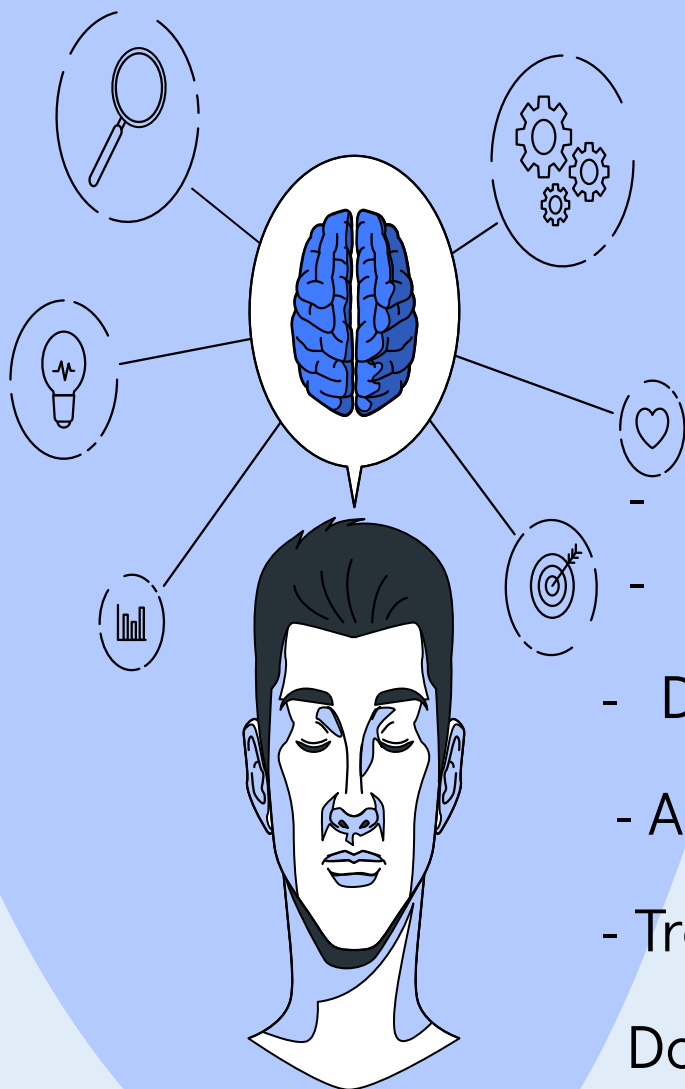


Neurocognitive/ Neuropsychiatric Disorders



Objectives:

- Delirium
- Major Neurocognitive disorders (MCD):
 - Dementia
 - Amnestic syndrome
 - Traumatic brain injury (TBI)

Done by: aljoharah Alshunaifi, Rahaf althnayan
and Norah alkadi

- Color index: Golden notes - Dr. notes - extra

Dr. Ali said anything that says reference in the title won't come in exam.

Cognitive functions vs Cognitive disorders

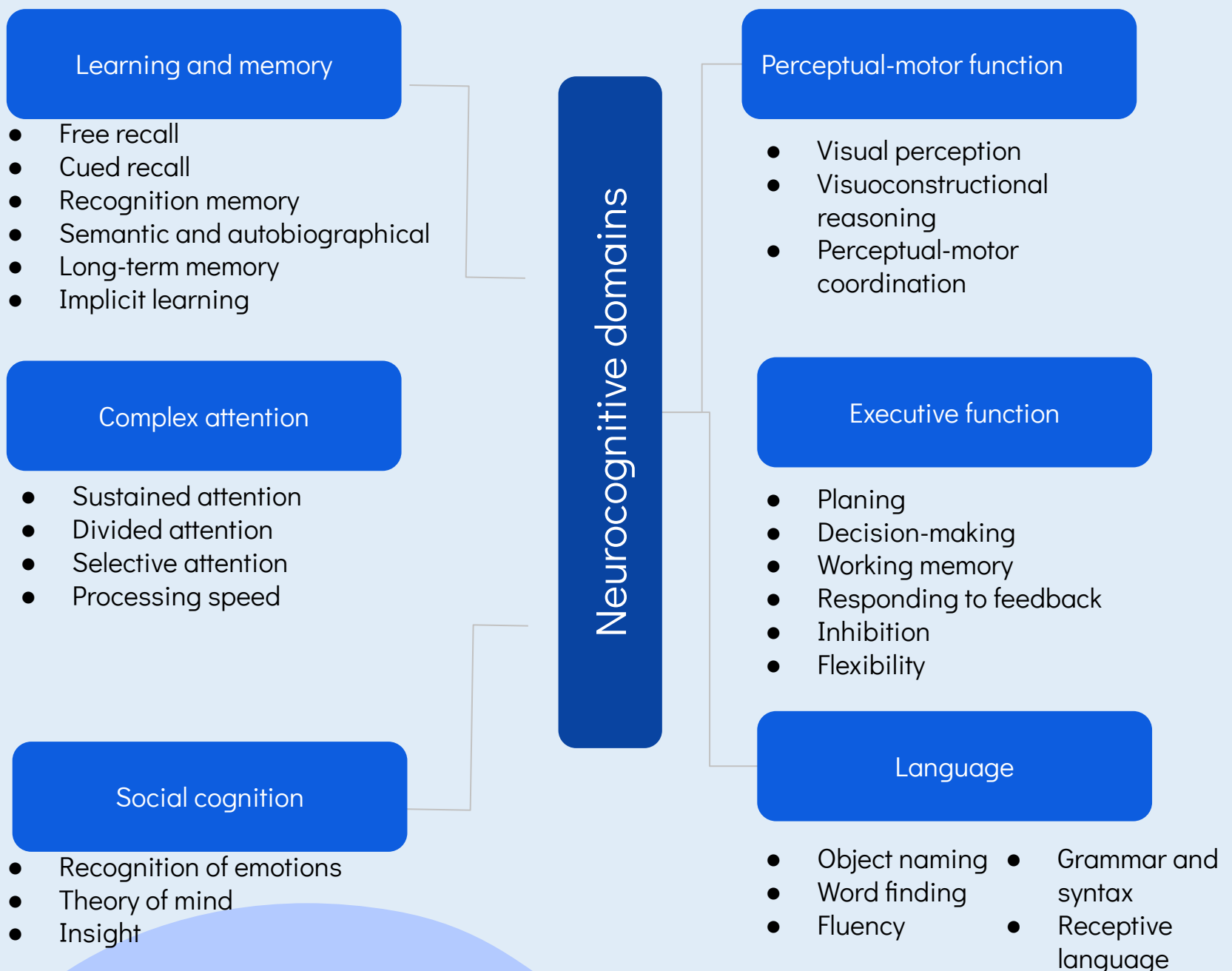
(Reference)

Cognitive functions: (قدرات عقلية) is the mental action or process of acquiring knowledge and understanding through thought, experience, and the senses

❖ It encompasses many aspects of intellectual functions and processes:

- | | | | |
|-------------|-----------------|---------------------|--------------------|
| Attention | Concentration | Memory | Processing speed |
| Orientation | Impulse control | Language processing | Executive function |

Eg. Being able to focus on one thing in a noisy place or being able to shift concentration from one thing to another



Cognitive/Neurocognitive disorders characterized by: [\(Reference\)](#)

Cognitive deficits:

- That present in many mental/neurological disorders.
- Not present from birth or very early in life.** Eg. ADHD and Autism are NOT cognitive deficits but neurodevelopmental disorders.
- Represent a decline from a previously attained level of functioning.

Different than cognitive function/Processes:

- (Our ways of thinking and conclusion formations).

Cognitive Therapy:

- Type of psychotherapy that concerned with detection of:
- Wrong thoughts and thinking process.
- It is not treatment for cognitive disorders.

In the Diagnostic and Statistical Manual of Mental Disorders, fifth edition DSM-5:

Neurocognitive disorders: *Delirium*, *Mild Neurocognitive Disorders*, *Major Neurocognitive Disorder* Dementias
Amnestic syndromes

Delirium:

Short-term confusion and changes in cognition. (Rapid change and it affects all domains of cognition)

Acute global cognitive disorder WITH disturbed consciousness (fluctuating in nature).

Major Neurocognitive Disorder:

● Dementias:

- Severe impairments in (short-term) memory, judgment, orientation, and cognition. (in that order)
- Chronic global cognitive decline WITHOUT disturbed consciousness. (in late stages affects all cognitive domains)

● Amnestic syndrome:

- Major neurocognitive disorder caused by other medical condition.
- Marked primarily by memory impairment or specific disorder of short-term memory. (will have problems learning new skills and memorising information)
- caused by :
 - Medical condition.
 - Toxins or medications.
 - Unknown causes.

Delirium الهذيان

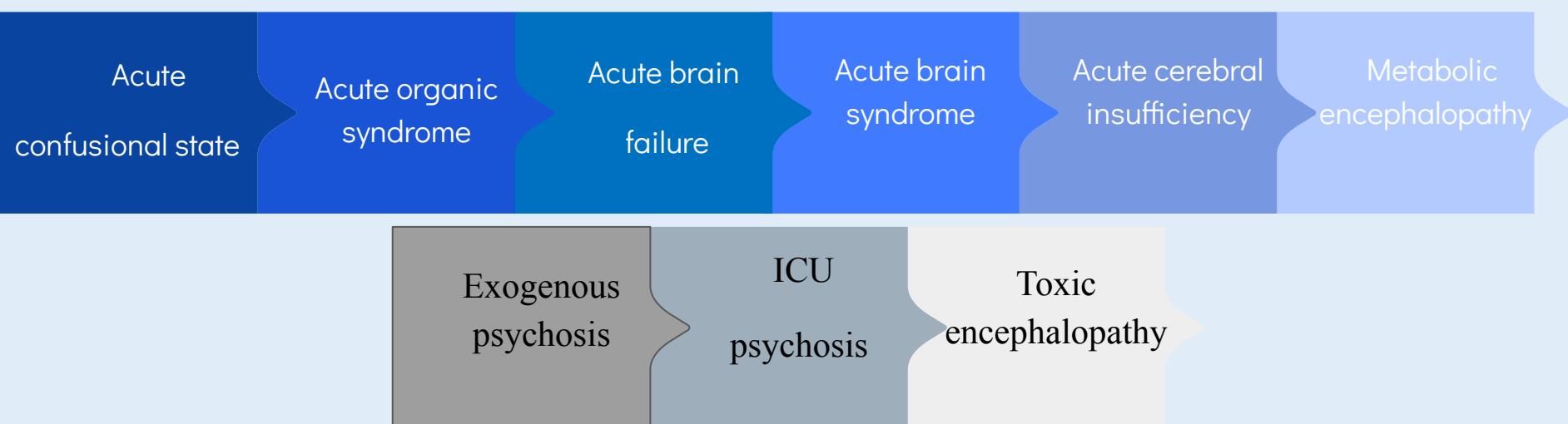
Case 1 :

- A 75-year-old male known to have a long-standing history of HTN, DM type 2, hypercholesterolemia, and BPH.
- He was brought to the ER by his family with three days history of high-grade fever, lethargy, and dysuria.
- He also started to have poor sleep for the last three days and therefore, his daughter gave him unknown medication that she bought from the pharmacy.
- On the same day of ER presentation, he started to have a high-grade fever, and he started to be *confused*.
- His daughter stated that he was *talking nonsense* and it seems that he saw *unobserved images on different occasions*. There was a *history of fluctuating consciousness*, and he was *disoriented to place, person, and time*.
- There were periods where her father was *less confused and less disoriented*. and it seems that he *went back to his usual self*. And there were periods of *complete confusion and disorientation*.
- Past medical history: HTN, DH, Hypercholesterolemia, and BPH.
- Personal/social history: smoke tobacco.
- Patient was admitted to the hospital and diagnosed to have *UTI and mild urinary retention*.
- Few hours later, after hospital admission:
 - *He started to be aggressive and agitated.*
 - *He pulled out his IV lines.*
 - *Insisted to be discharged from hospital because he thought that nursing staff want to kill him.*



Definition: **Acute transient** reversible **global** cognitive impairment with **impaired consciousness (fluctuating)** due to a medical problem

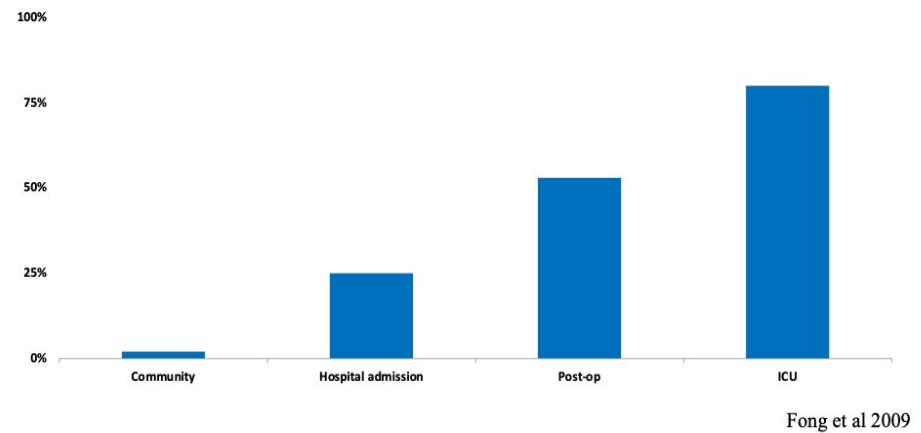
Many terms are used to describe delirium:



Epidemiology:

- It may occur at any age but more in elderly and children (because not yet developed).
- Community Prevalence:
 - General: 1-2 %.
 - > 85 years: ~ 14 %.
- 10-30 % Medically Ill Hospitalized patients.
 - ~ 10 to > 50 % Post-Operative Patients.
 - > 90 % Post-cardiotomy Patients.
 - ~ 70-85 % ICU.
- 60 % in nursing homes or post-acute care settings.
 - ~ 80 % at end of life.
- Underdiagnosed when patient is hypoactive and somnolent.
 - Such cases may be misdiagnosed as depression.

Delirium complicates at least 25% of all hospitalizations in the elderly



Clinical features:

Acute onset of mental status change with **fluctuating** course Attention deficits

Confusion or disorganized thinking (**they don't know where they are**)

Perceptual disturbances (e.g., visual hallucination)

Disturbed sleep/wake cycle (Sundowning phenomena)

Altered psychomotor activity

Disorientation and memory impairment

Behavioral and emotional abnormalities (**agitation**)

Other cognitive deficits

Paranoid

DSM-5 criteria for Delirium Important

A	<p><i>Disturbance in:</i></p> <ul style="list-style-type: none">● <i>Attention</i> (Reduced ability to direct, focus, sustain, and shift attention)● <i>Awareness</i> (Reduce orientation to the environment)
B	<p><i>The disturbance:</i> (Important)</p> <ul style="list-style-type: none">● Develops over a <i>short period</i> (usually hours to days).● Represent a <i>change in the baseline</i> attention and awareness.● Tends to <i>fluctuate in severity</i> during the course of a day.
C	<p><i>An additional disturbance in cognition:</i></p> <ul style="list-style-type: none">● Memory deficit, disorientation, language, perceptual disturbance (eg visual hallucinations)
D	<p><i>Disturbance in criteria A and C:</i></p> <ul style="list-style-type: none">● Not due to another preexisting, established, or evolving dementia● Do not occur in the context of a severely reduced level of arousal (e.g.coma)
E	<p>There is evidence from the history, physical examination, or laboratory findings that the disturbance is caused by a <i>direct physiologic consequence</i> of:</p> <ul style="list-style-type: none">● General medical condition● An intoxicating substance● Medication use● More than one cause (this is most commonly the case)

Diagnostic criteria (Simplified)

(Reference)

- A) Consciousness is disturbed (e.g. awareness of the environment is impaired but patient not in coma).
- B) Cognitive functions are impaired +/- perceptual disturbance (illusions or hallucinations)
- C) Acute onset with fluctuating symptoms (within hours during the day) & transient course (few days).
- D) Caused by a physical problem (e.g. hypoxia, hypoglycemia, infection..etc.)

Why it is important to discover delirium?

It is a very serious medical and psychiatric condition and that due to high risk of:

- 1) Death (due to associated serious medical condition) (30% of delirious patients die within 1 year)
- 2) Violence toward medical staff
- 3) Self-harm or suicidal risk
- 4) Impaired judgment (eg demanding to leave hospital 1 day after major operation)
- 5) Psychosis

Type of delirium (DSM-5 specifiers):

1) **Hyperactive 30%** (most clear and least controversial)

- Hyperactive psychomotor activity.
- May have mood lability, agitation, refusal to cooperate with medical care. (eg. pulls out IV lines and fights with nurses)

2) **Hypoactive 24%** (most difficult type to identify)

- Hypoactive psychomotor activity.
- May be have sluggishness or lethargy that approaches stupor.
- Inappropriately diagnosed and treated as depression.

3) **Mixed level of activity 46%** Most common type.

(Classic wax and waning pattern)

- Normal psychomotor activity with disturbed attention and awareness.
- May have rapidly fluctuating activity level.
- Eg Agitated then hypoactive

Delirium is associated with:

- ↑ morbidity and mortality
- ↑ length of hospital stay
- ↑ Rates of admission to long term care facilities
- 20 % of patients discharged post hip # still had evidence of delirium (should never discharge delirious patients)

Why does a delirious patient become suicidal or aggressive?

- Due to severe disturbance in the patient's perception, mood, judgment, thinking, and behavior
- Patient may act on hallucinations, illusions or delusional thoughts as if they were genuine dangers (e.g., blood extraction by a nurse might be perceived as an attack) (they may become aggressive)

Delirium Risk factors/Predisposing Factors: NOT causes

- > 60 years of age. (extremes of age)
- Male sex.
- Visual/hearing impairment.
- Underlying brain pathology such as stroke, tumor, vasculitis, trauma, or dementia.
- Major/ multiple medical illnesses.
- Recent major surgery
- Depression (Mental illness)
- Functional dependence on others
- Dehydration
- Substance abuse/dependence
- Hip fx
- Metabolic abnormalities
- Polypharmacy (very common in elderly)

Delirium Risk factors/Predisposing Factors:(Reference)

Demographics General Medical Hx	Psychiatric Hx	Current Medical Problem	Medications Important	Current Status
<ul style="list-style-type: none"> ✓ Male ✓ Age >75 ✓ Functional Impairment ✓ Immobility ✓ Low levels of activity ✓ Sensory Impairment ✓ Fall Hx 	<ul style="list-style-type: none"> ✓ Hx of Delirium ✓ Dementia ✓ Depression ✓ Bipolar ✓ Schizophrenia ✓ Drug/ETOH/Toxins 	<ul style="list-style-type: none"> ✓ Severe Illness ✓ Multiple Illnesses ✓ Abn. Blood Work ✓ Metabolic D/O ✓ CNS pathology ✓ Trauma ✓ Burns ✓ Post-Op ✓ Poor O2 States 	<ul style="list-style-type: none"> ✓ > 3 drugs ✓ Psychoactive Meds ✓ Anticholinergic ✓ Meds 5HT Meds ✓ Examples: ✓ Opioids* ✓ Corticosteroids* ✓ Benzodiazepines* ✓ NSAIDS ✓ Chemo Meds 	<ul style="list-style-type: none"> ✓ Dehydration ✓ Malnutrition ✓ Sleep Deprivation ✓ Over Sedation ✓ Pain ✓ Abnormal VS ✓ Catheters IV ✓ Restraints

Etiology (Delirium Precipitating Factors):

I watch death

<u>I</u> : Infections	<u>W</u> : Withdrawal	<u>D</u> : Deficiencies
	<u>A</u> : Acute metabolic (Na + Ca)	<u>E</u> : Endocrinopathies
	<u>T</u> : Trauma	<u>A</u> : Acute vascular
	<u>C</u> : CNS pathology (eg stroke)	<u>T</u> : Toxins
	<u>H</u> : Hypoxia	<u>H</u> : Heavy metal (poisoning)

Etiology (Delirium Precipitating Factors): (Reference)

Infections (encephalitis, meningitis, HIV, syphilis, sepsis, typhus, malaria)

Withdrawal from substance of the abuse (alcohol, sedative-hypnotic, barbiturates)

Acute metabolic (acidosis, alkalosis, liver/kidney failure)

Trauma (closed head trauma, heatstroke, recent surgery, severe burns)

CNS pathology (abscess, tumor, seizures, hydrocephalus)

Hypoxia (anemia, hypoperfusion due to heart/lung failure, co poisoning)

Deficiencies of vitamins (B12, folate, thiamine, niacin)

Endocrinopathies (Hyper/Hypoglycemia, Hypo/Hyperadrenocorticism, Hyperparathyroidism)

Acute vascular (hypertension, stroke, TIA, arrhythmia)

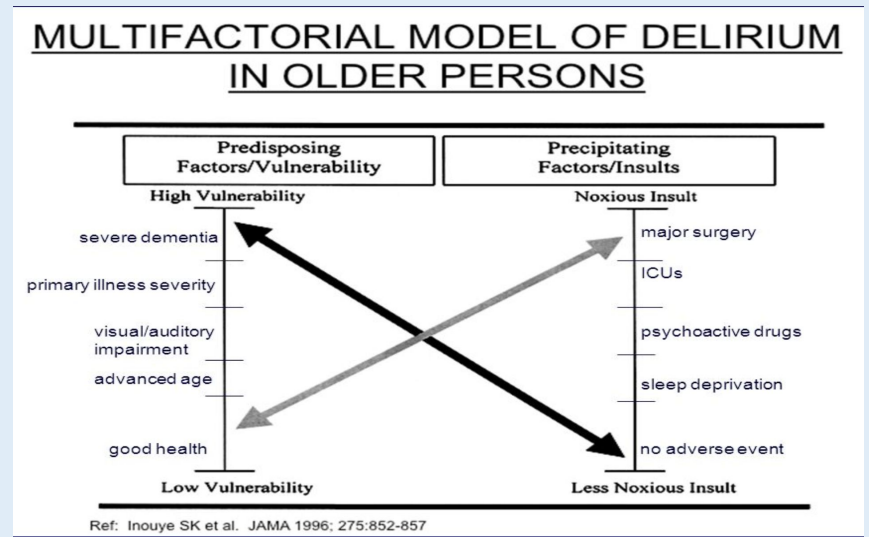
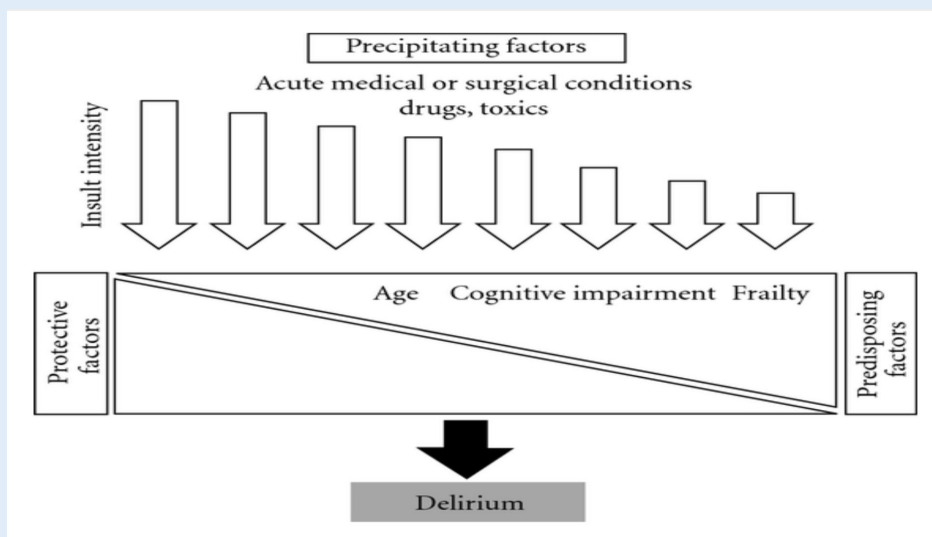
Toxins (medications, illicit drugs, pesticides, solvents)

Heavy metal (lead, manganese, mercury)

Life threatening causes of delirium:

(Irrespective of age)

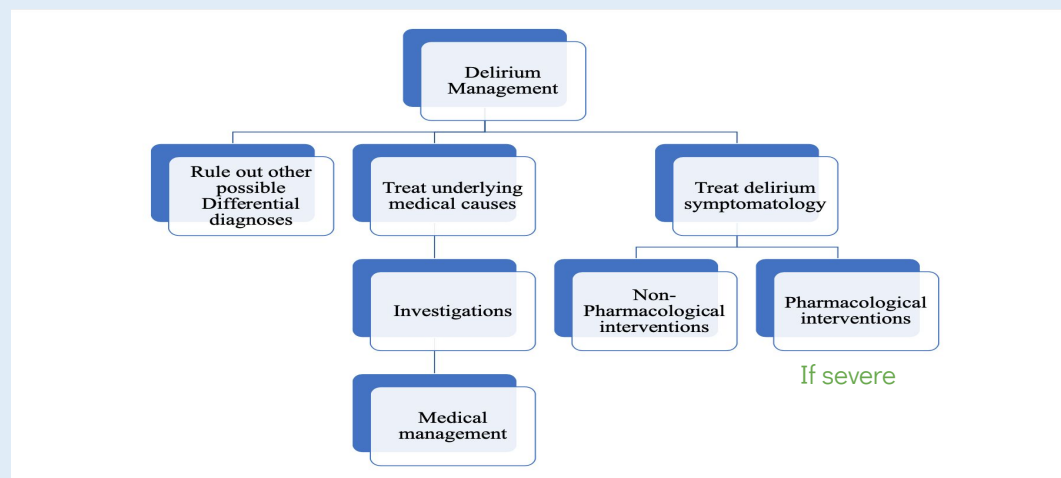
- 1) Wernicke's encephalopathy
- 2) Alcohol/Benzodiazepine withdrawal
- 3) Hypoxia
- 4) Hypoglycemia
- 5) Hypertensive encephalopathy
- 6) Intra-cerebral hemorrhage
- 7) Meningitis/encephalitis
- 8) Poisoning



Delirium Management/Interventions:

As predisposing factors increase and protective factors decrease, the less the severity of the insult needs to be to cause delirium

Ensure patient / staff safety and then treatment of the underlying medical causes



Delirium differential diagnoses:

1) Dementia:

In many Occasions, delirium occurs in a patient with dementia, a condition known as beclouded dementia. However, a dual diagnosis (i.e., delirium in top of dementia) can only be made when there is a definite history of pre-existing dementia

2) Substance abuse: (important to differentiate as it is life threatening and its treatment differs)

Alcohol, inhalants, sedatives, and opioids

3) Amnestic syndrome (see later)

4) Acute functional psychosis/Major psychiatric illness (brief psychosis, mania, exacerbation of schizophrenia)

Patients usually experience no change in their level of consciousness or their orientation. The hallucination and delusions are more constant and better organized than those of patients with delirium

5) Severe depression:


Patients with hypoactive symptoms of delirium may appear somewhat similar to severely depressed patients, but can be distinguished on the basis of EEG (normal in depression)

Proper assessment of mental functions

● Mini-Mental state exam (MMSE)

- Tests orientation, short-term memory, attention, concentration, constructional ability.
- 30 points is perfect score.
- < 20 points suggestive of problem.
- Not helpful without knowing patient's **baseline**.
- In delirium MMSE shows fluctuations day to day (eg a patient can have a score of 20 on day and then 26 the next)

● MoCA (Montreal Cognitive Assessment)

Mini-Mental State Examination (MMSE)		
Patient's Name: _____		Date: _____
Instructions: Ask the questions in the order listed. Score one point for each correct response within each question or activity.		
Maximum Score	Patient's Score	Questions
5		"What is the year? Season? Date? Day of the week? Month?"
5		"Where are we now? State? County? Town/city? Hospital? Floor?"
3		The examiner names three unrelated objects clearly and slowly, then asks the patient to name all three of them. The patient's response is used for scoring. The examiner repeats them until patient learns all of them, if possible. Number of trials: _____
5		"I would like you to count backward from 100 by sevens." (93, 86, 79, 72, 65, ...) Stop after five answers. Alternative: "Spell WORLD backwards." (D-L-R-O-W)
3		"Earlier I told you the names of three things. Can you tell me what those were?"
2		Show the patient two simple objects, such as a wristwatch and a pencil, and ask the patient to name them.
1		"Repeat the phrase: 'No ifs, ands, or buts.'"
3		"Take the paper in your right hand, fold it in half, and put it on the floor." (The examiner gives the patient a piece of blank paper.)
1		"Please read this and do what it says." (Written instruction is "Close your eyes.")
1		"Make up and write a sentence about anything." (This sentence must contain a noun and a verb.)
1		"Please copy this picture." (The examiner gives the patient a blank piece of paper and asks him/her to draw the symbol below. All 10 angles must be present and two must intersect.) 
30		TOTAL

Treat underlying medical causes

Investigation: There is no specific diagnostic investigation for delirium

- Good clinical skills are essential:
 - Careful History and physical examinations:
 - Acute onset + review medical conditions/diseases + cognitive & consciousness disturbances
(evaluating this factors helps in diagnosing delirium)
 - Collateral history:
 - Baseline cognition
 - Presence of sensory impairments
 - Exposure to risk factors
 - Review medications, procedures, tests....etc

First line investigations:

- Complete blood count (CBC) with differentials WBCs.
- Electrolytes, Mg, Ca, and PO4 tests.
- Liver function tests.
- Renal function tests.
- Urinalysis + cultures & sensitivity.
- Blood cultures & sensitivity.
- Thyroid function test.
- Electrocardiogram (ECG).
- Blood glucose.
- Chest x-rays.

Second line investigations:

- Drug screen.
- Cardiac enzymes.
- Blood gas (ABG).
- Serum folate / B12.
- Electroencephalography (EEG).
- Cerebrospinal fluid examinations.
- Brain CT scan.
- Brain MRI.

Treatment of delirium symptomatology

1) Non-Pharmacological interventions

- Symptomatic measures involving attention to fluid and electrolyte balance, nutritional status, and early treatment of infections.
- Environmental interventions:
 - Reduce unfamiliarity by providing a calendar, a clock, family pictures, and personal objects.
 - Maintain a moderate sensory balance in the patient by avoiding sensory overstimulation or deprivation.
 - Minimize staff changes, limit noise and the number of visits, a nightlight, and where necessary, eyeglasses and hearing aids.
 - Proper communication and support are critical with these patients.

2) Pharmacological interventions:

- All the patient's medications should be reviewed, and any unnecessary drugs should be discontinued (especially **anticholinergic**).
- If some medication needed, the patient should receive the lowest possible **effective** dose.
- Drugs such as phenobarbital (**no longer used**) or benzodiazepine should be avoided.
 - Their effects may increase disorientation, drowsiness, ataxia, and possible falls, head trauma and fractures.
- For agitation or aggressive behaviour: Haloperidol 5 mg oral/IV/IM or olanzapine 5 mg oral/IM (or other type of atypical antipsychotics) (**only for a short period**)
 - Intramuscular administration may be preferable for some patients with delirium who are poorly compliant with oral medications or who are too sedated,
- **NB. There are only two case were you can give benzodiazepines? When the cause of delirium is withdrawal of benzodiazepines or alcohol.**

Delirium course and Prognosis

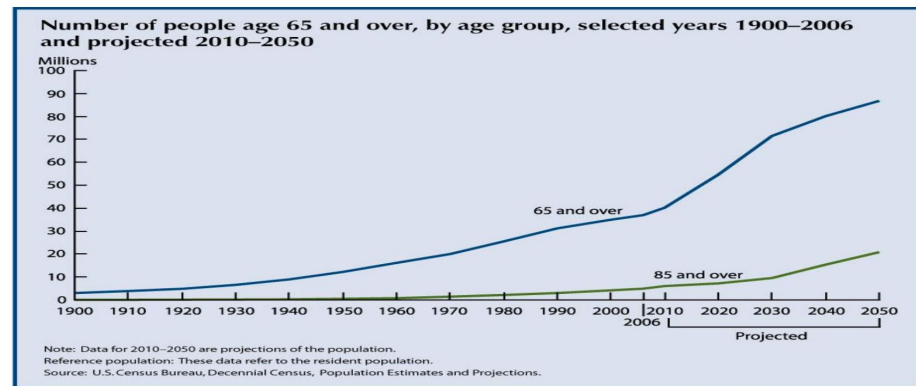
- The course usually short (7-10 days).
- Symptoms of delirium usually persist as long as the causally relevant factors (**underlying causes**) are present.
- The longer the patient has been delirious and the older the patient, The longer the delirium takes to resolve.
- Delirium may spontaneously resolved or progress rapidly into death because of the serious nature of the associated medical conditions.
- When underlying cause treated, it usually resolves rapidly.
 - Some residual deficit may persist. (**especially in elderly**)
- Some patients may develop depression symptoms or Post Traumatic Stress Disorder (PTSD).

Major Neurocognitive Disorders

Introduction: (Reference)

- Aging is a normal part of development.
- Unlike childhood development, there are NO specific motor, speech or cognitive milestone for adults to meet as they enter old age.
- Instead, aging is often accompanied by accumulating losses in functioning that gradually increase the risk of mortality.
- Many of these changes (including some degree of memory loss) are considered to be completely within the realm of normalcy.
- However, there are also a variety of conditions associated with old age that cause distress and dysfunction not only for the patient themselves but also for their family and caregivers.

People > 65 make up one of the fastest growing segment of population



Dementia

Case 2:

- 73 year-old-lady, she was diagnosed for many years to have DM, HTN, Hypercholesterolemia, and Osteoporosis. Her family noticed in the last year that she started to be more isolated and not socially engaged.
- She started to be more forgetful and repeating the same questions over and over. More recently, she started to misplace things like her keys and her items. Also, there were a few occasions where she left the refrigerator open.
- More recently, the patient's family discovered that the patient is either not taking her oral medications or taking her medications wrongly. In addition, she started to be more irritable and sometimes aggressive towards her family. She has poor insight into her current situation.
- Throughout the patient's history, there is no history of loss of consciousness. And there is no motor abnormality. There is no history of abnormal perception or unusual thinking; however, more recently, patient started to be more suspicious

Dementia refers to a disease process marked by:

- Progressive cognitive impairment in clear consciousness.
- Does NOT refer to low intellectual functioning or mental retardation because these are developmental conditions.
- Cognitive deficits represent a decline from a previous level of functioning.
- Involves multiple neurocognitive domains. (but starts affecting memory then involves other domains as the disease progresses)
- Cognitive deficits cause significant impairment in social or occupational functioning or both.

The Dementia Syndrome

(Reference)

- A) Global deterioration of intellectual function (learning & memory, complex attention, language, executive function, perceptual-motor abilities, social cognition)
- B) Clear consciousness (rule out delirium)
- C) Impairment in performance of personal activities of daily living and social or occupational activities due to the decline in intellectual function
- D) Noncognitive psychopathological symptoms and/or deterioration in emotional control, motivation, or personality frequently present but not necessary for diagnosis
- E) Duration of at least 6 months

Epidemiology:

No gender difference (in all dementias generally)

Increasing age is the most important risk factor (It is primarily a

disorder of the elderly)

The prevalence of moderate to severe dementia:

In the general population is 5 % > 65 years

20 - 40 % in > 85 years

15 - 20 % In outpatient general medical practice

50 % in chronic care facilities

Affective symptoms, including depression and anxiety are seen in 40 to 50 % of demented patients

Delusion and hallucination occur in 30 % (in advanced disease)

Dementia Presentation

In early stage cognitive impairment may not be apparent:

- Gradual loss of social and intellectual skills (first noticed in work setting where high performance is required).
- Mild memory impairment. (short-term memory most commonly affected)
- Subtle changes in personality.
- Changes in affect (irritability, anger,...).
- Multiple somatic complaints and vague psychiatric symptoms.

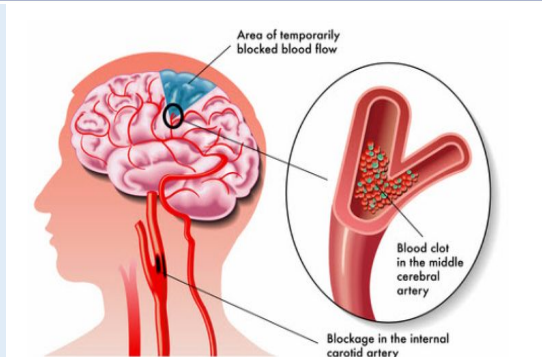
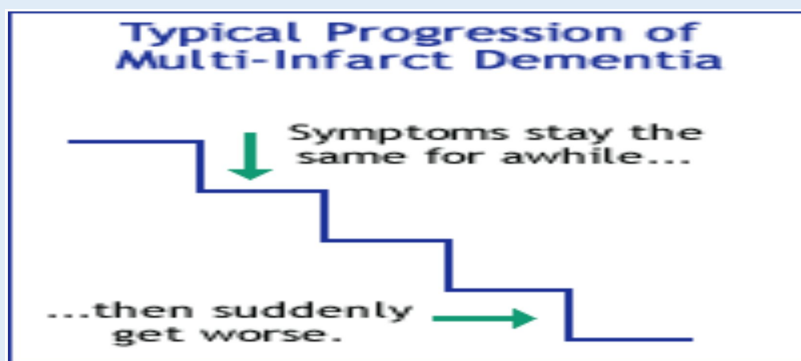
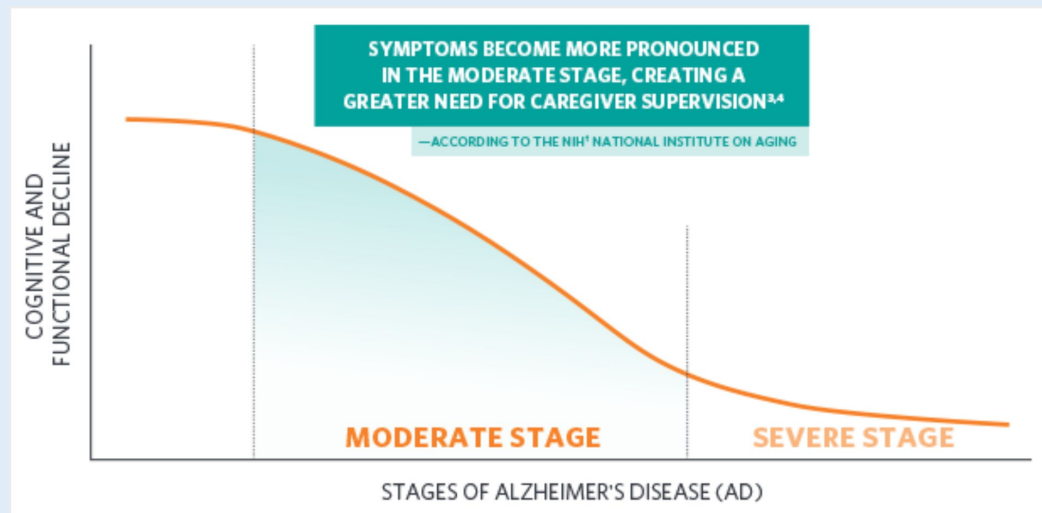
In the late stages cognitive disturbances emerge:

- Increasing memory impairment (esp. recent memory). (even long-term memory)
- Attention impairment.
- Disorientation (particularly to time, and when severe to place and person).
- Language: vague and imprecise speech with inappropriate repetition of the same thoughts (Perseveration).
- Impaired judgment.
- Potential aggression (verbal & physical)
- Psychotic features (hallucination & delusions).
- Emotional lability
- Catastrophic reaction (marked by agitation secondary to subjective awareness of intellectual deficits under stressful circumstances)

Causes of dementia

1) Alzheimer's disease (AD) (50 - 60 %)

- Gradual onset and a continuous slow but steady decline from a prior intellectual and functional capacities, especially memory.
- Age of onset:
 - Before age 65 (5%)
 - After age 65 (95%)
- Live an average of 10 years following diagnosis.
- Risk factors:
 - Old age, female, low education, first-degree relative with AD, cigarette smoking, depression, mild cognitive impairment, and social isolation.



2) Vascular (multi-Infarct) dementia (10 - 20 % of dementias):

- Declining Stepwise deterioration of intellectual functioning due to multiple infarcts of varying sizes or arteriosclerosis in the main intracranial vessels.
- Risk factors for vascular dementia:
 - Age > 60.
 - Male.
 - Previous stroke.
 - Stroke risk factors:
 - (HTN, heart disease/atrial fibrillation, DM, Smoking, obesity, and hypercholesterolemia)

3) Medical conditions (reversible conditions; 15 % of dementias):

- A variety of non-psychiatric, non-neurologic conditions can cause cognitive symptoms which can strongly resemble dementia.
- Referred as reversible dementias, as treating the underlying condition can effectively restore cognitive function back to its previous state.
- Common causes of reversible dementia:
 - Drugs (Benzodiazepines, anticonvulsants, anticholinergics...), alcohol/substance abuse.
 - Sensory impairments (Vision, hearing loss).
 - Metabolic abnormalities (Poorly treated DM).
 - Endocrinological problems (Hypothyroidism).
 - Nutritional deficiency (Vitamin B12 deficiency) (or folate deficiency)
 - Infections (HIV, neurosyphilis).

NB. If caught early on these cases are reversible. However, if the presentation is late we can stop the deterioration but not reverse it.

4) Lewy Body dementia:

Characterized by:

- Fluctuating in cognition.
- Vivid visual hallucinations.
- Parkinsonian features (tremor, rigidity, gait problems/falls).

5) Frontotemporal dementia:

Degeneration of the frontal and temporal lobe and characterized by:

- Inappropriate behavior (hypersexuality).
- Personality changes.
- Loss of impulse control.
- No memory changes

6) Other type of dementia:

- Parkinson's disease (20 - 30 % of patients with Parkinson's disease have dementia).
- Normal-pressure hydrocephalus (Progressive memory impairment, slowness and marked unsteady gait (+ urine incontinence in the late stage).
- Huntington's disease (intellectual impairments with extrapyramidal features)
- Creutzfeldt-Jakob's disease (CJD)
- Traumatic Brain Injury (TBI)
- Prion disease

Dementias are classified as: (Reference)

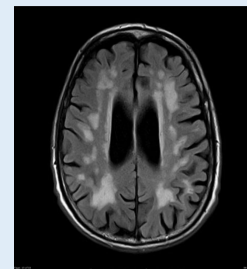
- Cortical:
 - Alzheimer's disease
 - Frontotemporal dementia
 - Dementia with Lewy Body
- Subcortical:
 - Huntington's disease
 - Parkinson's disease
 - Normal-pressure hydrocephalus
 - Subcortical dementias are associated with psychomotor retardation, movement disorders, gait incoordination, apathy, and akinetic mutism

Dementia workup:

1) Comprehensive history and physical examination

2) Investigations:

- Essential workup to detect treatable causes:
 - Blood work (CBC with differential, TSH, blood glucose, electrolytes, Ca, Mg, vitamin B12, folate, liver and renal function tests)
 - Other tests (serum HIV)
 - Neuropsychological testing (MoCA)
 - Neuroimaging (CT scan and MRI)



Vascular dementia:
Lesions and atrophy of cortical and/or subcortical structures corresponding to infarcts

- Alzheimer's dementia:
 - Cortical atrophy
 - Wide sulci & gyri
 - Wide ventricles



Dementias Differential Diagnoses

1) Normal aging:

- Age-related cognitive decline (the course is not progressively deteriorating),
- NO loss of social or occupational functioning
- Consider it but it's unlikely that a person will be brought to the hospital due to normal aging

2) Delirium:

- The onset is rapid and consciousness is impaired.
- Some demented patients may develop delirium.
- Diagnosis of dementia cannot be made before delirium clears.

3) Depression in the elderly (Pseudo-dementia):

- Cognitive disturbance is relatively of rapid onset and preceded by depressive features,
- The differentiation is sometimes difficult as demented patients may also become depressed as they begin to comprehend their progressive cognitive impairment.
- EEG and CT scan are normal in pseudo-dementia.

Delirium vs Dementia

Features	Delirium	Dementia	Depression
Onset	Acute (hours to days)	Insidious (months to years)	Acute or Insidious (wks to months)
Course	Fluctuating	Progressive	May be chronic
Duration	Hours to weeks	Months to years	Months to years
Consciousness	Altered	Usually clear	Clear
Attention	Impaired	Normal except in severe dementia	May be decreased
Psychomotor changes	Increased or decreased	Often normal	May be slowed in severe cases
Reversibility	Usually	Irreversible	Usually

Feature	Dementia	Delirium
onset	Slow/gradual (except for vascular dementia)	Rapid
Duration to develop	months to years	hours to weeks
Attention	Preserved <small>Especially in the beginning</small>	Fluctuates
Awareness	Unchanged	Reduced
Consciousness	intact	impaired
Course	Chronic/deteriorating	transient/clears within 7-10 days

Dementias Treatment/Management

1) Supportive measures:

- a) Ensure patient safety.
- b) Provide good meals & hygiene.
- c) Encourage family's involvement.
- d) Support.

Keep patient in familiar settings (if possible) to avoid accidents and possible agitation

2) Specific measures:

Identify and correct any treatable or controllable condition

- Hypothyroidism, Vitamin B12 deficiency, hypertension, diabetes,

4) Cognitive-enhancing medications (mainly for Alzheimer's dementia):

a) Cholinesterase inhibitors: (slow down dementia not stop nor cure it)

- Donepezil (Aricept): 5 mg at night & can be increased gradually to 10 mg. It is well tolerated
 - (S/E: diarrhea, weight loss, bradycardia, and syncope)
- Rivastigmine (Exelon): 1.5 mg twice/day & can be increased gradually to maximum 6mg twice/day
 - (S/E: anorexia, fatigue, somnolence, and dizziness)
- Galantamine (Reminyl): 4mg twice/day & can be increased gradually to 12mg twice/day
 - (S/E: similar to rivastigmin)

b) NMDA receptor antagonist:

- Memantine (Epixa, Akatinol):
 - an N-methyl-D-aspartate (NMDA) receptor antagonist, protects neurons from neurodegenerative process induced by glutamate excitotoxicity.
 - Memantine has been shown to have a modest effect in moderate to severe Alzheimer's disease and in dementia with Lewy body. In general, well tolerated.
 - Adverse drug reactions include confusion, dizziness, drowsiness, headache, insomnia, agitation, and/or hallucination. Less common adverse effects include vomiting, anxiety, hypertonia, cystitis, and increased libido.

3) Symptomatic treatment:

- a) **Agitation/aggression:** (small dose of antipsychotics (e.g. olanzapine 5mg, risperidone 2mg, or quetiapine 25mg))
- b) **Insomnia**
- c) **Depression:** (give a small dose of antidepressant (e.g. escitalopram 5 mg or sertraline 25mg))

Be aware of possible side effects (over-sedation, fall risk "head trauma/fractures", central anticholinergic activity that may cause delirium) (in dementia the brain is more sensitive → be cautious)

Course and prognosis

- The course and prognosis depend on the cause.
 - Alzheimer's dementia:
 - Shows a progressive slow deterioration.
 - The patient may become incontinent of urine and/or stool.
 - Vascular dementia:
 - Shows stepwise deterioration.

Amnestic syndrome

Case 3:

- A 48-years-old male. Has a long-standing history of: Hypertension, DM type 2, Hypercholesterolemia.
- Presented with significant cognitive and behavioural problems. He had difficulty with learning new information and making appropriate plans.
- Personal/social history: smoke tobacco and consume alcohol on an almost daily basis for many years.

Definition: **Impairment in short term memory** (retention of new information; temporal lobe function) due to a specific organic cause, in the absence of generalized intellectual impairment.

- Impairment in the ability to create new memories. (+ new information)
- It leads to social and occupational dysfunctioning.
- The patient may show confabulation (filling memory gaps with incorrectly retrieved information). (Not lying)
- The insight is partially impaired.
- In contrast to delirium, the immediate memory is usually intact. (i.e. digit span test “frontal lobe function” is normal). (remembers things in the moment, but forgets them the next day)
- In contrast to dementia, the remote memory is intact.

NB. Impairment in short term memory ONLY, all other cognitive domains are intact.

Etiology (major causes of amnestic disorders)

Head injury lesions:

(Hippocampus, Posterior Hypothalamus and nearby midline structures)

Thiamine (B1) Deficiency

- Thiamine is essential for the enzyme transketolase, which essential for glucose metabolism.
- Associated with alcohol abuse (long term/years), poor nutrition (e.g., starvation), gastric carcinoma, persistent vomiting, hemodialysis. **Bariatric surgery**

Systemic medical conditions :

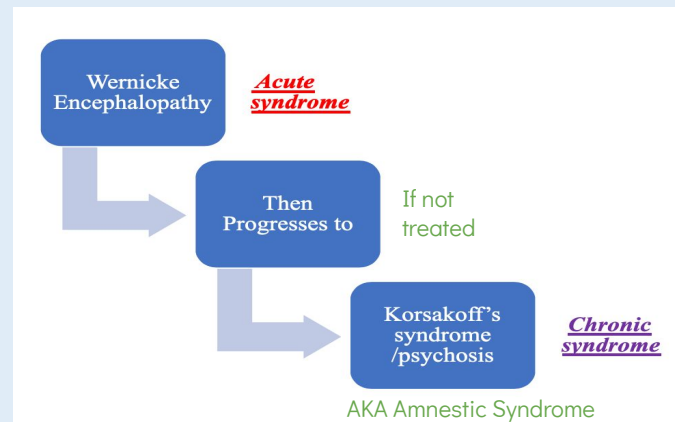
- Thiamine deficiency (Korsakoff's syndrome)
- Hypoglycemia
- Primary brain conditions
- Seizures
- Head trauma
- Cerebral tumors
- Cerebrovascular diseases
- Surgical procedures on the brain
- Encephalitis due to herpes simplex
- Hypoxia
- Transient global amnesia
- Electroconvulsive therapy
- Multiple sclerosis

Substance-related causes:

- Alcohol use disorders
- Neurotoxins
- Benzodiazepines
- (and other sedative hypnotics)
- Many over the counter preparations

Wernicke-Korsakoff's syndrome

- Is an amnestic syndrome caused by thiamine deficiency
- Most commonly associated with poor nutritional habits of people with chronic alcohol use



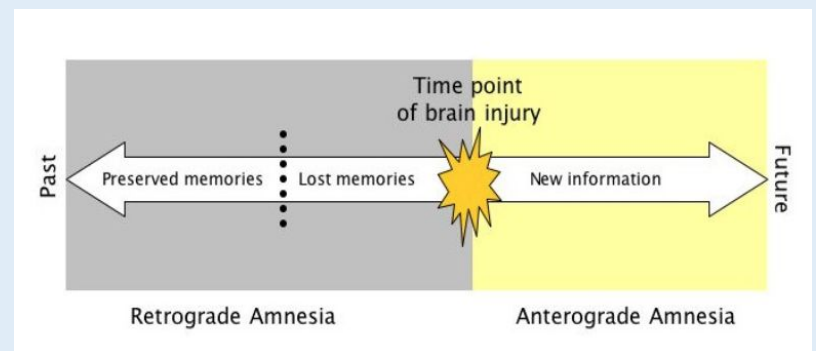
Wernicke encephalopathy

- Acute syndrome (triad in red)
 - Impaired consciousness (confusion)
 - Ophthalmoplegia
 - Ataxia
 - Memory impairment
 - It is a kind of delirium



Korsakoff's syndrome

- Chronic syndrome
 - Peripheral neuropathy Irritability and personality changes.
 - Apathy
 - Profound anterograde amnesia and inability to form a new memories.
 - Confabulate or make up information when asked questions.
 - Worst case scenario



Treatment:

- Identify and reverse the cause if possible.
- Thiamine supply (if due to thiamine deficiency).
- Supportive medical measures; fluids & nutrition.

Prognosis:

- If it is due to thiamine deficiency and thiamine is provided promptly.
- Prognosis is good. (if detected early)
- Otherwise, the course is usually chronic and may be progressive.

Traumatic Brain Injury (TBI)

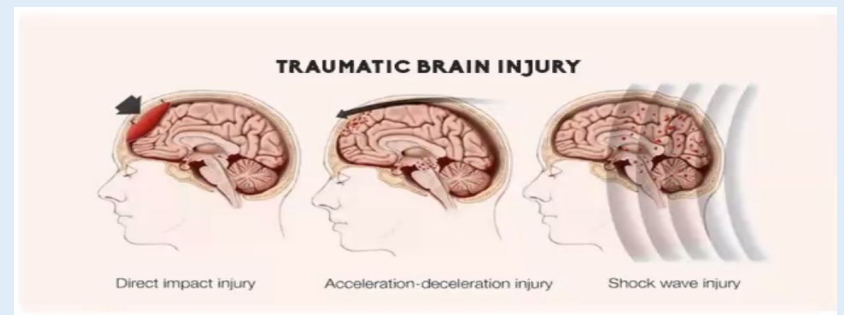
Case 4 :

- A 19-year-old male involved in a road traffic accident. He lost his consciousness for 5 days and remained 3 weeks in the hospital.
- After discharge, his parents noticed that he became:
 - Impulsive
 - Disinhibited
 - Sometimes aggressive
- More recently they noticed that he started to be more depressed and sometimes feeling anxious.

Definition: An insult to the brain from an external mechanical force, possibly leading to permanent or temporary impairment of cognitive, physical, and psychosocial functions.

- Associated diminished or altered state of consciousness (during trauma itself)
- Area of function affected:
 - Cognitive (eg. memory, processing speed, executive functions)
 - Sensory/perceptual (deafness or loss of sight)
 - Seizures
 - Other physical changes
 - Social-emotional (eg. anxiety, depression, irritable, impulsive, aggressive. They may also develop what looks like psychosis.)

Eg. There is no specific set of symptoms in TBI, as a lot of different factors (including the type and site of injury) contribute to the signs and symptoms the patient presents with



Acute consequences:

- Impaired consciousness in varying duration (hours, days, weeks or months). The long duration suggests poor prognosis
- Delirium (after severe head trauma)
- Memory defects (on recovery of consciousness, defects of memory are usually present)
 - Anterograde (post-traumatic) amnesia: Amnesia for events in the time between the trauma and the resumption of normal continuous memory (eg. after a car accident the last thing a patient remembers is driving on the road just before the trauma)
 - It is a good prognostic factor: probably full recovery when anterograde amnesia was less than 24 hours
 - Retrograde amnesia: Amnesia for events in the time between the trauma and the last clearly recalled memory before the injury. It is not a good predictor of outcome (eg. a patient only remembering leaving the house, but they don't remember going to the shops and petrol station before the trauma occurred)

Chronic Consequences:

- Lasting cognitive impairment:
 - When the injury has caused a prolonged post traumatic amnesia (of more than 24 hours).
 - Parietal and temporal damage, especially on the left side.
 - Recovery of function may be very slow and may continue over the years.
- Emotional disturbances:
 - Depressive, anxiety and phobic features are common.
 - Somatic complaints such as headache, fatigue and dizziness.
- Personality changes:
 - Irritability
 - Reduced control of aggressive impulses
 - Sexual disinhibition and some coarsening of behaviour (particularly after frontal lobe injury)
- Psychotic features:
 - Psychotic features related to depression (non-dominant frontal damage)
 - Paranoid psychosis (temporal lobe damage)
- Social consequences:
 - Many patients and their relatives experience severe distress of head injury, and have to make substantial changes in their way of life
- Medico-legal aspects:
 - The compensation issue is more likely to contribute to disability if the patient feels someone else is at fault, financial compensation is possible, low social status and in industrial injury.

Severity and type depends on the specifics of the trauma. A patient could have only one or a random combination of these symptoms.
NO SPECIFIC SYMPTOMS.

Factors affecting the outcome of head trauma:

- 1) Duration of loss of consciousness
- 2) Duration of anterograde (Post-traumatic) amnesia
- 3) Amount and location of brain damage
- 4) Premorbid personality and past psychiatric history
- 5) Development of seizures
- 6) Medico-legal factors e.g. compensation

The longer these last the worse the outcome will be

Treatment

- A plan for long-term treatment should be made as early as possible after head trauma.
- The treatment of the cognitive and behavioral disorders is similar to the treatment approaches used in other patients.
- Head trauma patients may be particularly susceptible to the side effects associated with psychotropics/antipsychotics medications.
- Drugs should be initiated in lower dosages than usual
- Should be titrated upward more slowly than usual
- Aggression and impulsivity can be treated with
 - Antipsychotics or anticonvulsants.
- Treatment should include physical and psychological rehabilitation
- Continuing psychosocial help should be provided to patients and caregiver by a special team

Treatment is symptom-based. It's very important to remember that (like in dementia) we have to start slow with drugs and go slow. Because in these cases the brain is very sensitive to side effects.

Capacity Vs. Competency (Reference)

Clinical Vs. Legal term that denotes the ability to make rational and reasonably well informed decisions by a particular patient (vs. person) in their treatment and/ or life decision/s.

- Capacity:
 - Is a clinical determination that addresses the integrity of mental functions.
- Competency:
 - Is a legal determination that addresses societal interest in restricting a person's right to make decisions or do acts because of incapacity.

Valid Informed Consent (Reference)

- Permission voluntary given by a competent person without any elements of force, deceit, coercion after explanation and disclosure of:
 - Purpose and details of procedure or treatment
 - Risks, Benefits and available alternative treatment/s
 - The right to withdrawal consent verbally or in written forms at anytime

Rules of capacity (Reference)

- Being mentally ill doesn't in itself imply a loss of capacity or competency
- Having Capacity or being Competent should be presumed until proven otherwise

Exceptions (Reference)

- Life threatening situation
- Patient who waive their rights to disclose and consent (do not want to be informed)

Table 1. Legally Relevant Criteria for Decision-Making Capacity and Approaches to Assessment of the Patient.

Criterion	Patient's Task	Physician's Assessment Approach	Questions for Clinical Assessment*	Comments
Communicate a choice	Clearly indicate preferred treatment option	Ask patient to indicate a treatment choice	Have you decided whether to follow your doctor's [or my] recommendation for treatment? Can you tell me what that decision is? [If no decision] What is making it hard for you to decide?	Frequent reversals of choice because of psychiatric or neurologic conditions may indicate lack of capacity
Understand the relevant information	Grasp the fundamental meaning of information communicated by physician	Encourage patient to paraphrase disclosed information regarding medical condition and treatment	Please tell me in your own words what your doctor [or I] told you about: The problem with your health now The recommended treatment The possible benefits and risks (or discomforts) of the treatment Any alternative treatments and their risks and benefits The risks and benefits of no treatment	Information to be understood includes nature of patient's condition, nature and purpose of proposed treatment, possible benefits and risks of that treatment, and alternative approaches (including no treatment) and their benefits and risks
Appreciate the situation and its consequences	Acknowledge medical condition and likely consequences of treatment options	Ask patient to describe views of medical condition, proposed treatment, and likely outcomes	What do you believe is wrong with your health now? Do you believe that you need some kind of treatment? What is treatment likely to do for you? What makes you believe it will have that effect? What do you believe will happen if you are not treated? Why do you think your doctor has [or I have] recommended this treatment?	Courts have recognized that patients who do not acknowledge their illnesses (often referred to as "lack of insight") cannot make valid decisions about treatment Delusions or pathologic levels of distortion or denial are the most common causes of impairment
Reason about treatment options	Engage in a rational process of manipulating the relevant information	Ask patient to compare treatment options and consequences and to offer reasons for selection of option	How did you decide to accept or reject the recommended treatment? What makes [chosen option] better than [alternative option]?	This criterion focuses on the process by which a decision is reached, not the outcome of the patient's choice, since patients have the right to make "unreasonable" choices

* Questions are adapted from Grisso and Appelbaum.³¹ Patients' responses to these questions need not be verbal.

Introduction

In psychiatry, the words "**cognition/cognitive**" are used in 2 different contexts;

Cognitive functions: attention, concentration, orientation, and memory. Disorders of which are called: "**Cognitive disorders**"

Cognitive Processes: ways of thinking and conclusion formation. **Cognitive Therapy:** a type of psychotherapy that is concerned with detection and correction of wrong thoughts & thinking process (negative cognition) commonly seen in patients with anxiety & depressive disorders.

Cognitive Therapy is *not* a treatment of cognitive disorders.

Cognitive Disorders

Delirium: an acute global cognitive disorder with disturbed consciousness.

Dementia: a chronic global cognitive disorder without disturbed consciousness.

Amnestic(amnesic) syndrome: a specific disorder of short-term memory.

In the DSM-5 classification:

Neurocognitive Disorders

Delirium

Mild Neurocognitive Disorders (new category).

Major Neurocognitive Disorders

Head Injury; psychiatric consequences.

Acute

Chronic

(الهذيان - الهذاء) Delirium

Mr. Hassan is a 75-year-old man was brought to the emergency department by his sons because of 3 days history of fluctuating consciousness, disorientation, & disturbed perception, speech, thinking, and behavior. Recently he developed fever and urinary incontinence.



★ **Definition:** Acute transient reversible global cognitive impairment with impaired consciousness due to a medical problem.

Epidemiology: It may occur in anyone at any age but more in elderly and children. The highest rate of delirium is found in post-cardiotomy patients > 80 %. In ICU 30%, post burn patients 20%, & among hospitalized patients about 10 %. **Delirium is under-diagnosed especially when patient is hypoactive, somnolent, or with minimal features. Such cases may be misdiagnosed as depression.**

★ **Diagnostic criteria (simplified):**

- A. Consciousness is disturbed (i.e., awareness of the environment is impaired but patient is not in coma).
- B. Cognitive functions are impaired + / - perceptual disturbances (illusions or hallucinations).
- C. Acute onset with fluctuating symptoms (within hours during the day) & transient course (few days).
- D. Caused by a physical problem (e.g. hypoxia, hypoglycemia, infection...others see causes).

Mnemonic

Acute Co Co Cause


Clinical Assessment: see p 13.

[video](#)

★  Dr., is delirium a **serious** condition & why?

Yes, Abdulrahman. It is a very serious medical & psychiatric condition due to high risks of:
1-Death (b/o the serious nature of the associated medical conditions) 2- Suicide 3- Violence 4- Impaired judgment & 5- Psychosis.




★  Dr., why does a delirious patient become **suicidal** or aggressive?!

Due to the severe disturbance in the patient's perception, mood, thinking, and behavior. Patient may act on hallucinations, illusions or delusional thoughts as if they were genuine dangers (e.g., blood extraction by a nurse might be perceived as an attack). However, the clinical presentation differs from patient to patient. Some patients may be excessively somnolent, and some may fluctuate from one state to the other, usually restless at night and sleepy during the day with lucid intervals.



Mr. Hassan showed difficulty focusing, sustaining, and shifting attention. He was not cooperative during physical & mental status examinations. He was agitated, shouting, and tried to pull out his intravenous lines.

★  Is there a **specific diagnostic investigation** for delirium?

No, it is a bedside clinical diagnosis. Thus, good clinical skills are essential:

A. History; acute onset + medical disease + consciousness & cognitive disturbances .

B. MSE; proper assessment of mental functions.





Abdulrahman, what are the common causes of delirium?



Etiology

- **Infections:** e.g. UTI, chest infection, encephalitis, septicemia.
 - **Medications** (e.g. anticholinergics).
 - **Metabolic & electrolyte disturbances.**
 - **Endocrinopathies** (e.g. hypoglycemia).
 - **Hypoxia;** cardiac or respiratory failure.
 - **Renal failure;** uremia.
 - **Hepatic failure;** encephalopathy.
 - **CNS:** seizure / head trauma/substance abuse (intoxication or withdrawal).
- Regardless of the cause, the presentation is similar.**

Inf
me
me
ends
hypoxia
Renal
Hepatic
CNS



Age ≥ 70 years , Fever
DM - HTN- COPD-
Organ failure.

Past history of delirium.
Current history of dementia.

Substance abuse.
Multiple medications.

Investigations :

Blood: CBC + differential WBCs. Blood chemistries (including electrolytes, renal and hepatic indexes, and glucose). Blood culture. Blood drug screen. Thyroid function tests. CPK

Urine: Urinalysis. Culture & sensitivity. Urine drug screen.

Additional tests when indicated:
Chest XR./ ECG./ EEG. / Brain scan (CT or MRI). Lumbar puncture and CSF examination.

Mr. Hassan's history revealed memory deterioration and time disorientation over the past 5 years.

Differential Diagnosis (DDx):

1. **Dementia :**

	Delirium	Dementia
Onset	Acute	Gradual /insidious (except for vascular dementia caused by stroke).
Consciousness	Impaired	Intact
Course	Fluctuates /transient /clears within 7-10 days	Chronic /deteriorating

Occasionally, delirium occurs in a patient with dementia, a condition known as **beclouded dementia**. However, a dual diagnosis (i.e. dementia and delirium) can only be made when there is a definite history of preexisting dementia (see dementia later in this chapter).

2. **Substance abuse;** alcohol, inhalants, sedatives, and opioids. (see later).
3. **Amnestic syndrome** (see later).
4. **Acute functional psychosis** (brief psychosis, mania, and exacerbation of schizophrenia or schizoaffective disorder): patients usually experience no change in their level of consciousness or in their orientation. The hallucinations and delusions are more constant and better organized than those of patients with delirium.
5. **Severe Depression :** patients with hypoactive symptoms of delirium may appear somewhat similar to severely depressed patients, but they can be distinguished on the basis of an EEG (normal in depression). When a delirious patient is treated with tricyclic antidepressants (TCAs), his/her cognitive functions deteriorate further because of the anticholinergic effect of (TCAs).

★ **Treatment:** (It should be in a well-equipped medical rather than a psychiatric ward).

1. The cause should be searched for and treated properly, e.g. ensure electrolyte balances, enough oxygen, nutrition, and hydration. The referring physician should do this task.
2. Control mental and physical disturbance with antipsychotics e.g. haloperidol (1mg oral, IV, or IM) or Olanzapine (5mg oral or IM) 2- 3 times/day. Intramuscular administration may be preferable for some patients with delirium who are poorly compliant with oral medications or who are too sedated to safely swallow tablets.
3. Limit benzodiazepines (or give with extreme caution) because their effects may increase disorientation, drowsiness and ataxia with possible falls, head trauma and fractures.
4. Keep the patient in a quiet, well lit-room; avoid over and under stimulation. Frequently reorient, reassure and explain procedures clearly to the patient.

Types of delirium (Meagher 1996):

Hyperactive (30%)	Hypoactive (24%)	Mixed (46%)
The most clear and least controversial.	The most difficult type to identify. A large percentage of these patients are inappropriately diagnosed and treated as depressed. Classically, these patients present with symptoms that are commonly associated with depression (lethargy, apathy, decreased level of alertness, psychomotor retardation, and decreased speech production)	The classic waxing and waning pattern. Commonly seen in surgical patients (agitated at times, with alternating episodes of hypoactivity).

Course and Prognosis: The course is usually short (7-10 days). However, the symptoms of delirium usually persist as long as the causally relevant factors are present. The longer the patient has been delirious and the older the patient, the longer the delirium takes to resolve. Delirium may spontaneously clear or progress rapidly into dementia or into death; because of the serious nature of the associated medical conditions. When treated, it usually resolves rapidly. However, some residual deficit may persist. It is sometimes followed by depression.

Neurocognitive Disorders (DSM-5)

1.Delirium : The criteria for delirium have been updated and clarified on the basis of currently available evidence.

2.Mild Neurocognitive Disorder : it describes a less severe & less disabling level of cognitive impairment that requires compensatory strategies and accommodations to help maintain independence and perform activities of daily living. To be diagnosed with this disorder, there must be changes that impact cognitive functioning. These symptoms are usually observed by the individual, a close relative, or other knowledgeable informant, such as a friend, colleague, or clinician, or they are detected through objective testing. This diagnostic category provides an opportunity for early detection and treatment of cognitive decline before patients’ deficits become more pronounced and progress to **major neurocognitive disorder** (dementia) or other debilitating conditions. Its inclusion in the manual will help clinicians develop effective treatment plans as well as encourage researchers to evaluate diagnostic criteria and potential therapies. Recent studies suggest that identifying mild neurocognitive disorder as early as possible may allow interventions to be more effective. Early intervention efforts may enable the use of treatments that are not effective at more severe levels of impairment and may prevent or slow progression.

3.Major Neurocognitive Disorder: it includes dementia and amnestic disorder. However, the term *dementia* can be used in the etiological subtypes. An updated listing of neurocognitive domains is also provided in DSM-5, as these are necessary for establishing the presence of NCD, distinguishing between the major and mild levels of impairment, and differentiating among etiological subtypes.

(الخراف) Dementia



Aminah is a 73-year-old diabetic woman noticed to show a gradual loss of social skills, a decreased range of interest, multiple somatic complaints, and memory impairment.

Definition: a progressive impairment of cognitive functions occurring in clear consciousness.

Epidemiology: The prevalence of moderate to severe dementia in the general population is 5 % > 65 years, 20- 40 % in > 85 years of age. In outpatient general medical practices, it is 15 - 20 %, and 50 % in chronic care facilities.

Affective symptoms, including depression and anxiety, are seen in 40 to 50% of demented patients. Delusions and hallucinations occur in 30%.

Features: The essential feature is a loss of intellectual abilities of sufficient severity to interfere with social or occupational functioning or both.



In early stages	In late stages
<p><i>Cognitive impairment may not be apparent.</i></p> <p>Features include :</p> <ul style="list-style-type: none"> - A gradual loss of <u>social and intellectual skills</u> (first noticed in work setting where high performance is required). - <u>Mild memory impairment</u>. - <u>Subtle changes in personality</u>. - <u>Changes in affect</u> (irritability, anger, ...). - Multiple <u>somatic complaints</u> and vague psychiatric symptoms. 	<p><i>Cognitive disturbances emerge:</i></p> <ul style="list-style-type: none"> -<u>Increasing memory impairment</u> (esp. recent memory). -<u>Attention impairment</u>. <u>Disorientation:</u> particularly to time, and when severe to place and person. -<u>Language:</u> vague and imprecise speech with inappropriate repetition of the same thoughts (perseveration). -<u>Impaired judgment</u>. -<u>Potential aggression</u> (verbal & physical). -<u>Psychotic features:</u> hallucinations and delusions. - <u>Emotional lability</u>. - <u>Catastrophic reaction</u> marked by agitation secondary to the subjective awareness of intellectual deficits under stressful circumstances. <p>Sundowner Syndrome Drowsiness, confusion, ataxia, and accidental falls. It occurs in demented patients when external stimuli, such as light and interpersonal orienting cues, are diminished.</p>

Clinical Assessment: see p 13.

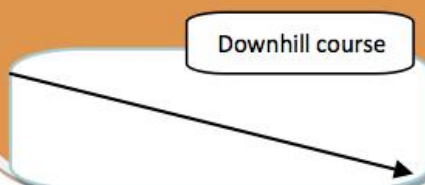
[youtube.com/watch?v=uAlkCMfTASQ](https://www.youtube.com/watch?v=uAlkCMfTASQ)

[youtube.com/watch?v=_hrBPrfDQVI](https://www.youtube.com/watch?v=_hrBPrfDQVI)

Causes of dementia:

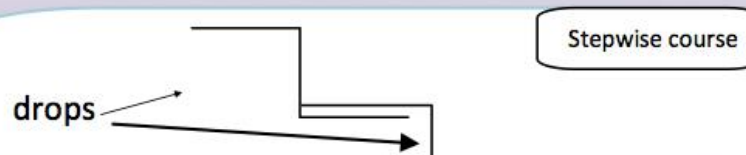


1. Alzheimer's disease (50 to 60% of dementias): Progressive **downhill** deterioration of intellectual functioning due to a degenerative process affecting the whole cortex, especially cholinergic neurons.



2. Vascular (multi-infarct) dementia (10 to 25% of dementias): Declining **stepwise** deterioration of intellectual functioning due to multiple infarcts of varying sizes or arteriosclerosis in the main intracranial vessels. It usually occurs in patients with hypertension or diabetes. Stepwise course (multiple drops) .

Onset: after a stroke, its sudden onset may resemble delirium. Some cases follow a stationary course.



★ **3. Medical conditions** (reversible conditions; 15% of dementias) e.g., metabolic causes: vitamin deficiency (e.g. B12, folic acid), hypothyroidism, TB affecting CNS.

4. Substance- induced dementia: e.g. alcoholic dementia.

5. Parkinson's Disease: it is a disease of the basal ganglia, commonly associated with dementia and depression. An estimated 20 -30 % of patients with Parkinson's disease have dementia, and an additional 30 - 40 % has measurable impairment in cognitive abilities.

5. Others :

- **Lewy Body Disease:** a dementia clinically similar to Alzheimer's disease and often characterized by hallucinations, parkinsonian features, and extrapyramidal signs. Lewy inclusion bodies are found in the cerebral cortex. The exact incidence is unknown. These patients show marked adverse effects when given antipsychotic medications.
- **Normal pressure hydrocephalus:** Progressive memory impairment, slowness and marked unsteady gait (+ urine incontinence in late stages).
- **Huntington's chorea:** global intellectual impairment with extra pyramidal features.
- **Creutz Feldt-Jakob's disease.** • **AIDS dementia .** • **Pick's disease** (dementia of frontal lobe type).
- **Binswanger's Disease** (also known as subcortical arteriosclerotic encephalopathy): is characterized by the presence of many small infarctions of the white matter that spare the cortical regions .

Dementias are classified as **cortical** and **subcortical** depending on the site of the cerebral lesion. A subcortical dementia occurs in vascular dementia, Parkinson's disease, normal pressure hydrocephalus, Huntington's disease and Wilson's disease. The subcortical dementias are associated with psychomotor retardation, movement disorders, gait incoordination, apathy, and akinetic mutism, which can be confused with catatonia.

Course and Prognosis (depend on the cause). Alzheimer's dementia shows a progressive slow deterioration. The patient may become incontinent of urine and / or stool. Vascular dementia shows stepwise deterioration or stationary course after a massive stroke that is then followed by a good control of the risk factors e.g., HTN, DM ...etc.

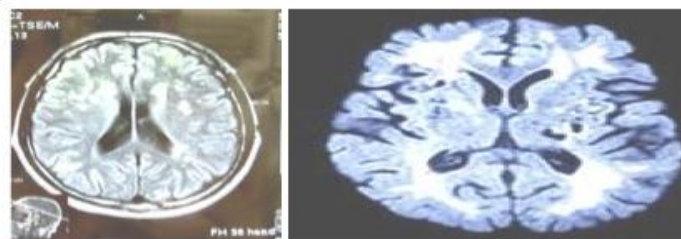
★ **Investigations**

Essential workup to confirm dx / exclude treatable causes:
B12 and folate blood levels. Thyroid Function Tests (TSH, T3, T4). Brain CT or MRI.

Alzheimer's dementia :
(cortical atrophy+ wide sulci, gyri, & ventricles).



Vascular dementia: multiple infarcts.



DDx

1-Normal aging:
Age-related cognitive decline (the course is not progressively deteriorating), no loss of social or occupational functioning.

★ **2. Pseudo-dementia (Depression in the elderly):** cognitive disturbance is relatively of rapid onset and preceded by depressive features. Patient is aware of problems & often answers, "I don't know" compared to confabulation in demented patient. The differentiation is sometimes difficult as demented patients may also become depressed as they begin to comprehend their progressive cognitive impairment. EEG and CT scan are normal in pseudo-dementia. See major depressive episode (MDE) later.

3. Delirium: the onset is rapid and consciousness is impaired. See p 28-30.

★ Treatment:

1. Supportive measures:

- Provide good meals & hygiene.
- Encourage family's involvement.
- Support the caregiver.
- Keep in familiar settings if possible to avoid accidents, wandering away,...etc.

2. Specific measures:

- Identify and correct any treatable or controllable condition e.g. : hypothyroidism, vitamin B12 deficiency, hypertension, diabetes.
- Symptomatic treatment:
 - Agitation, aggression: small doses of major tranquilizers (e.g. Olanzapine 5mg).
 - Insomnia: a small dose of major tranquilizers (e.g. olanzapine 5mg) or benzodiazepine (e.g. lorazepam 1mg).
 - Depression: small doses of antidepressant (e.g. citalopram 10 – 20 mg).

Be aware of possible mental side effects of such medications (over-sedation, risk of falling down - head trauma & fractures- and central anticholinergic activity that may cause delirium).

C. Cognitive-enhancing medications (mainly for Alzheimer's dementia).

I- Cholinesterase Inhibitors :

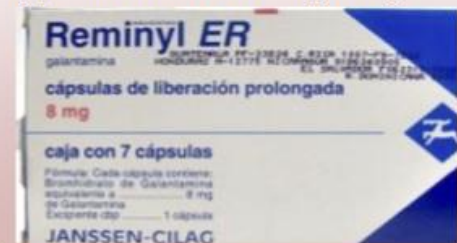
Donepezil (Aricept): 5 mg at night & can be increased gradually to 10 mg. It is well tolerated (S/E: diarrhea, weight loss, bradycardia, and syncope).



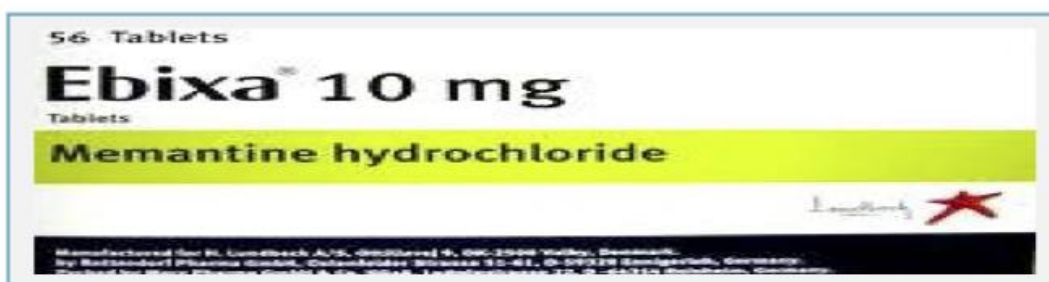
Rivastigmine (Exelon): 1.5 mg twice/day & can be increased gradually to maximum 6mg twice/day (S/E: anorexia, fatigue, somnolence, and dizziness). Also available as a skin patch



Galantamine (Reminyl): 4mg twice/day, can be increased gradually to 12mg twice/day. (S/E: similar to rivastigmine).

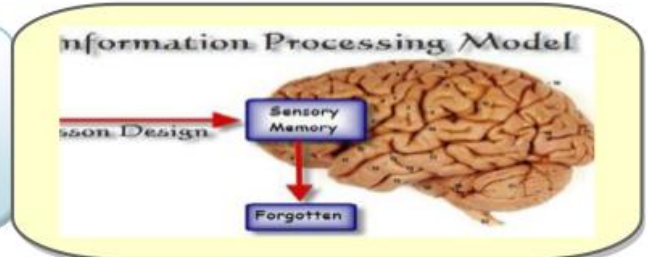


II- NMDA receptor antagonist; Memantine (Ebixa): an N-methyl-D-aspartate (NMDA) receptor antagonist protects neurons from neurodegenerative process induced by glutamate excito-toxicity. Memantine has been shown to have a modest effect in moderate-to-severe Alzheimer's disease and in dementia with Lewy bodies. It is, in general, well tolerated. Adverse drug reactions include confusion, dizziness, drowsiness, headache, insomnia, agitation, and/or hallucinations. Less common adverse effects include vomiting, anxiety, hypertonia, cystitis, and increased libido.



Amnestic (Amnesic) Syndrome

A 48-year-old alcoholic man displayed significant cognitive and behavioral problems. He had difficulty with learning new information and making appropriate plans.



Definition: impairment in the **short-term memory** (retention of new information; temporal lobe function) due to a specific organic cause, in the absence of generalized intellectual impairment. It leads to social and occupational dysfunctioning. The patient may show confabulation (filling memory gaps with incorrectly retrieved information). The insight is partially impaired.

✦ In contrast to delirium, the **immediate memory** is usually **intact**: i.e. digit span test (frontal lobe function) is normal. In contrast to dementia, the **remote memory** is **intact**.

Clinical Assessment: see p 13; memory assessment (normal registration and long term memory but defected short-term recall).

Etiology:

- **Head injury lesions** (hippocampus, posterior hypothalamus and nearby midline structures).
- **Thiamine (B₁) deficiency**, (associated with alcohol abuse, gastric carcinoma, and persistent vomiting). Thiamine is essential for the enzyme transketolase, which is essential for glucose metabolism.

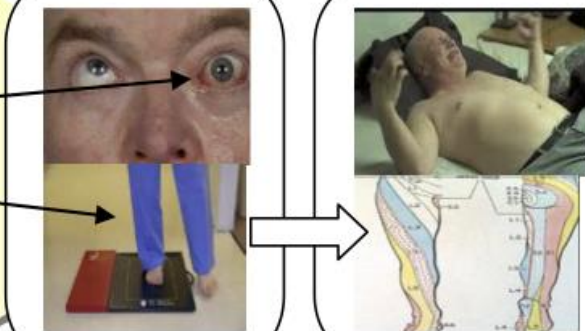
Amnestic Syndrome is most commonly found in alcohol use disorders (*Wernicke – Korsakoff's syndrome*, see below).

Wernicke – Korsakoff's syndrome

It starts as an **acute syndrome** >>>>>> then progresses to >>>>> a **chronic syndrome**.

Wernicke encephalopathy

Ophthalmoplegia.
Ataxia.
Impairment of memory.
Impaired consciousness



Korsakoff psychosis

Peripheral neuropathy.
Chronic memory defect.
Irritability.

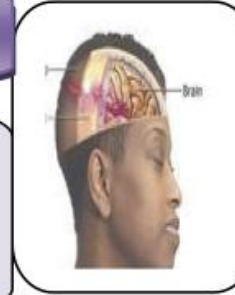
Treatment:

- Identify and reverse the cause if possible.
- Thiamine supply (if due to thiamine deficiency).
- Supportive medical measures; fluids & nutrition.
- (no specific treatment).

Prognosis: If it is due to thiamine deficiency and thiamine is provided promptly, prognosis is good. Otherwise, the course is usually chronic and may be progressive. Psychiatric symptoms occur with increased frequency in patients with seizures because of underlying brain tissue injury, side effects from anticonvulsant medications, or seizure-specific psychiatric disturbances.

HEAD INJURY - Neuro-psychiatric Aspects.

Hamad is a 19-year-old male who was involved in a road traffic accident, lost consciousness for 5 days, and remained 3 weeks in the hospital. After discharge, his parents noticed that he became impulsive, disinhibited, and aggressive at times.



A. Acute consequences:

- 1. Impaired consciousness** in varying duration (hours, days, weeks or months) long duration suggests poor prognosis.
- 2. Delirium** (after severe head trauma).
- 3. Memory defects** : on recovery of consciousness, defects of memory are usually present.
 - a. anterograde (post-traumatic) amnesia**: amnesia for events in the time between the trauma and the resumption of normal continuous memory. It is a **good prognostic factor**: probably full recovery when anterograde amnesia was less than 12 hours.
 - b. retrograde amnesia**: amnesia for events in the time between the trauma and the last clearly recalled memory before the injury. Final duration is frequently less than 1 minute. It is *not* a good predictor of outcome.

Factors affecting the outcome of head trauma:

1. Duration of loss of consciousness.
2. Duration of anterograde (post-traumatic) amnesia.
3. Amount and location of brain damage.
4. Premorbid personality and past psychiatric history.
5. Development of seizures.
6. Medico-legal factors e.g. compensation.

B. Chronic Consequences:

- 1. Lasting cognitive impairment**: there is more likelihood of cognitive impairment when the injury has caused a prolonged post traumatic amnesia (of more than 24 hours). Cognitive impairment was particularly associated with parietal and temporal damage, especially on the left side. Recovery of function may be very slow and may continue over the years.
- 2. Emotional disturbances**: depressive, anxiety and phobic features are common, and associated with somatic complaints such as headache, fatigue and, dizziness.
- 3. Personality changes**:
 - a. There may be irritability, reduced control of aggressive impulses,
 - b. Sexual disinhibition and some coarsening of behavior and premorbid personality traits, particularly after frontal lobe injury.
- 4. Psychotic features**: psychotic features related to depression (non-dominant frontal damage). Paranoid Psychosis (temporal lobe damage).
- 5. Social consequences**: many patients and their relatives experience severe distress of head injury, and have to make substantial changes in their way of life.
- 6. Medico-legal aspects**: compensation issue is more likely to contribute to disability if the patient feels someone else is at fault, financial compensation is possible, low social status and in industrial injury.

Treatment:

A plan for long-term treatment should be made as early as possible after head trauma. The treatment of the cognitive and behavioral disorders is similar to the treatment approaches used in other patients. However, head trauma patients may be particularly susceptible to the side effects associated with antipsychotics; therefore, these drugs should be initiated in lower dosages than usual and should be titrated upward more slowly than usual. Aggression and impulsivity can be treated with anticonvulsants or antipsychotics. Treatment should include physical and psychological rehabilitation to which the clinical psychologist can sometimes contribute behavioral and cognitive techniques. Problems of litigation and compensation should be settled as early as possible. Continuing psychosocial help should be provided to patient and carers, by a special team.

Questions:

1- 27-year-old man presented with agitation, hypervigilance, and yelling on the people in the street says that they want to hurt him. In ER his parent deny any psychiatric history or episodes or drug abuse, on physical examination his temperature was 40c and CBC showed high WBC count. What is the most likely diagnosis?

A. Schizophrenia B. Major neuroleptic disorder C. Dementia D. Delirium

Ans: D

2- Which of the following best drug for a Patient . With narcolepsy?

A. Benzodiazepines B. Modafinil C. Donepezil D. Rivastigmine

Answer: B

3-A 84-year-old Patient with Alzheimer for 4 years, recently on rivastigmine. Side effect?

A. Anorexia B. Hypertonia C. Tardive Dyskinesia D. Insomnia

Answer: A

4- Which of these statements fits narcolepsy?

A. A behavior disturbance
B. Psychosomatic dysfunction C. A sleep disorder
D. A Sexual disorder

Answer: C

5- A 74 y/o female has widened gyri and ventricles, what's the responsible neurotransmitter?

A. Acetylcholine B. Dopamine C. Serotonin D. Noradrenaline

Answer: A

6- A 19-year-old sustained a head trauma following a road traffic accident for which he was hospitalized for 10 days and he is ready for discharge today. His father asks you (as the intern in charge) about the prognosis. Which one of the following is an indicator for good prognosis?

A. Absence of open injury B. Anterograde Amnesia less than 12 hours.
C. Absence of visual hallucinations D. Retrograde Amnesia less than 12 hours

Answer: B

7-: 68-years-old man presented to the emergency with 3 days history of disorientation to time, place and agitation.What is the most important initial diagnostic method?

A. Brain MRI. B. Proper history. C. Electroencephalogram. D. Cognitive Behavioral therapy.

Answer: B

8- Patient came to you with delirium, which one of the following you will assess?

A. Orientation. B. Mood C. Attention D. Concentration

Answer:A

Questions:

9- Patient known to have gastric cancer came to you with impaired short term memory what is the most likely cause of his condition?

A. the cancer itself B. head injury C. Wernicke korsakoff syndrome D. Thiamine deficiency

Answer: D

10- A 73 year old patient with a history of stroke 4 year ago. He developed depressive symptoms like low mood, decreased interest. Which of the following is the best predictor factor for his depression?

A. Living alone B. Cortical atrophy C. Dysphasia D. Antidepressants compliance

Answer: B

11- What is the most difficult type of delirium to be diagnosed?

A. Hyperactive type B. Hypoactive type C. Mixed type D. No difference.

Answer: B

12- A 19-year-old sustained a head trauma following a road traffic accident for which he was hospitalized for 10 days and he is ready for discharge today. His father asks you (as the intern in charge) about the prognosis. Which one of the following is an indicator for good prognosis:

A. Absence of open injury. B. Absence of visual hallucinations.
C. Anterograde Amnesia less than 12 hours. D. Retrograde Amnesia less than 12 hours

. Answer: C

13-: 20 years old female have recurrent episode of irritability, olfactory sensation distortion, memory disturbance and followed by confusion. What is the most likely diagnosis?

A. Amnestic syndrome B. Temporal lobe epilepsy C. Acute functional psychosis D. Dissociative disorder

Answer: B

14- بنت صغيرة عندها اضطراب في المعادن + حرارة + ربو + عدوى وش التشخيص؟ والدكتور قالها من انا قالت له انت بابا. كانت disoriented

المطلوب:-سؤالين تسألها و ليش

ينفع تسوي ct؟

As she is young better not to do CT, we can do other investigation instead

to find the cause like CXR, CBC, electrolyte, urine analysis

And if she still need CT we can do later

-Is it acute and fluctuating? (To know if it delirium or not)

-previous Hx of delirium? (Suggests the dx of delirium)

-Hx of medications? (delirium due to Polypharmacy)

-resent trauma or head injury? (The cause of her sate)

التشخيص: Delirium