Intravenous Lidocaine: Use for Perioperative Analgesia Clinical Guideline

V2.1

October 2021
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Data Protection Act 2018 (General Data Protection Regulation – GDPR) Legislation

The Trust has a duty under the Data Protection Act 2018 and General Data Protection Regulations 2016/679 to ensure that there is a valid legal basis to process personal and sensitive data. The legal basis for processing must be identified and documented before the processing begins. In many cases we may need consent; this must be explicit, informed, and documented. We cannot rely on opt out, it must be opt in.

Data Protection Act 2018 and General Data Protection Regulations 2016/679 is applicable to all staff; this includes those working as contractors and providers of services.

For more information about your obligations under the Data Protection Act 2018 and General Data Protection Regulations 2016/679 please see the Information Use Framework Policy or contact the Information Governance Team

rch-tr.infogov@nhs.net
Summary - Intravenous Lidocaine: Use for Perioperative Analgesia

The use of intravenous lidocaine for analgesia is NOT endorsed by the RCoA, AofA or MHRA. This guidance is to promote safest use of this treatment where an anaesthetist/intensivist has decided upon, and taken responsibility for, its use.

GET PATIENT CONSENT if possible

Contraindications:
- Local Anaesthetic administration by other route
- Severe Hepatic impairment
- Allergy

Cautions:
- Arrhythmia/
- Conduction defects
- Cardiac failure
- Bradycardia
- Epilepsy/ Seizures
- Pregnancy
- Severe renal failure

Loading dose:
1.5 mg/kg IDEAL BODY WEIGHT* (Max. 120mg = 12ml 1% Lidocaine) infused over at least 10 mins. Wait 15 mins before commencing infusion

PRESCRIBE PERIOP LIDOCAINE PROTOCOL ON EPMA AND COMPLETE LIDOCAINE PRESCRIPTION SHEET

Maintenance Dosing (after 15 mins):
1.5 mg/kg/h IDEAL BODY WEIGHT* (Max. 120mg/h = 12ml/h)

1% Lidocaine neat, via syringe driver.
Separate cannula preferred, or anti-reflux valve mandatory

[Example regime in 165 cm female: 90mg (9ml 1%) + 90mg/h (9ml/h 1%)]

Intraoperative monitoring as per AAGBI standards
Monitoring in recovery:
- Continuous ECG monitoring
- Monitor BP, HR, RR, SpO2 pain
  as per RCHT ‘Analgesic Assessment Chart’

Discontinuation:
- After 24 hours MAXIMUM
- Or earlier if transferred to ward
- IMMEDIATELY if concerns of adverse reaction

If any concerns over side effects or toxicity, STOP THE INFUSION and contact patient’s anaesthetist urgently, or the SAT on bleep 3513 if out of hours.

NB: This protocol is for analgesic use of Lidocaine, not treatment of arrhythmia.

*Ideal Body Weight Broca’s formulae: Male: height (cm) – 100. Female: height (cm) – 105
Use ACTUAL weight if this is lower than ideal weight. Do not use if IBW<40kg.
1. **Aim/Purpose of this Guideline**

1.1. Degree and character of postoperative pain is difficult to predict.

1.2. Various treatments are available and used in common practice, each of which have their own profile of side effects and risks. A multimodal approach to postoperative analgesia is used to balance these against the benefits each drug offers.

1.3. Lidocaine is a commonly used local anaesthetic agent, which may have beneficial effects on postoperative pain when used intravenously.

1.4. Lidocaine should be considered a high-risk medicine when used intravenously.

1.5. This document is to guide Anaesthetists in using intravenous lidocaine as safely and consistently as possible.

1.6. This version supersedes any previous versions of this document.

2. **The Guidance**

2.1. **The Urgent Update**

2.1.1. The Journal *Anaesthesia* issued an article and an editorial in January 2021 regarding this treatment. Links are provided in appendix. In summary:

- There have been deaths and near misses associated with this treatment regime
- There is a consensus statement regarding how this treatment should be used, if it is to be used at all
- The editorial emphasizes that the consensus statement should not give the impression that this treatment is approved or endorsed.

2.1.2. **Intravenous lidocaine for analgesia is not endorsed** by the Royal College of Anaesthetists, The Association of Anaesthetists, or the Medicines and Healthcare Products Regulatory Agency (Information from Safe Anaesthesia Liaison Group SALG)

2.1.3. This guidance is provided on the basis that:

- It is the personal opinion of the author that it may be reasonable to use this treatment where no safer alternatives are available;
- Information should be provided to maximize safety in the event that this treatment is considered by the prescribing anaesthetist to be appropriate
2.2. **Background:**

2.2.1. Lidocaine is an amide local anaesthetic agent which is routinely used for peripheral and regional anaesthesia. It also has class 1b anti-arrhythmic action.

2.2.2. Its mechanism of action involves sodium channel blockade, preventing neuronal action potential generation and propagation.

2.2.3. There is evidence for the effectiveness of its intravenous use in the management of both acute and chronic pain. However its specific mechanism of action in these particular circumstances remains unclear.

2.2.4. Other potential beneficial effects of perioperative Lidocaine include: reduced incidence of ileus, reduced PONV, reduced opioid requirements.

- 2.2.4.1. Intraoperative IV Lidocaine has also been reported to have a MAC sparing effect.
- 2.2.4.2. IV Lidocaine has been reported to blunt airway reflexes and therefore has been employed to aid intubation, and to prevent coughing on extubation.

2.3. **Indications:**

- 2.3.1. The best evidence for beneficial effects from IV Lidocaine is in patients undergoing laparoscopic or open abdominal procedures.

- 2.3.2. Benefit has been reported in other specialties, but evidence of such is low grade and sparse.

- 2.3.3. This is a controversial treatment. Clinicians should advise patients accordingly, and attain their consent to use it if possible

2.4. **Contraindications:**

- 2.4.1. IV Lidocaine should NOT be used in conjunction with other administration of moderate to large volumes of local anaesthetic. This includes epidural, regional, or peripheral nerve blocks (especially those with indwelling nerve catheters). **At least 4 hours should elapse between an intravenous lidocaine infusion and the administration of local anaesthesia via other routes.**

- 2.4.2. IV Lidocaine may be used with caution in conjunction with spinal anaesthesia / analgesia.

- 2.4.3. IV Lidocaine should not be used in those with severe hepatic impairment due to its hepatic clearance.

- 2.4.4. Documented allergy to lidocaine.
2.5. **Cautions:**

2.5.1. Those with disturbed cardiac conduction; first three months after myocardial infarction; conditions of reduced cardiac output (left ventricular output less than 35 per cent of normal); bradycardia with heart rate below 50; Adam-Stokes syndrome; Wolff-Parkinson-White syndrome.

2.5.2. Epilepsy, or other increased tendency to convulsions; myasthenia gravis.

2.5.3. Severe renal impairment (eGFR <30ml/min/1.73m2).

2.5.4. Pregnancy.

2.6. **Initial dosing:**

2.6.1. An initial loading dose of **1.5mg/kg ideal body weight (max. 120mg)** of 1% Lidocaine should be given over at least 10 minutes

2.6.2. This can be given at induction or peri-operatively.

2.6.3. If this is given as rescue analgesia in recovery, this should be administered by the Anaesthetist. **Caution:** It should be considered whether such patients may have already received a local anaesthetic block. Do not administer within 4 hours of such a block

2.7. **Maintenance dosing:**

2.7.1. A continuous infusion of **1.5mg/kg/h** up to a maximum of 120mg/h (i.e. 12ml/h lidocaine 1%). Start at least 15 mins after bolus dose.

2.7.2. This may be down-titrated if required.

2.8. **Prescribing and administration:**

2.8.1. ***Prescribe the perioperative Lidocaine protocol on EPMA and chart the bolus dose***

2.8.2. Lidocaine should be prescribed in the **Lidocaine prescription sheet** (see appendix 4)

2.8.3. 50 ml (of 1% Lidocaine) containing 500mg should be drawn up in a LABELLED syringe

2.8.4. This should be administered via a syringe driver only, with an anti-reflux valve. Use “Rate Lock” if possible. Use a separate cannula if possible. The rate should be recorded on the analgesia chart. 1% Lidocaine can be given via peripheral venous access.

2.8.5. Lidocaine infusions for postoperative analgesia should only be given in theatre, theatre recovery, or critical care.
2.8.6. Dose regimens of IV Lidocaine differ if using peri-operatively to treat pain, or to treat arrhythmias. This must be carefully distinguished when prescribing.

2.9. **Monitoring:**

2.9.1. ECG monitoring should be continuous while any patient remains on a Lidocaine infusion.

2.9.2. Intraoperative monitoring should continue as per AAGBI standards.

2.9.3. Minimum frequency of postoperative BP, HR, RR and SpO2 monitoring should be: Every 15 minutes for the first hour; then half hourly for two hours; then hourly thereafter. Standard frequency of monitoring in recovery should continue if this is more frequent.

2.9.4. Patients on a Lidocaine infusion should be nursed at a minimum ratio of 1:2.

2.9.5. The cannula site should be checked at least as frequently as the observations, but as often as possible.

2.9.6. Document observations, infusion rate and any signs of LA toxicity on the RCHT 'Analgesic assessment chart'.

2.10. **Identification of local anaesthetic toxicity:**

2.10.1. Early or mild symptoms may include:

- perioral tingling
- metallic taste
- tinnitus
- agitation
- dizziness

2.10.2. Moderate symptoms may include:

- slurred speech or blurred vision
- bradycardia
- AV blocks
- hypotension
- paraesthesia
- confusion
2.10.3. Late or severe symptoms may include:

- Seizure
- Coma
- ventricular arrhythmia
- cardiac arrest.

2.11. **Management of local anaesthetic toxicity or other complication.**

2.11.1. If any adverse reaction is identified the infusion should be *immediately discontinued* and the anaesthetist (or on call anaesthetist, bleep 3513) should be contacted as a matter of urgency.

2.11.2. Local anaesthetic toxicity should be managed as per the AAGBI guidelines (see reference card in Appendix 3).

2.11.3. In the event of cardiac arrest: A cardiac arrest call should be made by dialing 2222 and management of the patient should follow advanced life support algorithms.

2.12. **Discontinuation:**

2.12.1. The infusion should be discontinued after 24 hours, or beforehand if the patient is due to return to the ward before this time.

2.12.2. Patients should never be transferred back to the ward with a Lidocaine infusion running.

2.13. **Other uses:**

Intravenous Lidocaine has uses in outpatient management of chronic pain and intra-arterial use during fibroid embolization. Use in these settings is not covered by this guideline.

**NB. This document is only as guidance for anaesthetists or intensivists prescribing, and the recovery and critical care staff administering, IV Lidocaine for analgesia – the use of IV Lidocaine for this purpose by other doctors or departments would not be expected without consultation.**
3. Monitoring compliance and effectiveness

<table>
<thead>
<tr>
<th>Element to be monitored</th>
<th>Problems occurring during infusion of intravenous lidocaine should be reported to the Acute Pain Lead, and documented using Datix Audit forms provided for feedback Usage of this treatment will be monitored by tracking prescription on JAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>Dr K Mitchell</td>
</tr>
<tr>
<td>Tool</td>
<td>Prescribing / Audit form – see appendix 4</td>
</tr>
<tr>
<td>Frequency</td>
<td>Yearly review of audit forms.</td>
</tr>
<tr>
<td>Reporting arrangements</td>
<td>All incidents will be reported to Acute/In-patient Pain Lead. Issues will be discussed at Acute Pain Group meetings</td>
</tr>
<tr>
<td>Acting on recommendations and Lead(s)</td>
<td>See “Reporting Arrangements”</td>
</tr>
<tr>
<td>Change in practice and lessons to be shared</td>
<td>As indicated</td>
</tr>
</tbody>
</table>

4. Equality and Diversity

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the 'Equality, Inclusion & Human Rights Policy' or the Equality and Diversity website.

4.2. Equality Impact Assessment

The Initial Equality Impact Assessment Screening Form is at Appendix 2.
## Appendix 1. Governance Information

<table>
<thead>
<tr>
<th>Document Title</th>
<th>Intravenous Lidocaine: Use for Perioperative Analgesia Clinical Guideline V2.1</th>
</tr>
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<tbody>
<tr>
<td>This document replaces (exact title of previous version):</td>
<td>Intravenous Lidocaine: Use for Perioperative Analgesia Clinical Guideline V2.0</td>
</tr>
<tr>
<td>Date Issued/Approved:</td>
<td>August 2021</td>
</tr>
<tr>
<td>Date Valid From:</td>
<td>October 2021</td>
</tr>
<tr>
<td>Date Valid To:</td>
<td>July 2024</td>
</tr>
<tr>
<td>Directorate / Department responsible (author/owner):</td>
<td>Keith Mitchell, Consultant Anaesthetist</td>
</tr>
<tr>
<td>Contact details:</td>
<td>01872 252792</td>
</tr>
<tr>
<td>Brief summary of contents</td>
<td>To provide safe and efficient administration of intravenous lidocaine to provide analgesia in High Dependency Areas in the perioperative period</td>
</tr>
<tr>
<td>Suggested Keywords:</td>
<td>Lidocaine, lignocaine, recovery, rescue, analgesia, intravenous, pain, perioperative</td>
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<td>Target Audience</td>
<td>RCHT</td>
</tr>
<tr>
<td>Executive Director responsible for Policy:</td>
<td>Medical Director</td>
</tr>
<tr>
<td>Approval route for consultation and ratification:</td>
<td>Anaesthetic Dept Governance Meeting Medication Practice Committee</td>
</tr>
<tr>
<td>General Manager confirming approval processes</td>
<td>Doug Riley</td>
</tr>
<tr>
<td>Name of Governance Lead confirming approval by specialty and care group management meetings</td>
<td>Anneka McBride</td>
</tr>
<tr>
<td>Links to key external standards</td>
<td><a href="https://www.aagbi.org/sites/default/files/la_toxicity_2010_0.pdf">https://www.aagbi.org/sites/default/files/la_toxicity_2010_0.pdf</a></td>
</tr>
<tr>
<td></td>
<td>Pandit &amp; McGuire. Unlicensed intravenous lidocaine for postoperative pain: always a safer ‘licence to stop’ than to start. Anaesthesia 2021</td>
</tr>
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</table>
Training Need Identified?  
No specific training required.

Publication Location (refer to Policy on Policies – Approvals and Ratification):  
Internet & Intranet ✓ Intranet Only

Document Library Folder/Sub Folder  
Clinical / Anaesthetics

**Version Control Table**

<table>
<thead>
<tr>
<th>Date</th>
<th>Version No</th>
<th>Summary of Changes</th>
<th>Changes Made by (Name and Job)</th>
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<tr>
<td>1 May 2018</td>
<td>V1.0</td>
<td>Initial Issue</td>
<td>Keith Mitchell Consultant Anaesthetist</td>
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<tr>
<td>24 August 2021</td>
<td>V2.1</td>
<td>Appendix 4. Intravenous Lidocaine for Perioperative analgesia added and section to provide details on how to use the form.</td>
<td>Anneka McBride, Governance Lead ACCT</td>
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</tbody>
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**All or part of this document can be released under the Freedom of Information Act 2000**

**This document is to be retained for 10 years from the date of expiry.**

**This document is only valid on the day of printing**

**Controlled Document**

This document has been created following the Royal Cornwall Hospitals NHS Trust Policy for the Development and Management of Knowledge, Procedural and Web Documents (The Policy on Policies). It should not be altered in any way without the express permission of the author or their Line Manager.
### Appendix 2. Equality Impact Assessment

#### Section 1: Equality Impact Assessment Form

<table>
<thead>
<tr>
<th>Name of the strategy / policy / proposal / service function to be assessed</th>
<th>Is this a new or existing Policy?</th>
</tr>
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<tbody>
<tr>
<td>Intravenous Lidocaine Use for Perioperative Analgesia Clinical Guideline V2.1</td>
<td>Existing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Directorate and service area:</th>
<th>Is this a new or existing Policy?</th>
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<tr>
<td>Theatres and Anaesthetics</td>
<td>Existing</td>
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</table>

<table>
<thead>
<tr>
<th>Name of individual/group completing EIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keith Mitchell, Consultant Anaesthetist</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contact details:</th>
</tr>
</thead>
<tbody>
<tr>
<td>01872 252792</td>
</tr>
</tbody>
</table>

1. Policy Aim

Who is the strategy / policy / proposal / service function aimed at?

To guide the safe and appropriate use of intravenous Lidocaine for perioperative analgesia.

2. Policy Objectives

To guide the safe and appropriate use of intravenous Lidocaine (lidocaine) for perioperative analgesia.

3. Policy Intended Outcomes

To guide the safe and appropriate use of intravenous Lidocaine (lidocaine) for perioperative analgesia.

4. How will you measure the outcome?

Monitoring through audit, departmental feedback, and discussion at governance meetings.

5. Who is intended to benefit from the policy?

Patients.

6a). Who did you consult with?

<table>
<thead>
<tr>
<th>Workforce</th>
<th>Patients</th>
<th>Local groups</th>
<th>External organisations</th>
<th>Other</th>
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</thead>
<tbody>
<tr>
<td>✓</td>
<td></td>
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</tbody>
</table>

b). Please list any groups who have been consulted about this procedure.

Anesthetists’ via group email and governance meeting

c). What was the outcome of the consultation?

Policy agreed
7. The Impact

Please complete the following table. If you are unsure/don’t know if there is a negative impact you need to repeat the consultation step.

Are there concerns that the policy *could* have a positive/negative impact on:

<table>
<thead>
<tr>
<th>Protected Characteristic</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
<th>Rationale for Assessment / Existing Evidence</th>
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<tr>
<td>Sex (male, female</td>
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<td>non-binary, asexual etc.)</td>
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<td>Gender reassignment</td>
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<td>Race/ethnic communities</td>
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<td>and some long term health</td>
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<td>Religion/other beliefs</td>
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<td>partnership</td>
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<td>Pregnancy and maternity</td>
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<td>Sexual orientation</td>
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<td>(bisexual, gay,</td>
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<tr>
<td>heterosexual, lesbian)</td>
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</table>

If all characteristics are ticked ‘no’, and this is not a major working or service change, you can end the assessment here as long as you have a robust rationale in place.

I am confident that section 2 of this EIA does not need completing as there are no highlighted risks of negative impact occurring because of this policy.

Name of person confirming result of initial impact assessment: Keith Mitchell, Consultant Anaesthetist

If you have ticked ‘yes’ to any characteristic above OR this is a major working or service change, you will need to complete section 2 of the EIA form available here: Section 2. Full Equality Analysis

For guidance please refer to the Equality Impact Assessments Policy (available from the document library) or contact the Human Rights, Equality and Inclusion Lead india.bundock@nhs.net
Appendix 3. AAGBI Safety Guideline for the Management of Severe Local Anaesthetic Toxicity

![AAGBI Safety Guideline](image)

1. **Recognition**
   - Signs of severe toxicity:
     - 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

2. **Immediate management**
   - 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

3. **Treatment**
   - **IN CIRCULATORY ARREST**
     - 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
   - **WITHOUT CIRCULATORY ARREST**
     - Use conventional therapies to treat:
       - Hypotension
       - Bradycardia
       - Tachyarrhythmia
   - **GIVE INTRAVENOUS LIPID EMULSION** (following the regimen overleaf)
     - Continue CPR throughout treatment with lipid emulsion
     - Recovery from LA-induced cardiac arrest may take >1h
     - Propofol is not a suitable substitute for lipid emulsion
     - Lidocaine should not be used as an anti-arrhythmic therapy
   - **CONSIDER INTRAVENOUS LIPID EMULSION** (following the regimen overleaf)
     - Propofol is not a suitable substitute for lipid emulsion
     - Lidocaine should not be used as an anti-arrhythmic therapy

4. **Follow-up**
   - 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:
     - 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)
   - If Lidop has been given, please also report its use to the international registry at www.lidopregistry.org. Details may also be posted at www.lipidrescue.org

**Your nearest bag of Lipid Emulsion is kept**

---

This guideline is not a standard of medical care. The ultimate judgement with regard to a particular clinical procedure or treatment plan must be made by the clinician in the light of the clinical data presented and the diagnostic and treatment options available.

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[www.aagbi.org/publications/guidelines/docs/la_toxicity_2010.pdf](http://www.aagbi.org/publications/guidelines/docs/la_toxicity_2010.pdf)

Intravenous Lidocaine: Use for Perioperative Analgesia Clinical Guideline V2.1
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Intravenous Lidocaine: Use for Perioperative Analgesia Clinical Guideline V2.1

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www.aagbi.org/publications/guidelines/docs/la_toxicity_2010.pdf
Appendix 4. CHA4603 Intravenous Lidocaine for Perioperative Analgesia

**Avoid local anaesthesia via other routes (except spinal) within 4 hours**
Prescribe periop lidocaine protocol on EPMA. See guideline.

Consented? Yes or No (Delete as appropriate)
Height:__________cm Estimated or Actual (Delete as appropriate)
Weight:__________kg Estimated or Actual (Delete as appropriate)
Ideal body weight (IBW):__________kg Male: height (cm) - 100
                                      Female height (cm) - 105
Calculate dose from IBW unless actual weight is lower, in which case use actual weight.
Bolus dose 1.5 x IBW =__________mg Duration at least 10 minutes
Infusion 1.5 x IBW =__________mg/hr Infusion maximum rate 120 mg/hr
Infusion rate of lidocaine 1% (10g/ml) =__________mg/hr (maximum 12ml/hr)

Bolus:__________mg Time commenced:________________________________________________
Time completed: __________________________________________________
Given by: __________________________________________________

Infusion: Lidocaine 1% at__________ml/hr (maximum 12ml/hr)
Prescribed by (Name in caps):_______________________________________________________
Prescribed by (Signature):_________________________________________________________

**Infusion maximum duration 24 hours**
Time commenced:________________________________________________
Committed by (Name in caps):___________________________________________
Committed by (Signature):_______________________________________________
Time completed:_______________________________________________________
Discontinued by:______________________________________________________
Intravenous Lidocaine for perioperative analgesia - Audit

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<tbody>
<tr>
<td>Pain at rest prior to infusion</td>
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<tr>
<td>Pain at rest after bolus</td>
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<tr>
<td>Pain at rest after infusion</td>
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All if applicable. 0 = No pain. 10 = Worst imaginable pain.

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<tr>
<th>Briefly detail circumstances</th>
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<th>Briefly detail effectiveness</th>
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<th>Briefly detail side effects or complications</th>
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<th>Any other comments?</th>
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File in patient notes alongside anaesthetic chart

CHA4603 V1