

Simulating LAST to Improve Peri-anesthesia Nursing Knowledge

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Dept Name: Hospital Pre/Post, Holding Room, PACU

Significance of the Problem

LAST = Local Anesthesia System Toxicity
Life-threatening complication occurring after local anesthetic

Rare - approximately 1/1000 patients

Signs and symptoms:

- Neurologic
- Cardiac
- Death

Can be immediate or delayed

★ Early recognition and intervention for LAST can be life saving!

Clinical Question

Education with simulation + access to resources for LAST vs. No formal education or resources

Search Strategy & Evidence Synthesis

Search key words on CINAHL, PubMed

- LAST
- Local Anesthesia System Toxicity
- Simulation

Searched American Society of Regional Anesthesia and Pain Medicine (ASRA)

- LAST checklist and treatment

- ✓ ASRA recommends quick access to treatment and using a checklist
- ✓ Early recognition and quick intervention improves patient morbidity and mortality
- ✓ Change is needed in peri-anesthesia to make LAST education mandatory with access to resources and treatment

Practice Change

Step 1: Assembled Team

- Manager
- Clinical Practice Specialist
- Simulation Site Specialist
- Bedside Nurses
- Anesthesiologist
- Pharmacy Director

Step 2: Distributed Resources to all affected units (see Fig. 1)

- ASRA LAST Checklist & Guideline for Treatments
- Pharmacy supplied treatment (lipid emulsion)

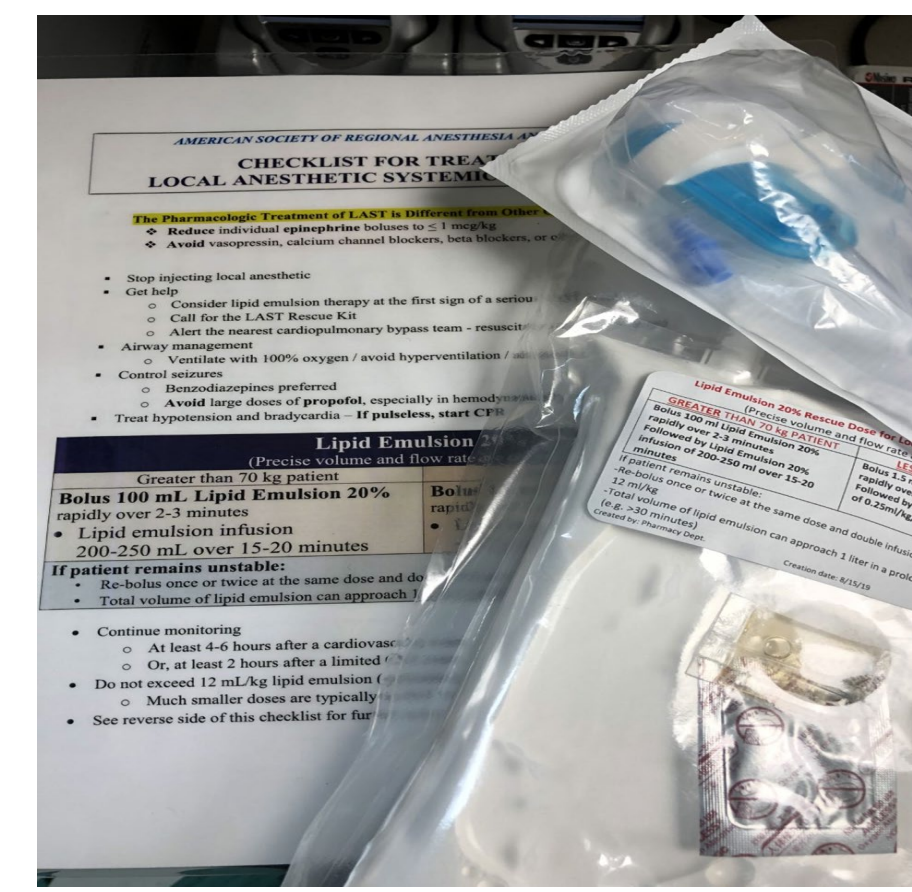


Figure 1. ASRA checklist for treating LAST pictured with lipid emulsion used for treatment.

Step 3: LAST Knowledge Test

Given during annual competencies (See Fig. 3)

Step 4: Developed & Presented Pre-Simulation Education

Step 5: High-Fidelity Simulation & Debriefing



- Nurses were required to participate
- Anesthesiologists were invited to participate

Figure 2. High-fidelity Simulation Lab at Advocate Christ Medical Center

Step 6: LAST Knowledge Test (see Fig. 3)

Given on the unit after completing the simulation

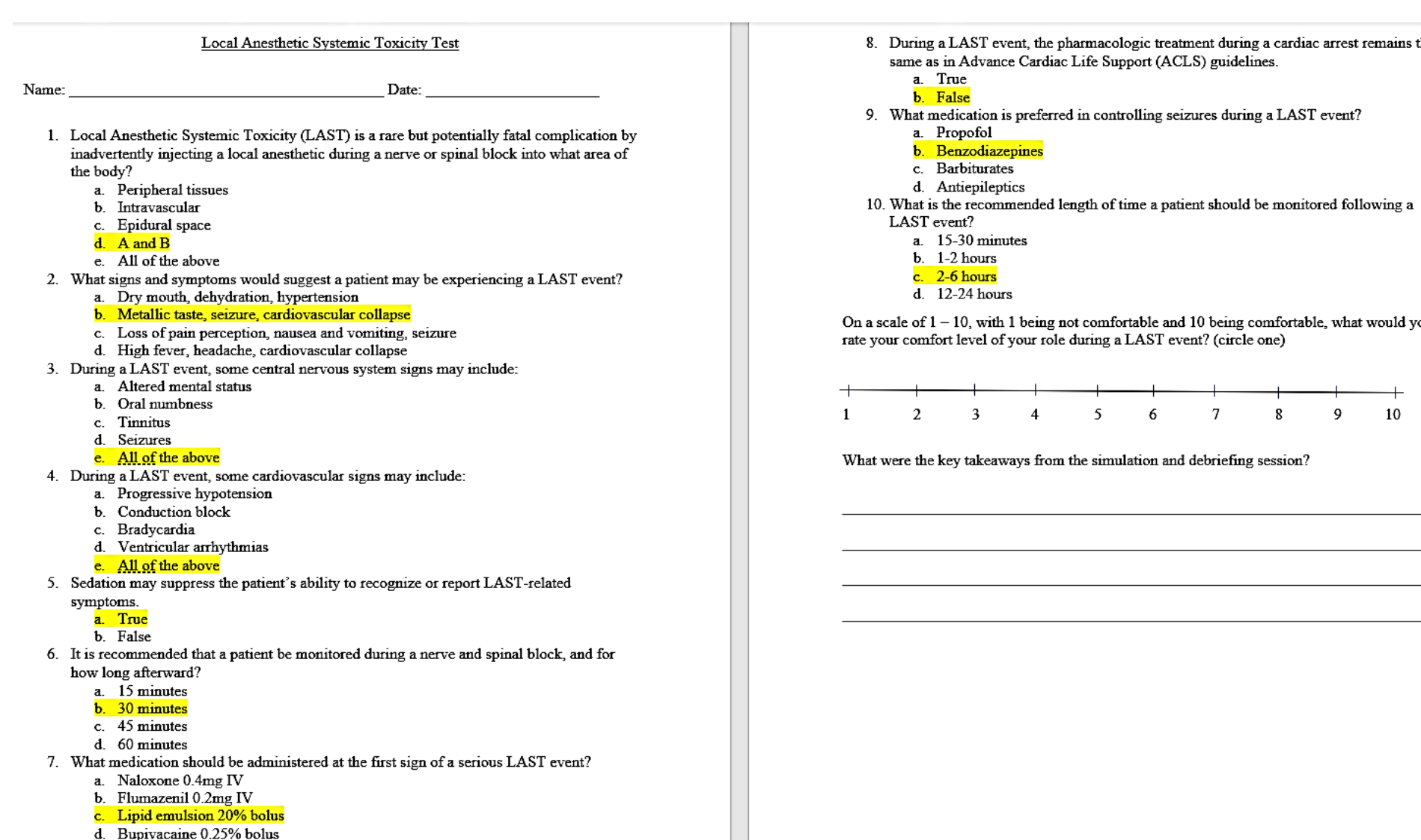


Figure 3. LAST Knowledge-based test with comfort scale

Results

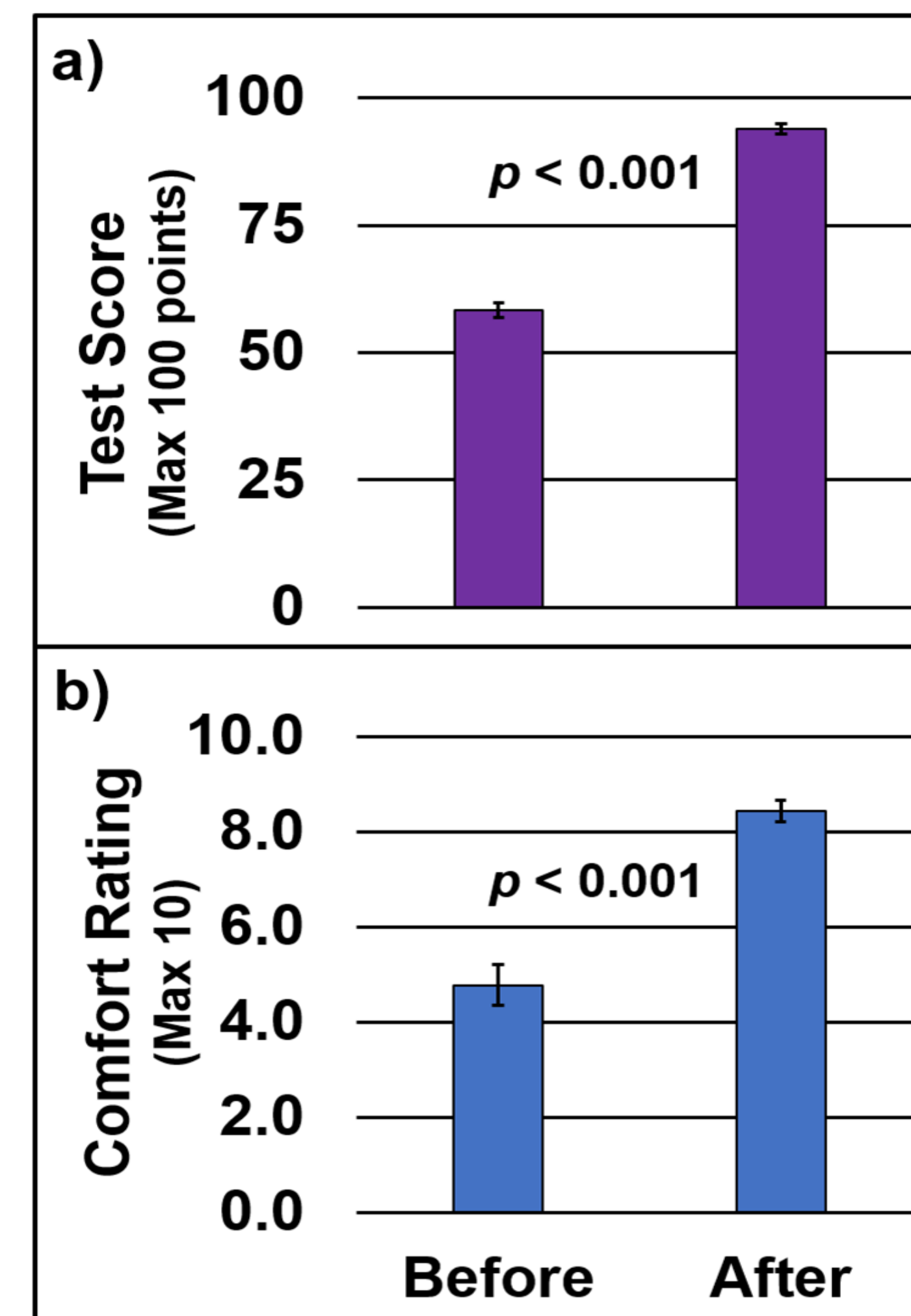


Figure 4. Means (standard error) for a) knowledge and b) comfort were both significantly higher after LAST education. We tested significance using one-tailed paired t-tests. Mean knowledge increased from 58(1.5) to 94(1.0) and mean comfort increased from 4.8(0.43) to 8.4(0.23).

During Step 5 Simulation training, a PACU nurse who had just finished the training identified LAST early in a patient. The patient received treatment and potentially severe harm was avoided.

In pre-op, a patient experienced a seizure after a nerve block. The nurse identified LAST. The patient received lipid treatment with improvement but was not diagnosed with LAST.

Conclusions

- Nurses' knowledge and ability to treat LAST was greatly improved by the practice change, which improves patient outcomes
- Nurses have recognized and treated symptoms of LAST with lipids → patients symptoms reduced and resolved
- Nurses in participating units feel that "simulation helped reinforce the education, and it will be easier to remember, and it was a cool way to learn."

Limitations

- Single-site hospital peri-anesthesia department
- Challenges with how and when to maintaining knowledge
- Operating Room (OR) staff and anesthesia not included in education and simulation
- There is no diagnosis for LAST and there is resistance to diagnosing LAST even when patients are treated for it = challenging to collect data on how well the education program has worked and how many patients helped.

Implications for Practice

- Annual competency in place to maintain knowledge
- New peri-anesthesia nurses receive education (presentation) during onboarding
- More projects are needed to determine success of maintaining education and if OR team and anesthesia should be included in mandatory education

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Acknowledgements

Special thanks to Akram Abdou MD; Judith Brown-Scott PharmD. cd.; Ann Marie Cook, RN, CAPA; Jennifer Murphy, RN-BC; Jennifer Olszowka, RN, CAPA; Debra Golen, RN, CAPA; Grace Greco, RN, CAPA; Alison Boone, Site Simulation Specialist, Meagan Cleary, PhD, BSN, RN