

Protocol 7-5

SECTION: Toxicological Emergencies

PROTOCOL TITLE: Medical – Overdose/Poisoning –
Calcium Channel Blocker

REVISED: 06/2017

CALCIUM CHANNEL BLOCKER

OVERVIEW:

Overdose by immediate-release agents is characterized by rapid progression to hypotension, brady-arrhythmias, and cardiac arrest. Overdose by extended-release formulations can result in delayed onset of arrhythmias, shock, delayed cardiac collapse, and bowel ischemia. Unfortunately, the history of poisoning / overdose is notoriously unreliable whether it is obtained from the patient, friends and family members or emergency services personnel. Despite the possible inaccuracies, the most important historical factors include **what** poison was involved, **how much** was taken, **how** it was taken, **when** it was taken, **why** it was taken, and especially **what else** was taken. Poison Control may be contacted at any time for information on poisoning (1-800-222-1222) but **only Medical Control may give patient treatment orders.**

HPI	Signs and Symptoms	Considerations
<ul style="list-style-type: none"> • Use or suspected use of a potentially toxic substance • Substance ingested, route, and quantity used • Time of use • Reason (suicidal, accidental, criminal) • Available medications in home • Past medical history 	<ul style="list-style-type: none"> • Mental status changes • Hypotension • Bradycardia, other dysrhythmias 	<ul style="list-style-type: none"> • Co-ingestions • Cardiac medications • Anti-hypertensive medications

	EMR	EMT	A	I	P
1. Obtain general assessment of the patient.	•	•	•	•	•
2. Administer Oxygen to maintain <u>SPO₂</u> 94 - 99%	•	•	•	•	•
3. Suction oropharynx as necessary.	•	•	•	•	•
4. Obtain blood glucose sample. If glucose is < 60 mg / dL or > 300 mg / dL, refer to <u>Hypoglycemia or Hyperglycemia protocol.</u>	•	•	•	•	•
5. Establish IV of Normal Saline. Titrate to maintain a systolic BP > 90 mmHg.			•	•	•
6. Administer Normal Saline 250 ml Bolus as needed to maintain systolic BP > 90 mmHg. Bolus amount should not exceed 20 cc / kg. Caution should be used with patients with history of renal failure and HF. Re-assess after 250 ml for signs of fluid overload.			•	•	•
7. Place the patient on a cardiac monitor and obtain / interpret <u>12 lead ECG.</u> Refer to appropriate <u>Cardiac Care protocol.</u>		•	•	•	•

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	EMR	EMT	A	I	P
8. Administer <u>CALCIUM CHLORIDE</u> 2.0 – 4.0 mg / kg IVP / IO every 10 minutes until signs and symptoms improve.				•	•
9. If no response noted to Calcium Chloride, administer <u>GLUCAGON</u> 1 mg IVP / IO. If no response in five (5) minutes, administer one (1) repeat dose of Glucagon 1 mg IVP / IO.				•	•
10. Administer <u>LEVOPHED</u> Infusion 0.1 – 0.5 mcg / kg / minute for hypotension that remains after fluid bolus administration.				•	•
11. Transport promptly in position of comfort. Reassess vital signs as indicated.		•	•	•	•

PEARLS:

1. Aggressive cardiovascular support is necessary for management of massive calcium channel blocker overdose. While calcium may overcome some adverse effects of calcium channel blockers, it rarely restores normal cardiovascular status.
2. Consider using calcium only if a witness confirms a CCB overdose; calcium may induce fatal arrhythmias in digoxin overdose, which can present with similar findings.
3. Empiric use of glucagon (adults: 5 - 15 mg IV) may be warranted for patients with an unknown overdose presenting with bradycardia or hypotension.
4. Atropine may be tried if hemodynamically significant bradycardia occurs; however, heart block is usually resistant to atropine in CCB toxicity. Mid-dose dopamine (5 - 10 mcg / kg / min) may improve heart rate and contractility.¹
5. According to many case reports, glucagon has been used with good results. However, vasopressors are frequently necessary for adequate resuscitation and should be administered early if hypotension occurs.
6. Be prepared to manage the airway after Glucagon administration due to possible emesis.
7. Do not rely on patient history of ingestion, especially in suicide attempts.
8. Bring bottles and contents to ER with patient.

Common Calcium Channel Blocker medications

• Amlodipine (Norvasc)	• Isradipine (Dynacirc)	• Nimodipine (Nimotop)
• Bepridil (Vascor)	• Nicardipine (Cardene)	• Nisoldipine (Sular)
• Diltiazem (Cardizem)	• Nifedipine (Adalat, Procardia)	• Verapamil (Calan, Isoptin)
• Felodipine (Plendil)		

¹ MedScape: Emergent Management of Calcium Channel Blocker Toxicity ; Author B. Zane Horowitz, MD, FACMT