

Top 100 Toxicology Concepts

EXTRACTED FROM Q-BANK & CURRICULUM

MEDICINE & PAEDS TOXICOLOGY

1. ACETAMINOPHEN (PARACETAMOL)

No.	High-Yield Concept
1	Toxic Dose: Ingestion of >150 mg/kg (children) or >10-12g (adults) causes toxicity.
2	The 4-Hour Rule: Serum paracetamol levels must be drawn 4 hours post-ingestion . Earlier levels are unreliable.
3	Nomogram: Use the Rumack-Matthew Nomogram to plot levels and determine need for NAC.
4	Mechanism: Depletion of Glutathione leads to accumulation of toxic metabolite NAPQI .
5	Antidote: N-Acetylcysteine (NAC) . Acts as a glutathione precursor.
6	Timing: NAC is nearly 100% effective if given within 8 hours of ingestion.
7	Late Presentations: If presenting >24 hours, NAC is still given if liver enzymes are raised or coagulopathy exists.
8	King's College Criteria: Used for Liver Transplant (pH < 7.3, INR > 6.5, Creatinine > 3.4).
9	Initial Signs: Nausea/Vomiting in first 24h. Liver tenderness/Jaundice appears Day 2-3 .
10	Activated Charcoal: Effective if given within 1 hour. Can be given with NAC (staggered).

2. ORGANOPHOSPHATES (THE "WET" POISON)

No.	High-Yield Concept
11	Mechanism: Inhibits Acetylcholinesterase -> Accumulation of Acetylcholine (Cholinergic crisis).
12	Pinpoint Pupils: Miosis is a hallmark sign.
13	DUMBELS: Diarrhea, Urination, Miosis, Bradycardia, Emesis, Lacrimation, Salivation.
14	Killer Symptom: Bronchorrhea (excessive lung secretions) causes respiratory failure.
15	Garlic Odor: Characteristic smell on breath or gastric contents.
16	Antidote 1: Atropine . Life-saving. Dries secretions. Titrate until chest is clear.
17	Antidote 2: Pralidoxime (2-PAM) . Regenerates enzyme. Treats muscle weakness/fasciculations.
18	Muscle Signs: Fasciculations (twitching) followed by flaccid paralysis (Depolarizing block).
19	Chronic Effect: Delayed Polyneuropathy can occur 1-3 weeks later.
20	Carbamates: Similar to Organophosphates but reversible bond. Usually only Atropine needed.

3. CARBON MONOXIDE

No.	High-Yield Concept
21	Source: Gas heaters, fires, car exhaust in closed spaces.
22	Scenario: Entire family with headache/nausea in winter ("Flu-like" illness).
23	Mechanism: Binds Hemoglobin 200x stronger than O ₂ . Left shift of O ₂ -dissociation curve.
24	Pulse Oximetry: Shows Normal/High Saturation (Falsely reads COHb as O ₂ Hb).
25	Cherry Red Skin: Classic textbook sign, but rarely seen in live patients (usually post-mortem).
26	Antidote: 100% Oxygen (decreases CO half-life from 5 hours to 1 hour).
27	Hyperbaric Oxygen: Indicated for pregnancy, coma, or CO > 25%.
28	Brain Lesion: Bilateral necrosis of the Globus Pallidus .
29	Diagnosis: Measure Carboxyhemoglobin levels in ABG.
30	Smokers: Have higher baseline CO levels (up to 10%).

4. OPIOIDS vs BENZODIAZEPINES

No.	High-Yield Concept
31	Opioid Triad: Coma + Pinpoint Pupils + Respiratory Depression (RR < 12).
32	Opioid Antidote: Naloxone . Short half-life, may need repeat doses.
33	Opioid Withdrawal: Dilated pupils, runny nose (rhinorrhea), lacrimation, yawning, piloerection.
34	Methadone: Used for opioid maintenance (long half-life).
35	Benzodiazepine OD: Coma and ataxia but usually Normal Vitals (respiration maintained).
36	Benzodiazepine Antidote: Flumazenil .
37	Flumazenil Risk: Can precipitate Seizures in chronic users. Use with caution.
38	Mixed Overdose: Benzos become lethal when combined with Alcohol (Synergistic respiratory depression).
39	Diagnosis: Urine toxicology screen (often qualitative).
40	Management: Airway protection is priority in both.

5. STIMULANTS (SYMPATHETIC OVERDRIVE)

No.	High-Yield Concept
41	Clinical Picture: Agitation, Tachycardia, Hypertension, Dilated Pupils (Mydriasis) .
42	Complication: Myocardial Infarction (Coronary spasm), Stroke, Rhabdomyolysis.
43	Contraindication: NO Beta-Blockers . (Causes unopposed Alpha stimulation -> Hypertensive crisis).
44	Treatment: Benzodiazepines (for agitation/seizures), Nitrates (for chest pain).
45	Cocaine Specific: Chest pain in young person. "Cocaine Bugs" (Formication - feeling of bugs under skin).
46	Amphetamine Specific: Hyperthermia, Bruxing (teeth grinding), Meth mouth.
47	Ecstasy (MDMA): Causes Hyponatremia (SIADH + excess water intake) and Serotonin Syndrome.
48	Lithium Toxicity: Tremors, confusion, renal failure. Precipitated by dehydration/NSAIDs.
49	Lithium Rx: Hydration. Hemodialysis if severe (>4 mEq/L or neuro signs).
50	Ice (Crystal Meth): Severe paranoia, aggression, skin picking.

6. ALCOHOLS & ANION GAP

No.	High-Yield Concept
51	Methanol Source: Moonshine, windshield washer fluid, solvents.
52	Methanol Sign: Visual Disturbances ("Snowstorm vision"), Blindness.
53	Metabolite: Formic Acid (Toxic to retina).
54	Ethylene Glycol: Antifreeze. Causes Renal Failure + Calcium Oxalate Crystals in urine.
55	Antidote: Fomepizole (Inhibits Alcohol Dehydrogenase) or Ethanol.
56	Labs: High Anion Gap Metabolic Acidosis + High Osmolar Gap.
57	Ethanol (Alcohol): Hypoglycemia is a major risk in children and alcoholics.
58	Wernicke's: Confusion + Ataxia + Ophthalmoplegia. Due to Thiamine (B1) deficiency.
59	Rx Wernicke's: Give Thiamine BEFORE Dextrose to prevent Korsakoff psychosis.
60	Dialysis: Indicated for Methanol/Ethylene glycol with visual signs or severe acidosis.

7. ANTICHOLINERGIC & TCA TOXICITY

No.	High-Yield Concept
61	Sources: Atropine, Antihistamines, Tricyclic Antidepressants (TCA), Datura.
62	Mnemonic: "Mad as a Hatter, Blind as a Bat, Red as a Beet, Hot as a Hare, Dry as a Bone".
63	Signs: Confusion, Dilated pupils, Flushing, Hyperthermia, Dry mouth/skin (No sweat).
64	TCA Cardiac: Wide QRS complex, QT prolongation. Risk of arrhythmias.
65	TCA Antidote: Sodium Bicarbonate (protects heart).
66	Physostigmine: Antidote for pure anticholinergic poisoning (use with caution).
67	Contraindication: Do NOT give Physostigmine in TCA overdose (causes asystole).
68	Urinary Retention: Common feature (Check bladder).
69	Management: Cooling, Benzos for agitation/seizures.
70	Datura Seeds: Common accidental poisoning in children (Belladonna alkaloids).

8. WHEAT PILL & CORROSIVES

No.	High-Yield Concept
71	Wheat Pill: Aluminum Phosphide. Releases Phosphine Gas .
72	Sign: Garlic Odor , Refractory Shock, Arrhythmias.
73	Mechanism: Inhibits Cytochrome C Oxidase (blocks cellular respiration).
74	Management: No specific antidote. Supportive (ABC). Gastric lavage with Coconut Oil (controversial but often cited).
75	Corrosives (Acid/Alkali): Do NOT induce vomiting (causes re-exposure burn).
76	Contraindication: Gastric lavage is contraindicated in corrosives (risk of perforation).
77	Management: Endoscopy within 24 hours to assess damage.
78	Kerosene/Hydrocarbons: Risk of Aspiration Pneumonia . Do NOT lavage.
79	Lead Poisoning: Basophilic stippling, Gingival "Burton lines", wrist drop.
80	Lead Chelation: EDTA, Dimercaprol, Succimer.

9. SNAKE BITE & ENVIRONMENTAL

No.	High-Yield Concept
81	Viper Bite: Hemotoxic. Local swelling, necrosis, systemic bleeding.
82	Cobra/Krait: Neurotoxic. Ptosis, paralysis, respiratory failure. Minimal local signs.
83	Test: 20 WBC: (Whole Blood Clotting Test). If blood doesn't clot in 20 mins -> Envenomation.
84	Antivenom: Only specific treatment. Give if systemic signs or severe local swelling.
85	Tourniquet: Generally CONTRAINDICATED (increases local necrosis).
86	Heat Stroke: Temp > 104°F + CNS dysfunction (Coma/Convulsions). Dry skin (anhidrosis).
87	Heat Rx: Rapid cooling (Ice water immersion). Antipyretics (Paracetamol) do NOT work.
88	Hypothermia: Rewarm. Risk of arrhythmia. \downarrow waves on ECGs.
89	Drowning: Main issue is Hypoxia. ABC approach. C-spine protection if trauma.
90	Electrocution: Check for Rhabdomyolysis (Myoglobinuria) and Cardiac Arrhythmias.

10. GENERAL MANAGEMENT PEARLS

No.	High-Yield Concept
91	ABCDE: Always the first step. Airway, Breathing, Circulation.
92	Wet: Always the first step. Airway, Breathing, Circulation.
93	Gastric Lavage: Only useful if within 1 hour of life-threatening ingestion.
94	Activated Charcoal: Universal binder. Dose 1g/kg. Best within 1 hour.
95	Whole Bowel Irrigation: PEG solution. For Body Packers or iron/Lithium (don't bind charcoal).
96	Dialysis Indication: "5 TUMBLE" (Uremia, Metabolic acidosis, Hyperkalemia, Osmolar gap, Lithium, Ethylene glycol).
97	Salicylates (Aspirin): Tinnitus, Respiratory alkalosis, Salicylates, Theophylline, Osmuria, Methanol, Barbiturates, Lithium, Ethylene glycol.
98	Anion Gap: $Na - (Cl + HCO_3)$. High in MUPHILES (Methanol, Uremia, DKA, Osmuria, Lithium, Ethylene glycol, Salicylates).
99	Osmolar Gap: Difference between measured and calculated osmolarity. High in Alcohol toxicity.
100	Psychiatry: Assess suicide risk after medical stabilization.