EMERGENCY ANTIDOTAL MANAGEMENT OF POISONINGS

POISON Help® 1-800-222-1222

Nebraska Regional Poison Center: 1-800-222-1222

This educational poster is not intended for individual patient care. Information is believed accurate as of 2/2011. If you are caring for a known or suspected toxic exposure patient, please call your regional poison center for patient-specific management advice.

Poison	Antidote	Stocking Level ⁂	Dose	Comments
Acetaminophen	N-acetylcysteine (NAC; Mucomyst®)	54 g* [30 mL 20% sol. vials x 9]	Loading Dose: 140 mg/kg PO; Maintenance Dose: 70 mg/kg q 4 hr PO. May require antiemetic for first few doses.	Most effective if initiated within 8 hours of acute ingestion. May be of value even in late presenters. Typically continued for 36 h or longer, depending on clinical situation. Contact PC for case-specific dosing recommendations.
	Acetylcysteine for IV use (Acetadote®)	30 g [10 mL vials (100 mg/mL) x 30]	150 mg/kg over 1 hr, then 12.5 mg/kg for 4 hr, then 6.25 mg/kg/hr for 16 hr or until APAP < 10 and liver enzymes normal or improving	Preferred if persistent vomiting, unable to protect airway, hepatic failure, or pregnancy. Should be continued beyond 21 h if acetaminaphen level remains elevated or worsening liver injury. Call PC for case-specific advice.
Anticholinergics	Physostigmine (Antilirium®)	4 mg* [2 mL vials (1 mg/mL) x 2]	1-2 mg IV (adult); 0.02 mg/kg IV (child) diluted in 10 cc NS over 5 min	Physostigmine may cause seizures or life-threatening arrhythmias (if used in setting of tricyclic antidepressant overdose with QRS widening or bradycardia). Contact PC for guidance.
Benzodiazepines	Flumazenil (Romazicon®) **NOT RECOMMENDED FOR OVERDOSE PATIENTS**	4 mg [1 mg/vial x 4]	Adult: 0.2 mg IV to total dose max 3 mg; Child: 0.01 mg/kg IV to total dose max 3 mg FOR IATROGENIC OVERDOSE ONLY	Contraindicated in benzodiazepine-dependent patients, poly-drug overdoses and unknown ingestions due to risk of seizures. Can almost always manage benzodiazepine exposure with supportive care.
Beta Blockers	Glucagon	90 mg* [1 mg/vial x 90]	50-150 mcg/kg IV bolus, then 50 to 100 mcg/kg/hr infusion	Continuous ECG monitoring. May cause nausea/vomiting. Phenol diluent should not be used for preparing infusion.
Calcium Channel Blockers	1) Calcium gluconate and/or Calcium chloride	Calcium 200 mEq* [CaCl 13.6 mEq/10ml x 20; CaGlu 4.65 mEq/10mL x 40]	Dose varies by agent/context	Ca chloride 10% recommended for administration by central venous catheter. Ca gluconate can be given through a peripheral vein.
	2) High dose insulin/glucose	Regular Insulin 3500 Units ***	Bolus 1 U/kg regular insulin + 25-50 g dextrose (adult); Infuse 0.5-1 U/kg/hr insulin and dextrose to maintain euglycemia	Give in ICU setting; monitor glucose. Response may be delayed 30-60 min. Has also been used in beta blocker toxicity.
	3) Glucagon	90 mg* [1 mg/vial x 90]	50-150 mcg/kg IV bolus, then 50-100 mcg/kg/hr IV titrated to effect	Glucagon as adjunctive tx of hypotension/bradycardia. Phenol diluent should not be used for infusions.
Carbon Monoxide	Oxygen	***	1) 100% Oxygen 2) Hyperbaric Oxygen	Call PC for indications for using hyperbaric oxygen.
Cholinesterase Inhibitors (Organophosphates; Carbamates; Nerve Agents)	1) Atropine	1) 20 mg* [20 mL vials (0.4 mg/mL) x 3; OR 1 mL vials (0.4 mg/mL) x 50; OR 10 mL vials (0.1 mg/mL) x 20]	Initial dose for Adult: 2 mg IV; Child: 0.05 mg/kg IV. Repeat q 5 min until reversal of bronchospasm and excessive secretions.	Atropine given until cessation of excessive oral and pulmonary secretions. Stockpiles of atropine and pralidoxime IV vials and auto-injectors (Mark I Kits and DuoDotes) are available in all states. Contact PC for access information.
	2) Pralidoxime (2-PAM, Protopam®)	2) 12 g* [10 mL vials 100 mg/mL x 12]	Initial bolus 30 mg/kg IV, up to 2 g over 30-60 min. Maintenance infusion of 8-10 mg/kg/h (up to 650 mg/h).	Pralidoxime may be given over 2 min for life-threatening nicotinic effects. Indicated in organophosphate poisoning. Efficacy in carbamate toxicity is controversial. Contraindicated in carbaryl (Sevin®) exposure.
Cyanide	1) Hydroxocobalamin (Cyanokit®)	10 g* (2 kits)	Adult: 5 g; Child: 70 mg/kg IV over 15-30 min	Preferred treatment (especially for cyanide poisoning due to smoke inhalation). Can be repeated as clinically necessary. Na thiosulfate can be co-administered through a separate IV line.
	2) Cyanide Antidote Kit (Amyl nitrite, Sodium nitrite & Sodium thiosulfate)	2 kits = 2 amyl nitrite ampules, 600 mg Na nitrite, 25 g Na thiosulfate	1) Amyl nitrite perles: Inhalation for 30 secs of each min; 2) Na nitrite, Adult: 10 mL of 3% sol IV over 3 min; Child: 0.33 mL/kg not to exceed 10 mL; 3) Na thiosulfate, Adult: 50 mL of 25% sol IV over 10 min; Child: 1.65 mL/kg.	Amyl nitrite given with continuous O2. Stop amyl nitrite when Na nitrite begun. Na nitrite dose assumes normal Hgb--call PC for adjustment if < 12 g/dL. Nitrites may cause excessive metHgb & hypotension. If diagnosis uncertain, may use Na Thiosulfate alone.
Cyclic Antidepressants and Other Sodium Channel Blockers (Diphenhydramine, Class IA & IC Antidysrhythmics)	Systemic alkalinization with Na Bicarbonate	Na bicarbonate*** [50 mL vials (1 mEq/mL) x 13]	Na bicarbonate: 1-2 mEq/kg IV bolus followed by infusion: 3 vials/L D5W at high maintenance rate to pH 7.45-7.55.	Systemic alkalinization for demonstrated sodium channel blockade (widened QRS). PC consultation strongly recommended.
Digoxin	Digoxin Immune Fab (Digibind®, DigiFab®)	15 vials*	#Vials = (Digoxin Serum Conc (ng/mL) x Wt (kg)/100. If unknown: Acute OD = 10-20 vials; Chronic Adult OD = 3 to 6 vials; Chronic Child OD = 1 vial	Monitor ECG and potassium levels. Digoxin assay may not be accurate after administration of Fab.
Ethylene Glycol	1) Fomepizole (Antizol®)	Fomepizole 3 g* [1.5 g vials x 2]	Fomepizole: 15 mg/kg IV LD; 10 mg/kg IV q 12 h x 4 doses, then 15 mg/kg thereafter. During dialysis, re-dose q 4hr	Fomepizole is preferred over ethanol. Call PC for use of ethanol and for hemodialysis indications.
	2) Thiamine 3) Pyridoxine	***	Thiamine 100 mg IV daily; Pyridoxine 100 mg IV daily	Thiamine and pyridoxine for enhanced elimination of metabolic acids.
Heparin	Protamine sulfate	Protamine 250 mg** [25 mL vial (10 mg/mL) x 1]	~ 1 mg per 100 units of heparin if within 15 min of the heparin dose. If greater than 30 min, give one-half of this dose.	Because heparin is cleared quickly and adverse effects of protamine or loss of anticoagulation may be severe, consider need for treatment carefully. Administer IV over 1 to 3 minutes, not to exceed 50 milligrams per 10 minutes. Efficacy for low molecular weight heparin is unclear. Consult with PC.
Hydrofluoric Acid	Calcium gluconate & Calcium chloride	Calcium 200 mEq* [CaCl (13.6 mEq/10 mL) x 20; CaGlu (4.65 mEq/10 mL) x 40]	Selection of agent, route and dose varies by exposure history and symptomatology.	Hypocalcemia and life-threatening arrhythmias possible from dermal exposure. Contact PC for case-specific advice.
Iodine (I^{131})	Potassium iodide (KI)	130 mg	Adult: 130 milligrams/day orally; Child 3 - 18 yrs: 65 mg/day; Infant 1 mo - 3 yrs: 32 mg/day; Neonate - 1 mo: 16 mg/day	Start as soon as possible (< 3 -4 hrs). Adults 18 - 40 years with exposure >= 10 centigray (cGy). Over 40 years of age need KI only with large internal dose (>= 500 cGy). Pregnant and lactating women should be treated at lower doses.
Ingestion	1) Activated charcoal without cathartic	100 g*	Adult: 25 - 100 g; Child: 1 g/kg	Use AC in most oral exposures within 1 - 2 hrs. Contraindicated with caustics. Ineffective with many metals.
	2) Polyethylene glycol (PEG)	10 L	Adult or adolescent:: 1.5 -2 L/hr; Child: 25 mL/kg/h or 500 mL/hr	Whole bowel irrigation with PEG reserved for particular settings. Consult PC.
Iron	Deferoxamine (Desferal®)	12 g* [500 mg/5 mL vials x 24]	5 - 15 mg/kg/hr IV infusion; Mild to mod toxicity, duration 6 - 12 hr; Severe toxicity, duration 24 hours, then reassess.	Indications for treatment include symptomatic patient with peak serum iron >= 350 mcg/dL or severe symptoms following iron ingestion. Benefit of deferoxamine beyond 24 - 48 hours unlikely and increased risk of pulmonary toxicity.
Isoniazid	Pyridoxine	8 g* [5 mL ampules (10 mg/mL) x 160]	Mg for mg ingested dose. Empiric dose: Adult: 5 g; Child: 75 mg/kg, IV infusion 0.5 g/min till seizures stop, then remainder over 4-6 hours	Consider stocking 20 g in tuberculosis-endemic areas. Pyridoxine also used with Gyrometra (false morel) mushroom toxicity.
Metals: Lead, Mercury, Arsenic	1) Succimer (DMSA)	3 g**	10 mg/kg PO tid x 5 days, then bid x 14 days	BAL given for encephalopathy and/or unable to take PO.
	2) BAL in Oil (Dimercaprol)	600 mg* [3 mL ampules (100 mg/mL) x 2]	75 mg/m2 or 3-5 mg/kg IM q 4 to 12 hrs up to 10 days	BAL given only if encephalopathic or unable to take PO Succimer
	3) Calcium disodium EDTA	2 g**	1500 mg/m2/day IV (up to 2-3 g) over 8 - 12 hrs x 5 days (started 4 hrs after BAL)	Ca Sodium EDTA must be started after BAL to decrease CNS lead penetration
Methanol	1) Fomepizole (Antizol®)	Fomepizole 3 g* [1.5 g vials x 2]	Fomepizole 15 mg/kg IV LD; 10 mg/kg IV q 12 h x 4 doses, then 15 mg/kg thereafter. During dialysis, re-dose q 4 hours.	Fomepizole is preferred over ethanol. Call PC for use of ethanol and for hemodialysis indications.
	2) Folic/Folinic acid	Folic acid 300 mg*** [10 mL vials (5 mg/mL) x 6]	50 mg IV q 4 h x 24 h	Folic acid to enhance metabolism.
Methemoglobin-Producing Agents	Methylene Blue	300 mg* [10 mL ampules (10 mg/mL) x 3]	0.1-0.2 mL/kg of 1% solution IV over 5 min. One 10 mL ampule of 1% solution is adult therapeutic dose.	Use methylene blue for symptomatic patients. Visible cyanosis occurs at methemoglobin levels of 10-15% but may not require treatment if patient is asymptomatic.
Methotrexate	Folinic acid (Leucovorin)	***	Mg for mg ingested dose. Empiric dose for adult is 100 mg/m^2 q 6 hr IV	Folate reductase inhibitor requires folinic acid instead of folate. Most effective if given within one hour; may be ineffective beyond 4 hours.
Opioids	Naloxone (Narcan®)	20 mg* [10 mL ampules (0.4 mg/mL) x 5]	0.4 - 2.0 mg IV, titrated to effect. An IV infusion may be used once reveral achieved.	Give minimum of 10 mg before concluding no response. Contraindicated in the neonate born to an opioid-dependent mother. Can precipitate opioid withdrawal in chronic opioid users.
Salicylates	Urinary alkalinization with Na bicarbonate	Na bicarbonate*** [50 mL vials (1 mEq/mL) x 10]	3 vials Na bicarbonate in 1 L D5W; initial rate at high maintenance, titrated to urine pH > 7.5 - 8.	Caution with pulmonary edema, or severe renal or CNS toxicity. Keep serum K > 4.0. Monitor urine pH at bedside hourly. Call PC for hemodialysis indications.
Snakebites: Rattlesnakes, Copperheads, Cottonmouths	Crotalidae Polyvalent Immune Fab Antivenom (CroFab®)	12-18 vials*	4 - 12 vials until initial control, then 2 vials q 6 hr x 3 doses	Should be stocked in areas with indiginous venomous snakes. Areas with snakes known to produce severe envenomation may wish to stock greater amounts. May see recurrent thrombocytopenia and coagulopathy post-discharge.
Sulfonylureas	Octreotide	200 mcg* [0.1 mg/mL x 2]	Adult: 50 to 100 mcg SC repeated q 6 - 12 hr prn. SC or continuous IV infusion has been used. Child: 4-5 mcg/kg/d divided q 6 h	Glucose is primary intervention. Octreotide antagonizes insulin release.
Warfarin/Superwarfarins	Vitamin K1	200 mg** [10 mg/1 mL, 5 mL vials x 4]	Use Oral Dose for Most Patients: 10-50 mg PO 3-4 times/day. For Active Bleeding in Adult: 10 mg diluted and given by slow IV infusion. Call PC.	Do not use Vit K1 prophylactically with normal PT/INR. If active bleeding, also administer fresh frozen plasma.

⁂ The minimum stocking amount needed to treat one 100 kg patient for 24 hours.
Higher levels of stocking should be considered and arrangements in place to rapidly obtain additional quantities.

* Stocking is recommended for all acute care hospitals.

** No consensus of expert panel regarding stocking requirements.

*** Stocking is usually based on other indications/uses.

Ref: Dart, et al. Ann Emerg Med 2009; Vol 54, No 3.

Call the Poison Center for assistance in locating antidotes.

Nebraska Regional Poison Center: 1-800-222-1222; 402-955-5555

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