

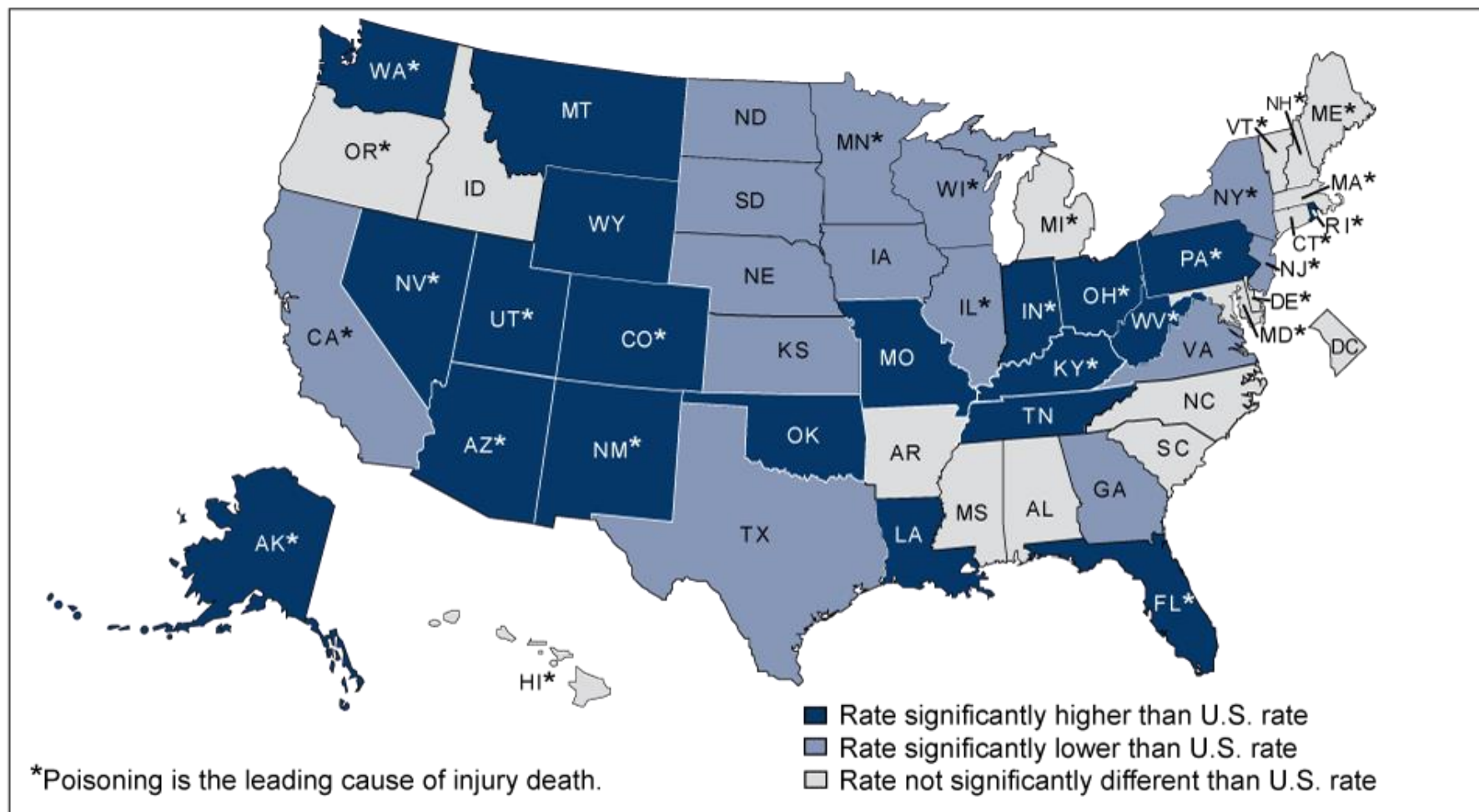
Toxic Ingestions



EMS CONSORTIUM

“Everything is a poison. There is nothing which is not. Only the dose differentiates a poison from a remedy.” – Paracelsus

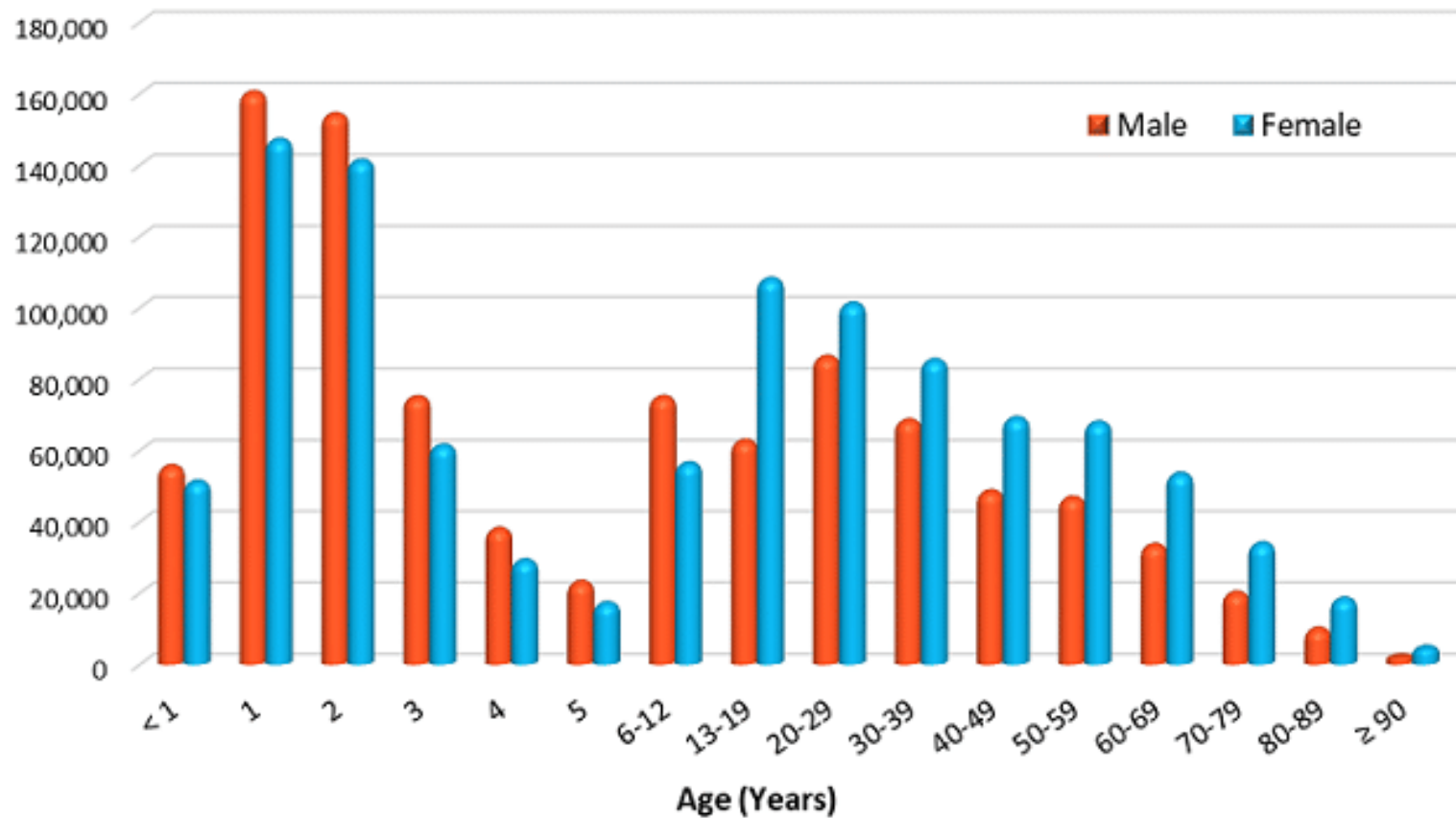
Figure 2. Age-adjusted poisoning death rates: Comparison of state and U.S. rates: United States, 2008



NOTES: The poisoning death rate for Georgia may not be based on the final numbers of poisoning deaths. See "Data source and methods" for details. Figure 2 at http://www.cdc.gov/nchs/data/databriefs/db81_tables.pdf#2.

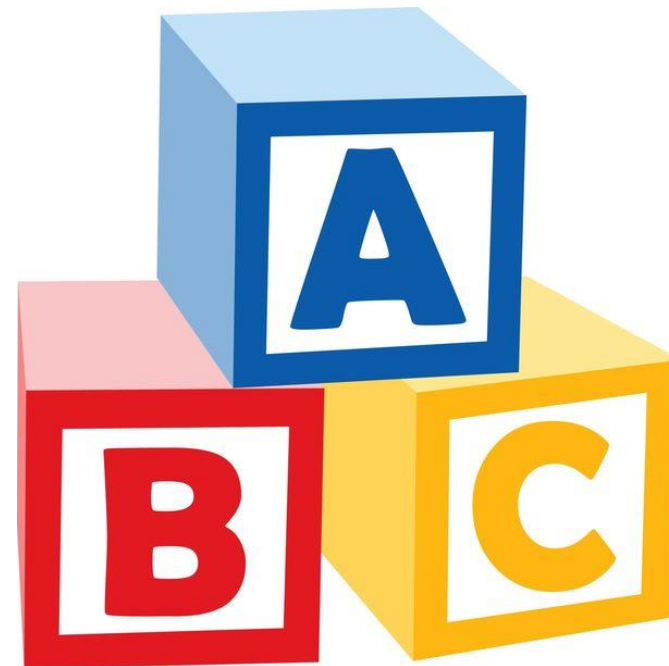
SOURCE: CDC/NCHS, National Vital Statistics System.

Bimodal Age Distribution



Vital Signs Are Vital!

1. Pay close attention to airway
2. Monitor Blood Sugar
3. **Get a 12 Lead**
4. Monitor Capnography
5. Monitor BP



Gather Clues and Ask Questions

- What substance(s)?
- How much?
 - Number of pills
 - Dosage
 - Extended release?
- What time?



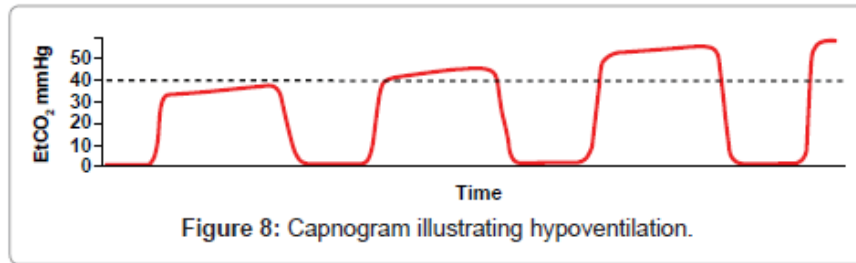
**You have access to information that
no one else will**

POISON
Heip™

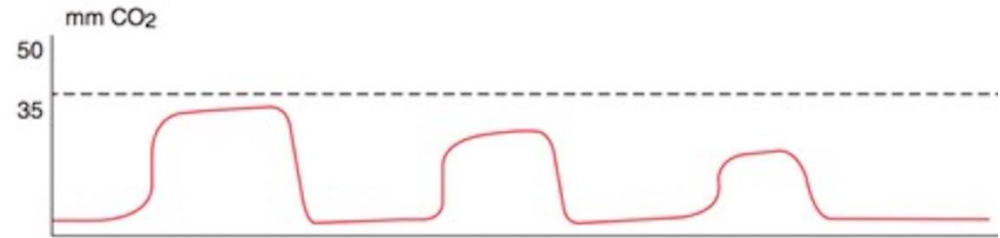


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Hypoventilation and Apnea



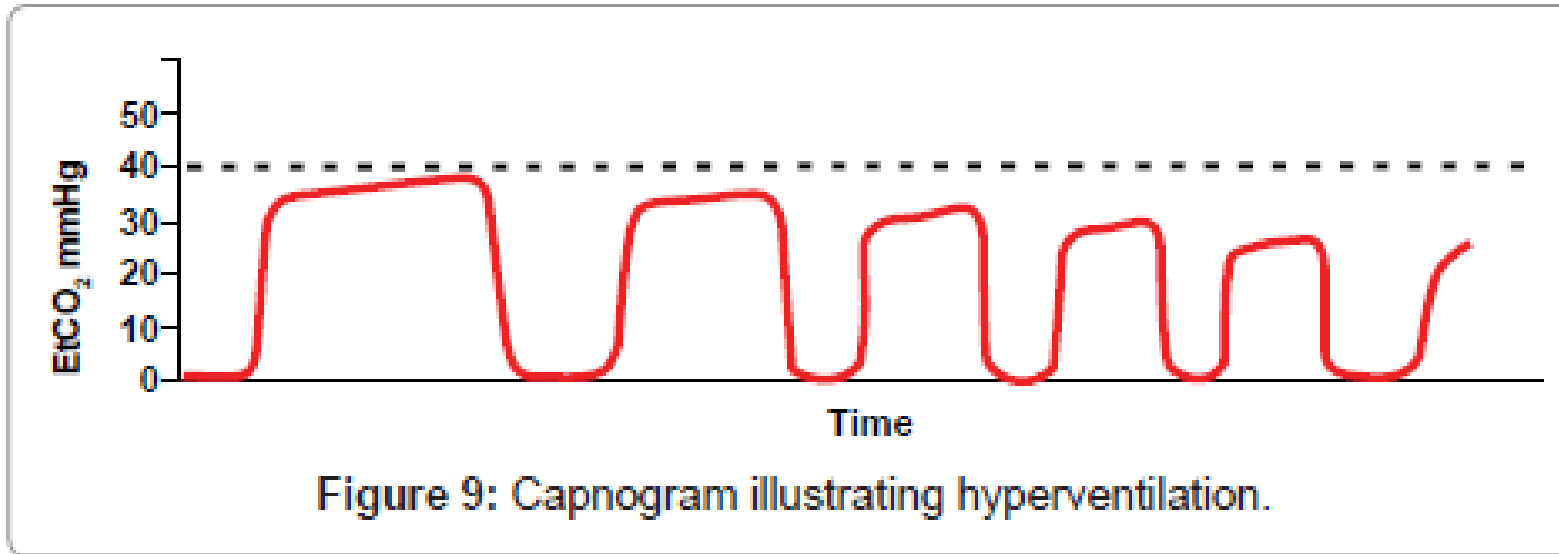
Hypoventilation



Apnea
















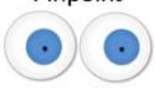




















- Decreased Respiratory Rate
- Increased ETCO₂ reading initially
 - Then begins to drop off and flat line
- Needs ventilation assistance

Hyperventilation



- Increased Respiratory Rate
- Decreased ETCO₂
- Could indicate acidosis and cell death

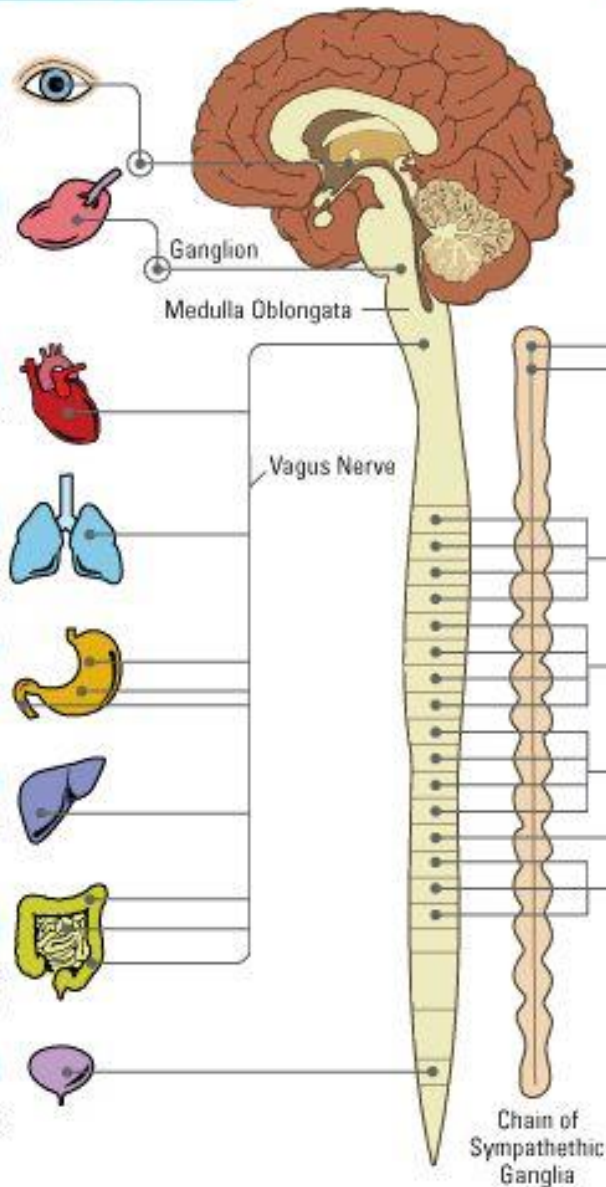
Toxidrome Clues

	HR & BP 	Resp. 	Temperature 	Pupils 	Bowel Sounds 	Diaphoresis 
Anticholinergic Anticholinergics – Atropine, scopolamine, glycopyrrolate, benztropine, trihexyphenidyl Antihistamines – Chlorpheniramine, Cyproheptadine, Doxylamine, Hydroxyzine, Dimenhydrinate, Diphenhydramine, Meclizine Promethazine	↑ 	No change 	↑ 	Dilated 		
Cholinergic Organic Phosphorous Compounds: Carbamates • Arecholine, Pilocarpine, Urecholine (Betanecchol), Carbachol, Choline, Metacholine, Mushrooms	No change 	No change 	No change 	Pinpoint 		
Opioid Morphine • Codeine • Tramadol • Heroin • Meperidine • Diphenoxylate • Hydromorphone • Fentanyl • Methadone • Propoxyphene • Pentazocine • DXM • Oxycodone • Hydrocodone	↓ 	↓ 	↓ 	Pinpoint 		
Sympathomimetic Caffeine, cocaine, amphetamines, methamphetamines, Ritalin, LSD, Theophylline, MDMA	↑ 	↑ 	↑ 	Dilated 		
Sedative-Hypnotic anti-anxiety agents, muscle relaxants, antiepileptics and preanesthetic medications – Barbituates – Benzodiazepines	↓ 	↓ 	↓ 	No change 		

Check mental status, skin color and temp, pupils, secretions, muscle rigidity

Parasympathetic

- Eyes**
Constrict Pupil
- Salivary Glands**
Stimulates Salivation
- Heart**
Slows Heartbeat
- Lungs**
Constrict Bronchi
- Stomach**
Stimulates Digestion
- Liver**
Stimulates Bile Release
- Intestines**
Stimulate Peristalsis and Secretion
- Bladder**
Contracts Bladder

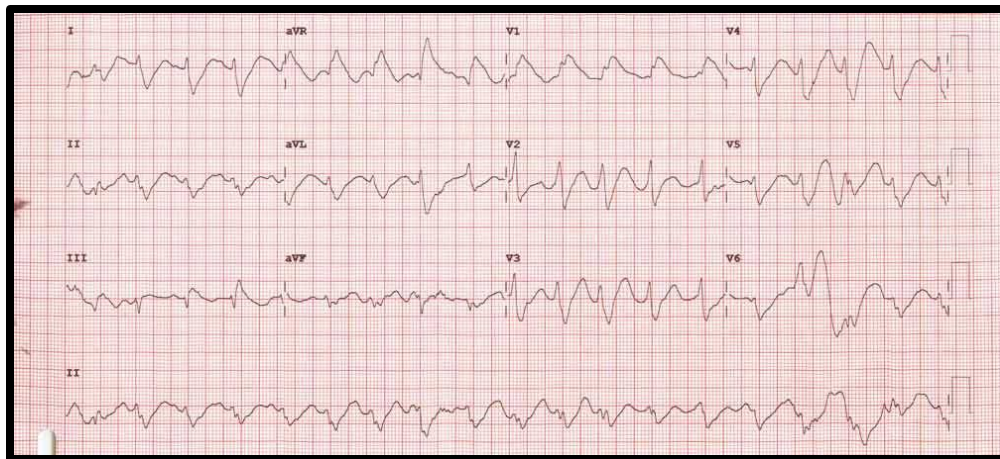


Sympathetic

- Eyes**
Dilate Pupil
- Salivary Glands**
Inhibit Salivation
- Heart**
Accelerates Heartbeat
- Lungs**
Dilate Bronchi
- Stomach**
Inhibits Digestion
- Liver**
Stimulates Glucose Release
- Kidneys**
Stimulate Epinephrine and Norepinephrine Release
- Intestines**
Inhibit Peristalsis and Secretion
- Bladder**
Relaxes Bladder

Benadryl Toxicity

- Watch Out For:
 - Seizures – give versed
 - Arrhythmia – give bicarb
 - Sodium channel effects
 - Wide QRS



Anticholinergic Toxidrome



Mad as a hatter
Altered mental status



Blind **as a bat**
Mydriasis



Red as a beet
Flushed skin

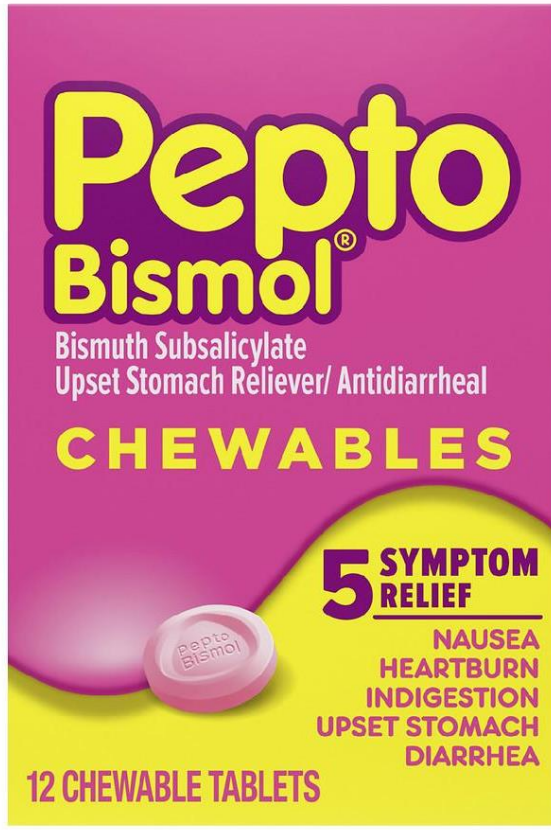


Hot as a hare
Dry skin (anhidrosis)



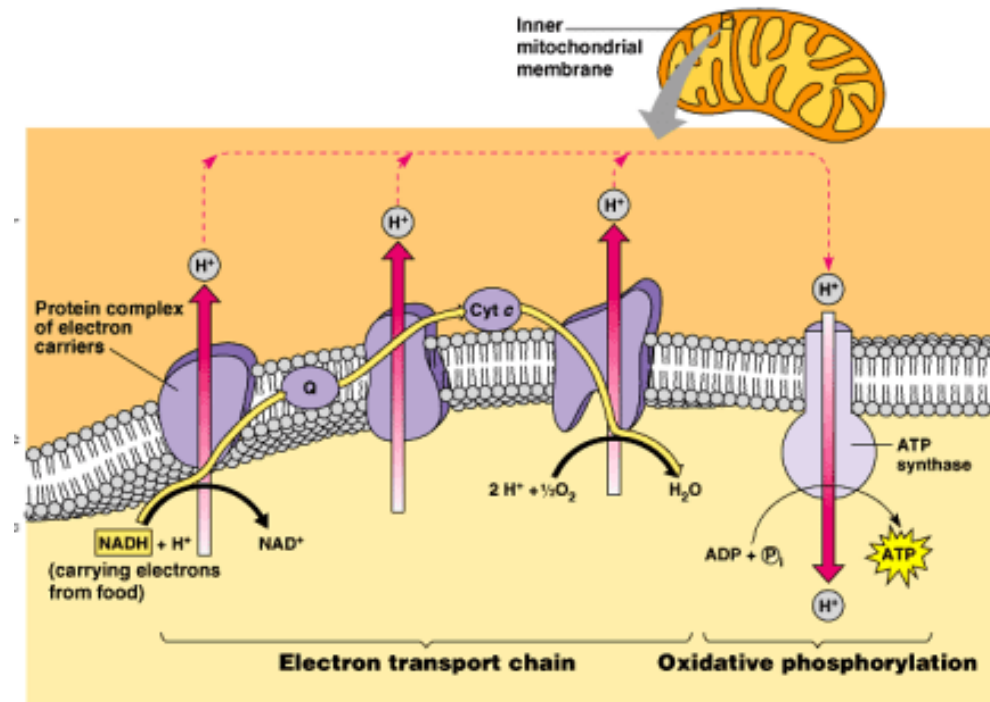
Dry as a bone
Dry mucous membranes

Aspirin (Salicylate) Sources



Aspirin (Salicylate) Toxicity

- Slows ATP production
 - Acid uncouples oxidative phosphorylation
 - Lactic acidosis
- Signs/symptoms
 - Increased respiratory rate
 - Tachycardia
 - Fever
 - AMS



Mimics Sepsis

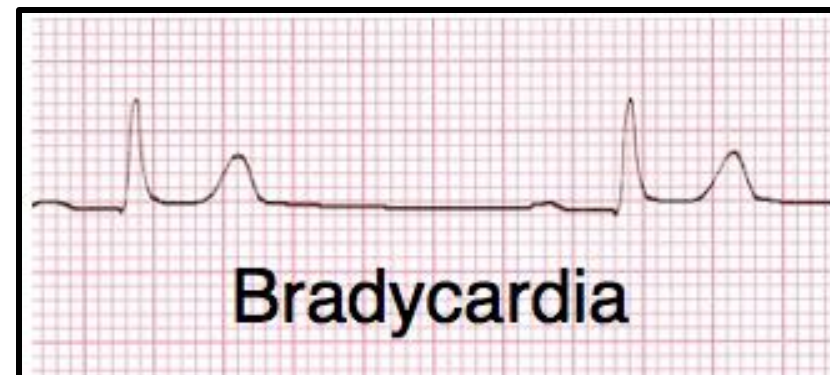
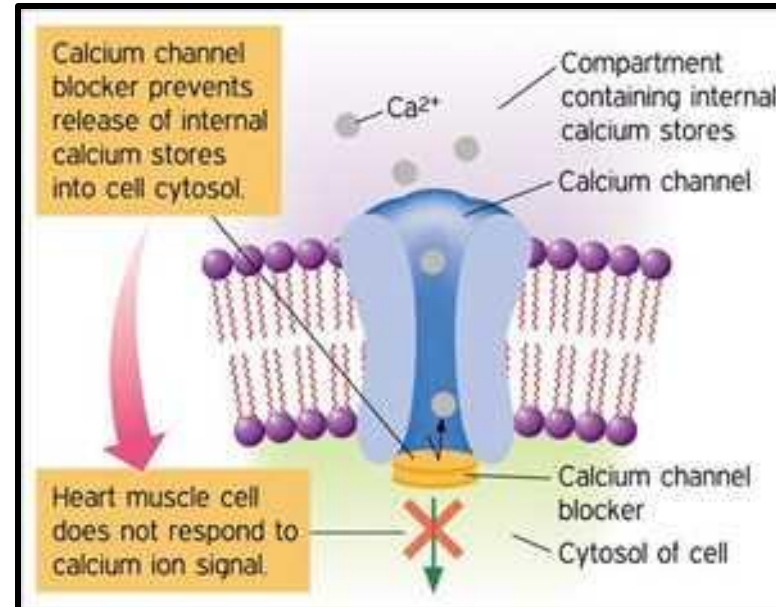
Tylenol (Acetaminophen) Sources



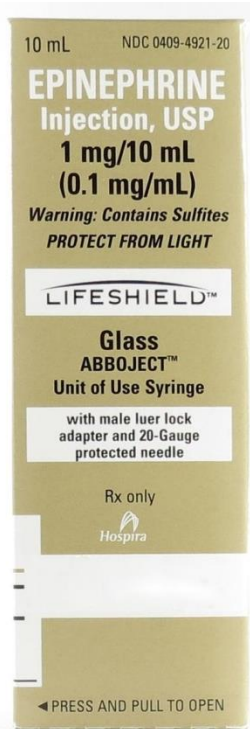
Toxic Dose = 150mg/kg

Beta Blocker/Calcium Channel Blocker

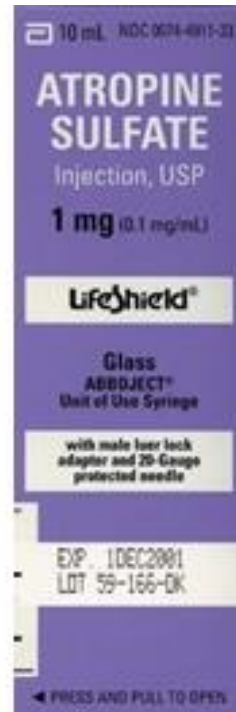
- Low BP
- Bradycardia
- Hypoglycemia
- Seizures
- Arrhythmia



Treatment: BB/CCB Overdose



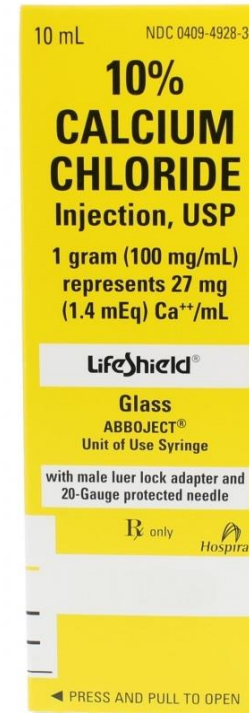
Hypotension



Bradycardia



Wide QRS



CCB OD



Hypoglycemia

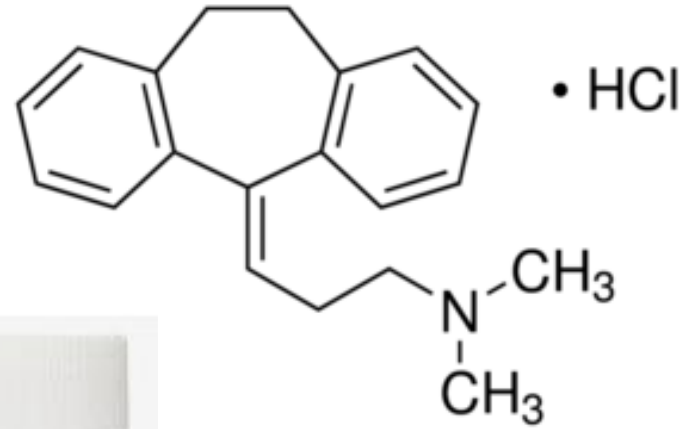
Cardiac Monitor



Prepare to pace or defibrillate

Tri-Cyclic Antidepressants (TCA)

- Amitriptylene
- Nortriptyline
- Imipramine
- Doxepin
- Flexeril



**Commonly
Prescribed For Back
Pain**

TCA Effects

- Antimuscarinic/antihistamine effects:

- Altered mental status, coma
- Dilated pupils, tachycardia, hyperthermia
- Dry mucous membranes, flushed skin
- Tremors, ataxia

- Increased serotonin activity

- Myoclonus, hyperreflexia

- Cardiac toxicity

- Sodium channel blockade

Anticholinergic Toxidrome



Mad as a hatter
Altered mental status

**Clinically
Apparent**

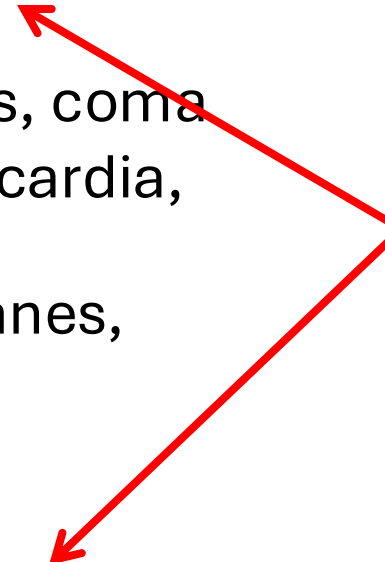


Red as a beet
Flushed skin

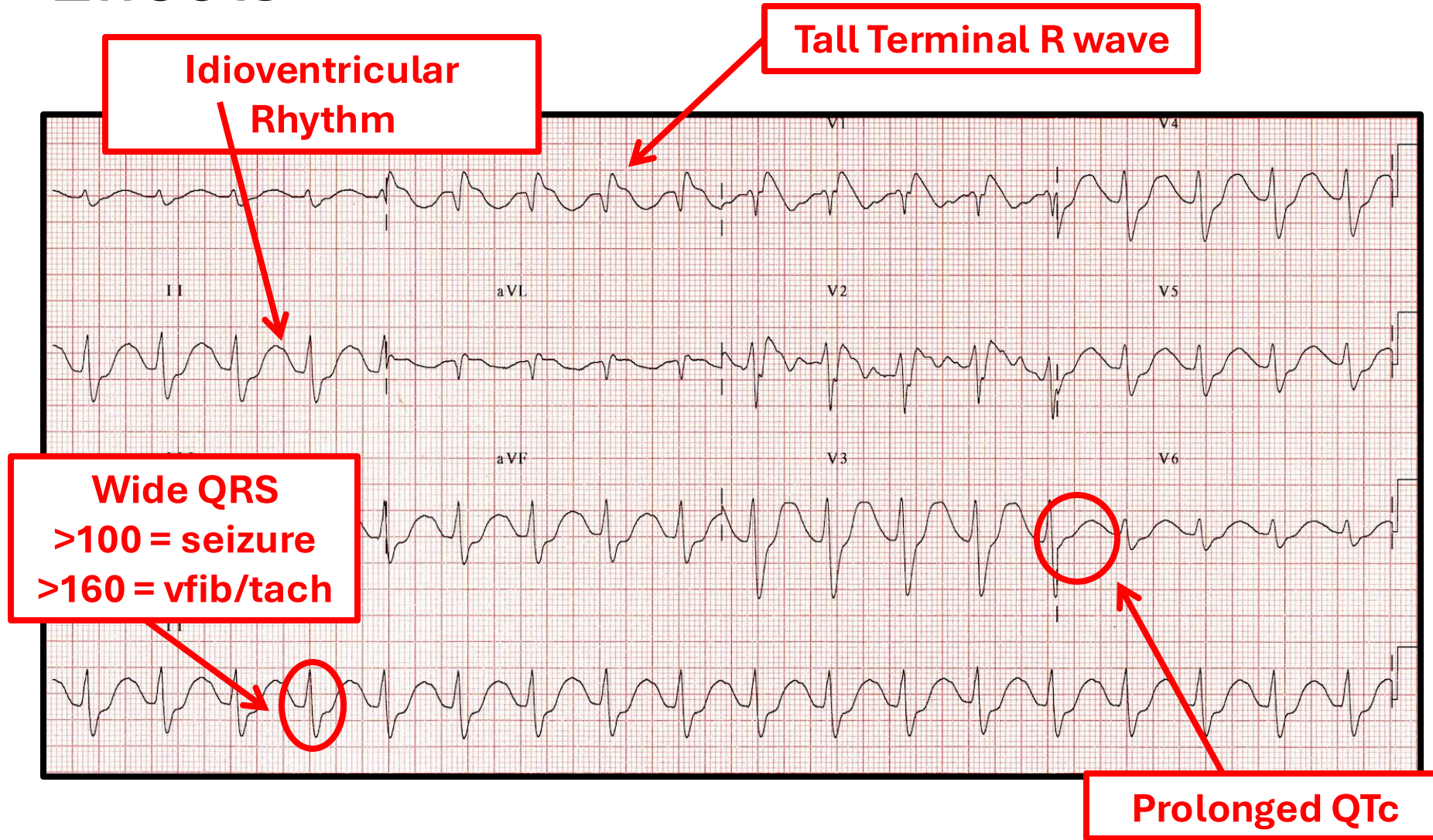


Hot as a hare
Dry skin (anhydrosis)

Deadly



TCA Overdose – Sodium Channel Effects



TCA Overdose Treatment



Wide QRS



Torsade

s



Seizure

s



Hypotensio

n

SSRI's and Serotonin Syndrome



Symptoms & Management in Serotonin Syndrome:

Mild

Mydriasis
Shivering
Sweating
Tachycardia (mild)

Moderate

Altered Mental Status
(agitation, disorientation, excitement)
Autonomic Hyperactivity
(rigidity, tachycardia, hyperthermia of >40°C)
Neuromuscular Abnormalities
(tremor, clonus, hyperreflexia)

Life Threatening

Delirium
Hypertension
Hyperthermia
Muscle rigidity
Tachycardia

SSRI (Anti-Depressant) Overdose



Wide QRS



Torsade

s



Seizure

s



Hypotensio

n

Lithium



Acute and acute-on-chronic intoxication

Gastrointestinal symptoms (nausea, vomiting, diarrhea)

Cardiac symptoms (ECG changes, arrhythmias, prolonged QTc intervals, bradycardia)

Neurological symptoms (late-developing: Syndrome of irreversible lithium effectuated neurotoxicity SILENT)

Chronic intoxication

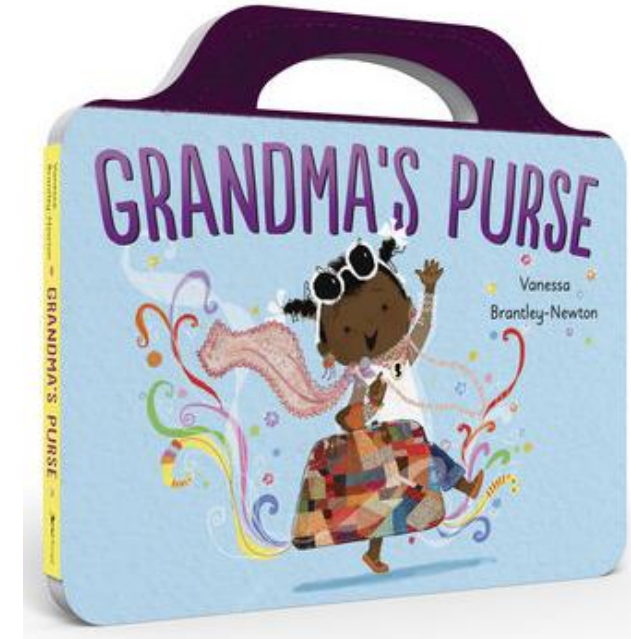
Neurological symptoms (gradually developing: sluggishness, ataxia, confusion, agitation, tremor)

Cardiac symptoms (see acute and acute-on-chronic intoxication)

Renal symptoms (nephrogenic diabetes insipidus)

One Pill Killers

- Oral hypoglycemics
- Blood Pressure
 - Calcium channel blockers
 - Beta Blockers
 - Clonidine
- Pain Killers
 - Suboxone
 - Opiates
 - Colchicine
- TCAs
- Benzos



Vital Signs Are Vital!

1. Pay close attention to airway
2. **Get a 12 lead** and keep them on the monitor
3. Anticipate arrhythmias
4. Anticipate seizures
5. Anticipate hypoglycemia



- **The Toxic Toddler: One Pill Can Kill**

- Children are the victims in 68% of all poisoning exposures. Most of the reported exposures involve children under 6 years of age. Young children often explore their environment by putting objects into their mouths. Because of the potential for a child to come in contact with medications in the home, it is important to be aware of the toxic potential of medications that members of the home may use, and to keep them out of the reach of children. The following is a list of medications that can be harmful if only a small amount (1-2 tablets) is ingested.

-

- **◆ Antidepressants and Antipsychotics**
- -Can cause seizures, heart arrhythmias, low blood pressure, abnormal muscle movements, and coma.
- *Examples: imipramine, desipramine, chlorpromazine (Thorazine[®]), and thioridazine (Mellaril[®])

- **◆ Heart Medications**

- 1. Beta-Blockers

- -Can lower blood sugar, blood pressure, and heart rate, cause seizures, heart

- rhythm problems, and coma.

- *Examples: propranolol (Inderal[®]) and sotalol (Betapace[®]).

- 2. Calcium Channel Blockers
- -Can lower blood pressure and heart rate, cause heart problems, and seizures.
- *Examples: verapamil (Calan[®], Covera[®]) and nifedipine (Adalat[®], Procardia[®])

- 3. Clonidine (Catapres®)
- -Can lower blood pressure and heart rate, cause difficulty breathing,
- hypothermia, pupil constriction, and coma.

- 4. Quinidine (Dura-Tabs[®])
- -Can lower blood pressure, cause heart rhythm problems, breathing difficulties,
- seizures, and coma.

- ♦ **Narcotic Medications**

- -Can cause breathing difficulties, hypothermia, pupil constriction, seizures, and
- coma. Keep all pain medications out of reach of children.
- *Examples: Methadone, Codeine, Oxycodone (Oxycontin[®]), and Hydrocodone (Vicodin[®]).

-

- **◆ Antimalarial Medications**

- -can cause seizures, visual disturbances, and heart function abnormalities.

- *Examples: chloroquine (Aralen[®]), hydroxychloroquine (Plaquenil[®]), and Quinine.

-

- ♦ **Theophylline** (Theo-Dur[®], Uniphyl[®], Slo-Bid[®])
- -Can cause heart rhythm abnormalities and seizures.
-
-

- **◆ Diabetic Medications**

- -Of concern are medications taken by people with Type 2 diabetes to lower their blood sugar level. Drugs classified as "sulfonylureas" are of particular concern.
- Insulin is not a concern since it is inactivated when taken orally.
- -Can lower blood sugar to dangerous level
- *Examples: glyburide, glucotrol, Amaryl, glipizide, Glucovance, Diabinese

- ♦ **Diphenoxylate (Lomotil®)**
- - Used to treat diarrhea.
- - Can cause breathing difficulties and coma.
- Toxic effects may not be immediate, need to observe child for several hours.

- **◆ Topical Products**

- 1. Methyl salicylate

- -A concentrated form of salicylate (the main ingredient in Aspirin).
- -Can cause nausea, vomiting, hyperthermia, blood sugar abnormalities, weakness, ringing in the ears, fast breathing rate, seizures, and coma.
- *Products containing methyl salicylate: Ben-Gay, Icy Hot, and Oil of Wintergreen liniment.
- -As little as $\frac{1}{2}$ teaspoonful of Oil of Wintergreen can be fatal!

- 2. Camphor
- -An anesthetic used in over-the-counter (OTC) topical rubs or to relieve chest colds.
- -Can cause breathing difficulties, seizures, and coma.
- *Products containing camphor: camphorated oil, Campho-Phenique[®], camphor spirits, Ben-Gay Children's Rub[®], Vicks Vaporub[®], Children's Soltice Quick Rub[®], Heet[®], and Sloan's Liniment[®].
- -1-4 teaspoonfuls can be fatal if ingested by a small child

- 3. Benzocaine
- -A local anesthetic found in many OTC preparations, including teething gels.
- -Applying too much of the product in the mouth can lead to ingestion, which
- may cause a decrease in oxygen getting to the tissues.
- -Can cause difficulty breathing, heart rhythm problems, seizures, shock,
- coma, and possibly death.
- *Products containing benzocaine: Baby Orajel[®], Baby Orajel Nighttime
- Formula[®], Baby Anbesol Gel[®], Anbesol Regular Strength[®], Anbesol Maximum
- Strength[®], Lanacane Spray[®], Americaine Topical Anesthetic First Aid
- Ointment[®], Vagisil Cream[®], throat lozenges, mouth washes, and hemorrhoid
- creams.

- 4. Lindane
- -Available in lotions, shampoos, and creams to treat lice and scabies.
- -Also found on flea collars, pet shampoos, and household sprays.
- -Can cause seizures, hyperthermia, difficulty breathing, and low blood pressure.
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