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| SickKids | Document Scope: Hospital-wide Patient Care |
| | Document Type: Policy<br>Approved on 2022-04-12<br>Next Review Date: 2025-04-11 |
| **Monitoring Requirements for Patients Receiving Regional Anaesthesia** | Version: 2 |

## 1.0 Introduction

The purpose of this document is to inform health care providers of the monitoring and assessment requirements for patients receiving regional anaesthesia via continuous epidural infusion or continuous peripheral nerve block

**Note:**

- Individual consideration regarding monitoring may be necessary and appropriate in cases such as palliative care, or patients with chronic use of opioids who wish to ambulate. Less stringent monitoring may be indicated in these situations. The RN is advised to assess the patient and consult with the Acute Pain Service (APS) or Responsible Provider when modifications to patient monitoring are being considered. A medical order should be obtained for any monitoring modifications
- Values listed in the tables below are the **minimum** Sedation Score, Respiratory Rate and Oxygen Saturation values that require notification of APS/Responsible team. Clinical judgement and an awareness of a patient's baseline status must be utilized when assessing patients receiving regional anaesthesia and/or opioids. **Patient condition may warrant notifying APS/Responsible team even if Sedation Score is lower, or Respiratory Rate or Oxygen Saturations are higher than the values listed.**

## 2.0 Definitions

**APS**: The Acute Pain Service; a consultation service responsible for the pain management in patients receiving epidural infusions and peripheral nerve blocks. This includes performing the technique, prescribing all analgesics, ongoing monitoring and side effect management. The APS is a team of Anaesthesiologists, Anaesthesia Fellows, and Advanced Practice Nurses (APN's) in the Department of Anaesthesia and Pain Medicine.

**Regional Anaesthesia:** A pain management technique that involves administration of local anaesthetics to numb a region of the body. Includes epidural and spinal anaesthesia and peripheral nerve blocks.

**Epidural Infusion:** A regional anaesthetic technique that involves the administration of local anaesthetics, with or without opioids, into the epidural space via an epidural catheter attached to an infusion pump. The local anaesthetics affect the dorsal route ganglion of the spinal nerve fibers adjacent to the site of local anaesthetic administration. The results are segmental analgesia which is influenced by the site, concentration, and volume of local anaesthetic. Epidural catheters may be placed in the lumbar, thoracic or caudal regions. See Epidural Analgesia learning package.

**Continuous Peripheral Nerve Block (CPNB):** A regional anaesthetic technique that produces a sensory and/or motor blockade via infiltration of local anaesthetic around the nerves innervating a specific area (e.g. surgical site). Peripheral nerve blocks include lower and upper extremity blocks. Although not peripheral, the following blocks are also included in CPNB category: paravertebral, intercostal, transverse abdominis plane (TAP), intrapleural, erector spinae plane (ESP), and incisional.

**Clinician Bolus** is a selected option on the CADD Solis Infusion Pump where only a member of the Acute Pain Service may access to give the patient a bolus dose of medication if required.

**Neuraxial Opioid Analgesia:** Epidural or spinal administration of opioids, either by single injection or continuous infusion as part of epidural therapy. Neuraxial opioids exert both local and systemic effects. As with intravenous and enteral opioids, adverse effects include pruritus, nausea and vomiting, urinary retention, sedation, and respiratory depression. Delayed respiratory depression up to 24h after administration of neuraxial opioids is possible.

## 3.0 Policy

### 3.1 Vital Signs Monitoring

**With initiation of epidural/nerve block infusion, change of dose/rate/medication, or on admission/transfer to a nursing unit:**

- Heart rate (HR), Blood pressure (BP), Respiratory rate (RR), Sedation Scale, motor block score and pain assessment: q1h x4h

**Ongoing monitoring**

- For epidurals:
    - Oxygen saturation continuously. RR, Sedation score q1h
    - Temperature, HR, BP, motor block and sensory block assessment q4h
    - Pain assessment q4h, or more often until pain relief goal is met

- For nerve blocks:
    - Temperature, HR, BP, motor block and sensory block assessment q4h
    - Pain assessment q4h, or more often until pain relief goal is met

- Refer to Section 3.2.1 Motor and Sensory Assessment for details

**Monitoring after Epidural/Nerve Block removal**

- Motor and sensory assessment will continue at a minimum of q4h until the patient returns to their baseline motor and sensory function
- Continue monitoring vital signs as above for 4 hours after removal

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| **Epidural/Nerve Block Infusion Monitoring Requirements** | | | |
|---|---|---|---|
| **Notify APS** | | | |
| Age group | If Respiratory Rate less than: * | Or, If **room air** Oxygen Saturation less than: *+ | Or, Other criteria |
| <3 mo | 20 | 90% | • sedation score 2, or patient disoriented<br>• inadequate analgesia<br>• bradycardia, hypotension, decreased expiratory effect or chest expansion |
| 3 – 12 mo | 20 | | |
| 1 – 5y | 15 | | |
| 5-12y | 15 | | |
| 12y+ | 12 | | |

| **Notify APS and Responsible team STAT, and TURN OFF infusion pump:** | | | |
|---|---|---|---|
| Age group | If Respiratory Rate less than: * | Or, If **room air** Oxygen Saturation less than: *+ | Or, Other criteria |
| <3 mo | 16 | 88% | Hypoventilation, Sedation score 3 *or* Cyanosis |
| 3 – 12 mo | 16 | | |
| 1 – 5y | 13 | | |
| 5-12y | 11 | | |
| 12y+ | 10 | | |
| **Startle patient and ask patient to breathe. Administer O2 at 100%. Assist ventilation with AMBU bag as needed. Have naloxone available.** | | | |

* unless otherwise ordered, based on patient-specific criteria

+ Oxygen therapy can mask desaturations that may otherwise occur when hypoventilating. For patients receiving oxygen therapy, very close attention to respiratory rate, respiratory effort, sedation score and level of consciousness is required.

### Additional Monitoring after an Epidural bolus by APS

- HR, RR, BP q5 minutes x 4 post-bolus.
- For epidurals containing fentanyl, include Sedation Score with above monitoring
- Then, resume regular epidural monitoring

### Monitoring after a Peripheral Nerve Block bolus

- Monitor as per Section 3.1 above.
- In cases where the APS physicians (Staff and/or Fellow) identify additional monitoring should be completed after a nerve block bolus, monitoring orders will be placed by APS in the electronic health record.

## 3.2 Ongoing Epidural/Nerve block Assessments

### 3.2.1 Motor and Sensory Assessment – COMPLETE Q4H

| Block type | Motor Assessment | Sensory Assessment | Notify APS |
|---|---|---|---|
| Thoracic epidural | Ask patient to squeeze both hands, flex both elbows, shrug shoulders | Verify vertebral level of epidural.<br><br>Using ice (preferred), pinprick, or touch, assess patient's ability to feel sensation in the dermatomes 3-4 levels above and below the epidural insertion level.<br><br>Assess sensory level bilaterally. | • Inadequate sensory block (pain)<br><br>• unilateral, progressive, or complete motor block<br><br>• numbness or weakness to upper extremities<br><br>• signs of Horner's syndrome: decreased pupil size, eyelid drooping, "sunken" eyeball, elevation of lower eyelid, decreased sweating on one side of face<br><br>• signs of compartment syndrome (pain, paresthesia, pallor, paralysis, pulselessness, cool limb) |
| Lumbar/caudal epidural | **I - Complete** = No movement of legs<br><br>**II - Almost Complete** = Able to move feet only<br><br>**III - Partial** = Able to move knees<br><br>**IV - None** = Able to move hips | | |
| Interscalene, supraclavicular, infraclavicular, axillary blocks | Ask patient to squeeze both hands, flex elbows, and shrug shoulders | Verify sensory function of the blocked nerve(s). Using pinprick, ice, or touch, assess patient's ability to feel sensation in affected areas. | |
| Fascia iliaca, femoral, popliteal, saphenous blocks | Ask patient to move the joints distal to the block site | | |
| Paravertebral, intercostal, TAP, intra/extrapleural, incisional, ESP | None, except for thoracic-level paravertebral and ESP: assess arm strength/motor function on side of block | | |

### 3.2.2 Other Assessments

| Assessment: | Details | Notify APS if: |
|---|---|---|
| Skin – **q2h** | Observe for pressure areas over bony prominences, and **reposition patient.** | • Signs of skin breakdown |
| Catheter and site – **q8h** | Assess for redness, swelling, pain or discharge at insertion site.<br>Assess for breakage or displacement of catheter<br>Assess for dressing integrity<br>**Continue to assess insertion site q8h for 24h post-removal** | • Signs of infection<br>• Catheter breaks or displaces<br>• Dressing lifts and sterility of insertion site is compromised. RNs can reinforce dressing as needed to prevent this.<br>• Catheter or pump malfunctions |
| Anticoagulation | Assess for presence or initiation of an anticoagulant | • Patient is on an anticoagulant<br>• **Do not remove catheter without consulting APS** |
| Local anesthestic adverse effects | Tachycardia, bradycardia, hypotension, headache, circumoral numbness, tongue paresthesia, tinnitus, unusual taste in mouth, respiratory depression, seizures, increasing or decreasing sensory and motor block | • Patient has any of the listed signs<br>• Follow LAST Protocol |

## 3.3 Single Dose Neuraxial Opioids (Epidural, Intrathecal)

Spinal/Epidural opioids can be effective for up to 24h following administration. There is a risk of late respiratory depression with neuraxial morphine (6-12h) post-administration.

### Vital sign monitoring:

- Continuous: oxygen saturation x 24h
- q1h: Respiratory rate, quality, pattern; Sedation Score
- q4h: HR; BP; Pain assessment

### Other considerations:

- No CNS depressants or opioids are to be given unless approved by the APS (exception: critical care units, POCU, DI)
- If patient is ordered PCA (Patient-Controlled Analgesia), do not given the PCA dose-request button to the patient or give any opioids until the patient is awake, alert and is reporting pain at the operative site.

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## 4.0 Related Documents

Care of Patients Receiving Regional Anaesthesia: Epidurals and Nerve Blocks
Pain Management
Administration of medication
Electronic Patient Monitoring
Vital Signs Monitoring

## 5.0 References

American Society of Anesthesiologists. (2009). Practice Guidelines for the Prevention, Detection, and Management of Respiratory Depression Associated with Neuraxial Opioid Administration. **Anesthesiology**, 110(2)Feb 2009 218-230.

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**Attachments:**

local anesthesia systemic toxicity protocol final (003) (3).docx