

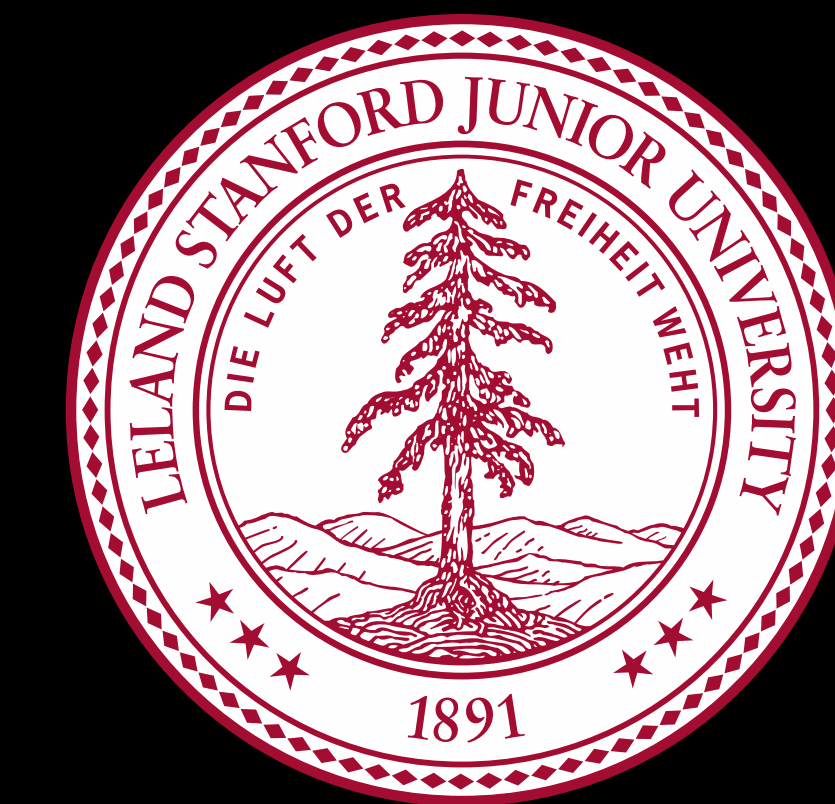


Local Anesthetic Toxicity Awareness in Tertiary Hospitals in Kigali, Rwanda

Jessica Dawson MD MPH¹, Justin Hagumimana MD², Agathe Mushimiyimana MD², Jackson Kwizera MD², Jean de Dieu Tuyishime MD², Gaston Nyirigira MD², Edouard Uwamahoro MD²

Department of Anesthesia, Perioperative and Pain Medicine

¹Stanford University School of Medicine, Stanford, California, United States ²University of Rwanda School of Medicine, Kigali, Rwanda



Introduction

- According to the World Federation of Societies of Anaesthesiologists 2015-2016 study, there are 31 physician anesthesiologists and 445 non-physician anesthetists (NPs) in all of Rwanda (population = 13 million people)
- Most of the anesthesia care in Rwanda, particularly in rural areas, is performed independently by non-physician anesthetists
- Regional anesthesia - local infiltration, neuraxial, and peripheral nerve blocks are frequently performed as a sole anesthetic
- Incidence of LAST in Rwanda unknown



Objectives

- Identify and analyze historical cases of LAST in Kigali hospitals
- Identify lipid emulsion availability
- Increase awareness of LAST through education and simulation

Methods

Anesthesiology residents and attendings at University Teaching Hospital of Kigali, King Faisal Hospital, and Rwanda Military Hospital were informally interviewed regarding potential LAST cases. Common themes were identified. Participants were asked about lipid emulsion availability, location, cost, and supply.

A pre- and post-simulation google survey was sent to the anesthesia residents at the University of Kigali.

Multiple choice questions included:

- Next course of action in suspected case of LAST
- Medications to avoid in LAST
- Cardiovascular signs of LAST
- Recommended dose of 20% lipid emulsion for LAST

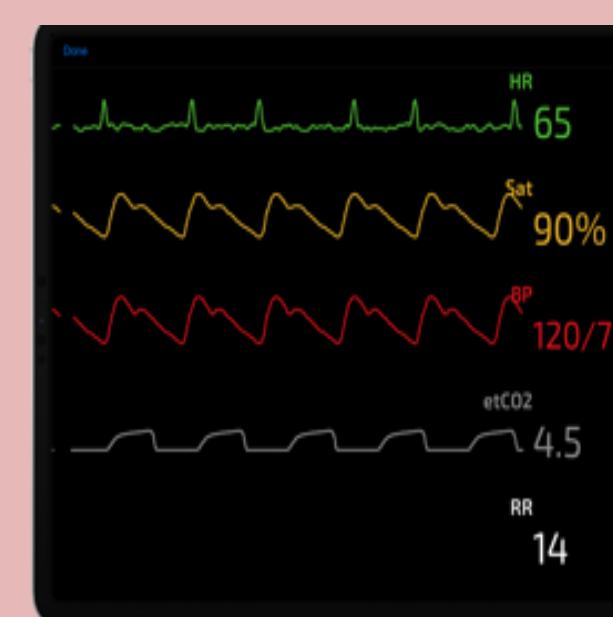
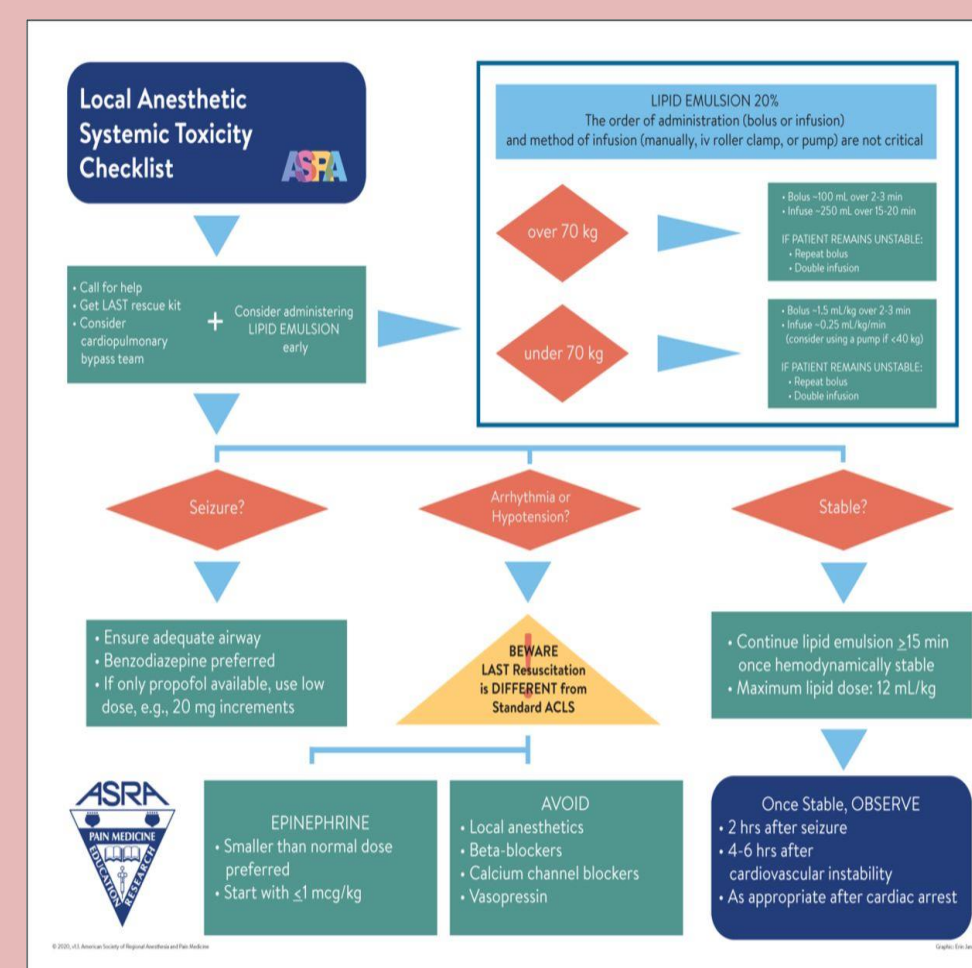
A series of **true/false questions**:

- Propofol can be used to reverse cardiac symptoms of local anesthetic toxicity because propofol has a high dose of lipids (F)
- Use of ultrasound increases the risk of local anesthetic toxicity (F)
- Pregnant women are at lower risk for local anesthetic toxicity (F)
- Elderly patients with low muscle mass are at higher risk for LAST (T)
- Toxicity from local anesthetics can be delayed up to 30 minutes (T)

Open ended question – measures to prevent death from local anesthetic systemic toxicity

LAST Simulation

- 2 groups of 10 students were lead through a simulation of LAST using a CPR mannequin in the University of Rwanda Simulation Center
- Vitals were simulated using SimMon Vitals app to demonstrate cardiac arrest from LAST
- ASRA LAST checklist available during simulation as cognitive aid
- Simulation ended with 30-minute lecture on LAST



Survey Results

Pre-simulation survey

- 19/25 residents responded

Post-simulation survey – given three days after the simulation

- 14/25 residents responded

No significant change in pre and post simulation scores

Question	Pre-test correct	Post-test correct	% change
Propofol cannot be used to treat LAST	68%	71%	+3%
Toxicity from LAST can be delayed	57%	71%	+14%
Recommended intralipid dose	63%	64%	+1%
Pregnant patients are at higher risk for LAST	100%	100%	0%

- 100% of respondents would recommend participating in a LAST simulation
- Every resident was able to list 2-3 action items to prevent death from LAST

“use ultrasound if possible”

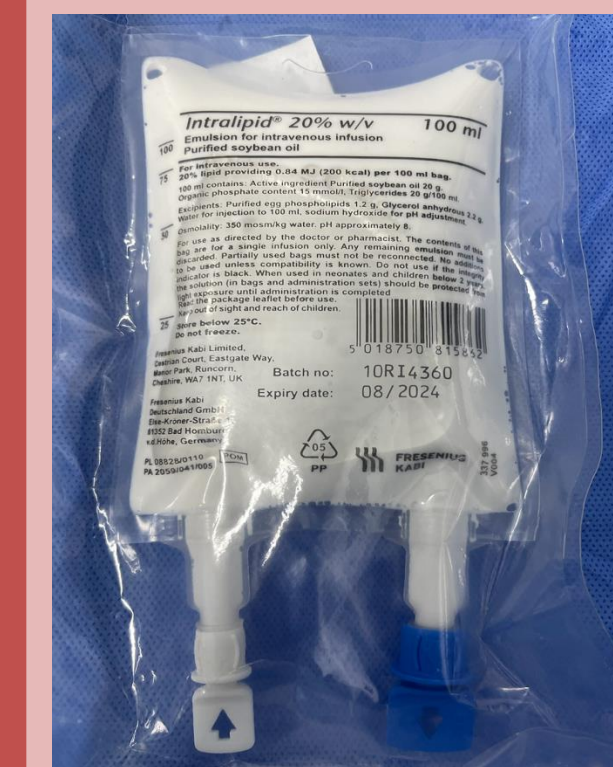
“titrate local anesthetic dose to weight of patient”

“have intralipid available when using LA”

“aspirate prior to injection”

“20% lipid emulsion from TPN can be used to treat LAST”

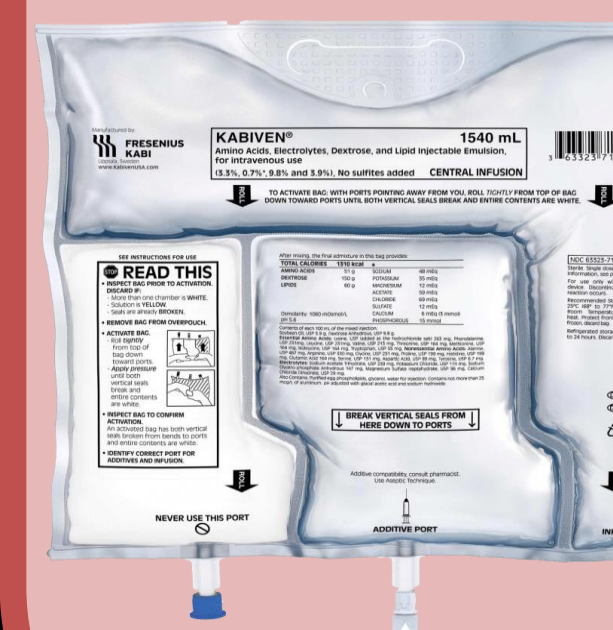
Lipid Emulsions in Kigali, Rwanda



- Bolus – 100 mL over 2-3 min
- Infuse – 250 mL over 15-20 min

IF PATIENT REMAINS UNSTABLE:

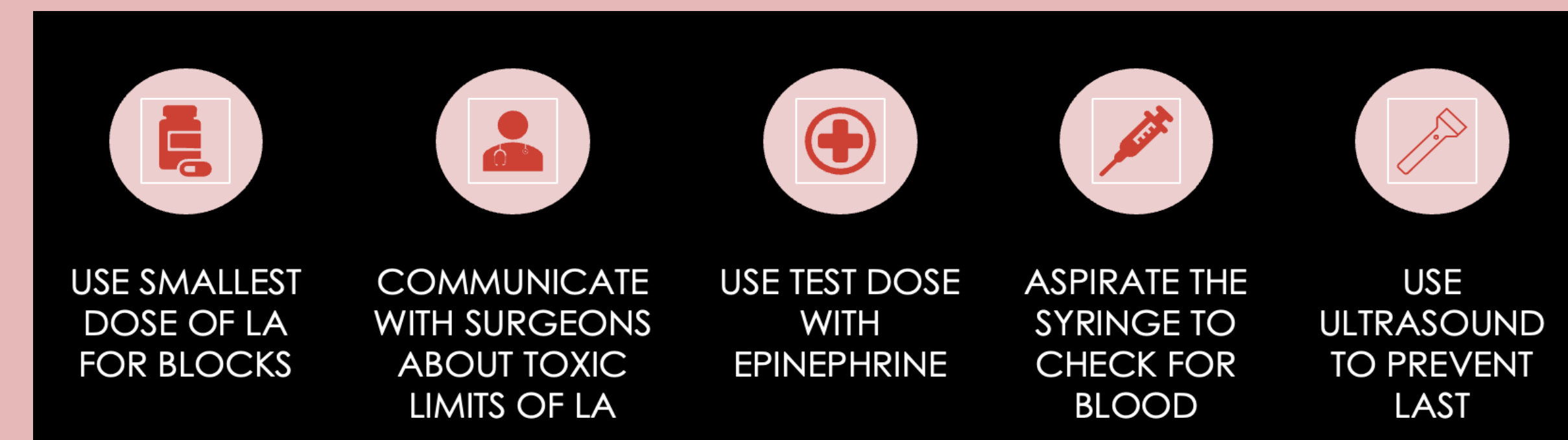
- Repeat bolus
- Double infusion



- Expensive >40 USD per 100mls
- Patients often cannot afford expensive medications
- Who will pay for lipid emulsion and what happens if unused?
- Donated by visiting medical groups
- Expires quickly – often within one year
- Not enough supply to give full recommended ASRA dose
- More suspected LAST cases than lipid emulsion available
- No central location of lipid emulsion – unsure where to look for in emergency
- 20% lipid emulsions have been used from TPN formulations during suspected LAST cases but often only enough for a partial/single dose

Discussion

- There are not enough lipid emulsion available in tertiary hospitals in Rwanda
- LAST can be lethal
- Lipid emulsions have a short shelf life and are expensive – who will pay for it?
- Hospitals cannot rely on intermittent donations of small amounts of lipid emulsions
- Ethical dilemma knowing not enough lipid emulsion available while performing regional anesthesia
- While simulation can help to increase awareness of LAST, additional educational measures must be taken to improve knowledge retention
- While lipid emulsion is not easily available, prevention of LAST is key first line defense



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Trends in Suspected LAST cases

- Timing of cardiovascular collapse 15-20 minutes after LA injection
- Unknown quantity of local anesthetic injected by surgeon without communication to anesthesiologist
- Multiple cases involving local infiltration in pregnant patients
- Lipid emulsion unavailable in different parts of hospital such as OR vs OB suite
- Lack of aspiration of anesthetic before injection
- Delayed recognition of LAST
- High dose bupivacaine used in surgical procedures
- Death more likely to occur when no intralipid available and difficulty obtaining TPN quickly