



FOUNDATIONS
of Emergency Medicine

Foundations Frameworks

Approach to the Poisoned Patient

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Adapted from Toxicology - EM Intern Orientation. Corey Slovis, MD and Keith Wrenn, MD

1. Stabilization/Treatment:
 - a. Airway/Breathing:
 - i. Obtunded, not protecting airway? Hypoxic? Not ventilating? -> Intubate
 - b. Circulation:
 - i. Bradycardia -> atropine (1 mg IV), external pacers, inotropes/pressors
 - ii. Hypotension -> fluid resuscitation, pressors (epi vs norepinephrine)
 - iii. Wide QRS -> give sodium bicarbonate
 1. Bicarb dosing:
 - a. IV push: start with 2-3 ampules (each amp 50 mL of 8.4% Bicarb)
 - b. If no response, may redose with 2-3 more ampules in 5 min
 - c. Once QRS begins to narrow, begin IV infusion: 150 mEq of Bicarb in 1 L of D5W at 250 mL/hr
 - iv. Long QT -> give magnesium (2g IV over 1-2 minutes, redose as needed)
 - c. Neuro Depression:
 - i. Evaluate need for NGT -> naloxone (2 mg IV), glucose (1 amp D50 IV), thiamine (50-100 mg)
 - ii. If not responding, provide O2, BVM, and intubate as needed
 - d. Seizure:
 - i. Fingertstick glucose -> if low, give 1 amp of D50 (25 g dextrose)
 - ii. Benzodiazepines: midazolam 5 mg IV/IM or lorazepam 2 mg IV/IM, repeat as needed
 - iii. Always check an EKG in poisoned patients who have a seizure
 - e. Hyperthermic or agitated
 - i. Treat with benzodiazepines
 - ii. Ketamine if needed -> 1-2 mg/kg IV or 4-5 mg/kg IM
 - iii. Obtain a core temp -> cool patient as needed with ice packs, IV fluids, evaporative cooling (cover in wet sheets and use fans), external cooling devices
 2. Clinical Presentations and Associated Diagnoses
 - a. Respiratory Depression/Arrest:
 - i. Opioid overdose: 2 mg IV naloxone may not be enough for fentanyl/synthetic opioid overdoses
 - ii. Consider giving high dose naloxone (4-8 mg) if suspect opioid toxidrome
 - b. Circulatory -> Cardiotoxins
 - i. Bradycardia:

1. Calcium channel blockers (CCB), beta blockers (BB), digoxin, opioids, clonidine, cholinergic poisoning
- ii. Hypotension:
 1. Evaluate for CCB, BB, clonidine, nitroglycerin, TCAs, anticonvulsants, barbiturates, opioids on medication list
 2. Rule out other causes of hypotension (hypovolemia, cardiogenic, obstructive, etc.)
- iii. Wide QRS: Na Channel blockers
 1. TCAs, antiarrhythmics, carbamazepine, lamotrigine, antimalarials, local anesthetics
- iv. Long QT
 1. Common causes -> amiodarone, methadone, many antibiotics, antipsychotics, SSRIs, TCAs
- c. Neuro Depression:
 - i. Toxicologic causes: sedative/hypnotics, opioids, ethanol, toxic alcohols, psychiatric medications, antiepileptic drugs
 - ii. Check an anion gap: consider toxic alcohols if elevated anion gap in high risk populations (alcoholics, undomiciled), send ethylene glycol and methanol levels, consider treatment with fomepizole
 - iii. Consider using ETCO₂ or checking a VBG to assess adequacy of ventilatory function
 - iv. Rule out other causes (infectious, ICH, etc.)
- d. Seizure
 - i. Final common pathway in many toxidromes (seizure, coma, death)
 - ii. Specific causes to think about:
 1. Salicylates, tramadol
 2. Sympathomimetics, amphetamines
 3. Benzo/sedative/EtOH withdrawal
 4. TCAs, carbamazepine, citalopram, venlafaxine, bupropion
 5. Isoniazid
 6. Theophylline
- e. Agitated Delirium:
 - i. Hyperthermic, agitated, 'super-human' strength
 - ii. Final common pathway for males, often with psychiatric comorbidities + drugs (sympathomimetics) + EtOH
- f. Cardiac Arrest: ACLS + Assess for appropriateness of intralipid fat emulsion as rescue therapy: 20% Intralipid as 1.5 mL/kg bolus then 0.25 mL/kg/min for 30 minutes
3. Absorption/Elimination Considerations
 - a. Absorption
 - i. Activated charcoal (AC): consider in patient who is protecting airway and expected to continue to protect airway (based on poisoning type, may not want to give AC if patient going to have seizures/worsening mental status)

- ii. Time consideration: typically only useful within 1-2 hours of ingestion, consider using up to 12-18 hrs post ingestion if substance is controlled release/extended release
 - iii. Use OG tube to deliver AC in intubated patients
 - iv. Does not work with heavy metals (iron, lead), lithium, toxic alcohols
 - b. Elimination:
 - i. Urine alkalinization: traps weak acids -> aspirin, phenobarbital
 - ii. Dialysis: TPALS
 - 1. Theophylline, phenobarbital, toxic alcohols (ethylene glycol and methanol), lithium, salicylates
- 4. Labs/Imaging
 - a. Consider in everyone: EKG, glucose, electrolytes (check for anion gap), LFTs/lipase/coags, acetaminophen/salicylate levels, EtOH level
 - b. As indicated: osmolality, toxic alcohol levels, carboxyhemoglobin, urine drug screen, specific drug levels, head CT, XR chest
- 5. Call poison control center (1-800-222-1222)

References:

- Adams, J et al. Emergency Medicine: Clinical Essentials, Second Edition. General Approach to the Poisoned Patient, pp. 1221-1230. 2013.
- Rhyee, S. General approach to drug poisoning in adults. Last updated: Aug 10, 2016. Uptodate.com