

Treating Canine Ventricular Arrhythmias with Intravenous Lidocaine

The information below offers guidance on when and how to use intravenous lidocaine for dogs with ventricular arrhythmias. An important note regarding lidocaine treatment for cats is included.

When—and when not—to use lidocaine treatment for dogs

USE	DO NOT USE	POSSIBLY USE
Ventricular tachycardia with a heart rate greater than 160 bpm lasting 30 seconds or longer	Sustained or intermittent ventricular rhythm with an instantaneous ventricular rate* of less than 120 bpm	Sustained or intermittent ventricular rhythm with an instantaneous ventricular rate* of 120–160 bpm
Or A nonsustained or intermittent ventricular rhythm with an instantaneous ventricular rate* greater than 160 bpm causing hypotension or other evidence of poor perfusion	<i>This rhythm represents either ventricular ectopic beats or ventricular escape beats, which do not require treatment with lidocaine.</i> <i>In this situation, lidocaine is often contraindicated, since there is some concern it could suppress an important escape rhythm.</i>	<i>At this rate, hemodynamic consequences are less likely. This rhythm most likely reflects an accelerated idioventricular rhythm (AIVR), but a slow ventricular tachycardia may also be present. (The difference between these two rhythms is defined by how close their rate is to the sinus rate.)</i> <i>AIVR does not require treatment and typically does not respond to lidocaine. A slow ventricular tachycardia may respond to lidocaine. That said, a trial bolus of lidocaine is unlikely to hurt and may help normalize the rhythm.</i>

*Instantaneous ventricular rate is the heart rate between two adjacent ventricular complexes or between a ventricular complex and its preceding sinus beat.

Intravenous lidocaine protocol for dogs

CAUTION: Do **not** administer the product containing epinephrine, which is often used for local analgesia. Epinephrine may make the arrhythmia worse and cause overall tachycardia.

Initial treatment

Give an intravenous (IV) bolus of 2 mg/kg of lidocaine over 30–60 seconds. The bolus can be repeated every 5–10 minutes up to three additional times, but do not exceed a maximum total dose of 8 mg/kg.¹

CAUTION: If the IV bolus is given too quickly, hypotension may occur. While side effects are generally rare at standard doses, signs of toxicity include:

- Central nervous system (CNS) signs (seizures, tremors, depression)
- Gastrointestinal (GI) signs (nausea, vomiting)
- Electrocardiogram (ECG) changes (PR prolongation, QRS widening, and QT interval shortening)¹

Continued treatment

If necessary, treatment may be continued with a 40–80 $\mu\text{g}/\text{kg}/\text{minute}$ constant rate infusion (CRI). A CRI may be deemed necessary if the patient initially responds to a lidocaine bolus, but the ventricular arrhythmia worsens as soon as the bolus is metabolized, generally within 10–20 minutes.¹ A 2 mg/kg IV loading dose should be given before beginning the CRI. If a severe ventricular arrhythmia recurs, give additional boluses at half the initial dose after initiation of CRI.

Efficacy

The efficacy of lidocaine treatment may consist of a reduction in heart rate (for instance, conversion of ventricular tachycardia to AIVR) or conversion to sinus rhythm.

The persistence of lower-grade ventricular ectopy, even if frequent, does not represent a failure of treatment or a reason for initiating more aggressive treatment.

Important note on intravenous lidocaine treatment for cats

Lidocaine must be used with extreme caution in cats. Cats are anecdotally reported to be more sensitive to the CNS and cardiodepressant side effects of lidocaine.

We strongly recommend addressing a concerning ventricular arrhythmia in a cat with a stat or superstat ECG for individualized treatment recommendations.

We're here to help you 24 hours a day, 7 days a week.

For assistance call **1-800-726-1212**, email telemedicinesupport@idexx.com, or visit idexx.com/telemedicine.

References

Lidocaine HCl (local anesthetic). Plumb's Veterinary Drugs Web site. plumbsveterinarydrugs.com/#!/monograph/aazQZ5yCEY. Published August 2017.