MONOGRAPH

Lidocaine - Intravenous

Scope (Staff):	Medical, Pharmacy, Nursing, Anaesthetic Technicians
Scope (Area):	Intravenous – Critical Care, Emergency Department, Theatre

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this DISCLAIMER

⚠ HIGH RISK MEDICINE ⚠

QUICKLINKS

Dosage/Dosage Adjustments	Administration	Compatibility	Monitoring

DRUG CLASS

Antiarrhythmic (class Ib) and local anaesthetic.[1]

Intravenous lidocaine is a High Risk Medicine.

INDICATIONS AND RESTRICTIONS

- Treatment of serious ventricular arrhythmias[1]
- Treatment of refractory seizures or status epilepticus[1]
- Treatment of acute and chronic pain under the direction of the Acute Pain Service[1]

CONTRAINDICATIONS

- Hypersensitivity to lidocaine, amide local anaesthetics or any component of the formulation[2]
- Second or third-degree heart block (without pacemaker) or severe sinoatrial block (without pacemaker)[2]
- Treatment with flecainide or disopyramide[2]

PRECAUTIONS

- Hypovolaemia and electrolyte disturbances (particularly hypokalaemia or hyperkalaemia) – associated with an increased risk of arrhythmia. Correct before starting treatment if possible. Monitor patient's blood pressure and ECG during administration.[2]
- Cardiogenic shock and myocardial ischaemia – associated with a risk of increased cardiovascular depressant effects. Monitor closely and adjust to effect.[2]
- Bradycardia and impaired cardiac conduction – associated with an increased risk of arrhythmia. Correct before starting treatment if possible.[2]
- Combined use with other anti-arrhythmic agents – patients may experience additive depressant effects. Use cautiously and monitor clinically.[2]
- Renal impairment – toxicity may develop with prolonged or repeated administration. Use with caution.[2]
- Severe hepatic impairment and reduced hepatic blood flow (e.g. in heart failure) – toxicity may develop with prolonged or repeated administration due to reduced clearance. Use with caution and adjust dose accordingly.[2]

FORMULATIONS

Listed below are products available at PCH, other formulations may be available, check with pharmacy if required:

- Lidocaine 1% (50 mg/5 mL) ampoule
- Lidocaine 2% (100 mg/5 mL) ampoule

Imprest location: Formulary One

DOSAGE & DOSAGE ADJUSTMENTS

Neonates: Refer to Neonatal Medication Protocols

Dosing in Overweight and Obese Children: For non-emergency indications, calculate dose based on ideal body weight to avoid excessive dosage.[3]

Children ≥ 4 weeks of age:

Ventricular arrhythmias:

Intravenous Injection:

- 1 mg/kg (maximum 100 mg)[1]
  - Follow bolus / loading dose with a continuous infusion[1, 3]
  - A repeat dose may be given if the infusion is initiated more than 15 minutes after the initial bolus[1]
  - Maximum intravenous load: 3 mg/kg (maximum 300 mg) in 1 hour[1]

Continuous Infusion:

- 0.6 – 3 mg/kg/hour[1, 3]
    - Cease continuous infusion once the cardiac rhythm stabilises or if toxicity occurs[1]

Refractory seizures or status epilepticus:

Intravenous Injection:

- 1 – 2 mg/kg (maximum 100 mg)[1]
    - Follow bolus / loading dose with a continuous infusion[1]

Continuous Infusion:

- 2 – 6 mg/kg/hour[1]

Acute Pain:

Refer to the Intravenous Lidocaine Infusion for Acute Pain guideline

Renal impairment:

- eGFR calculator
- Severe impairment may cause accumulation of lidocaine and active metabolites[3]
- Consider reducing dose during prolonged infusion longer than 24 hours or repeated intermittent intravenous doses[2, 4]

Hepatic impairment:

- Severe impairment and reduced hepatic blood flow (e.g. heart failure) may cause accumulation of lidocaine due to decreased clearance of lidocaine[2]
- Consider halving dose during prolonged infusion longer than 24 hours or repeated intermittent intravenous doses[2, 4]

ADMINISTRATION

Intravenous injection:

- Administer over 2 – 3 minutes[5]
- Maximum rate: 0.7 mg/kg/minute or 50 mg/minute (whichever is less)[5]
    - Faster infusion rates may be required in emergency, life-threatening situations[5]
- Dilute dose to a suitable volume with a compatible fluid to allow for administration as an IV push or inject undiluted (if volume is sufficient)[5]

Continuous intravenous infusion:

- Administer **10 mg/mL** undiluted using the **Lidocaine 1% (50 mg/5 mL) product**[2, 8]
  - For continuous infusions, draw an appropriate amount of undiluted lidocaine 1% into a 50 mL syringe.
  - The syringe driver may not be able to administer high infusion rates if a 30 mL syringe is used.
  - Lidocaine generally requires a separate vascular line to avoid inadvertent bolus administration
- Infusion via a large peripheral vein or central line is preferred

COMPATIBILITY *(LIST IS NOT EXHAUSTIVE)*

Compatible fluids: Glucose 5%, sodium chloride 0.9%, sodium chloride 0.45%, Ringer's, Hartmann's[6]

- At Y-site: Plasma-Lyte 148[6]

Compatible at Y-site: Alteplase, amikacin, amiodarone, calcium gluconate, cefazolin, cefotaxime, ceftazidime, ceftriaxone, fluconazole, furosemide, gentamicin, heparin sodium, hydrocortisone sodium succinate, labetalol, magnesium sulfate, meropenem, metoclopramide, micafungin, morphine sulfate, paracetamol, remifentanil, tobramycin, vancomycin[6]

Only commonly used drugs are listed below. This is not a complete list of incompatible drugs. Compatibilities of IV drugs must be checked when two or more drugs are given concurrently.

INCOMPATIBLE drugs: Some sodium bicarbonate solutions, aciclovir, azathioprine, caspofungin, ganciclovir, metoprolol, milrinone, phenobarbital, thiopental sodium[6]

MONITORING

- Continuous ECG monitoring[1, 6]
- Blood pressure[1]
- Symptoms of toxicity – numbness of tongue, tingling sensation, tinnitus, sensitivity to sound[6]
  - Please refer to the Local Anaesthetic Systemic Toxicity guideline
- Plasma levels – large or repeated doses may lead to plasma levels that are high enough to cause adverse effects. Consider measuring levels if toxicity is suspected[1, 6]
- Liver function test[7]

ADVERSE EFFECTS

Adverse effects are dose-related and are more frequent at infusion rates of 3 mg/minute or more[2]

Has proarrhythmic effect – may worsen arrhythmia[2]

Common: Headache, dizziness, drowsiness, confusion, visual disturbances, tinnitus, tremor, paraesthesia[2]

Infrequent: Hypotension, bradycardia, arrhythmias, cardiac arrest, muscle twitching, seizures, coma, respiratory depression[2]

Rare: Allergy (e.g. urticaria, rash, anaphylactoid)[2]

STORAGE

Ampoule: Store below 25˚C[6]

Infusion solution: Stable for 24 hours below 25 ˚C[6]

INTERACTIONS

This medication may interact with other medications; consult PCH approved references (e.g. Clinical Pharmacology), a clinical pharmacist or PCH Medicines Information Service on extension 63546 for more information.

Please note: The information contained in this guideline is to assist with the preparation and administration of **lidocaine (lignocaine) - parenteral**. Any variations to the doses recommended should be clarified with the prescriber prior to administration

Related CAHS internal policies, procedures and guidelines

Intravenous Lidocaine Infusion for Acute Pain

Local Anaesthetic Systemic Toxicity

References

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