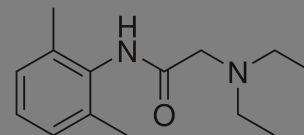


Lidocaine Infusion for Analgesia



MOA

1. Attenuation of proinflammatory effects:
 - Blocks polymorphonuclear granulocyte priming, reducing release of cytokines & reactive oxygen species¹
2. Diminish nociceptive signaling to central nervous system:
 - Inhibition of G-protein-mediated effects²
 - Reduces sensitivity & activity of spinal cord neurons (glycine and NMDA receptor mediated)^{3,4}
3. Reduces ectopic activity of injured afferent nerves⁵

Perioperative Use

- IV local anesthetic infusions have been used safely for pain control in the perioperative setting since the early 1950's^{6,7}
- Reduce pain, nausea, ileus duration, opioid requirement, and length of hospital stay

Evidence for Specific Surgeries:⁹⁻¹²

- **Strong:** Open & laparoscopic abdominal; Reduces postoperative pain, speeds return of bowel function, reduces PONV, reduces length of hospital stay
- **Moderate:** Open prostatectomy, thoracic procedures, ambulatory surgery, and major spine; Reduces postoperative pain and opioid consumption
- **Moderate:** Breast; Prevention of chronic postsurgical pain
- **No benefit:** Total abdominal hysterectomy, total hip arthroplasty, and laparoscopic renal surgery



Pharmacology

- Hepatic metabolism with high extraction ratio; plasma clearance is 10 ml/kg/min¹³
 - Adjust dose based on hepatic function and blood flow
- Renal clearance of metabolites
- Context-sensitive half-time after a 3-day infusion is ~20–40 min
- Clinical effect of lidocaine tends to exceed the duration of the infusion by 5.5 times the half-life, supporting the putative preventive analgesia effect¹⁴

Dosing

Infusion: 2mg/kg/hr (range 1.5-3 mg/kg/hr)

Loading dose: 1.5mg/kg (range 1-2 mg/kg)

- Strongly consider bolus to rapidly achieve therapeutic concentration, otherwise steady state reached in 4-8 hr

Max dose: 4.5 mg/kg

- Consider total dose from other local anesthetics (e.g. regional anesthesia, periarticular injections, & local infiltration)

Continuous infusions up to 3 mg/kg/hr have been shown to be safe

- Reduce infusion rate in patients with impaired drug metabolism & clearance (i.e. hepatic & renal dysfunction)

Therapeutic level: 2.5-3.5 µg/ml

- CNS toxicity: >5 µg/ml
- Cardiovascular toxicity: >10 µg/ml

LIDOCAINE _____ %

Date _____ Time _____ Init. _____



$$x\% = (x \cdot 10) \text{ mg/mL}$$

Caution

- Unstable coronary disease, recent MI, heart block, arrhythmias, heart failure
- Electrolyte disturbances
- Seizure disorders
- Liver disease (decreased metabolism)
- Renal disease (decreased clearance of metabolites)



Local Anesthetic Systemic Toxicity (LAST)

- **Mild:** Paresthesias (fingers, toes, perioral), metallic taste, tinnitus, lightheadedness, dizziness, visual disturbances, confusion
- **Moderate:** Nausea, vomiting, severe dizziness, decreased hearing tremors, BP/HR changes, confusion
- **Severe:** Drowsiness, confusion, loss of consciousness, muscle twitching, **seizures, cardiac arrhythmias, cardiac arrest**

ACLS*

*Reduced epinephrine dose, lipid emulsion (20%), benzodiazepines for seizures, consider ECMO

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