



مسمومیتهای دارویی در کودکان

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مقدمه:

- از علل مهم مرگ ناشی از آسیب
- اکثریت موارد با بلع اتفاق می افتد
- شایعترین داروهای بلعیده شده: مسکن ها-داروهای موضعی-ویتامین ها و آنتی هیستامین ها
- پیشگیری از مسمومیت



Common Agents Potentially Toxic to Young Children (<6 yr) in Small Doses*

SUBSTANCE	TOXICITY
Aliphatic hydrocarbons (e.g., gasoline, kerosene, lamp oil)	Acute lung injury
Antimalarials (chloroquine, quinine)	Seizures, dysrhythmias
Benzocaine	Methemoglobinemia
β -Adrenergic receptor blockers †	Bradycardia, hypotension
Calcium channel blockers	Bradycardia, hypotension, hyperglycemia
Camphor	Seizures
Caustics (pH <2 or >12)	Airway, esophageal and gastric burns
Clonidine	Lethargy, bradycardia, hypotension
Diphenoxylate and atropine (Lomotil)	CNS depression, respiratory depression
Hypoglycemics, oral (sulfonylureas and meglitinides)	Hypoglycemia, seizures
Laundry detergent packets (pods)	Airway issues, respiratory distress, altered mental status
Lindane	Seizures
Monoamine oxidase inhibitors	Hypertension followed by delayed cardiovascular collapse
Methyl salicylate	Tachypnea, metabolic acidosis, seizures
Opioids (especially methadone, buprenorphine)	CNS depression, respiratory depression
Organophosphate pesticides	Cholinergic crisis
Phenothiazines (especially chlorpromazine, thioridazine)	Seizures, dysrhythmias
Theophylline	Seizures, dysrhythmias
Tricyclic antidepressants	CNS depression, seizures, dysrhythmias, hypotension



Approach:

- ABC
 - Airway-breathing-circulation
- BS check
- Maybe naloxone
- A targeted history and physical examination



History

- Intentional poisonings are typically more severe than unintentional, exploratory ingestions
- determining exactly what the child was exposed to and the circumstances surrounding the exposure
- names and specific ingredients, along with their concentrations
- a list of all medications in the child's environment

SIGN	TOXIN
ODOR	
Bitter almonds	Cyanide
Acetone	Isopropyl alcohol, methanol, paraldehyde, salicylates
Rotten eggs	Hydrogen sulfide, sulfur dioxide, methyl mercaptans (additive to natural gas)
Wintergreen	Methyl salicylate
Garlic	Arsenic, thallium, organophosphates, selenium
OCULAR SIGNS	
Miosis	Opioids (except propoxyphene, meperidine, and pentazocine), organophosphates and other cholinergics, clonidine, phenothiazines, sedative-hypnotics, olanzapine
Mydriasis	Anticholinergics (e.g., antihistamines, TCAs, atropine), sympathomimetics (cocaine, amphetamines, PCP), post-anoxic encephalopathy, opiate withdrawal, cathinones, MDMA
Nystagmus	Anticonvulsants, sedative-hypnotics, alcohols, PCP, ketamine, dextromethorphan
Lacrimation	Organophosphates, irritant gas or vapors
Retinal hyperemia	Methanol
CUTANEOUS SIGNS	
Diaphoresis	Cholinergics (organophosphates), sympathomimetics, withdrawal syndromes
Alopecia	Thallium, arsenic
Erythema	Boric acid, elemental mercury, cyanide, carbon monoxide, disulfiram, scombroid, anticholinergics, vancomycin
Cyanosis (unresponsive to oxygen)	Methemoglobinemia (e.g., benzocaine, dapsone, nitrites, phenazopyridine), amiodarone, silver
ORAL SIGNS	
Salivation	Organophosphates, salicylates, corrosives, ketamine, PCP, strychnine

Oral burns	Corrosives, oxalate-containing plants
Gum lines	Lead, mercury, arsenic, bismuth
GASTROINTESTINAL SIGNS	
Diarrhea	Antimicrobials, arsenic, iron, boric acid, cholinergics, colchicine, opioid withdrawal
Hematemesis	Arsenic, iron, caustics, NSAIDs, salicylates
Constipation	Lead
CARDIAC SIGNS	
Tachycardia	Sympathomimetics, anticholinergics, antidepressants, antipsychotics, methylxanthines (theophylline, caffeine), salicylates, cellular asphyxiants (cyanide, carbon monoxide, hydrogen sulfide), withdrawal (ethanol, sedatives, clonidine, opioids), serotonin syndrome, neuroleptic malignant syndrome, MDMA, cathinones
Bradycardia	β -Blockers, calcium channel blockers, digoxin, clonidine, organophosphates, opioids, sedative-hypnotics
Hypertension	Sympathomimetics, anticholinergics, monoamine oxidase inhibitors, serotonin syndrome, neuroleptic malignant syndrome, clonidine withdrawal
Hypotension	β -Blockers, calcium channel blockers, cyclic antidepressants, iron, antipsychotics, barbiturates, clonidine, opioids, arsenic, amatoxin mushrooms, cellular asphyxiants (cyanide, carbon monoxide, hydrogen sulfide), snake envenomation
RESPIRATORY SIGNS	
Depressed respirations	Opioids, sedative-hypnotics, alcohol, clonidine, barbiturates
Tachypnea	Salicylates, sympathomimetics, caffeine, metabolic acidosis, carbon monoxide, hydrocarbon aspiration
CENTRAL NERVOUS SYSTEM SIGNS	
Ataxia	Alcohols, anticonvulsants, sedative-hypnotics, lithium, dextromethorphan, carbon monoxide, inhalants
Coma	Opioids, sedative-hypnotics, anticonvulsants, antidepressants, antipsychotics, ethanol, anticholinergics, clonidine, GHB, alcohols, salicylates, barbiturates
Seizures	Sympathomimetics, anticholinergics, antidepressants (especially TCAs, bupropion, venlafaxine), cholinergics (organophosphates), isoniazid, camphor, lindane, salicylates, lead, nicotine, tramadol, water hemlock, withdrawal
Delirium/psychosis	Sympathomimetics, anticholinergics, LSD, PCP, hallucinogens, lithium, dextromethorphan, steroids, withdrawal, MDMA, cathinones
Peripheral neuropathy	Lead, arsenic, mercury, organophosphates, nicotine

TOXIDROME	SIGNS					
	Vital Signs	Mental Status	Pupils	Skin	Bowel Sounds	Other
Sympathomimetic	Hypertension, tachycardia, hyperthermia	Agitation, psychosis, delirium, violence	Dilated	Diaphoretic	Normal to increased	
Anticholinergic	Hypertension, tachycardia, hyperthermia	Agitated, delirium, coma, seizures	Dilated	Dry, hot	Diminished	Ileus urinary retention
Cholinergic	Bradycardia, BP, and temp typically normal	Confusion, coma, fasciculations	Small	Diaphoretic	Hyperactive	Diarrhea, urination, bronchorrhea, bronchospasm, emesis, lacrimation, salivation
Opioids	Respiratory depression bradycardia, hypotension, hypothermia	Depression, coma, euphoria	Pinpoint	Normal	Normal to decreased	
Sedative-hypnotics	Respiratory depression, HR normal to decreased, BP normal to decreased, temp normal to decreased	Somnolence, coma	Small or normal	Normal	Normal	



Mini-Toxidromes

TOXIDROME	SYMPTOMS AND SIGNS	EXAMPLES
α_1 -Adrenergic receptor antagonists	CNS depression, tachycardia, miosis	Chlorpromazine, quetiapine, clozapine, olanzapine, risperidone
α_2 -Adrenergic receptor agonist	CNS depression, bradycardia, hypertension (early), hypotension (late), miosis	Clonidine, oxymetazoline, tetrahydrozoline, tizanidine, dexmedetomidine
Clonus/myoclonus	CNS depression, myoclonic jerks, clonus, hyperreflexia	Carisoprodol, lithium, serotonergic agents, bismuth, organic lead, organic mercury, serotonin or neuroleptic malignant syndrome
Sodium channel blockers	CNS toxicity, wide QRS	Cyclic antidepressants and structurally related agents, propoxyphene, quinidine/quinine, amantadine, antihistamines, bupropion, cocaine
Potassium channel blockers	CNS toxicity, long QT interval	Antipsychotics, methadone, phenothiazines
Cathinones, synthetic cannabinoids	Hyperthermia, tachycardia, delirium, agitation, mydriases	See Chapter 140 .



Physical Examination

- assessing and stabilizing the airway, breathing, circulation, and mental status
- key features of the physical exam are vital signs, mental status, pupils (size, reactivity), nystagmus, skin, bowel sounds, and muscle tone



Laboratory Evaluation

- A basic chemistry panel (electrolytes, renal function, glucose)
- liver transaminases
- creatinine kinase
- acetaminophen level



Laboratory Clues in Toxicologic Diagnosis

Anion Gap Metabolic Acidosis (Mnemonic = Mudpiles Cat)

M ethanol, metformin

U remia

D iabetic ketoacidosis

P ropylene glycol

I soniazid, iron, massive ibuprofen

L actic acidosis

E thylene glycol

S alicylates

C ellular asphyxiants (cyanide, carbon monoxide, hydrogen sulfide)

A lcoholic ketoacidosis

T ylenol (clinical significance depends upon presence or absence of liver injury)



Elevated Osmolar Gap

Alcohols: ethanol, isopropyl, methanol, ethylene glycol

Hypoglycemia (Mnemonic = Hobbies)

H ypoglycemics, oral: sulfonylureas, meglitinides
O ther: quinine, unripe ackee fruit
B eta **B** lockers

I nsulin
E thanol
S alicylates (late)



Hyperglycemia

Salicylates (early)
Calcium channel blockers
Caffeine

Hypocalcemia

Ethylene glycol
Fluoride

Rhabdomyolysis

Neuroleptic malignant syndrome, serotonin syndrome
Statins
Mushrooms (*Tricholoma equestre*)
Any toxin causing prolonged immobilization (e.g., opioids, antipsychotics)
or excessive muscle activity or seizures (e.g., sympathomimetics)



Radiopaque Substance on Kub (Mnemonic = Chipped)

C hloral hydrate, calcium carbonate

H eavy metals (lead, zinc, barium, arsenic, lithium, bismuth)

I ron

P henothiazines

P lay-Doh, potassium chloride

E nteric-coated pills

D ental amalgam, drug packets



- **quantitative blood concentrations:**
 - salicylates, some anticonvulsants, acetaminophen, iron, digoxin, methanol, ethanol, lithium, ethylene glycol, theophylline, CO, lead



- **urine drug-of-abuse screens:**
 - altered mental status of unknown etiology
 - persistent unexplained tachycardia
 - acute myocardial ischemia or stroke at a young age
 - neglected or abused child



Additional Diagnostic Testing

- ECG
- Chest radiography
- Abdominal radiography



Principles of Management

- supportive care, decontamination, directed therapy (antidotes, ILE), and enhanced elimination
- Antidotes



POISON	ANTIDOTE	DOSAGE	ROUTE	ADVERSE EFFECTS, WARNINGS, COMMENTS
Acetaminophen	N -Acetylcysteine (Mucomyst)	140 mg/kg loading, followed by 70 mg/kg q4h	PO	Vomiting (patient-tailored regimens are the norm)
	N -Acetylcysteine (Acetadote)	150 mg/kg over 1 hr, followed by 50 mg/kg over 4 hr, followed by 100 mg/kg over 16 hr	IV	Anaphylactoid reactions (most commonly seen with loading dose) (Higher doses of the infusion are often recommended depending on acetaminophen level or degree of injury)
Anticholinergics	Physostigmine	0.02 mg/kg over 5 min; may repeat q5-10 min to 2 mg max	IV/IM	Bradycardia, seizures, bronchospasm <i>Note:</i> Do not use if conduction delays on ECG.
Benzodiazepines	Flumazenil	0.2 mg over 30 sec; if response is inadequate, repeat q1min to 1 mg max	IV	Agitation, seizures from precipitated withdrawal (doses over 1 mg) Do not use for unknown or polypharmacy ingestions.
β-Blockers	Glucagon	0.15 mg/kg bolus followed by infusion of 0.05-0.15 mg/kg/hr	IV	Vomiting, relative lack of efficacy
Calcium channel blockers	Insulin	1 unit/kg bolus followed by infusion of 0.5-1 unit/kg/hr	IV	Hypoglycemia Follow serum potassium and glucose closely.
	Calcium salts	Dose depends on the specific calcium salt	IV	



Carbon monoxide	Oxygen	100% FIO ₂ by non-rebreather mask (or ET if intubated)	Inhalation	Some patients may benefit from hyperbaric oxygen (see text).
Cyanide	Hydroxocobalamin (Cyanokit)	70 mg/kg (adults: 5 g) given over 15 min	IV	Flushing/erythema, nausea, rash, chromaturia, hypertension, headache
Digitalis	Digoxin-specific Fab antibodies (Digibind, DigiFab)	1 vial binds 0.6 mg of digitalis glycoside; #vials = digitalis level × weight in kg/100	IV	Allergic reactions (rare), return of condition being treated with digitalis glycoside
Ethylene glycol, methanol	Fomepizole	15 mg/kg load; 10 mg/kg q12h × 4 doses; 15 mg/kg q12h until ethylene glycol level is <20 mg/dL	IV	Infuse slowly over 30 min. If fomepizole is not available, can treat with oral ethanol (80 proof)
Iron	Deferoxamine	Infusion of 5-15 mg/kg/hr (max: 6 g/24 hr)	IV	Hypotension (minimized by avoiding rapid infusion rates)



Opioids	Naloxone	1 mg if patient not likely to be addicted. 0.04-0.4 mg if possibly addicted; repeated as needed; may need continuous infusion	IV, intranasal, IO, IM, nebulized	Acute withdrawal symptoms if given to addicted patients May also be useful for clonidine ingestions (typically at higher doses)
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Supportive Care

- airway, breathing, and circulation
- *Hypotensive patients often are not hypovolemic but are poisoned*
- IV fluids+vasopressor
- Seizures



Medications to Maintain Cardiac Output and for Postresuscitation Stabilization*

MEDICATION	DOSE RANGE	COMMENT
Inamrinone	0.75-1 mg/kg IV/IO over 5 min; may repeat 2×; then: 2-20 µg/kg/min	Inodilator
Dobutamine	2-20 µg/kg/min IV/IO	Inotrope; vasodilator
Dopamine	2-20 µg/kg/min IV/IO in low doses; pressor in higher doses	Inotrope; chronotrope; renal and splanchnic vasodilator
Epinephrine	0.1-1 µg/kg/min IV/IO	Inotrope; chronotrope; vasodilator in low doses; vasopressor in higher doses
Milrinone	50-75 µg/kg IV/IO over 10-60 min then 0.5-0.75 µg/kg/min	Inodilator
Norepinephrine	0.1-2 µg/kg/min	Inotrope; vasopressor
Sodium nitroprusside	1-8 µg/kg/min	Vasodilator; prepare only in D5W

* Alternative formula for calculating an infusion: Infusion rate (mL/hr) = [weight (kg) × dose (µg/kg/min) × 60 (min/hr)]/concentration µg/mL).



Example:

- $6 * wt + 100cc$ DW
 - 1 drop = $1\mu g/kg$



Decontamination

- to minimize absorption of the toxic substance
- Decontamination should not be routinely employed for every poisoned patient
- Dermal and ocular decontamination
- Gastrointestinal (GI) decontamination strategies are most likely to be effective in the 1 or 2 hours after an acute ingestion



- **Gastric Lavage**
 - in most clinical scenarios, the use of gastric lavage is no longer recommended
- **Single-Dose Activated Charcoal**
 - **Charged molecules (i.e., heavy metals, lithium, iron) and liquids do not bind well to activated charcoal**



Activated charcoal

- Charcoal is most likely to be effective when given within 1 hr of ingestion
- 1 g/kg in children or 50-100 g in adolescents and adults
- the patient's airway is intact or protected and that the patient has a benign abdominal examination
- adding flavorings



Whole-bowel irrigation (WBI)

- large volumes (35 mL/kg/hr in children or 1-2 L/hr in adolescents) of a polyethylene glycol electrolyte solution
- assessment of the airway and abdominal exam before initiating WBI



Intralipid emulsion (ILE) therapy

- sequesters fat-soluble drugs, decreasing their impact at target organs
- enhances cardiac function
- **calcium channel blockers (verapamil, diltiazem), bupropion, and tricyclic antidepressants**
- 20% Intralipid
 - a bolus dose of 1.5 mL/kg is given over 3 min, followed by an infusion of 0.25 mL/kg/min until recovery or until a total of 10 mL/kg



Enhanced Elimination

- Urinary Alkalinization:
 - a continuous infusion of sodium bicarbonate—containing IV fluids, with a goal urine pH of 7.5-8
 - useful in managing salicylate and methotrexate toxicity
- Complications



Hemodialysis

- low volume of distribution (<1 L/kg) with a high degree of water solubility, low molecular weight, and low degree of protein binding
- methanol, ethylene glycol, salicylates, theophylline, bromide, lithium, and valproic acid
- severe electrolyte disturbances and acid-base derangements



Multidose Activated Charcoal

- 0.5 g/kg every 4-6 hr (for 4 doses)
- significant ingestions of carbamazepine, dapsone, phenobarbital, quinine, and theophylline
- the airway and abdominal exam should be assessed before each dose





Acetaminophen

- the most common cause of acute liver failure and is the leading cause of intentional poisoning death
- N -acetyl-p -benzoquinone imine (NAPQI)
 - **>200 mg/kg in children and**
 - **>7.5-10 g in adolescents and adults**



- Acetaminophen:
 - Tab 325-500
 - Syr 120mg/5cc
 - Supp 125-325
 - Drop 100mg/cc

پس در کودکی با وزن ۱۰ کیلوگرم
اگر حدوداً یک شیشه ی ۶۰ میلی
لیتری شربت آهن را کامل سر بکشد
دوز توکسیک مصرف کرده است.



Clinical and Laboratory Manifestations

- The initial signs are nonspecific

Classic Stages in Clinical Course of Acetaminophen Toxicity

STAGE	TIME AFTER INGESTION	CHARACTERISTICS
I	0.5-24 hr	Anorexia, vomiting, malaise Lab tests typically normal, except for acetaminophen level
II	24-48 hr	Resolution of earlier symptoms; right upper quadrant abdominal pain and tenderness; elevated hepatic transaminases (aspartate > alanine), INR
III	3-5 days	Peak transaminase elevations; development of liver failure, multi organ-system failure, death or recovery begins
IV	4 days to 2 wk	Resolution of liver function abnormalities Clinical recovery precedes histologic recovery

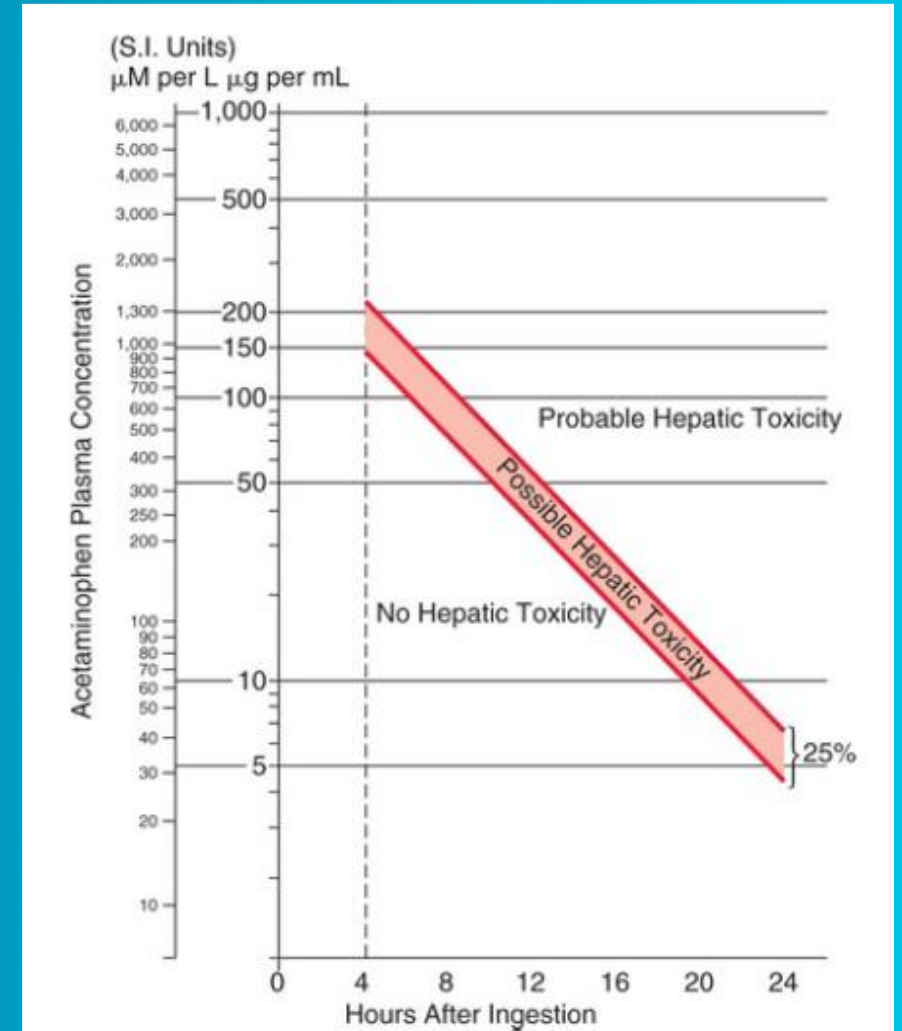


- a serum APAP level should be measured 4 hr after the reported time of ingestion
- more than **4 hr** after ingestion, a stat APAP level should be obtained
- hepatic transaminases, renal function tests, and coagulation parameters



Treatment

- 1 Prophylactic:
 - Rumak-matthew





- 2 Hepatic Injury
 - Any patient in this category requires therapy with NAC (IV or oral)
- 3 Acute Liver Failure
 - acidemia (serum pH <7.3) after adequate fluid resuscitation, coagulopathy (INR >6), renal dysfunction (creatinine >3.4 mg/dL), and grade III or IV hepatic encephalopathy



NAC

- IV form is used in patients with intractable vomiting, those with evidence of hepatic failure, and pregnant patients
- Administration
- complications



Nonsteroidal Antiinflammatory Drugs(NSAIDs)

- GI irritation, reduced renal blood flow, and platelet dysfunction
- Ibuprofen:
 - **ingestions of >400 mg/kg**
- Symptoms
- Treatment



Prescription Opioids

- Methadone
 - cause QTc interval prolongation
- Buprenorphine
- **Naloxone**
 - **1-2 mg**
 - **0.04-0.4 mg**



β -Adrenergic Receptor Blockers

- propranolol is considered to be the most toxic member
- Clinical and Laboratory Manifestations
- Glucagon



Calcium Channel Blockers

- diltiazem and verapamil are the most dangerous in overdose because of their higher lipophilicity and direct cardiac suppressant effects
- profound hypotension with preserved consciousness
- IV Calcium-High-dose insulin euglycemia therapy



Iron

- Ferrous sulfate contains 20% elemental iron, ferrous gluconate 12%, and ferrous fumarate 33%
- corrosive to the GI mucosa
- >40 mg/kg of elemental iron
- 5 stages
- Deferoxamine



Oral Hypoglycemics

- Hypoglycemia and symptoms associated with hypoglycemia
- ingestion of a single sulfonylurea tablet can lead to significant toxicity
- bolus of IV dextrose
- octreotide

A close-up photograph of a person's hands wearing blue nitrile gloves, holding several small, dark-colored vials of medication. The vials are arranged in a cluster, and some have white labels with text. The background is a light blue gradient.

Tricyclic Antidepressants

- even with ingestion of 1 or 2 pills (10-20 mg/kg)
- Cardiovascular and CNS symptoms
- activated charcoal-vasopressor
- **Indications for sodium bicarbonate**



Tricyclic antidepressants	Sodium bicarbonate	Bolus 1-2 mEq/kg; repeated bolus dosing as needed to keep QRS <110 msec	IV	Indications: QRS widening (≥ 110 msec), hemodynamic instability; follow potassium.
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Selective Serotonin Reuptake Inhibitors

- sedation and tachycardia, Cardiac conduction abnormalities
- serotonin syndrome
- Cyproheptadine

A close-up photograph of a person's hands wearing blue nitrile gloves, holding several small, clear glass vials with white caps. The vials contain different colored liquids, including yellow, orange, and dark brown. The person is holding the vials in a way that they are fanned out, showing the labels. The background is a light blue gradient.

Atypical Antidepressants

- Cardiac conduction defects, including QRS and QTc prolongation, and seizures
- Benzodiazepines-Intralipid emulsion
- vasopressors



Antipsychotics

- extrapyramidal symptoms, tardive dyskinesia, and development of the neuroleptic malignant syndrome (NMS)
- sedation, tachycardia, and QTc prolongation
- supportive care, IV fluids, cooling, benzodiazepines, and bromocriptine or dantrolene
- diphenhydramine and benztropine



Household Products:

- **Pesticides**

- **Cholinesterase-Inhibiting Insecticides**

- organophosphates and carbamates

- **DUMBBELS** : diarrhea/defecation,urination,
miosis,bronchorrhea/bronchospasm, bradycardia, emesis, lacrimation,and
salivation

- Basic decontamination

- Atropine

- Pralidoxime



Pyrethrins and Pyrethroids

- allergic reactions ranging from dermatitis to urticaria to anaphylaxis
- acute lung injury
- Decontamination
- antihistamines and corticosteroids
- benzodiazepines for tremors and seizures



Hydrocarbons:

- The most important manifestation of hydrocarbon toxicity is aspiration pneumonitis through inactivation of the type II pneumocytes and resulting in surfactant deficiency
- Compounds with low viscosity and high volatility produce significant injury
- unique toxicities



Clinical and Laboratory Manifestations

- ▶ Transient, mild CNS depression
- ▶ Chest radiographs may initially be normal, but they often show abnormalities within 6 hr of exposure in patients who have aspirated
- ▶ Fever and leukocytosis
- ▶ Pneumatocoles
- ▶ ventricular dysrhythmias-type IV renal tubular acidosis
- ▶ **Emesis and lavage are contraindicated given the risk of aspiration**
- ▶ charcoal is not useful
- ▶ treatment is supportive



Toxic Alcohols

- Drowsiness, mild inebriation, nausea, and vomiting
- metabolic acidosis and visual disturbances
 - feeling of being in a snowstorm
- osmolar gap
- Electrolytes(including calcium), acid-base status, kidney function, and ECG
- Ethanol/Fomepizole
 - Classic indications for fomepizole
- Indications for dialysis



Carbon Monoxide:

- CO binds to hemoglobin with an affinity >200 times that of oxygen, forming carboxyhemoglobin (HbCO)
- headache, malaise, nausea, and vomiting
- arterial or venous blood gas analysis with HbCO determined by CO-oximetry, CK level in severely poisoned patients, pregnancy test, and ECG in any patient with cardiac symptoms
- 100% oxygen

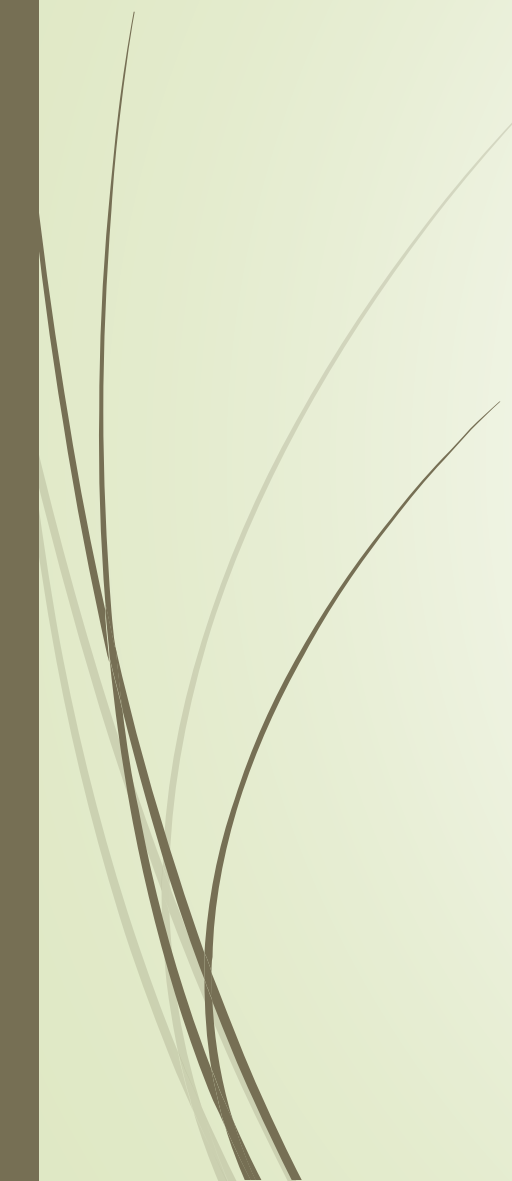


Hydrogen Cyanide

- ▶ headache, agitation/confusion, sudden loss of consciousness, tachycardia, cardiac dysrhythmias, and metabolic acidosis
- ▶ severe lactic acidosis (lactate >10 mmol/L) in fire victims
- ▶ Treatment:
 - ▶ high concentrations of oxygen
 - ▶ The cyanide antidote kit
 - ▶ Hydroxocobalamin
 - ▶ the preferred antidote for cyanide poisoning



Miscellaneous Toxic Agents Found in the Home

- Nicotine-Containing Products
 - Single-Use Detergent Sacs
 - Electric Dishwasher Detergent
- 

A black and white photograph of a mountain lake. In the background, a range of jagged, rocky mountains rises above a dense forest. The foreground shows the calm surface of a lake, which reflects the sky and the surrounding landscape. The sky is filled with dramatic, dark clouds. The overall mood is serene and majestic.

BE FREE, AND LIVE LIFE FULLY.

CAROLINE SHAW