ALZHEIMER’S DISEASE

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Overview

- Definitions
- Epidemiology
- Diagnosis
- Symptoms
- Treatment
- Effects of Exercise
- Exercise Testing
- Exercise Prescription
- Conclusions
Alzheimer's disease (AD) is a condition that destroys brain cells, causing problems with the memory, thinking, and behavior that lead to disability.

Two types of abnormal lesions that clog the brains of individuals with Alzheimer's disease.

- **Beta-amyloid plaques**: sticky clumps of protein fragments and cellular material that form outside and around neurons.

- **Neurofibrillary Tangles**: insoluble twisted fibers composed largely of the protein tau that build up inside nerve cells.

http://www.youtube.com/watch?v=7_kO6c2NfmE&feature=related
Alzheimer's disease affects more than 5.1 million Americans.

Alzheimer’s disease is also the most common cause of dementia and the seventh leading cause of death in the United States.

By the year 2050, it is estimated at 100 billion dollars in medical costs.
The National Institute on Aging indicates that the prevalence of Alzheimer's disease doubles every five years beyond age 65.

The incidence of the disease is rising in line with the aging population.

Alzheimer's disease typically progress over two to 20 years, and individuals live on average for eight to 10 years from diagnosis.
The causes of Alzheimer's disease is still unknown?

Current research indicates that Alzheimer's disease may be triggered by a multitude of factors:
- Age
- Genetic makeup
- Oxidative damage to neurons from the overproduction of toxic free radicals
- Serious head injuries
- Brain inflammation
- Environmental factors

There are three types main types of (AD): Early Onset, Late Onset, and Familial Alzheimer's disease (FAD).
Early-onset Alzheimer's: This is a rare form of Alzheimer's disease in which people are diagnosed with the disease before age 65. Less than 10% of all Alzheimer's disease patients have this type.

Late-onset Alzheimer's: This is the most common form of Alzheimer's disease, accounting for about 90% of cases and usually occurring after age 65.

Familial Alzheimer's disease (FAD): This is a form of Alzheimer's disease that is known to be entirely inherited, less than 1% of all cases.
Clinicians can now diagnose (AD) with up to 90 percent accuracy. But it can only be confirmed by an autopsy.

Clinicians can diagnose "probable" Alzheimer's disease by taking a complete medical history and conducting

- Lab Tests
- Physical Exams
- Brain Scans and Neuro-Psychological Scan
- Memory Tests
- Attention
- Language Skills
- Problem-Solving Abilities
Proper diagnosis is critical since there are dozens of other causes of memory problems..

The sooner an accurate diagnosis of "probable" Alzheimer's disease is made, the easier it is to manage symptoms and plan for the future.

“New tests may involve an injectable radioactive dye that stains amyloid deposits to highlight them on the PET brain scans.”
Phase I: Forgetfulness, appointments, names, and anxiety.

Phase II: Confusion and intellectual impairment, short-term memory problems, concentration, orientation.

Phase III: Increased delusions, agitation, loss of basic abilities, incontinences.
Stage 1 No Impairment (no symptoms).

Stage 2 Very Mild cognitive impairment. Individuals are aware, they are having memory lapses.

Stage 3 Mild cognitive decline (early stage). Others begin to notice deficiencies in the names, retention of information after reading a passage, ability to plan, organize.

Stage 4 Moderate cognitive decline (mild). Clear cut deficiencies are evident from medical assessment in the areas of recalling recent events, performing different tasks, there own history.
Stage 5 Moderately severe cognitive decline(moderate). Major gaps in memory, recalling dates, certain days, weeks, problems with activities of daily living.

Stage 6 Sever cognitive decline(moderately). Memory continues to decline, significantly personality changes, people may require assistance with daily living, experience disruption to cardiac rhythms.

Stage 7 Very severe cognitive(severe). Individuals lose the ability to respond to there environment, speak, loss control of movement.
Currently, there is no cure for Alzheimer's disease.
There is no surgical treatment for Alzheimer's disease at this time as well.

Researchers are continually testing the effectiveness of various drug therapies:

- Control symptoms
- Slow or reduce
- Reverse mental and behavioral symptoms
- Halt the disease
Once (AD) has gone to Stages 4 to 5 it may be an wise option to plan for
- Caregiver to Assist
- Assisted Living
- Senior Living

It is important to never leave them alone!

The annual cost of caring for one individual with Alzheimer's disease ranges from nearly $18,500 to more than $36,000, depending on the stage of the disease.
The goal of AD treatment is to improve memory and cognition and to delay progression.

- Eating Right
- Exercising
- No alcohol
- Board Games
- Puzzles
- Playing Bingo
- Cleaning Daily
- Daily Chart of Activities
### Acetylcholinesterase inhibitors

**Purpose**
To help raise acetylcholine levels in the brain to improve brain functions

Donepezil Hydrochloride *(Aricept)*, approved for all stages

Rivastigmine *(Exelon)* approved in pill and patch form for mild to moderate

Galantamine Hydrobromide *(Razadyne)*, approved for mild to moderate

Memantine HCl *(Namenda)* for the treatment of moderate to severe

### Possible Side Effects

- Liver Damage
- Diarrhea
- Vomiting
- Nausea
- Fatigue
- Insomnia
- Loss of Appetite
- Weight Loss
EFFECTS OF EXERCISE

- Substantial gains in physical fitness and mood maintenance of function in multiple language measures, and a slower than typical decline in mental status after a year.

- Significant improvement on four cognitive measures after three months of aerobic activity.

- Improved health and decreased levels of depression following exercising training.
Benefits of Exercise include:

- Reduce wandering
- Pulling at clothing
- Making repetitive noises
- Swearing
- Aggressive Acts
- Communication
- Social Skills
“In a study with 16 men and 24 women diagnosed with Alzheimer's disease participated in the study”
- After a 4 month participation patients who exercised, had improved cognition, better mobility, and increased Instrumental Activities of Daily Living scores (ADLS)

In another study subjects older than 65 that have been diagnosed with (AD) and other mental illness.
- Participants participated in strength and exercise programs.
Special Considerations when Testing:

- Because of the effects from (AD), tests such as treadmills and bike ergometers may be difficult and hard to perform, especially during later stages.

- Exercise testing may be best for early stages.

- When exercise testing it is recommended for a client, to perform several practice sessions before conducting an actual test.
All testing should be conducted in the morning because (AD) patients perform better cognitive function.

- **Aerobic**
  - Cycle
  - Treadmill

- **Strength**
  - Use machines whenever possible to avoid injury

- **Flexibility**
  - Upper Arms and Legs
EXERCISE PROGRAM

Precautions

- In early stages it is important to establish some sort of regular routine that the client can sustain.
- Low intensity exercise should be the main focus, involving activities that the person enjoys and perform successfully.
- Constant supervision during physical activity is necessary during the mid to later stages.
- Emotional instability or outbursts may effect the exercise program.
**Exercise Program**

- **Considerations:**
  - To minimize problems arising from the declining physical and mental health.
  - To recognize behavioral changes that may cause the client to become agitated with the exercise program to support the caregivers’ willingness to continue bringing the client to the exercise session.

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<th>Modes</th>
<th>Goals</th>
<th>Intensity/Frequency Duration</th>
<th>Time to Goal</th>
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| Enjoyable activities involving large group muscles  
Familiar activities  
Determine RPE 10-15/20 (in clients with adequate comprehension) | Increase functional health (i.e. maintaining ability to perform various activities and instrumental activities of daily)  
Increase endurance necessary for community ambulation | Monitor HR or RPE 40-60 min/sessions (may appear broken up into smaller 15-20 min activities) | Emphasize enjoyment rather than performance improvements  
Increase duration by adding daily activities that require exercise (e.g., walking to the mailbox or gardening). |
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Improving health and decreased levels of depression following exercising training.

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Exercise activities should be exercises they enjoy.
REFERENCES

- Alzehermise Foundation of America .(2011). http://www.alzfdn.org/?gclid=CI_S64muqa8CFWcHRQod_G4yWw