Epidural Policy and Management Guidelines

Section 1: Epidural Therapy

Section 2: Gemstar Pump Instructions

Indications and Rationale

Local Anaesthetic - Action and Side Effects

Ordering

Management Guidelines

Management per Patient Category

Nursing Actions

Complications

Management of Complications

Procedures

- Commencement of Epidural Infusion
- Programming the Pump for a New Patient
- Priming the Set Part A
- Prime the Set Part B
- Connecting to the Patient
- Change of Rate
- Air in the Line

Changing from Solution Containing Local Anaesthetic to Solution Containing Opiate Only

- Epidural Bag Change Procedure
- Using the Locked Box

Administration of Bolus Dose

- Epidural Dressing
- Epidural Filter

Intermittent Epidural Pethidine Boluses

Removal of Epidural Catheter
EPIDURAL ANALGESIA - Section 1

Indications and Rationale:

- The blockade of transmission of pain impulses by the use of local anaesthetic medication can reduce the body's physiological response to the stress of pain.
- Systemic opiate only, although a strong pain reliever, may cause respiratory depression, sedation, nausea, confusion, lightheadedness, constipation and immobilisation.
- The goal of regional axial blockade - epidural analgesia - in moderate to major surgery is, to diminish the development of an efficient pain pathway, by blocking conduction along pain nerve fibres.

Epidural infusions however, require constant assessment and at times intervention in order to provide this level of pain control.

- Vigilance is required as tolerance to local anaesthetic can develop which can require that more agent be infused to maintain the level of block.
- Other factors such as patient position and movement will influence the effectiveness of the infusion, as will the precision of the pump and time spent when changing infusions.
- Opiate added to an epidural infusion can augment the analgesic effect of the local anaesthetic block. The dosage is very much less than what would be required by systemic opioids, but can also cause side effects.

Epidurals can be sited in the labor ward for labor and delivery or pre-operatively. The tip of the catheter sits in the epidural space close to the dermatomes supplying the surgical area. The infusion rate of solution affects the area of spread to the dermatomes as does the patient's individual anatomy.

In some instances it is not possible to block conduction to all areas of a wound.

1. If an epidural catheter is in too far it may cause a unilateral block and the infusion may cause one-sided motor block with poor analgesia on the opposite side. Assessing the depth of the catheter and the height and range of the block provides information on the area being affected by the epidural infusion.
2. If conduction to a significant part of a wound is blocked by the epidural infusion there may be advantage in continuing the local anaesthetic to that area and manipulating the other drugs i.e. opiates to cover the additional pain.
3. The infusion may be changed to opiate only. In this instance the patient will be receiving less systemic opiate than with PCA and will continue to benefit.
Local Anaesthetic Action

Local anaesthetic agents administered into the epidural space gain access to the spinal nerve roots and block the pain impulses from travelling to the brain. Depending on the concentration of anaesthetic agent and the total dose used, all nerves i.e. sensory, sympathetic and motor can be affected. However, sensory (pain, temperature) and sympathetic nerves are thin and unmyelinated and thus easier to block. Motor nerve fibres are thick and myelinated and more difficult to block. Immobility is usually not desirable after surgery, so low concentrations of local anaesthetic are used to avoid weakness of the limbs.

At RHW the epidural catheters are predominantly placed in the L3-4 space for Caesarean sections and Labor, and L1-2 or higher for Gynae-oncology surgery. Local anaesthetic in this area at the concentrations required for surgery can cause a significant sympathetic block and motor block.

Side effects

Motor block - the low concentrations of local anaesthetic drugs should allow the patient to move and walk normally while still receiving good pain relief. However, this cannot be assumed and every patient should be assessed before ambulation is allowed.

Sensory block - pressure areas can develop due to immobility and decreased sensation.

Cardiovascular system

- Sympathetic block can lead to hypotension. Hypotension is more likely to occur with a high concentration and high total dose of epidural local anaesthetic. In low concentration significant hypotension is unlikely unless the patient is hypovolemic.
- If the block extends above T4 (nipple level) and sufficient concentration of local anaesthetic agent is used, the cardioaccelerator fibres to the heart may be blocked leading to bradycardia.

Respiratory system - epidural local anaesthetic in normal doses are very unlikely to impair normal respiration significantly. Intercostal muscle strength can be affected by thoracic epidural blockade - a situation normally compensated for by the diaphragm. The diaphragm is supplied by the cervical nerves and numbness and tingling in the arms would be apparent prior to the block ascending to the diaphragm. Measurement of the height of block is therefore an important factor in epidural management.

Urinary retention - urinary retention can occur but is not inevitable.

Gastrointestinal system – bowel motility is increased when local anaesthetics are used in epidurals.

Local or systemic toxicity - can occur due to inadvertent overdose or intravascular injection. The higher the blood concentration of the local anaesthetic drug, the more severe the signs and symptoms of toxicity. Signs of systemic local anesthetic toxicity include:

- Light-headedness
- Numbness of mouth and tongue
- Tinnitus, visual disturbance
- Muscular twitching
- Drowsiness
- Convulsions
- Coma
- Respiratory arrest
- Cardiovascular depression
EPIDURAL POLICY AND MANAGEMENT GUIDELINES cont’d

ORDERING

- The prescriber must follow guidelines for prescribing schedule 8 drugs.
- Epidural Infusion must be prescribed on Epidural Infusion Prescription Chart.
- If anti-emetics are required, sign the protocol on the epidural chart or order antiemetics on the patient’s medication chart.
- If the order is changed, it has to be rewritten and signed on the next line. The current order is the most recently timed and dated.

- Acute pain patients:
  Drugs used for epidural analgesia are opioids and local anaesthetics, most commonly a combination of both. Rate of infusion should be based on patient's age and titrated to effect.

The recommended dosages for continuous epidural infusions (adults) are as follows:

<table>
<thead>
<tr>
<th>Drug</th>
<th>Rate</th>
<th>Bolus dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ropivacaine 2 mg/ml and Fentanyl 2 mcg/ml</td>
<td>4 – 14 ml/hr</td>
<td>3-4 ml</td>
</tr>
<tr>
<td>Pethidine 2 mg/ml</td>
<td>3 – 15 ml/hr</td>
<td>5 - 10ml</td>
</tr>
<tr>
<td></td>
<td>= 6–30 mg/hr</td>
<td>= 10-20mg</td>
</tr>
</tbody>
</table>

Maximum daily dose of pethidine should not exceed 800mg. Please call APRS for patient assessment if the boluses and infusion rate will equal this daily dose.

Please note: individual patient requirements vary widely. Small doses should be used initially for elderly or very sick patients.
MANAGEMENT GUIDELINES

1. Epidural anaesthesia/analgesia will be discussed preoperatively with the patient.

2. Continuous epidural analgesia is to run as an infusion via an Abbott Gemstar pain management pump.

   The epidural line must be the yellow designated Gemstar epidural line with no injection ports.

3. Under usual circumstances, no other Parenteral opiates should be administered to the patient whilst they remain on opioid epidural infusion.

   Under special circumstances, additional opiate may be considered by the acute pain relief service while problem solving a semi effective epidural. Patient sedation and respiratory rate will require increased monitoring in this event.

   See management of complications.

4. Do not inject other drugs into the epidural line.

5. A bacterial filter must be attached to the epidural line. If disconnected, an epidural filter must not be reconnected unless the disconnection was witnessed and no contamination occurred. The Acute Pain Relief Service must be called to obtain a new filter.

6. If loading of the medication reservoir is required, clearly label the reservoir with a completed additive drug label.

7. Deliver oxygen 2 litres/minute via nasal cannula until the morning after surgery or as ordered on the epidural chart.

8. Only anaesthetists/Acute Pain Relief Service may alter prescription of infusion rates.

9. Maintain intravenous access at all times and for a minimum of four (4) hours after cessation of the Continuous Epidural Infusion.

10. Always prevent a time delay during the change of epidural infusion. Have a new infusion prepared before the existing one runs out.

11. Maintain documentation of a complete fluid balance chart for the duration of the epidural infusion.

12. Do not tilt the head of the bed down at any time, particularly when treating hypotension.

   This may increase the height of block and cause further hypotension and bradycardia. The legs alone can be raised in the event of hypotension.
### Plan of Management per Patient Category

**Oncology-Laparotomy**

**Premix  Ropivacaine 2mg and Fentanyl 2mcg**

<table>
<thead>
<tr>
<th>Status</th>
<th>Day of operation</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>No motor block</td>
<td>Post op Premix</td>
<td>Premix Or Pethidine</td>
<td>Premix Or Pethidine</td>
<td>Premix Or Pethidine</td>
<td>S/C Morphine or oral oxycodone if not NBM</td>
</tr>
<tr>
<td>Motor Block</td>
<td>Post op Premix</td>
<td>Premix</td>
<td>Pethidine infusion</td>
<td>Pethidine infusion</td>
<td>S/C Morphine Or oral oxycodone if not NBM</td>
</tr>
<tr>
<td>Pain unrelieved</td>
<td>Post op Premix</td>
<td>Boluses +/- S/C Morphine</td>
<td>Boluses 50mg q 2/24 PRN</td>
<td>Pethidine bolus or S/C morphine</td>
<td>Oral oxycodone</td>
</tr>
<tr>
<td>Excessive nausea or itch</td>
<td>Reduce fentanyl in infusion solution – using local anaesthetic only pain permitting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypotension (surgical complication excluded)</td>
<td>Good pain relief give fluid - no improvement in BP - a vasopressor may be necessary or change to pethidine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NB.** Some vulval surgery may have the epidural out on day 2 as can some unilateral salpingoopherectomy patients

### GYNECOLOGY-Laparotomy

**Premix  Ropivacaine 2mg and Fentanyl 2mcg**

<table>
<thead>
<tr>
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<th>Day of operation</th>
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<th>Day 2</th>
<th>Day 3</th>
</tr>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Hypotension (surgical complication excluded)</td>
<td>Change to Pethidine infusion or boluses</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MANAGEMENT CONSIDERATIONS

♦ Post Caesarean Section patients will have their epidurals removed from 24 hours post insertion. All epidural sites to be reviewed each shift and if the site is intact and clean, the epidural may remain insitu until 48 hours post insertion.

▪ In other post operative patients, the time for the epidural catheter to remain insitu is 72 hours. However, if strong pain is anticipated beyond this time the inserting anaesthetist or the Acute Pain Relief Service may monitor the epidural site, the patient’s temperature and white cell count and recommend the epidural remain insitu for up to 5 days.

NURSING ACTIONS

Monitoring And Documentation

▪ Record all observations on the RHW Pain Observation Chart
▪ Record the hourly infusion rate on the pain observation chart.
▪ Record the administration of all new infusions and the discarding of syringes in the Epidural Infusion Chart.

<table>
<thead>
<tr>
<th>OBSERVATIONS</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood pressure, pulse,</td>
<td>Acute patients: every (1) hour for the first six (6) hours. If stable, every two hours, for the remainder of the epidural infusion or as per Anaesthetist/Acute Pain Relief Service orders</td>
</tr>
<tr>
<td>Respiratory rate, pain score at rest and on coughing, Sedation score and infusion rate.</td>
<td></td>
</tr>
<tr>
<td>Height of Block</td>
<td>• Upon leaving recovery</td>
</tr>
<tr>
<td></td>
<td>• When Pain uncontrolled, before any rate increase and 2 and 4 hours post a rate increase.</td>
</tr>
<tr>
<td></td>
<td>• Before any rate decrease and 2 and 4 hours after any rate decrease</td>
</tr>
<tr>
<td></td>
<td>• If BP low, bradycardic, tingling in arms or dyspnoea.</td>
</tr>
<tr>
<td></td>
<td>• Hourly until stable if block too high or too low</td>
</tr>
<tr>
<td>Motor block</td>
<td>Every (1) hour for the first six (6) hours. If motor block complete or nearly complete, please contact the Acute Pain Relief Service for assessment and management plan.</td>
</tr>
</tbody>
</table>
**Epidural catheter insertion site**

Once per shift preferably at shift change and prior to administration of bolus dose, for any signs of leakage, infection or bleeding. Notify Acute Pain Relief Service if any problems.

**Filter Check**

When performing initial assessment of epidural every shift please perform a gentle tug test of the filter to detect if catheter is loose and prevent disconnection.

**Hourly Infusion rate**

Enter on the relevant hour any changes to the infusion rate, on the pain observation chart.

**Cumulative Total**

The cumulative total will be determined by reviewing the infusion record on the epidural order form.

**Urinary Output**

 Urinary retention must not occur in these patients. Most will have an IDC. The IDC's patency must be confirmed 4/24 and those women without an IDC (those in labor with ambulatory epidurals) must have their bladder function closely observed and managed as per protocol.

**Temperature**

Every four (4) hours for the duration of the epidural infusion

**Showering your patient**

The Epidural dressing must not get wet. Avoid wetting the back in the shower at fluid tracks down the back and into the dressing.

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**COMPLICATIONS**

**COMPLICATIONS RELATED TO PLACEMENT OF AN EPIDURAL CATHETER**

**Inadvertent dural puncture** - if the dura has been punctured during insertion of epidural catheter, part of the drug injected into epidural space may gain direct access to the CSF. Large doses of anaesthetic agents/opioid could result in high or total spinal blockade, potentially leading to profound decrease in blood pressure and/or respiratory/cardiac arrest.

**Spinal headache** - puncture of the dura may result in CSF leak causing a drop in CSF pressure and a spinal headache. Spinal headache is often produced and exacerbated when the patient assumes an upright position and relieved when the patient lies flat.

**Intravascular placement** - placement or migration of a catheter into an epidural vein could result in a high concentration of opioid and local anaesthetic within the bloodstream. This may cause sudden onset of adverse effects, for example, nausea, hypotension, complaint of tingling sensation around the mouth or lips, tremulousness, shaking and unusual sensation in another part of the body.

**Neurological injury** - serious neurological injury occurs very rarely in association with epidural analgesia. Paresthesias, palsies and paralysis are a result of contact of the catheter with neural tissue, administration of drugs or solutions toxic to the spinal cord tissues or spinal cord compression. The cord can be permanently damaged if medications such as antibiotics or vasopressors are mistakenly injected into the epidural line. Alcohol is toxic to the cord.
OTHER SERIOUS NEUROLOGICAL COMPLICATIONS

**Epidural abscess or meningitis** are very rare complications, but require early detection and urgent surgical intervention to minimise the consequences of spinal cord compression.

**Epidural haematoma** occurs very rarely, however, the risk is increased by the concurrent use of prophylactic anticoagulant therapy. Safety guidelines (refer to section *Removal of Epidural Catheter*) specify the timing for the removal of epidural catheter in-patients on heparin or low molecular weight heparin.

Symptoms of neurological dysfunction/spinal cord compression:
- back pain
- numbness, tingling sensation to lower limbs
- increasing motor block
- bowel, bladder incontinence

If the above symptoms occur immediately notify the Acute Pain Relief Service (anaesthetic registrar after hours). About 90% of patients will regain complete or good spinal function if decompression is performed before 8 hr after start of leg weakness. If this is delayed for 24 hrs or more prognosis for spinal cord recovery is less than 10%.

**MANAGEMENT OF COMPLICATIONS**

**Inadequate Analgesia**

The patient must be assessed and other causes of pain like post-surgical complications must be excluded. The management of inadequate analgesia is summarized in the table below.

<table>
<thead>
<tr>
<th>Reason</th>
<th>Action/ Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty equipment</td>
<td>Ensure that pain is not occurring at bag change times and that the solution is being delivered as programmed. Monitor the total fluid delivered and the hourly rate and ensure that the bags are being changed at appropriate times e.g. a 100ml infusion running at 10 mls per hour will run out after 10 hours.</td>
</tr>
</tbody>
</table>
Epidural catheter breakage, displacement or migration.

Check the lines and catheter connection for leakage.
Check the catheter insertion site for:
- leakage around dressing
- slippage or displacement from epidural space

Call Acute Pain Relief Service if problems detected.
If alternative analgesia is required it is essential that the patient have a "loading" prescription for opiate. Without the conduction block to pain, provided by the local anaesthetic, an opiate form of analgesia can provide good pain relief once the opiate receptors are loaded. Usually a regular 4th hourly dose of morphine subcutaneously will maintain adequate analgesia provided the patient has received this loading, which may be in the form of 2 breakthrough doses or by intravenous injection provided by the APRS. Please see Subcutaneous Morphine protocol.

Insufficient dose as demonstrated by no or loss of block to ice and pain.
Check the height of block, BP Urine output sedation score and pain score prior to loading dose.

All loading doses are to be given by accredited staff.

In the event that epidural morphine is prescribed in conjunction with the infusion containing Local Anaesthetic the APRS should be paged to administer the doses and the patient should be observed as per the prescriber’s instructions.

If pain>4 or Moderate Give a loading dose if prescribed and increase the infusion rate according to prescription by 2 mls. Perform observations (blood pressure, pulse, sedation score and respiratory rate depending on drug used) every 5 minutes for 20 minutes after the loading dose.

Reassess patient’s pain in 30 minutes and assess height of block
- If pain persists contact Acute Pain Relief Service
If Pain <4 – increase the infusion by 2mls each hour within the prescribed range. Ensure height of block is checked 4 hours after any increase of the infusion.
If complications occur, stop the infusion, treat according to management of complications and call the Acute Pain Relief Service.

Unilateral block

If the epidural analgesia is inadequate, and the sensory block is unilateral, the catheter tip may be displaced laterally in the epidural space.

Management:
- Roll patient onto painful side and give loading dose
- Notify Acute Pain Relief Service (catheter position may need to be reviewed).
Drug related complications

Side effects related to epidurally administered opioid and local anaesthetic are outlined in previous section. Management of these side effects is summarized in the table below.

<table>
<thead>
<tr>
<th>Side effect</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hypotension</strong></td>
<td>1. A) Stop the infusion Only if U/O &lt;1ml/kg/hr x 2 hours and/or patient lightheaded, dizzy, decreased LOC</td>
</tr>
<tr>
<td>(a drop in blood pressure below the limit set by the anaesthetist)</td>
<td>B) Continue infusion if patient conversing well</td>
</tr>
<tr>
<td></td>
<td>2. Increase venous return by raising the foot of the bed – NOT HEAD DOWN</td>
</tr>
<tr>
<td></td>
<td>3. give oxygen via face mask</td>
</tr>
<tr>
<td></td>
<td>4. administer rapidly 500ml of IV fluids e.g. Normal Saline if ordered/ or obtain order .</td>
</tr>
<tr>
<td></td>
<td>5. contact the APRS as other measures such as administration of ephedrine may be required</td>
</tr>
<tr>
<td><strong>Respiratory Depression</strong></td>
<td></td>
</tr>
<tr>
<td><em>Early onset</em></td>
<td>Respiratory Rate &lt; 8</td>
</tr>
<tr>
<td></td>
<td>- stop the infusion</td>
</tr>
<tr>
<td></td>
<td>- give oxygen via face mask, attach pulse oximeter</td>
</tr>
<tr>
<td></td>
<td>- give IV Naloxone as prescribed until the patient's respiratory rate &gt; 10</td>
</tr>
<tr>
<td></td>
<td>- contact Acute Pain Relief Service</td>
</tr>
<tr>
<td><em>Late onset</em></td>
<td>Respiratory Rate &lt; 5 is an emergency</td>
</tr>
<tr>
<td></td>
<td>- stop the infusion</td>
</tr>
<tr>
<td></td>
<td>- give high flow oxygen via face mask, attach pulse oximeter</td>
</tr>
<tr>
<td></td>
<td>- monitor vital signs for the possible need for CPR</td>
</tr>
<tr>
<td></td>
<td>- give IV Naloxone as prescribed until the patient's the respiratory rate &gt; 10</td>
</tr>
<tr>
<td></td>
<td>- contact the 777 medical emergency team/ notify Acute Pain Relief Service</td>
</tr>
<tr>
<td><strong>Nausea and Vomiting</strong></td>
<td></td>
</tr>
<tr>
<td>due to stimulation of the brain's vomiting center by opioids</td>
<td>- administer antiemetics as prescribed (including naloxone)</td>
</tr>
<tr>
<td></td>
<td>- contact Acute Pain Relief Service if antiemetic is not effective</td>
</tr>
<tr>
<td><strong>Urinary Retention</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>urinary bladder catheterisation</td>
</tr>
</tbody>
</table>
| **Pruritus** | - Administer naloxone every 30 mins up to 4 doses until side effect diminishes  
- usually mild and an intervention is not required  
- if intervention is required calamine lotion, cool, light clothing and diversional activities may be helpful  
- antihistamines may be effective but will increase the risk of respiratory depression  
- contact Acute Pain Relief Service if itching is severe |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Block</strong></td>
<td>A reasonable guide for the therapeutic goal is for a block approximately 4cm above the wound incision.</td>
</tr>
</tbody>
</table>
| - defined by a sensory level above the nipple line (T4) | Check Blood Pressure, heart rate, respiratory rate, oxygen saturation. If all parameters stable, sit patient and reduce epidural rate.  
If any parameter is compromised, please switch off epidural infusion and Page the APRS.  
If a patient has had high block for any period of time +/- pain-careful observation of respiratory function in the following 24hours is relevant to identify atelectasis. Notify the surgical and physiotherapy team if such respiratory complications are suspected. |
| **Motor block** | increasing leg weakness may indicate intraspinal bleeding or infection |
| - bedrest, do not ambulate the patient  
- contact Acute Pain Relief Service  
- observe for other signs of spinal cord compression | Ensure the heels are positioned off pressure points if there is any motor block as the patient is unlikely to be able to identify pressure problems. |
Epidural Policy Section 2

PROCEDURES

Commencement of Epidural Infusion via the GEMSTAR Pain management Pump

TWO RNS WHO HAVE BEEN TRAINED IN GEMSTAR MANAGEMENT MUST REVIEW THE PUMP SETTINGS PRIOR TO STARTING OR RESTARTING THE PUMP.

FOR ANY ADJUSTMENTS INCLUDING;

- CHANGE OF FLASK
- CHANGE OF RATE
- CHANGE OF PROGRAM
- NEW PROGRAM

- Assemble Pump, Power station or poleclamp and batteries, and Giving set
- The drug is to be checked by two (2) Registered Nurses and recorded on the Epidural order form.
- Premix solutions will be kept in the S8 drug cupboard, and must be signed out per RHW S8 procedure.
- Pethidine solutions are to be prepared individually. Recheck the prescription by the same two Registered Nurses, complete an additive label and attach it to the infusion bag.
- Perform a thorough hand wash and use an aseptic technique when handling the epidural line for priming or for disconnection.
- When attached to the patient, pethidine infusions are to be locked in the Gemstar Lock box, the key to which is kept with the PCA Keys

Programming the pump for a new patient- Accredited staff only

2 RNS must conduct the set up and review the program prior to connection of a patient to the pump

- Switch on pump for Gemstar Unit Self check, confirm Power source
- Choose resume program = 1 if wishing to continue the program on the same patient
- Choose Clear program and shift = 2 if wishing to which will clear the program but maintain recent history except for the volume and rate settings which can be re-entered on the same patient.
- Choose Clear Program shift and history= 3 to commence therapy on any new patient.
- Enter code to unlock pump.
- Set Rate and enter when done.
- Enter NO for programming a loading dose (a loading dose may be given if required only by accredited staff)
- Enter Container size i.e., fluid volume in prepared infusion flask in mls.
  
  *(To allow for an inaccuracy of fluid in the bag, please program 5mls less than the total volume in the bag - ie for 100 ml bas enter the volume as 95mls, and for a 200ml bag enter the volume as 195mls)*

- 2mls for air sensitivity will be selected automatically
- Arrow down for program review and press enter if review is correct
EPI D U R A L  P O L ICY  A N D  M ANAGEMENT  G UIDELINES  

Priming the set - Part A

- Take part A of the yellow epidural Gemstar giving set, Clamp the tubing, Spike the Infusion bag with the Giving set spike, and hold the tubing with the cassette inverted to 45 degrees
- Prime part A of the Giving set by depressing the lower white button (depicting 2 drops) of the giving set cassette and ensure the elimination of air while the cassette is inverted.
- Switch off the giving set cassette by depressing the upper white button (depicting the Circle slash over a single drop)
- Connect Part B (the antisiphon valve end) of the giving set to part A under aseptic technique.
- Insert the giving set cassette into the Gemstar with the circular membrane over the silver circular pulsator mechanism. Note the double click required above and below the cassette.

You May Prime Part B once you have programmed the Pump

Prime the set Part B -

- Before connecting to the patient
- press purge button
- Enter YES to prime the set
- To prime, confirm the patient is not connected to the set
- Press purge, holding the button down until all the air is expelled.
- You may now switch the pump off until required for your patient.

Connecting to the patient – Always confirm that the entire giving set has been primed prior to connecting to the patient.

- Conduct a full set of observations including height of block, pain score, and sedation. Respiratory rate and Blood Pressure.
- Check the epidural catheter insertion site prior to connection.
- The same two (2) Registered Nurses check the infuser program prior to attaching the infusion to the patient.
- Following a thorough hand wash and using an aseptic technique, connect the Epidural giving set to the epidural filter.
- Press start to commence the continuous epidural infusion as per prescription.
- The pump will automatically lock in full lock.
- The infusion will now start
- Complete the epidural infusion record specifying the appropriate drug/s concentration and the commencement volume on the epidural order form.
Change of Rate - 2 RNs must check

- Press stop button
- Press 3 to select key pad lock
- Press 3 for full lock
- Enter 5 digit number
- Press change
- Select 4 which is change program
- Change rate when set rate appears
- Confirm the rest of the program
- Press start and relock the pump as stated in connecting to the patient.

Air In the Line 2 RNS TO CHECK

If the Pump alarms that there is air in the line

- Press silence (alarm)
- Press stop
- Press options and 3 for keypad lock
- Select 3 and enter 5 digit number

- ALERT – you are about to disconnect the epidural line so ensure a thorough handwash has occurred and maintain aseptic technique.
- Press purge
- Enter yes to prime the set
- When the pump states disconnect the patient from the line do so between part A and part B maintaining aseptic technique
- Then press purge to eliminate the air from the line.
- Reconnect part A to part B
- And press start
- Lock the pump as per commencing the infusion
To Give a bolus containing Local anaesthetic –APRS and anaesthetic staff only

- Stop the pump
  (if you want to increase the infusion rate, follow the rate increase instructions now, prior to programming a loading dose) then
  - Select options
  - Select unlock pump
  - Select full lock
  - Enter lock code
  - Now
  - Press Enter
  - Press 0
  - And you will be asked if you wish to give a loading dose
  - Press enter which = Yes
  - Then enter the loading dose
  - You will be asked if you want to give the loading dose now
  - Select No for giving the loading dose now
  - Now press start to start the infusion
  - You will be again asked if you want to give the loading dose now
  - This time select yes.

Now the bolus will be given and the pump will automatically switch over to the infusion delivery when the bolus dose is complete.

- Ensure you document the loading dose and that the Nursing staff are aware of the post loading dose observations required

Changing from epidural containing Local Anaesthetic to Opiate only.-2 RNs to check

- If changing to epidural pethidine an inadvertent bolus of the local anaesthetic in the line must be avoided. Once the new solution is connected as per Epidural bag change procedure, the line must be purged. To purge the line

**ALERT**- When disconnecting the epidural infusion the risk of introducing microbes is to be reduced by:-

- Using aseptic technique, the epidural filter must be disconnected from the giving set and a sterile bung placed on the epidural filter.
- Place a sterile Blunt cannula over the end of the giving set.
- The line may then be purged following the steps to remove air from the line.
- 6mls must be purged to remove the previous solution from the line.
- Reconnect the filter to the giving set and discard the bung and blunt cannula
- Reprogram the pump for the new infusion.
Epidural Bag Change Procedure 2 RNS to check

- Carry out applicable general preparation.
- The drug is to be checked by two (2) Registered Nurses and recorded on the Continuous Epidural Infusion chart under “Record of Infusion” and in the Schedule 8 drug register. Record the amount to be discarded.
- Complete an additive label and attach it to the bag if appropriate.
- Prepare Infusion or premix
- Halt infusion flow to the patient by pressing the stop button on the syringe pump.
- Choose options
- Select lock level
- Enter 5 digit lock code
- Remove the old Infusion bag
- Spike the new infusion bag.

In order to cancel the infusion history switch the pump off.

Now switch the pump on and select 3 = Clear program Shift and History. This will delete the previous infusion total.

Program the pump as above.

Please enter the new volume minus the amount required to prime the line if priming has been required.

- Confirm the rest of the program
- Recheck prescription against the pump settings and recommence the continuous epidural infusion as per prescription.
- Two (2) Registered Nurses must witness and document the discarding of any remaining infusion and sign it on the epidural chart.
- Terminate encounter suitably.

To lock an Infusion in the Gemstar lock box. Keys kept with S8 keys in each ward.

- Unlock the Gemstar lock box using the lock box key
- The pump should be inserted to the lock box without the giving set attached.
- Prime the set as usual
- Inset the bag into the lock box
- Attach giving set to the pump the
- Lock box may now be locked

Now you may Follow usual procedure for priming or commencing the epidural infusion.
Administration of Epidural Bolus Doses and Rate Increase-

Infusion patients receiving Local Anaesthetic- (Only by Accredited staff)

- Bolus doses should be administered if the patient’s verbal pain score is 4/10 or more, and the patient is distracted by pain. dose as per prescription
- Bolus doses may only be administered and witnessed by accredited Registered Nurse, if ordered on Epidural Order Form. The order should specify the acceptable BP and urine output prior to any bolus containing local anaesthetic
- Check the epidural insertion site and lines prior to the administration of a bolus dose.
- The patient must have a full set of observations and a physical assessment, including wound check, height of block and urine output recorded, prior to administration of a bolus dose.
- Stop and disconnect the infusion and aseptically disconnect at the filter and gently aspirate with a sterile 10-ml syringe. Reconnect the infusion to the patient and program a bolus or loading dose.
- Deliver the bolus dose as ordered no faster than 5mls over 2 minutes, either by the syringe pump
- Record bolus doses delivered in the bolus section and sign for each dose; the person giving the prescribed bolus doses and the witness must sign as indicated in the bolus order section of the epidural form.
- BP must be taken each 5 minutes x 4 After a bolus has been given. Increase the infusion rate by 2mls within infusion range

Epidural dressing- reinforcement or redressing

The majority of dressings over an epidural consist of a transparent sterile occlusive dressing over the entry port of the epidural, and then Hypafix or Micropore to further attach the epidural catheter to the patient’s back.

- If a dressing is not stabilising an epidural catheter please page the APRS to redress.
- Leaking epidurals may require a new dressing. Comfeel transparent may be applied by the APRS in order to secure a leaking epidural catheter.
- When removing the comfeel transparent the dressing is to be stretched which then allows the dressing to lift off without damage to the skin.

Epidural Filter-

Epidural filters may remain insitu for 96 hours at which time a replacement may be performed by the APRS if the catheter is to remain in. In the event that a disconnection occurs, a new filter may be placed by APRS under the following circumstances-

1. If a disconnection has been witnessed and asepsis was maintained.
2. If the existing filter is faulty.
INTERMITTENT EPIDURAL PETHIDINE BOLUSES

Skill Level: Registered Nurse
A registered nurse that has received education and assessment on epidural injections of opioid medications may give opioids via the epidural route and subsequently manage the patient.
Patients receiving epidural opioids will be observed and managed for all side effects of this form of pain relief.
Analgesia will be ordered PRN and patients will be educated to ask for PRN pain relief.

OUTCOME
Patients will have their pain effectively managed via the epidural catheter with appropriate observation for the type of opioid agent used and the time since the catheter insertion

RATIONALE
The use of opioids such as Pethidine, Morphine and Fentanyl in the epidural space without local anaesthetic agents can provide excellent analgesia without the risk of motor block and hypotension. This may be the optimum choice of analgesia in patients wishing to ambulate post-operatively.
Patients with infusions containing local may be changed to infusions or intermittent boluses of opioid, or may use intermittent opioid as their primary (initial and most potent) analgesic. Knowledge of the pharmacokinetics of each opiate is necessary to safely manage these patients.

CATEGORIES OF PATIENTS
Caesarean section patients

Optimal analgesic dose is 25mg 2/24 PRN
Some women will require more than this.
The APRS must be notified if a patient’s pain has not been reduced below 4/10, 30 minutes post epidural bolus, and the dose will be reviewed.

If 50mg has been ordered and the patient experiences CNS effects the APRS must be informed in order to review the dose.

Laparoscopic surgery patients
Abdominal hysterectomy patients
Endometriosis surgery

Procedure for administration of intermittent bolus of Pethidine
1. Explain procedure to patient.
2. Perform & document Pain Score, Sedation Score & Respiratory rate
3. Ensure that motor block has been assessed that shift and is resolving appropriately
4. Ensure that venous access is available according to protocol
5. Check the medication order
6. Ensure the first dose of epidural drug has been administered by the anaesthetist.
7. Assess the dosage frequency
8. Ensure the patient has not received >800mgs of pethidine in the past 24 hours.
9. Assess analgesic response (pain relief) to previous doses

....../20
10. Evaluate the following side effects
   - Respiratory depression
   - Sedation
   - Nausea
   - Dysphoria
   - Itching

11. Contact the APRS to Adjust dose where necessary

12. Check dressing site for security and adequacy. Report and record as appropriate

13. Check the epidural catheter depth is the same as has been documented on the 
    anaesthetic form or pain chart and record findings

14. Check (and records appropriately) the epidural catheter for kinks, extrusion, leakage 
    or the presence of blood in the catheter.

15. Test all connections and filter with a gentle tug

16. Observe standard procedures, hand washing and avoid contamination throughout

17. Organise equipment.

18. Check and prepare Medication according to policy with another RN.

19. Use needleless system to draw up medication without contaminating it.

20. Remove filter cap using "no touch" technique and replace with Injection port for
    needleless system.

21. Wipe injection port with alcohol swab and allows to air dry for 30 seconds

22. Insert the needleless system into the port and gently aspirates the syringe for
    about 10 seconds

23. Check the catheter close to the site of entry to identify intravasation in the form
    of blood in the catheter.

24. Inject drug over 1 - 2 minutes

25. Reposition the patient and slow the rate of injection if pain occurs during injection

26. Reconnect filter cap using "no touch" technique.

27. Secure the filter and attach to the patient's gown in a manner which will avoid
    patient injury or damage to equipment

28. Remain with patient for a minimum of 3 minutes post-procedure

29. Observe and Document Pain Score, Sedation Score & Respiratory rate 
    and Blood pressure -15 minutes after bolus

30. Assist the patient from bed if desired.

31. Document observations & administration as per procedure

32. Dispose of equipment appropriately.
REMOVAL OF EPIDURAL CATHETER

MANAGEMENT CONSIDERATIONS
♦ Post Caesarean Section patients will have their epidurals removed from 24 hours post insertion. All epidural sites to be reviewed each shift and if the site is intact and clean, the epidural may remain insitu until 48hours post insertion.
♦ In other post operative patients, the time for the epidural catheter to remain insitu is 72 hours. However, if strong pain is anticipated beyond this time the inserting anaesthetist or the acute pain relief service may monitor the epidural site, the patient’s temperature and white cell count and recommend the epidural remain insitu for up to 5 days.

REMOVAL OF EPIDURAL CATHETER IN ALL PATIENTS
For Patients RECEIVING ANTICOAGULANT THERAPY the following timing should be observed. The risk of forming a haematoma is small at the time of removal of an epidural catheter, but the result particularly debilitating. A spinal haematoma can cause irreversible damage to the patient’s neurological function below the haematoma. The following guidelines describe the timing for anticoagulant therapy and epidural removal.

STANDARD OUTCOME
Epidural catheter is removed without complications.

RATIONALE
These precautionary measures are recommended to decrease the possibility of an epidural haematoma occurring in a patient on epidural infusion.

Skill level: Registered Nurse
Epidural catheter can be removed only by accredited Registered Nurse.
Epidural catheters should not be removed in the presence of therapeutic anticoagulation, as this appears to significantly increase the risk of epidural haematoma

ALERT Steps 3-7 must be followed prior to the removal of any epidural catheter in the following patients

Patients receiving Na Heparin or Calciparine: where possible epidural catheter should be removed 1-2 hour prior to Na Heparin or Calciparine dose or at least 4 – 6 hours after last Na Heparin or Calciparine dose.
Patients receiving low molecular weight heparin (e.g. Clexane, Fragmin): epidural catheter should be removed 10 – 12 hours after last dose, subsequent dose should be delayed at least 2 hours after catheter removal.
Patients receiving IV Heparin turn off Heparin for 4 -6hrs, remove catheter and recommence after 1-2 hours. This has to be confirmed with the surgical team.
In patients who have pre-eclampsia, the platelet count should be checked prior to the epidural removal, and should be greater than 100.
If a patient’s INR is greater than 1.4 the APRS may consider giving FFP prior to the epidural removal
Procedure
- Verify with the Acute Pain Relief Service that the epidural catheter is to be removed.
- Carry out applicable general preparation.
- Give clear and relevant explanation to the patient.
- Halt infusion flow to the patient.
- Position patient with spine slightly flexed in either sitting or lying position.
- Remove dressing covering epidural insertion site.
- Inspect catheter site for swelling/inflammation.
- Clean insertion site with antiseptic solution.
- Gently withdraw catheter.
- If signs of infection present, notify the Pain Relief Service and send the epidural catheter tip for culture.
- Apply a small adhesive dressing e.g. ‘OpSite’ to insertion site.
- Examine epidural catheter, confirm that tip is intact with a second Registered Nurse and document in the Epidural Infusion Prescription and Observation Record.
- Terminate encounter suitably.

Any need for clarification should be directed to the Acute Pain Relief Service

<table>
<thead>
<tr>
<th>Medication</th>
<th>When to Give dose</th>
<th>When to Remove catheter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Heparin</td>
<td>1-2 hours after epidural removed</td>
<td>6 hours after last sodium or calciparine dose</td>
</tr>
<tr>
<td>Na Heparin/Calciparin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Molecular Weight Heparin</td>
<td>No less than 12 hours post epidural insertion and 2 hours after epidural removed.</td>
<td>12 hours after last dose</td>
</tr>
<tr>
<td>Clexane/Fragmin</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The patients neurological function should be monitored 2/24 hourly for 8 eight hours post epidural removal. Any symptoms must be attended to immediately as the treatment, surgical decompression, must occur within 8-12 hours of onset, preferably earlier.

PLEASE CONTACT THE APRS/ANAESTHETIST ON DUTY URGENTLY IF ANY OF THE FOLLOWING SYMPTOMS OCCUR.

1. Back Pain  
2. Motor Weakness  
3. Sensory Deficit  
4. Bladder/bowel dysfunction