H-R1 CARDIOVASCULAR DRUGS		First Responder EMT AEMT Paramedic

NOTE: Poison Control may be contacted **[1-800-222-1222]** for **INFORMATION ONLY.** Treatment modalities must utilize these guidelines, or may be received through online Medical Control.

Cardiovascular Drugs		
Substance	Notes	Treatment (beyond typical supportive care)

Digitalis/Cardiac Glycosides
Digoxin
 	
Plants
Foxglove
Lily of the Valley
Oleander
Red Squill
 	
Skin of Toads (Bufonidae)
	• Acute toxicity:
	  ○ GI sxs (nausea/vomiting)
	  ○ Cardiac (**bradyarrhythmias, AV block,** etc.) with dizziness, syncope, etc.
	• Chronic toxicity/accumulation
	  ○ Typically the result of drug–drug interactions or changes in kidney function.
	  ○ Usually vague/nonspecific complaints including **weakness,** fatigue, **confusion/delirium**, etc.
	• The classic description includes viewing **yellow-green halos around objects**, termed *xanthopsia*.
		ED Treatment:
		Digibind (digoxin-specific antibody [Fab] fragments)

β-Adrenergic receptor antagonists (β-blockers)
Atenolol
Carvedilol
Labetalol
Metoprolol
Propranolol
…and others
	• Symptoms:
	  ○ Cardiovascular: **bradycardia**, cardiac dysrhythmias and **cardiogenic shock**
	  ○ Pulmonary: bronchospasm
	  ○ Neurologic/CNS: altered mental status, coma, and seizures
	  ○ **HYPOglycemia**
	• Notes:
	  ○ Propranolol can block sodium channels → wide QRS = treat with Sodium Bicarbonate
	  ○ Sotalol → QT prolongation/torsades = treat with Magnesium
		Fluid resuscitation and vasopressors, as per Medical Shock [M-06]
		
		ED Treatments:
		• **Glucagon** - requires <u>very</u> high doses
		• **High-dose Insulin**, with dextrose (D50, D10, etc.)
		• **Lipid emulsion therapy** (acts as a sink lessening the effect of the drug)

Calcium channel	• All CCBs relax vascular smooth muscle,	**Same as β-blockers**

blockers (CCBs) <u>Nondihydropyridines</u> *Diltiazem* *Verapamil* <u>Dihydropyridines</u> *Amlodipine* *Felodipine* *Isradipine* *Nicardipine* *Nifedipine* *Nimodipine* *Nisoldipine*	reduce pacemaker activity, and decrease cardiac contractility that ultimately may result in cardiovascular collapse. ● **Nondihydropyridines** ○ **Slow heart rate** (more rate control, i.e. “cardioselective”) ○ Used to manage hypertension, control atrial flutter/fibrillation and other supraventricular tachycardias ● **Dihydropyridines** ○ **Lower blood pressure** (more vasodilation) ○ May have **reflex tachycardia** ○ Used to treat hypertension, angina, and vasospasm after SAH ● Symptoms ○ **Profound, resistant hypotension** from decreased cardiac output and peripheral vasodilation ○ **HYPERglycemia** (compared to hypoglycemia from β-blockers	(above), also may consider more aggressive calcium administration: **Calcium Chloride** **1 gram (20 mg/kg) IV/IO** *or* **Calcium Gluconate** **1 gram (20-50 mg/kg) IV/IO** ● Give over 10 minutes ● Repeat every 20 minutes as needed
Diuretics *Amiloride* *Bumetanide* *Chlorothiazide* *Chlorthalidone* *Eplerenone* *Furosemide* *Hydrochlorothiazide* *Indapamide* *Metolazone* *Spironolactone* *Triamterene*	● Cause increased urine production leading to hypovolemia/dehydration and various possible electrolyte disturbances	Fluid Resuscitation
Alpha-Adrenergic Blockers α1-Blockers *Doxazosin* *Prazosin*	● Mechanism: inhibit peripheral sympathetic tone in order to decrease blood pressure. ● **Doxazosin**, **prazosin**, and **terazosin** primarily reduce peripheral vascular resistance (treatment of hypertension)	

Tamsulosin
Terazosin
 	
α2-Agonist
Clonidine
	• T**amsulosin** is used exclusively for management of benign prostatic hyperplasia (BPH)
	• **Clonidine**
	  ○ **ONE PILL may cause severe symptoms in a child**
	  ○ Stimulates α2-adrenergic receptors in the CNS, inhibiting release of catecholamines, resulting in decreased heart rate, contractility, and peripheral vascular resistance.
	  ○ Severe symptoms → **bradycardia, CNS depression, and hypotension**	

ACE Inhibitors [-PRIL's]
(Angiotensin Converting Enzyme)
Benazepril
Captopril
Enalapril
Fosinopril
Moexipril
Perindopril
Quinapril
Trandolapril
 	
ARBs [-SARTAN's]
(Angiotensin Receptor Blockers)
Candesartan
Eprosartan
Irbesartan
Losartan
Telmisartan
Valsartan
	• Not been associated with significant morbidity in overdose.
	• Mechanism: inhibition of ACE causes decreased production of angiotensin II, resulting in vasodilation. ARB's block the receptor directly.
	• **Angioedema**
	  ○ Most dangerous adverse effect
	  ○ Not dose dependant
	  ○ **Can occur any time** during treatment (i.e. years of being on the drug)
		Aggressive airway management with angioedema, including the need for potential surgical airway (cricothyrotomy)

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Vasodilators *Hydralazine* *Minoxidil*	• Isolated vasodilation (no direct cardiac effects) decreases blood pressure. • May be associated with reflex tachycardia.	