

High-Yield Toxicology for OPRA Exam

Acetaminophen (Paracetamol) Toxicity

- **Cause:** Overdose (>150 mg/kg) due to accidental or suicidal ingestion
 - **Toxic Metabolite:** NAPQI (N-acetyl-p-benzoquinone imine)
 - **Symptoms (4 Phases):**
 1. **Phase 1 (0-24h):** Nausea, vomiting, malaise, diaphoresis
 2. **Phase 2 (24-72h):** RUQ pain, hepatotoxicity, ↑ LFTs (AST/ALT)
 3. **Phase 3 (72-96h):** Fulminant hepatic failure, jaundice, coagulopathy, encephalopathy
 4. **Phase 4 (4-14 days):** Recovery or death
 - **Antidote:** N-acetylcysteine (NAC)
 - **Monitoring:** Rumack-Matthew Nomogram for risk stratification
-

Aspirin (Salicylate) Toxicity

- **Cause:** Excessive aspirin intake (>150 mg/kg)
 - **Symptoms:**
 - **Early:** Tinnitus, nausea, vomiting, tachypnea
 - **Late:** Metabolic acidosis (↑ anion gap), hyperthermia, respiratory alkalosis, AMS (Altered Mental Status)
 - **Antidote:** Sodium bicarbonate (alkalinise urine), IV fluids, Hemodialysis (if severe)
-

Opioid Overdose (Heroin, Morphine, Fentanyl, Codeine, Oxycodone)

- **Classic Triad:**
 1. **Pinpoint pupils (miosis)**
 2. **Respiratory depression**
 3. **CNS depression (sedation, coma)**
 - **Other Symptoms:** Bradycardia, hypotension, hypothermia
 - **Antidote:** Naloxone (Narcan) IV (may need repeated doses)
-

Benzodiazepine Overdose (Diazepam, Lorazepam, Alprazolam, Clonazepam)

- **Symptoms:**
 - CNS depression, drowsiness, ataxia
 - Hypotension, bradycardia (mild)
 - **NO respiratory depression unless combined with alcohol or opioids**
 - **Antidote:** Flumazenil (use with caution; may cause seizures in chronic users)
-

Beta-Blocker (BB) Toxicity (Propranolol, Atenolol, Metoprolol)

- **Symptoms:**
 - Bradycardia, Hypotension
 - Hypoglycemia (especially in children)
 - Bronchospasm (in asthmatics)
 - **Antidote:** Glucagon IV (bypasses beta-receptor blockade), **Atropine** for bradycardia
-

Calcium Channel Blocker (CCB) Toxicity (Amlodipine, Verapamil, Diltiazem)

- **Symptoms:**
 - Bradycardia, Hypotension
 - Hyperglycemia (unlike BB toxicity, which causes hypoglycemia)
 - **Antidote:** Calcium gluconate, High-dose insulin therapy, Vasopressors
-

Digoxin Toxicity

- **Symptoms:**
 - **GI:** Nausea, vomiting, diarrhea
 - **CNS:** Confusion, yellow-green vision changes (**xanthopsia**)
 - **Cardiac:** Bradycardia, AV block, bidirectional VT
 - **ECG Findings:** Scooped ST segment, bradycardia, AV block
 - **Antidote:** Digibind (Digoxin immune Fab), **Correct K⁺ cautiously**
-

Carbon Monoxide (CO) Poisoning

- **Cause:** Inhalation of CO from fires, faulty heaters, car exhaust
 - **Symptoms:**
 - Headache, dizziness, cherry-red lips, confusion
 - Hypoxia (but normal SpO₂ on pulse oximetry!)
 - **Antidote:** 100% Oxygen / Hyperbaric Oxygen Therapy
-

Cyanide Poisoning (Smoke Inhalation, Industrial Exposure)

- **Symptoms:**
 - Bitter almond breath
 - Hypotension, tachycardia, respiratory distress
 - Metabolic acidosis (lactic acidosis)
 - **Antidote:** Hydroxycobalamin (preferred) or Sodium Thiosulfate + Sodium Nitrite
-

Organophosphate (Cholinergic) Poisoning (Pesticides, Nerve Agents)

- **Symptoms (SLUDGE & DUMB BELLS):**
 - Salivation, Lacrimation, Urination, Defecation, GI upset, Emesis
 - Bradycardia, Bronchospasm, Miosis (pinpoint pupils)
 - **Antidote:** Atropine + Pralidoxime (2-PAM)
-

Methanol & Ethylene Glycol Poisoning (Antifreeze, Windshield Fluid, Moonshine)

- **Symptoms:**
 - Methanol: Blindness ("snowstorm vision"), metabolic acidosis
 - Ethylene Glycol: Kidney failure (calcium oxalate crystals in urine)
 - **Antidote:** Fomepizole or Ethanol, Hemodialysis (if severe)
-

Lead Poisoning (Old Paint, Batteries, Pipes)

- **Symptoms:**
 - Neuropathy (wrist drop, foot drop), Abdominal pain
 - Anemia (Basophilic stippling on smear)
 - **Antidote:** Dimercaprol (BAL) or Succimer (DMSA)
-

Iron Toxicity (Overdose in Children)

- Symptoms:
 - **Early:** GI distress (vomiting, diarrhea, hematemesis)
 - **Late:** Metabolic acidosis, liver failure, shock
 - Antidote: Deferoxamine (Iron chelator)
-

Warfarin Overdose (Excessive INR)

- Symptoms:
 - Excessive bleeding (epistaxis, GI bleed, intracranial hemorrhage)
 - Antidote: Vitamin K (mild), FFP/PCC (severe bleeding)
-

Heparin Overdose

- Symptoms:
 - Excessive bleeding (similar to warfarin toxicity)
 - Antidote: Protamine sulfate
-

Serotonin Syndrome (SSRIs, MAOIs, MDMA, Tramadol, Linezolid)

- Symptoms:
 - Hyperreflexia, clonus, tremor, mydriasis, hyperthermia, autonomic instability
 - Antidote: Cyproheptadine + Benzodiazepines
-

Neuroleptic Malignant Syndrome (Antipsychotics: Haloperidol, Risperidone, Olanzapine)

- Symptoms:
 - Lead-pipe rigidity, hyperthermia, autonomic instability
 - Antidote: Dantrolene + Bromocriptine
-

Malignant Hyperthermia (Succinylcholine, Volatile Anaesthetics)

- Symptoms:
 - Sudden hyperthermia, muscle rigidity, ↑ CK, rhabdomyolysis
 - Antidote: Dantrolene
-

Methemoglobinemia (Benzocaine, Dapsone, Nitrates)

- **Symptoms:**
 - **Chocolate-colored blood, cyanosis unresponsive to O₂**
 - **Antidote: Methylene blue**
-