# Unmasking LAST: Anesthetic Management of Postoperative Seizure-Like Activity Following Interscalene Block with Liposomal Bupivacaine

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## Introduction

- Local anesthetic systemic toxicity (LAST) is a spectrum of CNS and CVS symptoms, due to supratherapeutic levels of local anesthetic (LA) agents.
- Incidence rates range from 2 – 2.8 per 10,000 cases overall (significant procedure specific variation), lipid emulsion utilization indicates rates as high as 2.6 per 1,000 for peripheral nerve blocks for knee replacements.
- CNS: lower concentrations LAs block inhibitory neuronal pathways (tinnitus, paresthesia, tremor, altered mental status, seizures); higher levels block excitatory pathways (CNS depression, loss of consciousness, coma, respiratory failure.
- CVS: impaired cardiac conduction, repolarization, and myocardial depression due to sodium/potassium/calcium channel blockade, sympatholytic effects, mitochondrial dysfunction and ATP depletion

## Learning Objective

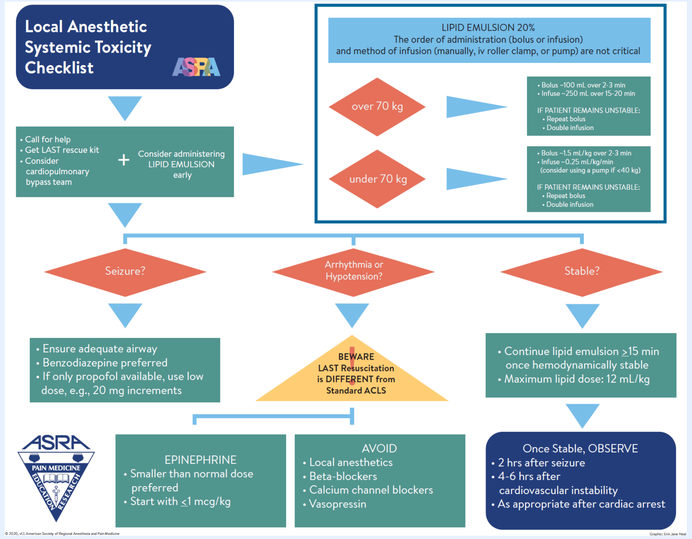
- Recognize early signs and symptoms of local anesthetic systemic toxicity (LAST)
- Review anesthetic interventions including prompt intralipid therapy and management of prolonged seizures.

## Case Description

- A 67-year-old, 94 kg female with a history of hypertension, hyperlipidemia, and migraines, underwent interscalene nerve block w/ 10 ml of 0.5% bupivacaine and 10 ml of liposomal bupivacaine at an outpatient surgical center for an uneventful R shoulder surgery.
- Upon emergence, the patient was difficult to arouse and exhibited intermittent seizure like movements.
- Intralipid therapy was initiated with 20% lipid emulsion bolus (100 ml), after which the patient exhibited rapid clinical improvement. She was given an addition 250 ml intralipid infusion.
- Transferred to the SVMC emergency department, where she again was witnessed to undergo seizure like activity, benzodiazepines were administered and Intralipid therapy was repeated resulting in rapid clinical improvement.
- The patient was transferred to the emergency department and subsequently upgraded to the medical step down unit for further management.
- During her hospitalization, she reported persistent dizziness and headaches but remained hemodynamically stable. The patient had 2 repeated episodes of altered mental status with seizure-like activity between 24-48 hours after her initial admission to the medical step-down unit, requiring repeated therapy with benzodiazepines and Intralipid therapy.
- After the patient was given 12 ml/kg intralipid, therapy was switched to Keppra (2 g loading dose, and 500 mg BID for 2 days) per the recommendations of poison control and neurology.
- Neurologic symptoms gradually resolved, and she was discharged in stable condition after 72 hours of receiving the interscalene block.
- This case highlights the importance of careful medication dosing, vigilance regarding early recognition of LAST, and preparedness for treatment of LAST in regional anesthesia. Particularly when long-lasting liposomal formulations are used.

## Discussion & Recommendations

- Liposomal bupivacaine, designed for prolonged analgesia, carries a risk of delayed systemic absorption and toxicity, particularly when combined with standard bupivacaine.
- This patient demonstrated classic features of CNS toxicity with delayed emergence and seizure-like activity necessitating immediate intervention.
- Intralipid therapy, the mainstay of LAST treatment, acts as a lipid sink to bind circulating anesthetic agents and rapidly reverse symptoms.
- Timely administration of intralipid is critical and was likely life-saving in this case. The combined use of liposomal and non-liposomal bupivacaine may have contributed to cumulative plasma levels leading to toxicity.
- LAST symptoms typically develop within 10 minutes of LA administration, but initial symptoms can be masked by general anesthesia
- LAST should always be considered when neurologic symptoms emerge postoperatively, even several hours after block placement.

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