LIDOCAINE

Lidocaine (parenteral)
(Lye doe-kane)

Lidocaine (local anesthetic)

Lidocaine (topical)

Classification

Therapeutic: anesthetics (topical/local), antiarrhythmics (class IB)

Pregnancy Category B

Indications

IV: Ventricular arrhythmias.
IM: Self-injected or when IV unavailable (during transport to hospital facilities).
Local:
Infiltration/mucosal/topical anesthetic.
Patch:
Pain due to post-herpetic neuralgia.

Action

IV, IM: Suppresses automaticity and spontaneous depolarization of the ventricles during diastole by altering the flux of sodium ions across cell membranes with little or no effect on heart rate. Sustains local anesthesia by inhibiting transport of ions across neuronal membranes, thereby preventing initiation and conduction of normal nerve impulses.

Therapeutic Effects:
Control of ventricular arrhythmias.
Local anesthesia.

Pharmacokinetics

Absorption: Well absorbed after administration into the deltoid muscle; some absorbed following local use.
Distribution: Widely distributed. Concentrates in adipose tissue. Crosses the blood-brain barrier and placenta; enters breast milk.
Metabolism and Excretion: Mostly metabolized by the liver; ~10% excreted in urine as unchanged drug.
Half-Life: Initial phase, 7–50 min; terminal phase, 95–120 min; ~1 HR and liver impairment.

Action

TIME/ACTION PROFILE (IV, IM antiarrhythmic effects; local = anesthetic effects)

ROUTE ONSET PEAK DURATION

IV immediate immediate 10–20 min (up to several hours after continuous infusion)

IM 5–15min 20–30min 60–90min

Local rapid unknown 1–3hr

Contraindications/Precautions

Applies mainly to systemic use
Contraindicated in:
Hypersensitivity; cross-sensitivity may occur; Third-degree heart block.

Use Cautiously in:
Liver disease, HF, patients weighing ~50 kg, and geriatric patients (| bolus and/or maintenance dose); Respiratory depression; Shock; Heart block; OB, Lactation: Safety not established; Pedi: Safety not established for transdermal patches.

Adverse Reactions/Side Effects

CNS:
SEIZURES, confusion, drowsiness, blurred vision, dizziness, nervousness, slurred speech, tremor.

EENT:
Mucosal use — | gag reflex.

CV:
CARDIAC ARREST, arrhythmias, bradycardia, heart block, hypotension.

GI:
Nausea, vomiting.

Resp:
Bronchospasm.

Hemat:
Methemoglobinemia.

Local:
Stinging, burning, contact dermatitis, erythema.

MS:
Chondrolysis.

Misc:
Allergic reactions, including ANAPHYLAXIS.

Interactions

Drug-Drug:
| Cardiac depression and toxicity with phenytoin, amiodarone, quinidine, procainamide, or propranolol.
| Cimetidine,azole antifungals,

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clarithromycin, erythromycin, fluoxetine, nefazodone, paroxetine, prazosin, ritonavir, and others may inhibit lidocaine metabolism and thus reduce lidocaine levels and risk of toxicity. Lidocaine levels may be monitored to determine the need for dose adjustments. When used concomitantly with other drugs known to increase lidocaine levels, additional caution should be used.

Route/Dosage

**Ventricular Tachycardia (with a Pulse) or Pulseless Ventricular Tachycardia/Ventricular Fibrillation**

**IV (Adults):** 1–1.5 mg/kg bolus; may repeat doses of 0.5–0.75 mg/kg q 5–10 min up to a total dose of 3 mg/kg; may then start continuous infusion of 1–4 mg/min.

**Endotracheal (Adults):** See 2–3.5 times the IV loading dose down the endotracheal tube, followed by a 10 mL saline flush.

**IV (Children):** 1 mg/kg bolus (not to exceed 100 mg), followed by 20–50 mcg/kg/min continuous infusion (range 20–50 mcg/kg/min); may administer second bolus of 0.5–1 mcg/kg if delay between bolus and continuous infusion.

**Endotracheal (Children):** See 2–5 mg/kg down the endotracheal tube followed by a 5 mL saline flush.

**IM (Adults and Children ≤50 kg):** 300 mg (4.5 mg/kg); may be repeated in 60–90 min.

**Local Infiltration (Adults and Children):** Infiltrate affected area as needed (increased amount and frequency of use increases likelihood of systemic absorption and adverse reactions).

**Topical (Adults):** Apply to affected area 2–3 times daily.

**Mucosal (Adults):** For anesthetizing oral surfaces—20 mg as 2 sprays/quadrant (not to exceed 30 mg/quadrant) may be used. 15 mL of the viscous solution may be used q3h for oral or pharyngeal pain.

**For anesthetizing the female urethra—3–5 mL of the jelly or 20 mg as 2% solution may be used.**

**For anesthetizing the male urethra—5–10 mL of the jelly or 5–15 mL of 2% solution may be used before catheterization or 30 mL of jelly before cystoscopy or similar procedures.**

Topical solutions may be used to anesthetize mucous membranes of the larynx, trachea, or esophagus.

**Patch (Adults):** Up to 3 patches may be applied once for up to 12 hr in any 24 hr period; consider smaller areas of application in geriatric or debilitated patients.

NURSING IMPLICATIONS

**Assessment**

- **Antiarrhythmic:** Monitor ECG continuously and BP and respiratory status frequently during administration.
- **Transdermal:** Monitor for pain intensity in affected area periodically during therapy.

**Lab Test Considerations:** Serum electrolyte levels should be monitored periodically during therapy.

- **Toxicity and Overdose:** Serum lidocaine levels should be monitored periodically during prolonged therapy. Therapeutic serum lidocaine levels range from 1.5 to 5 mcg/mL.

- Signs and symptoms of toxicity include confusion, excitation, blurred or double vision, nausea, vomiting, ringing in ears, tremors, twitching, seizures, difficulty breathing, severe dizziness or fainting, and unusually slow heart rate.

- If symptoms of overdose occur, stop infusion and monitor patient closely.

Potential Nursing Diagnoses

- Decreased cardiac output (Indications)
- Acute pain (Indications)

**Implementation**

- **High Alert:** Lidocaine is readily absorbed through mucous membranes. Inadvertent overdosage of lidocaine jelly and spray has resulted in patient harm or death from neurologic and/or cardiac toxicity. Do not exceed recommended doses.

- **Throat Spray:** Ensure that gag reflex is intact before allowing patient to drink or eat.

- **IM:** IM injections are recommended only when ECG monitoring is not available and benefits outweigh risks. Administer IM injections only into deltoid muscle while frequently aspirating to prevent IV injection.

**IV Administration**

- **Direct IV:** Only 1% and 2% solutions are used for direct IV injection. **Diluent:** Administer lidocaine loading dose over 2–3 min. Follow by IV continuous infusion.
CONTINUOUS INFUSION: LIDOCAINE may cause life-threatening cardiac arrhythmias, respiratory failure, coma, and death. May cause drowsiness and dizziness. Advise patient to call for assistance during administration and transfer.

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Available in LidoPen auto-injector for use outside the hospital setting. Advise patient to telephone health care professional immediately if symptoms of a heart attack occur.

Do not administer unless instructed by health care professional. To administer, remove safety cap and place back end on thickest part of thigh or deltoid muscle. Press hard until needle prick is felt. Hold in place for 10 sec, then administer, remove safety cap and place back end on thickest part of thigh or deltoid muscle. Press hard until needle prick is felt. Hold in place for 10 sec, then

Caution women to consult health care professional before using a topical anesthetic for a mammogram or other procedures. If recommended, use lowest drug concentration, and apply it sparingly. Do not apply heat to area (heating pad/electric blanket), to decrease chance that drug may be absorbed into the body. May result in seizures, coma, cardiac arrest, respiratory failure, convulsions, and death.

Patch may be cut to smaller sizes with scissors before removing release liner. Clothing may be worn over patch. If irritation or burning sensation occurs during application, remove patch until irritation subsides. Wash hands after application; avoid contact with eyes. Dispose of unused patch to avoid access by children or pets.

Do not wrap skin, and do not apply heat to area (heating pad/electric blanket); to decrease chance that drug may be absorbed into the body. May result in seizures, cardiac arrest, respiratory failure, convulsions, and death.

Inhalation: Lidocaine with epinephrine may be used to reduce systemic absorption and prolong local anesthesia.

Topical: Apply CibaGard Patch to intact skin to cover the most painful area. Patch may be cut to smaller sizes with scissors before removing release liner. Cooling may be worn over patch. If irritation or burning sensation occurs during application, remove patch until irritation subsides. Wash hands after application; avoid contact with eyes. Dispose of unused patches to avoid access by children or pets.

Gastrointestinal: Consider amount absorbed from all formulations. When used concomitantly with other products containing local anesthetic agents, consider amount absorbed from all formulations.
Advise patient referred for MRI test to discuss patch with referring health care professional and MRI facility to determine if removal of patch is necessary prior to test and for directions for replacing patch.

Evaluation/Desired Outcomes

- Decrease in ventricular arrhythmias.
- Local anesthesia.

Why was this drug prescribed for your patient?