	Document Scope: Hospital-wide Patient Care	
	Document Type: Policy Approved on 2018-11-28 Next Review Date: 2021-11-27	
	<b>Monitoring Requirements for Patients Receiving Regional Anaesthesia</b>	Version: 1

## 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 Physician 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:** APS or Acute Pain Service is a consultation service responsible for the care of the child while receiving epidural infusions and peripheral nerve blocks for pain management. This includes performing the technique, prescribing all medications, 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:** Regional anaesthesia is usually categorized as central (neuraxial) or peripheral. These techniques interrupt impulses to specific nerve fibers that innervate a larger but particular body area. Motor function may or may not be affected. These techniques are performed by an anaesthesiologist.

**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. Epidural local anesthetics affect the dorsal route ganglion of the spinal nerve fibers immediately adjacent to the site of local anesthetic administration. The results are segmental analgesia which is influenced by the site, concentration, and volume of local anesthetic. The local anesthetic blocks the nerve fibers that carry the pain impulses to the spinal cord producing the analgesic effect. Epidural catheters may be placed in the lumbar, thoracic or caudal regions.

**Continuous Peripheral Nerve Block (CPNB):** A regional anaesthetic technique that produces a sensory and/or motor blockade. This is achieved by the infiltration of local anaesthetic around the nerve leading to a surgical site. This is usually achieved with a continuous infusion of local anaesthetic via a catheter

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connected to an infusion pump. Continuous infusions for peripheral nerve blocks may include: interscalene, supraclavicular, infraclavicular, axillary, femoral, sciatic, popliteal, and saphenous.

The following nerve blocks although not peripheral will also be included in CPNB category: paravertebral, intercostal, transverse abdominous plane (TAP) intrapleural, 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.

### 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

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<b>Epidural/Nerve Block Infusion Monitoring Requirements</b>			
<b>Notify APS</b>			
Age group	If Respiratory Rate less than: *	Or, If <b>room air</b> Oxygen Saturation less than: **	Or, Other criteria
<3 mo	20	90%	<ul style="list-style-type: none"> <li>• sedation score 2, or patient disoriented</li> <li>• inadequate analgesia</li> <li>• bradycardia, hypotension, decreased expiratory effect or chest expansion</li> </ul>
3 – 12 mo	20		
1 – 5y	15		
5-12y	15		
12y+	12		


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

\* 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.

### Monitoring after an Epidural/Nerve Block bolus by APS


- HR, RR, BP q5 minutes x 4 post-bolus.
- Then, resume regular epidural/nerve block monitoring

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

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### 3.2.2 Other Assessments

Assessment:	Details	Notify APS if:
Skin – <b>q2h</b>	Observe for pressure areas over bony prominences, and <b>reposition patient.</b>	<ul style="list-style-type: none"> <li>Signs of skin breakdown</li> </ul>
Catheter and site – <b>q8h</b>	Assess for redness, swelling, pain or discharge at insertion site.  Assess for breakage or displacement of catheter  Assess for dressing integrity  <b>Continue to assess insertion site q8h for 24h post-removal</b>	<ul style="list-style-type: none"> <li>Signs of infection</li> <li>Catheter breaks or displaces</li> <li>Dressing lifts and sterility of insertion site is compromised. RNs can reinforce dressing as needed to prevent this.</li> <li>Catheter or pump malfunctions</li> </ul>
Anticoagulation	Assess for presence or initiation of an anticoagulant	<ul style="list-style-type: none"> <li>Patient is on an anticoagulant</li> <li><b>Do not remove catheter without consulting APS</b></li> </ul>
Local anesthetic 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	<ul style="list-style-type: none"> <li>Patient has any of the listed signs</li> </ul>

## 4.0 Related Documents

- [Care of Patients Receiving Epidural Infusions](#)
- [Care of Patients Receiving Peripheral 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. doi:10.1097/ALN.Ob013e31818ec946

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