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Made by wakeel Ahmed Nekmal

1. Regional Injuries

2. Head Hematoma

3. Forensic Psychiatry:

3. Mental Disorders and Responsibilities

Toxicology (Poisons):

4. Snakes – Neurotoxin Only

5. Somniferous Poisons

6. Alcohol

7. Deliriant

8. Datura

9. Cannabis

10. Cocaine

11. Spinal Poisons

12. Drug Dependence and Substance Abuse

Regional Injuries

DEFINITIONS

- Traumatic brain injury (TBI): Brain injury as a result of trauma
- Closed head injury: injury to the brain or cranium but dura matter is intact, Non-penetrating without fracture no penetrations to dura.
- Open head injury: penetrating, dura mater is damaged



CLASSIFICATION OF CRANIOCEREBRAL INJURY

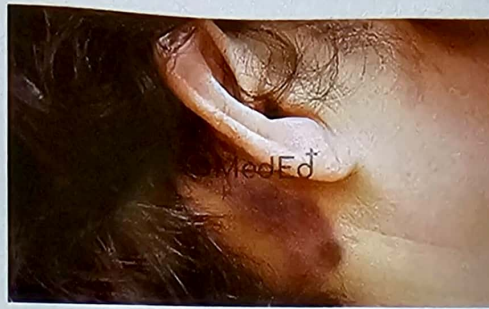
Based on area:

1. Focal:
 - ▶ Localized to some area.
 - ▶ Scalp laceration: hematoma in the layer of scalp aponeurosis.
 - ▶ Skull fractures: linear fracture
 - ▶ Contusion/laceration: (contusion: superficial injury with pia mater intact, laceration: injury with pia mater involved)
 - ▶ Intracranial hemorrhage.
2. Diffuse:
 - ▶ Entire brain is involved due to hypoxia, concussion injury, ischemia, cerebral edema.
 - ▶ Diffuse Axonal injury: retraction ball (Histo-patho)
 - ▶ Ischemic injury: cerebral death.
 - ▶ Vascular injury: occlusion of the vessels.
 - ▶ Brain swelling: brain edema.



Localized lesion - scalp hematoma Raccoon eye: spectacle hematoma.

- Cause for Raccoon Eye - Local violence, fracture of orbital plate, fracture of intracranial fossa. Example of migratory bruise.



- o Localized bleeding back of the ear: battle sign - fracture of middle cranial fossa - migratory bruise.

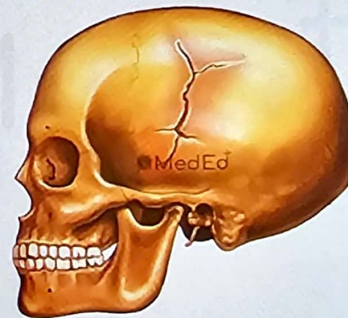
Classification based on the severity:

Classification	Duration of unconsciousness	Glasgow coma scale	Post traumatic amnesia
Mild	< 30 min	13 - 15	< 24 hours
Moderate	30 min - 24 hours	9 - 12	1 - 7 days
Severe	> 24 hours	3 - 8	> 7 days.

TYPES OF SKULL FRACTURE

1. Linear/Fissure fracture:

- ▶ linear fracture/fissure fracture. Most common fracture.
- ▶ MC site - pterion.
- ▶ Irregular course
- ▶ Involved outer table.
- ▶ Missed on X-ray
- ▶ Associate with EDH (bleeding from middle meningeal artery.)
- ▶ Unilateral.



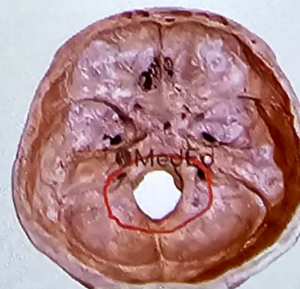
2. Depressed fracture:

- ▶ Caused by a heavy object with a small striking subject. (hammer, stone with sharp edg.)
- ▶ Signature fracture/fracture ala signature
- ▶ Pond fracture, elevated fracture



3. Ring fracture:

- ▶ Fracture around the base of foramen Magnum
- ▶ Fall from height: sudden movement of brain in the foramen magnum
- ▶ Blow to chin or RTA



4. Pond fracture:



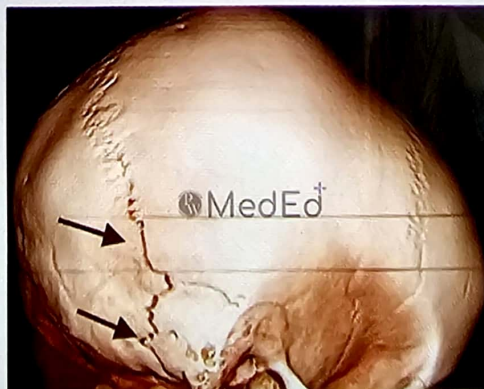
- ▶ Ping pong fracture
- ▶ Newborn: forceps delivery
- ▶ < 5 years
- ▶ Dura is intact

5. Hinge fracture/motorcyclist fracture:



- ▶ Type I hinge fracture: passes from petrosus ridge: sella turcica: opposite petrous ridge
- ▶ Type II hinge fracture: passes from petrosus ridge: sella turcica: opposite frontal bone
- ▶ Type III hinge fracture: involves anterior part of base, not passing the sella turcica
- ▶ Type I hinge fracture is most common, Nodding face sign seen

6. Sutural fracture:



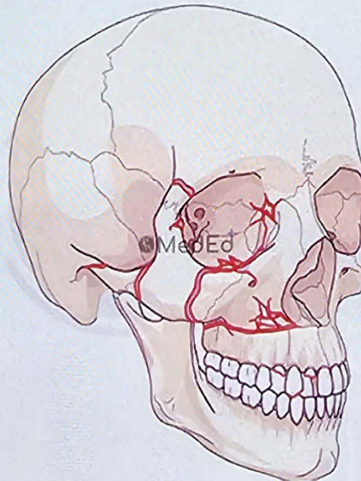
- ▶ RTA involving suture, suture diastasis.
- ▶ Common suture - sagittal suture (Best for age estimation)

7. Gutter fracture:



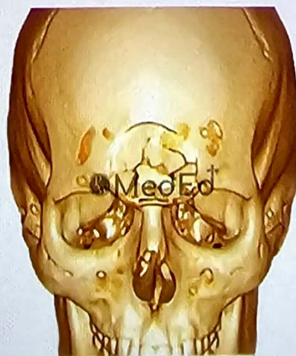
- ▶ When a bullet hits at the angle (40 to 45 degree) tangentially, only the outer table is damaged.
- ▶ Firearm injury
- ▶ Three types of gutter fracture: I, II, III
Type I is most common

8. Blow out fracture:



- ▶ Fracture and bleeding involving the base of the orbit. Bleeding from the orbital vessels.
- ▶ Injury to the occipital part, pressure wave transmitted towards the anterior part: contrecoup fracture.
- ▶ Tear drop sign is present

9. Comminuted fracture:



- ▶ Fracture of cranial vault into multiple small pieces like web.
- ▶ Spider web fracture/mosaic fracture.

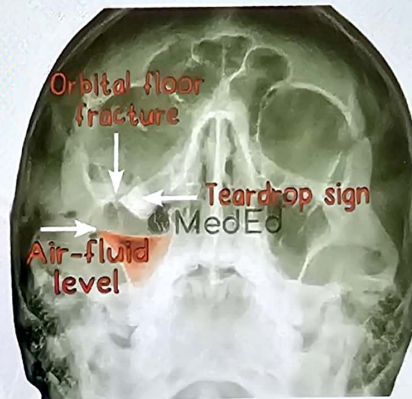
10. Perforating fracture:



- ▶ Fracture of the skull through and through.

Extra edge:

Polypoid mass in the roof of maxillary antrum in blow out fracture known as Tear drop sign.



Intracranial Hematoma

BRAIN INJURY

Primary:

1. Cerebral concussion.
2. Diffuse axonal injury: Most common site is the junction of white matter and gray matter & Corpus callosum. Histopatho finding is → retraction ball.
3. Cortical contusion/laceration.
4. Brain stem contusion.

Secondary:

1. Intracranial hematoma.
2. Cerebral edema (infection, inflammation).
3. Infection.
4. Metabolic disturbance.
5. Ischemia.

EXTRA EDGE

- Cerebral concussion → physiological diagnosis, physiological disturbance of functions of the brain. Resembles like drunkenness.
- Repeated cerebral concussion in boxers can lead to chronic traumatic encephalopathy.

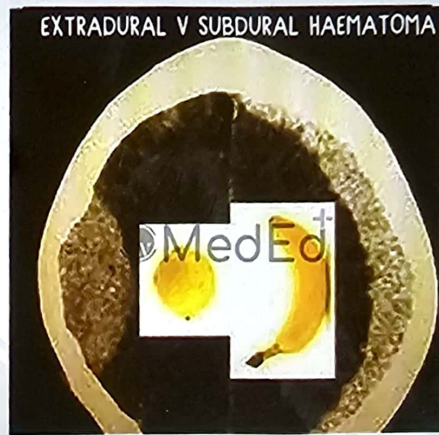
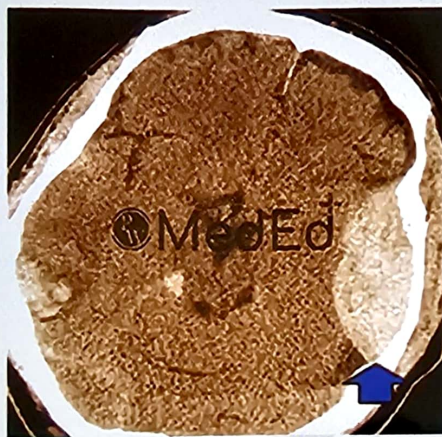
INTRACRANIAL HEMATOMA

I. EDH



- EDH - collection of blood outside the dura mater.
- Idli shape.

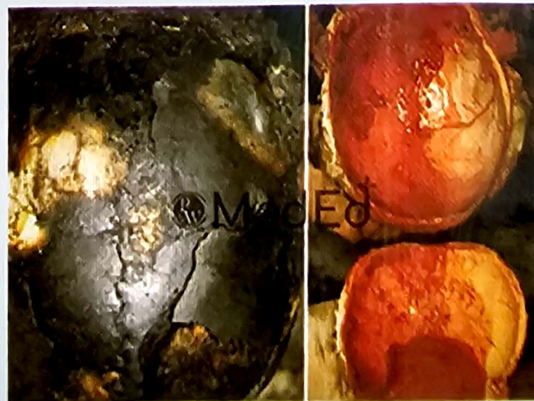
- EDH is exclusively by trauma.
- It is on temporal site. - Pterion
- Minimum amount is 100 ml which can cause compression of the brain and respiratory failure leading to death.
- Lucid interval (periods of consciousness between two periods of unconsciousness.) is common in EDH. Medical negligence if you discharge during a lucid interval.
- IPC 92 - whatever that is done on a good fate, without consent in an emergency is not an offense.
- Treatment Burr Hole to remove hematoma.
- Bleeding artery - middle meningeal artery.



Differential diagnosis of EDH

○ Heat hematoma:

- ▶ Bilateral
- ▶ Venous bleeding
- ▶ Chocolate in color.
- ▶ Can be antemortem or post mortem.



○ Drunkenness:

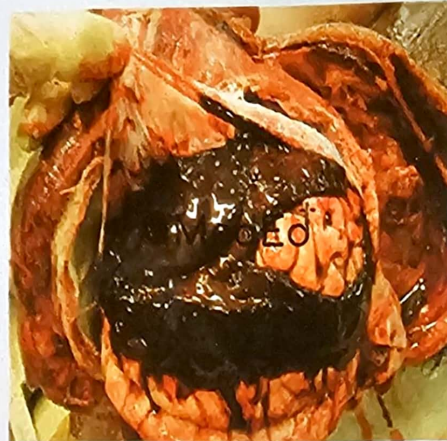
- ▶ Smell of alcohol present
- ▶ Skin is congested, warm, flushed.
- ▶ Dilated pupil.

- ▶ Rapid bounding pulse.



II. Subdural hematoma:

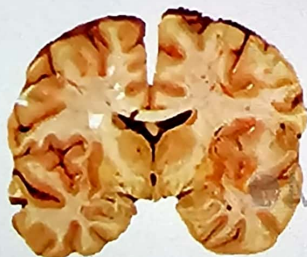
- Bilateral
- Below dura mater, cross suture line.
- Sickle shape, banana shape, concavo-concave shape.
- Bridging vein.
- 100-150 ml is fetal
- Elderly, children, boxers (punch drunk syndrome), alcohol.
- Shaken baby syndrome. (violent shaking of baby - retinal hemorrhage, periorbital edema, subdural hematoma.)



SDH 3 types:

- Acute - 0 to 3 days. Can be hyperdense.
- Subacute - 3 days to 3 weeks. Iso -dense.
- Chronic - more than 3 weeks. Hypo dense.

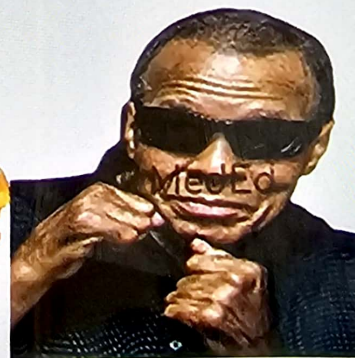
Extra edge-Chronic traumatic encephalopathy (Punch Drunk Syndrome):



Normal Brain



Advanced CTE



- Disorientation
- Depression and mood changes
- Tremors
- Chronic SDH
- Cerebral atrophy
- Neurofibrillary tangles

III. Subarachnoid hemorrhage:

- SAH - between arachnoid mater and pia mater, usually in subarachnoid space.
- Causes-Trauma or aneurysm, berry aneurysm.
- Clinical feature-Thunderclap headache.
- Photophobia, neurological signs.
- Blood in CSF - xanthochromia - 4 to 6 hours.
- Rx. Endovascular coiling or clipping.
- In the autopsy water is poured and if the blood gets washed off, this is SDH and if the blood is not washed off, it is SAH (Water test)
- Common site of rupture - Anterior cerebral artery.



IV. Intracerebral hemorrhage:

- Not traumatic.
- Common site - basal ganglia, putamen.
- Middle cerebral artery. Rupture of Charcot-Bouchard aneurysm.
- Hypertension is common cause



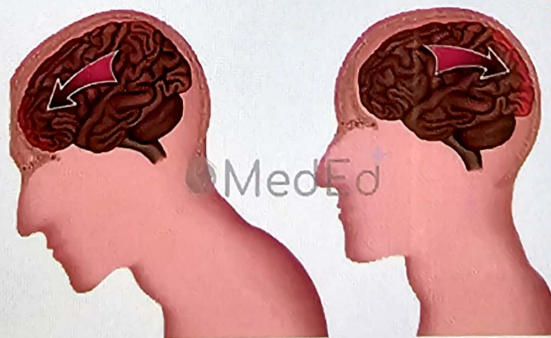
BRAIN CONTUSION

- Coup contusion - at the site of trauma.
- Contrecoup contusion - opp. site of trauma - larger than coup. Commonly seen in frontal, parietal and temporal. In fall or acceleration deceleration injury.
- Fracture contusion - skull fracture + contusion.
- Intermediary coup contusion - basal ganglia.
- Gliding contusion - seen in fall from height. Diffuse axonal injury.
- Herniation contusion - medial side of temporal lobe.

S. No	Feature	EDH	SDH	SAH
1.	Location is between	skull and dura	Dura and arachnoid	Arachnoid and pia
2.	Cause	Mostly traumatic. Rarely spontaneous, eg in coagulation disorders	Mostly traumatic. Could also be due to anticoagulants, iatrogenic, metabolic disorders etc	Both natural and traumatic Commonest of all intracranial bleeds.
3.	Incidence	Least common of all meningeal bleeds. 1-2% of treated head injuries and 5-10% of autopsies	Commoner than EDH. 5% of all head injuries; 50% of fatal head injuries. Bridging veins, cortical contusions. Dural	basal cerebral vessels

S. No Feature	EDH	SDH	SAH
4. Vessels involved	Middle meningeal artery (posterior branches) - most common. Dural venous sinuses	venous sinuses Generally diffuse	Much more diffuse than SDH. If due to berry aneurysm, then only on the base.
5. Extent	Mostly localized on one side, generally beneath pterion or over superior sagittal		
6. D/d	sinus. Could rarely be bilateral. Heat hematoma	None May sometimes be space	congestion
7. Effects	Space occupying lesion	occupying	Rarely space occupying
8. Distortion of brain surface	Gyri and sulci ironed out Seen as a classic case	Surface affected less Seen, but less often	Not affected Not seen
9. Lucid interval	If survival is longer, a very	May be saved in a similar	Generally not useful
10. Preservation for toxicology	valuable piece for analysis, as toxic material from blood may have been metabolized	way as an EDH and under similar circumstances	

CONCEPT OF COUP - CONTRECOUP INJURY



- Theories of contrecoup lesions.

MNEMONIC: LRH

- Lindenberg theory - positive pressure.
- Russel - negative pressure.
- Holbourn - rotational shear stress theory.
 - (1) Countercoup (syn, contrecoup) contusions occur in the brain directly opposite to the point of impact.
 - (2) Classically associated with falls.

- (3) Most common in frontal and temporal lobes. Virtually never seen in occipital lobes.
- (4) Seen more frequently than coup contusions.
- (5) Generally more severe than coup lesions.
- (6) Both coup and countercoup contusions are present over the crests of gyri.

EXTRA EDGE-Intermediary coup contusions -Occur in the deep structures of the brain (white matter, basal ganglia, corpus callosum, brain stem) between the location of coup and countercoup points, along the line of impact.



Forensic Psychiatry

DELUSION

False firm (unshakable) belief that is not accepted by other members of the patient's culture and society.

Delusions are a feature of psychosis.

Causes:

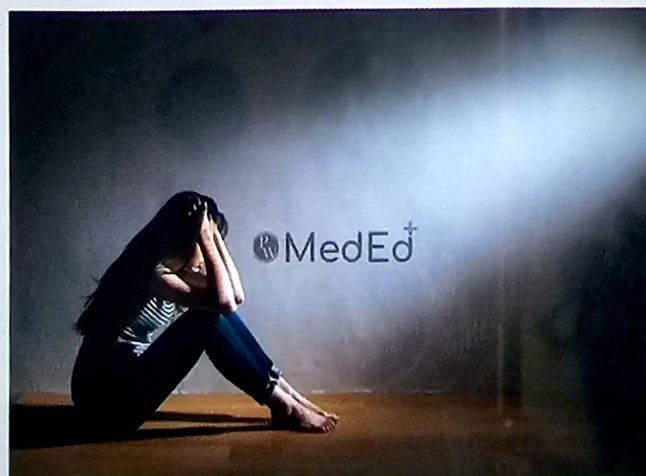
- o Delirium, schizophrenia, mania, depression, amphetamines, bipolar disease, withdrawal syndrome.

Types of delusion:

1. Delusion of **persecution**. The patient believes that someone wants to harm him/her:
 - ▶ Most common delusion.
 - ▶ Common cause: **Schizophrenia**.
 - ▶ Also known as **paranoid delusion**.



2. Delusion of **grandeur**- Delusion of **elated mood**. Patients with delusions of **grandeur** believe that they are wonderful, successful, more important than others, or even miraculous. They make assumptions that they have exceptional talents, possessions, or powers despite lack of evidence supporting these beliefs. Common in **mania** and **bipolar** disease.



3. Othello syndrome is a psychotic disorder characterized by delusion of infidelity or jealousy. "Othello syndrome". The name of this syndrome came about from the famous Shakespearean play, 'Othello', where Othello was extremely suspicious of the infidelity of his wife and it became an obsession.



4. Delusion of negation - Cotard's syndrome is a relatively rare condition that was first described by Dr. Jules Cotard in 1882. Cotard's syndrome comprises any one of a series of delusions that range from a belief that one has lost organs, blood, or body parts to insisting that one has lost one's soul or is dead. Common in depression. Known as "Cotard Nihilistic".



5. Erotomania: Erotomania is the delusional belief that one is passionately loved by another. These persons often go to great lengths to approach their object of desire, often necessitating the attention of the law. Example: A girl persistently believes that MS Dhoni is in love with her. She admits that she had never met MS Dhoni in her life



6. Person holds a delusion that a friend, spouse, parent, or other close family member has been replaced by an identical-looking impostor (stranger). Familiar person is thus seen as a stranger.

Also known as **Capgras syndrome**: Capgras syndrome (CS), or delusion of doubles, is a delusional misidentification syndrome. It is a syndrome characterized by a false belief that an identical duplicate has replaced someone significant to the patient.



7. **Delusion of infestation**: Delusory parasitosis, a belief that one's body is infested by invisible bugs.



EKBOM syndrome: Seen in cocaine addiction, alcohol withdrawal syndrome and also in schizophrenia.

8. Delusion of reference: Patient believes that he is referred to by all agencies, media, person (usually of negative nature). Common in schizophrenia.

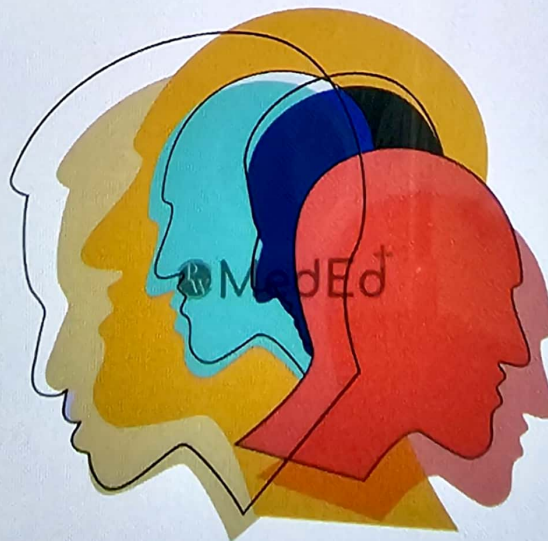


9. Delusion of disguise: Strangers identified as familiar people in his life also known as Fregoli syndrome.

NOTE- In Capgras syndrome, the patient believes that certain familiar persons have been replaced by a group of impostors resembling the original persons. In Fregoli syndrome, the patient believes that one or a few persons, repeatedly changing their appearances, follow and persecute the patient.



10. FOLIE A DEUX: Mental illness shared by two persons usually involves a common delusional system.



MLI OF DELUSION

- Doctrine of diminished responsibility: Reduced power of reasoning and understanding capacity.
- Macnaughten rule comes under (IPC - 84)- The M'Naghten rule was the first legal test for criminal insanity. The test originated in 1843 in England during the case against Daniel M'Naghten. M'Naghten shot and killed the secretary to the Prime Minister, Edward Drummond, believing he was the Prime Minister.

HALLUCINATIONS: (LATIN, TO WANDER IN MIND)

- False sense of perception without any external object or stimulus to produce it.

Types of Hallucinations:

- Hearing things (auditory hallucinations): Schizophrenia
- Seeing things (visual hallucinations): Delirium tremens
- Smelling things (olfactory hallucinations): Temporal lobe epilepsy
- Tasting things (gustatory hallucinations): Temporal lobe epilepsy
- Feeling things (tactile or somatic hallucinations): Cocainism
- Psychomotor hallucination: Moved body parts: Schizophrenia
- Lilliputian hallucination - Objects reduced in size: Migraine, Cannabis
- Reflex hallucination: Stimulus experienced in another modality of sensation
- Extracampine hallucination: Beyond the normal range of sensation
- Hypnagogic (falling asleep) and hypnopompic (waking up)

Illusion is a false interpretation by the senses of an external stimulus which has real existence.

Impulse: Sudden irresistible force compelling a person to perform the act consciously without motive and forethought (insight person).



Examples:

- Kleptomania: Compulsion of stealing
- Pyromania: Compulsion of setting fire
- Oniomania: Shopping addiction
- Trichotillomania: Compulsion to pull out hair
- Run Amok: Homicidal mania
- Satyriasis: Excessive sexual desire in males.
- Nymphomania: Excessive desire for sexual intercourse in females.

Summary:

Delusions	Hallucinations	Illusions
Fixed, false beliefs, cannot be corrected by logic and are not consistent with culture and education of the patient.	False sensory perception experienced without real external stimulus. They are usually Experienced as originated in the outside world not within the mind as imagination.	Misperception of real external stimulus. Most likely to occur when general level of sensory stimulation (consciousness) is reduced.

PHOBIA

- Excessive or irrational fear of a particular object or situation.
- Phobos (fear) is the brother of demons (terror).



- Agoraphobia: Fear of crowded places.



- Claustrophobia: Fear of closed places



- Acrophobia: Fear of height places



- Nyctophobia: Fear of night



- Ailurophobia: Fear of cats



MENTAL RETARDATION

- Where IQ is less.
- Mental retardation does not come under the mental health act.

S. No.	Types	IQ Ranges
1.	Mild mental retardation	50- 70
2.	Moderate mental retardation	35-50
3.	Severe mental retardation	20-35
4.	Profound mental retardation	< 20

IQ Range	Classification
90-110	Normal or average intelligence
110-120	Superior intelligence
120-140	Very superior intelligence
140 and over	Genius or near genius

Question: A 16-year-old boy presents to the clinic for an itchy rash on his hands. He reports he is concerned because of an ongoing pandemic, and he cannot help but wash his hands every hour while awake, even if he did not leave the house or touch anything dirty. He reports being very preoccupied with thoughts of having "dirty" hands filled with micro-organisms and feels partial relief when he washes his hands thoroughly with soap and water. Diagnosis is?



- A. Impulse disorder
- B. Phobia disorder
- C. Obsession-Compulsion disorder
- D. Delusional disorder

Answer: C. Obsession-compulsion disorder

OBSESSIVE COMPULSIVE DISORDER (OCD)

- Characterized by obsessive intrusive thoughts, sensations, or feelings that may be relieved by repetitive compulsive mental or physical actions.

Treatment:

- Cognitive behavioral therapy
- SSRI
- TCA

Neurosis	Psychosis
Reality Testing Judgement Present	Reality Testing Judgement Absent
Personality Not Affected	Personality is Affected
Insight is Present	Insight is Absent
Delusions Are Absent	Delusions Are Present
Hallucinations Are Absent	Hallucinations Are Present
No Disorganized Speech	Disorganized Speech Present
Disorganized Behaviour Absent	Disorganized Behaviour Present

LUCID INTERVAL

- Period in insanity during which all the signs and symptoms of insanity disappear, and behavior is like that of a normal person.
- Repeated occurrences.
- Common in mania and melancholia.
- Can be seen in the head injury.
- Criminal responsibility and testamentary capacity.
- Seen in insanity and extradural hemorrhage.

MCQS

Most common method of suicide in INDIA?

- A. Wrist cutting
- B. Hanging
- C. Poisoning
- D. Drug ingestion

Answer: B. Hanging

- Most common cause is depression.
- Cause of death is asphyxia.

SUICIDE RISK FACTORS: SAD PERSONA

- Sex: Male
- Females attempt more, males succeed more
- Age: > 45 years
- Depression or other mental illness
- Previous suicide attempts

- Ethanol/substance abuse
- Rational thoughts
- Sickness: Chronic illness
- Organized plan/access to weapons
- No spouse
- Marriage is protective
- Children of divorced parents at risk
- Social support lacking/socioeconomic class
- Upper class professionals at increased risk

- **Parasuicide** injures themselves by self mutilation but do not wish to die
- **Cyber-suicide** suicide pact made between individuals who meet on the internet
- **Copycat suicide** a suicide within a peer group/publicized suicide can serve as a model for next suicide in absence of sufficient protective factors (**Werther syndrome**)
- **Anniversary suicide** persons take their lives on the day a member of their family did

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Mental Disorder & Responsibility

Personal

FEATURES OF TRUE INSANITY

- Onset - Gradual
- Predisposing factors - present
- Signs and symptoms - Delusion, hallucination, speech, abnormal behavior.
- Signs and symptoms are present and uniform whether the patient is being observed or not.
- Worried look, insomnia & can withstand exertion.
- Motive - Absent
- Clothes & habits - Dirty
- Repeated examination - No fear

Criminal & civil responsibility of insane person

1. Avoid enquiry - 328 CrPC
2. To avoid court trial - 329 CrPC
3. To avoid conviction - 84 IPC
4. Marriage & divorce? - Yes
5. Valid will? - Not possible
6. Competency of witness in court of law? - not valid in court of law 118 IEA
7. Management of property? - No
8. Contracts - Can't sign
9. Validity of consent? consent taken from mentally ill is invalid. 90 IPC

One liners

- Capacity of a person to make a valid will - Testamentary capacity.
- Valid will must fulfill - >18 years, compos mentis, two witnesses.
- Holograph will - Own handwriting
- A written document that a person uses to give his explicit instructions in advance about the medical treatment to be administered if he becomes incompetent or is unable to communicate - Living will.
- 84 IPC: "Nothing is an offense which is done by a person who, at the time of doing it, by reason of unsoundness of mind, is incapable of knowing the nature of the act or that he is doing what is either wrong or contrary to the law"

PRINCIPLES

1. Every person is presumed to be sane (105 IEA)
2. Burden of proving mental illness on the person pleading it
3. Revenge not included
4. Incapable of knowing the nature of the act
5. There should be evidence of mental disease
6. Mental disease exist at the time of commision of crime
7. Mental dysfunction due to voluntary consumption of alcohol or drugs not included

RULES OF INSANITY

1. Durham rule

A criminal defendant cannot be convicted of a crime if the act was the result of a mental disease or defect at the time of the incident. (Establish mental disease and the act)

2. Curren rule

"An accused person will not be criminally responsible, if at the time of committing the act, he did not have the capacity to regulate his conduct to the requirements of law, as a result of mental disease or defect".

3. Mac-naughten rule

An individual is not responsible for criminal behavior if at the time mental disease or deficits made the individual unable to know what they were doing was illegal and wrong.

4. Brawner rule

Insanity should be decided by a jury. Under this proposal, juries are allowed to decide the 'insanity question' as they see fit.

5. Irresistible impulse test

Person may have known an act was illegal, but because of a mental impairment, he couldn't control his actions. In 1994, Lorena bobbitt was found not guilty of a crime, when her defense argued that an irresistible impulse led her to cut off her husband's penis.

Question: A male patient aged about 21 years was caught by police for fighting with classmates because he was complaining that they were planning to kill him. He states that his dead grandfather talks to him every now and then for the last one month. He is delusional from the past few weeks also. What will be the most likely diagnosis?

- A. Delusional disorder
- B. Post traumatic stress disorder
- C. Mania
- D. Schizophrenia

Ans: D. Schizophrenia

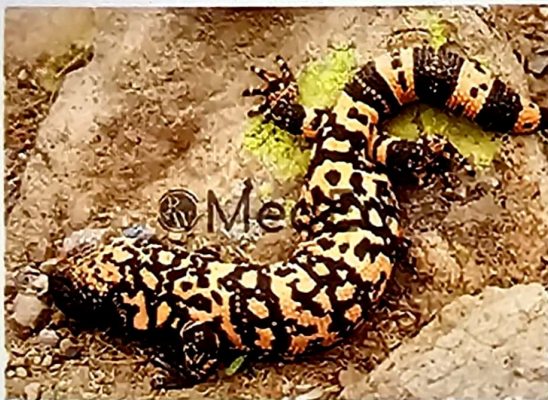
DSM - 5 CRITERIA OF DIAGNOSIS OF SCHIZOPHRENIA

Two (or more) of the following, each present for a significant portion of time during a 1 - month period (or less if successfully treated). At least one of these must be delusions, hallucinations or disorganized speech:

- Delusions
- Hallucinations
- Disorganized speech (e.g. frequent derailment or incoherence)
- Grossly disorganized or catatonic behavior
- Negative symptoms (i.e. diminished emotional expression or avolition)



Animal Organic Irritants (Snakes) Part-1



BIG FOUR SNAKES

Common Cobra:

- Hood and spectacle marks are seen.
- It is neurotoxic.
- The site of action of venom is Post synaptic.

Common Krait:

- Steel black in color.
- It has a white transverse line.
- Most common in India.

Russell viper:

- It has a triangular head, constricted neck, broad body and pointed tail.
- It is hemotoxic.
- It causes DIC and death.

Saw scaled viper:

- It has a triangular head, constricted neck, broad body and pointed tail with a white wavy line over the snake.

- It is hemotoxic.
- Treatment: Polyvalent antivenom



15 MG. 30 MINS-6 HOURS
NAJA NAJA



8 MG, 1 to 2 days
BIRD FOOT MARKS, E CARINATUS



(40 MG , 1 TO 2 DAYS),
DABOIA RUSSELLI



3 TO 6 MG, 18 HOURS, 8 CERULEUS
MOST COMMON (INDIA)

Toxicology Snake Bite Management

COMMON COBRA BITE

- Toxins: acetylcholine esterases, alpha bungarotoxin and cobrotoxin
- Site of action: postsynaptic
- AChE: decrease so muscle paralysis seen
- Neurotoxic: act on motor nerve cells and resemble curare
- Local symptoms appear in 6 to 8 minutes - small reddish wheal, burning pain, local necrosis causes wet gangrene with putrid smell in 1 to 2 days, skip lesions.
- Systemic symptoms appear after about 30 minutes: convulsions + paralysis, cyanosis, paralyzed tongue with hypersalivation.
- Sleepy, weakness in legs, nausea, vomiting, not able to speak, staggering gait, poor neck lift, falling PO_2 .
- Earliest sign: ptosis followed by external ophthalmoplegia
- Paralysis complete by 2 hours
- Respiratory failure



COMMON KRAIT BITE

- Toxins: beta bungarotoxin, acetylcholinesterase
- Site of action: presynaptic
- Similar signs and symptoms of cobra but less rapid
- Painless, no froth, no nausea and vomiting
- Abdominal pain, ptosis, dysarthria, dysphagia, quadriparesis
- No swelling, no burning pain at the site of bite



Common krait snake

Personal Not

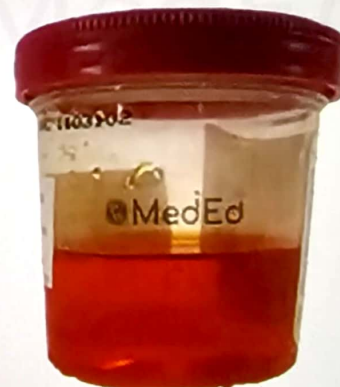
- More paralysis
- Mild convulsions
- More drowsiness and intoxication is more intense
- Albumin in urine
- Nocturnal bite: people sleeping on the floor, victim early morning wake up with paralysis

VIPER BITE

- Toxins: hyaluronidase, serine protease, phospholipase A2
- More local reactions like pain, oozing of blood
- Local necrosis leading to gangrene
- Blisters
- Bilateral parotid swelling (viper head), conjunctival edema, SCH
- Petechial hemorrhage, epistaxis, gum bleeding, hemoptysis, hematemesis, hematuria, rectal bleeding.
- Acute renal failure, anuria, oliguria, increased serum creatinine
- DIC, increased clotting time and bleeding time
- Hemotoxic



Saw scaled viper



Hematuria



Viper head



Papillary necrosis
Kidney necrosis




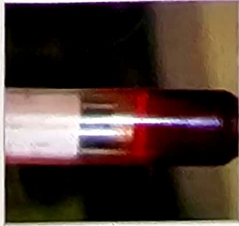

Blisters

SEA SNAKE

- Painless with minimal local symptoms
- Enlarged lymph nodes
- Sweating, vomiting, thirst
- Rhabdomyolysis (increase hb, increase myoglobin and kidney failure)
- Shoulder girdle muscle
- Lock jaw, trismus
- Myoglobinuria, hyperkalemia
- Generalized muscle pain ending in respiratory failure

Investigations:

- Enzyme immunoassay (most common) and radioimmunoassay (most sensitive)
- 20 minutes whole blood clotting test (20 WBCT)
- Single breath counting test

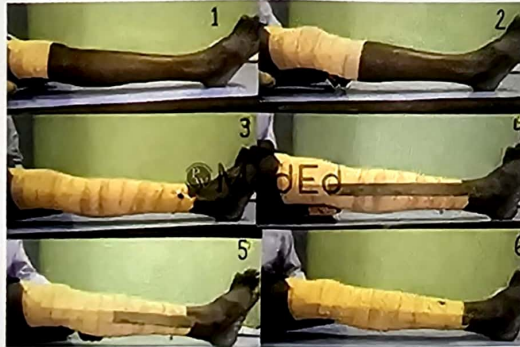
Whole Blood Clotting Test (WBCT)		
Draw 2 mL of venous blood and transfer directly into a clean and dry glass tube. Leave it upright, open, undisturbed for 20 and/or 30 minutes at room temp.	After exactly 20 minutes, pick up the tube and invert it. If a solid clot is retained, the test indicates normal coagulation.	If clot breaks down quickly upon inversion of the tube or fails to coagulate, the test indicates a coagulopathy.
		
Collection: a blood sample for WBCT testing immediately after collection.	Normal: a solid clot is retaining upon inversion of the tube at 20 or 30 minutes (Grade 0, no coagulopathy).	Abnormal: clot degrades rapidly (Grade 1, friable clot) or fails to coagulate whatsoever (Grade 2).

Whole blood clotting test

SNAKE BITE MANAGEMENT

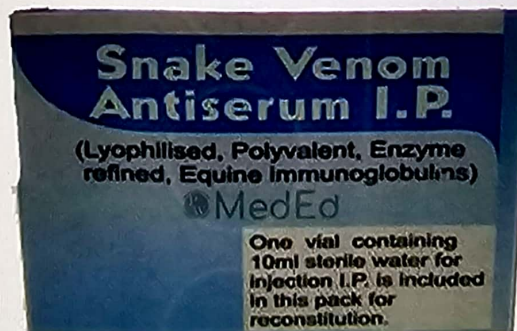
	Do it	Don'ts
R	Reassurance	Tight tourniquet
I	Immobilisation	Incision and suction of wound
GH	Get to Hospital immediately	Washing the wound
T	Telling the doctor about emergence of symptoms	Electro/cryotherapy

- Premium non nocere (first do no harm - incision over the bite, mouth suctioning, tourniquet around the limb, use of snake stones, icepack, electric shock)
- Reassurance
- Immobilization (splint or sling)
- Pressure immobilization - Sutherland wrap (if patient is > 1 hour from medical care) in elapidae bites. (not in vipers)
- Pressure pad or Monash technique - hard pad is applied directly to the wound.



Sutherland wrap (50-60 mmhg pressure)

Polyvalent antsnake venom:



Side effect of polyvalent anti snake venom: Anaphylaxis, serum sickness

How to give:

- Slow iv - 8 to 10 vials over a period of 1 hour
- Repeat doses 6 hour rule in vipers and 1 to 2 hour rule in elapidae
- Half life 90 hours/no test required/children same dose
- Max 20 in neurotoxic - 30 vials in vipers

- o Ideally within 4 hours
- o Procedure - freeze dried antivenom dissolved in water 10 ml of vial, about 80 to 100 ml diluted in 200 to 500 ml of isotonic solution of Normal saline and given slow iv.

Supportive treatment:

- o Broad spectrum antibiotics
- o Tetanus toxoid
- o Atropine followed by neostigmine in cobra bites
- o Endotracheal intubation
- o Dopamine - renal failure
- o Hypovolemic shock - normal saline, ringer lactate
- o Fresh frozen plasma
- o Heparin

Snake bite envenomation severity scale - SESS

No envenomation	: Absence of local or systemic reactions, Fang marks (+/-)
Mild envenomation	: Fang marks (+), moderate pain, minimal local edema (0-15cm), erythema (+), ecchymosis (+/-), no systemic reactions.
Moderate envenomation	: Fang marks (+), severe pain, moderate local edema (15-30cm), erythema and ecchymosis (+), systemic weakness, sweating, syncope, nausea, vomiting, anemia or thrombocytopenia.
Severe envenomation	: Fang marks (+), severe pain, severe local oedema (>30cm), erythema and ecchymosis (+), hypotension, paresthesia, coma, pulmonary edema, respiratory failure.

Markers of severe envenomation:

- o Very venomous snake
- o Rapid swelling extension
- o Early lymph nodes enlargement
- o Early systemic symptoms
- o Early spontaneous bleeding

Postmortem findings:

- o Snake bite mark - fang mark
- o CPC - congestion, petechial hemorrhage, cyanosis
- o Enlarged lymph nodes
- o Cellulitis, hemorrhage, swelling



Medicolegal aspects of snake bite:



- Accidental - most common manner
- Homicidal - throwing snake on the bed of sleeping person (302 IPC)
- Suicidal
- Cattle poison
- Medical negligence

Somniferous Poisons

OPIUM



Papaver Somniferum: Central green bulbous pod with red/white flowers

- SEEDS: Poppy seeds are Non- poisonous
- Latex: Lacerating immature pods (sticky brown residue)

Active principles-

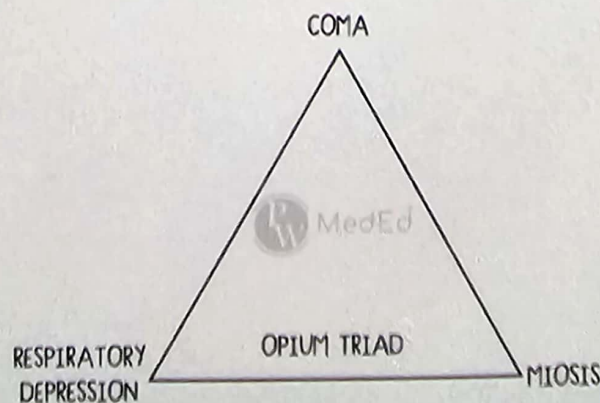
1. Phenanthrene derivatives:

- Natural - morphine, codeine
- Semisynthetic - heroine, pholcodine
- Synthetic - methadone, tramadol, fentanyl(50 to 100 times potent than morphine)

2. Benzylisoquinoline derivatives:

- Papaverine
- Noscapine

Clinical features:



Stages:

1. Stage of excitement
 2. Stage of stupor
 3. Stage of coma
- Receptors: mu, kappa, delta, OFQ-N

Routes:

1. Snorting
2. Inhalational vapors
3. Mainlining
4. Skin popping (S/C injection)

MORPHINE POISONING

- Miosis
- Orthostatic hypotension
- Respiratory depression
- Pain suppression/pneumonia (aspiration)
- Histamine release/Hormonal alterations/Hypotension
- Increased ICT/Infrequency (constipation/Urinary retention)
- Nausea
- Euphoria
- Sedations
- Fatal dosage: Opium - 2gm, Morphine - 200mg, Codeine - 50mg
- Fatal period: 6-12 hours
- D/D: stroke, CO poisoning, OP poisoning, barbiturates, diabetic coma, encephalopathy
- Cause of death: Respiratory paralysis.

Management

1. Gastric lavage
2. Enema
3. Whole bowel irrigation
4. Antidote - Naloxone/Naltrexone
5. Tests - Marquis test (H_2SO_4 + Formalin = Purple red violet color), Mandelin test
6. Post-mortem changes: CPC+++ , Black post mortem hypostasis
7. Medicolegal importance- Ideal suicidal, infanticide, euthanasia, aphrodisiac, accidental, negligence.



A case of body packers syndrome died due to Heroin poisoning

SMACK, BROWN SUGAR, JUNKIE

- Speedball - Heroin + Cocaine
- Hot Shot - Heroin + Strychnine
- Clinical features: same as morphine poisoning

Treatment:

- Acute - Naloxone/Naltrexone
- Chronic addiction - Suboxone/Methadone
- Withdrawal - "Cold turkey syndrome" - sweating, dilated pupils, piloerection, fever, rhinorrhea, diarrhea (flu like symptoms), muscle jerks, yawning
- Medicolegal importance- Infanticide, suicidal agent, euthanasia, aphrodisiac, accidental, negligence.

Image - Poppy Seeds - also known as "Khus Khus" seeds, non - poisonous.



Alcohol

In general, alcohol is a CNS depressant. However, initially at low dosage it causes excitation of the higher centers.

Percentage of alcohol by volume in beverages:

- Beer: 4 to 8%
- Champagne: 10 to 13%
- Wine: 10 to 15%
- Sherry: 17 to 21%
- Spirits (Whiskey, Gin, Brandy, Vodka, Rum): 35 to 50%
- Weekly safe limit of drinking in males is < 21 units and in females in < 14 units.
- One standard drink means 30ml of spirits, 330ml of beer, 100ml of wine.
- Increased absorption is seen in females, empty stomach and taken with carbonated drinks.

SIGNS AND SYMPTOMS OF ETHYL ALCOHOL

1. Stage of excitement (Most of the medicolegal cases occur during this phase): seen at blood alcohol level of 50 : 150 mg%.
2. Stage of incoordination (For eg muscle incoordination, gait is abnormal, Romberg test is abnormal): seen at BAL of 150 : 250 mg%.
3. Stage of coma (Mac Ewan's sign is positive that means pupil will dilate in response to painful stimulus): Seen at BAL of > 250mg%.

Fatal dosage is 150 : 250 ml of absolute alcohol

Fatal period is 12 : 24 hours

Cause of death is aspiration or respiratory depression

INVESTIGATIONS

1. Widmark formula: To find out the amount of alcohol present in the body. Here, blood or urine can be used.

A = CPR is used for blood samples

A = 3/4 QPR can also be used for urine samples

(A for amount of alcohol; B for blood alcohol concentration; P is body weight; R is constant)

According to Motor vehicle act 1985 section 185, the legal limit of alcohol for drink and drive is 30mg%.

TESTS FOR ALCOHOL

(Mnemonic: AMITABH KBC GREAT)

1. Alcohol dehydrogenase method
2. Kozelka test
3. Breast analyser test
4. Cavet test
5. Gas chromatography

PM findings if death occurs due to alcohol:

- The smell of alcohol is present
- CPC is present
- Rigor mortis is prolonged
- Putrefaction is delayed

Medicolegal aspects of alcohol intoxication:

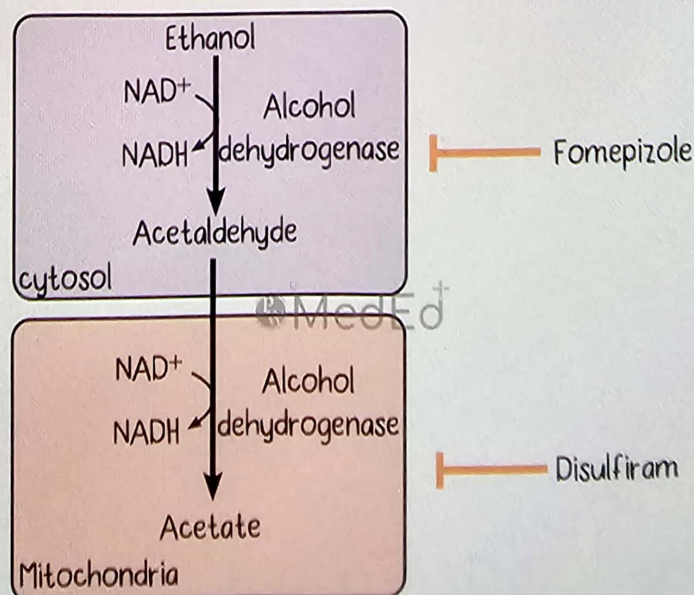
- Rape, Robbery, Assault
- Road traffic accidents
- 85 IPC ie. voluntary drunkenness is liable for punishment.
- 510 IPC ie. misconduct in public under alcohol is a punishable offense.

Treatment of alcoholism:

- **Disulfiram**: it inhibits acetaldehyde dehydrogenase leading to accumulation of acetaldehyde

Acetaldehyde produces unpleasant reactions like sweating, abdominal pain, palpitations and dizziness.

- Citrated calcium carbimide
- Metronidazole

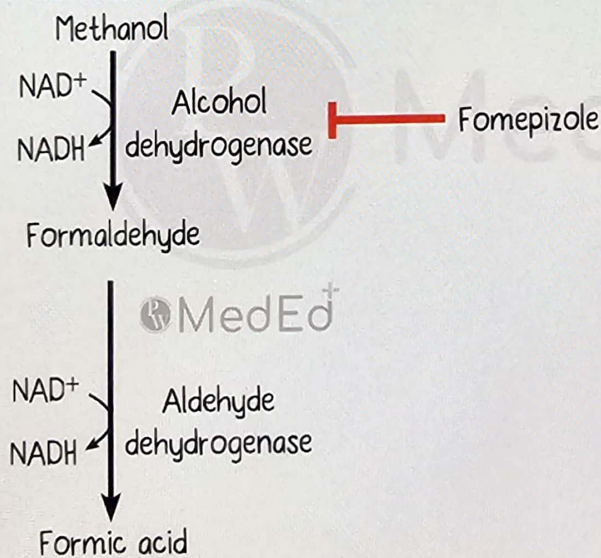


- Hypoglycemia
- Hyperglycemia
- Thyrotoxicosis
- Delirium
- Uremia
- CO poison
- Insulin
- Barbiturates
- Narcotics
- Antidepressants

Final opinion given should be:

1. There is nothing to suggest that the person has consumed alcohol
2. The person has consumed alcohol but is not under the influence of alcohol
3. The person has consumed alcohol and is under the influence of alcohol

METHANOL METABOLISM (WOOD ALCOHOL)



- Formaldehyde and formic acid are toxic metabolites
- Formaldehyde can cause coma and hemorrhages; Formic acid can cause retinal damage leading to blindness
- The fatal dose is around 60 to 200ml
- The fatal period is around 24 hours

Treatment:

1. Gastric lavage
2. Activated charcoal
3. IV Ethanol can also be given
4. Fomepizole: inhibits alcohol dehydrogenase

Chronic alcoholism: Clinical syndromes

1. Delirium tremens
2. Alcoholic hallucinosis (mostly visual)
3. Korsakoff psychosis (characterized by confabulations)
4. Wernicke's encephalopathy (characterized by Global confusion, Ataxia, Ophthalmoplegia)
5. Marchiafava bignami syndrome
6. Alcoholic seizures
7. Alcoholic paranoia

Withdrawal syndrome associated with alcoholism is delirium tremens, typically seen after 48 to 72 hours from last drink.

(Mnemonic: PAST NIGHT)

- Psychomotor agitation
- Anxiety
- Autonomic excitability
- Systolic hypertension
- Tremens
- Nausea and vomiting
- Insomnia
- Grand mal seizures
- Hallucinations and illusions
- Headache
- Hyperactive reflexes
- Tremor and tachycardia

Increased suicidal tendencies (40% mortality)

MARCHIAFAVA BIGNAMI DISEASE

- It is a rare neurological disorder of chronic alcoholism characterized by demyelination and necrosis of corpus callosum.
- Characterized by epilepsy, ataxia, hallucinations, dysarthria and spastic limb paralysis.
- Sandwich sign is seen on CT scan which is a classic of MBD.

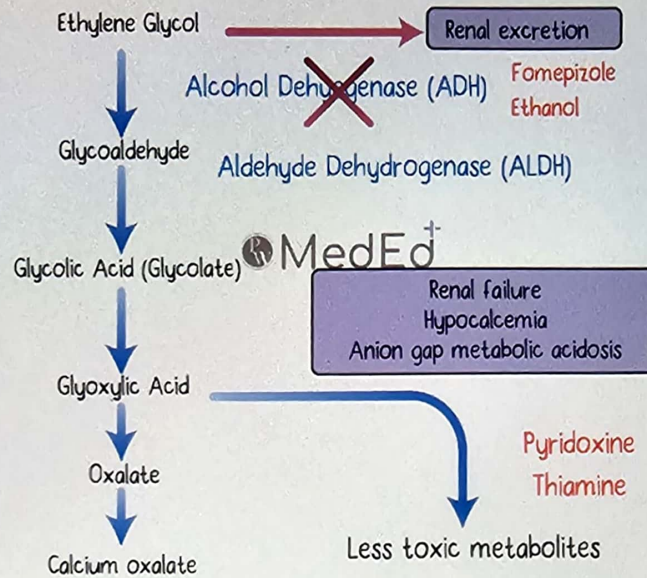
DRUNKENNESS

It is a condition produced in a person who has taken alcohol in a sufficient quantity to cause him to lose control of his mental and physical faculties to such an extent that he is unable to safely execute the occupation which he is engaged at that particular time.

D/d for drunkenness includes:

- Head injury
- Cerebral tumor

D/D is ethylene glycol poisoning (Distinguished by presence of Calcium oxalate crystals and renal failure)



SIGNS AND SYMPTOMS OF ETHYLENE GLYCOL POISONING

1. Convulsions and coma
2. CHF
3. Acute tubular necrosis
4. Slurred speech
5. Pontine hemorrhage

Question:

1. A 5 year old boy is brought to the emergency room lapsing in and out of consciousness. The mother reports that 30 min ago, the young boy was found exiting the garage severely confused. A container of freshly spilled antifreeze was found on the garage floor. What would be the next appropriate step?
 - A. Dimercaprol
 - B. N : acetylcysteine
 - C. Flumazenil
 - D. Fomepizole

Deliriant: Datura

TYPES OF DELIRIANTS

- Datura niger (black color) & Datura alba (white color): Active principle- Hyoscine
- Cannabis sativa or Indian hemp: Active principle- delta- 9-tetrahydrocannabinol
- Cocaine or White lady
- Atropa belladonna (deadly nightshade)
- Hyoscyamus niger (Henbane)
- Mandragora officinarum (Mandrake)

THORN APPLE/JIMSON WEED/HELL BELL/DEVIL TRUMPET



Entire plant is poisonous, First case of recorded accidental ingestion, JAMESTOWN VIRGINIA US 1676.



Datura Seeds:

- Brown in color
- Double edged
- Kidney shaped
- Active principle- Hyoscine, Hyoscyamine, Atropine

- Fatal dose - 100 seeds
- Causes delirium
- Embryo shows outward curving



Capsicum Seeds:

- Yellow color
- Single edged
- Oval/circular shaped
- Active principle-Capsaicin
- Embryo shows inward curving

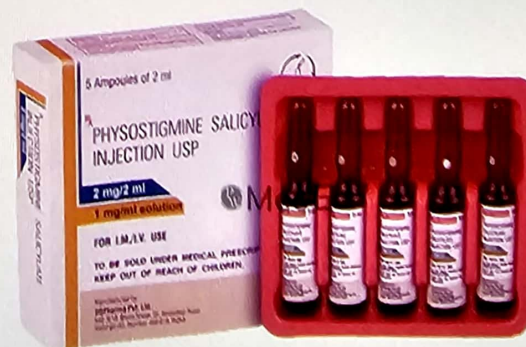
Signs & Symptoms:

Datura: "Red as a beet, dry as a bone, blind as a bat, mad as a hatter, hot as a hare, and full as a flask"

- Dysphagia
- Dysarthria
- Dilatation of blood vessels
- Diplopia/distension of bladder
- Dry hot skin (fever due to stimulation heat center)
- Drunken gait (visual & auditory hallucinations)
- Delirium (irrelevant talking & pin rolling movement- Carphologia)
- Drowsiness
- Dryness of mouth

Treatment:

- Emetics
- Gastric lavage with activated charcoal
- Physostigmine (Reversible Anticholinesterase inhibitor, slow IV 0.5 to 1 mg over 5 minutes)
- Pilocarpine
- Barbiturates



Physostigmine salicylate injection

- It is given slow i.v. as it causes life threatening cholinergic crisis such as seizures, respiratory depression, asystole.
- Contraindicated in patients receiving TCA, Disopyramide, Quinidine, Procainamide, Cocaine.
- Use of hemodialysis is not useful in datura poison, as datura is lipid soluble, but used in various alcohol poison.

Investigations:

- Radioimmunoassay
- Thin layer chromatography

Postmortem changes:

- Congestion, petechial hemorrhages, cyanosis (CPC++)

Medicolegal aspects:

- Stupefying poison used in robbery, kidnapping, Rape
- Railroad poison
- Criminal abortion
- Scopolamine used in narco analysis
- Chinese medicine- COPD, asthma
- Adulterant in liquor
- Aphrodisiac
- Yaqui in women - childbirth
- Accidental poison



Datura fruit usually in single



Castor fruit usually in clusters

Deliriant: Cannabis

- Also commonly known as Indian hemp, Marijuana.

Marijuana:

- Most common illegal substance abuse in world (Nicotine, Alcohol, Caffeine being the common substance of abuse but is legal substance)
- Pot, grass, weed, Mull, Rope, Joint- common names used for cannabis
- Has a carcinogenic substance known as- Benz-pyrene
- Active Principle: delta- 9-tetrahydrocannabinol

Cannabis Indica- Preparations:

- Bhang: (10-15%)- Leaves & Fruit Shoots- Beverages
- Ganja: (Purple Haze, weed, pot, grass) - (15-20%)-Flowering tops of female plants- Mixed with tobacco smoked in Pipe/Hookah- Rusty green colour.
- Hashish: (25-40%) Resin from leaves and stem, Flowers -Dark green or Brown
- Majun: Sweet prepared with cannabis like cannabis cookies, cannabis coffee
- Hashish Oil: Hashish Oil: Has the maximum concentration of cannabis - 60%
- Sinsemilla: (Without seeds) - Unfertilized flowering tops (6-11%)
- Dronabinol, Nabilone: Appetite stimulant in Anorexia & Chemotherapy induced vomiting



Bhang



Majun



Ganja



Charas



Hashish oil

Signs & Symptoms:

- **Stage of Excitement:** Feeling of wellbeing, detachment, grandiosity, dreaminess, talkativeness, laughing, rapidly changing emotions, impaired judgement, increased appetite, conjunctival injection (bloodshot eyes), dry mouth, slurred speech, nystagmus.
- **Stage of Narcosis:** Giddiness, incoordination, confusion, ataxia, paresthesia, respiratory paralysis.
- **Fatal dose:**
 1. Bhang- 10 gram/kg body weight
 2. Charas- 2 gram/kg body weight
 3. Ganja- 8 gram/kg body weight
- **Fatal period:** About 12 hours
- **Diagnosis:** Enzyme immunoassay, radioimmunoassay, Gas chromatography with mass spectrometry.
- **Duquenois-levine-test:** Presumptive test for cannabis-Purple colour.

Treatment:

- Gastric lavage
- Strong tea/coffee
- Artificial respiration
- Diazepam
- Haloperidol

Medicolegal aspects:

- Accidental poisoning
- Punishable under NDPS act 1985
- Robbery
- Criminals- to strengthen nerves
- Aphrodisiac- to increase the duration of coitus
- Children- It is mixed with chocolates to increase the cravings.



Chronic Cannabis poisoning:

- Degeneration of neurons in brain
- Anorexia, Impotence- The genital shrinking syndrome: Koro Cannabis
- Psychological dependence
- Run Amok- The impulse to murder, homicidal mania, period of depression
- Amotivational syndrome
- Flashback phenomena



Deliriant - Cocaine



- Colourless, odourless, crystalline substance with bitter taste
- Blocks the uptake of dopamine, NE, Serotonin at pre-synaptic neurons
- Hyperadrenergic state
- Local Anaesthetic
- Routes: Snorting, IV, Smoking (free-basing), Chewing
- Signs & Symptoms: 7sec after inhalation, 15 secs after taking IV, 3 mins after taking nasal route, 10 mins after ingestion.
- Initial stimulation (rush) and later depression (crash)
- Fatal dose - 20 mg IV, 500 mg to 1.2 gram orally

COCAINE SIGNS & SYMPTOMS

- Mental status changes: Euphoria, psychomotor agitation, grandiosity, hallucinations (including tactile hallucinations), Manic formication, paranoid ideations.
- Sympathetic activation: Appetite, tachycardia, pupillary dilation, hypertension, angina, stroke (intense vasoconstriction), sudden cardiac death.
- Stereotyped behaviour: Repetitive motions (e.g. Digging through trash)
- Diagnosis-Mandelin test, Scott test

- Medico- legal importance: Sudden death (seen in body packers syndrome), Suicide or homicide, foeticide, infanticide, sexual drive.

- **Management:**

1. Symptomatic
2. Amyl Nitrate

EXTRA EDGE

Cracked Lungs:

- It is the acute pulmonary edema & pneumonitis, due to cocaine toxicity (by snorting of cocaine).

Cracked foetus:

- Prenatal cocaine exposure to foetus, which leads to malformations in the baby.



Spinal Poison

NUX VOMICA

- One of the oldest poison
- Common names: Nux Vomica, Poison Hut, Quaker Hut, Buttons, Kuchila, Yeti.



Strychnine seeds:



- Ash gray in color
- Flat circular discs, slightly concave on one side & convex on the other side.
- Looks like: Enlarged RBCs
- Active principle: Brucine, Strychnine, Nux vomica, Loganin (BSNL)
- Uses: respiratory stimulation, rodenticide, killing stray dogs, herbal medicine as : purgative, appetite suppressants, nerve tonics.
- Fatal dose: 30 to 100 mg, 1 to 2 hours, 1 crushed seed.

Signs & Symptoms:

- Conscious seizure: 2 mins seizure: relax: 2 mins seizure
- Bitter taste
- Face: cyanosis, CPC++, Blood tinged froth, Respiratory paralysis
- Convulsions: Risus sardonicus, Opisthotonus, Emprosthotonus, Pleurothotonus
- Consciousness: Retained
- Pupil dilated
- Cause of death: Respiratory paralysis
- Differential diagnosis: Tetanus
- Tests: Mandelin test (yellow color), Wenzell test
- Treatment: Barbiturates & Diazepam

Medicolegal importance:

- Accidental poisoning
- Arrow poison
- Cattle poison
- Adulterant
- Can be detected in decomposed body



Risus sardonicus



Pleurothotonus



Opisthotonus



Emprosthotonos



Alcoholism & Opioid Addiction

DRUG DEPENDENCE FEATURES

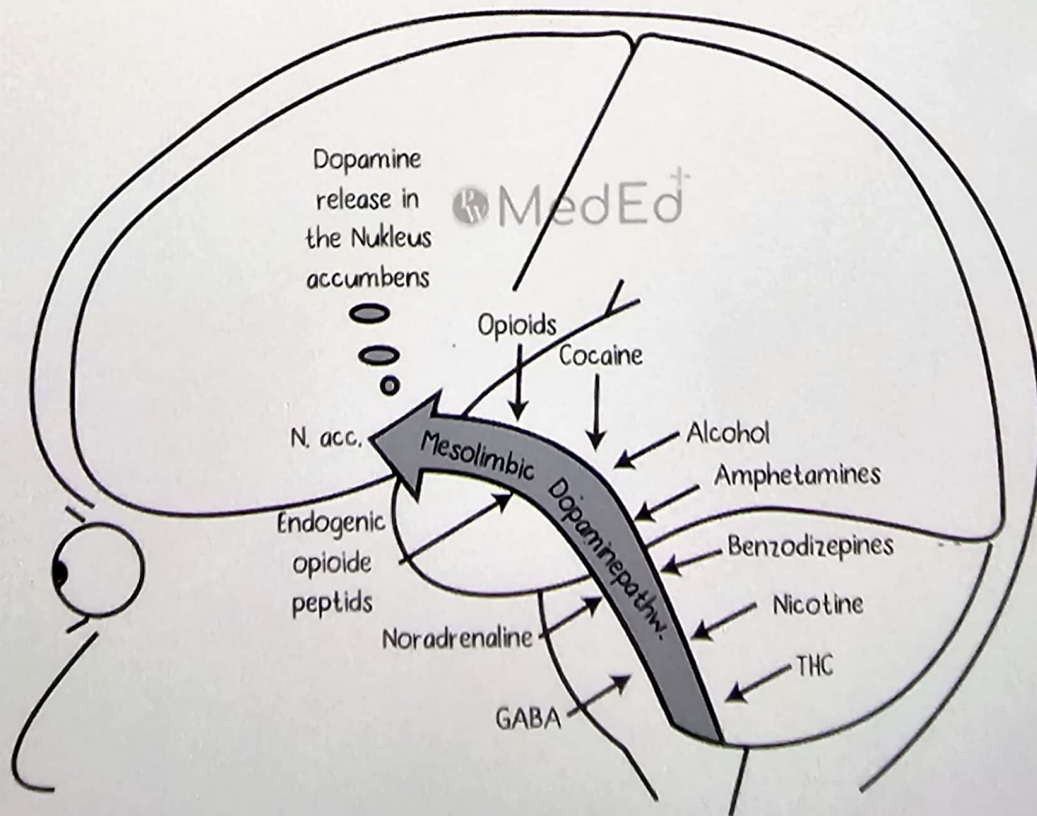
- Compulsion to take drugs
- Psychological/physical dependence
- Increasing dose tendency
- Presence of withdrawal symptoms
- Harm to individuals and society Eg. Run amok (seen in chronic cannabis addiction)

HARD AND SOFT DRUGS

1. **Hard Drugs:** cause severe physical dependence Eg. Heroin, methamphetamine, alcohol, nicotine.
2. **Soft drugs:** do not cause physical dependence but may lead to psychological dependence Eg; Cannabis, mescaline, psilocybin and LSD.

ACTION OF SUBSTANCE OF ABUSE

- They act on the Mesolimbic dopamine pathway



- Increases dopamine and serotonin, thus affecting mood and increase in energy.

Person

DESIGNER DRUGS

- Synthetic structural analogues with modified chemical structure to evade drug detection in standard drug tests.

DSM V - TYPES OF SUBSTANCE RELATED DISORDERS

- Encompasses 10 separate classes of drugs:
 1. Alcohol
 2. Caffeine
 3. Cannabis
 4. Hallucinogens
 5. Inhalants
 6. Opioids
 7. Sedatives, hypnotics and anxiolytics
 8. Stimulants
 9. Tobacco
 10. Other (or unknown) substances

ALCOHOL WITHDRAWAL- DELIRIUM TREMENS (MNEMONIC: PAST NIGHT)

- Psychomotor agitation (feeling of anxious restlessness)
- Anxiety
- Autonomic excitability
- Systolic hypertension
- Tremors
- Nausea and vomiting
- Insomnia
- Grand-mal seizures
- Hallucination/illusions
- Headache, hangover
- Hyperactive reflexes
- Tremor tachycardia

Note: Treatment- Naltrexone, Acamprosate, Disulfiram

Types of alcoholism:

1. **Alpha alcoholism:** excessive inappropriate drinking to relieve physical emotional pain with no loss of control.
2. **Beta alcoholism:** excessive inappropriate drinking with physical complications like gastritis, cirrhosis due to cultural thinking and poor nutrition, but there is no dependence.
3. **Gamma (malignant alcoholism):** physical and psychological dependence with tolerance with withdrawal symptoms and inability to control drinking.

4. **Delta alcoholism:** is similar to gamma alcoholism but is distinguished by the person's inability to abstain, as opposed to complete loss of control over drinking.
5. **Epsilon alcoholism:** dipsomania and spree drinking. Periodic drinking episodes or binges interspersed with dry periods lasting weeks or months.
6. **Zeta alcoholism:** violent behavior even with moderate amounts of alcohol.

OPIOIDS WITHDRAWAL SYNDROME (MNEMONIC- FLAPPY HANDS)

- Fever and chills
- Lacrimation
- Agitation
- Piloerection (cold moist goosebumps, aka: cold turkey)
- Pupillary dilation
- Yawning
- Hypertension and tachycardia
- Aches
- Nausea
- Diarrhea
- Sweating

Note: **Treatment-** Naloxone, Naltrexone, Methadone, Clonidine, Buprenorphine, LAAM (Levo-alpha acetylmethadol).

Question: A young male is brought into the AIIMS emergency by his friends who said he is not responding to them. The patient seems extremely drowsy and has slurred speech. On physical examination, he has pinpoint pupils and his respiratory rate is 4/min. Probable substance abuse is?

- A. Alcohol
- B. Opioid
- C. MDMA
- D. Cocaine

Answer: B. Opioid

Explanation: Coma, Miosis and Respiratory depression is a classical triad of opioid abuse.

Note: Hypertrophic linear scar caused by injections in opioid abusers are generally concealed by making tattoos at unusual sites.

Cocaine Withdrawal

- Mild physical, strong psychological dependence
- Withdrawal syndrome is triphasic:
 1. Crash phase (1 to 4 days): anorexia, hypersomnia, depression
 2. Normal phase (4 to 7 days): normal mood, anxiety, anhedonia
 3. Extinction phase (7 to 10 days): no withdrawal symptoms

Note: Treatment: Bromocriptine, Amantadine, Gabapentin, Topiramate, Trazodone.

Question: Identify the image.



Answer: First image is of brown sugar i.e. heroin + cocaine also called as speedball.

Second image is white powder i.e. cocaine.

CANNABIS WITHDRAWAL

- Mild physical dependence and withdrawal syndrome.
- Depression, tremors, irritability, insomnia, sweating, drug craving
- Involvement of **hippocampus**: impairment in attention, learning, memory
- Amotivational syndrome: lack of interest, lack of interest in day to day activities, impotence.

AMPHETAMINE

- Paranoid schizophrenia (split personality, paranoid delusion, hallucination)
- Marquis test: amphetamine turns orange brown
- Liquid gold: urine of amphetamine addicts sold on the street. Amphetamine is excreted unchanged in the urine in significant proportion, consumption of this is an economical way of amphetamine intake.
- MDMA: party drug *aka Ecstasy*
- Methamphetamine: violent criminal behavior
- Ecstasy plus psilocybin mushroom: hippy flipping
- Included in DOPE test

E:CIGARETTES (VAPING)

- Liquid in e:cigarettes consist of multiple substances, including nicotine, THC, cannabinoid oils flavorings (carcinogenic).
- Vaping use is associated with lung injury and severe acute respiratory syndrome.
- Banned under e:cigarette prohibition act, 2019.
- Transport, production, manufacturing, sale, export, import, advertisement is prohibited.
- First offense: 1 year of imprisonment and 1 lakh fine
- Repeated offenses: 1 to 3 years and 5 lakh fine

Note:

- Khat plant: source of synthetic cathinones. Banned under NDPS Act.



- U:4700 nicknamed as pink or pinky is a highly potent synthetic opioid.



LSD

- Aka: Acid, Blotters.
- LSD is associated with the "Flashback phenomenon".
- Obtained from Rye fungus.
- Rapidly absorbed from GIT with onset of action 30 to 40 mins.
- Increases 5HT in the brain.
- No physical dependence or withdrawal syndrome.
- Ehrlich reagent test: bluish purple color.
- Signs and symptoms – dilated pupils, hyperthermia, hyperactive reflexes, tremors, seeing smell and hearing colors, delusional ideation.

Note: Treatment: Anxiolytics, symptomatic treatment.

MDMA/ECSTASY/MOLLY

- Club drug/Rave drug
- Increases serotonin
- Euphoria, emotional energy
- Sudden death due to cardiac arrhythmia
- Treatment: symptomatic

PHENCYCLIDINE



- Aka Angel dust, super kool, rocket fuel
- White crystalline powder or clear yellowish liquid
- Smoking, intravenous, snorting, ingestion and transdermal
- Increases dopamine which leads to euphoria, erotic hallucination, elated mood, delusion.
- Fatal dosage: 1 mg/kg
- Signs and symptoms: hypertension, tachycardia, tachypnea, salivation, flushing, euphoria, illusions, hallucination, combativeness.
- Treatment: symptomatic

INHALANTS

- Paint thinners, gasoline, glues, spray paints, deodorant spray, amy nitrite, ether chloroform.
- Routes: Snorting, Sniffing, Bagging, Huffing
- Signs and symptoms: mild euphoria, enhanced musical appreciation and aphrodisiac effect.
- Suffocation and heart failure are common causes of death.

DATE RAPE DRUG (PREDATOR DRUG)

- Decreases the resistance and inhibition in the victim
- Generally mixed in the drinks
- Starts within 15 minutes and persists for 4 to 6 hours
- GHP/ketamine/flunitrazepam (Rohypnol)/alcohol
- Knockout drops: chloral hydrate + alcohol (Mickey finn)