Pharmacist's Guide to the Poisoned Patient

EMILY MCGEE, PHARMD, BCEMP, BCPS, NREMT
ASSISTANT CLINICAL PROFESSOR, *UNIVERSITY OF LOUISIANA AT MONROE COLLEGE OF PHARMACY*
EMERGENCY MEDICINE CLINICAL PHARMACIST, *OCHSNER LSU HEALTH SHREVEPORT*

ACPE UAN: [TO BE ASSIGNED]

The Louisiana Pharmacists Association is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education.

In accordance with LPA guidelines and in compliance with ACPE standards, this presentation has been developed without commercial interest or bias. Faculty and all others who have the ability to control the content of this activity must disclose whether they do or do not have any real or apparent conflict(s) of interest or other relevant financial relationships.

No faculty or planners for this activity have a financial relationship with an ineligible company.

Activity Objectives

At the end of this activity, pharmacists will be able to:

- Identify common toxidromes associated with medications, household products, and toxic plants using key vital sign and physical exam findings
- Apply a structured initial assessment approach (ABCs, focused history, exposure details) to patients with suspected poisoning
- Summarize appropriate initial management strategies, including supportive care, antidote use when indicated, and avoidance of harmful interventions

At the end of this activity, pharmacy technicians will be able to:

- Identify common toxidromes and warning signs of medication, household, or plant poisoning
- Describe the technician's role in facilitating appropriate referral, including directing patients to Poison Control or emergency services when prompted

Case 1 Presentation

A man calls your pharmacy to ask about his wife who has “not been acting like herself” over the past day. He reports that she seems confused, restless, and intermittently agitated, with episodes of disorientation and difficulty answering questions. She is also talking nonsensically at times, appears flushed and sweaty. He is worried something is seriously wrong and asks if her medications could be causing this.

Case 2 Presentation

A 34-year-old male presents to the emergency department after being bitten on the lower leg while working in his backyard. He reports seeing a small reddish-brown snake with Hershey kiss-shaped markings.

On arrival, the patient complains of:

- Increasing pain at the bite site

- Mild oozing from the bite wound

The patient initially states he feels “okay” and wonders if he really needs to stay and he’s not even sure the snake was poisonous.

Toxidrome (Toxic Syndrome)

The syndrome like symptoms of a poisonous agent.

Ex: opioid toxidrome; characterized by respiratory depression, pinpoint pupils, decreased level of consciousness

Xenobiotic

Substances that are foreign to the body.

Ex: pesticides, pharmaceuticals, food additives

Routes of Toxin Exposure

Ingestion

Injection

Inhalation

Absorption

Poison Control Center
1-800-222-1222

01

Identify

Common toxidromes associated with medications, household products, and toxic plants using key vital sign and physical exam findings.

Common Xenobiotics Responsible for Toxic Syndromes (Toxidromes)

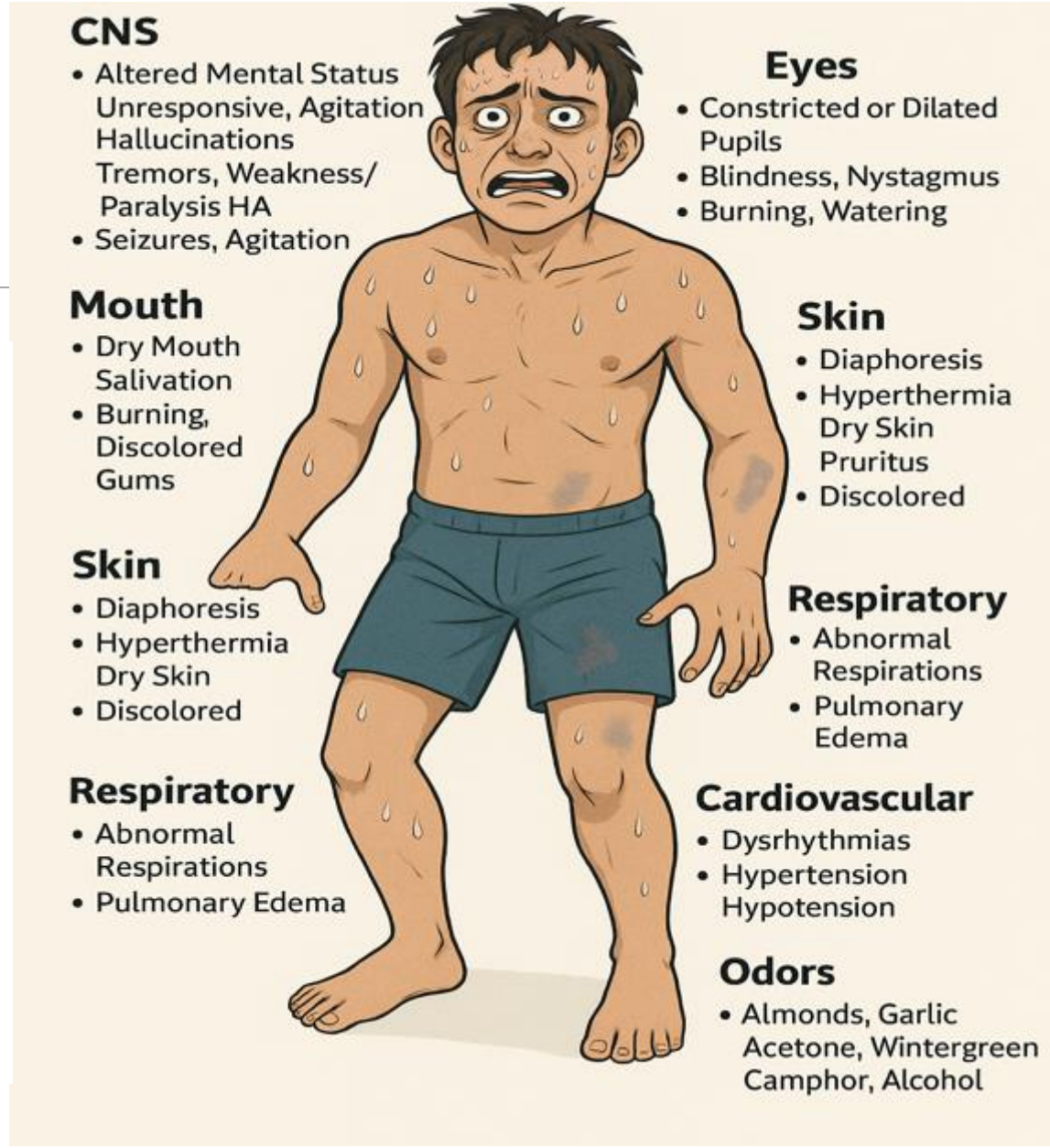
Top 5 Classes according to the American Assocation of Poison Control Centers:

1. Analgesics
2. Household Cleaning Substances
3. Cosmetics/Personal Care Products
4. Antidepressants
5. Sedatives/Hypnotics/Antipsychotics

- Illicit substances
- Antihypertensives
- Cyanide
- Carbon monoxide
- Heavy metals
- Pesticides
- Envenomations
- Plants

Gummin DD, et al. *Clin Toxicol (Phila).* 2021;59(12):1282-1501.

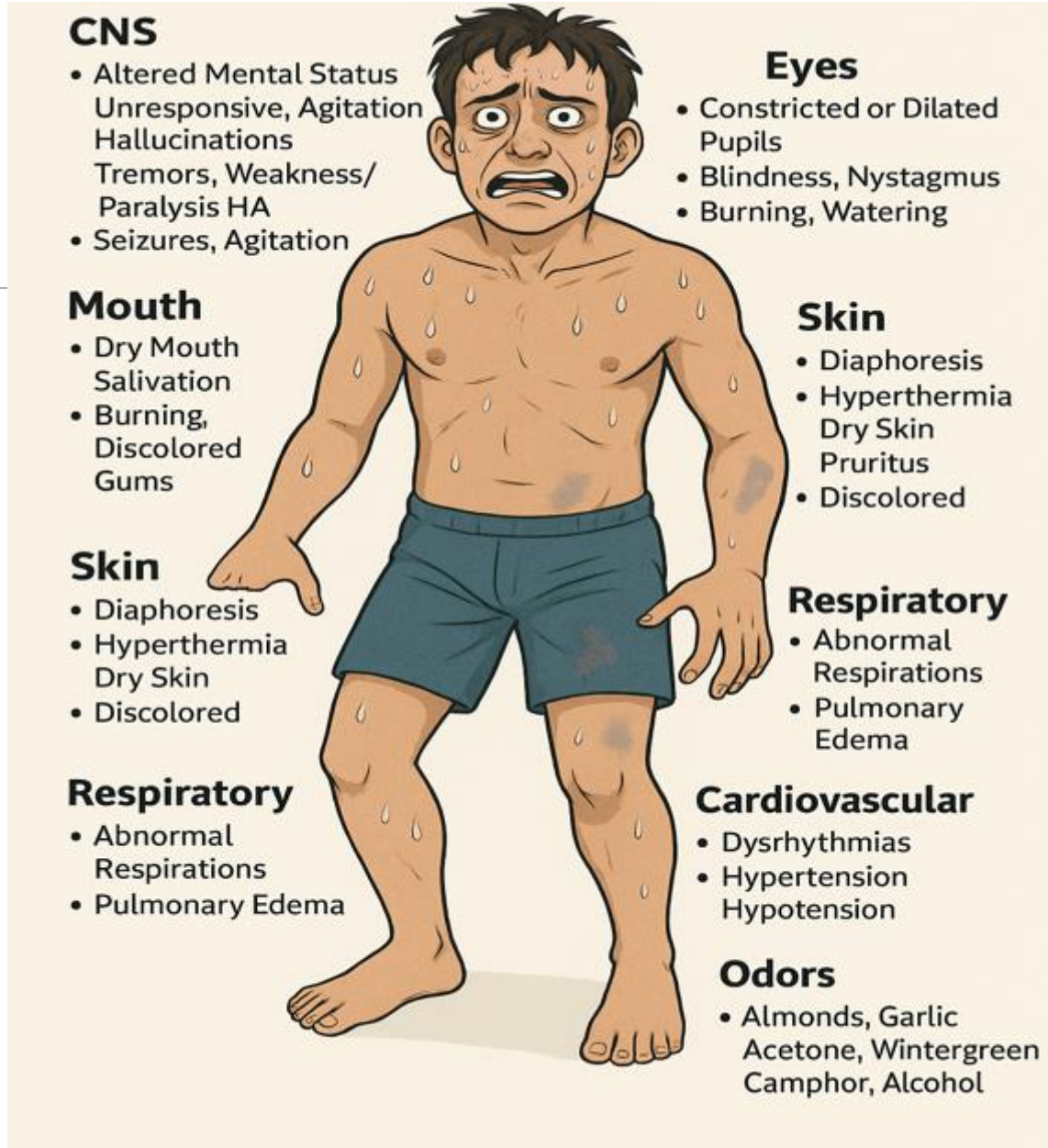
Identifying Toxidromes Through Vital Signs and Physical Exam



Identifying Toxidromes Through Vital Signs and Physical Exam

Cholinergic Poisoning:

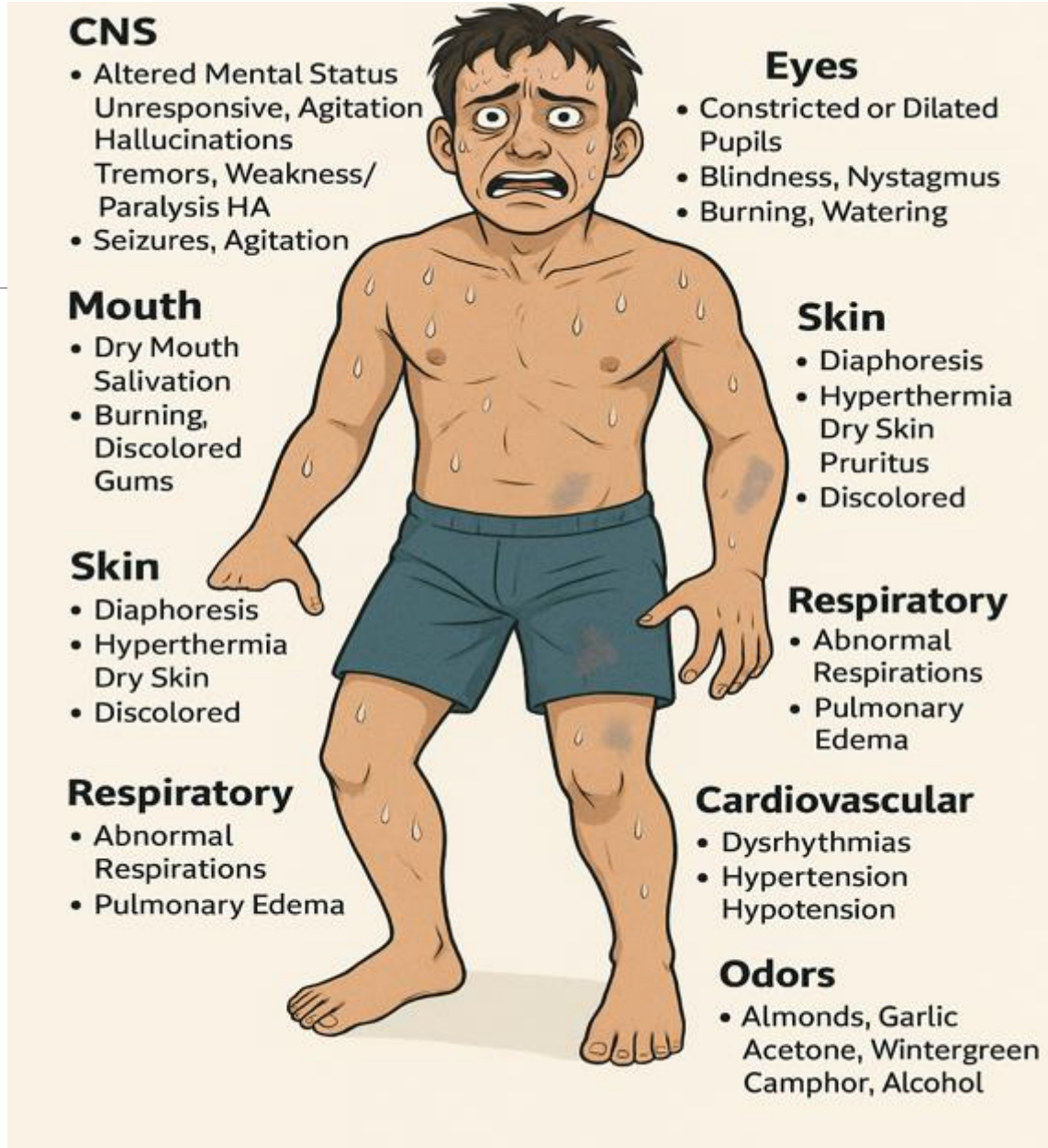
Salivation
Lacrimation
Urination
Defecation
GI cramps
Emesis
Myosis



Identifying Toxidromes Through Vital Signs and Physical Exam

Anticholinergic Toxicity:

Mad as a hatter → Agitation, delirium, hallucinations
Blind as a bat → Mydriasis causing blurry vision
Hot as a hare → Hyperthermia
Dry as a bone → Dry skin and mucous membranes
Red as a beet → Flushed skin
Full as a flask → Urinary retention



Xenobiotics Associated with Hypoglycemia

Sulfonylureas (glyburide), Meglitinides

- Hypoglycemia may occur 8–12 h post-ingestion
- Single pill can be dangerous, especially in children
- Will likely need monitoring for at least 24 h

Insulin

- Onset depends on formulation
- Treat with IV dextrose or glucagon

Metformin

- Rarely causes hypoglycemia alone

* Beta Blockers can mask the symptoms of hypoglycemia

Hypoglycemia = BG <70 +/-

Signs & Symptoms:

- Shaky
- Sweaty
- Hungry
- Anxious
- Tachycardia
- Dizziness
- Headache
- Confused
- Slurred speech
- Seizures
- Unconscious

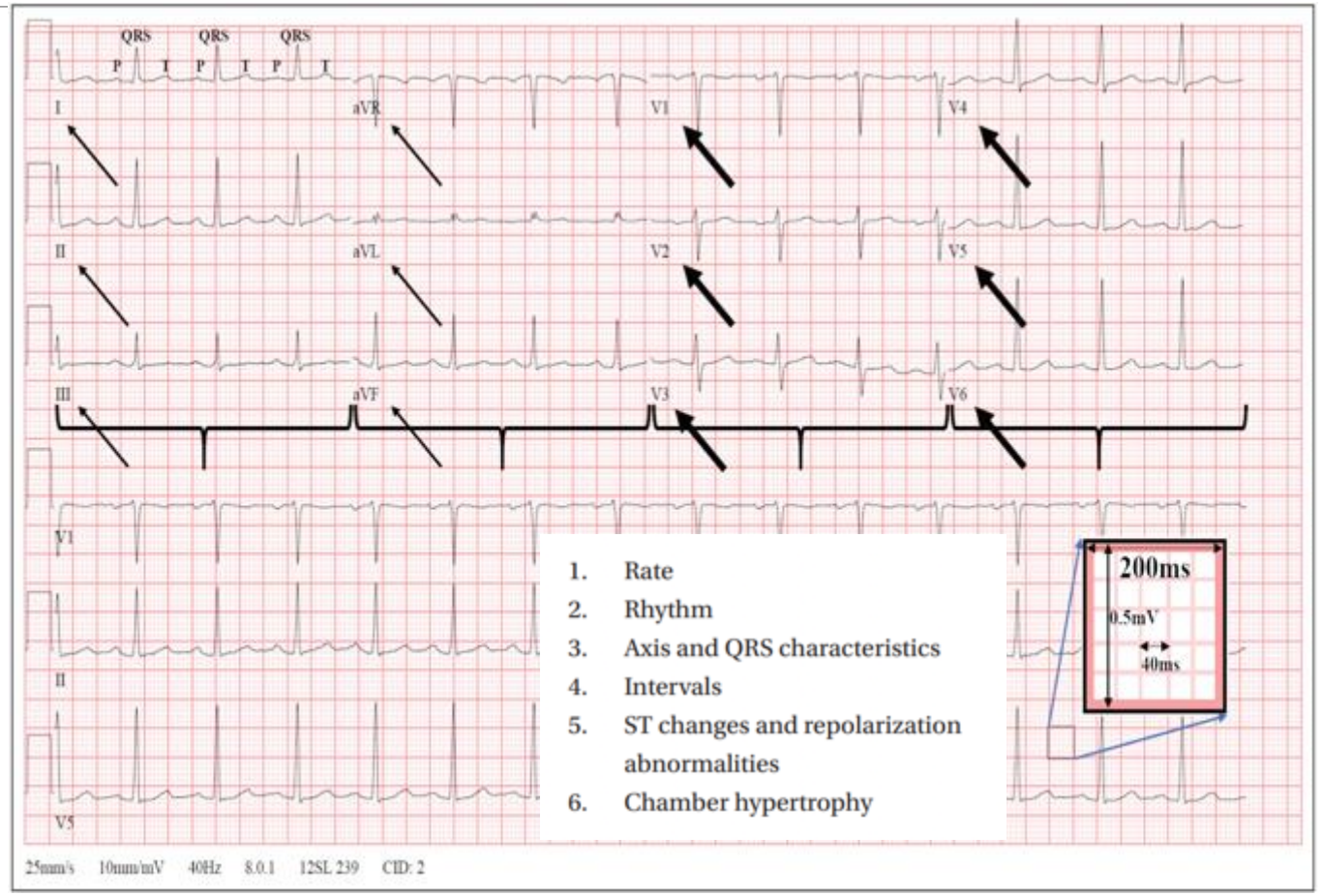
Goldfrank LR, et al., eds. *Goldfrank's Toxicol Emerg.* 8th ed. 2006.

Using Vital Signs to Identify the Toxin

- **Heart rate (HR) patterns** → Tachycardia vs bradycardia narrows your differential
- **Blood pressure trends** → Shock, hypertension, hypotension or widened pulse pressure
- **Respiratory rate (RR) pattern** → Bradypnea, hyperventilation, or respiratory failure
- **Temperature abnormalities** → Hyperthermia vs hypothermia clues

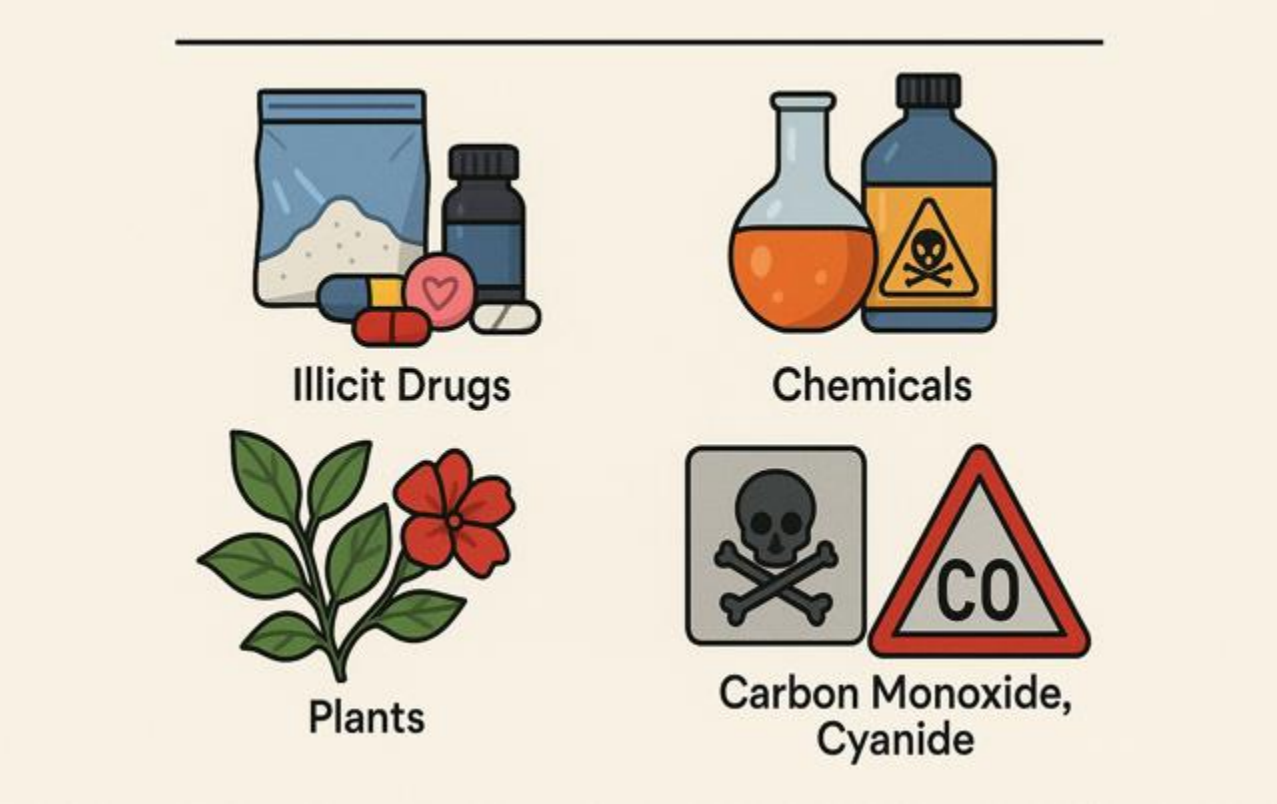
Basic ECG Principles in Toxicology

- Electrical information such as the rhythm, rate, and axis of the electrical activity can all be provided by the electrocardiogram (ECG)
- ECG plays a central role in both the diagnosis and treatment of common toxidromes such as and QT interval prolongation and QRS complex widening



Am J Health-Syst Pharm 2021;78(9):752–760

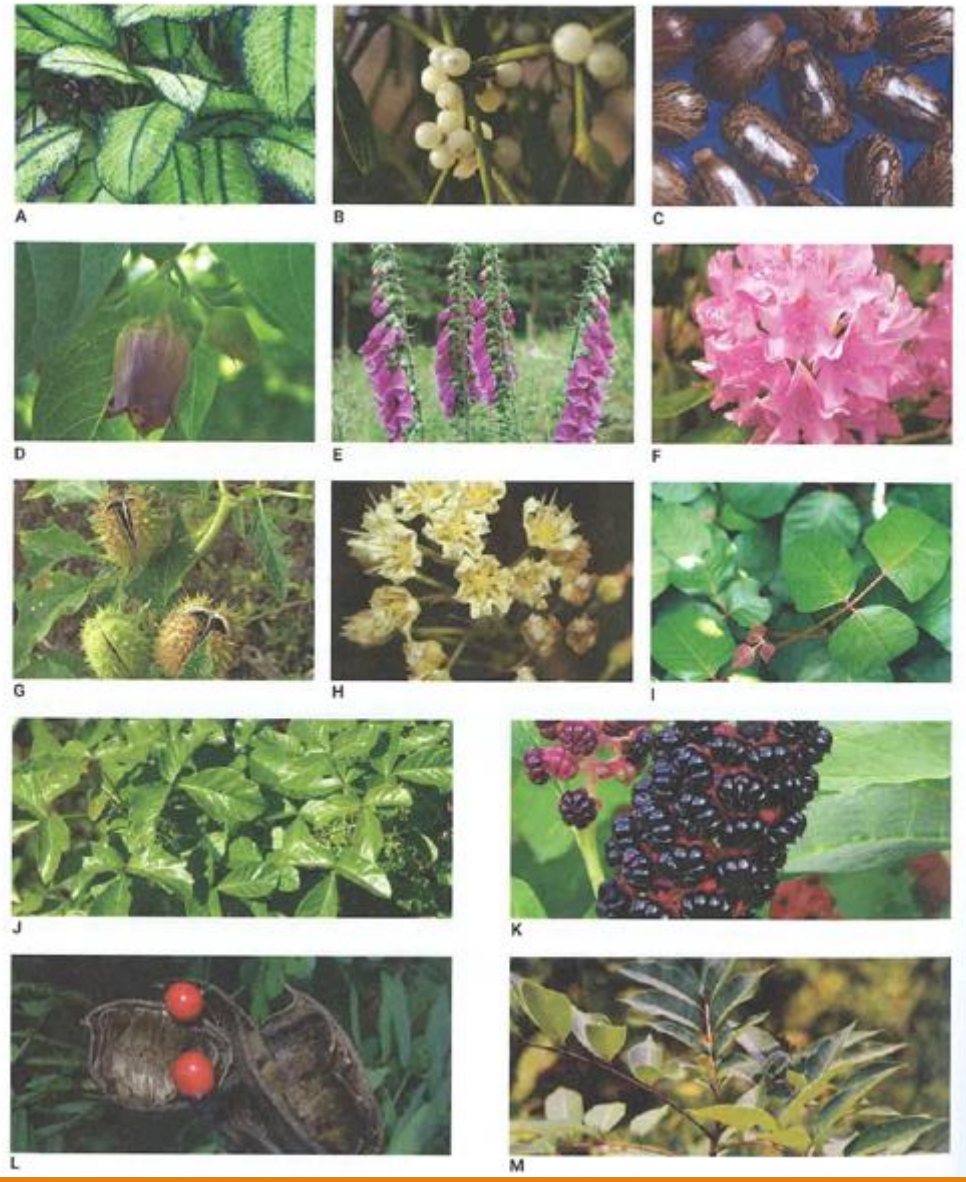
Toxidromes by Xenobiotic: Linking Symptoms to Specific Agents



Common Narrow Therapeutic Index Medications

Medication	Brand Names	Key Toxicity/Side Effects
Phenytoin	Dilantin, Phenytek	Nausea/vomiting, ataxia, nystagmus, confusion, tremors, QRS complex widening on ECG
Digoxin	Lanoxin	Bradycardia, AV block, lethargic, confusion, weakness, dizziness, visual disturbances, nausea/vomiting, ECG abnormalities
Lithium	Eskalith, Lithobid	Tremors, nausea/vomiting, dizziness, seizures, coma, electrolyte abnormalities, permanent neurological impairment (chronic toxicity)
Valproic Acid (VPA)	Depakote, Divalproex	Hyperammonemia, seizures not responsive to standard treatment, lactic acidosis
Methotrexate (MTX)	Trexall, Rheumatrex	Seizures, lactic acidosis
Isoniazid (INH)	Laniazid, Nydrazid	Seizures, lactic acidosis

Goldfrank LR, et al., eds. *Goldfrank's Toxicol Emerg.* 8th ed. 2006.



Toxic Plants

- Consult **Poison Control** for guidance
- May not require transport if caregiver can observe child, **monitor 4–6 hours** post-ingestion at home if asymptomatic
- **Any symptoms = transport for evaluation**
  - **Dieffenbachia (Dumb Cane):** Oral/tongue/laryngeal edema → potential for airway compromise
  - **Castor Bean (Ricin):** Burning mouth/throat, N/V, severe abdominal pain, prostration, vision loss, kidney failure

General rule: >12 hours asymptomatic = likely safe but always consult poison control center!

Mejia A, ed. *Adv Emerg Care Transp Sick Injured*. 4th ed. 2021: ch 23.

Illicit Substances

- Methamphetamine (meth, Ice, Crank, Crystal)
  - Agitation, tachycardia, hypertension, hyperthermia, dialated pupils, paranoia
- Cocaine (coke. Blow, snow, crack, rock)
  - Tachycardia, chest pain, agitation, seizures, MI, dilated pupils
- Synthetic Opioids (fentanyl, carfentenil, sufanentil, heroin)
  - Profound respiratory depression, pinpoint pupils, unresponsive/coma
- Cannabinoids (weed, pot, Mary jane, spice, k2,mojo, Delta-8 THC)
  - Euphoria, dry mouth, tachycardia, anxiety, agitation, psychosis, seizures, unresponsive, hyperemesis
  - Pediatric exposures frequently result in more severe effects

Feldman R, et al. *Am J Health Syst Pharm.* 2025;82(24):1362-1376

Illicit Substances

- Xylazine, medetomedine (tranq, zombie)
  - Alpha 2 agonist
  - CNS depression, hypotension, bradycardia, skin necrosis
- Psychedelics (psilocybin mushrooms)
  - Hallucinations, agitation, tachycardia, GI symptoms, diaphoresis, increased secretions
  - Could result in more serious outcomes such as seizures and respiratory failure
- MDMA (ecstasy, molly, E, X)
  - Euphoria, hyperthermia, unresponsive, hyponatremia, tachycardia
  - Can cause water intoxication and SIADH
- GHB (liquid ecstasy, G, Georgia home boy)
  - CNS depression, confusion/amnesia, respiratory depression, myoclonus

Feldman R, et al. *Am J Health Syst Pharm.* 2025;82(24):1362-1376

Illicit Substances

Unregulated psychotropics

- Phenibut (baclofen analog)
  - Agitation, autonomic dysfunction, neuromuscular abnormalities, seizures, may require airway management
  - Withdrawal may be an issue
- Tianeptine (TCA in other countries, sold in the U.S. as a dietary supplement)
  - Altered mental status, QT prolongation,
  - Chronic use may increase risk of opioid like withdrawal
- Kratom (plant derived, acts on opioid receptors)
  - Respiratory depression (rare), seizures, coma

Carbon Monoxide Toxicity

Mechanism of Toxicity: CO binds with greater affinity rapidly to hemoglobin, reducing oxygen-carrying capacity to tissues

Sources: Inhalation from smoke, vehicle exhaust, poorly ventilated areas with kerosene, charcoal, or gas stoves (especially in winter)

Clinical Signs:

- *HA, dizziness, N/V, chest pain, hypotension, lethargy, neuropsychiatric effects, syncope, seizures*
- Severe: MI, abnormal neurological exam, syncope, metabolic acidosis
- Pulse oximetry may show falsely high readings
- Carboxyhemoglobin levels >25% or 10% if pregnant

Mejia A, ed. *Adv Emerg Care Transp Sick Injured*. 4th ed. 2021: ch 23.

Cyanide Toxicity

Mechanism: Irreversibly binds to cytochrome oxidase → halts aerobic respiration

Sources: Fires (closed spaces), smoke inhalation from household items, metal plating (jewelry industry), sodium nitroprusside, seeds from almonds, apricots, and cherries

Clinical Signs:

- *HA, dizziness, N/V, agitation/confusion, hypotension, lethargy, neuropsychiatric effects, syncope, seizures, soot in airways, flushed to red skin, cyanosis, tachycardia, bitter almond breath, metabolic acidosis*

Mejia A, ed. *Adv Emerg Care Transp Sick Injured*. 4th ed. 2021: ch 23.

Metal Poisoning

Lead (most common):

- Symptoms: Altered mentation, irritability, mood changes, memory deficits, sleep disturbances, headache, seizures, ataxia
- Other signs: Abdominal pain, renal insufficiency, hypertension, gout, anemia

Iron (primarily pediatric ingestion):

- Symptoms: Abdominal pain, hematemesis, metabolic acidosis, tachypnea

Mejia A, ed. *Adv Emerg Care Transp Sick Injured*. 4th ed. 2021: ch 23.

Chemical Toxidromes: Recognizing Key Clinical Signs

Chlorine Gas

- Symptoms: Burning eyes/nose/throat, chest tightness, choking, HA, N/V, sneezing, cyanosis, crackles, shock, seizures, loss of consciousness

Hydrocarbons *(e.g., cleaning products, huffing)*

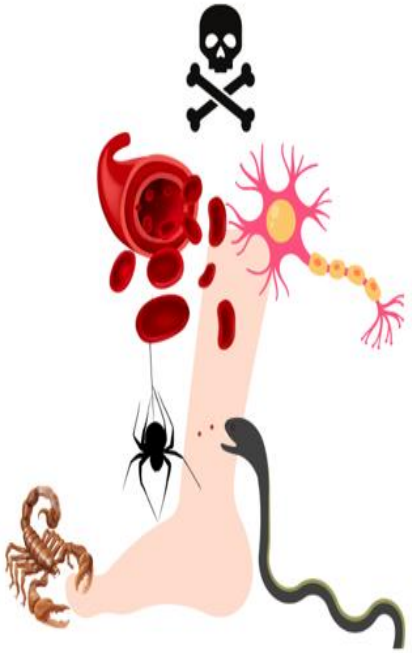
- Symptoms: Coughing, choking, vomiting, aspiration risk, respiratory distress, hypoglycemia, dysrhythmias, abdominal pain, belching

Caustics *(e.g., bleach, anhydrous ammonia)*

- Symptoms: Oral/chest pain if ingested, airway edema (larynx, epiglottis, vocal cords), respiratory distress

Mejia A, ed. *Adv Emerg Care Transp Sick Injured*. 4th ed. 2021: ch 23.

Envenomations



Loxosceles reclusa (brown recluse spider)

- Local cytotoxic venom: progressive joint pain, fever, chills, weakness, with central dusky necrosis ("red, white, and blue" lesion); rare systemic hemolysis

Latrodectus sp (black widow spiders)

- Widespread release of neurotransmitters: severe pain, autonomic dysfunction, muscle spasms, n/v, hypertension

Micrurus fulvius (coral snakes)

- Neurotoxicity: minimal local injury with delayed neurotoxicity

Crotalinae (pit vipers)

- Hematologic toxicity and tissue destruction: Swelling coagulopathy, rhabdomyolysis

Centuiroides Scorpions

- Neurotoxicity: Pain, motor hyperactivity, autonomic dysfunction

Goldfrank LR, et al., eds. *Goldfrank's Toxicol Emerg.* 8th ed. 2006.

Don't Forget About OTC Medications!

- *Anticholinergic*: Diphenhydramine, dimenhydrinate, some sleep aids
- *Cholinergic*: Insecticide-containing products (organophosphates sometimes found in OTC flea treatments)
- *Sympathomimetic*: Decongestants (pseudoephedrine, phenylephrine, caffeine-containing products)
- *Opioid-like effects*: Loperamide (high doses can cause opioid toxidrome)
- *Sedative-hypnotic*: Diphenhydramine, doxylamine, some cough suppressants (dextromethorphan)

- ❑ **Obtain a thorough medication history including OTC meds!**
- ❑ **Multi-ingredient products can complicate presentation!**

02

Apply

Structured initial assessment approach (ABCs, focused history, exposure details) to patients with suspected poisoning

Approach to the Poisoned Patient

Emerg Med J 2006; 23 [5]: 396-399

Primary Assessment-ABCs

Airway

Aspiration risk or cough/gag reflex intact? Consider advanced airways or adjuncts

Breathing

Hypoxia or bronchospasm? Consider end-tidal CO2 monitoring , supplemental oxygen, BVM

Circulation

Tachycardia or Bradycardia, hypotension or hypertension? Obtain 12 lead ECG, establish IV access

Mejia A, ed. *Adv Emerg Care Transp Sick Injured*. 4th ed. 2021: ch 23.

Secondary Assessment:

History-Taking

Medication History & History of Ingestion

- ❑ Timing and route
- ❑ Potential Agents
- ❑ Amount Ingested
- ❑ Possible Intent
- ❑ History from Family
- ❑ Onset/Progression of symptoms

Pre-Hospital Resuscitation of the Poisoned Patient

Supportive care (ABCs first)

Correct immediate issues

- Dextrose (hypoglycemia)
- Benzodiazepines (agitation/seizures)

Decontamination

- Activated charcoal (selected ingestions, if patient can protect airway)

Key antidotes

- Naloxone
- DuoDote
- Cyanokit

ECG-related treatment

- Sodium bicarbonate (wide QRS)
- Magnesium sulfate (torsades/QT)

Continuous monitoring + rapid transport

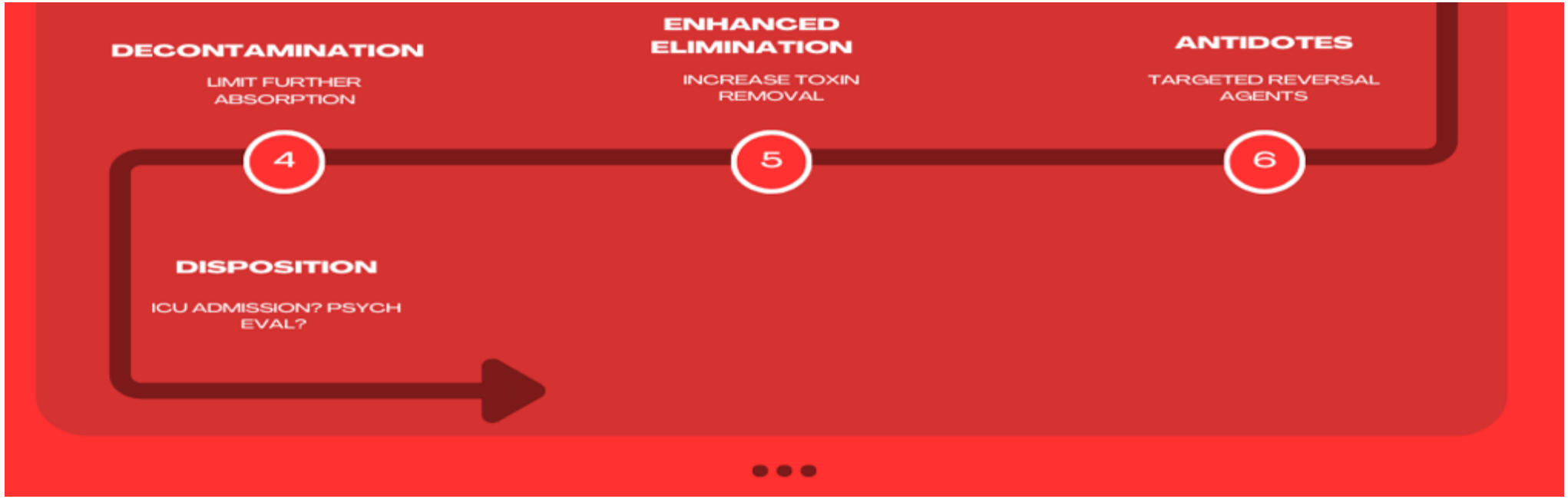
Daly FFS, et al. *Emerg Med J.* 2006;23(5):396-399.

03

Summarize

Appropriate initial management strategies, including supportive care, antidote use when indicated, and avoidance of harmful interventions

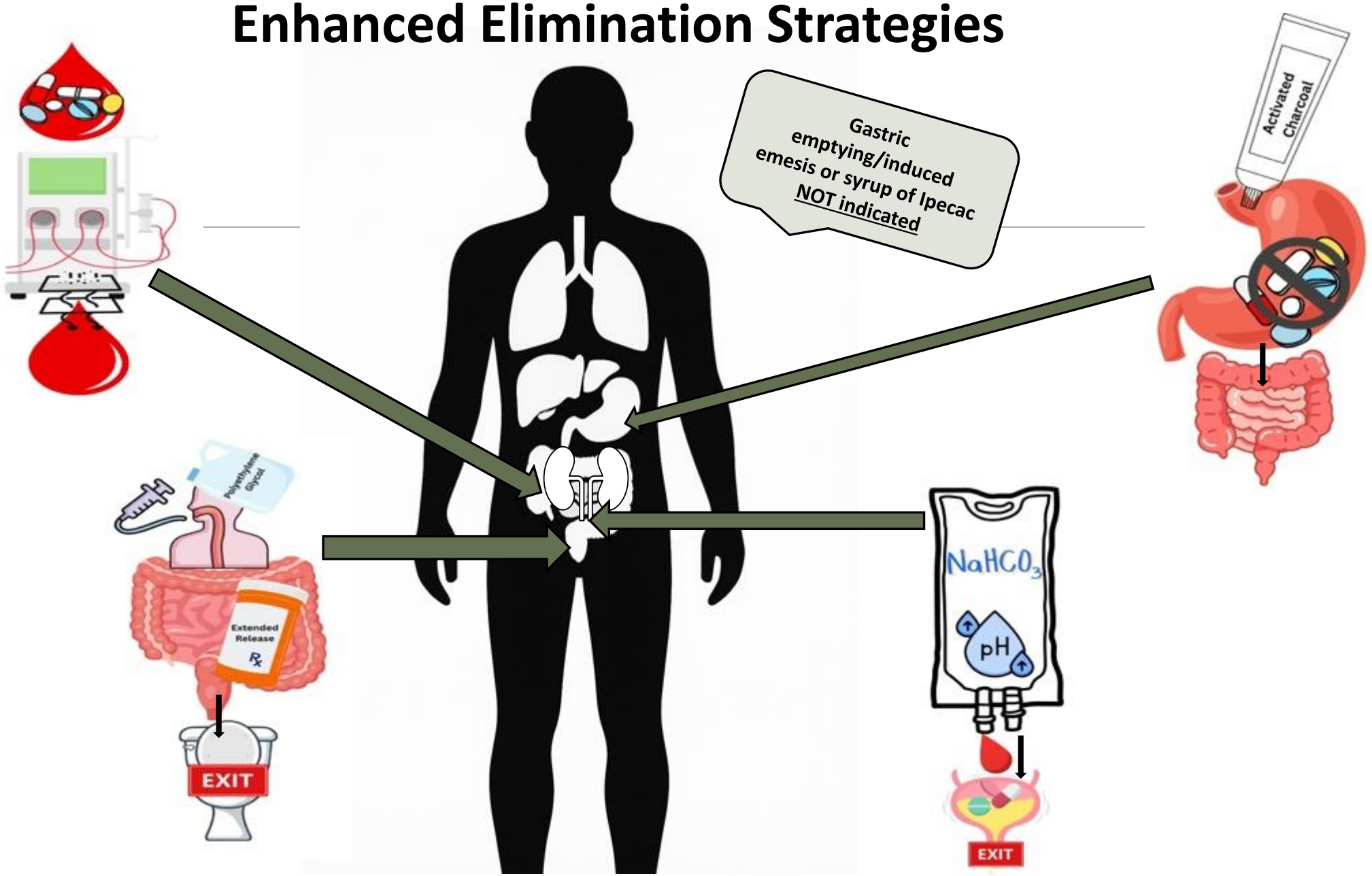
Approach to the Poisoned Patient



Emerg Med J 2006; 23 [5]: 396-399

Decontamination

Enhanced Elimination Strategies



Daly FFS, et al. *Emerg Med J.* 2006;23(5):396-399.

Activated Charcoal

Dosing & Administration

- Typical dose: **1 g/kg orally**
  - ~50–100 g for most adults
- Administer **within 1 hour** of ingestion
- **Requires vigorous mixing**
- Can be mixed with something more palatable
- Only administer if patient is **awake, alert, and able to protect airway due to risk of aspiration**
- Multi-Dose strategies may be effective for certain toxidromes

Clinical Pearls

- Messy
- Do not use if ingestion includes caustics, hydrocarbons, or metals
- Consider **antiemetic** co-administration if vomiting is likely
- Effectiveness declines significantly with time

Mejia A, ed. *Adv Emerg Care Transp Sick Injured*. 4th ed. 2021: ch 23.

Toxidromes with Specific Antidotes Available

- Opioids ->**Naloxone**
- Acetaminophen-> **N-Acetylcysteine (NAC)**
  - **Potential role for fomepizole?**
- Cyanide->**Hydroxocobalamin**, Sodium Thiosulfate, Sodium Nitrite
- Cholinergics-> **Atropine, Pralidoxime** (2-PAM); combo auto injector manufactured as DuoDote
- Benzodiazepines->Flumazenil?
- Lead Poisoning->Dimercaperol (BAL), Succimer (DMSA)
- Ethylene Glycol/Methanol-> Fomepizole
- Iron Overdose or Overload-> Deferoxamine
- Methemoglobinemia-> Methylene Blue
- Thallium-> Prussian Blue

Feldman R, et al. *Am J Health Syst Pharm.* 2025;82(24):1362-1376
Goldfrank LR, et al., eds. *Goldfrank's Toxicol Emerg.* 8th ed. 2006.

“Coma Cocktail”- No Longer the Standard of Therapy

For unresponsive overdose patients:

1. Physostigmine
2. Naloxone
3. Flumazenil

- Use declined after 2 case reports linked use to asystole
- Sole manufacturer of physostigmine ceased production in 2023
- This led to BZDs replacing physostigmine for anticholinergic delirium as although inferior
- Rivastigmine (PO & TD) has emerged as a potential replacement

Feldman R, et al. *Am J Health Syst Pharm.* 2025;82(24):1362-1376

Rescue Pharmacotherapy in Toxicologic Emergencies

Medication	Mechanism of Action	Toxidrome
High Dose Insulin	Increases glucose uptake by cells, **improving myocardial contractility**	Calcium Channel Blockers, Beta-Blockers, TCA
Dextrose Infusion	Provides glucose to counteract hypoglycemia (especially when giving HDIT) and prevent further metabolic complications	Insulin overdose, Sulfonylurea overdose, Alcohol toxicity
High Dose Glucagon	Stimulates adenylate cyclase to **increase cAMP,** counteracting effects of beta-blockers and calcium channel blockers	Beta-Blocker overdose, Calcium Channel Blocker overdose
Sodium Bicarbonate	Alkalinizes the urine, e**nhancing elimination** of certain drugs, and **combats acidosis**	TCA overdose, Salicylate toxicity, Phenobarbital toxicity
Calcium Chloride or Calcium Gluconate	Replenishes calcium to **stabilize cell membranes** and counteract effects of calcium channel blockade	Calcium Channel Blocker overdose, Hyperkalemia

Goldfrank LR, et al., eds. *Goldfrank's Toxicol Emerg.* 8th ed. 2006.

Rescue Pharmacotherapy in Toxicologic Emergencies

Medication	Mechanism of Action	Toxidrome
Magnesium Sulfate	Acts as a neuromuscular blocker, **stabilizes cell membranes**, and can reverse arrhythmias	Magnesium deficiency, Torsades de Pointes, Calcium Channel Blocker overdose
Naloxone Infusion	Competitive opioid antagonist that **reverses opioid toxicity** by displacing opioids from receptor sites	Opioid overdose with long duration of action, Overdose of ACE inhibitors with hypotension
Octreotide	Somatostatin analogue that **inhibits insulin release**, used for prolonged sulfonylurea toxicity	Sulfonylurea overdose (e.g., glyburide, glipizide)
20% Lipid Emulsion	Acts as a "lipid sink," **sequestering lipid-soluble toxins** and helping eliminate them from circulation	Local Anesthetic Toxicity, Lipophilic drug overdose (e.g., carbamazepine, tricyclic antidepressants)

Goldfrank LR, et al., eds. *Goldfrank's Toxicol Emerg.* 8th ed. 2006.

Antivenom, Rabies Exposure and Animal Bites

- Call Poison Control & activate emergency response!
- Do NOT use tourniquets, cut, or suck out venom or try to catch the animal
- Keep the patient calm and the bite below heart level
- Don't forget **Tetanus Booster** if >5 years since last dose!

Mejia A, ed. *Adv Emerg Care Transp Sick Injured*. 4th ed. 2021: ch 23.

North American Pit Viper Envenomations

Crotalus Species

Agkistrodon Species

Goldfrank LR, et al., eds. *Goldfrank's Toxicol Emerg.* 8th ed. 2006.

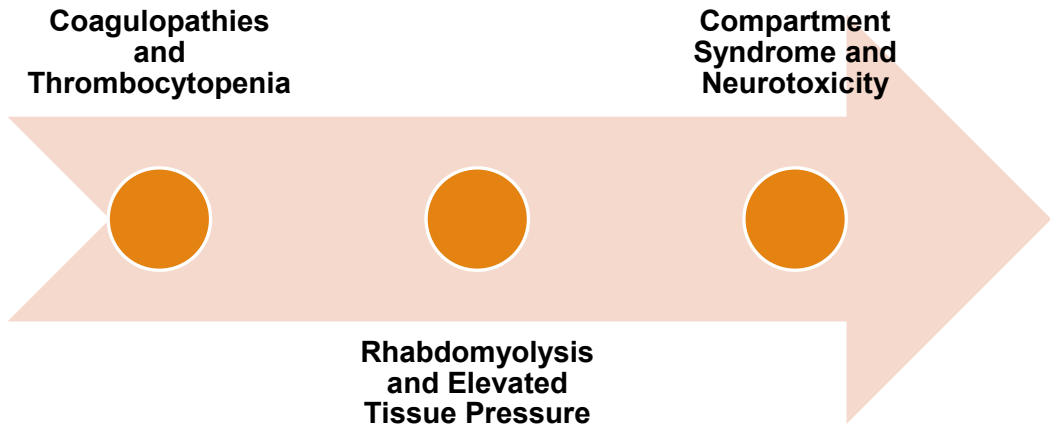
Pit Viper Antivenom

Indications for antivenom:
Elevated labs ***or*** Systemic signs

- 2 FDA approved antivenoms for North American Pit Viper envenomations:

- **Crofab** (crotalidae polyvalent immune F(ab))
  - Ovine derivative
  - Do not administer in papain allergy
- **Anavip** ((crotalidae polyvalent immune $F(ab)_2$)
  - Equine derivative
  - Higher α-galactose load

    - *Both seem to be effective, decision depends on formulary availability*



Bickler PE. *Toxins (Basel).* 2020;12(2).
Feldman R, et al. *Am J Health Syst Pharm.* 2025;82(24):1362-1376

Coral Snake (Micrurus) Bites

Venom is a neurotoxin:

- Can lead to paralysis and respiratory failure

North American Coral Snake Antivenom

- Shortage of antivenom can be an issue

Coral snake

Milk snake

Goldfrank LR, et al., eds. *Goldfrank's Toxicol Emerg.* 8th ed. 2006.

Emerging Therapies in Snakebite Treatment

Varespladib-methyl

- Oral prodrug that is a potentent inhibitor of venom secretory phospholipase A_2 ($sPLA_2$)
- Ongoing clinical trials, may one day be used pre-hospital or early in-hospital to inhibit venom $sPLA_2$ toxins, slowing progression of neurotoxic or hemotoxic effects

Carter RW, et al. *Toxins (Basel).* 2023;15(1):22.

Spider Bite Management

- Pain medications and seizure control
- Antivenom for black widow spider
  - **Black Widow Antivenom** (Latrodectus mactans) if severe

Black Widow

Brown Recluse

Goldfrank LR, et al., eds. *Goldfrank's Toxicol Emerg.* 8th ed. 2006.

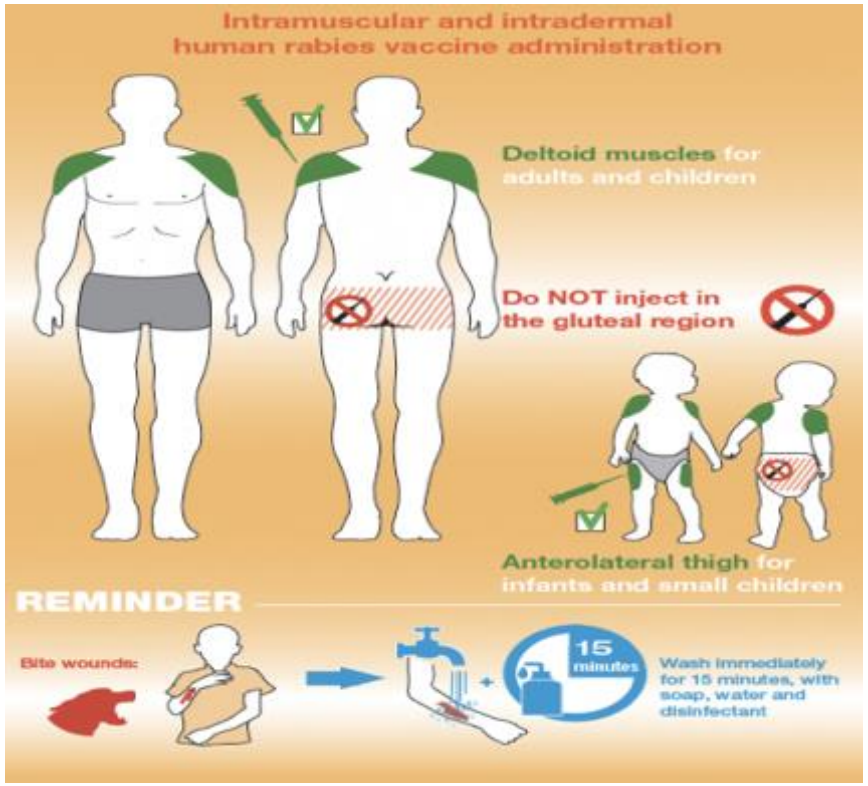
Rabies Post Exposure Prophylaxis (PEP)

Rabies Vaccine (within 72 h)

- Low risk: Squirrels & Chipmunks
- High risk: Foxes, Bats, Raccoons, Skunks, Dogs?
  - Decision to vaccinate based on if animal can be quarantines & tested

Rabies Immune Globulin

- Administer within 7 days of exposure if patient is previously unvaccinated
- Administered <u>in the wound distant from the vaccine</u>



CDC. Rabies post-exposure prophylaxis. Updated July 15, 2025.

Management of Illicit Substance Toxicity

- **Supportive care is the mainstay** ABCs, oxygen, IV access, cardiac monitoring

- **Naloxone** Give for suspected opioid toxicity
  - **High/repeated doses may be needed** → consult poison control

- Selonabant (ANEB-001)
  - Cannabinoid 1 receptor antagonist undergoing clinical trials for reversal of acture THC intoxication

- **Treat symptoms** Airway support if needed

- Benzodiazepines for **agitation/seizures**

Mejia A, ed. *Adv Emerg Care Transp Sick Injured*. 4th ed. 2021: ch 23.
Feldman R, et al. *Am J Health Syst Pharm.* 2025;82(24):1362-1376

Management of Cyanide and Carbon Monoxide Poisoning

Oxygen therapy immediately for suspected carbon monoxide poisoning

- Hyperbaric oxygen therapy if available

Cyanokit Give for suspected cyanide toxicity

- Alternatives if cyanokit unavailable:
  - Sodium thiosulfate
  - Amyl nitrite

*** Do not delay Cyanokit** if cyanide is suspected—treat based on clinical presentation and exposure risk.

Mejia A, ed. *Adv Emerg Care Transp Sick Injured*. 4th ed. 2021: ch 23.
Goldfrank LR, et al., eds. *Goldfrank's Toxicol Emerg.* 8th ed. 2006.

Key Takeaways

Symptoms of toxic exposures can be broad and nonspecific
– Seizures, altered mental status, agitation, unresponsiveness

Pattern recognition is key
– Narrow down by identifying telltale signs

Get as much information as possible
– Scene clues, bystander reports, med bottles, OTC products, drug paraphernalia

Supportive care is the mainstay
– Airway, breathing, circulation—treat what you see

Call Poison Control early!
– 1-800-222-1222

Back to Case 1

A man calls your pharmacy to ask about his wife who has “not been acting like herself” over the past day. He reports that she seems confused, restless, and intermittently agitated, with episodes of disorientation and difficulty answering questions. She is also talking nonsensically at times, appears flushed and sweaty. He is worried something is seriously wrong and asks if her medications could be causing this.

The pharmacy technician looks up the patient’s profile and finds the following medication list:

Lisinopril 10 mg daily

Metoprolol 25 mg twice daily

Sertraline 50 mg daily

Furosemide 20 mg daily

Metformin 500 mg twice daily

Atorvastatin 20 mg daily

The technician confirms these are her only prescription medications and that there have been no recent changes or missed doses.

Question 1

What is the most appropriate next question for the pharmacy technician to ask?

A. “When did she last see her primary care provider?”

B. “Has she taken any over-the-counter medications, herbal supplements, or vitamins recently?”

C. “Does your wife drink alcohol regularly?”

Case 1 Presentation Continued

The pharmacy technician gathers additional information:

The husband reports that the patient has been taking Tylenol PM, Tylenol Cold & Cough, and NyQuil around the clock for the past several days for a recent cold, with overlapping doses throughout the day and night.

Given the concern for duplicate therapy and potential medication-related toxicity, the pharmacy technician hands the call to the pharmacist for further evaluation.

Question 2

What is concerning about these medications and how she is taking them?

A. She may be experiencing an allergic reaction to acetaminophen

B. She is likely taking duplicate medications containing acetaminophen (APAP) and antihistamines, increasing risk for anticholinergic toxicity

C. The medications are appropriate and there are no concerns

D. She is at risk for hypoglycemia due to these medications

Question 3

What is the most appropriate next step in managing this patient?

A. Reassure the caller and recommend continuing current medications as directed

B. Advise monitoring at home and follow up if symptoms worsen

C. Recommend the patient take an additional dose of acetaminophen to relieve symptoms

D. Consult the Poison Control Center and direct the patient to seek emergency medical care

Case Presentation 1 Wrap Up

Problem: Accidental overuse of multiple acetaminophen-containing products along with sedating antihistamines → leading to acetaminophen toxicity and anticholinergic delirium

Symptoms:

- Confusion, agitation, disorientation
- Tachycardia, flushed skin
- Sedation with intermittent restlessness
- Overlapping medication use (Tylenol PM, Tylenol Cold & Cough, NyQuil)

Case Presentation 1 Wrap Up

What was done:

- Accurate medication history obtained, identifying multiple overlapping OTC products
- Pharmacist consulted Poison Control
- Patient was referred to EMS and transported to the ED
- Acetaminophen level found to be elevated

Treatment:

- Initiation of N-acetylcysteine
- Supportive care and monitoring

Outcome:

- Early identification of duplicate therapy and toxic exposure allowed prompt treatment, helping prevent progression to hepatic injury and stabilizing the patient

Case 2 Presentation

A 34-year-old male presents to the emergency department after being bitten on the lower leg while working in his backyard. He reports seeing a small reddish-brown snake with hershey kiss-shaped markings.

Vital signs are stable. However, the swelling and pain is progressing. Initial labs show:

- Elevated PT/INR
- Mild thrombocytopenia
- Early signs of coagulopathy

Question 4

Which snake species most likely envenomated this patient?

A. *Crotalus(rattlesnake)*
B. *Agkistrodon (copperhead or cottonmouth)*
C. *Micrurus (coral snake)*
D. Nonvenomous snake or dry bite

Question 5

What is the recommended management based on clinical signs and symptoms?

A. Antivenom not indicated
B. Supportive care only
C. CroFab or Anavip (based on formulary availability) and tetanus prophylaxis if indicated
D. Antibiotics and tetanus prophylaxis only

Case Presentation 2 Wrap Up

What was done:

- Bite identified with **progressive pain, swelling, and coagulopathies**
- Patient was admitted and labs confirmed abnormalities
- **Limb marked to monitor swelling progression**

Treatment:

- **4 vials of Crotalidae Polyvalent Immune Fab (CroFab)**
- Supportive care, pain control, monitoring
- **Additional doses if swelling progressed past markings or labs worsened**

Outcome:

- Prompt treatment prevented worsening toxicity
- Patient stabilized with improving symptoms and labs

Resources

- Gummin DD, Mowry JB, Beuhler MC, et al. 2020 Annual report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 38th annual report. *Clin Toxicol (Phila).* 2021;59(12):1282-1501. doi:10.1080/15563650.2021.2000407
- Mejia A, ed. *Advanced Emergency Care and Transportation of the Sick and Injured*. 4th ed. Chapters 22, 23, 34, and 42. Jones & Bartlett Learning; 2021.
- Goldfrank LR, Flomenbaum NE, Lewin NA, Howland MA, Hoffman RS, Nelson LS, eds. *Goldfrank's Toxicologic Emergencies*. 8th ed. McGraw-Hill; 2006.
- Daly FFS, Little M, Murray L. A risk assessment-based approach to the management of acute poisoning. *Emerg Med J.* 2006;23(5):396-399. doi:10.1136/emj.2005.030312
- Carter RW, et al; BRAVO Study Group. The BRAVO clinical study protocol: oral varespladib for inhibition of secretory phospholipase A_2 in the treatment of snakebite envenoming. *Toxins (Basel).* 2023;15(1):22. doi:10.3390/toxins15010022.

Louisiana Pharmacists Association CARES

Resources Continued

- McClendon J, Herrera S, Bride JM. Basic surface electrocardiogram interpretation for the pharmacist. *Am J Health-Syst Pharm*. 2021;78(9):752-760. doi:10.1093/ajhp/zxab070
- Spyres MB, Padilla GK, Gerkin RD, Hoyte CO, Wolk BJ, Ruha A-M; ToxIC Snakebite Study Group. Late hemotoxicity following North American rattlesnake envenomation treated with crotalidae immune F(ab')$_2$ (equine) antivenom and crotalidae immune polyvalent Fab (ovine) antivenom reported to the North American Snakebite Sub-registry. Clin Toxicol (Phila). 2022;60(7):838–842. doi:10.1080/15563650.2022.2042550
- Feldman R, Lund J, Rivera Pescatore J, Stanton M. Toxicology updates in emergency medicine. *Am J Health Syst Pharm.* 2025;82(24):1362-1376. doi:10.1093/ajhp/zxaf129
- Centers for Disease Control and Prevention. Rabies post-exposure prophylaxis (PEP). Updated July 15, 2025. Accessed [04/08/2026].

Louisiana Pharmacists Association CARES

Thank you!

Questions? Emmcgee@ulm.edu

Let’s connect!