

SECTION: R-06

PROTOCOL TITLE: Calcium Channel Blocker/Beta Blocker OD

REVISED: November 1, 2019

GENERAL COMMENTS:

BLS SPECIFIC CARE: See Protocols R-1, M-1, PM-1, PM-9

AEMT/O.M. SPECIFIC CARE: See adult General Toxicological Care Protocol R-1

ALS SPECIFIC CARE: See adult General Toxicological Care Protocol R-1

- Apply cardiac monitor and multi-function electrode (MFE) pads
- 12-lead EKG
- Contact OLMC at earliest indication of calcium channel blocker overdose

ANTIDOTES

- **Calcium Chloride (for Calcium Channel Blocker Only)**
 - IVP (Slow): 500-1000 mg
- **Glucagon**
 - IV,IM: 1-2 mg, repeated every 5 minutes as needed

Do not use diluents (e.g. propylene glycol) supplied with single use kits. Use saline Instead

Cardiovascular Agents:

In conjunction with fluids and glucagon

- Atropine sulfate:
 - Not indicated for complete and high degree heart blocks
 - Adult:
 - 0.5 mg IV/IO as needed every 3-5 minutes.
 - Maximum total dose 3 mg
 - Pediatric:
 - 0.02 mg/kg IV/IO
 - Minimum dose: 0.1 mg
 - Maximum child dose: 0.5 mg
 - Repeat every 3-5 minutes as needed

Cardiac pacing for patients not promptly responsive to pharmacological therapy

- **Adult and Pediatric:**
 - Start at 80 ppm and 30 mA.
 - Titrate for mechanical Capture
 - Consider sedation/analgesia per protocol with transcutaneous pacing if it will not cause unnecessary delays

Vasopressors:

For bradycardia or hypotension unresponsive to other therapies

- **Epinephrine infusion**
 - **IV Infusion: IV/IO: 0.05-1 mcg/kg/min titrate for effect**
 - **For refractory Cases**
- *Dopamine infusion*
 - Adult and Pediatric: 2-20 mcg/kg/min

PHYSICIAN PEARLS:

Calcium Channel Blockers

- Aggressive cardiovascular support is necessary for management of massive calcium channel blocker overdose. While calcium may overcome some adverse effects of CCBs, it rarely restores normal cardiovascular status.
- According to many case reports, glucagon has been used with good results. However, vasopressors are frequently necessary for adequate resuscitation and should be requested early if hypotension occurs.

Beta Blockers

- **Bradycardia with associated hypotension and shock (systolic BP <80 mm Hg, HR <60 BPM) defines severe beta-blocker toxicity.** Bradycardia by itself is not necessarily helpful as a warning sign because slowing of the heart rate and dampening of tachycardia in response to stress is observed with therapeutic levels.
- While case reports have documented hypotension in the absence of bradycardia, blood pressure usually does not fall before the onset of bradycardia. Bradycardia may be isolated or accompanied by mild conduction disturbances affecting the entire cardiac conduction system from the sinus node to the intraventricular Purkinje system.
- Cardiac pacing may be effective in increasing the rate of myocardial contraction. Electrical capture is not always successful and, if capture does occur, blood pressure is not always restored. *Reserve cardiac pacing for patients unresponsive to pharmacological therapy.* Multiple case reports describe complete neurological recovery, even with profound hypotension, if a cardiac rhythm can be sustained.
- Hypoglycemia, while uncommon, occasionally occurs with beta blocker use. *Always check a BG with a suspected Beta Blocker OD.*
- Agents with combined alpha- and beta-selective properties (Dopamine and Epinephrine) may be necessary to maintain blood pressure. A beta-agonist may competitively antagonize the effect of the beta-blocker. The amount of beta-agonist required might be several orders of magnitude above those recommended in standard ACLS protocols.