

Dementia



Cognitive Impairments

Definition: A cognitive impairment is a change in how a person thinks, reacts to emotions, or behaves.

The most common differential diagnosis in older adults of an acquired cognitive impairment includes three major categories:

1. **Dementia,**
2. **Delirium**
3. **Depression**



Defining Dementia

- A deterioration in cognitive functioning that renders a person unable to meet the diverse intellectual demands of everyday life.
- An acquired, persistent impairment in multiple areas of intellectual function not due to delirium.
- The onset:

Some forms of dementia are progressive, but others may plateau or be static. In some cases, onset may be insidious, as is typically the case in AD, but in other cases, onset of dementia may be acute, particularly if it occurs following head trauma or stroke.

- the first and foremost symptom of dementia is defined as memory loss, even though individuals to be diagnosed with dementia must also demonstrate other cognitive impairments (i.e., aphasia, agnosia, apraxia, or a disturbance of executive function) and a decline in occupational or social functioning.
- aphasia: loss of the ability to understand and express speech.
- agnosia: inability to recognize people, objects, sounds, shapes, or smells.
- Apraxia is an effect of neurological disease. It makes people unable to carry out everyday movements and gestures.
- A diagnosis of dementia is made when newly acquired cognitive impairments are sufficient to interfere with social or occupational functioning in a person without depression or delirium. More often it is other family members, rather than the affected person who notices the first symptoms of dementia.

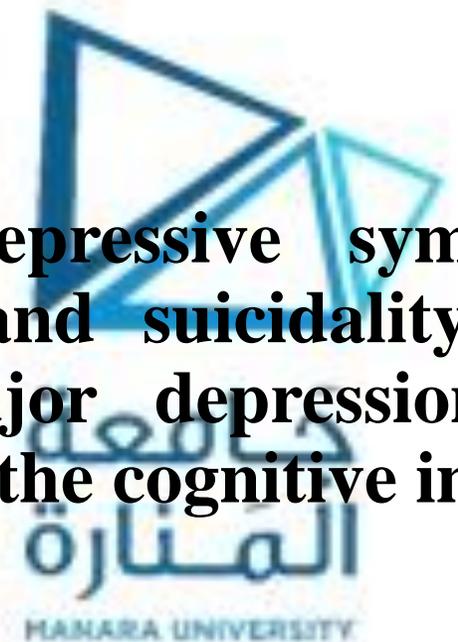
Potentially Reversible Dementias

Dementias are usually progressive and irreversible. However, there are a number of conditions that may rarely mimic dementia and may reverse if identified and properly treated. These “exceptions to the rule” include:

- Delirium
- Depression: so-called “Pseudodementia”
- Electrolyte disorders (hyponatremia, hypercalcemia, etc.)
- Hypothyroidism
- Wilson’s Disease (rare, and very rarely seen in Geriatric patients!)
- Late onset Psychosis

- Medication side effects (e.g. sedatives, anticonvulsants, antihypertensives, anticholinergics, first generation neuroleptics)
- ETOH overuse/misuse
- Vitamin deficiencies (B-12, folate)
- Obstructive Sleep Apnea
- Normal Pressure Hydrocephalus (although few, if any actually reverse with shunting)
- Brain tumor
- Subdural Hematoma (SDH)
- Sub-acute CNS infections (i.e. syphilis)





Older patients with depressive symptoms (i.e. hopelessness, excessive guilt, inertia and suicidality) may be suffering from pseudodementia (ie, major depression). When the depression improves with treatment, the cognitive impairments may resolve.

Mild Cognitive Impairment (MCI)

- Refers to mild memory impairment alone.
- Approximately 30% of those with MCI will decline to dementia within three years
- For these patients uncovering and management of risk factors such as hypertension, elevated lipids and smoking is crucial
- Some clinicians recommend starting Vitamin E (400 iu po OD) and the active extract form of Ginko Biloba (Egb 761, beginning at 40 mg po TID)
- Clinical trials using COX-2 inhibitors and cholinesterase inhibitors for patients with MCI are also underway.

Impact of Dementia

- Dementia has been described as “a health care problem of epidemic proportions”
- At least 7% of the world’s population (4% to 12% of persons over the age of 65, and nearly half of those over 85) experience some form of dementia.



Risk factors

Early life (<45 years)

- Less education

Midlife (age 45 to 65 years)

- Hypertension
- Obesity
- Hearing loss
- Traumatic brain injury

- Alcohol misuse)

Late-life (age >65 years)

- Smoking
- Depression
- Physical inactivity
- Social isolation
- Diabetes
- Air pollution



Common Types of Dementia

- There are over 70 different causes of dementia, and each has a particular pattern of decline, impairments, and underlying neurohistopathological processes.
 - Alzheimer's Disease AD about 65% of cases.
 - Vascular Dementia VaD
 - Dementia with Lewy Bodies DLB
 - Frontotemporal Dementia FTD
 - Parkinson's Disease with Dementia PDD
- each account for about 10% of cases

Criteria for Dementia

- A. Impairment in short- and long-term memory
- B. At least 1 of the following:
 1. Impairment in abstract thinking
 2. Impaired judgment
 3. Other disturbances of higher cortical function (agnosia, anomia, & visuospatial difficulties)
 4. Personality change
- C. Memory impairment and intellectual impairment cause significant social and occupational impairments
- D. Absence of occurrence exclusively during the course of Delirium
- E. Cannot be accounted for by any nonorganic mental disorder

Behavioral Problems in Dementia

Up to 90% of demented patients will develop significant behavioral problems at some point in the course of their illness

- Agitation (definition=a range of purposeless verbal, motor behaviors that put the patient or others at risk of harm) is the most commonest problem, and is seen in up to 75% of patients with dementia.
- Wandering in up to 60%
- Depression in up to 50%
- Repeated stories and statements in ~32%
- Psychosis in up to 30%
- Hoarding & Rummaging in up to 30%
- Screaming in up to 25%
- Aggression and violence in up to 20%
- Hyper sexuality in up to 10%



Alzheimer's Disease

must demonstrate a decline in three or more of the following spheres of cognition:

- Memory
- Language
- Perception (especially visuospatial)
- Praxis
- Calculations
- Conceptual or semantic knowledge
- Executive functions
- Personality or social behaviour
- Emotional awareness or expression



- The cause of AD remains unknown.
- risk factor:
 1. increasing age
 2. Gender (female)
 3. Ethnicity (African American)
 4. positive family history
 5. Serious head injury with a loss of consciousness
 6. Genetic factors
 7. some evidence that the use of oestrogens alone or with progestin by premenopausal



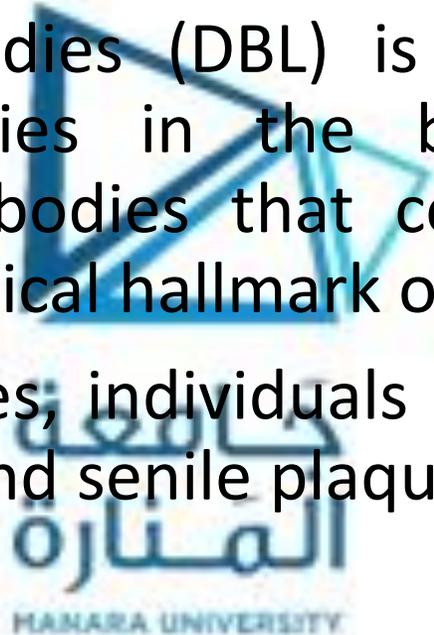
Vascular Dementia

- is a dementia syndrome that is a result of cerebral vascular damage.
- generally been similar to AD
- different consensus criteria have been used to diagnose VaD but all suffer poor sensitivity.
- VaD are simply the same as the diagnostic criteria for AD with the addition of **evidence of a temporally related cerebral vascular event (e.g., stroke)**.
- there is evidence that AD and VaD are separate diseases and different risk factor profiles
- it is also the case that a person can have both AD and VaD, or what is commonly referred to as “mixed” dementia

- Individuals demonstrate particular **impairments in attention, working memory, planning, sequencing, abstraction, and speed of mental processing rather than memory.**
- individuals with VaD are more likely than those with AD to demonstrate perseverative behaviors and to have difficulties with verbal fluency on neuropsychological tests.
- VaD accounts for between 10% and 30% of all dementias.
- risk factors for VaD including advancing age, male gender, known history of strokes, and other vascular risk factors such as hypertension.

Dementia with Lewy Bodies DBL:

- Dementia with Lewy bodies (DBL) is so named because of the presence of Lewy bodies in the brain. Lewy bodies, round neurofilament inclusion bodies that contain damaged nerve cells deposits, are the pathological hallmark of this disorder.
- In addition to Lewy bodies, individuals diagnosed with DBL typically have amyloid pathology and senile plaques similar to those with AD.



Dementia with Lewy Bodies DBL:

- DBL represents another neurodegenerative dementia with core features that include
- (a) parkinsonism—that is, an extrapyramidal movement disorder characterized by rigidity and bradykinesia.
- (b) cognitive fluctuations with prominent deficits in attention.
- (c) recurrent, well-formed, and detailed **visual hallucinations**.
- Although prominent or persistent memory impairment is not necessarily evident in the early stages of DBL, it typically becomes apparent as the disorder progresses.

Dementia with Lewy Bodies DBL:

- Deficits on tests of **attention, visuospatial ability, and executive function may be more prominent.**
- (Executive function is a set of mental skills that include working memory, flexible thinking, and self-control. We use these skills every day to learn, work, and manage daily life. Trouble with executive function can make it hard to focus, follow directions, and handle emotions, among other things.) proficiency in adaptable thinking, planning, self-monitoring, self-control, working memory, time management, and organization.
- Clinical diagnosis is strengthened if there are repeated falls, nonvisual hallucinations, delusions, syncope or transient losses of consciousness, and hypersensitivity to neuroleptics.
- accounts for about 14% to 20% of those with dementia.
- Males are twice as likely to be diagnosed with DBL and are, most often, over the age of 65 years when diagnosed

Frontotemporal Dementia

- Frontotemporal dementia (FTD) is part of a heterogeneous group of frontal lobe dementias that in addition to FTD includes more focal conditions such as primary progressive aphasia, semantic aphasia, and frontal dementia with motor neuron disease.
- Although the age of onset can vary widely, the average age of onset of FTD is 57 years with a typical range of 51 to 63 years.
- FTD typically has an insidious onset with slow progression.
- Gradual but prominent changes in personality, behavioral disturbances, and changes in social awareness are typically the early and most obvious impairments in FTD

- Those with FTD may manifest **lack of social tact**, fail to demonstrate acceptable manners, violate others' interpersonal space, or touch others inappropriately. Emotional blunting may also be an early indication of FTD, with affected individuals demonstrating a lack of sympathy, empathy, emotional warmth, and awareness of the needs of others.
- Because they can **fail to demonstrate basic emotions** such as happiness, sadness, fear, and anger, they may be judged by others as emotionally shallow and indifferent.
- **Neglect or loss of interest in maintaining personal hygiene** (i.e., no longer washing, bathing, grooming, or dressing appropriately) can also be an indication of FTD.

- In contrast, some individuals may show signs of **disinhibition** and may display an inability to regulate their own behaviors.
- This may be manifest by
 - hyper-oral or other eating behavior changes;
 - unrestrained expression of sexual feelings;
 - Disinhibited verbal or physical acts;
 - overt sexual comments;
 - compulsive-like, stereotypical, or repetitive behaviors.

- persons with FTD often experience loss of insight and demonstrate difficulties in abstract thinking, planning, and problem solving.
- Although memory is impaired in persons with FTD, this is often a reflection of inefficient and inconsistent use of active strategies for learning and retrieval.



Parkinson's Disease with Dementia

- The development of dementia in persons with PD is often very slow and insidious but, if present, usually becomes apparent about 10 years after the initial diagnosis of PD.
- **movement disorder.**
- Cognitive changes in PDD include **slowed performance** on tests of psychomotor speed, problems with tasks that place demands on attention, and difficulties initiating activities.
- Other changes include deterioration on tasks of delayed recall, semantic knowledge, frontal-executive functions, speech and language, and visuospatial functions.

- Persons with PDD develop **problems with specific aspects of memory** (i.e., short-term memory, effortful memory, incidental learning, retrieval of information, temporal ordering of learned information, and procedural memory).
- **Effortful memory** encoding of information that takes effort and attention **Examples** include reading something and understanding it OR knowing your class schedule for the day. **Effortful processing** requires attention and awareness like when we study in class or memorize a poem.

- **Incidental learning** refers to any **learning** that is unplanned or unintended. It develops while engaging in a task or activity. happens outside formal **teaching** environments. It's what happens when we **learn** something new from watching television, reading a book, talking with a friend, playing a video game or, as many language students do, travelling to another country and surrounding ourselves with the language.
- **Information retrieval** is the science of searching for **information** in a document, searching for documents themselves.
- **Procedural memory** is a type of implicit memory (unconscious, long-term memory) which aids the performance of particular types of tasks without conscious it is the **memory** of how to do certain things. Riding a bike, tying your shoes, and cooking an omelet are all **examples of procedural memories**.

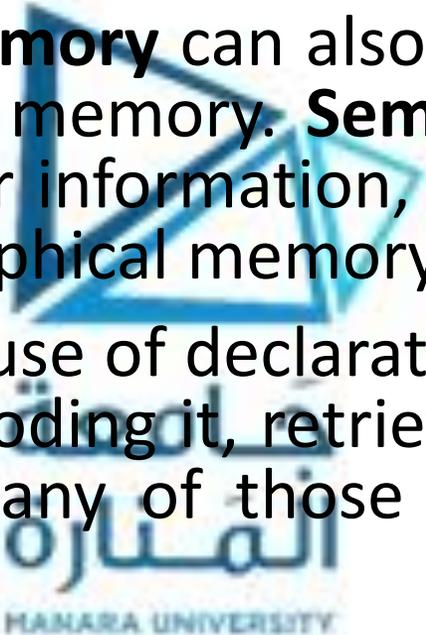
Approach to a Person Suspected of Having a Dementia

- The history is the key.
- If it has taken place over a period of a few years, and is very gradual, it is likely Alzheimer's Dementia (AD).
- If more steep a decline, and associated with walking problems, it more likely a Vascular Dementia (VaD)/ mixed VaD + AD.
- If behavior problems such as irritability and apathy are more prominent than memory issues, it may be a Frontotemporal Dementia (FTD).
- And if they have memory problems along with visual hallucinations and symptoms of Parkinsonism, it is likely Lewy Body Dementia.

Diagnosing Dementia

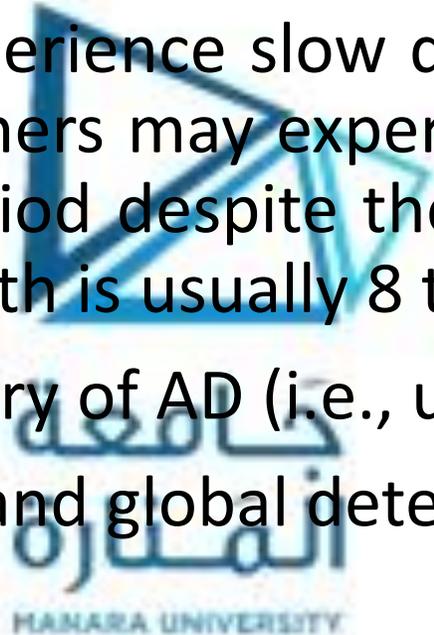
- the first step in the diagnostic process is to determine if an individual with a memory complaint actually has memory impairment.
- must take a careful patient history that includes a review of the individual's education and work history as well as their medical history and current symptoms.
- when an individual's subjective complaints are not confirmed by either objective assessment findings or by family members' reports, depression or anxiety are more likely to be the cause.

- Once the presence of memory impairment is established, the next step is to determine which type of memory impairment is present. Memory, however, is not a uniform construct. Two main distinctions are made between **short-term or immediate memory** and **long-term or delayed memory**.
- Short-term or immediate memory refers to the process whereby someone holds an idea in his or her mind for a brief period of time (30 seconds to a few minutes), often through active rehearsal.
- long-term or delayed memory can be thought of as including both **declarative (explicit) memory** (i.e., explicit memory that requires conscious effort and thought such as when remembering facts) and **procedural (non declarative) memory**.

- 
- The logo of Manara University is centered in the background. It features a blue geometric design consisting of overlapping triangles and lines, forming a stylized 'M' or a similar abstract shape. Below this graphic, the university's name is written in Arabic 'جامعة المنارة' and English 'MANARA UNIVERSITY' in a blue, sans-serif font.
- **Declarative or explicit memory** can also be divided into the concepts of semantic and episodic memory. **Semantic memory** is involved in the recollection of facts or information, whereas **episodic memory** is involved in the autobiographical memory of our past.
 - In general, the successful use of declarative episodic memory involves taking in information, encoding it, retrieving it later, and expressing a response. Difficulty with any of those steps will result in memory impairment.
 - it is essential to determine what, if any, other cognitive impairments are present, how these impairments affect the person's everyday life, and if any behavioral problems are evident.

Staging

- Some individuals may experience slow deterioration over a period of 20 years or more, and others may experience rapid progression in as little as a 1-year time period despite the fact that the duration from onset of symptoms to death is usually 8 to 10 years.
- based on the natural history of AD (i.e., untreated AD).
- seven stages of cognitive and global deterioration



- **Stage 1**

Stage 1 represents no decrement in the functioning of normal adults.

- **Stage 2**

As normal adults age, they begin to experience some subjective deficits in word-finding or recalling the location of objects.

- **Stage 3**

Individuals begin to note difficulties in demanding work settings, forget appointments, and may experience difficulty finding their way in unfamiliar environments. In the early stages of AD, individuals will typically experience difficulties maintaining their attention and remembering new information and may occasionally experience confusion and disorientation.

- They may go to great efforts to disguise or conceal any difficulties they experience by blaming others for misunderstandings; repeating things that have already been said; and dismissing forgotten tasks, appointments, or deadlines as being unimportant.
- often lack detail and informational content. Word-finding difficulties may be evident. Unable to recall an individual's name, persons with dementia may instead refer to others as "she" or "he." Similarly, objects may be referred to as "that thing" or "thingamajig."
- in the early stages of AD are still able to manage the activities that constitute their everyday lives. Thus, they can still care for themselves; independently perform instrumental activities of daily living (IADL) such as shopping, preparing meals, and cleaning the house; and if working, continue to carry out work-related tasks even though they may be done with greater effort and less efficiency and accuracy.

- **Stage 4**

they will require assistance with performance areas reflecting more complex community or domestic tasks, such as handling finances or shopping. Impairments in orientation and memory become more pronounced.

Affected individuals repeat stories more often and ask others the same questions repeatedly. When engaged in conversations with others, they experience difficulty staying on topic.

Language difficulties in the form of impaired comprehension and word-finding difficulties will become more evident.

Tasks will be performed with even less efficiency and even greater effort.

- **Stage 5**

By Stage 5 (moderate AD), **individuals are no longer able to live alone safely**. Although still able to dress, their ability to select appropriate attire will become compromised. Moreover, their ability to perform simple over-learned tasks is adversely affected.

Although individuals' underlying motor abilities are not affected in the earlier stages of AD, by the later stages, changes in tone, reaction time, movement time, and gait may be evident

- **Stage 6**

By Stage 6 (moderately severe AD), individuals will **require assistance to perform even the most basic personal activities** of daily living, such as dressing, eating, and the mechanics of toileting (e.g., wiping, flushing). Urinary and fecal incontinence begins at the end of Stage 6.

- **Stage 7**

Individuals with severe dementia (Stage 7) generally demonstrate incoherent speech; **disorientation for time, place, and person**; failure to recognize close relatives; incontinence of urine and feces; and complete dependence on others for basic personal care.

- Regardless of whether dementia is due to AD, VaD, DBL, or PDD, individuals in the late stages require similar levels of assistance for self-care tasks such as dressing, grooming, and feeding.

- It remains important to remember that the presentation and progression of non-AD dementias differ.
- For example, some studies have suggested that the rate of functional decline in those with VaD is slower than in those with AD.
- At this point in time, our understanding of the rate and pattern of functional decline in non-AD dementias remains limited.
- current pharmacological treatments for dementia are symptomatic and do not reverse the disease process.

STANDARDIZED MINI-MENTAL STATE EXAM (SMMSE)

“Now I’d like to ask you some questions to check on your memory; this is a standard test we do on all our patients.”

ORIENTATION TO TIME

- (1) What year is this?
- (1) What season of the year is it?
- (1) What is the month?
- (1) What is the date?
- (1) What day of the week is it?



ORIENTATION TO PLACE

(1) What is the name of this place?

(1) What floor are we on?

(1) What city are we in?

(1) What province are we in?

(1) What county is this?

IMMEDIATE RECALL

(3) I am going to say 3 objects. After I say them, I want you to repeat them. They are: "Car" "Ball" "Man" Now you say them. Remember what they are because I'm going to ask you to name them again in a few minutes.

[Interviewer: Repeat until all 3 are learned]



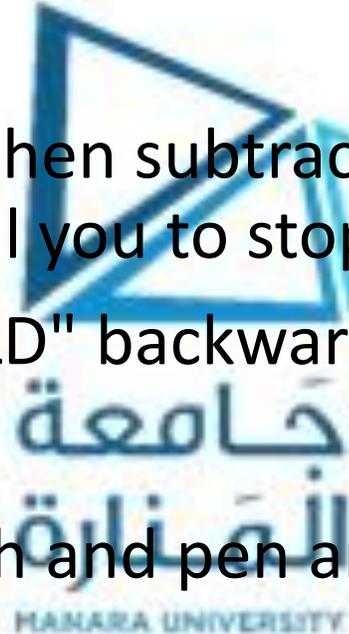
ATTENTION (either item)

(5) a) Subtract 7 from 100, then subtract 7 from the answer you get and keep subtracting 7 until I tell you to stop.

Or b) Spell the word "WORLD" backwards [DLROW].

NAMING

(2) Show patient wrist watch and pen and ask to name them.



REPETITION

(1) Repeat the following sentence exactly as I say it. **"No ifs, ands, or buts."**

3 STAGE COMMAND

(3) Now I want to see how well you can follow instructions. I'm going to give you a piece of paper. Take it in your right hand, use both hands to fold it in half, and then put it on the floor.

READING

(1) Read the words "Close your eyes" (provided on a sheet of paper prepared previously) silently to him/herself, and then do what it says.



WRITING

(1) On same sheet of paper, ask patient to write a complete sentence.

COPYING

(1) Give patient clean sheet of paper and ask him/her to copy the design of intersecting pentagons.



DELAYED RECALL

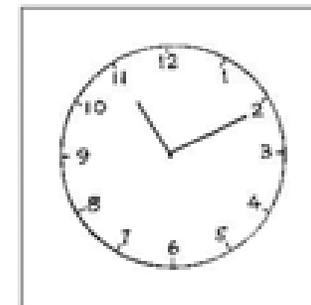
(1) What are the 3 words I asked you to remember earlier? (At least a 3 minute delay, 1 point for each, score out of 3)

Total Maximum score = 30

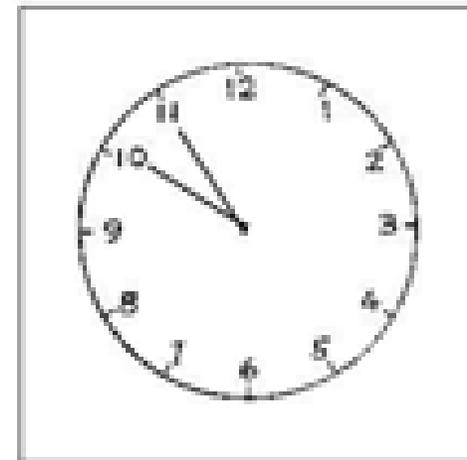
A score of 23 or less is probably abnormal by this screening test and suggests further cognitive testing and a search for the reason are needed; scores 24-30 may need further evaluation based on patterns of deficits (i.e. recall 0/3), or previous educational and intellectual achievements (e.g. a 65 year old lawyer with a SMMSE of 26/30 is a red flag that something is wrong). If a person is blind, cannot read or write, or has aphasia, note their deficits and provide scores out of this new denominator (i.e. 24/27)

Clock Drawing Test (CDT)

- This is another validated test for cognitive function and is particularly valuable when used with the SMMSE (which it is not part of, but is separate test). Draw a large circle, and ask the patient to place all the numbers in the correct position on this empty clock face, after which you will tell them a time to put the hands on their clock. For hand placement you must use the same time used in the original studies; “Please set hands of the clock to 10 after 11” (*remember, the 10 is a virtual 10 represented by the 2 on the clock*). Rate as Normal, struggle to complete, or abnormal)



- for cognitive impairments is 24 if their clock is abnormally drawn.
- Below is an example of a “concrete” clock; persons who are concrete (i.e. only capable of objects and concepts perceived by the senses, and incapable of abstract or imaginary concepts) from Vad, FTD, or AD will often put the hands at the 10 AND the 11, which is incorrect. They are “stimulus bound” by the nearby



Attempt individualized Non-pharmacological Approaches

- Management of problem behaviors can be shifted from trying to change the patient to trying to change the triggering or exacerbating factors.

Remember that drugs work only if there is:

- Psychosis and/or Aggression
- Depression
- Anxiety
- Sleep disturbance



Agitation

Possible Trigger	Management Strategy
Discomfort, pain	Check for full bladder, constipation, infection, ulcers & clothing for comfort
Fatigue	Schedule adequate rest, monitor activity
Medication ADRs	Assess, monitor, and reduce if possible
Overstimulation (noise, overhead paging, beepers, people, TV, activities)	Reduce noise, pagers on vibrate, use TV sparingly, dim lights at night.

Wandering

Possible Trigger	Management Strategy
Restless, bored, no stimuli.	Provide meaningful activity (folding towels, sorting buttons), provide safe circular path, fenced in yards.
Escaping from stress (noise, clutter, crowding, activity—>“Run away!”	Reduce excessive stimulation.
Lost—looking for something or someone familiar, “There’s no place like home, Auntie Em!”	Provide familiar objects, pictures of toilet on bathroom door, signs, reassure.
Eloping stimuli; exit signs, people leaving “Hey, wait for me!”	Camouflage exits, use stop signs or barrier tape, code access doors.

Inappropriate or Impulsive Sexual Behavior

Possible Trigger	Management Strategy
Decreased judgment and social awareness	Do not overreact or confront; respond calmly and firmly; distract or redirect.
Misinterpreting caregivers interactions (i.e. bathing, toileting)	Avoid mixed sexual messages, distract while performing personal care, bathing; be consistent.
Uncomfortable clothing; too tight or too hot	Check room temperature. More appropriate clothing.
Need for attention, affection, intimacy, hugs.	Model appropriate touch, offer soothing objects (stuffed animal), provide back massage, provide privacy

Behavioral “metaphor”	Agent to try
<p>Depressive Features (i.e. an agitated patient who is withdrawn, apathetic, irritable, negativistic, ruminating and/or dysphoric)</p>	<p>Antidepressant (i.e. citalopram, sertraline, venlafexine) Anticonvulsant (i.e. carbamazepine, divalproex)</p>
<p>Manic Features? (i.e. an agitated patient who is hyperactive with pressured speech, irritable mood, and sexual preoccupation)</p>	<p>Anticonvulsants (i.e. divalproex, carbamazepine) Beta-blockers (i.e. propranolol)</p>
<p>Anxious/Obsessive Features (i.e. an agitated patient relentlessly checking her purse for pocket money)</p>	<p>SSRI Antidepressants (i.e. citalopram, sertraline, paroxetine) Anticonvulsants (i.e. divalproex) Benzodiazepines (i.e. short term oxazepam)</p>
<p>Psychotic Features (i.e. a patient screaming and striking out because she thinks that aliens are experimenting on her)</p>	<p>Neuroleptics (ie. Risperidone, Olanzapine, Quetiapine)</p>
<p>Sexually Aggressive Features</p>	<p>Neuroleptics (i.e. low dose haloperidol)</p>