



Learning Series - #14



Making sense of Alzheimer's



World Alzheimer's Awareness Day
September 21, 2021

Alzheimer's is the most common form of dementia, accounting for 60-80% of all diagnoses. It's a progressive disease, there is no cure, but the symptoms can be treated. The diagnosis is made both clinically and through imaging. On brain scans, plaques of a protein called beta-amyloid and fiber clumps/tangles looking like railroad tracks are hallmark findings of the disease, but not a conclusive finding yet. These plaques and clumps prevent signals and nutrients from reaching their destination, causing the following symptoms: memory decline, personality changes, and decreased ability to complete activities of daily living (ADLs). Alzheimer's attacks all parts of the brain, whereas other forms of dementia may only attack one portion.

Forms of Alzheimer's

1. **Sporadic** – non-hereditary, multi-factorial (genes, environment, lifestyle), with age being the greatest factor. Disease typically begins after age 60-65
2. **Familial** – hereditary, accounts for less than 5% of all cases; children have a 50% chance of inheriting the disease-causing gene and symptoms can develop at any age

Effects of the disease

1. **Reduced cognitive/functional abilities**
 - a. Understand, think, remember and communicate will be affected over time
 - b. Inability to make decisions, making even simple tasks difficult to complete or forgotten
 - c. Confusion in conversation or in activities of daily living begin to occur
 - d. Symptoms usually begin a few years prior to diagnosis
2. **Emotions and moods**
 - a. Loss of interest in hobbies
 - b. Reduced expressiveness and more withdrawn as disease advances
 - c. Depression and anxiety
3. **Behaviours**
 - a. Reactions to events around them may be out of character
 - b. Repeating actions or words, hiding possessions/suspiciousness, physical outbursts and restlessness
4. **Physical abilities**
 - a. Declines in coordination and mobility, affecting ADLs such as eating, bathing and getting dressed



Treatment



There are **4 medications** that, when used in early stages, can help slow the progression:

- mild/moderate Alzheimer's: Galantamine, Rivastigmine
- moderate/advanced Alzheimer's: Donepezil, Memantine



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The Global Deterioration Scale (GDS)

| Stage | Typical Symptoms |
|--|--|
| Stage 1: No cognitive decline (normal function) | <ul style="list-style-type: none"> No memory problems |
| Stage 2: Very mild cognitive decline (may be normal age related changes or earliest signs of Alzheimer's disease) | <ul style="list-style-type: none"> Memory lapses Forgetting familiar names and locations of objects These lapses are not typically obvious to others |
| Stage 3: Mild cognitive decline (early stage Alzheimer's disease can be diagnosed in some, but not all individuals with these symptoms) | <ul style="list-style-type: none"> Mild forgetfulness Difficulty learning new things Difficulty concentrating or limited attention span Problems with orientation, such as getting lost Communication difficulties such as finding their right words Loss or misplacing of valuable objects Difficulty handling problems at work Issues are noticeable to family, friends or co-workers |
| Stage 4: Moderate cognitive decline (mild or early stage Alzheimer's disease) | <ul style="list-style-type: none"> Some memory loss or one's personal history Difficulty with complex tasks e.g., managing finances, shopping, travel Decreased knowledge of current events and recent events Impaired ability to perform challenging mental arithmetic (e.g., counting backward from 75 to 7) |
| Stage 5: Moderately severe cognitive decline (moderate or mid-stage Alzheimer's disease) | <ul style="list-style-type: none"> Major gaps in memory e.g., phone numbers or names of close family members Help is needed with day-to-day tasks |
| Stage 6: Severe cognitive decline (moderately severe or mid-stage Alzheimer's disease) | <ul style="list-style-type: none"> Continued memory loss e.g., occasionally forgetting the name of a spouse or primary caregiver Loss of awareness of recent events and experiences in their lives e.g., not remembering what they had for lunch or their child's graduation Assistance is needed with activities of daily living e.g., getting dressed, bathing Difficulty counting Personality and emotional changes such as confusion, anxiety, suspiciousness, anger, sadness/depression, hostility, apprehension, delusions and agitation Obsession such as repetition of simple activities Disruption of normal sleepwalking cycle Increasing episodes of incontinence |
| Stage 7: Very severe cognitive decline (severe or late-stage Alzheimer's disease) | <ul style="list-style-type: none"> Severe cognitive impairment Vocabulary becomes limited and verbal abilities eventually disappear Loss of ability to walk independently and sit without support Help is needed with eating and using toilet; usually incontinent |

Modified from Global Deterioration Scale, Reisberg, 1982



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Diagnosis

1) Rule out other conditions that could be causing or contributing to symptoms:

other health conditions: signs of past strokes, Parkinson's disease, depression or other medical conditions. Individuals will present to their medical doctor complaining of forgetfulness or decreased memory; this is a very common complaint among elderly individuals and many times the complaints are related to underlying depression or anxiety, not a dementia.

2) Assessing memory problems and other symptoms

a) Mental status tests

• Folstein Mini-Mental State Exam (MMSE):

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

• **Clock drawing test (CDT):** Draw a face of a clock showing all 12 numbers in the right places and a time specified by the examiner. Covers a wide range of cognitive functions, including selective and sustained attention, auditory comprehension, verbal working memory, numerical knowledge, visual memory and reconstruction, visuospatial abilities, on-demand motor execution (praxis) and executive function. Has the capacity to evaluate multi-domain impairments that may go undetected by other cognitive screening instruments, such as the MMSE.

• **The Knopman Delayed word recall (DWR):** Each of ten common words is presented on a 3x5 inch card and simultaneously read aloud. The subject is asked to complete a sentence using each word. This process is repeated. After a five-minute interval, the subject is asked to recall as many words as possible. Those individuals who are unable to recall greater than three of the 10 words have an increased risk of developing dementia.

• **Minnesota Cognitive Acuity Screen (MCAS):** A brief cognitive screening tool that can correctly identify mild to moderate cognitive impairment. MCAS uses DWR and the Verbal Fluency Measure subtests which help make it sensitive to the mildest

forms of cognitive impairment. The test focuses on more than just memory; the Verbal Fluency Measure tests word finding ability and complex thinking.

For example, individuals are given a category (such as animals) and asked to name all of the animals they can in a 30 second period. Through this additional testing, the MCAS can more accurately detect non-Alzheimer syndromes, which are estimated to cause 20-25% of dementia.

b) **Neuropsychological tests:** can include extensive tests to evaluate memory and cognitive skills. They provide as much information on what the individuals can still do as well as what they may have lost

c) **Interviews with friends and family:** observations from family members regarding behavioral changes or memory impairment should be taken seriously.

3) **Laboratory tests:** to rule out other disorders that cause some similar symptoms, such as a thyroid disorder or vitamin B-12 deficiency.

4) Brain imaging tests

- can help rule out other causes, such as hemorrhages, brain tumors or strokes.
- distinguish between different types of degenerative brain disease
- establish a baseline about the degree of degeneration

The brain-imaging technologies most often used are:

- Magnetic resonance imaging (MRI).
- Computerized tomography (CT)
- Positron emission tomography (PET).

Most commonly used is a fluorodeoxyglucose (FDG) PET scan, which can identify brain regions with decreased glucose metabolism. The pattern of metabolism change can distinguish between different types of degenerative brain disease.

The choice of imaging study is determined by the suspected cause of the memory impairment.

MRI is more sensitive than CT scanning in detecting abnormalities, such as small strokes, that could lead to dementia.

Cognitive screening carries a number of important benefits. A firm diagnosis of dementia helps to provide an explanation to patients and families regarding recent changes in instrumental activities of daily living, behavior, intellectual functioning, and mood. Once the diagnosis is established, patient and family can plan for important issues including powers of attorney for property and personal care, living wills for end-of-life care, planning for long-term care, and the preparation of a last will and testament. Further, early diagnosis provides opportunity for medication management, if appropriate, with the hope of improving function, behavior, and cognition.





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Underwriting considerations

- recognize abnormal results and correlate them with other information obtained
- low score on a cognitive screening test does not mean the individual has dementia. It means that other factors must be considered to determine the correct action:
 - functional status
 - diagnostic tests
 - changes in behaviour
 - medications
 - any documentation from a family member or informant regarding the behaviour of the proposed insured
- presence of white matter lesions on brain imaging is a marker for vascular disease and cardiovascular and cerebrovascular disease should be assessed with an eye toward the functional status of the individual.
- many people with early dementia of the Alzheimer type (DAT) can be in good health. Cognitive deficits appear to be the only manifestations of early DAT. A special effort should be made to look for dementia at time of underwriting because many dementias in early stages go unnoticed, even by attending physicians.



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