

24. Types of toxicities:

	Acute Toxicity	Chronic Toxicity (Hydrargyris)
Sources	*Environmental, industrial accidents/ terrorism (9/11) *Accidents (e.g. broken thermometers/ lamps) *Iatrogenic (vaccinations with ethyl Hg, other medications)	*Continuous exposure (workers) *Excessive therapeutic use (amalgam fillings) *Prolonged use (mercurial ointment) *Professional hazards (work in dental office) *Mother → baby (thru placenta/ breastfeeding) *Consuming contaminated food
Signs & symptoms	*Metallic taste *Excessive salivation *Abdominal pain, vomiting & diarrhea *Renal tubular acidosis, oliguria, proteinuria, hematuria, renal failure	*Neuropsychiatric changes *Gingivitis, salivation, stomatitis, halitosis, loose teeth *Burtonian lines *Tremors: a) Danbury (intentional) tremors b) Hatter's shakes (glass-blewer shakes) c) Concussio mercurialis (tongue, arm, leg tremors)  *Mercurial erethism (mad hatter): a) Anxiety, depression b) Delusions, hallucinations c) Amnesia d) Insomnia *Mercuria lentis (Hg deposition at anterior surface of lens) *Renal damage → uremia

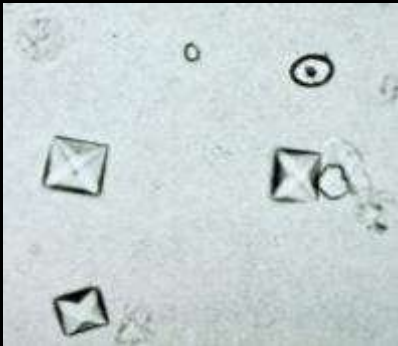


SUB- PART CC 03 (C): OXALIC ACID

29. General:

- Colorless, odorless
- Used as ink remover (in signature forgeries)

30. Clinical features:

	Local Action	Remote Action
Action	Corrosion	Ca ²⁺ consumption (to form oxalates) → hypoCa²⁺emia
Features	*Burning in mouth & throat *Dysphagia *Black vomitus (the blood in it has its Hb converted to acid hematin) *Abdominal pain, purging	*Tetany *Numbness/ tingling *Spasmodic twitching *Convulsions *Oxaluria (envelope-shaped Ca²⁺ oxalate crystals excreted via urine)   *Nephrotoxicity

*↑ secretions → nausea, vomiting, diarrhea, salivation, lacrimation, sweating *Bronchospasm, wheezing *Miosis *Urinary incontinence *Chromolactouria (red tears due to porphyrias) 	*Fasciculations *Weakness (intermediate syndrome) *HT, tachycardia 	Restlessness, drowsiness, convulsions 
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5. Post-mortem finding: **kerosene-like odor**

6. Effect of chronic poisoning (esp. in farmers): **polyneuropathy**

7. Treatment:

- Decontamination** (stomach wash)
- Antidotes** (atropine, pralidoxime)
- Diazepam** (to treat convulsions)

SUB-PART CD 02 (B): ORGANOCHLORINES

8. E.g.s: BHC, lindane, endrin, endosulfan, DDT

SUB-PART CD 02 (C): CARBAMATES

9. E.g.s: carbofuran, aldicarb, propoxur (Baygon)

10. Are **reversible** inhibitors of ChEs (hence, no oximes needed)

SUB-PART CD 02 (D): PYRETHRINS & PYRETHROIDS

11. E.g.s: allethrin, D-allethrin
12. Are insect repellants



13. **Least fatal** of pesticides, but can cause **asthma** in children (even when used as pesticides only)

PART CD 03: RODENTICIDES

SUB-PART CD 03 (A): AL PHOSPHIDE

14. E.g.s: al-/ cel-phos
15. Action is due to **phosphine** @ PH_3 (due to interaction with phosphide with gastric acid → multi-organ failure)
16. Clinical features:
 - a) **Garlicky odor**
 - b) **Abnormal liver functions**
 - c) **Adult RDS**



5. Uses:

- a) **Mydriatic**
- b) **Antispasmodic**
- c) Antidote in **organo P** poisoning
- d) **Pre-anesthetic**

*[See also: Sub-part CD 02 (A)]

6. Mechanism:

Central Action	Peripheral Action
*Small doses: stimulation → excitement, restlessness *Large doses: depression, delirium, coma	* Anticholinergic/ parasympatholytic

7. Signs & symptoms:

Category	Basis	Signs & Symptoms
Dryness	↓ secretions	*Dryness of mouth & throat, *Difficulty in talking *Dysphagia
Redness	Cutaneous vasodilation → hyperemia	
Blindness		*Excessive mydriasis *Blurred vision *Diplopia
Hotness	Dryness, no sweating	Dry, hot skin
Madness		*Delirium (with carphologia) *Drunken gait

18. Clinical features:

1. Features appear...

- soon after smoking & last for 1 – 2 hrs
- within 30 mins after ingestion & last for 2 – 3 hrs

2. Effects by dose:

Small doses	Moderate doses	High Doses
*Euphoria *Disorientation	*Impaired immediate memory *Disturbed thought patterns *Attention lapse	*Marked sensory distortion *Depersonalization *↑ sense of hilarity (esp. when smoking in a group) *Appetite stimulation *Bloodshot eyes (due to conjunctival congestion)



(L-R): euphoria, attention lapse, bloodshot eyes

19. Features of acute & chronic intoxication:

Acute Intoxication	Chronic Intoxication
*Sleepiness, dreaminess, sense of well-being, ↑ self-confidence *Irrelevant thoughts, ↓ conc & attention, altered sense of identity *Vivid images, pleasant hallucinations & illusions *Maladaptive behavior *Somnolence, ataxia, tremors *Altered (↑) appetite, chest tightness	*CNS degeneration, insanity *Paranoid psychosis, violent behavior *Behavioral problems, mental derangement, insanity (hashish insanity) *Amotivational syndrome *Ataxia *Tremors, muscle wasting *↓ testosterone, impotence *Run amok (physical disturbance, characterized by period of depression followed by violent attempts to kill people @ murder impulse)

CHAPTER CG: SEDATIVES & HYPNOTICS (BARBITURATES)

1. Classification:

	E.g. Drugs	Fatal Dose (g)
Ultra-short-acting	Thiopental, monohexital	1
Short-acting	Pento-/ amo-barbital	2
Intermediate-acting	Amylobarbitone	3
Long-acting	Pheno-/ mepho-barbital	4

2. Clinical features:

- Giddiness, ataxia, slurred speech
- Confusion/ automatism
- Delirium
- Stupor
- Coma
- Pupils initially constricted, then dilated
- Cheyne Stokes respiration
- Absence of bowel sounds
- Cold, clammy, cyanotic skin
- Barbiturate blisters (due to capillary permeability)

3. Treatment

- Gastric lavage (KMnO_4)**
- Forced alkaline diuresis**
- Dialysis**
- Exchange transfusion**
- General measures

QUICK BYTZ



treatment for Barbiturates are Blood-related

Others	Severe bruising (of various ages) due to frequent, unprotected, clumsy falls
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16. Autopsy features:

1. **Alcoholic odor**
2. **Conjunctival congestion**
3. **Pulmonary/ cerebral edema**

17. Medicolegal importance:

- a) Alcohol & **drug abuse**
- b) Alcohol & **illicit brewing**
- c) Alcohol & **unnatural deaths**
- d) Alcohol & **medical practice**

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SUB-PART CH 01 (E): DRUNKENNESS

18. Definition:

That the person concerned was **so much under the influence of alcohol** as to have **lost control** over his **mental faculties** to such an extent as to render him unable to **execute safely** the occupation in which he was engaged **at the material time**

19. Features scrutinized during exam of drunkenness case:

1. **Identification marks** are noted (as evidence)
2. General **demeanor** (of the drunkard)
3. **Slurring** of speech/ **confabulation** (story-switching w/o any link between them)
4. **Clothes** worn (by drunkard)
5. **Breath** (fruity odor present)
6. **Mydriasis**
7. Changes in **tongue**
8. **Memory** disturbances
9. Slow, sluggish, **reflexes**
10. Muscular **incoordination**

*Requisition (request) from police [automatic consent under section 53 (I) CrPC] is required prior to exam



SUB-PART CH 01 (F): METHANOL/ METHYL ALCOHOL

20. General:

- a) **Cheap, potent** adulterant
- b) Toxicity delayed up to 24 hrs (due to **slow metabolism**)

Cerbera odollam (not an oleander) 	Dabur	*Cerberin *Cerbroside
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8. Clinical features:

- a) Nausea, vomiting
- b) Ventricular **tachycardia**, **fibrillation**, **AV** block, **cardiac** failure

9. Treatment (no specific antidote):

- a) Decontamination
- b) Cardiac monitoring (for arrhythmias)
- c) Anti-arrhythmics
- d) General (symptomatic) measures

10. Post-mortem findings (non-specific):

- a) **Irritant** effects (e.g. GIT inflammation)
- b) **Visceral congestion**

PART CI 03: DIGITALIS (DIGITALIS PURPURA/ FOXGLOVE)

11. Active principles: **digoxin**, **digitoxin**



Relaxation	*Complete relaxation *Non-traumatic rhabdomyolysis (leads to Mb-uria, renal tubular necrosis, kidney failure) *(Clear consciousness)
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5. Differential diagnosis:

a) **Epilepsy**

b) **Tetanus:**

	Tetanus	Strychnine
History	Wound	Poisoning
Onset	Variable	Immediate
Muscle involvement	1 group at a time	All at once
Trismus	1st manifestation (other body parts normal)	Not the 1 st manifestation (other body parts abnormal)
Chest fixation	Yes	Yes
Relaxation	Partial	Complete
Chemical analysis		Strychnine found

6. Treatment:

a) **Stomach wash**

b) **Diazepam/ barbiturates**

c) **Ventilation**

d) Keep patient in **dark, quiet room** (tetanus room)



7. Post-mortem findings:

1. Post-mortem **caloricity**
2. **Early rigor** mortis (ATP used up during convulsions)
3. **Asphyxial** signs

8. Medicolegal importance:

- a) **Aphrodisiac** (↑ sexual desire)



- b) Rodenticide
c) Arrow/ cattle poison
d) (Formerly) to put down stray dogs

*Note: **gelsemium** is another spinal poison (but it's inhibitory)*



7. Medicolegal importance:

- a) Accidental
- b) Suicidal
- c) Homicidal (rarer)

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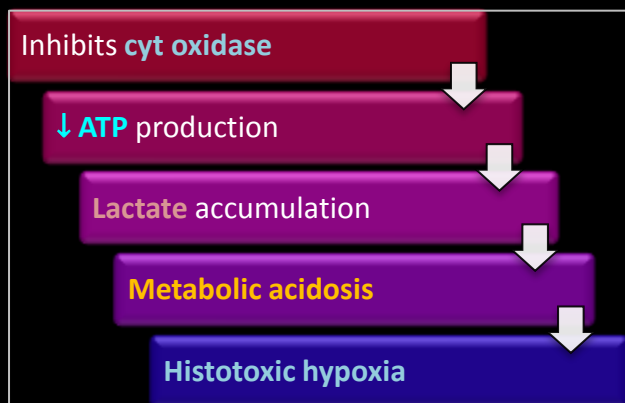
PART CK 02: CN-

8. General:

- a) Solid form: (usually NaCN/ KCN)
- b) Liquid form: hydrocyanic acid
- c) Gaseous form: HCN
- d) Has a **bitter almond odor**



9. Mechanism:



10. Clinical features:

Acute Exposure	Chronic Exposure
*Inhalation leads to rapid symptoms (the converse is true for ingestion) *Arrhythmias, pulmonary edema *Abdominal cramps *Mydriasis *Brick-red discoloration of skin & mucus membranes *Anxiety, confusion, convulsions *Coma	*Tobacco amblyopia *Tropical ataxic neuropathy *Leber's hereditary optic atrophy

11. Metabolism:

- Converted to **SCN⁻** by **rhodanase**
- Also converted to **cyanocobalamin** (vit B12) in presence of **hydrocobalamin** (vit B12a)

12. Fatal period: 2 – 10 min

13. Fatal dose:

- 50 – 60 mg of pure acid
- 200 – 300 mg of NaCN/ KCN