Lidocaine (Intravenous) Short Term Infusion – Intermediate Dose

Site Applicability

PHC Critical Care, Post Anesthetic Care Unit (PACU), High Acuity Units

PHSA - BC Cancer Surgical Suites/ PACU

Practice Level

Specialized:

- Registered Nurses working in Critical Care and High Acuity Units, PACU.

Requirements

- Patients must have a baseline 12 lead ECG completed and read prior to initiation of first IV lidocaine infusion.
- Subsequent IV lidocaine infusions will require a cardiac rhythm strip to be printed and placed on chart before each infusion is initiated.
- Patients receiving IV lidocaine intermediate dose infusion must have continuous ECG monitoring throughout infusion
    - Palliative Care: discussion should be had with the Most Responsible Palliative Care Physician prior to initiating monitoring (BC Cancer only)

Need to Know

1. Lidocaine is an amide local anesthetic that is a non selective sodium channel blocker. Systemic administration of lidocaine has been shown to have analgesic actions in patients with chronic neuropathic pain. Lidocaine decreases pain by inhibiting nerves through the blockade of sodium channels. Systemic lidocaine is thought to inhibit spontaneous impulse generation arising from injured nerve fibers and the dorsal root ganglion, and by suppressing primary afferent reflexes in the spinal cord
2. Intravenous (IV) lidocaine has analgesic, antihyperalgesic and potent anti-inflammatory properties. Lidocaine IV works in both the central and peripheral nervous systems by sodium channel blockade, inhibition of G protein-coupled receptors, and blocking the NMDA (Nmethyl-D-asparate) receptors (responsible for hyperalgesia).
3. Pain relief from systemic lidocaine may last from a few hours to weeks.
4. Lidocaine IV infusions can be given via peripheral IV or central IV lines.
5. Intermediate dose IV Lidocaine only to be used in an environment where there is the following:

6. One to one or one to two monitoring by PACU/Critical Care/HAU RN staff.
   Note: *This does not apply to BC Cancer patients receiving lidocaine infusions on inpatient units who do not require cardiac monitoring.*
7. Lidocaine 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. Persons allergic to "amide" type medication e.g. bupivacaine etc. should also not receive lidocaine.
8. Patients are not allowed to drive for 24 hours after IV lidocaine infusion. If patient does not have a person to drive, notify the APS/Pain Anesthesiologist/Palliative Care Physician prior to the initiation of the lidocaine infusion.
9. The PowerPlan orders in Cerner will be completed by the APS/Pain Anesthesiologist/ Palliative Care Physician prior to treatment. Pharmacy will provide the standard lidocaine solution
10. Only the APS/Pain Anesthesiologist/ Palliative Care Physician may give an IV bolus dose of lidocaine. The usual bolus dose is 100 to 160 mg (1 to 2 mg/kg).
11. Immediately after the bolus, the IV lidocaine infusion is initiated using an Alaris®PC CareFusion Edition Infusion Pump with Guardrails set to **Critical Care profile or Surgical Oncology Profile (BC Cancer)**. The infusion is ordered as a fixed dose or as per the SCPAINLI Protocol (BC Cancer). The patient will be ordered 800 mg, 1000 mg or 1200 mg to infuse at a fixed rate of 6.67 mg/min or 100 mg/h that can be adjusted based on side effects.
    Important safety: note the total volume to be infused will be determined by the fixed dose. Maximum dose is 1200 mg OR 15 mg/kg to be given over 3 or more hours.
12. Potential side effects of lidocaine are dose-related and include:
    - Hypotension or hypertension
    - Lightheadedness
    - Confusion
    - Dizziness
    - Fatigue and drowsiness
    - Nausea and vomiting
    - Tinnitis
    - Perioral numbness
    - Slurred speech
    - Itching
    - Headache
    - Arrhythmias-irregular heartbeat or rapid heartbeat, cardiac arrest
    - Tremors
    - Seizures
13. Lidocaine has a short plasma half-life of 1.5 to 2 hours. Thus, stopping or decreasing the infusion at the initial signs of toxicity may quickly resolve symptoms. See Appendix A for signs and symptoms of toxicity.

Equipment and Supplies

1. I.V. infusion Alaris®PC CareFusion Edition Infusion Pump with Guardrails set to the critical care or Surgical Oncology Profile (BC Cancer) profile and I.V. tubing(s).
2. Premixed Lidocaine solution prepared by pharmacy
    a. SAFETY NOTE: The fixed dose will determine total volume to be infused
3. Bedside Monitor: Cardiac monitor or telemetry unit, ECG electrodes, BP cuff, SpO_2 monitor

Protocol

Assessment

Initial

1. Patient must have a baseline 12 lead ECG completed and read prior to initiation of first IV lidocaine infusion and initial cardiac rhythm strip printed before any subsequent treatments.
2. Blood Pressure (BP), Heart Rate (HR), Respiratory Rate (RR), Pasero Opioid Sedation Scale (POSS) [Appendix B] Oxygen Saturation (SpO_2), Pain Assessment, Cardiac Monitor and printed initial cardiac rhythm strip
3. Patient must be weighed and weight documented in Cerner PowerChart /paper chart before infusion initiated.

Ongoing:

1. Continuous cardiac monitoring
2. **PHC:**BP, HR, RR , SpO_2, POSS Pain intensity Scale and side effects Q15min for 1 hour then Q30min until 30 minutes post infusion completed

   BC Cancer: During infusion: BP, HR, and pain level q15min. After infusion: BP, HR and pain level q15min x2. – *as per the* SCPAINLI Protocol

Interventions

An **independent double check** is required with **initial programming** of the pump **AND** with any **changes to the pump programming.** 2 RN's (or RN and anesthesiologist) then cosign on the MAR.

Note: Total volume to be infused (VTBI) is related to the fixed dose. It is NOT the volume provided. **VTBI needs an IDC.**

☐ Independent Double Check (IDC) is a process where two health care clinicians work independently to verify the medication and pump settings. The second health clinician performs another check of the medication without assistance or prior knowledge of the conclusions and steps followed by the first clinician. Results are compared and any discrepancies addressed before any action is taken with the medication.

I.V. lidocaine to be infused intravenously using an Alaris® PC CareFusion Edition Infusion Pump with Guardrails set to critical care profile or Surgical Oncology Profile (BC Cancer). . The lidocaine infusion

is maintained by PACU/Critical Care/HAU nurse and may be adjusted based on patients experience of side effects. At centers using fixed dosing, the total volume to be infused will be related to the total dose ordered by the APS/Pain Anesthesiologist.

PHC

Total Lidocaine Dose	Total Volume to be Infused (VTBI)	Rate of Infusion	Minimum Number of Hours Infusion Will Run
800 mg	200 mL	6.67 mg/min 100 mL/hour (as tolerated)	2 hours
1000 mg	250 mL		2.5 hours
1200 mg	300 mL		3 hours

BC Cancer

Lidocaine Dose	Administration Guideline
Intermittent Dose 5 to 10 mg/kg (maximum single dose of 900 mg)	IV in 250 mL ** D5W 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

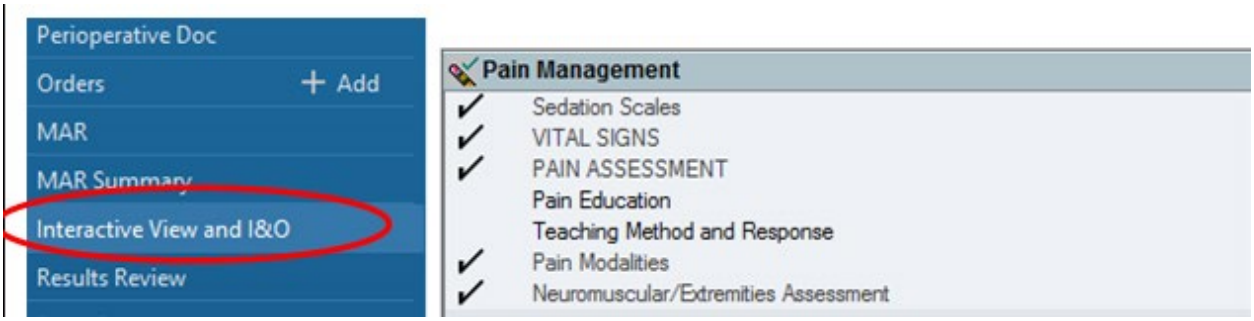
Safety Note: When the programmed VTBI is infused (dose completed) the Alaris pump will convert to TKVO (to keep vein open) rate of 5 mL/hr. The infusion needs to be stopped immediately once dose completed.

BC Cancer: TKVO is 20 mL/hr followed by a 'rinse' post-infusion for 25 mL.

1. Stop the infusion and notify by calling or paging APS/Pain Anesthesiologist immediately if:
   - POSS 3 or greater AND respiratory rate less than 6/min
   - Blood pressure drop of 15mmHg or increase of 30mmHg (systolic or diastolic) or change in HR/pulse rate of 20/min
   - Significant arrhythmia (heart rate decrease by 15% or less than 48 beats/min, more than 120 bpm, new 1°, 2°, 3° AV block, PVC's more than 6/min, VT (sustained or non sustained).
   - Patient cardiac status unstable: - run an ECG rhythm strip, mount, analyze and report rhythm (see above).
   - Patient's experience of the listed potential side effects becomes distressing to the patient.

Documentation

All related assessments will be found in the Pain Management band within the **Interactive View and I & O**.



1. Record any time the infusion is interrupted or dose adjusted and reasoning.
    - Pain assessment before and after the treatment.
    - Record the initial assessment: POSS, BP, HR, RR & SpO_2, printed cardiac rhythm strip
    - Document POSS, pain scale, BP, HR, RR and SpO_2 in the first hour of infusion every 15 minutes then every 30 minutes until 30 minutes post treatment completed.

2. **PACU/HAU/Critical Care RN to mount ECG strip:**

   Mount an initial ECG rhythm strip on the ECG Strip Flowsheet form ID 2892.

3. **Record eMAR (Cerner):**
    - Any lidocaine bolus doses that were given. Record amount, time and by whom the dose was given.
    - An IDC must be completed and documented on the eMAR
    - PHC & BC Cancer: time and VTBI will be completed automatically in Interactive View I & O.

Patient and Family Education

1. Review the potential side effects of lidocaine
2. Inform patient to report their level & quality of their pain
3. Reinforce that patient must not drive for 24 hours after treatment.

Related Documents

2. B-00-13-10011 - Cardiac Monitoring: protocol
3. B-00-13-10171 - Lidocaine (Intravenous) Low dose: for Neuropathic and Post-operative pain
4. B-00-13-10108- Local Anesthetic Systemic Toxicity Management
5. B-00-07-10044 – Independent Double Check – High Alert Medications and High Risk Situations
6. SCPAINLI Protocol – BC Cancer Protocol Summary for Extreme Pain Therapy Using Parenteral Lidocaine

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Appendix A: Local Anesthetic Toxicity

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 ☐ Confusion ☐ Muscle twitching ☐ Convulsions ☐ Loss of consciousness ☐ Cardiac arrhythmias ☐ Cardiac arrest

Appendix B: Pasero Opioid Induced Sedation Scale (POSS)

POSS	PASERO OPIOID INDUCED SEDATION SCALE
S	Sleep, easy to rouse
1	Awake and alert
2	Slightly drowsy, easily roused
3	Frequently drowsy, rousable, drifts off to sleep during conversation
4	Somnolent, minimal or no response to verbal and physical stimulation (use trapezius muscle squeeze for physical stimulation - do not use sternal rub)

Persons/Groups Consulted:

- Pharmacy
- Nurse Educator, PACU
- Anesthesiology, Pain Specialists

Revised By:

- Clinical Nurse Specialist, Pain Program
- BC Cancer

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