Alzheimer’s Diagnostic Basics For Mental Health Professionals

1 CE Hour

By: Kathryn Brohl, MA, LMFT

Learning objectives

- List the possible causes of Alzheimer’s disease.
- Describe diagnostic methods for Alzheimer’s disease.
- Identify Alzheimer’s disease symptoms.
- Describe the progression of Alzheimer’s disease.

Introduction

In this continuing education training, licensed mental health professionals will gain a deeper understanding about Alzheimer’s disease, in order to inform and support clients who struggle to understand and guide family members toward responsible caregiving.

Many mental health professionals will come in direct or vicarious contact with people who suffer from Alzheimer’s disease, especially as greater numbers of Baby Boomers become caregivers. And, this population will begin to acquire the disease as it grows older.

A basic understanding of Alzheimer’s disease can assist licensed mental health professionals to provide a general overview about the disease to clients and, when appropriate, recommend referral for further evaluation. It has been reported that the average length of time between the onset of symptoms and the diagnosis of Alzheimer’s disease is 2.8 years.

The brain is the most complex organ in the human body and it controls conscious, as well as unconscious, body functions that become affected when someone acquires Alzheimer’s disease. The disease begins when nerve cells responsible for learning and memory functions become damaged and eventually die. Consequently, certain aspects of brain function can be lost.

Alzheimer’s disease statistics

These statistics reflect Alzheimer’s disease’s more recent detection and diagnosis:

- As of 1996, Alzheimer’s disease (AD) affected an estimated 4 million people in the United States.
- The duration of survival following a diagnosis of Alzheimer’s disease depends critically on the subject’s age at diagnosis.
- Alzheimer’s disease is the leading cause of dementia. In the United States, it has been estimated that 10 percent of the people over 65 years old and nearly half of those over 85 years old have AD.
- Persons diagnosed with Alzheimer’s disease at age 65 could anticipate a 67 percent reduction in their life span compared to those without Alzheimer’s disease, while persons diagnosed at age 90 could anticipate a 39 percent reduction in their life span.
- Statistical analysis found that the median survival times ranged from 8.3 years for people diagnosed at age 65, to 3.4 years for people diagnosed at age 90.
- There are no significant differences between men and women in survival after diagnosis of the disease.
- It is projected that in the next 50 years, the prevalence of Alzheimer’s disease will quadruple with approximately 1 in 45 Americans living with the disease.

Alzheimer’s disease – definition

Alzheimer’s disease (AD) was named for Dr. Alois Alzheimer, who first described the disease in 1907. Alzheimer’s disease gradually causes problems with judgment, planning and concentration, and personality changes. In its later stages, it also affects physical abilities. The disease’s causes, cures and preventions are generally unknown.

In general, Alzheimer’s disease can be defined as: “a disease that is a progressive fatal illness that causes areas of the brain to shrink. The resulting symptoms start with memory loss and other cognitive deficits, advancing to major personality changes and eventual loss of control over bodily functions.”

Alzheimer’s disease is a form of degenerative brain disease resulting in progressive mental deterioration with disorientation,
memory disturbance and confusion rarely occurring before the age of 50. AD leads to progressive dementia, often accompanied by dysphasia and/or dyspraxia. The condition may also give rise ultimately to spastic weakness and paralysis of the limbs, epilepsy and other variable neurological signs. The disease takes from a few months to four or five years to progress to complete loss of intellectual function.

The role of chemical messengers
Another change that Alzheimer’s disease causes is a change in the brain’s chemical messengers. The chemical messenger acetylcholine is particularly important. Acetylcholine is believed to be involved in the working of brain cells responsible for memory, thinking and judgment. Individuals with Alzheimer’s disease have decreased levels of acetylcholine. There are some medicines that can increase the amount of acetylcholine in the brain by stopping it from being broken down. This can help the brain’s cells work better and slow the progression of Alzheimer’s disease symptoms.

CAUSES OF ALZHEIMER’S DISEASE

Alzheimer’s disease is complex. Alzheimer’s disease begins to damage the brain years before symptoms appear. Most scientists believe that AD begins with the buildup of beta amyloid protein in the brain. Why pathological changes occur in the brain leading to such profound damage is an area of scientific investigation that is making considerable progress. There are a number of theories about why this should happen.

The exact cause of Alzheimer’s disease is still unknown, despite the dramatic progress in understanding. Most gene mutations associated with Alzheimer’s disease point to the amyloid precursor protein and amyloid beta. The alpha-, beta- and gamma-secretases are the three executioners of amyloid precursor protein processing. Significant progress has been made in the selective inhibition of these proteases, regardless of the availability of structural information.

Current insights into causes of Alzheimer’s disease include:

Age
- Age is the biggest risk factor for Alzheimer’s.
- At 65 to 70 years, your risk is about 1.5 percent.
- At 70 to 74 years, your risk is about 3.5 percent.
- At 75 to 79 years, your risk is about 6.8 percent.
- The risk of Alzheimer’s nearly doubles every five years, so by the age of 95, nearly one half will have Alzheimer’s disease.

The genetics of Alzheimer’s disease

Diseases such as cystic fibrosis, muscular dystrophy, and Huntington’s disease are single-gene disorders. If a person inherits the gene that causes one of these disorders, he or she will usually acquire the disease. AD, on the other hand, is not caused by a single gene. More than one gene mutation can cause AD, and genes on multiple chromosomes are involved.

The two basic types of AD are familial and sporadic. Familial AD (FAD) is a rare form of AD, affecting less than 10 percent of AD patients. All FAD is early-onset, meaning the disease develops before age 65. It is caused by gene mutations on chromosomes 1, 14, and 21. Even if one of these mutated genes is inherited from a parent, the person will almost always develop early-onset AD. This inheritance pattern is referred to as autosomal dominant inheritance. In other words, all offspring in the same generation have a 50/50 chance of developing FAD if one of their parents had it.

Genetics play a vital role as more researchers learn about AD. Little by little they become aware of the important function genes play in the development of Alzheimer’s disease. Recent excitement has centered around the discovery of the relationship between the apolipoprotein E (apoE) gene and Alzheimer’s disease.

Genetic risk factors as a cause of Alzheimer’s disease is an area of intense investigation. Having a parent or sibling with Alzheimer’s increases the risk by two to three times that a person is more likely to develop the disease. The more individuals in a family, the greater the risk of developing Alzheimer’s disease.
Risk factors

While scientists do not yet fully understand what causes Alzheimer’s disease, they lean towards several factors that can affect each person differently:

- Down syndrome.
- The loss of estrogen production.
- The lack of a formal education.
- Severe head trauma resulting in unconsciousness.
- Retrograde amnesia.
- Longevity and familial history.
- Aluminum toxicity.
- Exposure to certain viruses.

Age is the most important known risk factor for Alzheimer’s disease. The number of people with the disease doubles every five years beyond age 65.

Brain damage

Where amyloid is deposited in the brain immediately after a head injury, a positive link to dementia has been found, as head trauma follows vascular damage from such diseases as stroke, high blood pressure, diabetes mellitus and atherosclerotic disease.

Understanding the brain

Alzheimer’s disease causes a number of changes in the brain. To understand these changes, it helps to understand how the brain works. The human brain is made up of billions of nerve cells, called neurons. Neurons are responsible for our physical and mental abilities. They help us think, remember, and direct our body movement.

Plaques and tangles — In Alzheimer’s disease, neurons and the spaces between them become clogged with protein deposits, often referred to as plaques and tangles. Plaques and tangles develop as part of the normal aging process. But in people with Alzheimer’s disease, there are many more of them.

Plaques and tangles prevent the neurons from sending impulses to each other. The protein that makes up plaque is found in the body naturally. But plaques are abnormal, sticky clusters of this protein. They are found in the spaces between the neurons. They can disrupt the pathways that carry signals from one neuron to the other.

Tangles are also made up of a protein that is found in the body naturally. But the protein gets “tangled” up. Tangles, which look like threads wrapped around each other inside the neurons, clog and keep the neurons from functioning properly. Some researchers believe that tangles seriously damage the neurons, causing them to die.

When neurons are clogged with tangles, the spaces between neurons are clogged with plaques. This causes the transmission of nerve impulses from one neuron to misfire. As a result, the brain has difficulty performing some mental functions, such as remembering and thinking.

DIAGNOSIS OF ALZHEIMER’S DISEASE

When evaluating for Alzheimer’s disease, the primary care doctor may refer a patient to one of the following specialists:

- A psychologist with advanced training in testing memory, concentration, problem solving, language and other mental functions.
- A psychiatrist who specializes in disorders that affect mood or the way the mind works.
- A neurologist who specializes in diseases of the brain and nervous system.

Today, the only definite way to diagnose AD is to find out whether there are plaques and tangles in brain tissue. To look at brain tissue, however, doctors must usually wait until they do an autopsy. Therefore, doctors can only make a diagnosis of “possible” or “probable” AD while the person is still alive.

At specialized centers, doctors can diagnose AD correctly up to 90 percent of the time. Doctors use several tools to diagnose “probable” AD, including:

- Questions about the person’s general health, past medical problems and ability to carry out daily activities.
- Tests to measure memory, problem solving, attention, counting and language.
- Medical tests, such as tests of blood, urine or spinal fluid.
- Brain scans.

Methods of diagnosing Alzheimer’s disease

In order to diagnose Alzheimer’s disease, the health care provider must rule out other possible causes of symptoms, such as a simple memory loss stemming from other causes. A properly trained physician will need to conduct a complete examination to determine whether Alzheimer’s disease is causing a person’s symptoms.

The health care provider will:

- Take a medical history regarding information about:
  - Medications that are taken regularly.
  - Past and present illnesses.
  - Past surgeries.
Mental health problems of the patient and close relatives.
Alcohol use.

Give a complete physical exam including:
- Take blood or urine samples, or both.
- Give memory and psychological tests to see at what level the brain is working.
- Order a brain scan.

Benefits of early diagnosis

Early diagnosis of Alzheimer’s disease (AD) allows time to initiate appropriate treatments that may delay cognitive deterioration and to consider such nonpharmacologic interventions as behavior therapy. Additionally, early diagnosis provides the patient and family with time to plan for preparatory counseling, care-giving and management decisions, proper referrals, development of living wills, legal and financial decisions, and selection of health care surrogates.

When Alzheimer’s has been diagnosed early, the loss of abilities is often mild, permitting an individual to continue living independently much as they did before. In this early stage, some people experience minor physical compensations, such as falling asleep easily, or immunity to colds.

Symptoms of Alzheimer’s disease

When Alzheimer’s disease begins to destroy brain cells, no outward symptoms are evident. After a while, small memory lapses appear and grow more serious. The afflicted individual may:
- Feel more suspicious, cautious, or anxious.
- Feel stressed when making decisions.
- Forget the names of familiar people or places.
- Forget simple things, like familiar people’s names, commonly used phone numbers, or what month it is.
- Forget the location of everyday objects.
- Forget how to get to familiar places.
- Forget the words to express what he or she wants to say.
- Lose his or her train of thought when speaking.
- Lose interest in things and people that used to be enjoyable.
- Misplace things more often than usual.
- Repeat things often.

While some individuals experience mild memory losses with aging, people with Alzheimer’s have a more noticeable and rapid decline in memory and other cognitive skills.

The symptoms of early-stage AD may not be obvious to others. Typically, close friends and family members may notice slight changes in their loved one’s memory, judgment, language ability and behavior. The first symptom of the disease is usually memory loss, with the most recent memories affected first.

Model of a healthy brain versus an Alzheimer’s brain

A diagnosis of probable Alzheimer’s disease is made after complete medical, neurological and psychological examinations rule out other possible causes of the person’s symptoms.

Alzheimer’s diagnosis centers perform thorough evaluations to determine if a person suffers from symptoms of the disease.

The normal aging of the brain is very different from what happens in AD. The old thinking was that the normal cognitive changes in aging were the result of cell loss throughout the brain. Changes in brain chemistry that result in changes in the way the neurons communicate are more likely to be responsible for the memory problems associated with normal aging.
Stages of Alzheimer’s disease

Gradual onset and progression are the distinguishing characteristics of Alzheimer’s disease, and three general symptomatic stages typify its development. They include early, middle and late (mild, moderate and severe). In the early stage of disease, an individual or a close companion may notice increased forgetfulness and word-finding difficulties, the tendency to lose or misplace things, repeated questioning and some disorientation.

- **Early-stage Alzheimer’s (mild)**
  Memory loss or other cognitive deficits are noticeable, yet the person can compensate for them and continue to function independently. Motor skills at the early stage of disease are still intact. A person with early-stage disease scores at least 20 on the Mini-Mental State Examination (MMSE) and can be cared for at home by family.

- **Mid-stage Alzheimer’s (moderate)**
  Cognitive decline continues in the second stage of the disease, memory deteriorates, and the ability for self-care is further lost. This stage includes declining mental abilities, personality changes, confused time and place and physical problems. The person becomes more and more dependent on caregivers, has trouble communicating and recognizing family members or friends, develops agitation, begins to wander, experiences delusions and hallucinations, and has an increasing tendency to fall. The person can be cared for at home or in an institutional setting.

- **Late-stage Alzheimer’s (severe)**
  At this stage, the individual can be bedridden, incontinent, unable to understand or speak and require full-time care. Typically, an individual diagnosed with Alzheimer’s disease lives from seven to 10 years, spending five of those years in a nursing facility or with continuous care at home. Death may result from:
  - Decubitus ulcer.
  - Inanition.
  - Lung or urinary tract infection.
  - Pulmonary embolism.
  - Sepsis.

The focus of late-stage Alzheimer’s is the complete deterioration of the personality. Cognitive symptoms worsen, and physical symptoms become profound. The loss of brain cells in all parts of the brain leads to lack of functioning in all systems of the body. The wild behaviors of earlier stages disappear, replaced by a dulling of the mind and body.

Tests used to diagnose Alzheimer’s disease

Alzheimer’s disease often goes unrecognized or is misdiagnosed in its early stages because doctors and nurses, patients, and family members mistakenly view the early symptoms as the inevitable consequences of aging.

Some disorders that can result in dementia are curable, but Alzheimer’s disease is not. Therefore, it is very important to make the diagnosis as early as possible because some AD symptoms, such as incontinence and depression, can be effectively treated. An early and accurate diagnosis of the symptoms is important to:

- Rule out Alzheimer’s disease and ease the patient’s and family’s concern.
- Identify any treatable condition and initiate treatment as appropriate.
- Identify Alzheimer’s disease at the earliest possible stage.
- Give the patient and family time to plan for the future needs and care of the patient.
- Make it possible for the patient to start using some medicines that are only useful in the earlier stages of Alzheimer’s.

Alzheimer’s disease cannot be definitely diagnosed until after death, when the brain can be closely examined for certain microscopic changes caused by the disease. Medical and psychological tests, as well as other considerations, are used to help make a diagnosis of Alzheimer’s disease and include:

- **Chest X-rays.**
  An X-ray is a test in which an image of the body is created by using low doses of radiation. When viewing X-ray images of the chest, doctors can view structures inside the chest, including:
  - The heart.
  - The lungs.
  - The bones.

This test may be used by the doctor to help rule out other disorders that may be causing symptoms similar to those of Alzheimer’s disease.

- **Computed tomography (CT or CAT) scan.**
  A computed tomography (CT or CAT) scan is a technique in which multiple X-rays of the body are taken from different angles in a very short period of time. These images are then fed into a computer, which creates a series of images that look like “slices” through the body. CT scans can show certain changes that are characteristic of Alzheimer’s disease in its later stages. These changes include a reduction in the size of the brain, referred to as atrophy.

- **Electroencephalography (EEG).**
  Electroencephalography (EEG) is a medical technique that measures brain function by analyzing the electrical activity generated by the brain. This activity is measured through special electrodes applied to the scalp. EEG is often used to study various brain processes, such as perception, memory, language and emotion, and is most helpful in identifying disorders that can mimic Alzheimer’s disease.

- **Electrocardiogram (ECG or EKG).**
  An electrocardiogram (ECG or EKG) registers as a graph or series of wavy lines on a moving strip of paper giving
the doctor important information about the heart. This test may be used by the doctor to help rule out other conditions that may be causing symptoms similar to those of Alzheimer’s disease.

- **Patient history.**
  A history from the patient helps the doctor assess a person’s past and current health situation. It also helps the doctor:
  - Evaluate whether there are any medical problems.
  - Develop a plan of treatment.
  - Monitor the patient's health over time.

  During this evaluation, the doctor asks the person a series of questions addressing the following patient history:
  - Current health status.
  - Family history.
  - History of any current illness.
  - Information about the difficulties in daily living.
  - Information about other symptoms.
  - Patient’s identifying information.
  - Past medical history.
  - Psychosocial history including:
    - Marital status.
    - Living conditions.
    - Employment.
    - Sexual history.
    - Important life events.
  - Mental state to determine if the person is experiencing any evidence of psychiatric illness, like depression.

- **Mini-Mental State Examination (MMSE).**
  This is a very brief test that the doctor can use to test a person’s problem-solving skills, attention span, counting skills and memory. It will give the doctor insight into whether there has been damage to different areas of the brain. Mental status testing gives the doctor a general idea of whether a person:
  - Is aware of having symptoms or feels nothing is wrong.
  - Knows the date, time and where he or she is.
  - Can remember a short list of words, can follow instructions and do simple calculations.

  Examples of questions could include:
  - Copy a picture of two interlocking shapes.
  - Count backward from 100 by 7s, or spell “world” backwards.
  - Follow a three-part instruction, such as: take a piece of paper in your right hand, fold it in half, and place it on the floor.
  - Identify the location of the examiner’s office (state, city, street address, floor).
  - Name two familiar objects present in the office as the examiner points to them.
  - Remember and repeat a few minutes later the names of three common objects (for instance, horse, flower, penny).
  - Repeat a common phrase or saying after the examiner.
  - State the year, season, day of the week and date.

  The maximum MMSE score is 30 points. A score of 20-24 suggests mild dementia, 13-20 suggests moderate dementia, and less than 12 indicates severe dementia. On average, the MMSE score of a person with Alzheimer’s declines about two to four points each year.

- **Physical exam.**
  The physical examination is part of the patient care process. The exam enables the doctor to assess the overall physical condition of the patient. If the patient has a medical complaint, the physical exam provides the doctor with more information about the problem, which helps him determine an appropriate plan of treatment. The physical exam includes an examination of the following:
  - Abdomen.
  - Bones and muscles.
  - Breasts.
  - Chest, including lungs and heart.
  - Head, eyes, ears, nose.
  - Height and weight.
  - Nerves.
  - Rectal/genital area.
  - Skin.
  - Throat/neck.
  - Vital signs.

  The physician will also inquire about the following to determine physical condition:
  - Diet, nutrition and use of alcohol.
  - Review all medications currently being taken, including over-the-counter drugs and supplements.
  - Check blood pressure, temperature and pulse.
  - Listen to the heart and lungs.
  - Collect samples of blood and urine.

- **Neurological exam.**
  The neurological examination is an important part of the examination. Its goal is to assess the function of the brain and nervous system to identify symptoms of brain disorders other than Alzheimer’s. During the neurological exam, the physician may test:
  - Coordination and balance.
  - Eye movement.
  - Muscle tone and strength.
  - Reflexes.
  - Speech.
  - Sensation.

- **Laboratory tests.**
  When a doctor is diagnosing an illness, he or she often orders laboratory tests on certain fluids and tissue samples from the body. These tests can help identify problems and diseases that help doctors make a diagnosis. The most common are:
  - Blood tests.
  - Urinalysis.

  Blood tests involve a series of tests routinely done on blood to look for abnormalities associated with various diseases and disorders.

  Blood tests may also be used to look for the presence of a specific gene that has been identified as a risk factor for Alzheimer’s disease. A urinalysis is a test in which a urine sample is evaluated to detect abnormalities of sugar or protein. This test may be used by the doctor to help rule out other disorders that may be causing symptoms similar to
those of Alzheimer’s disease. In some cases, testing a small amount of spinal fluid may be used.

- **Magnetic resonance imaging (MRI).**
  Magnetic resonance imaging (MRI) is a test that produces very clear pictures, or images, of the human body without using X-rays. Instead, MRI uses a large magnet, radio waves, and a computer to produce these images. MRI is beneficial in ruling out other causes of dementia, such as tumors or strokes. It also may help to show the structural and functional changes in the brain that are associated with Alzheimer’s disease.

- **Neuropsychological testing.**
  Neuropsychological testing studies the relationship between the brain and behavior. It is used when the patient is having serious problems with memory, concentration, remembering words and names, understanding language, and a variety of other symptoms. These tests help in the diagnosis and treatment of conditions that affect thinking, emotion and behavior, including various psychiatric problems, like:
  - Depression and anxiety.
  - Problems caused by medicines.
  - Substance abuse.
  - Strokes.
  - Tumors.

  Neuropsychological tests accompany a comprehensive interview with the patient and may include tests to:
  - Assess memory.
  - Assess personality stability.
  - Emotional stability.
  - Language.
  - Ability to plan and reason.
  - Ability to modify behavior.

  Neuropsychological testing also can help the doctor and family better understand the effect of a disorder on a patient’s everyday functioning. There are additional tests that may be done to help diagnose and monitor the progression of Alzheimer’s disease. The following tests are not done routinely and are more often used for research purposes:
  - **Positron emission tomography (PET) scan.**
    PET scanning is a three-dimensional imaging technique that allows a doctor to examine:
    - The heart.
  - **Magnetic resonance spectroscopy imaging (MRSI).**
    MRSI is a test that allows the doctor to observe certain substances throughout the brain without the use of radioactive materials. MRSI is an imaging technique that is used to study changes caused by brain tumors, strokes, seizure disorders, Alzheimer’s disease, depression, and other diseases affecting the brain.
  - **Single photon emission computed tomography (SPECT) scan.**
    SPECT is a technique for creating very clear, three-dimensional pictures of a major organ, such as the brain or heart. Energy from the radioactive substance in the body is detected by a special camera, which then takes the pictures. SPECT can be used to see how blood flows in certain regions of the brain and is useful in evaluating specific brain functions and abnormalities that are characteristic of Alzheimer’s disease.

Remember! No matter what stage the individual is in at the time of diagnosis, apathy is a major problem. More than 40 percent of people in early-stage Alzheimer’s show a lack of interest, initiative, and emotional involvement. In the last stage of Alzheimer’s, more than 90 percent of people are apathetic.

### Clinical manifestations of Alzheimer’s disease

The primary cognitive feature of AD is usually progressive memory impairment that involves impairment of learning new information that is often characterized as short-term memory loss. In the early (mild) and moderate stages of the illness, recall of remote well-learned material may appear to be preserved, but new information cannot be adequately incorporated into memory.

Language impairments are also a prominent part of AD where the individual has difficulty in spontaneous speech. The language of the AD patient is often vague, lacking in specifics and may have increased automatic phrases and clichés. Difficulty in naming everyday objects is often prominent.

- The brain.
- Other internal organs.

PET scans also can show how the organs are functioning, unlike X-ray, CT or MRI, which show only body structure. PET is particularly useful for the detection of cancer and coronary artery disease and can provide information to pinpoint and evaluate diseases of the brain. PET imaging can show the region of the brain that is causing a patient to have seizures and is useful in evaluating brain diseases like:
  - Alzheimer’s.
  - Huntington’s.
  - Parkinson’s.

PET scans can show the difference in brain activity between a normal brain and one affected by Alzheimer’s disease; it can also help differentiate Alzheimer’s disease from other forms of dementia.

- **Magnetic resonance spectroscopy imaging (MRSI).**
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Complex deficits in visual function are present in many AD patients, as are other focal cognitive deficits.

Noncognitive or behavioral symptoms are common in AD and may account for an even larger proportion of caregiver burden or stress than the cognitive dysfunction. Personality changes are commonly reported and range from progressive passivity to marked agitation. Patients may exhibit changes such as decreased expressions of affection and personality changes.
  - Depressive symptoms are present in up to 40 percent.
  - Psychosis occurs in 25 percent.
Clinical diagnosis of Alzheimer’s disease

Previous studies have shown that the clinical diagnosis of Alzheimer’s disease is often inaccurate when compared with neuropathologic findings. The clinical diagnosis of Alzheimer’s disease correlates strongly with the pathologic diagnosis. A chart review also indicated that most of the patients with an incorrect diagnosis of Alzheimer’s disease had atypical clinical characteristics such as Parkinsonian features, focal neurologic signs or absence of language impairment.

Autopsy examinations of both prospective and retrospective subjects was conducted to compare the accuracy of the clinical diagnosis of Alzheimer’s disease with pathologic evidence of the disease on autopsy. A total of 220 patients participating in the study included 170 patients who had been clinically diagnosed as having Alzheimer’s disease. Eighty-eight percent of the 170 patients with a clinical diagnosis of Alzheimer’s disease were found to have evidence of the disease on autopsy, and 36 percent were found to have co-morbid conditions. Of the 21 patients, 12 percent had an incorrect diagnosis of Alzheimer’s disease, but still with either Parkinson’s disease or cerebrovascular disease.

After completing all exams and tests, a health care provider will likely provide one of two diagnoses if evidence of the disease exists:

- Probable AD indicates symptoms are probably due to AD and not some other disorder.
- Possible AD indicates symptoms may be due to AD, but one or more other disorders may contribute to symptoms as well.

Differential diagnosis

In order to bring uniformity to the diagnosis of typical diverse symptoms, a joint National Institute of Health (NIH)/Alzheimer’s Association working group (NINCDS-ADRDA) developed criteria for the clinical diagnosis of probable and possible AD. Of the patients diagnosed with probable AD using these criteria, the diagnosis is confirmed at the time of autopsy by 85-90 percent. The criteria requires a one-year course of decline in two or more areas of cognition such as:

- Memory.
- Language.
- Visuospatial function.
- Orientation.
- Judgment and problem solving.

Pick’s disease (now known as frontal type dementia) is characterized by prominent behavioral disturbances, with relatively preserved cognition. Very likely a history of hypertension, stroke or clear-cut transient ischemic attacks and the presence of localizing signs on neurological exam causes a vascular contribution to the dementia. Other common dementias have prominent motor signs at presentation and have been called “subcortical dementias.”

These include a wide variety of Parkinson-like motor presentations accompanied by fluctuating cognitive abilities and, frequently, hallucinations. Normal pressure hydrocephalus is often raised as a possibility on radiological studies. It should only be seriously considered when the dementia is mild and follows a more severe gait disturbance. Incontinence is variable.

FOLLOWING A DIAGNOSIS

The course of the disease and how fast the changes occur will vary from person to person. On average, AD patients live from eight to 10 years after they are diagnosed. However, the disease can last as long as 20 years.

Younger onset patients may have somewhat more aggressive courses, with prominent language and visuospatial problems. Those individuals with onset in their 80s often have primarily memory loss and a more gradual decline. Delirium or acute confusion is a common complication even with fairly mild metabolic derangements.

Even if it is expected, a diagnosis of AD can come as a shock. There is much that one can do in the early stages that can help to make life easier and more enjoyable. Once AD has been diagnosed, it is important to consider what to do next.

- **Maintain independence.**
  A person who has been diagnosed should be encouraged to remain as independent as possible and to continue to enjoy their usual activities and occupations. There is advice and support now available.

- **Research community care services.**

Services arranged by local advocates are known as community care services. They vary from area to area but may include:

- Day care services.
- Equipment and adaptations.
- Home care services.
- Respite care and residential and nursing care.

- **Arrange for financial obligations.**
  A person with AD should arrange their financial and legal affairs while they are still able to do so. The family can receive advice from a lawyer when completing legal documents to check that documents are completed correctly and are legally valid. Local legal aid affiliates can provide a list of attorneys with experience helping people with AD.

It is important that all legal papers are in order and can be easily accessible. These documents could include bank and building society statements, mortgage or rent documents, insurance policies, a will, tax and pension details, bills and guarantees. It might be a good financial decision to set up direct debits or standing orders for regular bills, so that no one has to remember to pay them.
Keep in mind the following suggestions to help a diagnosed individual and family cope with a positive diagnosis:

- All members of the family should be honest about their feelings.
- Be positive by concentrating on the things that one can do instead of things that have become too difficult to do.
- Keep a sense of humor.
- Rebuild self-confidence after the initial shock of the diagnosis.
- It is important that the diagnosed individual tell people that he or she has a memory problem.

- Do not be embarrassed to ask friends and family to repeat or explain things.
- Do not fear asking for help and accepting it.
- Do not rush thoughts but concentrate on specifics.
- Plan difficult tasks during the times of the day when the individual normally feels best.
- Avoid overstimulations as too much noise and activity creates anxiety and confusion for some individuals.
- When frustrated about things not going well, do not self-blame.

### Evaluating the drugs used to treat Alzheimer’s disease

The medicines used to slow mental decline in people with Alzheimer’s disease are not particularly effective, with only 10 to 20 percent more people taking an Alzheimer’s drug benefiting them. To date there is little to predict who will respond and who will benefit from one of the five drugs approved to treat Alzheimer’s disease. The decision to begin a drug is largely based on whether the treatment is worth the cost and the risk of side effects.

- **Considering the cost** – Averaging $148 to $195 a month, the Alzheimer’s drugs are costly and may not be worth the added cost if the patient must take many other medicines. This is true even if insurance or Medicare coverage helps pay since out-of-pocket payments can still be quite steep.
- **Considering the side effects** – While the long-term adverse effects of the Alzheimer’s drugs have not been fully evaluated, short-term side effects are either mild or reversible when a person stops taking the medicine. On this basis, many people with Alzheimer’s disease may opt to try one of the drugs for six months to one year to see if it helps.

Based on the evidence of their effectiveness, side effects, tolerability, flexibility of use and cost, the following prescription drugs have been identified as Consumer Reports Best Buy Drugs to treat Alzheimer’s disease:

- Donepezil (Aricept) – early-stage Alzheimer’s disease meds.
- Galantamine (Razadyne) – early-stage Alzheimer’s disease meds.
- Memantine (Namenda) – middle-stage and late-stage Alzheimer’s disease meds.

Aricept’s and Razadyne’s lower risk of adverse effects and higher tolerability justify their choice, but Namenda is the only drug approved by the Food and Drug Administration to treat people with middle to late-stage Alzheimer’s disease.

### A closer look at neurons

The billions of neurons in the brain send messages, or impulses, to one another. Each neuron has branch-like structures. Some of these branch-like structures bring impulses to the neuron. Others carry impulses away from the neuron. This relaying of impulses from neuron to neuron in the brain is what makes it possible for us to carry out mental and physical tasks.

**Remember:** Evidence of significant vascular disease can be found in as many as one-third of cases of AD.

### Looking toward the future

In the future, the prevalence of Alzheimer’s disease is expected to increase to 11.3-16 million cases in America by 2050. It is helpful to keep these additional statistics in mind:

- 19 million people have had a family member with Alzheimer’s in the U.S.
- Nearly 50 percent of people over 85 in the U.S. have Alzheimer’s.
- AD was the eighth-leading cause of death in 1999 and 2000.
- There were 31,145 deaths from AD in women in the U.S. 1999.

- $80 billion to $100 billion is spent each year in health care expenses and lost wages of both patients and their caregivers.
- The average lifetime cost of care for an AD diagnosed individual is $170,000.
- 7,900 patients were hospitalized with Alzheimer’s as a primary diagnosis in the United States in 2000.
- The U.S. government spent an estimated $640 million for research of the disease in America 2003.
Conclusion

The cause of Alzheimer’s disease continues to remain somewhat of a mystery. There is no single factor that leads to an Alzheimer’s diagnosis. Some experts say that the most reliable way to diagnose the disease is after a patient has died by means of an autopsy of the brain. An autopsy can show the plaques and tangles that are considered characteristic of Alzheimer’s disease. In recent years, advances in technology and medical research are helping us to identify more and more factors that are associated with the progression of the disease. In moving toward a diagnosis, doctors can now consider many of the following:

- Typical brain changes.
- Risk factors.
- Genes or heredity.
- Diagnostic markers.
- Cognitive deficits and behavioral changes.

Professionals now believe they can diagnose Alzheimer’s with a greater degree of certainty by applying a number of tests and measures, even very early in the course of the disease. A hands-on physical exam and in-depth interviewing of patient and family are part of the process, along with various medical and psychological tests. When other causes of symptoms have been ruled out, the diagnosis is “probable” or “possible” Alzheimer’s disease, even though the certainty is in the 90 percent range. If there is any significant doubt about the diagnosis, a doctor will ask for a re-evaluation in six months to check for a progression of symptoms.

Doctors cannot diagnose AD in living people from any single lab test, scan, or exam; they can only definitively identify the disease from brain-tissue samples after death. Instead, health care providers compile results from a variety of sources to reach a diagnosis. With current methods, health care providers can diagnose AD with 90 percent accuracy.

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ALZHEIMER’S DIAGNOSTIC BASICS FOR MENTAL HEALTH PROFESSIONALS

Final Examination Questions

Select the best answer for each question and then proceed to www.EliteCME.com to complete your final examination.

1. It has been reported that the average length of time between the onset of symptoms and the diagnosis of Alzheimer’s disease was:
   a. 1 year.
   b. 1.6 years.
   c. 2 years.
   d. 2.8 years.

2. Which of the following statements is NOT true regarding Alzheimer’s disease?
   a. Alzheimer’s disease is the leading cause of dementia.
   b. Men diagnosed with Alzheimer’s disease tend to live longer than women diagnosed with the disease.
   c. The duration of survival following a diagnosis of the disease depends on the subject’s age at diagnosis.
   d. The life span of a person age 65 diagnosed with Alzheimer’s disease could be reduced by 67 percent.

3. Genetics play a vital role in the research of Alzheimer’s disease. Which of the following is a true statement?
   a. Alzheimer’s disease is caused by a single gene.
   b. The more individuals in a family, the greater the risk of developing Alzheimer’s disease.
   c. Having a parent or sibling with Alzheimer’s does not increase the risk of developing the disease.
   d. Sporadic Alzheimer’s disease is a rare form, affecting less than 10 percent of AD patients.

4. Alzheimer’s disease can be definitely diagnosed:
   a. In the early stages.
   b. In the mid stages.
   c. In the late stages.
   d. After death.

5. A brief exercise that the doctor can use to test a person’s problem solving skills, attention span, counting skills and memory is called:
   a. Neuropsychological testing (NT).
   b. Differential diagnosis testing (DDT).
   c. Mini-Mental State Examination (MMSE).
   d. Clinical Alzheimer’s Association testing (CAAT).