

SECTION: R-6

PROTOCOL TITLE: Calcium Channel Blocker/Beta Blocker OD

REVISED: April 29, 2011

GENERAL COMMENTS:

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

- Maintain patent airway as necessary
- Supplemental oxygen as needed and as tolerated
- Assisted ventilations if necessary to maintain adequate SpO₂
- Obtain a full set of vital signs
- Assess blood glucose level as needed
- If pediatric patient, determine patient's color category on length based resuscitation tape (Broselow Tape)
- Position patient as appropriate
- In addition to obtaining standard medical history attempt to obtain:
 - o Name of ingested substance(s)
 - o Quantity ingested
 - o Time of ingestion
 - o Has vomiting occurred?

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

- If adult patient, obtain intravenous access and administer one 250-500 ml crystalloid fluid bolus (20 ml/kg over 10-20 minutes if pediatric patient) if signs and symptoms of volume depletion are present
- Use Metriset administration set on medical patients less than 8 years of age
- Withhold fluids and maintain IV at TKO rate if patient is hemodynamically stable or if signs and symptoms of fluid overload are present

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

- Maintain patent airway as necessary to include endotracheal intubation when appropriate.
- Apply cardiac monitor and multi-function electrode (MFE) pads if necessary.
- Bradycardia with variable degrees of AV block are common
- 12-lead EKG if indicated
- Contact OLMC at earliest indication of calcium channel blocker overdose
Additional 500 ml NS boluses

Protocol R-6

Calcium Channel Blocker/BETA BLOCKER

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 and as available

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
 - Maximum total child dose: 1 mg
 - Maximum adolescent dose: 1 mg
 - Maximum total adolescent dose: 2 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 80 mA.
 - 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

- ♦ Adult: 2-10 mcg/min.
 - Titrated to adequate heart rate and/or blood pressure response
 - See, "Adult Epinephrine Infusion Chart"
- ♦ Pediatric: 0.1-1 mcg/kg/min.
 - Titrated to adequate heart rate and/or blood pressure response
 - See, "Pediatric Epinephrine," preparation/infusion chart

Dopamine infusion

- Adult and Pediatric: 2-20 mcg/kg/min.
 - Titrated to adequate heart rate and/or blood pressure response
 - See, "Adult Dopamine," and, "Pediatric Dopamine," infusion charts

Nebulized bronchodilators

For associated bronchospasm.

- ♦ Pediatric and adult.
 - For first treatment, combine one albuterol (2.5 mg/3 mL) nebule and one Atrovent (0.5 mg/2.5 mL) nebule in reservoir of oxygen driven nebulizer unit and administer at 10 LPM
 - If Atrovent is contraindicated, use 2 albuterol nebules for first treatment
 - Repeat as needed with albuterol treatments only

Protocol R-6

Calcium Channel Blocker/BETA BLOCKER

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