

# BCCA Protocol Summary for Extreme Pain Therapy Using Parenteral Lidocaine

<b>Protocol Code</b>	SCPAINLI
<b>Tumour Group</b>	Supportive Care – Pain and Symptoms Control
<b>Contact Physician</b>	VC - Dr Pippa Hawley CSI - Dr Gillian Fyles

## PREFACE

**Lidocaine** is an amide local anesthetic that is a non-selective sodium channel blocker given with the intent of relieving chronic neuropathic pain. Injured nerves develop abnormal, spontaneous active sodium channels at the site of nerve injury and along the nerve pathway. In low doses, lidocaine can suppress this abnormal firing at concentrations that do not affect normal nerve or cardiac function. Lidocaine is rapidly metabolized in the liver and the metabolites are excreted by the kidneys. Dose adjustments may be required in the case of liver and/or renal insufficiency. Lidocaine can also have a negative inotropic effect and should be used with caution when there is a history of cardiac failure.

## ELIGIBILITY

- Patients with diagnosis of severe pain syndrome unresponsive, **completely or incompletely**, to standard **therapy including adjuvant** therapies.
- Patients with particularly severe neuropathic pain requiring acute therapy to diminish pain with the understanding that other less invasive medications will be administered to provide ongoing pain relief.

## EXCLUSIONS

- **Patients must be adequately cognitively intact to report pain intensity and adverse effect**
- Prior allergy to local anaesthetics
- Liver failure (Bilirubin greater than or equal to 25 micromol/L)
- Severe cardiac failure or **second/third degree** heart block
- Uncontrolled seizures
- Hypertension (BP greater than 160 mm Hg systolic)
- Hypokalemia

## TESTS

- **Baseline:**
  - EKG within 14 days of procedure if male over 65 yrs, female over 55 yrs and/or known or suspected of having cardiac problems
  - **Bloodwork:** potassium, creatinine, BUN, AST/ALT, bilirubin
- During each treatment:
  - During infusion: blood pressure, heart rate and pain level every 15 minutes
  - **After** infusion: blood pressure, heart rate and pain level every 15 minutes x 2
- If clinically indicated:
  - repeat EKG, serum potassium, AST/ALT, bilirubin
- **Rule out previous allergy to amide type local anesthetic.**

## PREMEDICATIONS

- None

## TREATMENT for adults

Drug	Dose	BCCA Administration Guideline
lidocaine	<a href="#">Intermittent Dose</a> First dose: 5 mg/kg (maximum single dose of 900 mg)	IV in 250 mL** <b>D5W</b> over 60 to 120 min

Drug	Dose	BCCA Administration Guideline
lidocaine	<a href="#">Intermittent Dose</a> Subsequent doses*: 5 to 10 mg/kg	IV in 250 mL** <b>D5W</b> over 60 to 120 min

\* Subsequent doses will be determined by clinical effect and evidence of toxicity

\*\*In 100 mL for lower doses to keep final concentration at 1 to 4 mg/mL

- Repeat as per patient's need (up to **every** 30 days). Discontinue if no response or **toxicity occurs.**

## DOSE MODIFICATIONS

1. **Hematological:** None
2. **Renal dysfunction:** Titrate to effect and toxicity.
3. **Hepatic dysfunction:** Use with caution and titrate to effect and toxicity.

## PRECAUTIONS

1. **CNS effects:** Adverse reactions usually involve CNS effects, and are related to lidocaine dose and serum concentration.
  - **Lower concentration** Early warning signs include ringing in ears, metallic taste, lightheadedness, perioral numbness or tingling, and headache.
  - **Higher concentration** (near 21 micromol/L) CNS disturbances: feelings of dissociation, paresthesias, mild drowsiness, or mild agitation, nausea/vomiting.
  - **Highest concentrations** (> 21 micromol/L) CNS disturbances: decreased hearing, tinnitus, disorientation, blurry vision, muscle twitching, convulsions, or respiratory arrest.

When adverse reactions occur, stop the infusion and contact physician. Infusion may be restarted at lower rate after resolution of symptoms as per physician's orders. LORazepam for seizures may be ordered.

**Unrest, tremor and facial twitching are warning signs of impending generalized convulsions.**

**Perspiration, dyspnea, and short intervals of apnea are warning signs of impending respiratory arrest.**

2. **Cardiovascular effects:** Reactions are rare with lidocaine and are usually related to high serum levels of lidocaine; they may be the first manifestations of toxicity.
  - **Myocardial depression or bradycardia (at high therapeutic serum levels):** Physician to specify lowest heart rate (HR). Atropine for bradycardia may be ordered. Although lidocaine after myocardial infarction has been associated with a trend towards increased risk of arrhythmias, cardiac monitoring during studies of normal patients have noted no major cardiovascular toxicity at clinically appropriate levels.
  - **Gradual increase in blood pressure:** If blood pressure changes over 3 consecutive readings by plus or minus 10 mmHg or is greater than systolic 160 mmHg, stop the infusion and contact physician. Infusion may be restarted at lower rate after resolution of symptoms, as per physician's orders. At low serum levels, high blood pressure may be observed; as the serum levels increase, the

blood pressure may decrease. Physician to specify lowest and highest systolic blood pressure (SBP). Captopril for hypertension may be ordered.

3. **Respiratory toxicity:** Perspiration, dyspnea and short intervals of apnea are warning signs of impending respiratory arrest. Stop infusion, contact physician and administer oxygen. Lidocaine may potentiate bronchospasm and cause airway narrowing in asthmatics.
4. **Drug Interactions:** Cimetidine or beta-blockers may increase lidocaine serum concentrations. Phenytoin may stimulate the hepatic metabolism of lidocaine.

**Call Dr. Pippa Hawley (pager 05081) at (604) 877-6000 or 1-800-663-3333 with any problems or questions regarding this treatment program.**

**Date activated:** 01 September 2003

**Date revised:** 1 Mar 2016 (Eligibility and Exclusions clarified, Tests, Treatments and Precautions updated)

#### **References:**

1. Antiarrhythmic Agents – Lidocaine. In: AHFS 2003 Drug Information. McEvoy GK, editor. Bethesda (MD): American Society of Health-System Pharmacists, Inc.; 2003, pp. 1547-51.
2. Ismail K, Simpson PJ. Anaphylactic shock following intravenous administration of lignocaine. *Acta Anaesthesiol Scand* 1997;41:1071-2.
3. Mao J, Chen LL. Systemic lidocaine for neuropathic pain relief. *Pain* 2000;87:7-17.
4. Ferrini R. Parenteral lidocaine for severe intractable pain in six hospice patients continued at home. *J Palliative Med* 2000;3(2):193-200.
5. Ferrini R, Paice J. How to initiate and monitor infusional lidocaine for severe and/or neuropathic pain. *J Support Oncol* 2004;2(1):90-4.
6. Thomas J, Kronenberg R, Craig M, et al. Intravenous lidocaine relieves severe pain: results of an inpatient hospice chart review. *J Palliative Med* 2004;7(5):660-7.
7. Tremonts-Lukats IW, Challapalli V, McNicol E, et al. Systemic administration of local anesthetics to relieve neuropathic pain: a systematic review and meta-analysis. *Anesth Analg* 2005;101:1738-49.
8. Challapalli V, Tremont-Lukats IW, McNicol E, et al. Systemic administration of local anesthetic agents to relieve neuropathic pain. *Cochrane Database Syst Rev* 2005 Oct 19;(4):CD003345.
9. Jarvis V, Smyth C, Fitzgibbon EJ. Options for management of intractable pain: continuous lidocaine infusion in the home. *Crossroads: Profiles in innovative care*. 2007;6(2):35-8.
10. Vancouver Coastal Health. Pain: Parenteral lidocaine, nursing management of the palliative care patient with neuropathic pain. June 2008.
11. Sharma S, Rajagopal MR, Palat G, et al. A phase II pilot study to evaluate use of intravenous lidocaine for opioid-refractory pain in cancer patients. *J Pain Symptom Manage* 2009;37(1):85-93.
12. Burches BR, Warner DO. Bronchospasm after intravenous lidocaine. *Anesth Analg* 2008;107(4):1260-2.
13. Peixoto RD, Hawley P. Intravenous lidocaine for cancer pain without electrocardiographic monitoring: a retrospective review. *J Palliat Med* 2015;18(4):373-7.