

Drugs for Selected Medication Overdoses and Poisonings

Hospitals may not be prepared to treat poisonings or overdoses due to unavailability of antidotes. Unavailability of enough antidote to treat a patient until more of the antidote can be procured can also be a problem. Hospitals should stock type and quantity of antidotes based on geographic location, type of hospital, referral base, risk of more than one victim, etc.¹ For example, snake bites are not uncommon in rural areas, or local industry might increase the risk of exposure to certain chemicals. Cost can be a concern; avoid stocking excessive amounts or using antidotes inappropriately.¹ Some states have suggested par levels of antidotes, so check with your state’s poison control center, which can be reached at 800-222-1222 (US). In Canada, check with the Canadian Association of Poison Control Centres (<http://www.capcc.ca/provcentres/centres.html>). **For management of specific patients, consultation with poison control center staff helps ensure the right antidote, right frequency, right dose, etc. is given. Plus, these experts will make follow-up calls to ensure that the patient’s treatment remains optimal throughout their hospital stay.**² See our FAQ, [Managing Bleeding with Anticoagulants](#) for information on anticoagulant reversal agents.

—Doses in chart can vary according to the reference used. Doses may also vary depending on patient-specific characteristics and clinical considerations. This chart is **NOT meant to replace consultation with poison control center** staff or use of appropriate resources. (Also see footnotes at end of chart.)—

Drug or Antidote ^c	Used For Poisonings or Overdoses with:	Adult Dosing Information ^a	Amount to Treat a 100 kg Adult for 24 h ^{1,b}	Comments
Acetylcysteine* (Available as injection and inhalation solution for oral use.)	<ul style="list-style-type: none"> Acetaminophen¹ 	<ul style="list-style-type: none"> Regimens vary. A regimen that provides acetylcysteine ≥ 300 mg/kg (PO or IV) over the first 20 to 24 h of treatment is recommended.⁴ 	30 g	<ul style="list-style-type: none"> Errors include delayed treatment, dose miscalculation, treatment interruption, wrong infusion rate, and prolonged infusion.^{4,28} Do not stop treatment before discontinuation criteria are met.⁴
Atropine sulfate**	<ul style="list-style-type: none"> Beta-blockers³⁰ Calcium channel blockers³⁰ Clonidine²⁹ Digoxin³⁰ Local anesthetics³⁰ 	<ul style="list-style-type: none"> IV: 0.5 to 1 mg every 3 to 5 min PRN for bradycardia (max total dose 3 mg)^{29,30} 	---	<ul style="list-style-type: none"> Commonly used first-line for bradycardia.^{29,30} Use based on case reports; efficacy varies.³⁰
<i>Continued...</i>				

Drug or Antidote ^c	Used For Poisonings or Overdoses with:	Adult Dosing Information ^a	Amount to Treat a 100 kg Adult for 24 h ^{1,b}	Comments
Atropine sulfate , continued	<ul style="list-style-type: none"> Organophosphate pesticides or nerve agents¹ Carbamate insecticides¹ 	<ul style="list-style-type: none"> IV loading dose: 1 to 2 mg doubled every 5 min PRN.³⁰ Infusion: 10% to 20% of the total loading dose/h, up to 2 mg/h.³⁰ 	165 mg	<ul style="list-style-type: none"> Used to treat muscarinic effects.³⁰ Titrate to control bronchorrhea, bronchospasm, bradycardia, and blood pressure.³⁰ Does not treat paralysis (does not block acetylcholine at the neuromuscular junction or nicotinic ganglia).³⁰
Calcium chloride 10%**	<ul style="list-style-type: none"> Beta-blockers³³ CCBs¹ Fluoride¹ 	<ul style="list-style-type: none"> For CCB overdose, 2 g IV over 5 min, then 20 to 40 mg/kg/h.^{22,30} 	10 g	<ul style="list-style-type: none"> Titrate to blood pressure.³⁰ Central line administration preferred.³⁰ Monitor serum ionized calcium. Max level 1.5 to 2 x ULN.³⁰
Calcium disodium versenate (edetate calcium disodium)	<ul style="list-style-type: none"> Lead¹ 	<ul style="list-style-type: none"> Dose differs according to BSA, SCr, and blood level of lead. See product information for specific doses. 	2.25 g	<ul style="list-style-type: none"> Also called calcium disodium EDTA.²²
Calcium gluconate 10%**	<ul style="list-style-type: none"> Beta-blockers³³ CCBs¹ Fluoride¹ 	<ul style="list-style-type: none"> For CCB overdose, 6 g IV over 5 min, then 60 to 120 mg/kg/h.^{22,30} 	30 g	<ul style="list-style-type: none"> Titrate to blood pressure.³⁰ Monitor serum ionized calcium. Max level 1.5 to 2 x ULN.³⁰
Calcium trisodium pentetate	<ul style="list-style-type: none"> Americium¹ Curium¹ Plutonium¹ 	<ul style="list-style-type: none"> 1 g IV over 3 to 4 min.²² 	1 g	<ul style="list-style-type: none"> Also called calcium DTPA, Ca-DTPA, and pentetate calcium trisodium.^{1,22}
Charcoal	<ul style="list-style-type: none"> Several medications and poisons³¹ 	<ul style="list-style-type: none"> 50 to 100 g PO x 1.²² Multiple doses are not routinely indicated.^{5,31} 	100 g ²²	<ul style="list-style-type: none"> Most benefit if given within 1 h.⁵ Avoid formulation with sorbitol.⁵

Drug or Antidote ^c	Used For Poisonings or Overdoses with:	Adult Dosing Information ^a	Amount to Treat a 100 kg Adult for 24 h ^{1,b}	Comments
Centruoides Antivenin* (<i>Anascorp</i> [US])	<ul style="list-style-type: none"> Scorpion¹ 	<ul style="list-style-type: none"> 3 vials IV in 50 mL NS over 10 min.²⁰ 	3 vials	<ul style="list-style-type: none"> Additional doses may be needed.²⁰
Crotalidae Polyvalent Immune Fab, ovine* (<i>CroFab</i> [US])	<ul style="list-style-type: none"> North American pit vipers (rattlesnake, copperhead, water moccasin, or cottonmouth)^{1,22} 	<ul style="list-style-type: none"> 4 to 6 vials IV in 250 mL NS (total volume) over 60 min.²² Monitor for one hour.²² Follow poison control's recommendation regarding need for additional doses.⁷ 	18 vials	<ul style="list-style-type: none"> Some patients may need up to 12 vials initially, depending on severity of envenomation and clinical judgement.²² For the first 10 min, infuse at 25 to 50 mL/h, then increase rate to 250 mL/h if no allergic reaction.²² <i>Anavip</i> (crotalidae immune f[ab]2, equine) is also available.
Cyproheptadine	<ul style="list-style-type: none"> Serotonergic drugs¹ 	<ul style="list-style-type: none"> Initial (first 24 h): 4 mg PO TID, or 12 mg x 1, then 2 mg Q1-2H.²¹ Maintenance: 2 mg TID to 8 mg QID based on efficacy and tolerability.²¹ Continue for 1 to 4 weeks, with tapering over ~2 weeks.²¹ 	36 mg	---
Dantrolene** (e.g., <i>Dantrium</i> , generics; <i>Ryanodex</i> [US])	<ul style="list-style-type: none"> Anesthetic agents that cause malignant hyperthermia in susceptible people.²⁴ 	<ul style="list-style-type: none"> 2.5 mg/kg IV, repeated PRN for continued symptoms, with a suggested max dose of 10 mg/kg.²³ 	36 vial of dantrolene 20 mg (<i>Dantrium</i> etc), or 3 vials of dantrolene 250 mg (<i>Ryanodex</i> [US]) ³⁴	<ul style="list-style-type: none"> Ensure availability where general anesthesia is administered.¹ The Malignant Hyperthermia Association of the United States (www.mhaus.org) has information on preparedness and a hotline for emergency help (800-644-9737).

Drug or Antidote ^c	Used For Poisonings or Overdoses with:	Adult Dosing Information ^a	Amount to Treat a 100 kg Adult for 24 h ^{1,b}	Comments
Deferoxamine mesylate* (<i>Desferal</i> , generics)	<ul style="list-style-type: none"> Iron¹ 	<ul style="list-style-type: none"> Acute iron intoxication: 15 mg/kg/h IV infusion until iron level and symptoms have normalized.²² 	36 g	<ul style="list-style-type: none"> Can be given IM, but IV is preferred because of more reliable absorption.²² Total dose determined by clinical response.²²
Dextrose (D50)**	<ul style="list-style-type: none"> Hypoglycemic agents¹ 	<ul style="list-style-type: none"> IV: 10 to 25 g (20 to 50 mL) repeated PRN.²² Initial treatment is usually followed by a continuous infusion of D10.^{1,22} 	250 g	---
Digoxin Immune Fab** (<i>DigiFab</i>)	<ul style="list-style-type: none"> Digoxin¹ 	<ul style="list-style-type: none"> Dose varies by amount ingested. See product information for details. 	15 vials	---
Dimercaprol* (<i>Bal</i> [US])	<ul style="list-style-type: none"> Arsenic¹ Gold²² Lead¹ Mercury¹ 	<ul style="list-style-type: none"> Dose differs by heavy metal and severity of poisoning. See product information for details. 	2.4 g	---
Ethanol*	<ul style="list-style-type: none"> Ethylene glycol (antifreeze)¹ Methanol¹ 	<ul style="list-style-type: none"> PO: 1g/kg, then 0.5 g/kg hourly, titrated to an ethanol target level of 1 to 1.5 g/L.^{6,8} Continue until ethylene glycol or methanol level is <20 mg/dL⁹ 	360 g	<ul style="list-style-type: none"> Fomepizole is preferred because it is easier to use and has fewer side effects.^{1,6} Injectable ethanol is not commercially available.
Flumazenil**	<ul style="list-style-type: none"> Benzodiazepines¹ 	<ul style="list-style-type: none"> IV bolus regimen: 0.2 mg x 1, then 0.3 mg 30 sec later if needed. Additional 0.5 mg doses can be given every min to a total dose of 3 to 5 mg. If resedation occurs, regimen can be repeated every 20 min to a max of 3 mg each h.²² IV infusion: 0.1 to 4 mg/h titrated to level of sedation.²² 	12 mg	<ul style="list-style-type: none"> Flumazenil half-life is shorter than that of benzodiazepines, so resedation can occur.²² Used for sedation, not hypoventilation.²² Can precipitate seizures, especially in patients taking benzodiazepines chronically.²² Could precipitate anxiety or a panic attack.²²

Drug or Antidote ^c	Used For Poisonings or Overdoses with:	Adult Dosing Information ^a	Amount to Treat a 100 kg Adult for 24 h ^{1,b}	Comments
Fomepizole*	<ul style="list-style-type: none"> Ethylene glycol (antifreeze)¹ Methanol¹ 	<ul style="list-style-type: none"> IV: 15 mg/kg x 1, then 10 mg/kg Q12H x 4 doses, then 15 mg/kg Q12H until ethylene glycol or methanol levels are <20 mg/dL.²² 	4.5 g	<ul style="list-style-type: none"> Fomepizole is preferred over ethanol because it is easier to use and has fewer side effects.^{1,6} During hemodialysis, doses should be given Q4H.²²
Glucagon** (<i>GlucaGen</i>)	<ul style="list-style-type: none"> Beta-blockers¹ CCBs¹ 	<ul style="list-style-type: none"> IV: 2 to 10 mg, then 1 to 15 mg/h continuous infusion.³⁰ 	250 mg	<ul style="list-style-type: none"> In Canada, IV administration is off-label.¹⁰ Used for bradycardia and hypotension.³⁰ Vomiting is common.³⁰ Tachyphylaxis may develop quickly.³⁰ Efficacy varies.³⁰ Not a preferred treatment for CCB toxicity due to limited/mixed evidence.³⁰
Glucarpidase (<i>Voraxaze</i> [US])	<ul style="list-style-type: none"> Methotrexate¹ 	<ul style="list-style-type: none"> IV: 50 units/kg/dose over 5 min x 1 dose²² 	5 vials	<ul style="list-style-type: none"> Indicated to treat toxic levels in patients with slow methotrexate clearance due to kidney impairment.²² Separate from leucovorin by ≥2 hours.²²
Hydroxocobalamin hydrochloride** (<i>Cyanokit</i> [US])	<ul style="list-style-type: none"> Cyanide¹ 	<ul style="list-style-type: none"> IV: 5 g in 200 mL NS (preferred diluent) over 15 min x 1 dose. Repeat the 5 g dose if necessary, infusing it over 15 to 120 min.²² 	10 g	---

Drug or Antidote ^c	Used For Poisonings or Overdoses with:	Adult Dosing Information ^a	Amount to Treat a 100 kg Adult for 24 h ^{1,b}	Comments
Insulin, regular	<ul style="list-style-type: none"> Beta-blocker³³ CCB³³ 	<ul style="list-style-type: none"> 1 unit/kg IV bolus, then 0.5 units/kg/h IV infusion.³³ Titrate every 15 to 30 min.³⁶ 	---	<ul style="list-style-type: none"> Administer with D10 at 0.5 g/kg/h. If glucose is <200 mg/dL, start with a bolus of 50 mL of D50.³⁵ Target HR (50 bpm), MAP (65 mm Hg), and glucose (e.g., 125 to 250 mg/dL).^{36,37}
<i>Latrodectus mactans</i> antivenin	<ul style="list-style-type: none"> Black widow spider 	<ul style="list-style-type: none"> IV: 2.5 mL (6,000 units) in 10 to 50 mL NS over 15 min.²² A second dose may be necessary.²² 	1 vial	<ul style="list-style-type: none"> Perform skin or conjunctival sensitivity testing before administration; serum sickness and/or death could occur in patients allergic to horse serum.²² Dose can be given IM, but IV is preferred in severe cases, and in children.²²
Leucovorin*	<ul style="list-style-type: none"> Methotrexate¹ Methanol¹ 	<ul style="list-style-type: none"> IV, IM, or PO: 15 mg (10 mg/m²) Q6H until serum methotrexate level is <0.05 micromol/L. If SCr has increased ≥50% above baseline 24 hours following methotrexate administration, or if serum methotrexate is >5 micromol/L, use leucovorin 100 mg/m² IV or IM Q3H until serum methotrexate level is <0.05 micromol/L.²² 	1,000 mg	<ul style="list-style-type: none"> Role in methanol poisoning is unclear.²⁵

Drug or Antidote ^c	Used For Poisonings or Overdoses with:	Adult Dosing Information ^a	Amount to Treat a 100 kg Adult for 24 h ^{1,b}	Comments
Levocarnitine* (<i>Carnitor</i> , generics)	<ul style="list-style-type: none"> Valproic acid¹ 	<ul style="list-style-type: none"> IV: 100 mg/kg x 1, then 50 mg/kg (max 3 g) Q8H (if tolerated) until ammonia levels are dropping and patient is improving.²⁶ 	15 g	---
Lipid emulsion**	<ul style="list-style-type: none"> Local anesthetics¹ 	<ul style="list-style-type: none"> See our checklist, Safe Use of Local Anesthetics. 	1,250 mL	<ul style="list-style-type: none"> Our checklist, Safe Use of Local Anesthetics, provides information on strategies to prevent and manage toxicity.
Methylene blue**	<ul style="list-style-type: none"> Methemoglobinemia¹ CCB³⁰ 	<ul style="list-style-type: none"> IV: 1 to 2 mg/kg, repeated hourly if necessary.^{22,30} IV infusion (for treatment-resistant vasodilatory shock due to CCB overdose): 1 mg/kg/h.³⁰ Max dose 5 to 7 mg/kg.³⁰ 	600 mg	<ul style="list-style-type: none"> For methemoglobinemia, consider alternate treatment if no resolution after two doses.²² Efficacy for CCB overdose is unclear.³⁰
<i>Micrurus fulvius</i> antivenin (US)*	<ul style="list-style-type: none"> North American coral snake (Eastern and Texas) 	<ul style="list-style-type: none"> IV: 3 to 5 vials (30 to 50 mL when reconstituted). Administer in 250 to 500 mL NS.¹⁹ 	10 vials	<ul style="list-style-type: none"> Consider skin testing before treatment.²² Consider reconstituting one vial to withdraw test dose from before reconstituting the remaining vials to minimize waste in case patient has anaphylaxis to test dose.
Naloxone** (<i>Narcan</i>)	<ul style="list-style-type: none"> Opioids¹ 	<ul style="list-style-type: none"> See our FAQ, Meds for Opioid Overdose. An IV maintenance infusion starting with 2/3 of the effective dose per hour can be titrated to maintain respiratory drive and airway protection.³⁰ 	40 mg	---

Drug or Antidote ^c	Used For Poisonings or Overdoses with:	Adult Dosing Information ^a	Amount to Treat a 100 kg Adult for 24 h ^{1,b}	Comments
Octreotide* (<i>Sandostatin</i>)	<ul style="list-style-type: none"> Sulfonylureas¹ 	<ul style="list-style-type: none"> SC: 50 to 100 mcg Q6-12H¹¹ 	225 g	<ul style="list-style-type: none"> Used to reverse hypoglycemia.¹¹
Physostigmine salicylate**	<ul style="list-style-type: none"> Anticholinergics¹ 	<ul style="list-style-type: none"> IV: 0.04 mg/kg (2 mg), then 1 to 4 mg every 20 minutes. Repeat previously effective dose if symptoms recur.¹² Administer slowly (e.g., in 50 mL NS over 10 to 15 min).¹² 	4 mg	<ul style="list-style-type: none"> Unapproved drug¹² Used to target mental status changes.¹² Contraindicated with cholinesterase inhibitors for dementia (e.g., donepezil). Use caution in tricyclic antidepressant ingestion.¹²
Potassium iodide* (<i>Iosat, ThyroSafe</i> , tablets; oral solution [US]; <i>RadBlock</i> [Canada])	<ul style="list-style-type: none"> Thyroid radioiodine protection¹ 	<ul style="list-style-type: none"> PO: 130 mg x 1¹³ 	130 mg	<ul style="list-style-type: none"> Product is OTC.
Pralidoxime chloride* (<i>Protopam</i> [US])	<ul style="list-style-type: none"> Organophosphate¹ 	<ul style="list-style-type: none"> Follow poison center dosing recommendations.¹⁴ 	18 g	<ul style="list-style-type: none"> Can be given IM but IV is preferred.¹⁴
Prussian blue (<i>Radiogardase</i>)	<ul style="list-style-type: none"> Radiocesium¹ Thallium¹ 	<ul style="list-style-type: none"> PO: 3 g TID¹⁵ 	25 g	<ul style="list-style-type: none"> Also called ferric hexacyanoferrate.¹⁵ Treatment duration dependent on level of internal radioactivity.¹⁵
Pyridoxine hydrochloride**	<ul style="list-style-type: none"> Isoniazid¹ Hydrazine¹ 	<ul style="list-style-type: none"> IV: Give g per g for the amount of isoniazid taken.^{16,17} If isoniazid dose unknown, give pyridoxine 5 g over 30 to 60 min.¹⁶ If seizing, administer over 3 to 5 minutes.¹⁶ May repeat if needed.¹⁶ 	24 g	<ul style="list-style-type: none"> Consider similar dosing for hydrazine toxicity.¹⁸

Drug or Antidote ^c	Used For Poisonings or Overdoses with:	Adult Dosing Information ^a	Amount to Treat a 100 kg Adult for 24 h ^{1,b}	Comments
Sodium bicarbonate**	<ul style="list-style-type: none"> • Tricyclic antidepressants¹ • Cocaine¹ • Local anesthetics¹ 	<ul style="list-style-type: none"> • IV Bolus: 50 to 150 mEq (50 to 150 mmol).³⁰ • Maintenance: 150 mEq (150 mmol)/L infused at 1 to 3 mL/kg/h.³⁰ 	84 g (1,000 mEq)	<ul style="list-style-type: none"> • For wide-complex tachyarrhythmias (cocaine: or cardiac arrest).³⁰ • Do not exceed blood pH 7.55, or sodium 155 mEq/L.³⁰ • Monitor for hypokalemia.³⁰
	<ul style="list-style-type: none"> • Salicylates¹ 	<ul style="list-style-type: none"> • IV: 132 to 150 mEq (132 to 150 mmol) in 850 mL D5W with 20 to 40 mEq (20 to 40 mmol) KCl, at 2 to 3 mL/kg/h.²² 		<ul style="list-style-type: none"> • For salicylate toxicity, target urine output 2 to 3 mL/kg/h and urine pH 7.5 to 8.
Thiamine**	<ul style="list-style-type: none"> • Ethylene glycol toxicity • Ethanol (chronic alcohol misuse) 	<ul style="list-style-type: none"> • Ethanol misuse: See our FAQ, Management of Inpatient Alcohol Withdrawal. • Ethylene glycol toxicity: thiamine 100 mg IV.²⁷ 	1,500 mg	<ul style="list-style-type: none"> • Our FAQ, Management of Inpatient Alcohol Withdrawal addresses common questions about the pharmacotherapy of alcohol withdrawal in acute care patients. • Thiamine is typically given as part of the treatment for ethylene glycol toxicity because it is a cofactor in its metabolism.²⁷
Uridine triacetate (<i>Vistogard</i> [US])	<ul style="list-style-type: none"> • Fluorouracil • Capecitabine 	<ul style="list-style-type: none"> • PO: 10 g Q6H x 20 doses.³² 	40 g	---

Abbreviations: BSA = body surface area; CCB = calcium channel blocker; ED = emergency department; h = hour; IM = intramuscular; IV = intravenous; min = minutes; NS = normal saline; PO = by mouth; PRN = as needed; SC = subcutaneous; SCr = serum creatinine; sec = seconds; TID = three times daily; ULN = upper limit of normal

*Expert Consensus Guidelines for Stocking of Antidotes in Hospitals That Provide Emergency Care recommends that these antidotes be available **within 60 min.**¹ These can be stocked in the pharmacy if the antidote can be delivered to the emergency department quickly.¹

****Expert Consensus Guidelines for Stocking of Antidotes in Hospitals That Provide Emergency Care recommends that these antidotes be available immediately (e.g., stocked in the emergency department).¹**

- a. Doses may vary according to resource used. Some doses may differ from manufacturer product labeling. Doses may also vary depending on patient-specific characteristics/clinical considerations and **should not be used without consultation of appropriate resources and/or consultation with a poison control center.**
- b. Information provided to aid in determining appropriate product par levels to stock. **Doses are an approximation** and in most cases will vary depending on patient-specific characteristics and clinical considerations (e.g., weight, amount drug/poison ingested, kidney function, etc). This information should **NOT** be used to guide treatment.
- c. In Canada, some drugs (e.g., black widow antivenin, hydroxocobalamin) are available through Health Canada's Special Access Programme.³

Users of this resource are cautioned to use their own professional judgment and consult any other necessary or appropriate sources prior to making clinical judgments based on the content of this document. Our editors have researched the information with input from experts, government agencies, and national organizations. Information and internet links in this article were current as of the date of publication.

References

- Dart RC, Goldfrank LR, Erstad BL, et al. Expert Consensus Guidelines for Stocking of Antidotes in Hospitals That Provide Emergency Care. *Ann Emerg Med.* 2018 Mar;71(3):314-325.e1.
- Gummin DD, Mowry JB, Beuhler et al. 2022 Annual Report of the National Poison Data System® (NPDS) from America's Poison Centers®: 40th Annual Report. *Clin Toxicol (Phila).* 2023 Oct;61(10):717-939.
- Ontario Poison Centre. Guidelines for stocking emergency antidotes. October 2020. https://www.ontariopoisoncentre.ca/siteassets/pdfs/english/opcm-antidote-stocking-recommendations-2020.pdf#mce_temp_url#. (Accessed June 6, 2024).
- Dart RC, Mullins ME, Matoushek T, et al. Management of Acetaminophen Poisoning in the US and Canada: A Consensus Statement. *JAMA Netw Open.* 2023 Aug 1;6(8):e2327739. Erratum in: *JAMA Netw Open.* 2023 Sep 5;6(9):e2337926.
- Chyka PA, Seger D, Krenzelok EP, Vale JA; American Academy of Clinical Toxicology; European Association of Poisons Centres and Clinical Toxicologists. Position paper: Single-dose activated charcoal. *Clin Toxicol (Phila).* 2005;43(2):61-87.
- Rietjens SJ, de Lange DW, Meulenbelt J. Ethylene glycol or methanol intoxication: which antidote should be used, fomepizole or ethanol? *Neth J Med.* 2014 Feb;72(2):73-9.
- University of Maryland School of Pharmacy. Maryland Poison Center. *ToxTidbits.* May 2021. <https://mdpoison.com/media/SOP/mdpoisoncom/ToxTidbits/2021/May%202021%20ToxTidbits.pdf>. (Accessed June 6, 2024).
- Sasanami M, Yamada T, Obara T, et al. Oral Ethanol Treatment for Ethylene Glycol Intoxication. *Cureus.* 2020 Dec 25;12(12):e12268.
- Le Daré B, Gicquel T. Therapeutic Applications of Ethanol: A Review. *J Pharm Pharm Sci.* 2019;22(1):525-535.
- Product monograph for GlucaGen. Novo Nordisk Canada. Mississauga, ON L5N 6M1. February 2022.
- Dougherty PP, Klein-Schwartz W. Octreotide's role in the management of sulfonylurea-induced hypoglycemia. *J Med Toxicol.* 2010 Jun;6(2):199-206.
- Product information for Aticholium. Direct Success. Farmingdale, NJ 07727. July 2023.
- CDC. Radiation emergencies. Potassium iodide (KI). April 16, 2024. <https://www.cdc.gov/radiation-emergencies/treatment/potassium-iodide.html>. (Accessed June 7, 2024).
- Product information for Protopam. Baxter Pharmaceutical Solutions. Bloomington, IN 47403. January 2018.
- Product information for Radiogardase. Heyl Chemisch, Berlin, Germany. August 2014.
- Product information for isoniazid. Chartwell Pharmaceuticals. Congers, NY 10920. May 2023.
- Product monograph for isoniazid. Pendopharm. Montreal, QC H4P 2T4. November 2020.
- Ivanov I, Lee VR. Hydrazine Toxicology. [Updated 2023 Apr 23]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK592403/>. (Accessed June 8, 2024).
- Product information. North American coral snake antivenin (equine). Wyeth Pharmaceuticals. Philadelphia, PA 19101. July 2019.
- Product information for Anascorp. Rare Disease Therapeutics. Franklin, TN 37067. August 2022.
- Prakash S, Patel H, Kumar S, Shah CS. Cyproheptadine in serotonin syndrome: A retrospective study. *J Family Med Prim Care.* 2024 Apr;13(4):1340-1346.
- Clinical Pharmacology powered by ClinicalKey. Tampa (FL): Elsevier. 2024. <http://www.clinicalkey.com>. (Accessed June 5, 2024).
- Malignant Hyperthermia Association of the United States. FAQs. <https://www.mhaus.org/faqs/category/frequently-asked-questions-about/dantrolene/>. (Accessed June 9, 2024).
- Malignant Hyperthermia Association of the United States. Safe and unsafe anesthetics. <https://www.mhaus.org/healthcare-professionals/be-prepared/safe-and-unsafe-anesthetics/>. (Accessed June 9, 2024).
- Ghosh A, Boyd R. Leucovorin (calcium folinate) in "antifreeze" poisoning. *Emerg Med J.* 2003 Sep;20(5):466.
- Perrott J, Murphy NG, Zed PJ. L-carnitine for acute valproic acid overdose: a systematic review of published cases. *Ann Pharmacother.* 2010 Jul-Aug;44(7-8):1287-93 [abstract].
- Agency for Toxic Substances and Disease Registry. Ethylene glycol and propylene glycol toxicity. March 20, 2022. <https://www.atsdr.cdc.gov/csem/ethylene-propylene-glycol/treatment.html>. (Accessed June 9, 2024).
- Ali J, Thompson M, Mackenzie C. Assessing the frequency and types of errors involved in the use of a modified intravenous N-acetylcysteine protocol for acetaminophen overdose. *CJEM.* 2024 Mar;26(3):174-178.
- Riley D. Clonidine toxicity. August 21, 2023. <https://emedicine.medscape.com/article/819776-overview>. (Accessed June 4, 2024).
- Lavonas EJ, Akpunonu PD, Arens AM, et al. 2023 American Heart Association Focused Update on the

- Management of Patients With Cardiac Arrest or Life-Threatening Toxicity Due to Poisoning: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2023 Oct 17;148(16):e149-e184.
31. The Royal Children's Hospital Melbourne. Clinical practice guideline. https://www.rch.org.au/clinicalguide/guideline_index/Use_of_Activated_Charcoal_in_Poisonings/. (Accessed June 5, 2024).
 32. Product information for Vistogard. Wellstat Therapeutics. Rockville, MD 20850. February 2017.
 33. Goldfine CE, Troger A, Erickson TB, Chai PR. Beta-blocker and calcium-channel blocker toxicity: current evidence on evaluation and management. *Eur Heart J Acute Cardiovasc Care*. 2024 Feb 16;13(2):247-253.
 34. Malignant Hyperthermia Association of the United States. What should be on an MH cart? <https://www.mhaus.org/healthcare-professionals/be-prepared/what-should-be-on-an-mh-cart/>. (Accessed June 14, 2024).
 35. Alshaya OA, Alhamed A, Althewaibi S, et al. Calcium Channel Blocker Toxicity: A Practical Approach. *J Multidiscip Healthc*. 2022 Aug 30;15:1851-1862.
 36. Krenz JR, Kaakeh Y. An Overview of Hyperinsulinemic-Euglycemic Therapy in Calcium Channel Blocker and β -blocker Overdose. *Pharmacotherapy*. 2018 Nov;38(11):1130-1142.
 37. Manitoba Poison Centre. High-Dose Insulin Euglycemia Therapy (HDIE)/ Hyperinsulinemia-Euglycemia Therapy (HIE). February 2024. <https://www.ontariopoisoncentre.ca/siteassets/pdfs/english/highdoseinsulin2024.pdf>. (Accessed June 14, 2024).

Cite this document as follows: Clinical Resource, Drugs for Selected Medication Overdoses and Poisonings. Pharmacist's Letter/Pharmacy Technician's Letter/Prescriber Insights. June 2024. [400663]

—To access hundreds more clinical resources like this one, visit trchealthcare.com to log in or subscribe—