Lidocaine (Subcutaneous) Outpatient Infusion for Neuropathic Pain

Site Applicability

SPH Chronic Pain Clinic

Practice Level

Advanced: RN's working in the Chronic Pain clinic with additional education in pharmacology, principles of pain management and infusion pump education (Q2 year review)

Note: Only anesthesiologist/prescribing physician or skill checked RN in the Chronic Pain clinic can prepare lidocaine and fill infusor pump

Requirements

Patients receiving subcutaneous (SUBCUT) lidocaine infusion must have baseline ECG, current within the last year, reviewed by prescribing physician prior to initial subcutaneous lidocaine administration OR approval to receive subcutaneous lidocaine documented by prescribing physician in patient health record (CST-Cerner PowerChart).

Need to Know

1. Lidocaine is a local anesthetic that is a non-selective sodium channel blocker. Blocking the sodium channels is thought to produce analgesic effects. It is theorized that in injured nerves develop abnormal, spontaneous active sodium channels at the site of the nerve injury and along the nerve pathway. In low doses, Lidocaine can suppressive this abnormal firing of sodium channels in the injured nerve(s) i.e. suppressive effects on ectopic discharges of the injured nerve, without blocking normal nerve conduction or cardiac conduction.
2. Lidocaine has been shown to reduce neuropathic pain and act on hyperactive nerves (while affecting conduction in normal nerves to a lesser degree). It is believed to be helpful with some types of unresolved **neuropathic** pain e.g. Complex Regional Pain Syndrome (CRPS) or palliative neuropathic pain. The subcutaneous delivery route appears to achieve a stable, maintainable blood serum level.
3. Pain relief from subcutaneous lidocaine may last from a few hours to weeks.
4. Patients receiving subcutaneous lidocaine may have had a previous IV lidocaine trial to assess for efficacy of reducing neuropathic pain in each individual patient.
5. The Chronic Pain Anesthesiologist/Prescribing Physician will explain the treatment goals, obtain informed consent, and will order the dosage. Prescribing Physician/Chronic pain anesthesiologist OR skill checked RN in outpatient chronic pain clinic will prepare subcutaneous lidocaine and fill infusor pump.

6. Only isotonic fluids may be administered subcutaneous for example NS or Ringers Lactate. (Hypotonic solutions such as D5W and D10W **are contraindicated**)
7. The usual dose is 1000 mg to 3000 mg of 2% lidocaine diluted in the elastomeric infusor pump at 5 mL/hr. The amount of volume will determine how long the infusion will last. Infusion can take up to 36 hours to complete.

   Note: DO NOT put the infusor close to a heat source e.g. hot water bottle or electric heating pad or under a blanket as it could cause the infusor to deliver the lidocaine too quickly. Important to also do the following:

   a. Tape the flow restrictor valve on end of Baxter elastomeric infusor tubing securely to the skin as skin temperature regulates the flow rate.

   b. Keep the Baxter elastomeric infusor at the same level as the subcutaneous butterfly needle as gravity affects the flow rate.
8. The infusion will may be set up in the chronic pain clinic. The patient may clamp the infusion to drive home. The patient must not drive during lidocaine subcutaneous infusion nor until 2 hours after subcutaneous infusion completed
9. Persons allergic to "amide" type medication (e.g. bupivacaine) should not receive lidocaine due to potential allergic reaction.
10. Lidocaine subcutaneous infusions should not be administered to persons with bradycardia, cardiac conduction problems, ischemic heart disease, congestive heart failure (CHF), hypovolemia, liver disease or renal disease. The exception may be palliative patient for neuropathic pain control.
11. 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
12. Common expected side effects that do not require intervention include mild drowsiness (POSS 2 or better), headache and slight metallic taste in mouth.
13. Potential side effects of lidocaine are dose-related and include:

Signs and Symptoms of Local Anesthetic Systemic Toxicity (LAST)		
Mild Symptoms	**Moderate Symptoms**	**Severe Symptoms**
• Perioral Numbness and tingling • Metallic taste in mouth • Ringing in ears • Lightheadedness • Dizziness • Visual disturbances • Confusion	• Nausea and vomiting • Severe dizziness • Decreased hearing • Tremors • Changes in heart rate and blood pressure (hyper/hypotension) • Confusion	• Drowsiness POSS 3 or 4 • Confusion • Muscle twitching • Convulsions • Loss of consciousness • Cardiac arrhythmias • Cardiac arrest

Equipment and Supplies

1. Baxter elastomeric infusor (5 mL/hour infusion rate) containing 1 to 2% preservative free lidocaine as ordered and tubing (delivers 50 to 100 mg/hour lidocaine depending on concentration)
2. 25 or 27 gauge butterfly needle or Intercath
3. Occlusive dressing
4. Alcohol swab
5. Tape

Set up and initiation of subcutaneous lidocaine infusion can be completed by MD

Only Chronic pain anesthesiologist/Prescribing Physician/Skill checked RN in Chronic pain outpatient anesthesia/block pain clinic to:

- Obtain and set up equipment for subcutaneous lidocaine infusion
- Review Prescriber's order for lidocaine subcutaneous infusion, prepare medication and fill infusor pump
- Ensure that the flow restrictor valve on end of Baxter elastomeric infusor tubing is securely taped to the skin as skin temperature regulates the flow rate.
- Keep the Baxter elastomeric infusor at the same level as the subcutaneous butterfly needle/intercath as gravity affects the flow rate.

Assessment:

1. Vital signs, and pain assessment,
    - Ensure baseline 12 lead ECG is current within the last year and reviewed by prescribing physician and/,or documented approval within PowerChart by prescribing physician for patient to receive SUBCUT lidocaine.

Documentation:

1. Cerner documentation:
    a. Document vital signs
    b. Nursing documentation that should include:
        i. where subcutaneous catheter inserted,
        ii. how the catheter was secured,
        iii. lidocaine dose, lidocaine volume, NS volume, then total volume.
        iv. Document time of set up and time of discharge.
        v. Include pre-procedure assessment and percentage of pain reduction since last treatment and any side effects with previous infusion.
        vi. Include that pamphlet and call number provided to patient

vii. Document how patient was discharged (accompanied or unaccompanied, walking etc.)

Patient and Family Education

1. Review the potential side effects of lidocaine and inform the patient to call the pain clinic if experiencing side effects
2. Inform the patient that they need to clamp the lidocaine infusion if self-driving home. The patient must not drive during lidocaine subcutaneous infusion nor until 2 hours after subcutaneous infusion completed
3. **Ensure the patient understands to NOT put the infusor close to a heat source** e.g. hot water bottle or electric heating pad or under a blanket as it could cause the infusor to deliver the lidocaine too quickly.
4. Inform the patient to keep the Baxter elastomeric infusor at the same level as the subcutaneous butterfly needle as gravity affects the flow rate.
5. Provide patient pamphlet Subcutaneous lidocaine infusion: Going home EZ.200.Su14PHC
6. Encourage patient to keep a brief diary of their pain following the infusion.

References:

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6. Sea, D. Herschtal, A, Tan, H., Thakerar, A., Fullerton, S. (2017) Subcutaneous lidocaine infusion for pain in patients with cancer. *Journal of Palliative Medicine*, 20, (6), 667-671. Doi: 10.1089/jpm.2016.0298

Persons/Groups Consulted:

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