LRI Children's Hospital

Care of Children and Young People Requiring Continuous Peripheral Local Anaesthetic Infusion.

Staff relevant to:	Health Professionals providing care for a child or young person receiving continuous peripheral local anaesthetic infusion.
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Written by:	Zoe Syrett
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1. Introduction/Scope

To provide Health Professionals in UHL guidance in the safe, effective care and management of a child or young person receiving continuous peripheral local anaesthetic infusion.

A local anaesthetic infusion is where a catheter is inserted adjacent to a nerve trunk or in a plexus sheath by a surgeon or an anaesthetist under strict aseptic conditions, ideally in theatre or an anaesthetic room. A continuous infusion of local anaesthetic can then be delivered via a locked infusion device, and the patient nursed on a general ward (Serpell 2003)

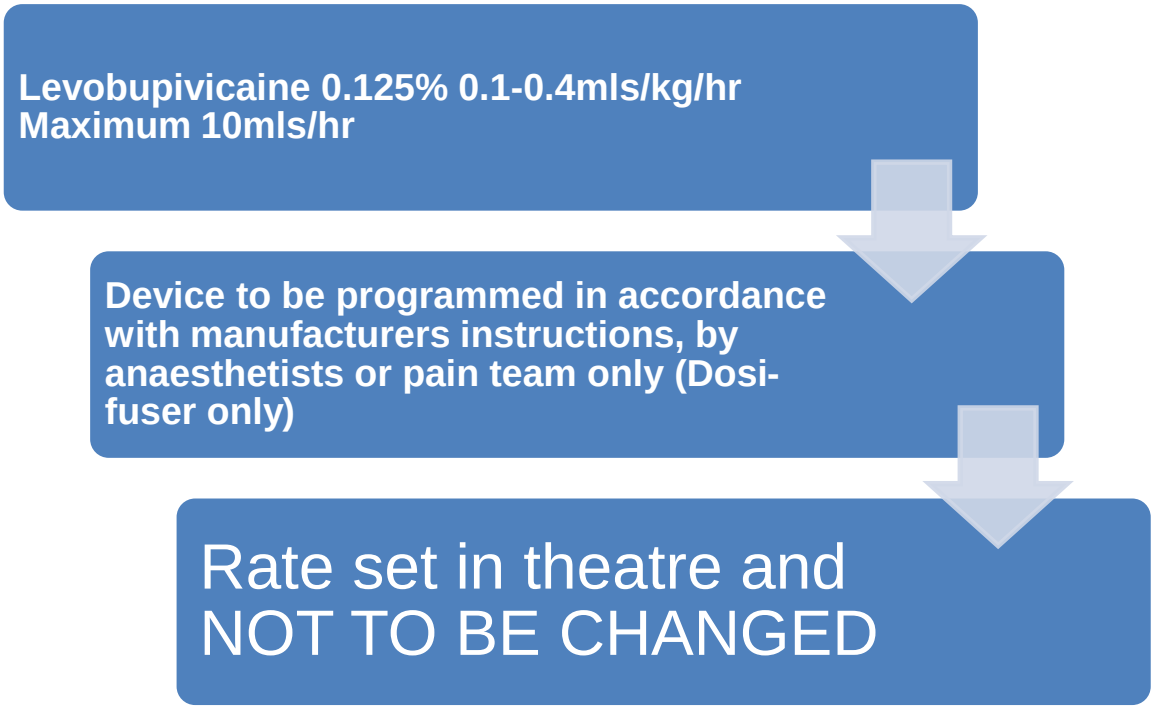
Related documents:

This guideline should be used in conjunction with the;

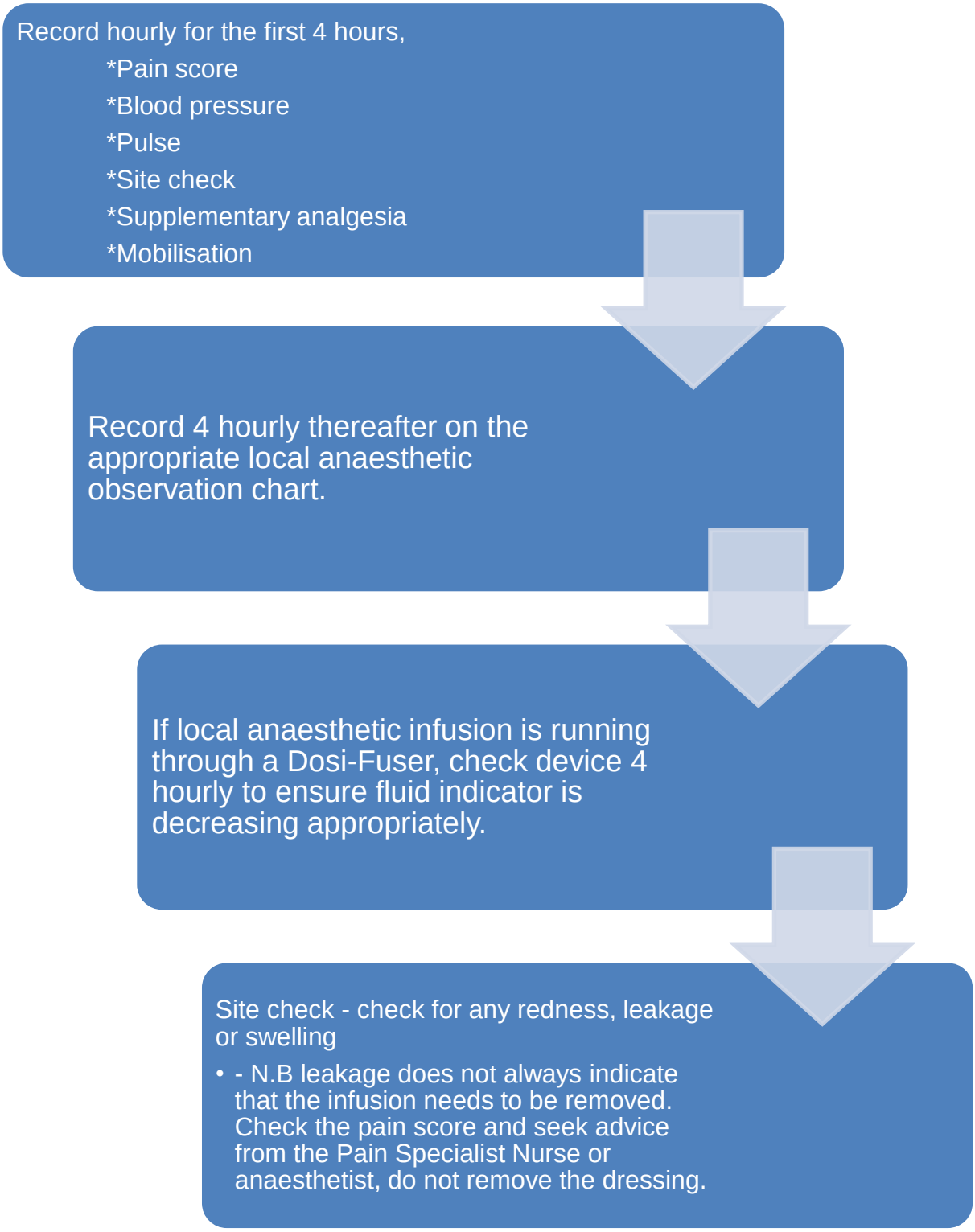
- Consent to Examination or Treatment UHL Policy
- Leicestershire Medicines Code UHL Policy
- Aseptic Non Touch Technique UHL Guideline

2.Guideline for the Care of Children and Young People Requiring a Continuous Peripheral Local Anaesthetic Infusion	
No.	**Action**
2.1	• The decision to use a continuous local anaesthetic will be made by the anaesthetist. You must ensure that the parent/carer and child are given a full explanation of- • What a continuous local anaesthetic infusion is • Answer any questions • Ensure that an information leaflet on continuous local anaesthetic infusion is available and given to the parent/carer and young person at the time of consent of treatment. • Explain to the parent/carer and child what observations are necessary and why.
2.2	Ensure the prescription is prescribed on the pre-printed stickers: • Orange-plain Levobupivicaine 0.125%

2.3 SET UP PROTOCOL:



2.4 Monitor and observe the baby, child or young person as follows:



2.5 STOP the infusion and DIAL 2222 if any of the following occurs:

Signs of severe local anaesthetic toxicity:

- Sudden alteration in mental status, severe agitation or loss of consiousness, with or without tonic-clonic seizures.
- Cardiovascular collapse: sinus brady cardia, conduction blocks, asystole and ventricular tachyarrhythmias may all occur.
- Local anaesthetic toxicity may occur some time after an initial injection.

Be aware that intravenous Intralipid 20% may be requested as an antidote for local anaesthetic toxicity.

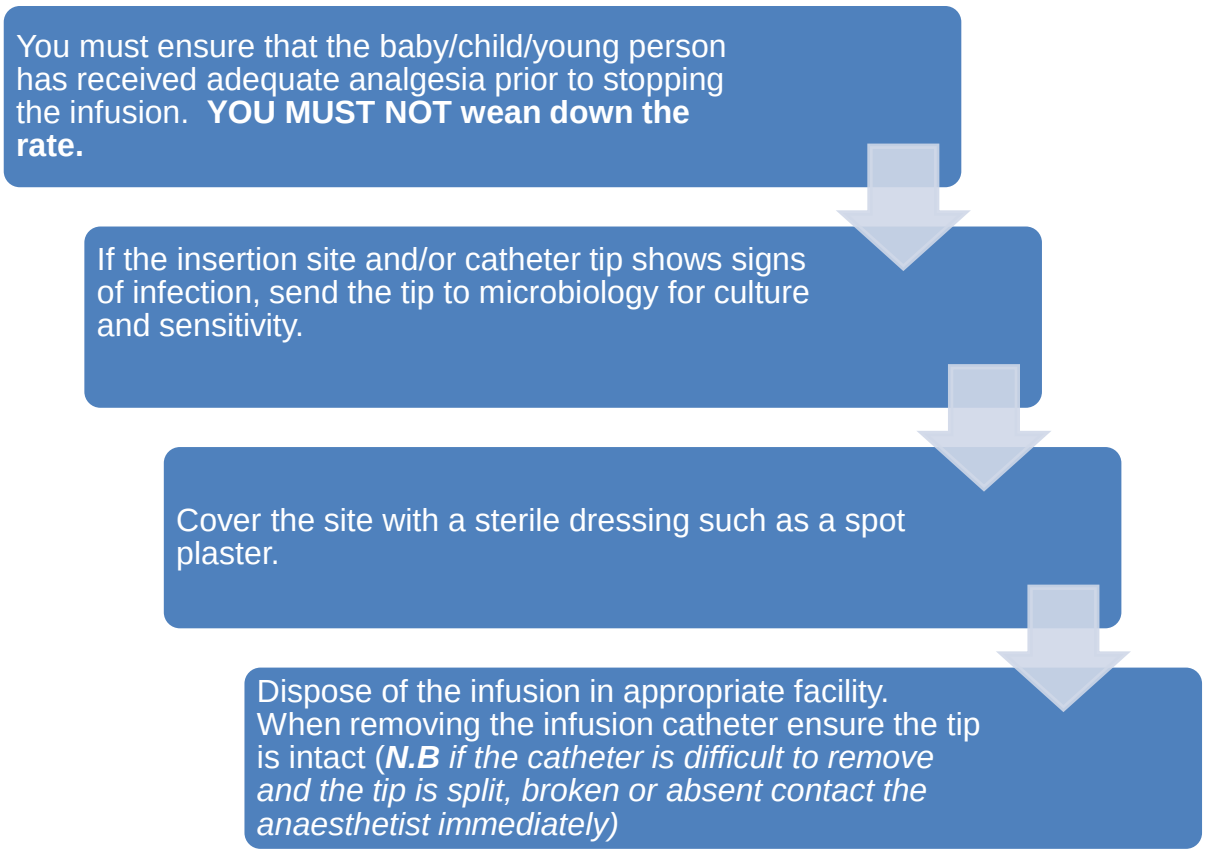
Know where the nearest bag is located and guidelines for use:

- **ASRA guideline** (see appendix)
- **Ward 10 – cupboard 10 (labelled on outer door)**
- **Ward 19 – Bottom cupboard Next to TTO's (labelled on outer door)**
- **Recovery - treatment room**

2.6 Assessment:

- Assess pain using the pain tool identified during the admission process
- Where applicable allow the child to assess their own pain

2.7 Discontinuing the local anaesthetic infusion:



3. Education and Training

All nursing staff caring for Local anaesthetic infusions must be able to:

- Give an explanation to the child and family on local anaesthetic infusions
- Able to check and troubleshoot the device
- Able to troubleshoot any problems or complications associated with the local anaesthetic infusion
- Have an understanding of any side effects of local anaesthetic and are able to deal with complications effectively

4. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
100% prescription are on appropriate orange pre-printed stickers	Prescriptions Audited by Pain Specialist Nurses	Pain Specialist Nurse	Annual	Local clinical practice meeting

5. Supporting Documents and Key References

Royal College of Nursing (2009) Recognition and Assessment of Acute Pain in Children, Update of full guideline, September 2009

Royal College of Anaesthetists (2012) Good Practice in Post-Operative and Procedural Pain Management, 2nd Edition,

Code of Professional Conduct (2015) NMC

Serpell M. (2003) Clinical pharmacology – Local anaesthetics. In Clinical Pain Management Acute Pain. Rowbotham D. Macintyre P. (eds) Arnold London.

6. Key Words

Local Anaesthetic Infusion, Children, Levobupivicaine, Peripheral, Pain

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CONTACT AND REVIEW DETAILS	
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Details of Changes made during review: January 2024 No changes	

AMERICAN SOCIETY OF REGIONAL ANESTHESIA AND PAIN MEDICINE

CHECKLIST FOR TREATMENT OF LOCAL ANESTHETIC SYSTEMIC TOXICITY (LAST)

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

- **Reduce** individual epinephrine boluses to ≤ 1 mcg/kg
- **Avoid** vasopressin, calcium channel blockers, beta blockers, or other local anesthetics

- Stop injecting local anesthetic
- Get help
  - Consider lipid emulsion therapy at the first sign of a serious LAST event
  - Call for the Intralipid 20%
  - Alert the nearest cardiopulmonary bypass team - resuscitation may be prolonged
- Airway management
  - Ventilate with 100% oxygen / avoid hyperventilation / advanced airway device if necessary
- Control seizures
  - Benzodiazepines preferred
  - **Avoid** large doses of **propofol**, especially in hemodynamically unstable patients
- Treat hypotension and bradycardia – **if pulseless, start CPR**

Lipid Emulsion 20% (Precise volume and flow rate are not crucial)	
Greater than 70 kg Patient	Less than 70 kg Patient
Bolus 100 mL Lipid Emulsion 20% rapidly over 2-3 minutes • Lipid emulsion infusion 200-250 mL over 15-20 minutes	Bolus 1.5 mL/kg Lipid Emulsion 20% rapidly over 2-3 minutes • Lipid emulsion infusion ~0.25 mL/kg/min (ideal body weight)
If patient remains unstable: • Re-bolus once or twice at the same dose and double infusion rate; be aware of dosing limit (12mL/kg) • Total volume of lipid emulsion can approach 1 L in a prolonged resuscitation (e.g > 30 minutes)	

- Continue monitoring
  - At least 4-6 hours after a cardiovascular event
  - Or, at least 2 hours after a limited CNS event
- Do not exceed 12 mL/kg lipid emulsion (particularly important in the small adult or child)
  - Much smaller doses are typically needed for LAST treatment
- See reverse side of this checklist for further details

Risk Reduction (Be sensible)

- Use the least dose of local anesthetic necessary to achieve the desired extent and duration of block.
- Local anesthetic blood levels are influenced by site of injection and dose. It is important to identify patients at increased risk of LAST prior to using local anesthetics, e.g., infants <6 months old, small patient size, advanced age and frailty, heart failure, ischemic heart disease, conduction abnormalities, or rhythm disorders, metabolic (e.g., mitochondrial) disease, liver disease, low plasma protein concentration, acidosis, and medications that inhibit sodium channels. Patients with very low ejection fraction are more sensitive to LAST and may be especially prone to elevated local anesthetic levels associated with 'stacked' injections.
- Consider using a pharmacologic marker and/or test dose, e.g. epinephrine 2.5 to 5 mcg/mL (total 10-15mcg). Know the expected response, onset, duration, and limitations of a "test dose" in identifying intravascular injection.
- Aspirate the syringe prior to each injection while observing for blood in the syringe or tubing
- Inject incrementally, while observing for signs and inquiring for symptoms of toxicity between each injection.
- Consider discussing local anesthetic dose as part of the pre-procedural or pre-surgical pause ("time out").

Detection (Be vigilant)

- Monitor the patient during and after completing injection. Clinical toxicity can be delayed 30 minutes or longer.
- Use standard American Society of Anesthesiologists (ASA) monitors.
- Communicate frequently with the patient to query for symptoms of toxicity.
- Consider LAST in any patient with altered mental status, neurological symptoms or signs of cardiovascular instability after a regional anesthetic (e.g., change in HR, BP, ECG). Consider LAST even when the local anesthetic doses is 1) small (susceptible patient), 2) atypically administered (subcutaneous, mucosal, topical), 3) administered by the surgeon, or 4) after recent tourniquet deflation.
- Central nervous system signs (may be subtle, atypical, or absent)
  - Excitation (agitation, confusion, vocalization, muscle twitching, seizure)
  - Depression (drowsiness, obtundation, coma, or apnea)
  - Non-specific (metallic taste, circumoral numbness, diplopia, tinnitus, dizziness)
- Cardiovascular signs (occasionally the only manifestation of severe LAST)
  - Initially may be hyperdynamic (hypertension, tachycardia, ventricular arrhythmias), then
    - Progressive hypotension
    - Conduction block, bradycardia or asystole
    - Ventricular arrhythmia (ventricular tachycardia, Torsades de Pointes, ventricular fibrillation or asystole)
- Sedation may abolish the patient's ability to recognize or report LAST-related symptoms.

Treatment

Suggested components of a "Intralipid Kit"

- Bag Intralipid 20%
- Several large syringes and needles for administration
- Standard IV tubing
- ASRA LAST Checklist

- Administer lipid emulsion at the first sign of a serious LAST event.
- Lipid emulsion can be used to treat LAST caused by any local anesthetic.
- Standard dose epinephrine (1 mg) can impair resuscitation from LAST and reduce the efficacy of lipid rescue. Use smaller doses than typical for ACLS, e.g., $\leq$ 1mcg/kg boluses, or for treating hypotension.
- Propofol should not be used when there are signs of cardiovascular instability.
- Prolonged monitoring (2-6 hours) is recommended after any signs of LAST, since cardiovascular depression due to local anesthetics can persist or recur after treatment.
  - If LAST event is short-lived and without signs of cardiovascular instability, one may consider proceeding with surgery after an uneventful~30 minute interval of monitoring.

Please report LAST events to www.lipidrescue.org

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;43:113-123

The ASRA LAST™ smartphone app can be purchased from The Apple App Store or Google Play