

## Treatment of Local Anesthetic Systemic Toxicity (LAST)

### Signs/Symptoms of Toxicity due to Local Anesthetics (e.g., Lidocaine, Bupivacaine, Ropivacaine, etc.)

#### MILD TO MODERATE

- Anxiety/impaired concentration
- Perioral numbness or tingling
- Mental status changes
- Lethargy
- Muscular twitching, tremors
- Metallic taste
- Tinnitus
- Lightheadedness, dizziness
- Dysarthria
- Visual disturbances

#### SEVERE

##### CNS

- Seizures (tonic-clonic)
- Agitation
- Loss of consciousness

##### Cardiac

- Tachycardia/hypertension
- Ventricular arrhythmias
- Bradycardia/hypotension
- Cardiac arrest

**For signs/symptoms of Mild/Moderate toxicity:** Discontinue local anesthetic immediately. Monitor closely for sign/symptom resolution or worsening. Consider lipid emulsion therapy at the first sign of a serious LAST event

**For signs/symptoms of Severe toxicity:** Discontinue local anesthetic immediately. Follow checklist for the treatment of local anesthetic toxicity below. Activate code response if necessary.

### Treatment of Severe Local Anesthetic Toxicity

#### Checklist for the Treatment of Local Anesthetic Systemic Toxicity (LAST)<sup>1,2</sup>

##### Pharmacologic Treatment of LAST is Different from Other Cardiac Arrest Scenarios

- AVOID vasopressin, calcium channel blockers, beta blockers, and local anesthetic-based anti-arrhythmics
- Consider reducing each epinephrine doses to < 1 mcg/kg.
  - Dilute 1 mg in 100 mL NS (10 mcg/mL) for dosing accuracy

- Immediately discontinue all local anesthetics
- Notify anesthesia clinician/acute pain service
- Consider lipid emulsion therapy at first sign of severe LAST event
  - Located in the crash cart, select anesthesia pyxis/carts, and the OR Pharmacy satellites
- Administer all doses through a 1.2 micron filter

##### Lipid Emulsion 20% Dosing Recommendations

(Precise volume and flow rate are not crucial)

Greater than 70 kg	Less than 70 kg
Bolus 100 mL lipid emulsion 20% rapidly over 2-3 minutes followed by a 250 mL infusion over 20 min	Bolus 1.5 mL/kg rapidly over 2-3 minutes followed by a 0.25 mL/kg/min (IBW) infusion over 20 minutes

If patient remains unstable:

- Re-bolus once or twice at the same dose and double infusion rate
- Do not exceed 12mL/kg IBW lipid emulsion (particularly important in the small adult or child)

- Airway management
  - Ventilate with 100% oxygen; avoid hyperventilation; advanced airway device as needed
- Seizure suppression
  - Benzodiazepines preferred (in addition to lipid emulsion therapy)
  - Avoid large doses of propofol, especially in patients with cardiovascular instability
- Treat hypotension and bradycardia – If pulseless, start CPR
- Monitoring
  - At least 4-6 hours after a cardiovascular event or 2 hours after a limited CNS event
- Report SEMS event

Adapted from 2018 American Society of Regional Anesthesia and Pain Medicine

## References

1. Neal JM, Woodward CM, Harrison TK. The American Society of Regional Anesthesia and Pain Medicine Checklist for Managing Local Anesthetic Systemic Toxicity: 2017 Version. *Reg Anesth Pain Med.* 2018;43(2):150-153.
2. Neal JM, Barrington MJ, Fettiplace MR, et al. The Third American Society of Regional Anesthesia and Pain Medicine Practice Advisory on Local Anesthetic Systemic Toxicity: Executive Summary 2017. *Reg Anesth Pain Med.* 2018;43(2):113-123.