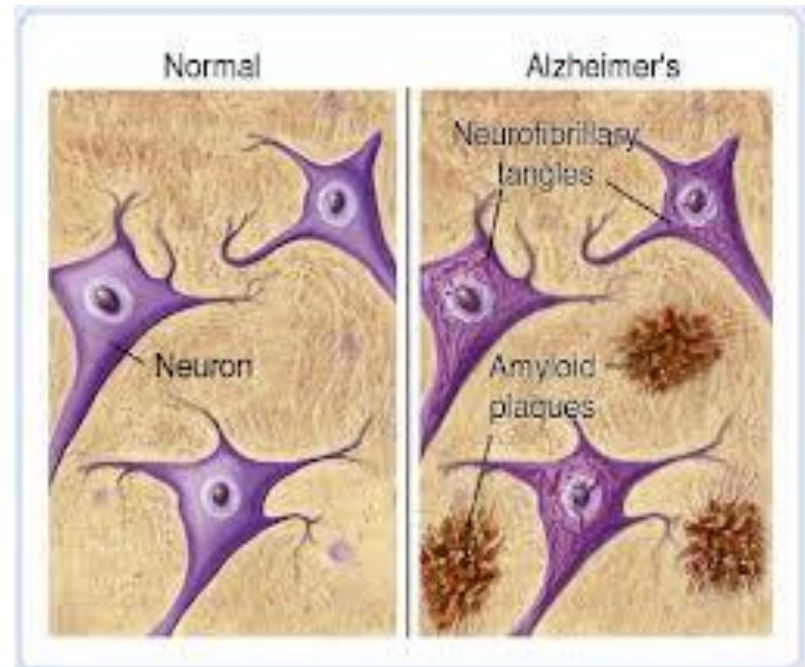
# Advantages and Disadvantages of Pharmaceuticals for Alzheimer's Disease (AD)

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The Goal of this Power Point Slide Presentation is to present a current review of pharmaceutical, nutritional, botanical, and stimulatory therapies. Examples of stimulatory therapies can include physical exercise, music and cognitive therapy.

## AD Pathology:

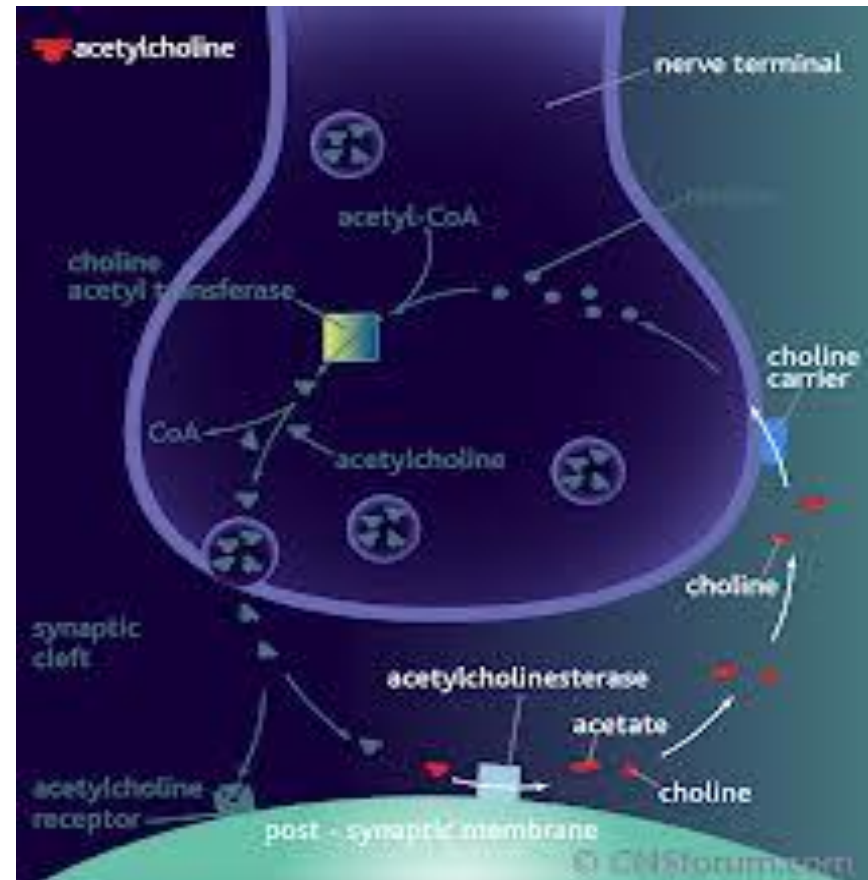
1. AD brains have low levels of acetylcholine (ACh)
2. This may be caused by the accumulation of beta amyloid protein fragments that form hard plaques.
3. The formation of hard plaques can interfere with the ability of ACh to effect synaptic transmission.
4. An inflammatory process may become initiated producing reactive oxygen species.
5. Beta amyloid opens channels in cell membranes, permitting calcium ions to enter the cell.
6. The triggering of these processes leads to mitochondrial dysfunction, inflammation and cell death.



## Pharmaceutical Therapies acetyl cholinesterase Inhibitors (AChEIs)

### AChEIs:

1. Inhibit the action of acetyl cholinesterase (AChE).
2. This enables the Ach to work for longer periods of time
3. The Ach interacts with cholinergic receptors and potassium ion channels.
4. The uptake, synthesis, and release of neurotransmitters are affected.



## Advantages and Disadvantages of Pharmaceuticals for AD

### Acetylcholinesterase inhibitors

- Advantage- Prolongs Ach, some evidence for neuroprotection, FDA approved
- Disadvantage- Short term efficacy, severe side-effects, high costs, modest benefits

## Advantages and Disadvantages of Pharmaceuticals for AD

### Memantine

- **Advantages-** Decreases glutamate excitotoxicity, possible other neuroprotective effects, well tolerated, FDA approved for moderate to severe AD, also helps mild to moderate AD
- **Disadvantages-** Possible neurotoxicity, some severe adverse effects, recommended for moderate to severe AD, high cost

# Advantages and Disadvantages of Pharmaceuticals for AD

Antihypertensive  
drugs

- **Advantages-** reduces inflammation, may block calcium ions, may reduce beta amyloid and increase Ach
- **Disadvantages-** Most of the research to date has been done on animals and hypertensive individuals.

# Advantages and Disadvantages of Pharmaceuticals for AD

## Anti-inflammatory drugs

- **Advantage-** may reduce neural inflammation
- **Disadvantages-** Most research acquired by focus on risk of developing AD and not on treatment, intestinal tract, liver, and kidney side effects, therapeutic benefit questioned (correlation and causation components to research appear suspect)

## Advantages and Disadvantages of Pharmaceuticals for AD

### Secretase Inhibitors

- Advantages: May reduce beta amyloid, may inhibit Ache
- Disadvantages: Little human research, severe adverse effects, insufficient data



# Advantages and Disadvantages of Pharmaceuticals for AD

## Insulin Drugs

- **Advantages:** Improves energy production and cellular functions, may reduce ADDLs and oxidative stress, reduces cell death
- **Disadvantages:** Must be administered nasally to prevent insulin changes in non-brain areas, little human data

## Advantages and Disadvantages of Pharmaceuticals for AD

### Etanercept

- **Advantages:** Produces dramatic improvement within minutes
- **Disadvantages:** Little research, risky spinal injections required

## Advantages and Disadvantages of Pharmaceuticals for AD

### BDNF

- **Advantages:** Stimulates neurogenesis, reverses synaptic damage, improves signaling, reduces oxidative stress and cell death
- **Disadvantages:** Molecule not small enough to pass through the blood-brain barrier, administration is risky because it requires a cannula enter the skull which may pose serious side effects, little human research

## Advantages and Disadvantages of Pharmaceuticals for AD

### Immunization

- Advantage: Reduces beta amyloid
- Disadvantages: often ineffective, the clearing of beta amyloid not always accompanied by symptom reduction, still in early stages of research and development