Alzheimer's Disease: Occupational Therapy

Indexing Metadata/Description

› Title/condition: Alzheimer’s Disease: Occupational Therapy
› Synonyms: Alzheimer dementia; Alzheimer disease; senile dementia of Alzheimer type (SDAT); primary degenerative dementia of the Alzheimer type (DAT); presenile dementia; Alzheimer dementia: occupational therapy; Alzheimer disease: occupational therapy; Alzheimer's dementia: occupational therapy; senile dementia of Alzheimer type: occupational therapy; SDAT: occupational therapy; major neurocognitive disorders (NCD): Occupational Therapy
› Anatomical location/body part affected: Cerebral cortex of the brain
› Area(s) of specialty: Acute care, neurological rehabilitation, home health, geriatrics
› Description
  • Alzheimer’s disease (AD) is an adult neurological, degenerative disease of the cerebral cortex of unknown cause that impairs memory, language, judgment, and social and occupational functioning, ultimately resulting in death
  • In May 2013, the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) was published and in this edition the term “dementia” was replaced with “major neurocognitive disorder (NCD).” According to the DSM-5, NCD exists on a spectrum defined by the extent of cognitive and functional impairments. The term mild NCD refers to cognitive impairment that does not interfere with independence but results in the need for occasional assistance, increased time to complete activities, or use of compensatory strategies. The term major NCD refers to cognitive impairment that is so severe that it results in considerable functional impairments and the individual requires assistance to complete activities of daily living (ADLs). DSM-5 authors note that the terms mild NCD and major NCD are inherently arbitrary and that the diagnosis will be based on the physician’s careful history taking and observation to determine and appropriately label the extent of impairment. According to the DSM-5, AD is defined as “major or mild neurocognitive disorder due to Alzheimer’s disease.” Diagnostic criteria for AD in the DSM-5 includes an insidious onset and gradual progression in one or more cognitive domains
  • Onset is typically after age 65 and in the United States two-thirds of those affected are female
  • Stages
    – Stage 1
      - Lasts 2-4 years
      - Orientation is affected
      - Reduced functional skills
      - Confabulation is common
      - Inability to complete meaningful activities such as driving and household tasks
      - Depression might occur
      - Patient is often unable to remain living independently
    – Stage 2
      - Memory loss advances
      - Wandering
- Loss of speech
- Inability to motor plan effectively
- Decline in appetite
- Agitation
- Delusions/hallucinations
  - Stage 3
- Dependent care
- Mutism
- Loss of motor skills
- Inability to take food/drink by mouth
- Incontinence

• A presumptive, preclinical diagnosis can also be made based on imaging (Pittsburgh compound B and PET) and/or biomarkers (e.g., total tau, phosphorylated tau $\tau_{181}$, and $A\beta_{42}$)\(^{(40)}\)

• For more information on Alzheimer’s disease (AD), see Clinical Review...Alzheimer’s Disease: Item Number: T708728

› ICD-9 codes
  • 331.0 Alzheimer’s disease
  • 290.0 senile dementia, uncomplicated
  • 290.1 presenile dementia
    – 290.10 presenile dementia, uncomplicated
    – 290.11 presenile dementia with delirium
    – 290.12 presenile dementia with delusional features
    – 290.13 presenile dementia with depressive features
  • 290.2 senile dementia with delusional or depressive features
    – 290.20 senile dementia with delusional features
    – 290.21 senile dementia with depressive features
  • 290.3 senile dementia with delirium
  • 290.8 other specified senile dementia with delirium
  • 290.9 unspecified senile psychotic condition

› ICD-10 codes
  • G30.0 Alzheimer’s disease with early onset
  • G30.1 Alzheimer’s disease with late onset
  • G30.8 other Alzheimer’s disease
  • G30.9 Alzheimer’s disease, unspecified
  • F02.80 dementia in other diseases classified elsewhere without behavioral disturbance
  • F02.81 dementia in other diseases classified elsewhere with behavioral disturbance
  • F03.90 unspecified dementia without behavioral disturbance
  • F03.91 unspecified dementia with behavioral disturbance
  • F05 delirium due to known physiological condition
  • G31.84mild cognitive impairment, so stated

(ICC codes are provided for the reader’s reference, not for billing purposes)

› G-Codes
  • Mobility G-code set
    – G8978, Mobility: walking & moving around functional limitation, current status, at therapy episode outset and at reporting intervals
    – G8979, Mobility: walking & moving around functional limitation; projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
    – G8980, Mobility: walking & moving around functional limitation, discharge status, at discharge from therapy or to end reporting
  • Changing & Maintaining Body Position G-code set
    – G8981, Changing & maintaining body position functional limitation, current status, at therapy episode outset and at reporting intervals
–G8982, Changing & maintaining body position functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
–G8983, Changing & maintaining body position functional limitation, discharge status, at discharge from therapy or to end reporting

• **Carrying, Moving & Handling Objects G-code set**
–G8984, Carrying, moving & handling objects functional limitation, current status, at therapy episode outset and at reporting intervals
–G8985, Carrying, moving & handling objects functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
–G8986, Carrying, moving & handling objects functional limitation, discharge status, at discharge from therapy or to end reporting

• **Self Care G-code set**
–G8987, Self care functional limitation, current status, at therapy episode outset and at reporting intervals
–G8988, Self care functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
–G8989, Self care functional limitation, discharge status, at discharge from therapy or to end reporting

• **Other PT/OT Primary G-code set**
–G8990, Other physical or occupational primary functional limitation, current status, at therapy episode outset and at reporting intervals
–G8991, Other physical or occupational primary functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
–G8992, Other physical or occupational primary functional limitation, discharge status, at discharge from therapy or to end reporting

• **Other PT/OT Subsequent G-code set**
–G8993, Other physical or occupational subsequent functional limitation, current status, at therapy episode outset and at reporting intervals
–G8994, Other physical or occupational subsequent functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
–G8995, Other physical or occupational subsequent functional limitation, discharge status, at discharge from therapy or to end reporting

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<td>CH</td>
<td>0 percent impaired, limited or restricted</td>
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<tr>
<td>CI</td>
<td>At least 1 percent but less than 20 percent impaired, limited or restricted</td>
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<td>CJ</td>
<td>At least 20 percent but less than 40 percent impaired, limited or restricted</td>
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<tr>
<td>CK</td>
<td>At least 40 percent but less than 60 percent impaired, limited or restricted</td>
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<tr>
<td>CL</td>
<td>At least 60 percent but less than 80 percent impaired, limited or restricted</td>
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<tr>
<td>CM</td>
<td>At least 80 percent but less than 100 percent impaired, limited or restricted</td>
</tr>
<tr>
<td>CN</td>
<td>100 percent impaired, limited or restricted</td>
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› **Reimbursement**: Reimbursement for therapy will depend on insurance contract coverage; no specific issues or information regarding reimbursement have been identified
Presentation/signs and symptoms

- An estimated 5.2 million Americans have AD, with 6% aged 65-74 years, 44% aged 75-84 years, and 46% over age 85 years

- Signs and symptoms
  - Memory loss, typically reported by family members/caregivers
  - Personality changes
  - Inability to learn and remember information
  - Difficulty with familiar activities
  - Limited reasoning
  - Impaired judgment
  - Disorientation with regard to people, places, and situations
  - Creation of imaginary experiences to compensate for memory loss
  - Apathy; lack of personal interest; withdrawal
  - Apraxia
  - Delusions and hallucinations
  - Limited attention to personal hygiene
  - Visual spatial impairment
  - Falls
  - Agitation
  - Psychosis
  - Word-finding difficulties

Causes, Pathogenesis, & Risk Factors

- Causes
  - Largely unknown
  - Early-onset cases are presumably genetically linked
    - With relation to genetically linked cases, specific genes have been identified that can impact susceptibility
    - Possible autosomal dominant genetic link with regard to chromosomes 1, 14, 19, and 21
      - Initially involves an accumulation of amyloid beta, followed by synapse dysfunction and eventual neuron loss

- Pathogenesis
  - For early-onset cases:
    - A mutation of a gene on chromosome 21, the gene that produces amyloid precursor protein
    - As a result of the mutation of chromosome 21, amyloid protein deposits form
    - Amyloid protein deposits inhabit neuritic plaques and arterial walls
    - These protein deposits and materials accumulate in extracellular space of the brain
    - These proteins accumulate in the extracellular space of the brain and likely lead to the development of AD

- Risk factors
  - Age over 65 years
    - In women, more common after the age of 80
    - In men, more common before the age of 80
  - Smoking
  - Down syndrome (DS)
    - Approximately 25% of adults with DS over the age of 35 have some signs and symptoms of AD
    - Prevalence of AD-related dementia in adults with DS over the age of 60 is over 40%
    - Adults with DS who do develop dementia (such as or similar to AD) and cognitive deterioration may also demonstrate impairments in executive function and significant changes in behavior
    - For additional information on DS, see the series of Clinical Reviews on this topic
  - Having a first-degree relative diagnosed with AD
• Apolipoprotein E (APOE) gene e4 allele increases risk of development of late onset AD

• Depression

• Cardiovascular disease and atherosclerotic disease

• Myocardial infarction

• History of mild cognitive impairment (MCI)

**Overall Contraindications/Precautions**

› As the patient often has difficulty with orientation, all considerations should be made both verbally and visually to orient the patient to who the clinician is, where he or she is, and where he or she will be going if there is a transition to a treatment room or group situation occurring

› Due to impaired memory and loss of skills, supervision is critical to patient safety for the prevention of wandering and becoming lost, as well as to assist with orientation in unfamiliar surroundings

› Due to changes in personality and mood, irritability can occur, which might impact participation and cooperation

› Patients are at risk for “sundowning” (where a patient experiences heightened confusion in the evening, leading to increased agitation, wandering, anxiety, and opposition)

› Motor planning becomes challenging due to impaired cognition and an inability to remember once familiar processes, which may also lead to agitation

› Transitions should be carefully planned with regard to any change in the routine or living situation; the patient should be involved in the process with repeated notice and visitations to reduce negative responses

› Temperature of the therapeutic and home environment is critical and should remain at least 70° F (21° C), as people with AD are at risk for hypothermia because they often forget to wear appropriate clothing for the ambient temperature

› Whenever possible, information provided by the patient should be verified by family or caregiver(s)

› Report signs of elder abuse or neglect

› See specific **Contraindications/precautions to examination** and **Contraindications/precautions** under **Assessment/Plan of Care**

**Examination**

› **Contraindications/precautions to examination**
  • Take note of any recent illness or changes in medications that may contribute to a change in mental status or cognitive functioning (e.g., urinary tract infection [UTI], depression medication changes)
  • The clinician should be cognizant of his or her instructions and ensure commands or inquiries are kept simple/concise
  • The clinician should monitor patient agitation level throughout exam and discontinue assessment if necessary, as indicated by the patient’s tolerance

› **History**
  • **History of present illness/injury**
    – **Mechanism of injury or etiology of illness:** The diagnosis of AD is based upon clinical history, results of physical and neurologic examinations, and the use of accepted diagnostic criteria. While a physician is the professional to make a diagnosis of AD, he or she may request that the patient be seen by other healthcare professionals before making the diagnosis. If the patient presents with a diagnosis of AD, when was the diagnosis made?
    - Has there been any report of memory loss, personality changes, and/or impaired judgment or orientation reported by patient or family members?
    - Is there a lack of interest in activities previously valued?
    - Are language skills recently impaired?
    - Is there a familial history of AD?
    - How much time has passed since onset of symptoms?
    - What is the rate of symptom progression?
    - For what specific deficits is the patient seeking therapy?

  – **Course of treatment**
    - **Medical management**
      - Medical management will vary greatly depending on the symptoms and the stage of the disease. In general, the patient’s symptoms are managed with medication
- **Medications for current illness/injury**
  - There is no medication to completely stop the progression of or cure AD\(^2\)
  - Acetylcholinesterase inhibitors such as donepezil (Aricept), rivastigmine (Exelon), and galantamine (Razadyne) can be used to enhance memory\(^3\)
  - Authors of a study using functional MRI (fMRI) conducted in the United Kingdom found that the use of donepezil increased brain activation for visuospatial processing in patients with AD\(^1\)
  - Selective serotonin reuptake inhibitors (SSRIs) might be used to treat depression in patients with AD\(^3\)
  - Trazodone, zolpidem (Ambien), zaleplon (Sonata), or ramelteon (Rozerem) might be used to treat insomnia in patients with AD\(^3\)
  - Benzodiazepines, buspirone, or SSRIs might be used to treat anxiety in patients with AD\(^3\)
  - Risperidone (Risperdal), carbamazepine (Tegretol), or memantine (Namenda) might be used to manage agitation in patients with AD\(^3\)
  - Methylphenidate (Ritalin) is well tolerated by patients with AD and can decrease apathy/improve participation in ADLs\(^1\)
  - Vitamin E (alpha tocopherol) might be useful in mild to moderate AD to slow the progression
  - Authors of a randomized controlled trial (RCT) involving 561 patients throughout the United States and Puerto Rico with probable mild to moderate AD (TEAM-AD trial) found that high-dose(2000IU/day) vitamin E resulted in slower functional decline over time compared with placebo\(^4\)
  - Anticholinergic drugs are contraindicated in patients with AD\(^3\)
  - Is the patient compliant with taking medications? Does the patient and/or caregiver feel the medications are helping with symptoms?

- **Diagnostic tests completed:** Testing will be completed to rule out other causes of symptoms; diagnosis of AD includes the exclusion of other diagnoses or etiologies for the clinical presentation
  - Although controversial, MRI or CT scan to rule out other diagnoses might be appropriate\(^2\)
  - Authors of a study conducted in China with 66 patients with AD found that the presence of subcortical ischemic lesions as seen on MRI was associated with poorer functional status as measured by the Physical Self-Maintenance Scale (PSMS)\(^5\)
  - Positron emission tomography (PET) scan to differentiate AD from frontotemporal dementia\(^3\)
  - First approved by the United States Food and Drug Administration (FDA) in 2012, an Amyvid PET scan (Florbetapir) for amyloid imaging is a relatively new test that can assist physicians in diagnosing the underlying cause of memory loss. A positive result on this test supports AD as the underlying cause of memory impairment in an adult undergoing workup for AD. A negative result will trigger the need for additional tests so that the diagnostic team can accurately diagnose and treat the underlying cause of memory loss\(^4\,5\)

- **Home remedies/alternative therapies:** Document any use of home remedies or alternative therapies (e.g., acupuncture) and whether or not they help
  - Results of studies with ginkgo biloba extracts are conflicting in studies for treatment of AD\(^3\)
  - Although sometimes used by patients with AD, studies have not found coenzyme Q10 or huperzine to be effective in improving symptoms of AD\(^3\)

- **Previous therapy:** Document whether patient has had occupational, physical, or speech-language therapy for this or other conditions and what specific treatments were helpful or not helpful. What education about the condition have the patient and/or caregivers received?

- **Aggravating/easing factors:** Ask the patient and caregivers if they have determined what worsens or alleviates symptoms. Patients with AD are not always able to provide reliable information about symptoms. Additionally, patients with AD often get agitated when asked questions pertaining to their memory loss, cognitive decline, or symptoms that could be interpreted as inappropriate behavior. For these reasons, it is important to include the caregiver when gathering this type of information
  - Are there any strategies used by the caregiver(s) that are successful in calming the patient if sundowning occurs?

- **Body chart:** Use body chart to document location and nature of symptoms

- **Nature of symptoms:** Interview patient and caregiver with regard to current symptoms (e.g., memory loss, disorientation, impaired executive functioning, impaired ADLs) as well as overall progression of symptoms
Pattern of symptoms: Document changes in symptoms throughout the day and night, if any (A.M., mid-day, P.M., night). Changes in symptoms can be related to alterations in the physical setting, time of day, and noises/sounds.

Sleep disturbance: Sleep disturbances are common in patients with AD(2).
- Document number of wakeings/night and presence of sundowning as well as alterations in sleep/wake cycles and daytime sleepiness.

Other symptoms: Document other symptoms patient is experiencing that could exacerbate the condition and/or symptoms that could be indicative of a need to refer to physician.
- AD patients with psychotic symptoms are likely to have increased functional deficits compared AD patients without psychotic symptoms.
- Authors of a longitudinal cohort study of 234 AD patients in Canada found that increased psychotic symptoms correlated with a deterioration in ability to complete basic ADLs(45).

Current nutritional intake/method: Identify if the patient has a diminished appetite; determine from patient/caregiver if appropriate nutrition is being obtained.

Respiratory status:
- Does patient require supplemental oxygen? Is respiratory status compromised?

Barriers to learning:
- Are there any barriers to learning? Yes__ No__
- If Yes, describe: Due to the nature of AD, barriers to learning include the decline of a patient’s ability to participate in the learning of new tasks. Assessment should occur during the natural course of the patient’s routines to gain a more accurate understanding of his or her skill level. Agitation and irritability can also be present, impacting a patient’s participation in tasks and the learning of new skills.

Medical history:
- Past medical history
  - Comorbid diagnoses: Ask patient and family/caregiver about other diagnoses, including depression and cardiovascular disease.
  - Patients with AD and comorbid depression are at increased risk of stroke(12).
  - Medications previously prescribed: Obtain a comprehensive list of medications prescribed and/or being taken (including over-the-counter drugs).
  - Prescription medication might impact the rate of deterioration observed in individuals with AD(13).
    - Based on an observational study with 224 subjects conducted in Greece.
    - Participants had a diagnosis of probable AD and were followed for 1 year.
    - Medications that were associated with an accelerated rate of deterioration (compared with patients not on these medications) included:
      - Antipsychotic drugs
      - Sedatives
    - Medications that were associated with a reduced rate of deterioration (compared with patients not on these medications) included:
      - Medications licensed for dementia
      - Medications impacting the renin-angiotensin system
      - Statins
  - Other symptoms: Ask patient/caregivers about other symptoms patient is experiencing.

Social/occupational history:
- Patient’s goals: Document what the patient and family hope to accomplish with therapy and in general to promote/maintain as much independence as possible. For example, if the patient is currently living at home with caregivers, be sure to ask the caregivers to report on what their primary concerns are and what would be the most beneficial skill areas to target, so the patient can remain as independent as possible within the home environment.
- Vocation/avocation and associated repetitive behaviors, if any: Does the patient participate in recreational activities? What are the patient’s previous and current interests (information obtained in an effort to assist with appropriate treatment plans which enhance motivation)? What are the patients’ previous and current occupations and roles (e.g., husband, wife, father, mother, grandparent)? These prior responsibilities can assist guidance of treatment planning and provide motivation to participate in tasks.
- Functional limitations/assistance with ADLs/adaptive equipment: What current adaptive equipment or modifications are available to the patient at home? Can they still be utilized based on the patient’s current functioning level? Document
any other strategies put into place such as memory aids. What is the patient’s current status in terms of independence with ADLs?

- **Living environment:** Inquire about home layout (e.g., stairs, number of floors in home, with whom does patient live [e.g., caregivers, family members]); identify if there are barriers to independence in the home; any modifications necessary? Will the patient be able to remain in the home environment and be safe?
  - How have the family/caregivers been handling the symptoms? What strategies have they already put in place? Which ones are successful? Which ones are not working? Has the family recently moved the patient in with a family member or into a care facility? Has one family member taken on all the burden?

- **Relevant tests and measures:** (While tests and measures are listed in alphabetical order, sequencing should be appropriate to patient medical condition, functional status, and setting.) It is critical to obtain a caregiver input during the evaluation of a patient with AD. As the nature of the disease is degenerative, the patient might not be an accurate historian. Evaluation will likely reveal declining cognitive function and that attempting to process novel information is more challenging than performing previously ingrained, familiar motor skills. Depending on the stage of the disease, end-stage clients might have lost language skills with significantly impaired mobility and ROM, requiring total dependent care. Evaluation of the patient should include a combination of standardized testing for cognitive status, coupled with observation of functional activities in the natural context of the patient’s daily routines. The level of functioning will vary depending upon the stage of the disease; modify evaluation accordingly

  - **Arousal, attention, cognition (including memory, problem solving)**
    - Document patient’s level of arousal and ability to communicate
    - Assess memory for ability to follow directions (single and multistep), sustain attention to task, and ability to problem solve both familiar and unfamiliar tasks
    - Evaluate orientation to person, place, time, and situation
      - Mini-Mental State Examination (MMSE) to assess cognitive skills
      - Functional Assessment Staging Scale (FAST) to assess cognitive regression or decline, and to assist with staging AD
      - Allen Cognitive Level Screen (ACLS) to gather quick information regarding a patient’s functional abilities
      - Allen Diagnostic Module (a more in-depth assessment using craft activities) to evaluate cognitive function and ability for new learning
      - Alzheimer's Disease Assessment Scale (ADAS): an assessment of cognitive-linguistic abilities developed for patients with AD
        - Authors of a study conducted in the United States with 788 patients with mild AD or subjective complaints of memory impairment found that the addition of a delayed recall subtest to the ADAS increased measurement precision. Additionally, poorer scores on the delayed recall subtest was associated with poorer performance on IADLs
        - Functional Independence Measure-Cognition (FIM-C)
        - Authors of a cross-sectional study from Japan that included 37 AD patients found correlations between the FIM-C and MMSE. The FIM-C profile used with patients who have dementia reflects global cognitive function and can be used to evaluate language disorders
        - In addition to noting cognitive deficits, it is important for the speech-language pathologist (SLP) to make a statement regarding the patient’s relative cognitive strengths
        - The rate of decline of individual cognitive functions varies in the person with AD; social interaction and response to the patient’s own name might be preserved even when the MMSE score is below 5
        - For detailed information about the SLP’s role in therapy for patients with AD, see Clinical Review...Alzheimer's Disease: Speech Therapy; Item Number: T708913

  - **Assistive and adaptive devices**
    - Document use of, independence with, and effectiveness of assistive technology and adaptive devices or techniques to assist with grooming/hygiene, such as long-handled sponges/reachers, and clothing without fasteners
    - Patients with AD can benefit from verbal-instruction technology. In a study conducted in Italy, researchers found improved participation in ADLs as well as improved mood in 9 subjects with AD when technology (such as MP3 player or walkman) with verbal instructions was used to cue the patients during shaving, makeup application, and meal/snack preparation
    - Does the patient have any positioning devices (e.g., supportive chair, wheelchair, cushion, pressure-relieving cushions or mattress) for use during the day?
– Ask the caregiver to report on whether the patient consistently remembers to utilize the adaptive equipment and whether the caregiver is required to be present to provide supervision and cueing, as well as to ensure the device is utilized as indicated for safety
– Document cognitive aids currently in use such as memory aids, picture schedules, calendars, and pre-measured medications
– Document any other environmental measures the family has put in place to reduce symptoms such as agitation and wandering (e.g., locks, alarms, motion detectors)

**Balance**
– Evaluate static and dynamic balance formally if possible, and/or functionally during ADLs
  - Berg Balance Scale
  - Functional Reach Test

**Cardiorespiratory function and endurance**
– Evaluate pulse and vital signs regularly pre/during/post activity
– Monitor breathing/respiration rate to assist with determining fatigue and endurance levels; use the Borg Rating of Perceived Exertion (RPE) Scale if the patient is able to understand the concepts in the scale

**Circulation**
– Monitor for signs of good circulation, especially in the client at end stage of the disease, who might not demonstrate volitional/purposeful movement
– Skin should be without discoloration
– Extremities should be warm to touch

**Ergonomics/body mechanics**
– Observe body mechanics during functional tasks
– Observe caregiver’s body mechanics if assisting with functional tasks

**Functional mobility** (including transfers)
– Evaluate level of independence and degree of mobility during transfers and ADLs
– Monitor safety awareness
– Utilize FIM

**Gait/locomotion**
– Document previous and current mobility status
– Document presence of any gait devices and/or use of wheelchair
– Refer to physical therapist (PT) if appropriate
  - In a 12-month prospective cohort study conducted in the United States of 125 patients (62.4% female and 96% white) with preclinical AD, patients were found to be at risk for falls, indicating that patients are at risk even before cognitive impairment begins[40]

**Joint integrity and mobility**
– Document any contractures
– In end-stage patients, monitor joint and limb positioning and utilize splinting as indicated to maintain integrity

**Motor function (motor control/tone/learning)**
– Assess fine motor coordination through observation of functional ADLs and leisure tasks
– Assess muscle tone as indicated and appropriate, may utilize Modified Ashworth Scale
– Assess motor control by describing amount and quality of specific movements

**Muscle strength**
– Manual muscle testing (MMT) if patient is able to follow the directions and has no tone or coordination issues; otherwise, observe strength during functional tasks

**Observation/inspection/palpation** (including skin assessment)
– Inspect the skin and document any bruising, circulatory changes, or skin breakdown

**Perception** (e.g., visual field, spatial relations)
– Document patient’s use of vision during tasks; does patient attend to all items present in his or her visual field?
– Evaluate for visual discrimination, visual pursuits, saccades, and the presence of visual scanning
– Evaluate for figure ground discrimination during functional tasks
– For detailed information about assessing for visual dysfunction, see *Clinical Review...Visual Dysfunction: Occupational Therapy*; Item Number: T708963
• **Posture**
  – Document static/dynamic posture in both sitting/standing throughout a variety of tasks
  – Document posture while positioned in wheelchair, seating device, or standard chair

• **Range of motion**
  – Assess AROM and PROM of both extremities
  – Note pain response via report or facial grimacing with any active movement or stretching
  – Document location and presence of contractures

• **Self-care/activities of daily living:** The ability to perform ADLs declines as AD progresses\(^{(16)}\)
  – Assess safety and ability to perform ADLs: brushing teeth, combing hair, dressing upper and lower extremities, clothing management, using the toilet, applying makeup or shaving the face, bathing, eating
    - Patients with AD aged 75 years and older are at increased risk for poor oral health and poor oral hygiene\(^{(12)}\)
    - Authors of a study conducted in Japan of 150 patients with AD found that independence in eating was maintained in patients with a “mild” or “moderate” severity of dementia rating; independence in eating was significantly reduced for patients whose severity of dementia rating was “severe.”\(^{(18)}\) Additionally, as the severity of dementia increased, so did the symptoms of dysphagia\(^{(18)}\)
  – Functional ADLs observation
    - Patient interview
    - Family/caregiver interview
    - The Routine Task Inventory analyzes how a patient will perform specific ADLs, such as bathing, dressing, and grooming, and assigns a cognitive level based on his or her participation to assist the therapist with developing functional goals and to aid in effective treatment planning\(^{(9)}\)
    - The Barthel Index rates self-care, continence, and mobility skills with regard to level of assistance\(^{(4)}\)
    - The Assessment of Motor and Process Skills (AMPS) is a standardized test for ADLs appropriate for patients with AD\(^{(19)}\)
  – Assess IADLs such as driving and car transfers, meal preparation, shopping, and housework\(^{(19)}\)
    - Assess the patient’s ability to use everyday technology (ET) such as remote controls, cell phones, and computers; the ability to use ET is often affected early in the course of AD and can significantly impair the ability to participate in activities around the house and IADLs\(^{(20)}\)
    - Lawton and Brody Instrumental Activities of Daily Living Scale\(^{(19)}\)
      - Includes items related to using the telephone, using public transportation, shopping, meal preparation, housework, and medication and money management

• **Sensory testing**
  – Examine for sensory awareness of the upper extremities, though formal testing may be challenging due to the inability to accurately follow the directions for specific sensory tests such as touch localization, two-point discrimination, and stereognosis. Clinical observation of task completion might provide some information regarding sensory awareness

### Assessment/Plan of Care

› **Contraindications/precautions**
  • Patients with this diagnosis are at risk for falls; follow facility protocols for fall prevention and post fall prevention instructions at bedside, if inpatient. Ensure that patient and family/caregivers are aware of the potential for falls and educated about fall prevention strategies. Discharge criteria should include independence with fall prevention strategies
  • Only those contraindications/precautions applicable to this diagnosis are mentioned below, including with regard to modalities. Rehabilitation professionals should always use their professional judgment
  • Clinicians should follow the guidelines of their clinic/hospital and what is ordered by the patient’s physician. The summary below is meant to serve as a guide, not to replace orders from a physician or a clinic’s specific protocols

› **Diagnosis/need for treatment**
  • Occupational therapy for patients with AD is recommended to allow the patient to improve, restore, or maintain quality of life and maximal functional abilities for as long as possible\(^{(21)}\)
  • Task modification and activity analysis by an occupational therapist (OT) is important so that functional activities can be completed as independently as possible based on the patient’s current cognitive level
• Caregivers might require assistance with incorporating modifications into the home environment and during functional tasks.

Rule out

- Vascular dementia or dementia of other etiology
- Depression
- Cancer
- Parkinson disease
- Huntington’s disease
- Pick’s disease
- Chronic drug abuse and alcoholism
- Liver disease
- Lewy body dementia
- Wilson’s disease
- Supranuclear palsy
- Normal-pressure hydrocephalus
- Thyroid disease
- Pituitary disease
- Dialysis
- Pellagra
- Vitamin B12 deficiency
- Folate deficiency
- Infection
- Heavy metal intoxication (e.g., mercury exposure)

Prognosis

- The prognosis for patients with AD is poor, with a typical life expectancy of 4-8 years after diagnosis. Patients with more severe executive functioning impairment have a worse prognosis (i.e., more rapidly progressing AD). Death often results from an infection (e.g., pneumonia) or body system failure.
- In a study conducted in the United Kingdom of 653 patients with AD, male sex, increased age, presence of psychotic symptoms at baseline, and poor performance on paired-associate learning test were all associated with a poorer overall prognosis.

Referral to other disciplines

- Social work for support groups, community referrals, and placement in nursing facility, if necessary
- Physical therapy to assist with balance, strength, and gait
- Speech therapy for cognitive, language, and swallowing needs
- Support groups (for both patients and caregivers)
- Visiting nurse to assist with homecare as needed
- Psychology or neuropsychology for management psychosocial disturbances
- Refer to geriatrician as indicated, for multiple comorbidities and polypharmacy issues in patients over age 65

Other considerations: Individuals who are caregivers of patients with AD are at increased risk for psychosocial disturbances and should be offered reassurance, education, and provided with access to community resources. Families that receive education and support might experience less caregiver stress, depression, and burnout and participate in more meaningful activities with the patient. Treating a caregiver’s psychological symptoms might decrease the need to transfer the patient with AD to a skilled nursing facility.

Treatment summary

- Treatment activities include motivating the patient to participate in independent and group activities that incorporate exercise, psychosocial skills, arts/crafts, meal preparation, reminiscence tasks, reality orientation, and cognitive skills.
- Occupational therapy programs for patients with AD
  – Occupational therapy practice guidelines for adults with AD recommend (based on at least fair to good evidence) the following:
- Implementation of compensatory and environmental strategies for patients with mild to moderate dementia
- Providing patient-centered (e.g., leisure) activities tailored to the patient with dementia
- Falls prevention programs in hospital and geriatric settings
- Physical training (e.g., balance, gait, flexibility, gait) for falls prevention in older adult patients with cognitive impairments
- Therapeutic cooking groups in residential setting
- Attention-focus groups for visual matching
- Music, body awareness, and mobility training
- Sleep hygiene strategies and sleep routines to improve daytime activities and sleeping at night
- Toileting strategies (e.g., prompted voiding)
- Caregiver education, case management, and stress management
- Home-based intervention for caregivers
- Caregiver support groups

Authors of a systematic review of the studies regarding the efficacy of nonpharmacological therapies for patients with AD found that multicomponent interventions based on caregiver education delayed the need for institutionalization of patients with AD.

- The effects of specific interventions to improve cognition, ADLs, behavior, and mood was similar to the effects obtained by pharmacological interventions
- Authors of the study emphasized that pharmacological and nonpharmacological therapies should be viewed as complementary, with the best outcomes seen when they are used in combination

16 patients with AD who participated in a multifaceted intervention program (including occupational therapy) demonstrated a more stable cognitive status and improved mood.

- 16 patients and their caregivers were selected from a group of 200 in Trieste, Italy
- Patients were between the ages of 60 and 80 with mild-moderate dementia as defined by the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)

In the treatment group
- Patients participated in three 60-minute sessions per week of reality orientation therapy (ROT), occupational therapy, and reminiscence therapy (RT) for 4 months
- Caregivers participated in weekly psychoeducational support groups for 1 hour
- During the weekly psychoeducational groups, caregivers learned about dementia and were educated regarding occupational therapy and ROT principles that could be incorporated into the home environment
- The control group received no form of intervention

- Assessments utilized included the MMSE, Milan Overall Dementia Assessment (MODA), Instrumental Activities of Daily Living (IADL) and Activities of Daily Living (ADL), and the Geriatric Depression Scale (GDS)

- Phase 1 included 24 sessions of ROT for 8 weeks
- Phase 2 included 12 sessions of occupational therapy for 8 weeks focusing on ADLs and IADLs as well as RT activities utilizing items such as old photos and postcards of important people and events from the 1940s through the 1990s, songs, and rhymes
- Caregivers were administered the Brief Symptom Inventory and the Caregiver Burden Inventory prior to the start of therapy, after 2 months, and after 4 months
- The effectiveness of supporting caregiver’s coping skills through support groups was identified as a positive outcome

Environmental modifications
- After short-term, home-based environmental modifications, caregivers of dementia patients reported a positive impact on the patients IADL dependence, and feeling less burdened during care

- Based on an RCT conducted in the United States
- Participants included 202 primary caregivers from Philadelphia from 1993 to 1996 living with a family member diagnosed with AD
- Randomly, 100 were assigned for intervention, 102 were assigned to the control group
- 31 caregivers dropped out of the study
- Inclusion criteria required the patient with AD to need assistance with two areas of self-care and the caregiver to have difficulty managing related behavioral symptoms such as agitation and wandering
- Follow-up was also performed 3 months after the study concluded
- Caregivers reported on their family member’s ability to participate in ADLs, IADLs, and noted behavioral concerns using a modified version of the FIM and the Memory and Behavior Problems Checklist (MBC)
- OTs provided five 90-minute home visits
- The intervention provided recommendations to the primary caregiver on home and behavioral modifications
- Authors of a study of 5 residential care facilities in Canada and the United States for patients with AD found a significant increase in the amount of time residents engaged in leisure activities when the care facility environment was set up in a more home-like manner

**Cognitive training and rehabilitation**

- Cognitive training and cognitive rehabilitation are interventions targeting the memory problems and cognitive impairments seen in early stages of AD
- The authors of a systematic review assessing the evidence for cognitive therapy for mild to moderate AD found that there is limited evidence and its quality is low to support cognitive training for AD. The authors feel that this may be due, in part, to the use of outcomes measures that are not adequate to assess positive gains from intervention in the existing studies

**Exercise programs** (for detailed information about exercise and AD, see Clinical Review...Alzheimer Disease and Exercise; Item Number: T902776)

- Authors of a study conducted in Brazil showed that a mild to moderate intensity multimodal exercise program over the course of 6 months resulted in improvements in sleep disturbances and reduction in IADL deficits
- A nonrandomized study with matched controls was conducted to assess the impact of a 6-month multimodal exercise program (e.g., warm-up, resistance exercise, balance and motor coordination activities, and aerobic fitness) on function and sleep quality in patients with AD
- The training groups had significant pre to post intervention improvements in sleep (Mini-Sleep Questionnaire) and IADL performance (Pfeffer Instrumental Activity Questionnaire)
- Investigators of the Finnish Alzheimer Disease Exercise Trial (FINALEX) found that a long-term (1 year) intense exercise program improved the physical function of patients with AD
- 210 AD patients living at home with a spouse caregiver were randomized to group exercise or tailored home-based exercise (2x/wk for 1 year) or usual community care (control group)
- The function of all groups deteriorated during the course of the trial, but the rate of deterioration was significantly faster at both 6 and 12 months in the control group versus either of the exercise groups
- Both the group exercise and home exercise groups had significantly fewer falls than the control group
- The addition of the exercise interventions did not significantly increase the total health care and social services cost compared to the control group
- Authors of an RCT conducted in Australia compared a usual treatment program for AD with a usual treatment + community-based exercise program to increase functional abilities and independence in ADLs
- RCT was 4 months in duration; included 40 community-dwelling individuals with AD
- Exercise program consisted of 10 daily, progressively challenging exercises that focused on upper and lower body strengthening, balance training, and brisk walking that the individuals with AD completed with their caregiver after initial training by a PT
- Participants were assessed at baseline and after 4 months by an assessor blinded to the participant’s allocation to experimental or control group; assessments at baseline and follow up included cognitive function, physical function, ADLs, depression, and global change in function
- At the conclusion of the RCT, researchers documented a significantly greater improvement in ADL performance for the patients in the experimental group; physically, the members of the experimental group performed significantly better compared with controls at follow up in balance, mobility, and strength tasks

<table>
<thead>
<tr>
<th>Problem</th>
<th>Goal</th>
<th>Intervention</th>
<th>Expected Progression</th>
<th>Home Program</th>
</tr>
</thead>
</table>

- Authors of a study of 5 residential care facilities in Canada and the United States for patients with AD found a significant increase in the amount of time residents engaged in leisure activities when the care facility environment was set up in a more home-like manner.
| Impaired cognition | As cognitive skills decline, the goal is to maintain the patient’s highest level of function while maintaining patient’s safety through the implementation of various treatment strategies | **Therapeutic strategies**

Provide verbal cueing and picture cueing\(^{(34)}\)

ROT\(^{(30)}\)

RT\(^{(30)}\)

Bring personal memories to new living place\(^{(34)}\)

Use of calendar, note taking, and other cognitive aids\(^{(34)}\)

Holidays may disrupt the patient’s well-being due to a change in routine\(^{(34)}\)

*See Treatment summary, above*

| Due to the nature of the disease, regression will ultimately occur, so activities are presented to the patient and modified individually providing more cueing and assistance as required if/when regression is observed

<p>| Assist caregivers with incorporating these strategies into the home or attended facility; educate patient and family/caregivers on what to expect with disease progression |</p>
<table>
<thead>
<tr>
<th>Agitation</th>
<th>Minimize behaviors associated with a decline in mental status and maintain patient’s safety</th>
<th><strong>Therapeutic strategies</strong></th>
<th>N/A</th>
<th>Assist caregivers with incorporating these strategies into the home or attended facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wandering</td>
<td>RT and ROT</td>
<td>Use a calm voice(^{(35)})</td>
<td>Provide familiar routine(^{(35)})</td>
<td></td>
</tr>
<tr>
<td>Presence of sundowning</td>
<td>Offer comfort, reassurance, and distraction if patient is engaged in these behaviors(^{(36)})</td>
<td>Provide soothing activities prior to times that sundowning may occur to assist with prevention(^{(36)})</td>
<td></td>
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</tbody>
</table>

**Modifications**

Install motion sensors with alarms\(^{(35)}\) due to wandering to assist in safety

Label items in environment, use bright color for those who wander\(^{(35)}\)

Nightlights or other visual aids to assist with orientation in low light during presence of sundowning\(^{(35)}\)
| As client demonstrates loss of motor abilities and function, proper positioning will be required; there is increased risk of secondary complications such as skin breakdown, contractures, pneumonia, and DVT | Incorporate exercise routines as appropriate to maintain flexibility and proper positioning for the patient throughout the day and prevention of secondary complications | Therapeutic exercise
Incorporate exercise routines with functional activities\(^{(36)}\) at the patient’s level and pace | Reduce the demands if the patient has difficulty motor planning the exercise activities
Provide more supportive seating as motor function declines with the use of lateral supports, seatbelts, head rests, or cushions\(^{(35)}\) | Train caregivers in proper positioning techniques and ROM exercises, as well putting patient on a turning schedule if bedbound; educate caregivers on prevention of secondary complications |

**Positioning/equipment**

Ensure proper wheelchair fit and positioning, including support surfaces and cushions (refer to wheelchair clinic as necessary)
| Loss of interest in leisure and functional skills; decreased functional mobility and ability to perform ADLs and self-care | Incorporate functional tasks during the day with appropriate level of assistance based on client’s cognitive level; maximize patient’s independence while maintaining safety | **Functional skill and ADL training**
Complete functional skills during time of day patient is least symptomatic\(^{(35)}\)

Sequence activities such as dressing, grooming, hygiene with materials laid out or pictures depicting the steps\(^{(35)}\)

Reduce opportunity for choices\(^{(35)}\)

Reduce visual distractions and keep only necessary items present in visual field\(^{(35)}\)

Engage in simple repetitive, familiar tasks\(^{(35)}\)

Provide reassurance\(^{(35)}\)

Tailor program to involve patient’s previous or current interests | Modify functional activities based on client’s cognitive level, providing more cueing and assistance as disease progression occurs | Educate caregiver on modifications appropriate to patients cognitive level, provide training to incorporate strategies into home routine |
<table>
<thead>
<tr>
<th>Sensory deficits may lead to negative behaviors</th>
<th>Utilize strategies to reduce overstimulation and minimize negative behaviors</th>
<th>Environmental modifications</th>
<th>Provide more or less sensory input, depending on the client’s response</th>
<th>Educate caregiver on modifications appropriate to patient’s cognitive level, provide training to incorporate strategies into home routine</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>Organize the environment, monitor lighting (35)</td>
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<td></td>
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<td>Provide calm, familiar songs/music (35)</td>
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<td></td>
<td>Use calm voice when speaking (35)</td>
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<td>Forewarn of transitions and touch (35)</td>
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<td></td>
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<td>Allow access to soothing sensory input to reduce stress</td>
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<tr>
<td>Dependency on caregivers within home environment</td>
<td>Caregivers will incorporate home modification suggestions to assist with safety in the current home environment; decrease dependency on caregivers while maintaining safety</td>
<td><strong>Environmental modifications</strong></td>
<td></td>
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<tr>
<td>-------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>N/A</td>
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<td></td>
<td><strong>Bathroom modifications</strong> may include adjustable showerhead, grab rails, shower chair[^44] Remove all throw rugs and rearrange clutter, cords to reduce risk for falls[^44] Remove stove knobs[^44] Set thermostat to at least 70° F (21° C) at home to prevent hypothermia[^2] Check thermostat on water heater[^35] Gait stairways that may pose a risk[^44] Alarm system/motion detectors,[^35] monitor[^36] for safety due to wandering Use of “stop” sign[^36] to discourage wandering out into unsafe situations Premeasure medications[^36] Lock cabinets to reduce hoarding[^35] Ensure caregivers are aware of the necessary assist level/supervision required in order to maintain patient safety</td>
<td><strong>Assist caregiver with incorporating recommendations for home modifications to allow for safety as the disease progresses. Refer to social services or nursing to assist with home services or placement</strong></td>
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</tbody>
</table>
Desired Outcomes/Outcome Measures

- Promotion of the patient’s highest level of function through the implementation of various treatment strategies as cognitive level declines
  - MMSE\(^4\)
  - FAST\(^2\)
  - ACLS\(^9\)
  - Allen Diagnostic Module\(^{39}\)
- Minimized inappropriate behaviors associated with a decline in mental status
  - Relevant Outcome Scale for Alzheimer’s Disease (ROSA)
    - This assessment tool was shown to be feasible for assessing cognitive, functional, and behavioral deficits in a study looking at the outcomes of memantine in treatment of AD\(^{42}\)
- Maintenance of ROM
  - Goniometry
- Maintenance of proper positioning for the patient throughout the day
- Ability to complete functional tasks during the day with appropriate level of assistance based on client’s cognitive level
  - ROSA
  - Barthel Index
  - FIM
    - In a cross-sectional study of AD patients in Brazil, more advanced dementia in patients correlated with lower performance on the FIM\(^{44}\)
- Utilization of compensatory strategies to reduce overstimulation
- Incorporation of home modification suggestions to increase safety in the current home environment
- Reduced risk of injuries and falls
- Improved sleep

Maintenance or Prevention

- Considering the nature of this progressive disease, the goal is for the patient to maintain functional skills and independence for as long as possible
- Keep the patient as active as possible with group exercise and leisure activities using activities appropriate to his or her cognitive level to assist with maintenance of skills
- Caregivers, both those in the home and those in daycare and residential environments, should be consulted and educated as much as possible regarding recommended modifications and activities to enhance the patient’s quality of life
- For patients with AD for whom wandering is a frequent occurrence, a medical identification bracelet can help emergency workers ensure the patient is returned home safely\(^{37}\)
- Incorporate above mentioned suggestions for fall prevention

Patient Education

- Alzheimer’s Association, [www.alz.org](http://www.alz.org)
- Alzheimer’s Foundation of America, [www.alzfdn.org](http://www.alzfdn.org)
- Information on how to help caregivers of adults cope with providing care, [http://www.aota.org/-/media/Corporate/Files/AboutOT/consumers/Caregivers/Caregive2.pdf](http://www.aota.org/-/media/Corporate/Files/AboutOT/consumers/Caregivers/Caregive2.pdf)
References


