

J07: Beta Blockers

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Reviewed:

Introduction

Beta blockers are widely used in the management of an extensive range of clinical problems, including hypertension, heart failure, migraine headaches, tremor, and aortic dissection. Although overdoses of these medications, either accidental or otherwise, occur infrequently, beta blocker toxicity associated with significant morbidity and mortality. The primary mechanism for beta blocker toxicity is through the adrenergic blocking action of these medications. Some beta blockers, such as sotalol, propranolol, and acebutalol, have significant pro-arrhythmic tendencies.

Essentials

- As with all poisoning or overdoses, manage the airway and ensure adequate oxygenation and ventilation while a more comprehensive history is obtained
- Search for and treat reversible causes: do not overlook other causes of the patient's symptoms
- Prehospital management of beta blocker overdose is limited, and specific therapies should only be undertaken in consultation with ClinCall. Rapid transport is indicated for virtually all patients.

General Information

- Consider the possibility of co-ingestion of other drugs in patients who are suspected of beta blocker toxicity, particularly calcium channel blockers, digoxin, clonidine, and cholinergic agents.
- Beta blocker toxicity is generally more severe in individuals with a pre-existing cardiovascular history.
- Patients who have overdosed on beta blocking drugs typically become symptomatic within two hours, with virtually all becoming symptomatic within six hours.
- The most common symptoms are bradycardia and hypotension. Myocardial depression and cardiogenic shock can develop in severe cases. Ventricular dysrhythmias are more common with propranolol and sotalol. Mental status changes, such as confusion, delirium, seizures, and unconsciousness, can occur at virtually any point.
- Respiratory depression has been reported. Bronchospasm and hypoglycemia, produced by the beta blockade, can complicate management.
- Possible electrocardiogram changes include PR elongation, QRS prolongation, and any bradydysrhythmia.

Interventions

First Responder

- Protect the airway and ensure adequate oxygenation and ventilation
 - → [B01: Airway Management](#)
- Provide supplemental oxygen as required
 - → [A07: Oxygen and Medication Administration](#)

Emergency Medical Responder – All FR interventions, plus:

- Provide supplemental oxygen to maintain SpO₂ ≥ 94%
 - → [A07: Oxygen and Medication Administration](#)
- Measure capillary blood glucose levels
- Initiate transport and consider ACP intercept

Primary Care Paramedic – All FR and EMR interventions, plus:

- Consider vascular access and fluid bolus. Target systolic blood pressure of 90 mmHg or better. Do not give

more than 2 L of fluid.

- → [D03: Vascular Access](#)
- Correct hypoglycemia if present:
 - → [E01: Hypoglycemia and Hyperglycemia](#)

Advanced Care Paramedic – All FR, EMR, and PCP interventions, plus:

- Obtain and interpret 12-lead ECG
 - → [PR16: 12 Lead ECG](#)
- Treat bradycardia:
 - → [C02: Bradycardia](#)
 - [Atropine](#). Note that atropine may not reverse bradycardia, or offer only partial recovery
 - [Transcutaneous pacing](#) may be required, and may be ineffective
- Manage seizures:
 - [MIDAZOLam](#)
 - See CPG [F02: Seizures](#) for additional details.
- If airway management is required, *aggressively* attempt to limit peri-procedural hypotension.
- → [PR18: Anesthesia Induction](#)
- → [PR23: Awake Intubation](#)

CONSULTATION WITH CLINICAL (1-833-829-4099) IS MANDATORY FOR ANY OF THE FOLLOWING THERAPIES:

- Consider [glucagon](#): 5 mg slow IV push if available.
- Correct ventricular arrhythmias:
 - Consider [calcium chloride](#).
 - Consider [sodium bicarbonate](#) in wide complex dysrhythmias.
 - Consider [magnesium sulfate](#) (particularly in cases of sotalol-induced ventricular dysrhythmia)
 - Consider [EPINEPHrine](#) infusion, escalating in consultation with CliniCall. Note that higher dose rates may be required to overcome competitive inhibition.

Evidence Based Practice

[Overdose-Poisoning](#)

References

1. Barrueto F. Beta blocker poisoning. In UptoDate. 2020. [\[Link\]](#)

