ED CLINICAL GUIDELINE
LOCAL ANESTHETIC SYSTEMIC TOXICITY

This guideline is strictly intended for educational purposes, and does not assure outcomes, set a definitive standard of care, or replace the physician's duty to apply clinical judgment tailored to each patient's individual presentation.

CONTEXT & PURPOSE

While generally safe, the growing use of local anesthetics may increase the incidence of Local Anesthetic Systemic Toxicity (LAST). LAST is due to the blockade of voltage-gated sodium channels affecting both the CNS and heart.[1-3]. This guideline aims to equip ED physicians and providers with the knowledge to effectively recognize and manage this rare complication.

CLINICAL FEATURES

CNS

- **Lower Severity:** agitation, confusion, dizziness, drowsiness, dysphoria, auditory changes, tinnitus, perioral numbness, metallic taste, and dysarthria
- **Higher Severity**: Seizures (most common), respiratory arrest, and coma

Cardiac

- Hypotension and bradycardia are the first signs of toxicity and bradyarrhythmias are the most common dysrhythmias
- Ventricular ectopy/tachycardia/fibrillation and asystole are also seen
- Widened QRS and ST changes on ECG

INTERVENTION - LIPID EMULSION THERAPY

All dosing should be based on ***ideal body weight*** *(MDcalc)*

Initial bolus

- ≤ 70kg = 1.5 ml/kg of 20% lipid
- > 70kg = 100 ml of 20% lipid

Infusion

- ≤ 70 kg = 0.25 ml/kg/min. Continue infusion for 10 minutes after hemodynamic stability is attained.
- > 70kg = 200-250 ml over 15-20 minutes
- Max recommended total dose for initial administration is 10-12 mL/kg for 30 minutes.

If stability is not achieved, an **additional** bolus and an increase in the infusion rate to 0.5 ml/kg/min can be administered.

Management is in ***conjunction*** with standard-of-care practices for patients with seizures, dysrhythmias, hemodynamic instability, and cardiac arrest. However, lidocaine **should not** be used as it can exacerbate the condition. If cardiac stability has not been achieved following modified ACLS guidelines and lipid emulsion therapy, then cardiopulmonary bypass is recommended (VA-ECMO).

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DISPOSITION
Admission to medicine telemetry, ICU, or transfer depending on level of stability

Table 1: Maximum doses of common anesthetic agents [5-7] A max dose calculator can be found here on MDCalc.

	w/o Epi	w/ Epi
Lidocaine	5 mg/kg (max 300mg)	7 mg/kg (max 500mg)
Bupivacaine	2 mg/kg (max 175mg)	3 mg/kg (max 225mg)
Mepivacaine	5 mg/kg (max 300mg)	7 mg/kg (max 500mg)
Procaine	7mg/kg (max 500mg)	9mg/kg (max 600mg)
Ropivacaine	3mg/kg (max 225 mg)	

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