

Intravenous Lidocaine for Acute Pain Management

Potential Indications:

Renal colic, sickle cell crisis, intractable migraine, postherpetic neuralgia, neuropathic and centrally mediated pain, ischemic limb pain, etc. in patients > 17 years of age.

Advantages of Lidocaine in Pain Management:

Lidocaine IV provides significant pain relief, reduces concurrent opioid consumption (synergistic analgesia), and can decrease opioid-induced nausea and vomiting. The side-effect profile of parenteral lidocaine is predictable and has a wide safety margin at low dosages (e.g. 1.5 mg/kg).

Mechanism of Action:

Lidocaine is an amide local anesthetic that has analgesic, anti-hyperalgesic and anti-inflammatory properties. It has various mechanisms of action as an analgesic resulting from the interaction with sodium channels and interaction with different receptor and nociceptive transmission pathways.

Dosage and Administration:

Lidocaine 1.5 mg/kg in NS 50 mL IVPB over 15 mins; Max single dose 300 mg

- If needed, may consider a repeat dose. Do not exceed 3 mg/ kg in a 4-hour period.
- Can be administered via peripheral or central IV lines.

Pharmacokinetics (single bolus dose):

Onset of Action: 45 to 90 seconds

Peak effect: 10 minutes

Duration of analgesia: 1-3 hours (*case studies revealed extended pain relief > 24 hours*)

Monitoring:

- Baseline EKG
- Continuous cardiac monitoring (during and 30 minutes following infusion)
- Blood pressure, heart rate, oxygen saturation (prior to, during, and 30 minutes following infusion)
- Pain Scale level (baseline and 30 minutes following infusion)
- Neurological and respiratory status throughout infusion for signs of toxicity
- Site of infusion for signs of local thrombophlebitis

Adverse Effects:

Lidocaine has a short plasma half-life of 1.5 to 2 hours. Thus, stopping the infusion at the initial signs of toxicity may quickly resolve symptoms. ****Although lidocaine has a broad safety margin, serious adverse effect due to incorrect dosing have occurred****

Mild Adverse Effects: (continue infusion) (Lower dosages)	Moderate Toxicity: (discontinue infusion)	Severe Toxicity: (discontinue infusion & consider intralipid) (Typically with dosages > 6 mg/kg)
<ul style="list-style-type: none">• Dysarthria/Slurred speech• Periorbital/perioral numbness• Lightheadedness/dizziness• Metallic taste• Tinnitus	<ul style="list-style-type: none">• Severe dizziness/confusion• Visual disturbances• Hypotension• Nausea/vomiting• Tremors/restlessness	<ul style="list-style-type: none">• Arrhythmias• Cardiovascular collapse• Cardiac arrest• Seizures

Absolute Contraindications:

- Amide allergy ("caine" allergy)
- Stokes syndrome; Wolff-Parkinson-White syndrome; severe degrees of SA, AV, or intraventricular heart block (except in patients with a functioning artificial pacemaker)

Precautions:

- Use cautiously in hepatic impairment, CHF, recent MI, and/or concurrent local anesthetics.

References:

Lidocaine. Lexi-Drugs. Lexi-Comp Online. Hudson, OH: Lexi-Comp; 2015. Accessed September 5, 2017.

Schwartz DR, Kaufman B. Local Anesthetics. In: Hoffman RS, Howland M, Lewin NA, Nelson LS, Goldfrank LR. eds. *Goldfrank's Toxicologic Emergencies*, 10e New York, NY: McGraw-Hill; 2015.

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