



**Signs of BB and CCB toxicity:**  
 Hemodynamics abnormalities such as low heart rate, low blood pressure, decreased contractility or abnormal peripheral vascular resistances

**“Watch out for fluid overload”**

\* In the absence of myocardial dysfunction

Dialyzable beta-blockers: Sotalol, Atenolol

Moderately dialyzable beta-blockers: Acebutolol, bisoprolol (to discuss with the toxicologist)

Dialyzable beta-blockers with limited clinical date: Nadolol (to discuss with the toxicologist)

**Cardiac arrest secondary to BB and CCB toxicity**  
**Standard ACLS**  
**Sodium bicarbonates if signs of sodium channel blockade (wide QRS)**  
**Calcium IV if calcium channel blockade**  
**Lipid emulsion therapy**  
**VA-ECMO (ECLS) if available**

**ANTIDOTES:**

Please consult: <https://www.ciuss-capitalenationale.gouv.qc.ca/antidotes>

**Doses for first line treatments:**

**Sodium bicarbonate bolus:**

- 1 – 2 mmol/kg IV direct to be repeated as needed until QRS improvement (blood pH max 7.55)
- Adults and children aged 2 yo and more: Use a 7.5% (0.89 mmol/mL) or a 8.4% (1 mmol/mL) solution
  - Children < 2 yo: Use a 4.2% (0.5 mmol/mL) solution max 8 mmol/kg/day (do not administer IV direct)

**Calcium IV:**

Peripheral IV or central line

- Adults: 3 to 6 g (30 – 60 mL) of calcium gluconate 10% IV direct, to be repeated as needed every 10 min for a maximum of 4 doses and then check calcemia (target mild hypercalcemia)
- Children: 30 – 60 mg/kg (0.3 – 0.6 mL/kg) of calcium gluconate 10% IV direct, to be repeated as needed every 10 min for a maximum of 4 doses and then check calcemia (target mild hypercalcemia)

Central line

- Adults: 1 to 2 g (10 – 20 mL) of calcium chloride 10% IV direct, to be repeated as needed every 10 min for a maximum of 4 doses and then check calcemia (target mild hypercalcemia)
- Children: 10 to 20 mg/kg (0.1 to 0.2 mL/kg) of calcium chloride 10% IV direct, to be repeated as needed every 10 min for a maximum of 4 doses and then check calcemia (target mild hypercalcemia)

**High-dose insulin (expect 30 – 60 min before observing an effect):**

- High dose insulin IV (regular): 1 unit/kg bolus followed by an infusion at 1 unit/kg/h (maintain euglycemia with dextrose)
- For the incremental doses of high-dose insulin IV (regular): Progressive increase of the infusion rate up to 10 units/kg/h (maintain euglycemia with dextrose)
- Plan to administer D50% in adults or D25% in children by a central line to limit IV fluids. As an example, a 70 kg patient could need an initial bolus of 50 mL of D50% followed by an IV infusion of 0.5 – 1 g/kg/h, which could be equivalent to 70 – 140 mL/h of D50%

**Information concerning vasopressors and inotropes for centers where protocols are not available: High doses are expected at high concentrations to limit IV fluids.**

Vasopressors	Indications	Dose	Receptors			
			α1	β1	β2	Dopamine
<b>Norepinephrine</b>	Increases mostly peripheral vascular resistances, but may increase heart rate and contractility. Often used in undifferentiated shock and vasoplegic shock.	0.01 à 3 mcg/kg/min (no max dose)	+++++	+++	++	N/A
<b>Epinephrine</b>	Increases heart rate, contractility, peripheral vascular resistances, decreases bronchospasms. Often used in bradycardia cardiogenic shock or anaphylactic shock.	0.01 à 0.50 mcg/kg/min (no max dose)	+++++	++++	+++	N/A
<b>Dopamine</b>	Increases heart rate and contractility from 3 to 10 mcg/kg/min, but increases more peripheral vascular resistances from 10 to 20 mcg/kg/min. Often used at low dose for bradycardia and at higher dose for vasoplegic shock.	2 à 20 mcg/kg/min (less benefit if more than 20 mcg/kg/min)	+++ (10 to 20 mcg/kg /min)	++++ (3 to 10 mcg/kg /min)	++ (3 to 10 mcg/kg /min)	+++++ (0.3 to 3 mcg/kg/min)