## LIGNOCAINE HYDROCHLORIDE (Lidocaine)

### ACTIONS

<table>
<thead>
<tr>
<th>Amide local anaesthetic:</th>
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<tbody>
<tr>
<td>Stabilizes excitable membranes and prevents initiation and transmission of nerve impulses</td>
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<td>Class 1B antiarrhythmic and membrane stabilizer</td>
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<tr>
<td>Reduces phase four diastolic depolarisation, decreases automaticity, and causes a decrease or no change in excitability and membrane responsiveness</td>
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<td>Ratio of effective refractory period to action potential duration is increased</td>
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<td>Lignocaine raises the ventricular fibrillation threshold</td>
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<td>Good efficacy in ischaemic myocardium</td>
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</table>

### INDICATIONS

- Treatment or prophylaxis of life threatening ventricular arrhythmias, VF, VT, Torsades de pointes
- Local or regional anaesthesia for nerve block, infiltration injection, caudal or other epidural blocks

### DOSAGE & ADMINISTRATION

#### CONVERSION:

- 1% Lignocaine = 10mg/mL
- 2% Lignocaine = 20mg/mL

#### Arrhythmias

**Bolus dose**

- Bolus of 1 to 1.5 mg/kg (usually 75 to 100 mg) IV, over 1 to 2 minutes
- Duration of action of single bolus dose is 10-20 minutes
- If bolus unsuccessful/refractory VT or VF give further 0.5mg – 0.75mg/kg bolus every 5 – 10 minutes (cumulative maximum dose no greater than 3mg/kg – or 200-300mg- in 1 hour)

If bolus successful, follow with an IV infusion.

**Intravenous (IV) Infusion** (please note, the pre-mixed bags are no longer available)

0.4% Lignocaine in Glucose 5% 500mL:

1. Withdraw 100mL fluid from a 500mL Glucose 5% bag
2. Add the contents of FIVE Lignocaine 400mg/20mL (2%) Vials -that is, 100mL volume to the above bag

**Note: the bag is preservative free as is required for Lignocaine infusions**

**Infusing regimen:**

- Infusion at 4 mg/minute
  - That is: 1ml/min = 60ml/hr for 60 minutes

Then infuse 1mg to 3 mg/minute

- That is: 0.25-0.75ml/min = 15 -45ml/hr

- Infusion should be stopped as soon as patient’s cardiac rhythm appears to be stable or at the earliest sign of toxicity (see Adverse Reactions)
- It should rarely be continued for more than 24hours

**Check compatibility before administering with other medications**

### IMPORTANT: This is a guideline ONLY, for more detailed information please refer to:

- MIMS
- Mircomedex
- The Australian Injectable Drugs Handbook
- Australian Medicines handbook
CONCORD REPATRIATION GENERAL HOSPITAL

Intensive Care Unit Drug Guidelines

CRGH ICU Drug Guideline: This guideline is written for use in the ICU only

LIGNOCAIN HYDROCHLORIDE

CONTRAINDICATION

- Known hypersensitivity to local anaesthetics of the amide type
- Inflammation or sepsis at the proposed site of injection and in the presence of septicemia
- Myasthenia gravis, severe shock or impaired cardiac conduction
- Use as an antiarrhythmic in patients with supraventricular arrhythmia; or Stokes-Adams syndrome or severe degrees of sinoatrial, atrioventricular or intraventricular block unless the patient has an artificial pacemaker as can result in ventricular standstill
- Current treatment with other antiarrhythmic agents in particular Class I agents such as flecainide or disopyramide (concurrent use of > 1 antiarrhythmic agents should only be on the advice of duty Intensivist or Cardiologist
- Heart block

PRECAUTIONS

- History of Epilepsy; Hepatic disease; Renal disease; Congestive cardiac failure; heart block; Sinus bradycardia; conduction disturbances; digoxin toxicity
- Marked hypoxia; severe respiratory depression
- Severe shock or hypovolaemia

LOCAL ANAESTHETIC

Maximum dose:
- Lignocaine without adrenaline 3mg/kg
- Lignocaine WITH adrenaline 7mg/kg

MONITORING

- Continuous ECG, observe for widening of QRS, prolongation of QTc, ST segment monitoring
- Blood pressure and SpO2 monitoring

ADVERSE REACTIONS

- CVS: Hypotension, bradycardia, decreased cardiac output, heart block, arrhythmia and cardiac arrest
- CNS: Circumoral paraesthesia, numbness of the tongue, lightheadedness and tinnitus. Visual disturbance and muscular tremors. Unconsciousness and grand mal convulsions may follow
- Malignant hyperthermia

TOXICITY

Cardiovascular precedes CNS toxicity.

TREATMENT OF TOXICITY REQUIRES INTRALIPID INFUSION: Intralipid 20%

Using Intralipid 20%

Initial management

- Bolus 1.5ml/kg IV over 1 min
- Then commence infusion at 15ml/kg/hr

After 5 minutes

- Repeat bolus a MAXIMUM of twice more for persistent CV collapse, ensure there is 5 minutes between each bolus
- If continued cardiovascular instability double the rate to 30ml/kg/hr

Then

- Continue infusion until stable and adequate circulation restored or maximum dose of lipid emulsion given (maximum cumulative dose of 12 ml/kg).

The patient is likely to require prolonged resuscitation and consideration of cardiovascular bypass/ECMO.
<table>
<thead>
<tr>
<th>COMPATIBILITY</th>
<th>Compatible fluids: Glucose 5%, Hartmann’s, sodium chloride 0.45%, sodium chloride 0.9%</th>
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<tbody>
<tr>
<td>INCOMPATIBILITY</td>
<td>Some sodium bicarbonate solutions</td>
</tr>
<tr>
<td>TRADE NAMES</td>
<td>Xylocaine; Xylocard Pfizer; also known as Lidocaine</td>
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<tr>
<td>REFERENCES</td>
<td>MiMS; Australian Injectable Drugs Handbook; eTherapeutic Guidelines; Micromedex 2.0</td>
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<tr>
<td></td>
<td>AAGBI (Association of Anaesthetists of Great Britain and Ireland, 2010) Safety Guideline: Management of Severe Local Anaesthetic Toxicity. Guideline endorsed by ANZCA; Lignocaine Hydrochloride CRGH Cardiology Department 2012; UpToDate.com; RPA ICS Lignocaine guideline</td>
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<td>Nursing Policy Practice Committee November 2015</td>
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<td>CRGH Drug Committee December 2015</td>
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<tr>
<td>REVISION DUE</td>
<td>November 2019</td>
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