MED437
KING SAUD UNIVERSITY

Revised By
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Psychiatry Team 437

# Introduction to neuropsychiatric disorders

## Objectives

- Important
- Notes
- Girls' slides
- Extra

- Know the cognitive functions & the neurocognitive disorders.
- Understand delirium and know how to detect it.
- Understand dementia and know how to detect it.
- Know other neurocognitive disorders (amnestic syndrome/ TBI).

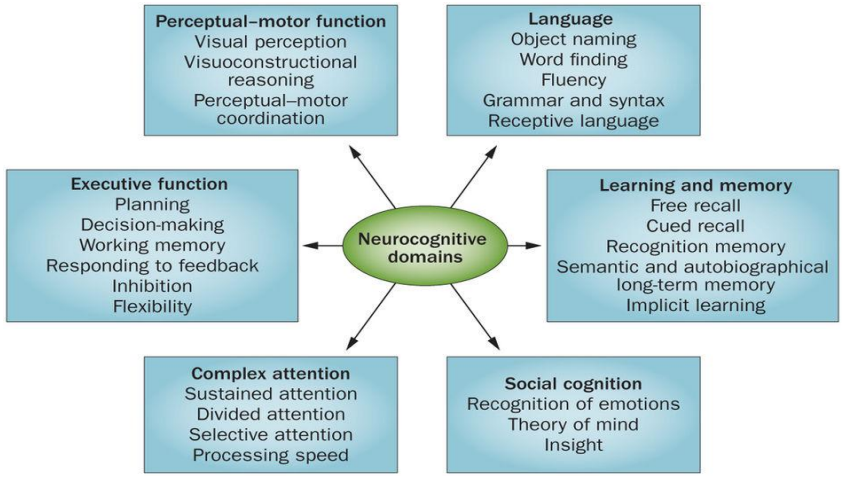
*"A lot of the time, you're going into a situation you know nothing about. So what you need is to be quick to act… and make tough decisions in worst-case scenarios."*
*– Levi Ackerman*

# Cognition

- **Cognitive functions** (controlled by frontal lobe)**:** attention, concentration (its sustained attention, so the difference is the duration), orientation(time, place, people), and memory. Processing speed, Impulse control, Language processing, Executive function.

Note the difference between **Cognitive functions** and **Cognitive Processes**.

- Disorders of which are called **"Cognitive disorders"**




- **Cognitive deficits**

That present in <u>many mental disorders.</u>
Were not present from birth or very early in life Middle age
Represent a decline from a previously attained level of functioning.

- **Cognitive Processes:** ways of thinking and conclusion formation.
- **Cognitive Therapy** For Anxiety and depression **:** a type of psychotherapy that is concerned with detection and correction of wrong thoughts & thinking process (negative cognition).

- It is **not** a treatment of cognitive disorders.

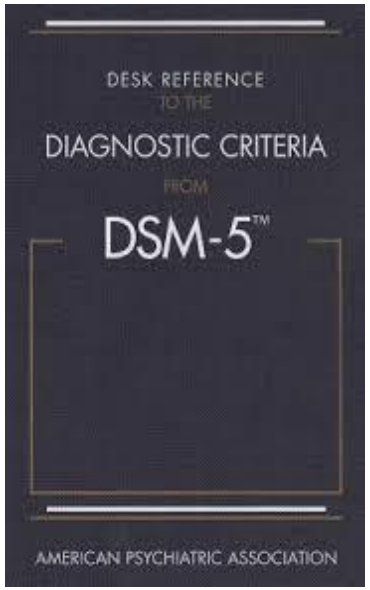
Perseveration: its an important neurocognitive sign المواظبة والمثابرة على نفس نمط التفكير

**Extra facts**
Your brain is 73% water. It takes only 2% dehydration to affect your attention, memory and other cognitive skills.

# Cognition

Girls' slides

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




## ❑ Mild Neurocognitive Disorders:

Delirium:

- Short-term confusion and changes in cognition
- Acute global cognitive disorder with disturbed consciousness.

## ❑ Major Neurocognitive Disorder:

Dementia:

- Severe impairments in memory, judgment, orientation, and cognition.
- Chronic global cognitive decline without disturbed consciousness.

Amnestic syndrome: **(major neurocognitive disorder caused by other medical condition):**

marked primarily by memory impairment or specific disorder of short-term memory caused by :

- Medical condition.
- Toxins or medications.
- Unknown causes.

DSM V; Kaplan & Sadock (2014; 2009)

# Case number 1

Girls' slides

- **75 year old male** with long standing history of **HTN, DM type 2,** and **hypercholesterolemia** and hx Medical history of BPH benign Prostatic Hyperplasia.
- Presented to the ER with 3 days history of low-grade fever, lethargy, and dysuria.
- He also started to have poor sleep for three days and therefore, his daughter give him unknown medication that she bought from the pharmacy.
- On the same of ER presentation, he started to have high grade fever and he stared to be confused.
- His daughter stated, that he was talking non-sense and it seems that he was seeing unseen images. There was 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 normal 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 Dx to have UTI and mild urinary retention.
- **Few hours later, after hospital admission:**

1. He started to be aggressive and agitated.
2. Pulled out his IV lines.
3. Insisted to be discharge from hospital because he was thinking that nursing staff want to kill him.

07:38

# Delirium

- "الهذيان" is a global impairment of cognitive functions and awareness of the surrounding (consciousness) (This is very essential to differentiate between Delirium and other neurocognitive disorders ).
- **Acute transient reversible** self-limiting **global cognitive impairment with impaired consciousness due to a medical problem.**

  Not due to psychiatric problem
- **Severe.**

**Many terms are used to describe delirium:**

- Acute confusional state
- Acute organic syndrome
- Acute brain failure.
- Acute brain syndrome.
- Acute cerebral insufficiency.

**Usually associated with disturbances of the following:**

✓Perception (hallucinations "هلوسة" visual or auditory/illusions).
✓Thinking (delusions "اعتقاد جازم خاطئ غير قابل للاقناع").
✓Affect emotional state at the moment/Mood (perplexity/ irritability).
✓Behavior (agitation/aggression).

- Exogenous psychosis
- Metabolic encephalopathy.
- ICU psychosis
- Toxic encephalopathy.

- The patient may be dangerous to himself or others.
- Thus, delirium is one of the **serious emergencies**.

**Extra facts**

Memory is better thought of as an activity rather than being associated with a specific area of the brain. Any given memory is deconstructed and distributed in different parts of the brain. Then, for the memory to be recalled, it gets reconstructed from the individual fragments.

# Delirium

## Epidemiology

- more common among elderly and children. M=F. Among hospitalized patients about 10 %, post burn patients 20%, intensive care unit 30%.
- Community Prevalence: General: 1-2%  > 85yr: ~ 14%.
- 10-30% Medically Ill Hospitalized patients.

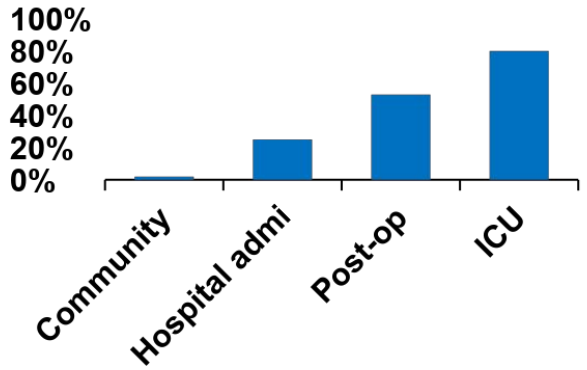
I. ~ 10 to >50% Post-Operative Patients.

II. > 90% Post-cardiotomy Patients.

III. **~ 70-85% ICU.** Very common place

- 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.

- **Reticular formation system** is the part of brain controlling consciousness.
- When the patient is **Delirious** this part of the brain is affected.
- Frontal lobe is responsible for **orientation.**
- Agitation and Restless "عدم الاستقرار" are part of the presentation of **Delirium.**
- **Hypoxia** is one of the important causes of Delirium.
- The **etiology is usually biological or physical problem.**




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

# Clinical features

Girls' slides

- cute onset of mental status change with fluctuating course.
- Attentional deficits.
- Confusion or Adisorganized thinking.
- Perceptual disturbances.
-
- Disturbed sleep/wake cycle. ( sundowning phenomena)
- Altered psychomotor activity.
- Disorientation and memory impairment.
- Behavioral and emotional abnormalities.
- Other cognitive deficits

## ➢ The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)diagnostic criteria

**A) Disturbance in:**

Attention (I.E., Reduced ability to direct, focus, sustain, and shift attention)

Awareness (reduce orientation to the environment).

**B) The disturbance**

Develops over a short period (usually hours to days)

Represent a change in the baseline attention and awareness.

Tends to fluctuate in severity during the course of a day.

C) An additional disturbance in cognition:

Memory deficit, disorientation, language, perceptual disturbance

**D) Disturbance in criteria A and C:**

Not due to another preexisting, established, or evolving dementia.

Do not occur in the context of a severely reduced level of arousal, (eg coma)

**E) There is evidence from the history, physical examination, or laboratory findings that the disturbance is caused by a direct physiologic consequence of:**

General medical condition

An intoxicating substance

Medication use

More than one cause

# Diagnostic criteria (Simplified)

Girls' slides

- **A) Consciousness is disturbed** (i.e., 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?

- ↑ **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.**

# Types of delirium

## Hypoactive (24%)

Classically, these patients present with symptoms that resemble **depression** (lethargy, slowness, decreased level of alertness, and decreased speech production).

. A large percentage of these patients are inappropriately diagnosed as **depressed**.

**. The most difficult type to identify.**

- Hypoactive psychomotor activity.
- May be have sluggishness or lethargy that approaches stupor.

## Hyperactive (30%)

The most clear and least controversial in diagnosis.

Hyperactive psychomotor activity.

May have mood lability, agitation, refusal to cooperate with medical care.

## Mixed (46%)

Waxing and waning pattern. Commonly seen in surgical patients (agitated at times, with alternating episodes of hypoactivity).

Normal psychomotor activity with disturbed attention and awareness.

May have rapidly fluctuating activity level.

# Delirium

Girls' slides

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

1) Death (due to associated serious medical condition)
2) Violence toward medical staff.
3) Self-harm or suicidal risk. Leaving bed, pulling tubes ,IV line
4) Impaired judgment.
5) Psychosis severe mental disorders that cause abnormal thinking and perceptions.

## Why dose 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** no extreme stimulus, **illusions** extreme stimulus or **delusional** thoughts as if they were genuine dangers (e.g., blood extraction by a nurse might be perceived as an attack).
- Clinical presentation are differs from patient to patient.

I. Some patient may be excessively somnolent.

II. Other may fluctuate from one state to the other, usually restless at night and sleepy during the day with lucid intervals.

# Delirium

Girls' slides

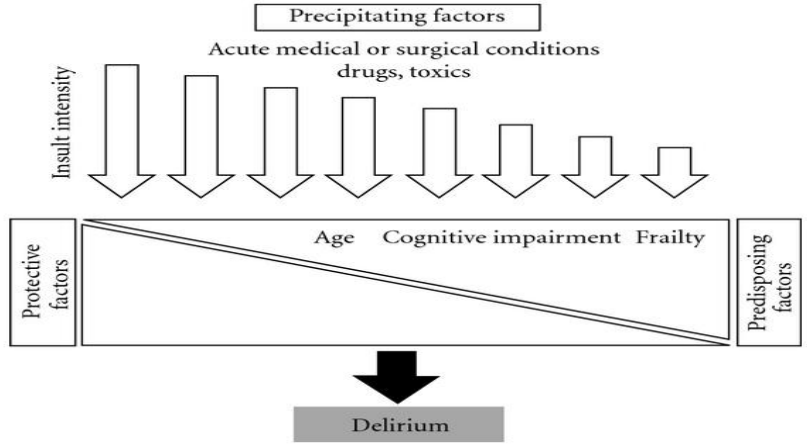
## Risk factors/Predisposing Factors:

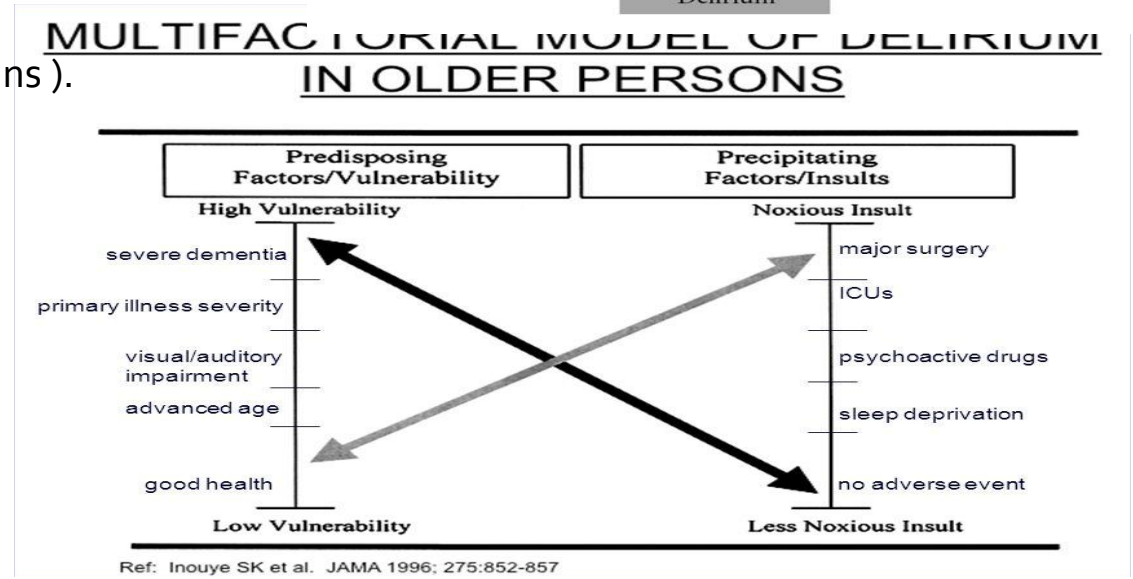
- > 60 years of age
- Male sex
- **Visual impairment**
- Underlying brain pathology such as stroke, tumor, vasculitis, trauma, dementia
- Major medical illness
- Recent major surgery
- Depression
- Functional dependence
- Dehydration
- Substance abuse/dependence
- Hip fx
- Metabolic abnormalities
- **Polypharmacy** the concurrent use of multiple medications by a patient. very common in hospital setting

# Delirium

## Etiology

- **Metabolic disturbances/** electrolyte imbalance.
- **Endocrinopathies (**e.g. hypoglycemia**,** hyperglycemia).
- **Medications** (multiple drugs with multiple interactions).
- **Infections: systemic**(e.g. septicemia)**,** specific (e.g. encephalitis).
- **Organ failure**: e.g. hepatic encephalopathy**,** uremia**,** hypoxia.
- **Neurological diseases**: seizure / head trauma.
- **Substance abuse:** intoxication or withdrawal (e.g. Delirium tremens ).
- Anything disturbed in the body may affect the brain and cause Delirium



# Delirium

Girls' slides

## Etiology (Precipitating Factors): I watch death

- I: Infections (encephalitis, meningitis, HIV, syphilis, sepsis, typhus, malaria)
- W: Withdrawal from substance of the abuse (alcohol, sedative-hypnotic, barbiturates)
- A: Acute metabolic (acidosis, alkalosis, liver/kidney failure)
- T: Trauma (closed head trauma, heatstroke, recent surgery, severe burns)
- C: CNS pathology (abscess, tumor, seizures, hydrocephalus)
- H: Hypoxia (anemia, hypoperfusion due to heart/lung failure, co poisoning )
- D: Deficiencies of vitamins (B12, folate, thiamine, niacin)
- E: Endocrinopathies (Hyper/Hypoglycemia, Hypo/Hyperadrenocorticism, Hyperparathyroidism)
- A: Acute vascular (hypertension, stroke, TIA, arrhythmia)
- T: Toxins (medications, illicit drugs, pesticides, solvents)
- H: Heavy metal (lead, manganese, mercury)

# Delirium Management

## DDx (Differential diagnosis):

- **1) Dementia:**
- Occasionally, delirium occurs in a patient with dementia, a condition known as beclouded dementia. However, a dual diagnoses (i.e., delirium in top of dementia) can only made when there is a definite history of pre-existing dementia.
- **2) Substance abuse:** alcohol, inhalants, sedatives, and opioids
- **3) Amnestic syndrome** (see later)
- **4) 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)
- When delirious patients treated with TCA, cognitive functions deteriorate further because of the anticholinergic effects of TCA.
- 5) **Other neurocognitive disorders** (may coexist)e.g., stroke.
- 6) **Acute psychosis** "جنون"(no disturbance in awareness of the environment). (brief psychosis, mania, exacerbation of schizophrenia):
- Patients usually experience no change in their level of consciousness or in their orientation. The hallucination and delusions are more constant and better organized than those of patients with delirium.

# Investigations

- There is **no specific** diagnostic investigation for delirium.

➢ **A) Good clinical skills are essential:**

**1) Careful History and physical examinations:**

- Acute onset + review medical conditions/diseases + cognitive & consciousness disturbances.

**2) Collateral history:**

- Baseline cognition
- Presence of sensory impairments
- Exposure to risk factors
- Review medications, procedures, tests,…etc

➢**First line investigations:**

I. Complete blood count (CBC) and differentials WBCs
II. Electrolytes, Mg, ca, and po4 tests.
III. Liver function tests.
IV. Renal function tests
V. Urinalysis + cultures & sensitivity
VI. Blood cultures & sensitivity
VII. Thyroid function test
VIII. Electrocardiogram (ECG)
IX. Blood glucose.
X. Chest x-rays

➢**Second line investigations:**

I. Drug screen.
II. Cardiac enzymes
III. Blood gas (ABG)
IV. Serum folate / B12
V. Electroencephalography (EEG)
VI. Cerebrospinal fluid examinations.
VII. Brain CT scan
VIII. Brain MRI

➢ **B) MSE: proper assessment of mental functions.**

# Delirium

## Course and Prognosis:

- The onset is usually sudden.

- The course is usually short self-limiting(7-10 days).
- Symptoms of delirium usually persist as long as the causally relevant factors are present. When treated, it usually resolves rapidly.
- However, some residual deficit may persist. Patients may have another episode later in their life.
- 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 treated, it usually resolves rapidly.
- Some residual deficit may persist.
- Some patients may develop depression symptoms or Post Traumatic Stress Disorder(PTSD).

# Treatment

Correct the cause if you can or optimize the physical condition "حسن ما تستطيع تحسينه"

- **Detect the cause (s)&treat it properly,** e.g. infection, electrolyte imbalances
- Control mental and physical disturbance with **antidopaminergics**, e.g. **haloperidol** (1mg oral, IV, or IM), quetiapine 25mg, or Olanzapine (5mg oral or IM) 2- 3 times/day.
- IM 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.
- Limit benzodiazepines (or give with extreme caution) because their effects may increase disorientation, drowsiness and ataxia with possible falls, head trauma and fractures.
- Keep the patient in a quiet, well lit-room; avoid over and under stimulation. Frequently reorient, reassure and explain procedures clearly to the patient.

- **Treatment of the underlying medical cause and ensure patient / staff safety**

# Treatment

Girls' slides

## 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 ambient noise and the number of visits from strangers, and provide a radio or a television set, a nightlight, and where necessary, eyeglasses and hearing aids.
- Proper communication and support are critical with these patients

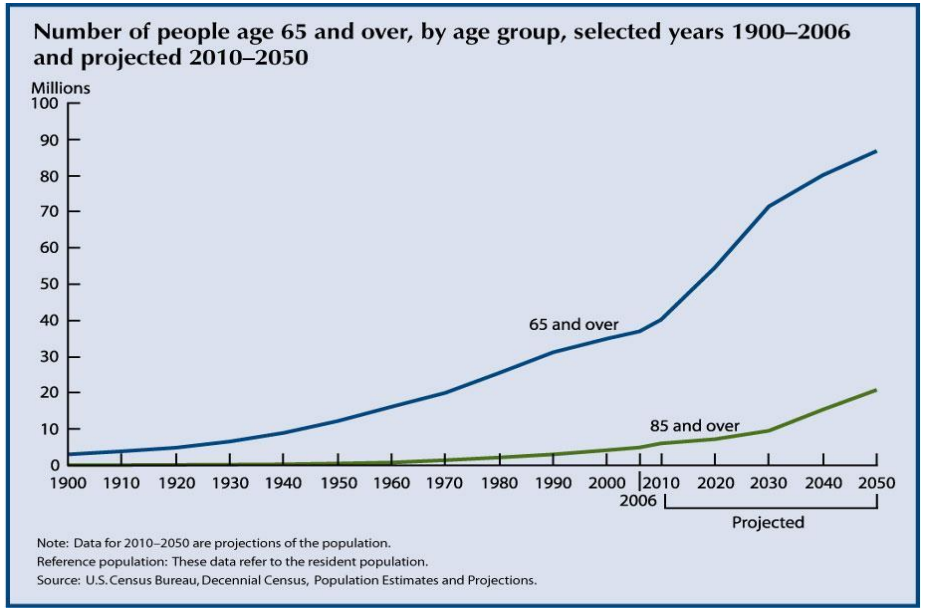
## 2) Pharmacological interventions

- All the patient's medications should be reviewed, and any unnecessary drugs should be discontinued.
- These patients should receive the lowest possible dose and should not get drugs such as phenobarbital or benzodiazepine.
- Their effects may increase disorientation, drowsiness, ataxia, and possible falls, head trauma and fractures
- For agitation or aggressive behavior: **haloperidol** 1mg oral, IV, IM) or olanzapine (5 mg oral or IM).
- Intramuscular administration may be preferable for some patients with delirium who are poorly compliant with oral medications or who are too sedated

# Neuropsychiatric disorders

Girls' slides

- **Aging** is a normal part of development.
- Unlike childhood development, however, 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

**Extra facts**

Your brain starts slowing down at the ripe old age of 24, but peaks for different cognitive skills at different ages. In fact, at any given age, you're likely getting better at some things and worse at others. An extreme case is vocabulary skills which may peak as late as the early 70s!

# Case number 2

Girls' slides

- 73 years old lady, she was diagnosed for many years to have DM, HTN, Hypercholesterolemia, and Osteoporosis.
- Her family noticed in the last year that she start 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 misplaces things like her keys and her personal items. Also, there were few occasions where she left refrigerator open.
- More recently patient's family discovered that 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 about her current situation.
- Throughout 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.

04:42

# Dementia

➢ A **chronic global** impairment of cognitive functions **without disturbed consciousness.**

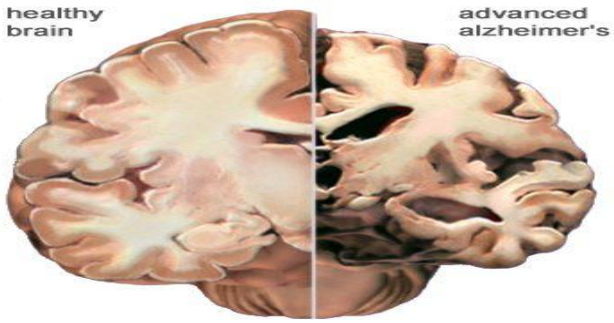
## Features

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

- **Memory impairment** (short-term memory first then, in advanced stages long-term memory is affected).
- **Thinking and speech:** inappropriate repetition of the same thoughts (perseveration) with vague and imprecise speech.
- **Shrinkage of social interaction with other.**
- **Disorientation:** particularly to time and place and when advanced to person (can't identify relatives).
- Judgment impairment.
- **Psychotic features:** hallucinations and delusions.

- The difference between delirium and dementia:
  1. in the onset Dementia is chronic.
  2. in the presentation Delirium has consciousness problem.

- We can diagnose dementia in a patient with delirious. لا يوجد بينهم تعارض



# Dementia

Girls' slides

- **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.
  - Cognitive deficits cause significant impairment in social or occupational functioning or both.

## The Dementia Syndrome

- 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.

Lobo a: manual de psiquiatria general. Madrid, editorial panamericna s.a., 2013

# Dementia

## Epidemiology

- no gender difference, Increasing age is the **most important risk factor.**
- It is primarily **a disorder of the elderly** ( if < 65 years, it is called presenile dementia).
- 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 %

# Dementia

Girls' slides

## 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.
  - 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)
  - 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.

# Dementia

## The most common causes of dementia :

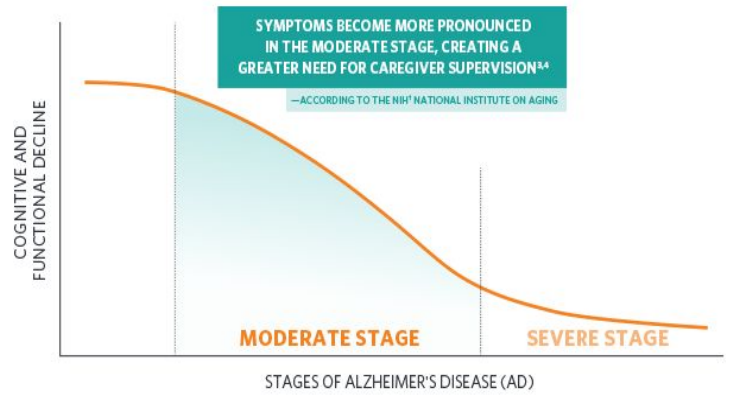
1. **Alzheimer's disease (AD) (50-60 %)** :

continuous deterioration of intellectual functioning due to degenerative process affecting the whole cortex, especially cholinergic neurons. Wide sulci and gyri.

Gradual onset and a continuous slow but steady decline in 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.

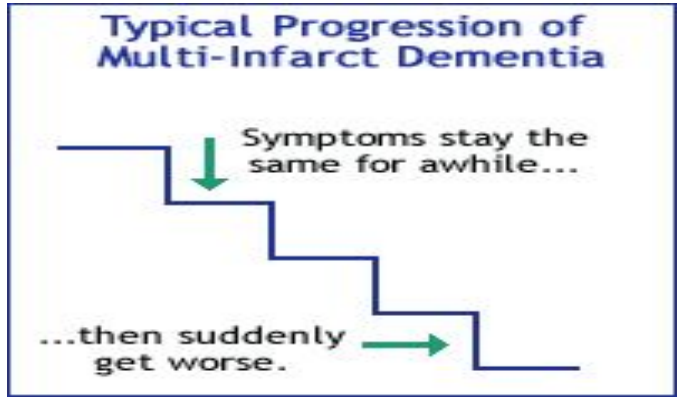
# Dementia

## The most common causes of dementia :

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

- 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.

- **Risk factors** for vascular dementia:
  - Age > 60
  - Male
  - Pervious stroke
  - Stroke risk factors:
  - HTN, heart disease/atrial fibrillation, DM, Smoking, obesity, and hypercholesterolemia



# Dementia

## The most common causes of dementia :

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

e.g., Parkinson's D., metabolic causes: severe B 12 deficiency, hypothyroidism.

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 pervious 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)
- Infections (HIV, neurosyphilis)

# Dementia

Girls' slides

## The most common causes of dementia :

**4) Lewy Body dementia:**

characterized by fluctuating in cognition, 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, and loss of impulse control.

**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 extra pyramidal features.

Creutz-feldt-jakob's disease.

Traumatic Brain Injury (TBI).

Prion disease.

# Dementia

Girls' slides

## Dementias are classified as:

**Subcortical:** Motor

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

Girls' slides

1) Comprehensive history and physical examination.

2) Investigations:

Essential workup to detect treatable causes:

**Blood work:**

CBC with differential, blood glucose, electrolytes, Ca, Mg, vitamin B12, folate, liver and renal function tests.

Other tests: serum HIV.

**Neuroimaging:**

CT scan and MRI

**Alzheimer's dementia:**

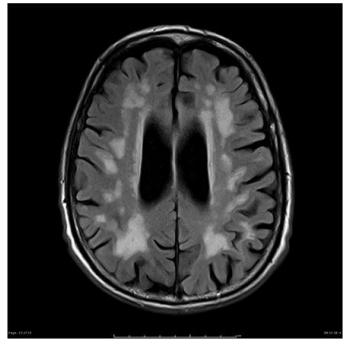
Cortical atrophy

Wide sulci & gyri

Wide ventricles

**Vascular dementia:**

Lesions and atrophy of cortical and/or subcortical structures corresponding to infarcts.



# Dementia

## DDx (Differential diagnosis):

- *Normal aging*: age-related cognitive decline (the course is not progressively deteriorating), no loss of social or occupational functioning.
- ***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:* the onset is rapid and consciousness is impaired.
- Some demented patients may develop delirium. Diagnosis of dementia *cannot* be made before delirium clears.

# Dementia

Girls' slides

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

## Delirium vs. Dementia vs. Depression

| 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 |

# Treatment

- **1) Supportive measures**: provide good physical care (meals, hygiene), encourage the family's involvement, support the care givers (they are prone to depression), keep in familiar settings if possible to avoid accidents and possible agitation, wandering away,…etc.
- **2) Medications:** if agitated, aggressive, or insomniac: give a small dose of antidopaminergic drug (e.g. olanzapine 5mg, risperidone 2mg, or quetiapine 25mg). If depressed: give a small dose of antidepressant (e.g. escitalopram 5 mg or sertraline 25mg). Be aware of possible mental side effects of such medications e.g. confusion, over-sedation, risk of falling down.
- **3) Specific measures:** identify and correct any treatable or controllable condition e.g.: hypothyroidism, vitamin B12 deficiency, hypertension, diabetes.
  - **A) Identify and correct any treatable or controllable condition**
    - Hypothyroidism, Vitamin B12 deficiency, hypertension, diabetes.
  - **B) Symptomatic treatment:**
    - I) Agitation/aggression: small dose of antipsychotics (e.g. olanzapine 5mg, risperidone 2mg, or quetiapine 25mg).
    - II) Insomnia: small dose of antipsychotics (e.g. olanzapine 5mg) or benzodiazepine (e.g. lorazepam 1 mg )
    - III) 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)

# Treatment

- **C) Cognitive-enhancing medications (mainly for Alzheimer's dementia):**
  - **1) Cholinesterase inhibitors:**
    - I) 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).
    - II) Rivastigmine ( Exelon ):
    - 1.5 mg twice/day & can be increased gradually to maximum 6mg twice/day (S/E: anorexia , fatigue , somnolence, and dizziness )
    - III) Galantamine ( Reminyl):
    - 4mg twice/day & can be increased gradually to 12mg twice/day (S/E: similar to rivastigmine )
  - **2) 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.

# Treatment

## Course and Prognosis

- usually progressive deterioration (slow downhill in Alzheimer's dementias and stepwise in vascular dementia). Some patients become double incontinent.
- The course and prognosis depend on the cause

I. Alzheimer's dementia once started we cant stop it
   - Shows a progressive slow deterioration.
   - The patient may become incontinent of urine and/or stool.

II. Vascular dementia
   - Shows stepwise deterioration
   - Stationary course after a massive stroke that is then followed by a good control of the risk factors e.g., HTN, DM…..etc

## Memory-enhancing medications (mainly for Alzheimer's dementia)

- ***Cholinesterase Inhibitors***: Donepezil, Rivastigmine, or Galantamine.
- ***Memantine*****:** an N-methyl-D-aspartate (NMDA) receptor antagonist , protects neurons from neurodegenerative process induced by glutamate excitotoxicity.

# Case number 3

Girls' slides

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

**Extra facts**

The "Mozart effect" has been debunked. While listening to certain kinds of music can improve memory and concentration, there's nothing unique about listening to Mozart. ☺

09:45

# Amnestic disorder

- It is a major NCD but focal impairment of **short-term memory** (hippocampal pathology) (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 impairment.
- It's old terminology is Wernicke–Korsakoff's syndrome, which starts as an acute syndrome (Wernicke's encephalopathy) characterized by impairment of memory, ataxia, ophthalmoplegia and impaired consciousness.
- Then followed by Korsakoff's disorder (chronic short-term memory defect, peripheral neuropathy and irritably).
- **Impairment in the ability to create new memories**
- 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.

# Amnestic disorder

## Etiology

- The most common cause is **thiamine (vitamin B1),** deficiency associated with alcohol abuse. Thiamin is essential for the enzyme transketolase which is important for glucose metabolism.
- Other causes of thiamine deficiency include gastric carcinoma and persistent vomiting (e.g. typhoid fever).
- Head injury lesions
- ( hippocampus, posterior hypothalamus and nearby midline structures)
- (associated with alcohol abuse, poor nutrition (e.g., starvation), gastric carcinoma, persistent vomiting, hemodialysis.
- Thiamine is essential for the enzyme transketolase, which essential for glucose metabolism.

### Major Causes of Amnestic Disorders

- **Systemic medical conditions**
  - Thiamine deficiency (Korsakoff's syndrome)
  - Hypoglycemia
  - Primary brain conditions
    - Seizures
    - Head trauma (closed and penetrating)
    - Cerebral tumors (especially thalamic and temporal lobe)
    - Cerebrovascular diseases (especially thalamic and temporal lobe)
    - Surgical procedures on the brain
    - Encephalitis due to herpes simplex
    - Hypoxia (including nonfatal hanging attempts and carbon monoxide poisoning)
    - 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

Girls' slides

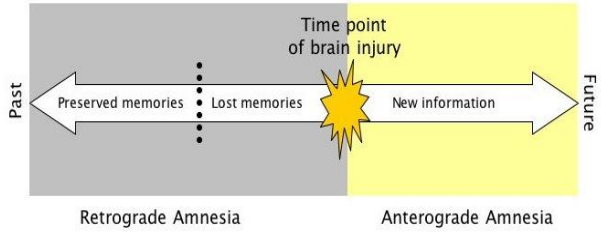
- Is an amnestic syndrome caused by thiamine deficiency, most commonly associated with poor nutritional habits of people with chronic alcohol use.

## Wernicke encephalopathy

- **Acute syndrome**
- Impaired consciousness (confusion)
- Ophthalmoplegia.
- Ataxia
- Memory impairment

## 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.



# Amnestic disorder

## Treatment

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

## Prognosis

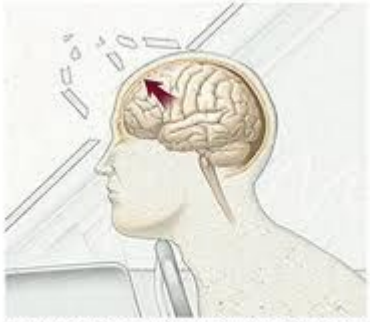
- If it is due to thiamine deficiency and thiamine is provided promptly, prognosis is good.
- Otherwise, the course is usually chronic and may be progressive.
- Psychiatric symptoms & seizures may arise as a result of underlying brain tissue injury.

# Case number 4

Girls' slides

- Hamad is a 19-year-old male was 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 become
  - Impulsive
  - Disinhibited
  - And sometimes aggressive
  - More recently they noticed that he started to be more depressed and sometimes feeling so anxious



If the head hits a hard surface or if the person is severely shaken or jerked, the brain can strike the skull and become damaged.

# Traumatic Brain Injury (TBI)

- TBI is a an **insult** to the brain from an external **mechanical force**, possibly leading to permanent or temporary impairment of cognitive, physical, and psychosocial functions, with an associated diminished or altered state of consciousness
- Area of function affected:
  - 1- Cognitive
  - 2- Sensory/perceptual
  - 3- Seizures
  - 4- Other physical changes
  - 5- Social-emotional

## 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.

**Extra facts**

There are almost 200 known cognitive biases and distortions that cause us to think and act irrationally.

# Traumatic Brain Injury (TBI)

## The neuropsychiatric effects of head trauma include:

### Delirium يُشبه Acute consequences

- Impaired consciousness in varying duration (hours, days, weeks or months) long duration suggests poor prognosis.
- Delirium (head concussion): usually 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. It is a good prognostic factor: probably full recovery when anterograde amnesia was less than 12 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.

# Traumatic Brain Injury (TBI)

## The neuropsychiatric effects of head trauma include:

Dementia يُشبه Chronic Consequences

- **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.
- **Emotional disturbances / Personality changes:** Depressive, anxiety and phobic features are common, and associated with somatic complaints such as headache, fatigue and, dizziness.
- **Psychotic features: delusions/ hallucinations.** There may be irritability, reduced control of aggressive impulses, sexual disinhibition and some coarsening of behavior and premorbid personality traits, particularly after frontal lobe injury.
- 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:** Compensation issue is more likely to contribute to disability if 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.
- 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 / caregiver, by a special team.
- 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.
- Drugs should be initiated in lower dosages than usual.
- Should be titrated upward more slowly than usual.

# Quick Revision

**Cognitive functions**: attention, concentration, orientation, and memory.
Cognitive Therapy is not a treatment of cognitive disorders.

**Delirium**: is a global impairment of cognitive functions and awareness of the surrounding (consciousness), Acute and sever
- is  one of the serious emergencies.
- Types of delirium: Hypoactive (24%), Hyperactive (30%), Mixed (46%)

**Dementia**; is a chronic global impairment of cognitive functions without disturbed consciousness.
- no gender difference, Increasing age is the most important risk factor.

**Amnestic disorder:** It is a major NCD but focal impairment of short-term memory (hippocampal pathology)
- The most common cause is thiamine (vitamin B1), deficiency associated with alcohol abuse.

**Traumatic Brain Injury (TBI):** TBI is a an insult to the brain from an external mechanical force, possibly leading to permanent or temporary impairment of cognitive, physical, and psychosocial functions, with an associated diminished or altered state of consciousness.
- The neuropsychiatric effects of head trauma include: Acute consequences, Chronic Consequences.

# Key words and cases VERY IMPORTANT!!!!

## Case A

50-80 years old male ,he has UTI or RTI, he is acutely confused, fluctuating agitated , he want to leave the hospital

Diagnosis: delirium

Treatment: treat the underlying cause

Treatment of agitation : haloperidol

## Case B

60 years old Male , history of Stroke (or risk factors of stoke) he suffers from memory impairment

Diagnosis : vascular dementia

## Case C

Ophthalmoplegia, ataxia , memory impairment, confused patient , history of alcohol

Diagnosis : wernicke encephalopathy

# MCQs

**1 – The most common cause of DEMINTIA is ?**

a) Alzheimer's disease.
b) Vascular disease.
c) Huntington's disease.

**2 – Loss of the memory of recent events due to a specific organic cause is ?**

a) Delirium.
b) Dementia.
c) Amnestic disease.

**3- 23 years old male suffered a head trauma due to a car accident, he started showing aggressive and inappropriate behavior, what is the site of the damage?**

a) Midbrain
b) Cervical segments of the spinal cord
c) Frontal lobe

**4- which of the following is thought to involve dysfunction of reticular formation & Ach transmission?**

a) Dementia
b) Delirium
c) Parkinson's

**5 – which one is a loss of intellectual abilities of sufficient severity to interfere with social or occupational functioning or both?**

a) Delirium.
b) Dementia.
c) Amnestic disease.

**6- which one of these affect physical, and psychosocial functions, with an associated diminished or altered state of consciousness?**

a) Traumatic Brain Injury.
b) Dementia.
c) Amnestic disease

1- A  2- C  3- C  4- B  5-B  6-A

# *Thank you for checking our work*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Reference: Girls' & Boys' Slides