



Musgrove Park Hospital

Anaesthetic Department Guideline

Title: Intralipid® (Lipid Emulsion) in the Management of Severe Local Anaesthetic Toxicity

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Ratified by: Anaesthetic Department

Active date: 1st June 2010

Ratification date: 16th June 2010

Review date: 1st June 2013

Applies to: All adult patients with severe local anaesthetic toxicity

Exclusions: Children

Purpose: Guidelines for the management of severe local anaesthetic toxicity.

Keywords: Local Anaesthetic Toxicity, Intralipid, Lipidrescue, Cardiac Arrest, Levobupivacaine, Ropivacaine, Bupivacaine, Marcain, Lignocaine, Lidocaine

Key Points

- Common presenting signs of moderate toxicity include shivering, loss of consciousness and seizures; severe toxicity is associated with and can progress to cardiac depression and asystole (cardiac arrest).
- Resuscitation from local anaesthetic induced cardiac arrest is often refractory to normal treatments and prolonged. In particular, bupivacaine induced toxicity has a poorer prognosis than the newer chirally clean local anaesthetics, levobupivacaine and ropivacaine.
- Intralipid® 20% (lipid emulsion) has been shown to reverse local anaesthetic induced cardiac arrest, in animal models^(1,2), in human case reports^(3,4), and its use has been reported in the treatment of life threatening toxicity without cardiac arrest⁽⁵⁾. Its therapeutic potential has been highlighted by the National Patient Safety Agency (NPSA)⁽⁶⁾.
- Use of Intralipid 20% (lipid emulsion) should not interfere with the provision of advanced life support
- Intralipid® 20% (lipid emulsion) should be readily available in all clinical area where the practice of regional anaesthesia is performed along with guidelines for its use (see appendix A for a list of clinical sites where the LipidRescue™ Big Green Boxes are available within Musgrove Park Hospital).
- Intralipid® 20% (lipid emulsion) is available from Pharmacy, as part of the LipidRescue™ Big Green Box. (For contents see appendix A)
- Although some Propofol preparations are provided in Intralipid® e.g. Diprivan®, these are not a suitable alternative, due to the significant cardiovascular depression caused by the Propofol. This does not preclude the use of small, incremental doses of Propofol to control seizures.

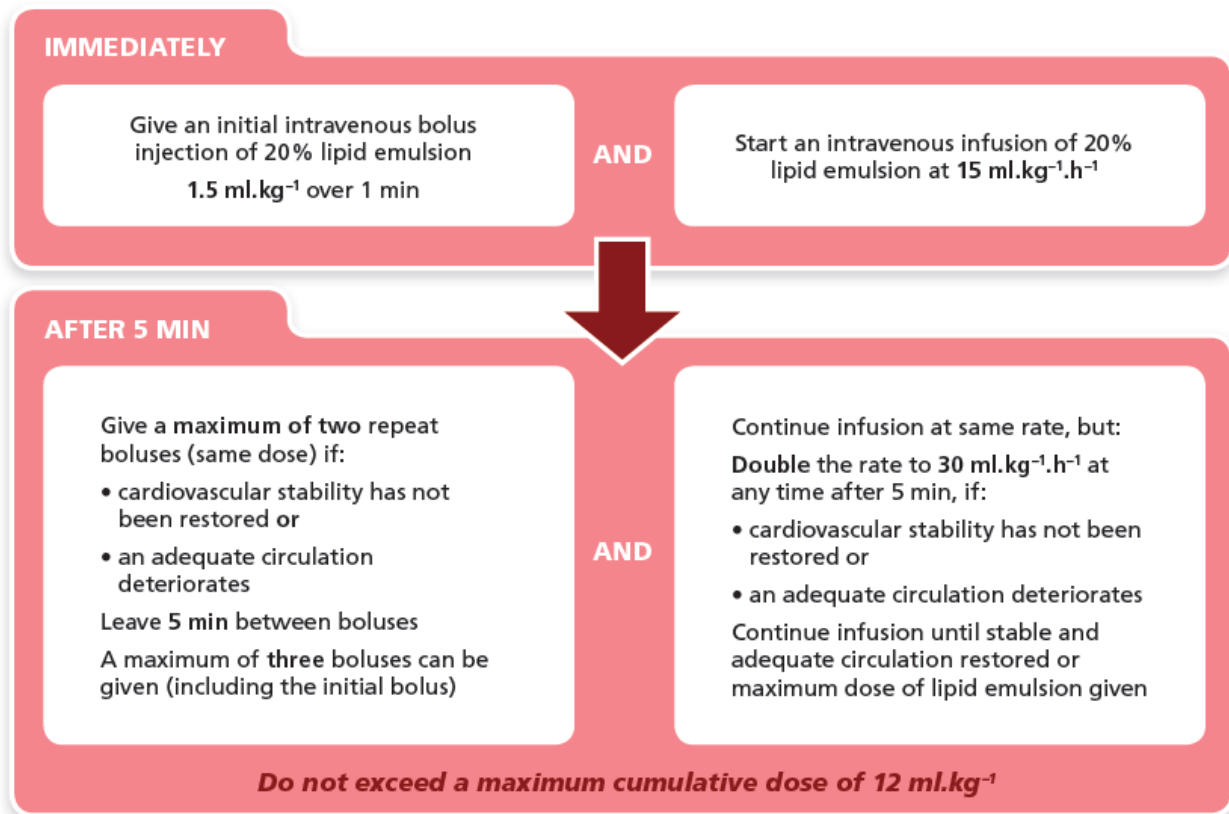
Management of Severe Local Anaesthetic Toxicity

(AAGBI Safety Guideline 2010)

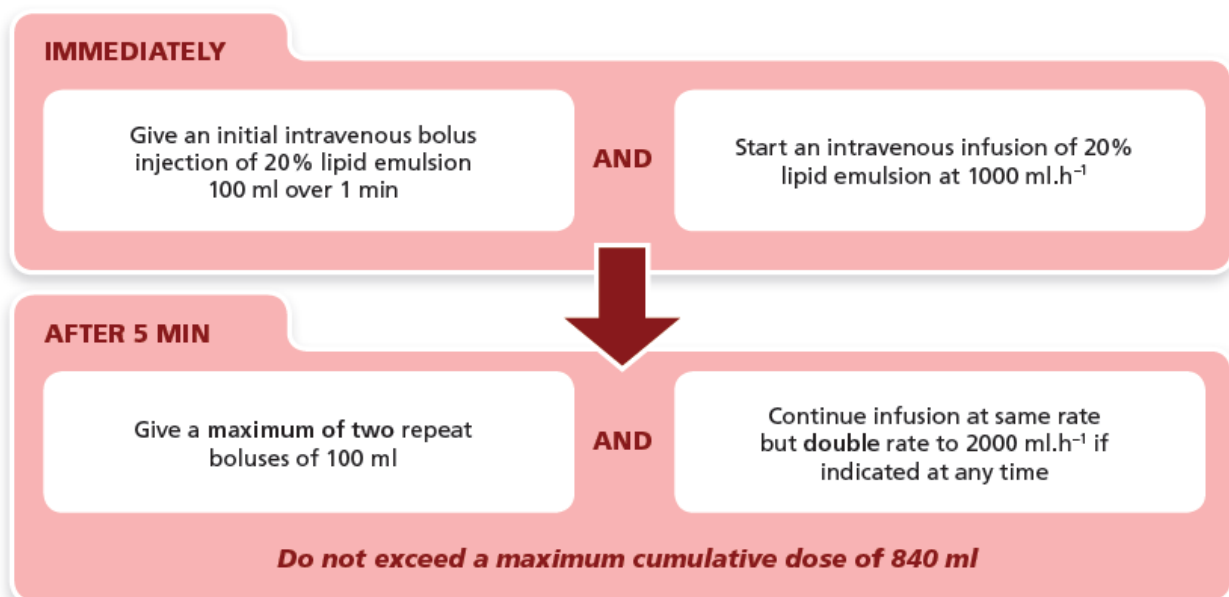
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| <h1>1</h1> <h2>Recognition</h2> | <p>Signs of severe toxicity:</p> <ul style="list-style-type: none"> • Sudden alteration in mental status, severe agitation or loss of consciousness, with or without tonic-clonic convulsions • Cardiovascular collapse: sinus bradycardia, conduction blocks, asystole and ventricular tachyarrhythmias may all occur • Local anaesthetic (LA) toxicity may occur some time after an initial injection | |
| <h1>2</h1> <h2>Immediate management</h2> | <ul style="list-style-type: none"> • Stop injecting the LA • Call for help • Maintain the airway and, if necessary, secure it with a tracheal tube • Give 100% oxygen and ensure adequate lung ventilation (hyperventilation may help by increasing plasma pH in the presence of metabolic acidosis) • Confirm or establish intravenous access • Control seizures: give a benzodiazepine, thiopental or propofol in small incremental doses • Assess cardiovascular status throughout • Consider drawing blood for analysis, but do not delay definitive treatment to do this | |
| <h1>3</h1> <h2>Treatment</h2> | <p>IN CIRCULATORY ARREST</p> <ul style="list-style-type: none"> • Start cardiopulmonary resuscitation (CPR) using standard protocols • Manage arrhythmias using the same protocols, recognising that arrhythmias may be very refractory to treatment • Consider the use of cardiopulmonary bypass if available <p>GIVE INTRAVENOUS LIPID EMULSION (following the regimen overleaf)</p> <ul style="list-style-type: none"> • Continue CPR throughout treatment with lipid emulsion • Recovery from LA-induced cardiac arrest may take >1 h • Propofol is not a suitable substitute for lipid emulsion • Lidocaine should not be used as an anti-arrhythmic therapy | <p>WITHOUT CIRCULATORY ARREST Use conventional therapies to treat:</p> <ul style="list-style-type: none"> • hypotension, • bradycardia, • tachyarrhythmia <p>CONSIDER INTRAVENOUS LIPID EMULSION (following the regimen overleaf)</p> <ul style="list-style-type: none"> • Propofol is not a suitable substitute for lipid emulsion • Lidocaine should not be used as an anti-arrhythmic therapy |
| <h1>4</h1> <h2>Follow-up</h2> | <ul style="list-style-type: none"> • Arrange safe transfer to a clinical area with appropriate equipment and suitable staff until sustained recovery is achieved • Exclude pancreatitis by regular clinical review, including daily amylase or lipase assays for two days • Report cases as follows: <ul style="list-style-type: none"> in the United Kingdom to the National Patient Safety Agency (via www.npsa.nhs.uk) in the Republic of Ireland to the Irish Medicines Board (via www.imb.ie) <p>If Lipid has been given, please also report its use to the international registry at www.lipidregistry.org. Details may also be posted at www.lipidrescue.org</p> | |

Dosing of Intralipid® 20% (lipid emulsion)

(AAGBI Safety guideline 2010)



An approximate dose regimen for a 70-kg patient would be as follows:



Local Additions to AAGBI Safety Guideline

- **If possible, take a blood sample into a plain tube and a heparinised tube, before and after administration of Intralipid® 20% (lipid emulsion) and at 1hr intervals afterwards.**

Ask the laboratory to measure Local Anaesthetic and Triglyceride levels (these have not as yet been reported in a human case of Local Anaesthetic intoxication treated with lipid emulsion).

- Arrange safe transfer to a clinical area with appropriate equipment and suitable staff until sustained recovery is achieved.
- To replace your supply of Intalipid® 20% (lipid emulsion) after use, **return the LipidRescue™ Big Green Box to pharmacy, and exchange for a replacement box.**
- Exclude **Pancreatitis** by regular clinical review, including daily Amylase or Lipase assays for two days.
- A Taunton and Somerset NHS Foundation Trust Incident Form should be completed. In addition, a local audit form should be completed and returned to the Pain clinic (see appendix B)
- Report cases from the United Kingdom to the National Patient Safety Agency (via www.npsa.nhs.uk).
- If Intralipid® 20% (lipid emulsion) has been given, please report its use to the International Registry at www.lipidregistry.org. Details may also be posted at www.lipidrescue.org

References:

- Weinburg G et al. *Lipid emulsion rescues dogs from bupivacaine-induced cardiac toxicity.* Regional Anesthesia and Pain Medicine 2003; **28**: 198-202
- Weinburg GL et al. *Pretreatment or resuscitation with lipid infusion shifts the dose-response to bupivacaine-induced asystole in rats.* Anesthesiology 1998; **88**: 1071-5
- Rosenblatt MA et al. *Successful use of 20% Lipid emulsion to resuscitate a patient after presumed bupivacaine-related cardiac arrest.* Anesthesiology 2006; **105**: 217-8
- Litz RJ et al. *Successful resuscitation of a patient with ropivacaine-induced asystole after axillary brachial plexus block using lipid emulsion.* Anaesthesia 2006; **61**: 800-1
- Foxall G et al. *Levobupivacaine-induced seizures and cardiovascular collapse treated with Intralipid.* Anaesthesia 2007; **62**: 516-8
- Patient Safety Alert **21** (28 march 2007) – *Safer practice with epidural injections and infusions.* London: National Patient Safety Agency (<http://www.npsa.nhs.uk>)
- Association of Anaesthetists of Great Britain and Ireland: *Safety Guideline. Management of Severe Local Anaesthetic Toxicity.*
(http://www.aagbi.org/publications/guidelines/docs/la_toxicity_2010.pdf) January 2010

LipidRescue™ box contains:

- x3 500mls of Intralipid® 20% (lipid emulsion)
- x2 50ml Luerlok syringes
- x1 I.V. giving set specifically for lipid emulsion administration (same as TPN giving set)
- x1 Laminated AAGBI Safety Guideline - Management of Severe Local Anaesthetic Toxicity, which includes instructions for use
- x1 LipidRescue™ record form – to be completed and sent to Dr B J Nicholls's Secretary, Pain Clinic, MPH.

LipidRescue™ boxes should be available in the following clinical sites in Musgrove Park hospital:

- 1 [General Theatres](#) (Theatre 1 – Anaesthetic Room) **Old Building**
- 2 [Theatre 5](#) (Anaesthetic Room) **Old Building**
- 3 [Intensive Therapy Unit](#) (ITU, Drug Area) **Old Building**
- 4 [Ward 5](#) **Old Building**
- 5 [Orthopaedic Theatres](#) (Theatre 6a Anaesthetic Room) **Queens Building**
- 6 [Head & Neck Theatres](#) (Theatre 8b Anaesthetic Room) **Queens Building**
- 7 [Sheppard Ward](#) **Queens Building**
- 8 [Accident and Emergency](#) (A&E, Resuscitation Bay) **Queens Building**
- 9 [Diagnostic Imaging](#) (Main X-ray Department, Drug Area) **Duchess Building**
- 10 [Cardiac Catheter Lab](#) (Drug Area) **Duchess Building**
- 11 [Mobile Theatre](#) (Opposite Pharmacy, in **Duchess Building** Car Park)
- 12 [Day Surgery Centre](#) (Theatre 9a Anaesthetic Room)
- 13 [Labour Ward](#) (Resus Trolley) **Maternity Unit**

LipidRescue™

When you have used a bag of Intralipid® 20% (lipid emulsion) complete this form and return to Secretary, Pain Clinic, MPH

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|-----------------|
| Name of Patient |
| Patient Number |
| D.O.B |
| Sex M / F |
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Ward / Department:

Treatment outcome: Successful Unsuccessful

Further details.....
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Signed (PRINT NAME & signature):.....

Date:...../...../.....