



ALZHEIMER

CE Broker Number 20-300415

ALZHEIMER

Objectives

At the completion of this home study the learner will:

1. Verbalize the pathophysiology of Alzheimers
2. Verbalize various theories of what causes Alzheimers
3. Discuss the signs and symptoms associated with Alzheimers
4. Describe the Stages of Alzheimers
5. Identify the diagnostic tests involved with the process of the disease

Alzheimer's disease is an irreversible, progressive brain disease that slowly destroys memory and thinking skills. Although the risk of developing AD increases with age – in most people with AD, symptoms first appears after age 60 – AD is not a part of normal aging. It is caused by a fatal disease that affects the brain. AD is a slow disease, starting with mild memory problems and ending with severe brain damage. The course the disease takes and how fast changes occur vary from person to person. On average, AD patients live from 8 to 10 years after they are diagnosed, though some people may live with AD for as many as 20 years.

Alzheimer's is not normal aging; it's a progressive fatal disease. There is no cure. Today, it is the seventh-leading cause of death in the United States. There are currently more than 5 million Americans living with Alzheimer's – including 500,000 individuals under age 65. By 2050 there could be as many as 16 million with the disease. With no effective prevention or treatment methods, Alzheimer's disease has the power to bankrupt families, communities and our health care system.

THE ORIGINS OF ALZHEIMER'S DISEASE

Dr. Alois Alzheimer, a German physician in 1901 case study of woman in 50s suffering from “mental illness” Their symptoms were memory loss, language problems, and unpredictable behavior. Autopsy after death in 1906 revealed dense deposits (neurotic plaques) outside and around nerve cells in brain, the inside cells were twisted strands of fiber (Neurofibrillary tangles, NFTs)

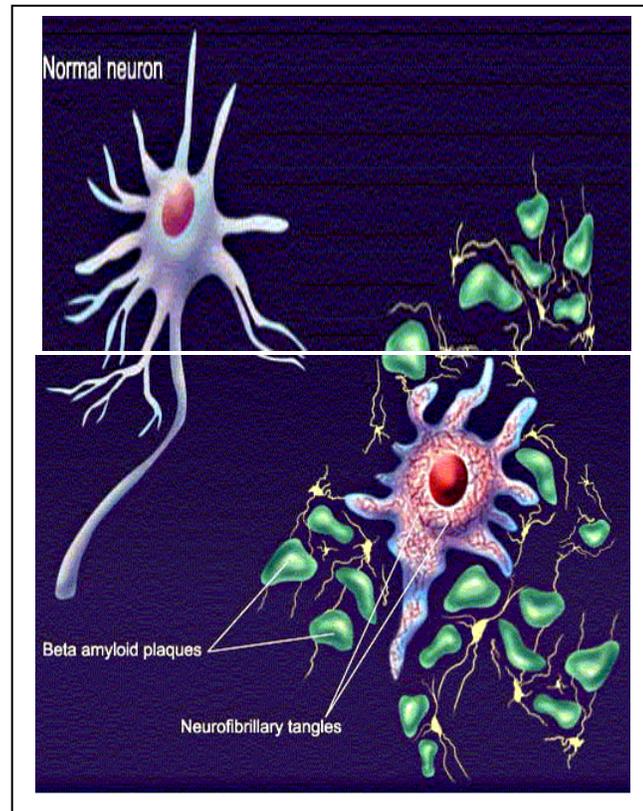
Causes

No one factor appears to cause Alzheimer's disease. Instead, scientists believe that it may take a combination of genetic, lifestyle and environmental factors to trigger the onset of symptoms. While the causes of Alzheimer's are poorly understood, its effect on brain tissue is clear. Alzheimer's disease damages and kills brain cells.

Two types of brain cell (neuron) damage are common in people who have Alzheimer's: **Plaques**. Clumps of a normally harmless protein called beta-amyloid may interfere with communication between brain cells. Although the ultimate cause of neuron death in Alzheimer's isn't known, mounting evidence suggests that the abnormal processing of beta-amyloid protein may be the culprit.

NEURITIC PLAQUES

Abnormal processing of amyloid-beta proteins (APP)
Cleavage by betasecretase on the amino end & gamma-secretase on the carboxy end
Highly amyloidogenic Abeta42 protein which aggregates into diffuse plaques
Presence of neurotic plaques begins a Secondary cascade of inflammatory events causing additional damage (excitotoxicity, apoptosis)



AMYLOIDBETA42

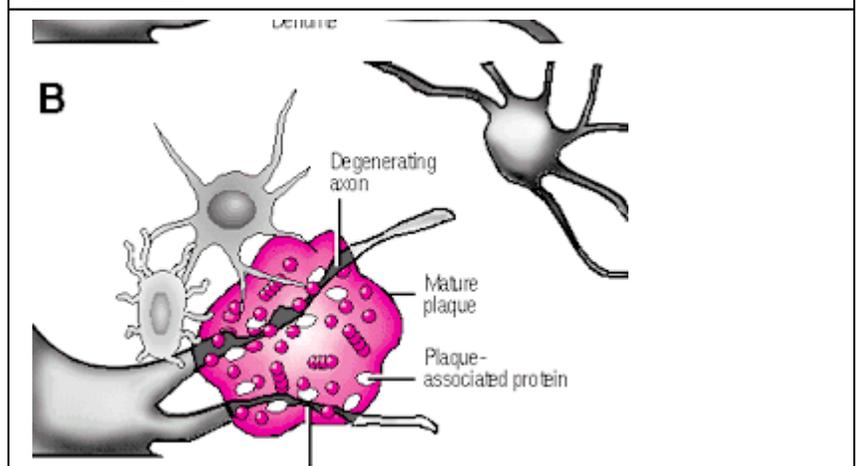
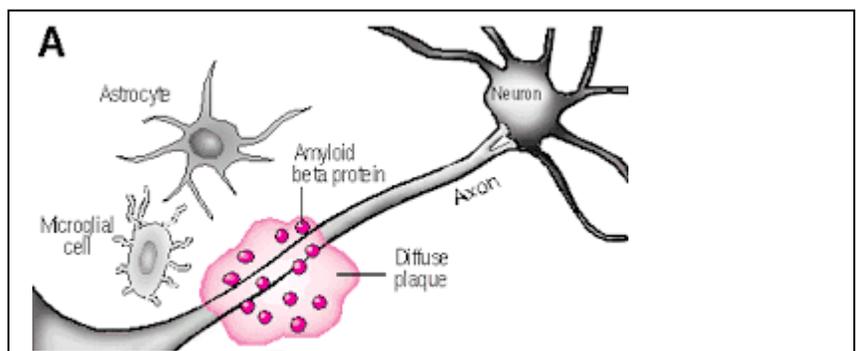
The Alzheimer's Disease "Cholesterol"

Protein normally present in blood and cerebrospinal fluid, also found to make up plaques in AD

Mayo Clinic in Jacksonville working on a test that correlates high levels with increased risk of AD

Steven Younkin, MD, PhD

And Michael Hutton, PhD

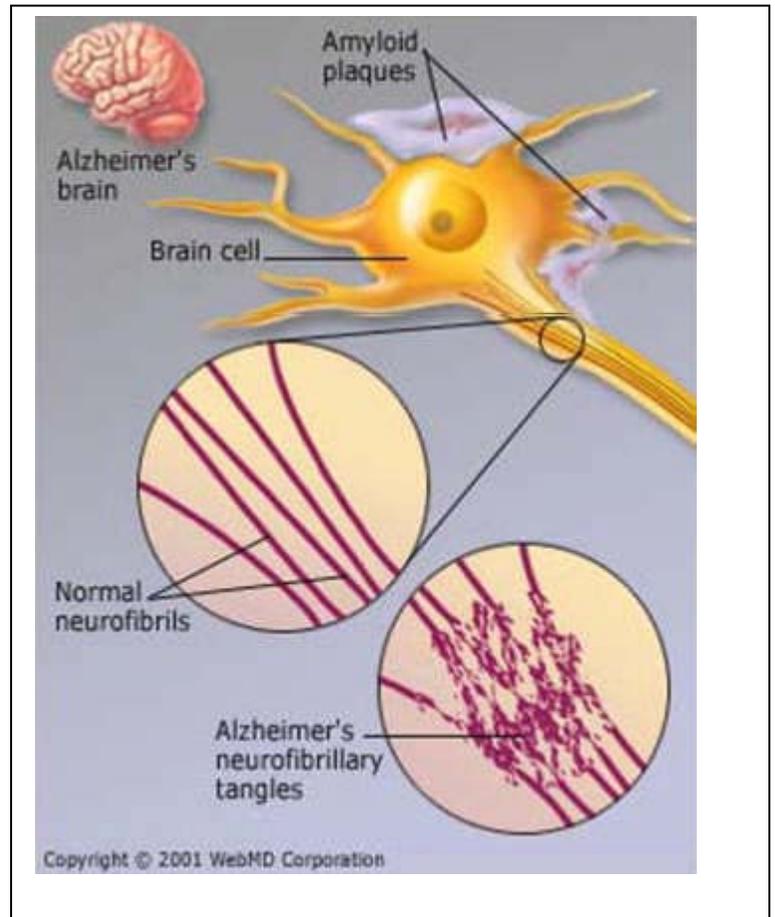


NEUROFIBRILLARY TANGLES (NFTS)

NFTs consist of hyperphosphorylated form of microtubule-associated protein, tau
Cleaved tau proteins are critical to NFT formation

Murine studies suggest the mutant tau protein primarily initiates neurotoxicity rather than the NFTs

NFTs more closely correlate with cognitive decline than neuritic plaques caused by amyloid deposition



LINKING NEURITIC PLAQUES WITH NFTS

Determining a link between neurotic plaques and NFTs

The Proposed link is that Cysteine aspartyl proteases (capases) is a known initiators of apoptosis
The Evidence suggests A-beta protein accumulation activates capases, and capases induce the cleavage of tau
It is this process that is thought to begin early in AD, and initiate the progressive cognitive decline

Feb 2009 from BBC News Dr. Kishore Kuchibhotla from MassGeneral Institute for Neurodegenerative Disease. Confirms plaques are known to damage neurons, he Hypothesizes that plaques impact astrocyte cells. Once thought to be passive support, now discovered to send own chemical signals across long distances, the presence of plaques increases signaling of astrocyte cells. Synchronized wave-like fashion to distant areas of the brain. This can possibility lead to new target for drugs to treat Alzheimer's Disease

Symptoms

Alzheimer's disease may start with slight memory loss and confusion, but it eventually leads to irreversible mental impairment that destroys a person's ability to remember, reason, learn and imagine.

Memory loss

Every one has occasional lapses in memory. It's normal to forget where you put your car keys or to blank on the names of people whom you rarely see. But the memory problems associated with Alzheimer's disease persist and worsen. People with Alzheimer's may:

- Repeat things
- Often forget conversations or appointments
- Routinely misplace things, often putting them in illogical locations
- Eventually forget the names of family members and everyday objects

Problems with abstract thinking

People with Alzheimer's may initially have trouble balancing their checkbook, a problem that progresses to trouble recognizing and dealing with numbers.

Difficulty finding the right word

It may be a challenge for those with Alzheimer's to find the right words to express thoughts or even follow conversations. Eventually, reading and writing also are affected.

Disorientation

People with Alzheimer's disease often lose their sense of time and dates, and may find themselves lost in familiar surroundings.

Loss of judgment

solving everyday problems, such as knowing what to do if food on the stove is burning, becomes increasingly difficult, eventually impossible. Alzheimer's is characterized by greater difficulty in doing things that require planning, decision making and judgment.

Difficulties performing familiar tasks

Once-routine tasks that require sequential steps, such as cooking, become a struggle as the disease progresses. Eventually, people with advanced Alzheimer's may forget how to do even the most basic things.

Personality changes

People with Alzheimer's may exhibit:

- Mood swings
- Distrust in others
- Increased stubbornness
- Social withdrawal
- Depression

- Anxiety
- Aggressiveness

THE FOUR A'S OF ALZHEIMER'S DISEASE

Amnesia

Memory loss, initially short-term progression to long term (i.e.: loss of recognition)

Aphasia

Impaired or absent comprehension or performance of communication of familiar people, places, and events)

Agnosia

Impaired ability to recognize familiar objects or correctly interpret various stimuli (i.e.: comprehending the difference between a toaster and a wristwatch) (speech, writing, understanding writing)

Apraxia

Disorder of voluntary movement; impairment of purposeful movements requiring skill or dexterity (i.e.: doorknobs, opening mail, brushing teeth)

STAGES OF ALZHEIMER'S DISEASE

Mild / Early Stage

Physical changes—

Loss of hippocampal neurons, loss of short term memory

Presentation—

Passive mood, forgetful of familiar places, trouble with recent events, lost understanding of concepts of money/mathematics; denial

Daily activities not greatly affected

Moderate / Middle Stage

Physical changes—

Neuronal loss spreads to frontal lobe, affects judgment, safety awareness, planning, and other complex thinking

Presentation —

Difficulty with routine tasks (brushing teeth), mistaken identity, trouble with language/cognition

Daily activities significantly affected

Severe / Late Stage

Physical changes—

Neuronal loss spreads covering larger area of brain affects multiple functions of the brain (i.e. both cognitive and motor)

Presentation—

Wander, forgotten identity, speechless, movement disorders, behavior symptoms Very Severe—
Loss of psychomotor skills (swallowing), choking, incontinence

Require complete care from care-giver

Risk factors

Age

Alzheimer's usually affects people older than 65, but can, rarely, affect those younger than 40. Less than 5 percent of people between 65 and 74 have Alzheimer's. For people 85 and older, that number jumps to nearly 50 percent.

Heredity

Your risk of developing Alzheimer's appears to be slightly higher if a first-degree relative — parent, sister or brother — has the disease. Although the genetic mechanisms of Alzheimer's among families remain largely unexplained, researchers have identified several genetic mutations that greatly increase risk in some families.

Sex

Women are more likely than men are to develop the disease, in part because they live longer.

Mild cognitive impairment

People who have mild cognitive impairment have memory problems that are worse than what might be expected for people of their age, yet not bad enough to be classified as dementia. Many of those who have this condition go on to develop Alzheimer's disease.

Lifestyle

The same factors that put you at risk of heart disease may also increase the likelihood that you'll develop Alzheimer's disease. Examples include:

- High blood pressure
- High cholesterol
- Poorly controlled diabetes

And keeping your body fit isn't your only concern — you've got to exercise your mind as well. Some studies have suggested that remaining mentally active throughout your life, especially in your later years, reduces the risk of Alzheimer's disease.

Education levels

Studies have found an association between less education and the risk of Alzheimer's. But the precise reason why this occurs is unknown. Some researchers theorize that the more you use your brain, the more synapses you create, which provides a greater reserve as you age. But it may simply be harder to detect Alzheimer's in people who exercise their minds frequently or who have more education.

Complications

In advanced Alzheimer's disease, people may lose all ability to care for themselves. This can make them more prone to additional health problems such as:

- **Pneumonia.** Difficulty swallowing food and liquids may cause people with Alzheimer's to inhale (aspirate) some of what they eat and drink into their airways and lungs, which can lead to pneumonia.
- **Infections.** Urinary incontinence may require the placement of a urinary catheter, which increases the risk of urinary tract infections. Untreated urinary tract infections can lead to more-serious, life-threatening infections.
- **Injuries from falls.** People with Alzheimer's may become disoriented, increasing their risk of falls. Falls can lead to fractures. In addition, falls are a common cause of serious head injuries, such as bleeding in the brain.

How Alzheimer's Disease Is Diagnosed

Alzheimer's disease can be definitively diagnosed only after death by linking clinical course with an examination of brain tissue and pathology in an autopsy. But doctors now have several methods and tools to help them determine fairly accurately whether a person who is having memory problems has "possible Alzheimer's disease" (dementia may be due to another cause) or "probable Alzheimer's disease" (no other cause for dementia can be found). To diagnose Alzheimer's, doctors:

- ask questions about the person's overall health, past medical problems, ability to carry out daily activities, and changes in behavior and personality
- conduct tests of memory, problem solving, attention, counting, and language
- carry out medical tests, such as tests of blood, urine, or spinal fluid
- perform brain scans, such as computerized tomography (CT) or magnetic resonance imaging (MRI)

These tests may be repeated to give doctors information about how the person's memory is changing over time.

Early diagnosis is beneficial for several reasons. Having an early diagnosis and starting treatment in the early stages of the disease can help preserve function for months to years, even though the underlying disease process cannot be changed. Having an early diagnosis also helps families plan for the future, make living arrangements, take care of financial and legal matters, and develop support networks.

In addition, an early diagnosis can provide greater opportunities for people to get involved in clinical trials. In a clinical trial, scientists test drugs or treatments to see which are most effective and for whom they work best. (See the box, at right, for more information.)

How Alzheimer's Is Treated

Alzheimer's disease is a complex disease, and no single "magic bullet" is likely to prevent or cure it. That's why current treatments focus on several different aspects, including helping people maintain mental function; managing behavioral symptoms; and slowing, delaying, or preventing the disease.

Helping People with Alzheimer's Maintain Mental Function

Four medications are approved by the U.S. Food and Drug Administration to treat Alzheimer's. Donepezil (Aricept®), rivastigmine (Exelon®), and galantamine (Razadyne®) are used to treat mild to moderate Alzheimer's (donepezil can be used for severe Alzheimer's as well). Memantine (Namenda®) is used to treat moderate to severe Alzheimer's. These drugs work by regulating neurotransmitters (the chemicals that transmit messages between neurons). They may help maintain thinking, memory, and speaking skills, and help with certain behavioral problems. However, these drugs don't change the underlying disease process and may help only for a few months to a few years.

Managing Behavioral Symptoms

Common behavioral symptoms of Alzheimer's include sleeplessness, agitation, wandering, anxiety, anger, and depression. Scientists are learning why these symptoms occur and are studying new treatments—drug and non-drug—to manage them. Treating behavioral symptoms often makes people with Alzheimer's more comfortable and makes their care easier for caregivers.

Slowing, Delaying, or Preventing Alzheimer's Disease

Alzheimer's disease research has developed to a point where scientists can look beyond treating symptoms to think about addressing the underlying disease process. In ongoing clinical trials, scientists are looking at many possible interventions, such as cardiovascular and diabetes treatments, antioxidants, immunization therapy, cognitive training, and physical activity.

Supporting Families and Caregivers

Caring for a person with Alzheimer's disease can have high physical, emotional, and financial costs. The demands of day-to-day care, changing family roles, and difficult decisions about placement in a care facility can be hard to handle. Researchers are learning a lot about Alzheimer's caregiving, and studies are helping experts develop new ways to support caregivers.

Becoming well-informed about the disease is one important long-term strategy. Programs that teach families about the various stages of Alzheimer's and about flexible and practical strategies for dealing with difficult caregiving situations provide vital help to those who care for people with Alzheimer's.

Developing good coping skills and a strong support network of family and friends also are important ways that caregivers can help themselves handle the stresses of caring for a loved one with Alzheimer's disease. For example, staying physically active provides physical and emotional benefits.

Some Alzheimer's caregivers have found that participating in a support group is a critical lifeline. These support groups allow caregivers to find respite, express concerns, share experiences, get tips, and receive emotional comfort. The Alzheimer's Association, Alzheimer's Disease Centers, and many other organizations sponsor in-person and online support groups across the country. There are a growing number of groups for people in the early stage of Alzheimer's and their families. Support networks can be especially valuable when caregivers face the difficult decision of whether and when to place a loved one in a nursing home or assisted living facility. For more information about at-home caregiving, see **Caring for a Person with Alzheimer's Disease: Your Easy-to-Use Guide from the National Institute on Aging** at www.nia.nih.gov/Alzheimers/Publications/CaringAD.

Advancing Our Understanding

Thirty years ago, we knew very little about Alzheimer's disease. Since then, scientists have made many important advances. Research supported by NIA and other organizations has expanded knowledge of brain function in healthy older people, identified ways we might lessen normal age-related declines in mental function, and deepened our understanding of the disease. Many scientists and physicians are now working together to untangle the genetic, biological, and environmental factors that, over many years, ultimately result in Alzheimer's. This effort is bringing us closer to the day when we will be able to manage successfully or even prevent this devastating disease.

For More Information

To learn about support groups, services, research centers, research studies, and publications about Alzheimer's disease, contact the following resources:

Alzheimer's Disease Education and Referral (ADEAR) Center

P.O. Box 8250
Silver Spring, MD 20907-8250
1-800-438-4380 (toll-free)
www.nia.nih.gov/Alzheimers

The National Institute on Aging's ADEAR Center offers information and publications for families, caregivers, and professionals on diagnosis, treatment, patient care, caregiver needs, long-term care, education and training, and research related to Alzheimer's disease. Staff members answer telephone, email, and written requests and make referrals to local and national resources. The ADEAR website provides free, online publications in English and Spanish; email alert and online *Connections* newsletter subscriptions; an Alzheimer's disease clinical trials database; the Alzheimer's Disease Library database; and more.

Alzheimer's Association

225 N. Michigan Avenue, Floor 17
Chicago, IL 60601-7633
1-800-272-3900 (toll-free)
1-866-403-3073 (TDD/toll-free)
www.alz.org

Alzheimer's Foundation of America

322 Eighth Avenue, 7th Floor
New York, NY 10001
1-866-AFA-8484 (1-866-232-8484; toll-free)
www.alzfdn.org

Eldercare Locator

1-800-677-1116 (toll-free)
www.eldercare.gov

Family Caregiver Alliance

180 Montgomery Street, Suite 1100
San Francisco, CA 94104
1-800-445-8106 (toll-free)
www.caregiver.org

NIHSeniorHealth

www.nihseniorhealth.gov/alzheimersdisease/toc.html

References

1. Alzheimer's disease fact sheet. National Institute on Aging. <http://www.nia.nih.gov/Alzheimers/Publications/adfact.htm>. Accessed Oct. 31, 2008.
2. Shadlen MF, et al. Evaluation of cognitive impairment and dementia. <http://www.uptodate.com/home/index.html>. Accessed Nov. 3, 2008.
3. Caselli RJ, et al. The degenerative dementias: Alzheimer's disease. In: Goetz CG, et al. *Textbook of Clinical Neurology*. 3rd ed. Philadelphia, Pa.: Saunders Elsevier; 2007. <http://www.mdconsult.com/das/book/body/109112945-3/0/1488/287.html>. Accessed Nov. 3, 2008.
4. Alzheimer's information: Causes. National Institute on Aging. <http://www.nia.nih.gov/Alzheimers/AlzheimersInformation/Causes/>. Accessed Nov. 6, 2008.
5. Shadlen MF, et al. Dementia syndromes. <http://www.uptodate.com/home/index.html>. Accessed Nov. 6, 2008.
6. Basics of Alzheimer's disease: What it is and what you can do. Alzheimer's Association. http://www.alz.org/national/documents/brochure_basicsofalz_low.pdf. Accessed Nov. 6, 2008.
7. Alzheimer's disease genetics fact sheet. National Institute on Aging. <http://www.nia.nih.gov/Alzheimers/Publications/geneticsfs.htm>. Accessed Nov. 6, 2008.
8. Shadlen MF, et al. Risk factors for dementia. <http://www.uptodate.com/home/index.html>. Accessed Nov. 6, 2008.
9. Kelley BJ, et al. Alzheimer's disease and mild cognitive impairment. *Neurological Clinics*. 2007;25:577.
10. Late-stage care. Alzheimer's Association. http://www.alz.org/national/documents/brochure_latestage.pdf. Accessed Nov. 7, 2008.
11. Dementia care practice recommendations for assisted living residences and nursing homes. Alzheimer's Association. http://www.alz.org/national/documents/brochure_DCPRphases1n2.pdf. Accessed Nov. 7, 2008.
12. Neurological diagnostic tests and procedures. National Institute of Neurological Disorders and Stroke. http://www.ninds.nih.gov/disorders/misc/diagnostic_tests.htm. Accessed Nov. 7, 2008.
13. Press D, et al. Cholinesterase inhibitors in the treatment of dementia. <http://www.uptodate.com/home/index.html>. Accessed Nov. 7, 2008.
14. Press D, et al. Treatment of dementia. <http://www.uptodate.com/home/index.html>. Accessed Nov. 7, 2008.
15. Press D, et al. Prevention of dementia. <http://www.uptodate.com/home/index.html>. Accessed Nov. 7, 2008.
16. Natural medicines in the clinical management of Alzheimer's disease. Natural Medicines Comprehensive Database. <http://www.naturaldatabase.com>. Accessed Nov. 10, 2008.

17. Alexander M, et al. Patient information: Alzheimer's disease.
http://www.uptodate.com/patients/content/topic.do?topicKey=~eWpcY17IC9LRwe.
Accessed Nov. 10, 2008.
18. Press D, et al. Future directions in dementia treatments.
http://www.uptodate.com/home/index.html. Accessed Nov. 7, 2008.
19. Smith GE (expert opinion). Mayo Clinic, Rochester, Minn. Nov. 19, 2008.
20. 2007: The Year in Alzheimer Science. Alzheimer's Association. 2009.
21. 2009 Alzheimer's Disease Facts and Figures. Alzheimer's Association. Alzheimer's &
22. Dementia, Volume 5, Issue 3.
23. Alzheimer's Disease Genetics Fact Sheet. Alzheimer's Disease Education & Referral
24. (ADEAR) Center, A Service of the National Institute on Aging National Institutes of Health
25. U.S. Department of Health and Human Services. NIH Publication No. 08-6424.
26. November 2008. www.nia.nih.gov/Alzheimers
27. Alzheimer's plaques □ 'big impact.' BBC News. Published 27 Feb 2009.
28. news.bbc.co.uk/go/pr/fr/-/2/hi/health/7910513.stm
29. Clerici F, Vanacore N, Elia A, et al. Memantine in moderately-severe-to-severe
30. Alzheimer's disease: a postmarketing surveillance study. *Drugs Aging*.
2009;26(4):321-
31. 32.
32. DeKosky S, Williamson J, Fitzpatrick A, et al. Ginkgo biloba for Prevention of
Dementia:
33. A Randomized Controlled Trial. *JAMA*. 2008;300(19):2253-2262.
34. Guideline for Alzheimer's Disease Management. California Workgroup for
Alzheimer's
35. Disease Management. Final Report 2008. California Version. April 2008.
36. Grossberg G, Sadowski C, Frostl H, et al. Safety and tolerability of the rivastigmine
37. patch: results of a 28-week open-label extension. *Alzheimer Dis Assoc Disord*. Apr-Jun
38. 2009;23(2):158-64.
39. NIH Publication No. 08-6423 November 2008 (reprinted February 2010)
40. Paula Grammas, Ph.D. Executive Director Mildred and Shirley Garrison Chair in
Aging Alzheimer's Disease Research Update and New Treatment Options September
24, 2008

**To take the course examination and complete the course.
Please [Click Here](#) to start the process**