

**CLINICAL GUIDELINE FOR CONTINUOUS EPIDURAL INFUSION ANALGESIA  
(PRE AND POST- OPERATIVELY) IN ADULTS**

<b>APPROVING COMMITTEE(S)</b>	Clinical Policies Group – Chair's Action	Date approved:	July 2016 Revised January 2019
<b>EFFECTIVE FROM</b>	January 2019		
<b>DISTRIBUTION</b>	Adult Inpatient Pain Service Consultant Anaesthetists Haematology Pharmacy Wards and Clinical Departments Trust Wide via Barts Health Intranet		
<b>RELATED DOCUMENTS</b>	Infection Control Policies Cleaning and Decontamination- Infection Control Policy Adverse Incident Policy Controlled Drugs in Wards and Departments Policy Medicines Management Policy Intravenous Patient and Nurse Controlled Analgesia (PCA/NCA) For The Adult Patient in Acute Pain Clinical Guideline Adult PCA/Epidural Observation Chart Observation and Escalation Policy		
<b>STANDARDS</b>	RCOA 2013 Guidelines for the Provision of Anaesthetic Services - Anaesthesia services for acute pain management RCOA 2012 – Raising the Standard: A compendium of audit recipes Section 11: Acute Pain Services		
<b>OWNER</b>	Inpatient Adult Pain Service Barts Health NHS Trust		
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<b>SUPERCEDED DOCUMENTS</b>	CLI/POL/180/2016-001 Clinical Policy for Continuous Epidural Analgesia (pre and post – operatively) in Adults		
<b>REVIEW DUE</b>	January 2022		
<b>KEYWORDS</b>	Epidural, Acute Pain, Analgesia, Pain Service		
<b>INTRANET LOCATION(S)</b>	<a href="http://bartshealthintranet/Policies-and-Guidelines/Documents/Policies-Trust-wide/Continuous-Epidural-Infusion-Analgesia-in-Adults.pdf">http://bartshealthintranet/Policies-and-Guidelines/Documents/Policies-Trust-wide/Continuous-Epidural-Infusion-Analgesia-in-Adults.pdf</a>		

<b>CONSULTANT</b>	<i>Barts Health</i>	Pain Service Pharmacy Clinical Policies Group
	<i>External Partner(s)</i>	

SCOPE OF APPLICATION AND EXEMPTIONS	<b>Included in policy:</b> This guideline applies to any <b>ADULT</b> who is receiving epidural analgesia, and to all medical and nursing staff who has received appropriate epidural analgesia training and is involved in the care of patients receiving this mode of analgesia.
	All Trust staff, working in whatever capacity
	Other staff, students and contractors working within the Trust
	<b>Exempted from policy:</b> <i>The following groups are exempt from this policy</i> All non-clinical staff groups are exempt from this policy. Paediatric & Neonatal Wards.

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## CLINICAL GUIDELINE FOR CONTINUOUS EPIDURAL INFUSION ANALGESIA (PRE AND POST- OPERATIVELY) IN ADULTS

### 1 INTRODUCTION

#### Aims of guideline

- 1.1 Epidural analgesia is highly effective for controlling acute pain after surgery or trauma to the chest, abdomen, pelvis or lower limbs. It has the potential to provide excellent pain relief, minimal side-effects and high patient satisfaction when compared with other methods of analgesia. However, epidural analgesia can cause serious, potentially life-threatening complications; safe and effective management requires a co-ordinated multidisciplinary approach (RCoA, 2010)
- 1.2 This guideline outlines the use of epidural analgesia in adults in the hospital setting. It aims to ensure the safe and effective management of adult patients who receive continuous epidural analgesia. This is required in order to ensure patients receive effective pain management whilst minimizing any risk of side effects or untoward complications. Guidance has been issued by the Royal College of Anaesthetists regarding best practice in the management of epidural analgesia in the hospital setting (RCoA, 2010)

#### Summary

- 1.3 This guideline outlines the overall management of patients with epidural infusions. It highlights:
  - Expected practice for the prescribing, preparation, supply and storage of epidural infusions compliant with relevant legislation and NPSA guidance.
  - Requirements for designated areas deemed suitable for care of patients with epidural infusions and how these are identified.
  - Requirements for training and competency for all health professionals (including reference to Trust nursing competencies).
  - Procedures for choice and labelling of equipment for optimum safety.
  - Standards for the monitoring of patients and the duties of particular clinical staff and groups.
  - Compliance with the Trust epidural guideline will be monitored and audited by the inpatient pain service who will conduct ongoing audit throughout the year.
  - Breaches within this guideline must be reported using the Trust's incident reporting system and investigated by the relevant Consultant or Clinical Manager and communicated to the inpatient pain service.

### 2 ABBREVIATIONS AND DEFINITIONS

<b>ANZCA</b>	Australian and New Zealand College of Anaesthetist
<b>APTTR</b>	Activated partial thromboplastin time ratio
<b>BH</b>	Barts Health
<b>CEI</b>	Continuous Epidural Infusion

<b>CPPC</b>	Clinical Policies and Procedures Committee
<b>cm</b>	Centimetres
<b>CNS</b>	Clinical Nurse Specialist
<b>CrCl</b>	Creatinine clearance
<b>CSF</b>	Cerebro Spinal Fluid
<b>DOB</b>	Date of Birth
<b>HCP</b>	Health Care Professional
<b>INR</b>	International Normalised Ratio
<b>IR</b>	Immediate release
<b>ITU/HDU</b>	Intensive Care Unit/High Dependency Unit
<b>IM</b>	Intramuscular
<b>IV</b>	Intravenous
<b>LMWH</b>	Low Molecular Weight Heparin
<b>mcg</b>	microgram
<b>mg</b>	milligram
<b>MRI</b>	Magnetic Resonance Imaging
<b>MRN</b>	Medical Record Notes
<b>NMC</b>	Nursing and Midwifery Council
<b>NPSA</b>	National Patient Safety Agency
<b>NSAID</b>	Non-Steroidal Anti- Inflammatory Drug
<b>NUH</b>	Newham University Hospital
<b>ODP</b>	Operating Department Practitioner
<b>NEWS</b>	National Early Warning Score
<b>PCA</b>	Patient Controlled Analgesia
<b>PRN</b>	As Required
<b>RCoA</b>	Royal College of Anaesthetists
<b>RLH</b>	Royal London Hospital
<b>SBH</b>	St Barts Hospital
<b>sc</b>	Subcutaneous
<b>UFH</b>	Unfractionated heparin
<b>WCH</b>	Whipps Cross University Hospital

<b>Bolus Dose</b>	A measured amount of epidural solution given if the patient is in pain or the block is inadequate to cover the required pain area.
<b>Bromage score</b>	The Bromage Score is used to measure the degree of motor block whilst a patient is having a continuous epidural infusion for analgesia.
<b>DOOP kit</b>	Controlled drug destruction kit.
<b>Opioids</b>	Opioids are drugs that exert their activity by acting as agonists at endogenous receptors (opioid receptors), and that elicit the characteristic stereospecific actions of natural morphine-like ligands. These receptors are widespread throughout the central and peripheral nervous systems (The British Pain Society, 2010).
<b>Pump Checks</b>	Checks to be carried out by the Healthcare Professional caring for the patient at the beginning of the shift to ensure safe and effective management of epidural analgesia.
<b>Step-down Analgesia</b>	Medications given to patient after the discontinuation of epidural analgesia.
<b>Test Dose</b>	Medication delivered through the epidural catheter to confirm the epidural was placed correctly.

### 3 SELECTION AND IDENTIFICATION OF SUITABLE PATIENTS FOR EPIDURAL ANALGESIA (BY ANAESTHETISTS)

#### Inclusion criteria

- 3.1 Anaesthetists must check the list of wards designated to care for epidurals prior to commencing the procedure (appendix 1). They must liaise with the nurse in charge to ensure the ward is adequately staffed to care for patients with an epidural infusion for the current and subsequent shifts before insertion (RCoA, 2004).
- 3.2 Patients admitted with blunt chest trauma who require insertion of a thoracic epidural must be cared for in a monitor bed (HDU) for the first 24 hours or until clinical stable.
- 3.3 Anaesthetist must ensure that there is an epidural pump available for use, before insertion of an epidural catheter.
- 3.4 A list of designated wards that accept patients with epidural analgesia is provided in appendix 1.
- 3.5 The patient's suitability for epidural analgesia must be assessed and documented by the anaesthetist on the anaesthetic chart or other suitable place in the health care records. Where epidural analgesia is not deemed appropriate alternative comparative approaches must be considered and offered (RCoA, 2004).
- 3.6 This assessment should include:



- Procedure Planned
  - Coagulation Status
  - Patient Choice
  - Physical and Mental Status
  - Ward where patient is expected to be cared for post-operatively
- 3.7 The anaesthetist must, whenever possible, obtain verbal informed consent from the patient and this must be documented in the healthcare record taking into account religious beliefs surrounding pain management (RCoA, 2004)
- 3.8 The explanation must include:
- The reason for insertion of an epidural
  - The benefits of using epidural analgesia
  - The risks involved – both likelihood and severity should be discussed
  - That he/she has the right to refuse an epidural
  - Comparative risks of alternative pain management strategies / anaesthetic techniques

Note: Explanation of risks must be translated by an advocate for non-English speaking patients.

### **Exclusion criteria**

- 3.9 Absolute contraindications:
- Patient refusal
  - Patients with coagulation abnormalities
  - Spinal compression
  - Infection at site of insertion
  - Systemic sepsis
  - Proven allergy to proposed drugs used
  - Unstable spinal fracture
  - Uncorrected hypovolaemia
  - Lack of medical/nursing personnel with appropriate experience with epidural analgesia
  - Raise intracranial pressure (a risk of herniation if a Dural tap occurs)
- 3.10 Relative contraindications:
- Anti-coagulant therapy
  - Certain neurological conditions e.g. multiple sclerosis
  - Unstable cardiovascular system (hypotensive / shocked patient)
  - Spinal deformity
  - Gross obesity

EPIDURAL CATHETER INSERTION – PATIENT PREPARATION	
ACTION	RATIONALE
<p><i>An epidural catheter must only be inserted by an anaesthetist who has experience of the technique or by a trainee under supervision.</i></p> <p>Epidural catheters must be placed using an aseptic technique in main theatres or HDU/ ITU <b>ONLY</b>.</p> <p>An antibacterial in-line filter <b>MUST</b> always be used.</p> <p>Patients undergoing epidural analgesia must always have a cannula and intravenous infusion in situ before the procedure.</p> <p>Explain and discuss the procedure with the patient. If the intention is to provide post-operative analgesia then explanation and consent must have been discussed prior to surgery.</p> <p>Assist the patient into the required position:</p> <p>Lying:</p> <ul style="list-style-type: none"> <li>• Patient must be lying comfortably on a firm surface. (bed, trolley, or operating table).</li> <li>• Position pillow under patient's head.</li> <li>• Assist patient to lay on their side with knees drawn up to the abdomen and clasped by hands.</li> </ul> <p>Support the patient in this position</p> <p>Sitting:</p> <ul style="list-style-type: none"> <li>• Patient sits on edge of firm surface (bed, trolley, or operating table), with arms supported on 2 pillows, and with head resting on arms.</li> <li>• Support, encourage and observe the patient throughout the procedure.</li> </ul>	<ul style="list-style-type: none"> <li>• To minimise the risk of complications.</li> <li>• To minimise the risk of infection.</li> <li>• A reaction to the opioid or local anaesthetic solution (e.g. respiratory depression or sympathetic blockade) may require immediate venous access.</li> <li>• To ensure that the patient understands the procedure and gives his/her valid consent and to ensure patient has time to assess information and ask questions.</li> <li>• To allow identification of the spinal processes and inter- vertebral discs.</li> <li>• To ensure maximal widening of the inter-vertebral spaces that will provide easy access to the epidural space.</li> <li>• It is important to give reassurance to patient as the procedure takes place.</li> <li>• To ensure maximal widening of the inter-vertebral spaces that will provide easy access to the epidural space.</li> <li>• It is important to give reassurance to the patient as the procedure takes place.</li> </ul>



EPIDURAL CATHETER – INSERTION PROCEDURE	
ACTION	RATIONALE
<p>The epidural must be inserted using a full aseptic technique as follows:</p> <ul style="list-style-type: none"> <li>• A mask, gloves and gown will be worn by the anaesthetist.</li> <li>• Position the patient, and locate the appropriate space for the insertion.</li> <li>• Clean the skin with alcohol – based solution (e.g. 0.5% Chlorhexidine only to minimise the risk of CSF contamination).</li> <li>• Identify the area to be punctured and inject the skin and subcutaneous layers with local anaesthetic.</li> <li>• Introduce Tuohy or spinal needle between vertebrae at chosen level.</li> <li>• Fill the syringe with 0.9% sodium chloride for injection or air and attach to the needle. Advance the needle between the vertebral spines maintaining a constant pressure.</li> <li>• Ensure epidural space has been entered.</li> <li>• Inject test dose of drug.</li> <li>• <b><i>The doctor inserting the epidural should administer a test dose and connect the epidural infusion. This practice should be followed wherever the procedure takes place. Further bolus doses and or an infusion may be administered by anaesthetists in theatre and recorded on the anaesthetic chart by the end of the procedure.</i></b></li> <li>• <b>The epidural infusion should be attached by an anaesthetist (another witness also present) prior to leaving the recovery area or operating room. This needs documenting on the Adult PCA/NCA and Epidural Observation Chart. If not connected, the anaesthetist should clearly document the reason and formulate a plan with regards to the epidural catheter.</b></li> <li>• Thread epidural catheter through barrel</li> </ul>	<ul style="list-style-type: none"> <li>• To minimise the risk of infection.</li> <li>• To allow for ease of insertion.</li> <li>• To clean skin and minimise the risk of contamination.</li> <li>• To ensure loss of resistance to injection is detected as soon as the needle passes through the ligamentum flavum.</li> <li>• The epidural space is reached when loss of resistance is felt.</li> <li>• To prevent anaesthesia being given directly into spinal cord or intravenously by means of the dural veins.</li> <li>• To avoid incorrect usage of epidural catheter or incorrect connection of epidural infusion to an intravenous catheter.</li> <li>• To reduce the risk of infection, leakage or displacement of the</li> </ul>

of Tuohy needle. <ul style="list-style-type: none"> <li>• Attach the anti-bacterial filter.</li> <li>• Apply 'lock-it' device to secure catheter to the skin surrounding the insertion site, and cover with a transparent occlusive dressing.</li> <li>• Inject solution into epidural space via catheter.</li> <li>• Position the patient according to the doctor's instructions.</li> <li>• Take vital signs observations: blood pressure, pulse, respirations, and oxygen saturations once every 5 minutes for 20 minutes.</li> <li>• Make the patient comfortable.</li> </ul> <p>Usually the patient is nursed flat for the first hour post-insertion, and the slowly elevated into a sitting position.</p> <ul style="list-style-type: none"> <li>• Bedclothes must not constrict the feet.</li> </ul>	catheter. <ul style="list-style-type: none"> <li>• To ensure spread of solution to provide optimum effect.</li> <li>• To monitor for signs of hypotension and respiratory depression.</li> <li>• To minimise risk of developing foot drop.</li> </ul>
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#### 4 PRESCRIPTION OF EPIDURAL INFUSIONS

- 4.1 A combination of low concentration local anaesthetic and opioid compared to the drugs used on their own at higher concentrations has been shown to provide superior pain relief (ANZCA, 2010; Bujedo 2013). The lowest possible effective concentration of local anaesthetic should be used in order to preserve motor function. This improves patient satisfaction and aids detection of neurological complications (<http://www.rcoa.ac.uk/>). In this Trust the following concentrations are used cross site for continuous infusions.

##### EPIDURAL DRUGS – DIFFERENT SITES

Site	Drug and concentration ready-to-administer epidural infusions	Volume	Prescription
NUH	Fentanyl 4mcg/ml and Bupivacaine 0.1% OR 0.1% Bupivacaine only	<ul style="list-style-type: none"> <li>➤ 480ml bags</li> <li>➤ 250ml bags</li> </ul>	Yellow preprinted epidural prescription sticker (refer to appendix 5). To be placed on the PRN side of the prescription chart
RLH and SBH	Fentanyl 4mcg/ml and Bupivacaine 0.1% OR 0.1% Bupivacaine only	<ul style="list-style-type: none"> <li>➤ 480ml bags</li> <li>➤ 250ml bags</li> </ul>	
WCH	Fentanyl 4mcg/ml and Bupivacaine 0.1% OR 0.1% Bupivacaine only	<ul style="list-style-type: none"> <li>➤ 480ml bags</li> <li>➤ 250ml bags</li> </ul>	

- 4.2 According to Bujedo (2013) Fentanyl is the opioid of choice as it is lipophilic, causes less sedation and adverse effects compared to Morphine.
- 4.3 If hydrophilic opioids are given epidurally then the observations schedule in MONITORING section may need to be revised. This is to account for increase risk of respiratory depression and a greater incidence of other adverse effects (ANZCA, 2010; Bujedo, 2013).
- 4.4 Ready-to-administer licensed epidural solutions must always be selected if available. Epidural solutions prepared in clinical areas should only be used if ready-to-administer solutions not available (NPSA, 2007).
- 4.5 This must be prescribed in the correct place by the Anaesthetist or a non-medical prescribing Pain CNS, including the starting rate and maximum rate. The pre-printed yellow prescription sticker should be used (refer to appendix 5). The maximum recommended rate is 15mls/hour; to keep within the safe limits of local anaesthetic toxicity.
- 4.6 For clinical situations that require a combination of both PCA and Epidural, please also refer to the Intravenous Patient and Nurse controlled analgesia (PCANCA) for the adult guideline.

### **Prescriptions Related to Epidurals**

- 4.7 All patients with epidurals must be prescribed regular paracetamol and an NSAID if not contra-indicated. First line NSAID in the Trust is Ibuprofen.
- 4.8 An anti-emetic (appendix 6: Anti-Emetic Prescriptions- Different Sites), naloxone and chlorphenamine for the management of opioid-related side-effects must be prescribed PRN for the duration of the epidural.

Whilst naloxone use can be life-saving in respiratory depression and respiratory arrest, the use of naloxone in patients where it is not indicated, or in larger than recommended doses, can cause a rapid reversal of the physiological effects for pain control, leading to intense pain and distress, and an increase in sympathetic nervous stimulation and cytokine release precipitating an acute withdrawal syndrome. Hypertension, cardiac arrhythmias, pulmonary oedema and cardiac arrest may result from inappropriate doses of naloxone being used for these types of patients (NHS /PSA 2015).

The HCP must initially administer a bolus dose of naloxone intravenously 100mcg to 200mcg. Reassess in 2 minutes. Further doses of 100mcg can be given up to every 2 minutes until respiratory function improves.

- 4.9 Oxygen must not be routinely prescribed and given to patients with epidural analgesia in progress. Oxygen only to be used if clinically indicated with low saturations (after discussion with medical team).
- 4.10 If a patient is on long acting opioids pre-operatively, or is at risk of respiratory depression, or is particularly sensitive to opioids, discuss with inpatient pain service or anaesthetic consultant pre-operatively.
- 4.11 If a new drug chart is started for a patient the epidural prescription must be transferred immediately. The inpatient pain service or on-call anaesthetist can help with any queries regarding prescription of epidurals.

- 4.12 Opioid analgesics should not normally be prescribed alongside an epidural unless advised by an anaesthetist or member of the inpatient pain service to continue or to start concurrently. An explanation should be clearly documented in the healthcare records and the inpatient pain service informed.
- 4.13 Colloid must be prescribed for the treatment of hypotension attributed to epidurals including top-ups and rate changes.
- 4.14 Intravenous access must be maintained at all times.

### **Storage**

- 4.15 Epidural solutions must be stored separately, in a designated locked epidural cupboard isolated from other controlled drugs and IV's in accordance with NPSA guidance (NPSA, 2007).

### **Anticoagulation with epidurals**

- 4.16 Epidural haematoma is a rare but potentially disastrous complication of epidural analgesia. Patients with impaired blood clotting, either due to their medical condition or to the use of drugs for anticoagulation (prophylactic and therapeutic) and/or platelet inhibition (aspirin, clopidogrel, ticlopidine) have a higher risk of developing this complication.

### **Prophylactic anticoagulation with Low molecular weight heparin**

- 4.17 Use the standard prophylactic regimen of LMWH daily, must be given at 18.00 or 22.00. This facilitates a safe placement or removal of the epidural catheter the following day.
  - Prophylaxis must not be omitted because of epidural analgesia.
  - In the case of LMWH being required it must be given 12 hours pre insertion of epidural catheter or 4 hours post insertion of epidural catheter.
  - 75mg Aspirin (low dose) once a day is considered safe.
- 4.18 Please refer to appendix 4: Regional Anaesthesia and Patients with Abnormalities of Coagulation (November 2013).

## **5 COMPETENCY AND TRAINING**

- 5.1 All healthcare practitioners involved in the care of patients with epidurals must be appropriately educated about potential complications and trained in their recognition and management. This knowledge should be tested as part of a competency assessment.
- 5.2 Epidural training must be offered by the inpatient pain service as part of a regular education programme.

Book training for RLH and SBH sites via the intranet WESHARE: Your Career tab /

Clinical Course / Book On A Course / Courses tab/ Clinical Courses / General Pain, PCA, Epidural (adult)).

Book training for WCH site by emailing the pain CNSs:

PainNurseWCH@bartshealth.nhs.uk

Book training for NUH site by emailing the pain CNSs:

PainNurseNUGH@bartshealth.nhs.uk



- 5.3 Such education should not be considered exhaustive; attendance of training does not reduce the professionals' responsibilities to maintain their own knowledge and competency to practice.

<b>Nurses and ODPs</b>	<p>In order to be considered competent to care for patients with epidurals nurses and ODPs must:</p> <ul style="list-style-type: none"> <li>• Complete the Assessment Of Safe Practice: To Care For A Patient With A Continuous Epidural Infusion (CEI).</li> <li>• Have a documented assessment of this competency. This should be placed into the individuals professional profile and a copy kept by the ward / department manager. This competency should be re-assessed 2 yearly.</li> <li>• Have attended an epidural update session in the past 2 years.</li> </ul>
<b>Anaesthetic trainees</b>	<ul style="list-style-type: none"> <li>• Anaesthetic trainees must demonstrate competencies for acute pain (including epidural care) through formal assessment prior to entering the on call rota.</li> <li>• Anaesthetic trainees must attend training on the use of epidural pumps used in Barts Health as part of their induction. Those who are unable to attend formal training must arrange informal training with the pain service.</li> <li>• College tutors are responsible for organising education of anaesthetic trainees and for keeping a record of competency assessments. The lead consultant for the inpatient pain service will arrange further training or competency assessment if requested by college tutors.</li> </ul>
<b>HDU &amp; ITU fellows</b>	<ul style="list-style-type: none"> <li>• Training in epidural care is mandatory for ITU &amp; HDU fellows. Responsibility for organising training and competency assessment rests with the Lead ITU Consultant for ITU fellows and the Lead HDU Consultant for HDU fellows.</li> <li>• The inpatient pain service will make appropriate training available on request (subject to reasonable notice).</li> </ul>
<b>Pain Clinical Nurse Specialists</b>	<ul style="list-style-type: none"> <li>• CNSs will complete a programme of training, supervised practice and competency assessment before administering prescribed epidural boluses or administering colloid or ephedrine either under a Patient Group Directive or as independent prescribers.</li> </ul>

## 6 ADMINISTRATION OF EPIDURAL INFUSION

- 6.1 All drugs given by epidural infusions must be checked by two qualified practitioners (Doctors, Nurses, Midwives or ODPs). This applies regardless of the grade or profession of the first practitioner.
- 6.2 No practitioner may draw up drugs for another to administer via the epidural route (NPSA, 2007).

## **Continuous Epidural Infusions**

- 6.3 In order to prevent accidental intravenous administration of epidural fluids:
- Continuous epidural infusions must be given via a designated epidural pump using a dedicated epidural giving set.
  - Pumps and sets must be clearly identified as being for this purpose by being yellow in colour.
  - Only designated yellow epidural giving sets can be used for epidural infusions.
- 6.4 Yellow epidural pumps and giving sets may be used to infuse epidural fluids in other types of local nerve blockade and must be clearly labelled as such. They must never be used for intravenous fluids.
- 6.5 The epidural pump, epidural catheter and giving set, must bear a yellow sticker marked with the word 'epidural infusion'. No practitioner may use an epidural giving set to administer epidural drugs unless it is labelled in this way.
- 6.6 The epidural infusion sticker should be attached to the catheter near the filter and clearly visible.
- 6.7 Two practitioners should witness the connection of the infusion to the epidural catheter, one of which should be the anaesthetist who inserted it.
- In order to prevent subsequent errors, a transparent occlusive dressing 'seal' should be applied around the catheter / filter / giving set connections.
  - The anaesthetist who inserts the epidural must ensure the Trusts dedicated Epidural Observation Chart is correctly filled in and personally sign for the connection on the front page of this observation chart.
  - A second practitioner must check the connection and sign on the front page of the observation chart.
  - The epidural infusion must be prescribed using a yellow pre-configured epidural prescription sticker (refer to appendix 5) on PRN page of the drug chart and signed by the same two practitioners as above.
- 6.8 When commercially available, technology to prevent accidental connection of epidural sets to IV cannulae should be utilised (NPSA, 2007 and NPSA, 2011).
- 6.9 Continuous epidural infusions should be commenced in recovery or the operating theatre. The epidural infusion should ideally be attached prior to leaving the recovery area or operating room to avoid incorrect usage of epidural catheter or incorrect connection of epidural infusion to an intravenous catheter. If not connected, the anaesthetist should clearly document the reason and formulate a plan with regards to the epidural catheter.
- 6.10 Only registered HCP who have been certified as competent in care of epidurals and have IV certification may:
- Adjust epidural infusion rates within the prescribed range, but only after a full and documented assessment of the patient's condition.
  - Discontinue epidural infusions on advice of a doctor, the inpatient pain service or in the event of an adverse reaction.
  - Re-start epidural infusions on advice of a doctor or the inpatient pain service if prescribed.



- Change ready-to-administer epidural bags - or if no availability of ready-to-administer bags, prepare opioid and solution to bags aseptically.
  - Remove epidural catheter.
- 6.11 The rate of infusion must be adjusted to the minimum required to achieve a pain score of 0-3 out of 10 (None-Mild) without causing a dense motor block (preventing ambulation) or sensory block above the level of T4. Sensory blocks up to T3 are allowable in HDU or ITU areas.

#### **Bolus Doses for Rescue Analgesia**

- 6.12 Bolus doses must only be administered by anaesthetists, doctors, or pain management CNSs who have been properly trained and assessed as competent to do so.
- 6.13 Post-operatively, bolus doses must be prescribed in the single dose section of the current drug chart.
- 6.14 Anaesthetists must always use the drug chart to prescribe and to sign as given any dose they administer outside of theatres.
- 6.15 Whenever possible, breaks in the integrity of the epidural administration circuit must be avoided by administering boluses via the epidural infusion pump (Whiteman, 2010). In this way repeated connections and associated errors can be avoided, as well as minimising infection risk.
- 6.16 In the absence of such a plan, the managing team should seek the advice of the on-call anaesthetist in line with guideline on removal of epidural catheters.

### **7 MONITORING OF PATIENTS WITH CONTINUOUS EPIDURAL INFUSIONS**

- 7.1 Although the incidence of complications during insertion of the epidural catheter and epidural infusion is low, the patient needs to be monitored very closely during the post-operative phase, as complications can occur rapidly. If appropriate action is not taken such complications could potentially result in paralysis or death (Whiteman, 2010).
- 7.2 All the observations must be recorded on the Adult PCA/ Epidural Observation Chart. Schedule A observations need to be monitored regularly, whereas Schedule B observations need to be checked only periodically. See below for Instructions for the frequency of observations, these can also be found on the Epidural observation chart.

#### **EPIDURAL OBSERVATIONS**

##### **Schedule A**

OBSERVATION	PARAMETERS	These parameters are based on a NEWS score of 0. Anything above this is a cause for concern. Please see Barts health PCA/Epidural
Temperature	36.1-38.0°C	
Pulse	51-90 beats per minute	
Systolic BP	111-219 mmHg	
Respiratory rate	12-20 breaths per minute	
O <sub>2</sub> Saturations	≥ 96%	
CNS (sedation) response	Alert	

Pain score on rest and movement 0-10 (0- No pain, 10 – severe)	0-3/10	observation chart for directions.
Nausea	0	
Motor block	Bromage score 1 (L and R)	

**Motor block should be recorded using the Bromage scale as below.**

GRADE	CRITERIA	DEGREE OF BLOCK
1	Free movement of legs and feet	Nil (0%)
2	Just able to flex knees and free movement of feet	Partial (33%)
3	Unable to flex knees, but with free movement of feet	Almost complete (66%)
4	Unable to move legs or feet	Complete (100%)

## Schedule B

### Sensory check

- 7.3 Ethyl chloride spray should be used to identify an area of sensory blockage. The upper and lower levels of the dermatomes for both lateral sides must be recorded on the observation chart. Maximum sensory block dermatome is level T4. Sensory blocks up to T3 are allowable in HDU or ITU areas.

### Epidural insertion site

- 7.4 Observe for signs of:
- Redness
  - Pus
  - Tenderness
  - Bleeding
  - Leakage
  - Epidural catheter displacement
- 7.5 If any of these are present, this is a cause for concern. Please contact the inpatient pain service/ on call anaesthetist immediately.

**FREQUENCY OF OBSERVATIONS**

<b>Schedule A- Temperature, Pulse, Blood pressure, Respiratory rate, O<sub>2</sub> saturations, Sedation, Motor block, Pain and Nausea scores</b>	
From Recovery (or in HDU/ITU if the patient does not go via recovery)	<ul style="list-style-type: none"> <li>• Every 15 minutes for the first hour. During this time the patient should not be transferred to the ward</li> <li>• Then 30 minutes for the 4 hours unless a change in clinical condition</li> <li>• Then hourly thereafter</li> <li>• After 24 hours of stable observations, the frequency can be reduced to 4 hourly</li> </ul>
Post removal of Epidural catheter	<ul style="list-style-type: none"> <li>• Continue as per NEWS score frequency of observation</li> </ul>
<b>Schedule B- Sensory block and Epidural catheter site</b>	
Recovery (or in HDU/ITU if the patient does not go via recovery)	<ul style="list-style-type: none"> <li>• Must be evaluated prior to discharge from recovery (or theatre (if a patient bypasses recovery))</li> </ul>
On the ward	<ul style="list-style-type: none"> <li>• Must be checked at the start and finish of each shift</li> <li>• Motor block should be checked prior to mobility</li> </ul>
Post removal of Epidural catheter	<ul style="list-style-type: none"> <li>• Monitor at least once per nursing shift for 48 hours</li> </ul>
<b>Miscellaneous</b>	
Following a clinician bolus dose	<ul style="list-style-type: none"> <li>• Schedule A observations should be every 5 minutes for 15 minutes</li> <li>• Schedule B observations should be done before another bolus is required or if a patient is pain managed. Then normal observations can be recommenced.</li> </ul>
Increase in Epidural Infusion rate	<ul style="list-style-type: none"> <li>• Schedule A &amp; B observations to be done an hour after the increase</li> </ul>
Leakage from epidural site	<ul style="list-style-type: none"> <li>• Schedule A &amp; B observations to be done</li> <li>• If good pain control, continue epidural</li> <li>• If poor pain control, stop epidural and remove catheter and commence alternative mode of pain relief. Seek advice from the inpatient pain service</li> </ul>

- 7.6 Patients receiving epidural analgesia can sit out of bed or walk but this should be done gradually with assistance because of the risk of leg weakness, loss of proprioception or postural hypotension.
- 7.7 The rate of infusion should be recorded on the Trust epidural observation chart at time of observations and following any change.
- 7.8 Within the first hour of every nursing shift and following any transfer e.g. Recovery to HDU/ITU, the named nurse should carry out “pump checks” to verify:
- The pump is turned on and in operational order
  - The epidural fluid and rate are appropriate and match those prescribed for that patient and recorded on charts
  - The pump is of the correct type and the giving set is correctly labelled
  - As soon as practically possible, the epidural site and integrity of circuit should also be inspected including connections (NMC, 2008; NPSA, 2007).
- 7.9 Patients must be informed that limb weakness is abnormal with an epidural. Patients should be encouraged to self-report should any leg or arm weakness occur.
- 7.10 Early diagnosis and treatment of a haematoma is crucial to avoid permanent neurologic deficits. A high index of suspicion should be maintained and careful and repeated clinical examinations are necessary to assess symptoms, especially if there is gradual worsening (Whiteman, 2010). Any discrepancies should be rectified as a matter of urgency.

## 7.11

REVIEWING OF PATIENTS WITH EPIDURAL INFUSIONS	
ACTION	RATIONALE
<p>The anaesthetist must assess patients in recovery prior to discharge to the ward and whenever possible patients should be reviewed on the ward as well.</p> <p>The anaesthetic team must contact the inpatient pain team (Monday to Friday) of any epidural catheters inserted.</p>	<p>To reduce the risk of error and ensure patient safety</p>
<p>Daily review by the adult inpatient pain service to complement and enhance, not replace nursing care provided by ward-based nurses.</p> <p>It is the staff nurses responsibility to contact the inpatient pain service or on-call anaesthetist out of hours by midday if a patient has not been reviewed to ensure patient with epidural analgesia is on their radar for review.</p> <p>These reviews must continue until the removal of the epidural catheter.</p>	<p>To reduce the risk of error and ensure patient safety</p> <p>To ensure prompt detection and treatment of any complications.</p>

<p>The inpatient pain service should document a plan for the discontinuation and removal of epidural catheters the day before this is due or on the preceding working day if the catheter is due for removal at a weekend or public holiday.</p> <p>In the absence of such a plan, the managing team should seek the advice of the on-call anaesthetist in line with guideline on removal of epidural catheters.</p>	<p>To reduce the risk of error and ensure patient safety</p> <p>To ensure prompt detection and treatment of any complications</p>
<p>Monday to Friday, at the end of the day shift, a written handover of patients likely to require anaesthetic/inpatient adult pain service support must be available to the on call anaesthetist and/or the Hospital at Night team.</p>	<p>To reduce the risk of error and ensure patient safety</p> <p>To ensure prompt detection and treatment of any complications</p>
<p>Monday to Friday mornings, at the end of the night shift, the on call anaesthetist and Hospital at Night team must handover to the inpatient pain service any changes to the status of the patients reviewed and inform them of any new epidural infusions.</p>	<p>To reduce the risk of error and ensure patient safety</p> <p>To ensure prompt detection and treatment of any complications</p>
<p>Out of hours review by on-call anaesthetists or Hospital at Night team on a daily basis.</p> <p>If unable to do this personally, overnight, during weekends and bank holidays, the on-call anaesthetist must routinely review patients if requested by the inpatient pain service</p>	<p>To reduce the risk of error and ensure patient safety</p> <p>To ensure prompt detection and treatment of any complications</p>
<p>Recovery areas must keep a record of patients who have epidural infusion in progress (including those patients with epidural catheter but not connected to an infusion). If a patient is transferred to ITU or HDU (bypasses recovery) it is the responsibility of the anaesthetist to ensure the patient is entered into this record and/or the inpatient pain service is made aware. The record must contain the patient's name, MRN and the ward they were transferred to.</p>	<p>To comply with record keeping and ensure patients are reviewed by the inpatient pain service or on-call anaesthetist. This minimises the risk of complications.</p>
<p>HCPs should contact the inpatient pain service or the on-call anaesthetist out of hours if a patients pain score is greater than 3/10 for over one hour despite your intervention(s).</p>	<p>To ensure adequate analgesia at all times</p> <p>To enhance patient experience/satisfaction</p>



Inpatient pain service must check recovery every weekday to ensure awareness of all epidurals inserted.	To reduce the risk of error and ensure patient safety
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## 8 COMMUNICATION AND HANDOVER

### Essential epidural infusion checks

BEFORE LEAVING THE CLINICAL AREA AND FOLLOWING ANY TRANSFER FROM ONE AREA TO ANOTHER THE HEALTHCARE PROFESSIONAL SHOULD CHECK THAT:	
ACTION	RATIONALE
The drug being administered via the epidural corresponds with the drug prescribed on the medication chart.	To adhere to Trust drug policy and prevent drug errors.
The pump programming has been checked and corresponds with the programme on the epidural assessment chart / prescription.	To reduce the risk of error and ensure patient safety
The epidural is working and patient has a pain score of less than 4/10.	To ensure effective analgesia is established prior to discharge to ward
The epidural site is clean and dry and there is no swelling, redness or tenderness.	To ensure prompt detection and treatment of any complications.
There is no leakage around the site	To ensure early detection to prevent patient being in pain To reduce the risk of infection
Check the bromage score.	To ensure prompt detection and treatment of any complications.
The drug chart has been completed correctly: Epidural infusion and concurrent drugs (e.g. paracetamol +/- NSAID's) are prescribed on the regular side of the chart. Naloxone, chlorphenamine and an anti-emetic are prescribed on the 'as required' section of the drug chart. <b>All other opioids and sedatives have been stopped unless indicated otherwise by Anaesthetist/Inpatient Pain Service.</b>	To prevent drug errors and comply with medicines legislation.  To allow for immediate treatment of side effects and complications.  To reduce the risk of complications (e.g. sedation and/or respiratory depression).
The epidural assessment chart has been completed correctly, including details of bolus doses administered.	To ensure accurate records of clinical care relevant to epidural
The patient is not excessively sedated.	To reduce the risk of complications (e.g. sedation and/or respiratory depression).



The patient is not experiencing nausea, vomiting or pruritus.	To ensure the patient is comfortable and any side effects are well controlled.
That the patient has IV access	To allow for immediate treatment of side effects and complications.
The line clamps on the epidural giving set are released and open.	To allow for uninterrupted delivery of analgesia via epidural.

## 9 CHANGING THE RATE OF A CONTINUOUS EPIDURAL INFUSION

- 9.1 Registered nurses, clinical nurse specialists in pain and anaesthetists can change the rate as long as these individuals have undergone the necessary training as mentioned already (section 5).
- 9.2 Increasing or decreasing the rate of the continuous epidural infusion can alter the spread of the sensory blockade. It is advisable to increase or decrease the rate incrementally by 1-2mls/hr.
- 9.3 If the patient has pain, the rate could be increased. If a sensory block is too high (i.e. above T4- nipple line), the patient is suffering bradycardia or has a motor block, the rate would need to be reduced. The infusion rate can vary according to the patients' weight and epidural catheter insertion level. The catheter should be placed at specific levels relating to the dermatomal site of operation and consequent pain. The epidural pump does not need reprogramming in order to do this. Registered nurses, clinical nurse specialists in pain and anaesthetists are allowed to adjust the rate within the prescribed range.

CHANGING THE RATE OF A CONTINUOUS EPIDURAL INFUSION		
	ACTION	RATIONALE
a.	Explain procedure to the patient and rationale for increase or decrease in rate	To ensure that the patient understands the reason why the infusion is being increased or decreased  So that the patient is kept fully informed of what is being performed
b.	Enter the new rate using the keypad provided on the pump (maximum 15ml/hr) Press 'Start/OK' The pump will then ask you for a code Enter the generic code Press 'Start/OK' again	This allows the registered nurse, clinical nurse specialist in pain/anaesthetist to increase or decrease the rate of the continuous epidural infusion, within pre-set parameters
c.	Check the new rate with another registered nurse/ clinical nurse specialist in pain /anaesthetist	To ensure safe practice
d.	Document the new rate on the Trusts dedicated Epidural Observation Chart	To document the change

Consider multimodal analgesia as well as adjusting the epidural infusion rate. Note- opioids should not be given parentally if the epidural (containing fentanyl) is still running.

## 10 CHANGING THE EPIDURAL INFUSION BAG

- 10.1 The epidural pump does not need reprogramming in order to change the infusion bag. Registered nurses, clinical nurse specialists in pain and anaesthetists can change an epidural infusion bag as long as these individuals have undergone the necessary training as mentioned already (section 5).
- 10.2 All epidural infusion bags must be clearly labelled and contain the words: 'FOR EPIDURAL USE ONLY'

CHANGING THE EPIDURAL INFUSION BAG		
	ACTION	RATIONALE
a.	Empty epidural infusion bags must be changed promptly	Delays in recommencing the infusion may result in inadequate analgesia  This can result in the need to give an epidural bolus by an anaesthetist or clinical/associate nurse specialist to re-establish effective pain control
b.	When the infusion bag is 'nearly empty' or 'empty', the epidural pump will start to alarm and display this on the screen  Press 'Start/OK' to acknowledge the alarm	To silence the alarm whilst preparing a new bag
c.	Both prescription solution and prescription should be checked by two registered nurses/ clinical nurse specialist in pain /anaesthetists, one of whom should be trained and competent in IV drug administration	To ensure that the correct epidural solution is administered
d.	Identify the patient, checking both the identity band on the patient and the drug chart	To ensure that the correct patient received the correct infusion
e.	Explain the procedure to the patient	To ensure that the patient understands the need for a bag change
f.	Press and hold down 'STOP/NO' button Select 'menu' Select 'change bag' Change the bag Press the Start/OK' button to restart infusion	This takes you to the menu screen  Enables you to change the bag and then recommence the continuous epidural infusion

g.	Sign for the bag change on the drug chart	To document change of bag
h.	Dispose of any wasted solution according to the Trust's policy on controlled drug wastage	To ensure controlled drugs and other substances are safely disposed of

## 11 CLEARING THE AIR IN THE EPIDURAL GIVING SET

- 11.1 The epidural pump has an air sensor that detects when 2ml or more of air is situated along the epidural giving set. The pump will begin to alarm and stops automatically. If this occurs, the air will need purging promptly from the giving set before the epidural can be restarted, and in order to maintain effective analgesia. Registered nurses, clinical nurse specialists in pain and anaesthetists can clear air in the giving set as long as these individuals have undergone the necessary training as mentioned already (section 5).

CLEARING THE AIR IN THE EPIDURAL GIVING SET		
	ACTION	RATIONALE
a.	Air in the line should be cleared promptly	Delays may result in inadequate analgesia
b.	When the epidural pump detects air in the giving set, the pump will start to alarm Press 'STOP/NO' to acknowledge the alarm	To silence the alarm The epidural pump will not allow the air to be cleared whilst infusing
c.	Explain the procedure to the patient	To ensure that the patient understands the need for the air to be cleared from the line
d.	Press and hold down 'Stop/NO button' Select 'menu' Select 'prime line' option Using aseptic technique, disconnect the giving set from the patient The pump will display 'do you want to prime set?' Press 'Start/OK' button The epidural pump will remind you to disconnect the giving set by displaying 'disconnect the set from the patient' Press 'Start/OK' The pump will then start to prime the line and purge out all of the air Once prime complete, reconnect the giving set to the epidural catheter	This allows registered nurses/ clinical nurse specialist in pain/anaesthetists to clear air from the line

	Press the 'Start/OK' button to restart infusion
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## 12 CLEARING OCCLUSIONS

- 12.1 The epidural pump will detect when there is an occlusion along the epidural giving set. This will either be a proximal (between the bag and the pump) or a distal occlusion (between the pump and the patient). The pump will automatically stop the infusion and start to alarm once this has been detected. The occlusion will need clearing promptly before the epidural infusion can be restarted, and in order to maintain effective analgesia. Registered nurses, clinical nurse specialists in pain and anaesthetists can clear occlusions as long as these individuals have undergone the necessary training as mentioned already (section 5).

CLEARING OCCLUSIONS		
	ACTION	RATIONALE
a.	Occlusions should be cleared promptly	Delays may result in inadequate analgesia
b.	When the epidural pump detects an occlusion, the pump will start to alarm either 'proximal occlusion' or 'distal occlusion' on the display screen Press 'STOP/NO' to acknowledge the alarm	To silence the alarm The epidural pump will not allow the occlusion to be cleared whilst infusing
c.	Explain the procedure to the patient	To ensure that the patient understands the need for the occlusion to be cleared
d.	<b>Proximal Occlusion'</b> - check for- Any kinks along the epidural giving set An empty bag  <b>'Distal Occlusion'</b> - check for Any kinks along the epidural giving set and the epidural catheter A clamp that may have been left on the epidural giving set That the epidural catheter is still in place and that it is not leaking	This allows the registered nurses/anaesthetists to clear the occlusion  If the pump continues to alarm, call the in-patient pain management service for further assistance or the on-call anaesthetist as the epidural catheter may require a flush

## 13 REMOVAL OF EPIDURAL CATHETER

Registered nurses, clinical nurse specialists in pain and anaesthetists can remove epidural catheters as long as these individuals have undergone the necessary training as mentioned already (section 5).

PRIOR TO REMOVAL OF EPIDURAL CATHETER	
ACTION	RATIONALE
Adequate alternative analgesia should be prescribed and given before the epidural analgesia is discontinued. Epidural infusions should <b>not be weaned</b> .	To ensure minimal breakthrough pain.
<p><b>IMPORTANT</b></p> <p>The longer an epidural catheter remains in situ, the greater the risk of infection.</p> <p>If an epidural catheter remains in place for 72 hours following its insertion, the inpatient pain service and consultant anaesthetist for the inpatient pain service must be informed to ensure appropriate management of the catheter.</p> <p>An epidural catheter can remain up to a maximum of 5 days but a benefit outweighs risk statement should be made in the medical notes as to why.</p>	To reduce the risk of infection and other serious complications.
<p>Prior to removing the epidural catheter, check the following:</p> <p>If there is any pre-existing or suspicion of newly developed clotting disorders (e.g. major blood loss intraoperatively (<math>\geq 1.5</math> litres)), perform a full clotting screen. The results must be within 24 hours: Target INR result – 1.4 or less and platelets greater than 75.</p> <p>If outside of these ranges DO NOT REMOVE THE EPIDURAL CATHETER – discuss with inpatient pain service/anaesthetist. Likely to need haematology opinion.</p> <p>Refer to appendix 4 for recommendations related to drugs used to modify coagulation and regional anaesthesia.</p> <p>If no major blood loss intraoperatively, or pre-existing or suspicion of newly developed clotting disorders, then remove epidural catheter.</p>	To maintain patient safety and minimise the risk of complications (e.g. epidural haematoma).

<p>The epidural site should be:</p> <p>Inspected immediately prior to removal for any bleeding, inflammation or discharge. This must be recorded in the healthcare records and communicated to the inpatient pain service/on call anaesthetist immediately.</p> <p>In the presence of inflammation or discharge from the epidural site or if infection is suspected, the entry site must be swabbed and the epidural catheter tip must be sent for culture and sensitivity.</p>	<p>To ensure that appropriate antibiotics or intervention is taken to treat the problem.</p> <p>To ensure prompt detection and treatment of any complications.</p>
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REMOVAL OF EPIDURAL CATHETER	
ACTION	RATIONALE
<p>The epidural catheter must only be removed by:</p> <ul style="list-style-type: none"> <li>• A HCP trained and competent in epidural analgesia</li> <li>• Pain CNS</li> <li>• Anaesthetist</li> </ul>	<p>To maintain patient safety and minimise the risk of complications</p>
<p>Equipment needed:</p> <p>Plastic apron, non-sterile gloves, dressing pack, including sterile gloves, Chlorhexidine 0.5% w/v in 70% v/v, small transparent sterile semi-permeable dressing, sterile scissors.</p>	<p>To minimise the risk of infection.</p>
<p>Procedure:</p> <ul style="list-style-type: none"> <li>• Ensure epidural infusion is stopped.</li> <li>• Explain to the patient the procedure.</li> <li>• Put on plastic apron and wash hands thoroughly.</li> <li>• Position patient comfortably either on their side or sitting upright (depending on type of operation).</li> <li>• Put on gloves.</li> <li>• Remove the mifix and transparent occlusive dressings.</li> <li>• Gently pull the catheter out and check the blue tip of the catheter is intact.</li> <li>• If the tip looks infected (or raised</li> </ul>	<p>To ensure prompt detection and treatment of any complications</p> <p>To minimise the risk of infection.</p> <p>To meet information needs and reduce anxiety</p> <p>To ensure the whole catheter has been removed.</p>



<p>inflammatory markers on patients blood results) trim off 5cm from the end using sterile scissors. Put into a sterile pot and send for MC&amp;S. Furthermore, swab the entry site if it looks red or swollen.</p> <p>Any damages/incomplete catheters should be recorded and the inpatient pain service/on call anaesthetist informed immediately. The removed portion of catheter should be retained for inspection.</p> <ul style="list-style-type: none"> <li>• Dry with sterile gauze.</li> <li>• Apply a small transparent sterile semi-permeable dressing.</li> <li>• Dispose of used equipment according to the waste policy.</li> <li>• The small transparent sterile semi-permeable dressing should remain in situ for at least 24 hours after which time the site should have closed over.</li> <li>• Send any swabs or specimens to the laboratory for investigation.</li> <li>• Record the removal of the catheter on the front of the Adult PCA/Epidural Observation Chart and in the patient's health care records.</li> </ul>	<p>To minimise the risk of infection.</p> <p>To comply with hospital infection control policy.</p> <p>To maintain an accurate record</p>
<ul style="list-style-type: none"> <li>• Supply a 'Discharge advice after epidural analgesia' leaflet (verbally explain this as well as give a paper copy) Contact the inpatient pain service for a copy of this leaflet.</li> </ul>	<p>To ensure prompt detection and treatment of any complications</p>

## 14 DISCONTINUATION OF EPIDURAL INFUSION

- 14.1 In addition to the prescribing of regular analgesics, appropriate analgesics must be prescribed on the 'as required' section of the prescription chart for the management of breakthrough pain depending on age and renal function. IM and SC injections must be avoided where possible if the patient can tolerate oral fluids.
- 14.2 Continue regular pain assessment after the epidural has been discontinued.
- 14.3 The epidural pump must be returned clean to theatre department (signed and dated with a green sticker attached).
- 14.4 The epidural pumps must be cleaned as per Trust policy (Cleaning and decontamination– Infection Control Policy).

- 14.5 To dispose of unused medication from an epidural infusion please refer to the Controlled Drugs in Wards and Departments Policy on the Intranet.

### STEP-DOWN ANALGESIA

<div>Titrate up or down</div>		SEVERE PAIN (Pain Score 7-10 )
	MODERATE PAIN (Pain Score 4-6)	<b>Step Three:</b>
MILD PAIN (Pain Score 1-3)	<b>Step Two:</b>	Paracetamol 1g QDS +/- NSAID +
<b>Step One:</b>  Paracetamol 1g QDS +/- adjuvant analgesic	Paracetamol 1g QDS +/- NSAID +/- mild opioid +/- adjuvant analgesic	Strong opioid (Morphine 1 <sup>st</sup> line)  +/- adjuvant analgesic
+/- NSAID PRN	+/- Morphine IR/Oxycodone IR* PRN	+/- Morphine IR/Oxycodone IR* PRN

*\*Oxycodone IR must ONLY be used if Morphine IR causes intolerable side effects or patient has moderate to severe renal impairment. NB: Targinact or Tapentadol must ONLY be prescribed on advice of the inpatient acute pain service.*

## 15 COMPLICATION AND MANAGEMENT OF A CONTINUOUS EPIDURAL INFUSION

### POTENTIAL DRUG INDUCED SIDE EFFECTS

COMMON	SIDE	ACTION
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EFFECTS	
Inadequate Analgesia	Contact the on-call anaesthetist or inpatient pain service if the epidural infusion is running at the maximum prescribed rate and pain relief is not achieved.
Hypotension	<ul style="list-style-type: none"> <li>If the systolic blood pressure is &lt;100mmHg inform medical team responsible for the patient. Epidural infusion rate may also need to be decreased by 2ml/hr to establish whether the drop in blood pressure is related to the epidural.</li> <li>Systolic blood pressure &lt; 80mmHg is a medical emergency call crash team. Hypotension can be an indication of hypovolaemia but the possibility of post-operative bleeding must be excluded, increase frequency of observations.</li> </ul>
Respiratory Depression	<p>If the respiratory rate is &lt;8 breaths per minute and/or sedation score 3, stop the epidural infusion. Administer 15 litres of oxygen via non rebreathing mask and inform medical team immediately, consider naloxone. <b>Call</b> [REDACTED]</p> <p>Ephedrine is located in the resuscitation trolley and naloxone is stored in the ward IV medication cupboard. Administer a bolus dose of naloxone intravenously 100mcg to 200mcg. Reassess in 2 minutes. Further doses of 100mcg can be given up to every 2 minutes until respiratory function improves.</p>
Nausea and Vomiting	Administer antiemetic medication if nausea score 1 or above. If persistent nausea occurs consider a regular antiemetic. For further advice contact the inpatient pain service and medical team responsible for the patient.
Opioid induced pruritus	Administer PRN Antihistamine. If symptoms persist consider regular antihistamine.
Urinary retention	Most patients should return from theatre with a urinary catheter. However if they are not catheterised and have not passed urine within 6 hours of surgery the medical team should be informed.
Sensory block above T4	<ul style="list-style-type: none"> <li>If sensory block is higher than T4 ensure the patient is sat upright if normotensive.</li> <li>Consider reducing the epidural infusion rate by 2ml/hr if patient is pain free.</li> <li>Stop epidural and maintain an upright position if patient complains of dyspnoea and or bradycardia. <b>Contact the inpatient pain service/ on-call anaesthetist immediately.</b></li> </ul> <p><b>Note:</b> Sensory blocks up to T3 are allowable in HDU or ITU areas but inform the inpatient pain service.</p>
Motor Bromage ≥2 block	<ul style="list-style-type: none"> <li><b>Bromage 2</b> Consider reduction in epidural infusion rate if patient is pain free. If patient is in pain contact the inpatient pain service/ on-call anaesthetist</li> <li><b>Bromage 3</b> Reduce epidural infusion by 2ml/hr and reassess in 1 hour. If the patient is in pain or there is no improvement contact the inpatient pain service/ on call anaesthetist</li> <li><b>Bromage 4 STOP EPIDURAL IMMEDIATELY and contact the inpatient pain service/ on-call anaesthetist immediately.</b></li> </ul>

INADEQUATE ANALGESIA - UNILATERAL, PATCHY SENSORY BLOCK	
ACTION	RATIONALE
<ul style="list-style-type: none"> <li>• Check level of sensory block and bromage score.</li> <li>• Perform a full set of clinical observations.</li> <li>• Tilt patient onto their side which does not have a sensory block (<i>Caution in patient's who have had total hip replacement or hip hemiarthroplasty surgery due to risk of dislocation</i>).</li> <li>• If pain has not improved contact inpatient pain service or on-call anaesthetist</li> <li>• If safe to do so, the anaesthetist should administer a 'top-up' bolus dose</li> <li>• If no or slight effect, the anaesthetist or inpatient pain service will check how much catheter remains in the epidural space. If greater than 4 cm is left in the epidural space, the attending anaesthetist or inpatient pain service can pull back the epidural catheter. This procedure <b>MUST</b> be performed using an aseptic technique.</li> </ul>	<ul style="list-style-type: none"> <li>• To establish a baseline prior to any intervention and assess suitability for a bolus dose.</li> <li>• To review the patient and analgesia.</li> <li>• To assist equal spread of the local anaesthetic.</li> <li>• To try to relieve the patient's pain and improve the level and spread of the sensory block.</li> <li>• To reposition the epidural catheter to improve the level and equal spread of the sensory block.</li> <li>• To restore optimal analgesia.</li> </ul>

CATHETER DISCONNECTION	
ACTION	RATIONALE
<ul style="list-style-type: none"> <li>• A witnessed disconnection from the filter:</li> <li>• Wrap both ends (the anti-bacterial filter and the epidural catheter) in sterile gauze.</li> <li>• Temporarily stop the epidural infusion.</li> <li>• Contact the inpatient pain service/anaesthetist on-call out of hours via their bleep.</li> <li>• The inpatient pain service or</li> </ul>	<ul style="list-style-type: none"> <li>• To minimise the risk of infection.</li> </ul>

<p>anaesthetist on-call will reconnect the epidural catheter only if the disconnection was witnessed.</p> <ul style="list-style-type: none"> <li>The catheter does not appear to be contaminated.</li> <li>Aseptic techniques used as per Infection Control Policy.</li> <li>All actions documented in patients' healthcare records</li> </ul>	<ul style="list-style-type: none"> <li>To minimise the risk of infection.</li> </ul>
<ul style="list-style-type: none"> <li>If the disconnection is not witnessed contact the inpatient pain service or on-call anaesthetist as the epidural catheter and infusion should be removed with alternative analgesia arranged.</li> </ul>	<ul style="list-style-type: none"> <li>To minimise the risk of infection.</li> <li>To provide effective analgesia.</li> </ul>

SUSPECTED EPIDURAL HAEMATOMA /ABSCESS	
ACTION	RATIONALE
<p>Epidural haematoma is a rare complication of epidural anaesthesia. The epidural space is filled with a network of venous plexuses, and puncture of these veins, with bleeding into the confined epidural space, may lead to the rapid development of a haematoma.</p> <p>Epidural infection is rare but a potentially serious complication. Pathogenic organisms can be introduced into the epidural space if strict asepsis is not observed.</p> <p>Early signs and symptoms include:</p> <ul style="list-style-type: none"> <li>back pain/tenderness</li> <li>persistent motor block / neurological deficit</li> <li>bowel/ bladder dysfunction or priapism</li> <li>redness, tenderness or exudate from epidural /spinal insertion site</li> <li>pyrexia (if source unknown)</li> </ul> <p>The following steps should be taken in the presence of the above signs and symptoms:</p> <ul style="list-style-type: none"> <li>If the epidural infusion is in progress; <b>STOP</b> the infusion.</li> <li>Contact a member of the inpatient pain</li> </ul>	<p>An epidural haematoma or abscess may lead to compression of the spinal cord, and can have disastrous consequences for the patient including paraplegia.</p> <p>To prevent further administration of local anaesthetic.</p>



<p>service.</p> <ul style="list-style-type: none"> <li>• Immediate neurological assessment must be performed by the anaesthetist on-call.</li> <li>• On-call consultant anaesthetist and anaesthetist who performed procedure to be informed of patient's condition.</li> <li>• <b>If no improvement to neurological function after 1 hour an urgent MRI has to be arranged via a senior on site radiologist. Refer to appendix 7 and 8 for Newham Hospital as practice differs in and out of hours</b></li> </ul> <p><b>Please Note: This should be treated as any acute neurosurgical epidural/spinal haematoma or abscess (spinal or supra-spinal)</b></p>	<p>To summon appropriate help to deliver prompt treatment.</p> <p>To review the patient and obtain a baseline assessment.</p> <p>To ensure early detection and treatment of any complications associated with the regional anaesthesia.</p>
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TOTAL SPINAL BLOCKADE	
ACTION	RATIONALE
<p>This is a rare complication occurring when the epidural needle, or epidural catheter, is advanced into the sub-arachnoid space without the operator's knowledge, and a continuous infusion of local anaesthetic is injected directly into the CSF. The result is profound hypotension, apnoea, unconsciousness and dilated pupils</p> <p>The use of a test dose should prevent most cases of total spinal, but cases have been described where the epidural initially appeared to be correctly sited, but subsequent top-up doses caused the symptoms of total spinal.</p> <p><b>Management of total spinal</b></p> <ul style="list-style-type: none"> <li>• <b>Put out emergency call Ext. [REDACTED]</b></li> <li>• <b>Airway - secure airway and administer 100% oxygen</b></li> <li>• <b>Breathing - ventilate by facemask and then intubate.</b></li> <li>• <b>Circulation - treat hypotension with IV fluids and vasopressors:</b></li> </ul>	<p>A result of the action of local anaesthetic on the brainstem.</p> <p>To summon appropriate help to deliver prompt treatment.</p> <p>To maintain patient safety.</p> <p>To ensure prompt treatment of any side effects associated with the local anaesthetic.</p>



<ul style="list-style-type: none"> <li>• <b>Ephedrine 3-6mg</b></li> <li>• <b>Metaraminol 1-2mg increments</b></li> <li>• <b>0.5-1ml Adrenaline 1:10000 as required</b> Perform a full set of clinical observations (blood pressure, pulse, temperature, respiratory rate and oxygen saturations).</li> </ul> <p>Continue to ventilate until the block wears off (2 - 4 hours). Remove the epidural catheter.</p> <p>Document all actions in the patient's health care records.</p>	<p>To prevent any further administration of local anaesthetic.</p> <p>To maintain accurate records.</p>
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Please refer to appendix 9- Management of post dural puncture headache (PDPH).  
Also refer to appendix 2- Management of local anaesthetic toxicity.

## 16 DUTIES AND RESPONSIBILITIES

<b>Inpatient Pain Service</b>	<p>To promote education of health care workers in areas accepting epidural infusions.</p> <p>Provide advice and support to clinical staff in the management of patients with epidural infusion.</p> <p>Promote good practice in the care of patients with epidural Infusion.</p> <p>Provision of epidural infusion devices.</p> <p>Ensure the Adult Continuous Epidural Infusion Guideline is compliant with the National Guidelines on management of Epidural Infusions.</p>
<b>Director of Nursing, Associate Directors of Nursing, Matrons/Senior Nurses</b>	<p>Ensure the implementation and maintenance of the Adult Continuous Epidural Infusion Guideline.</p> <p>To work closely with the inpatient pain service.</p> <p>Safety</p> <p>Cost-effectiveness</p>
<b>Matrons / Ward mangers / Charge Nurses / Sisters</b>	<p>Ensure all staff that come into contact with epidural infusion are competent in their use.</p> <p>Ensure all the staff have received appropriate training and education on the use of epidural infusion.</p> <p>Inform the inpatient pain service or on-call anaesthetist (out of hours) by midday of any patients with epidural analgesia in order to</p>

	<p>ensure they are reviewed daily.</p> <p>Ensure the epidural infusion device and lock box are cleaned according to the Trust Infection Control Policy and stored appropriately and safely in a dedicated area.</p>
<b>Staff Nurses (including bank and Agency staff) in areas accepting Epidural Infusion</b>	<p>Ensure their educational requirements regarding epidural infusion are met.</p> <p>To follow the Adult Continuous Epidural Infusion Policy at all times.</p> <p>Inform the inpatient pain service or on-call anaesthetist (out of hours) by midday of any patients with epidural analgesia in order to ensure they are reviewed daily.</p> <p>Patients with epidural infusion should not be allocated to a member of staff who has not completed the appropriate training.</p>
<b>Bank, Agency and Temporary Staff</b>	<p>Patients with epidural infusion should not be allocated to a member of staff who has not completed the appropriate training.</p> <p>Should the bank, agency or temporary staff work on a regular basis on areas accepting patients with epidural infusion, they should attend epidural infusion training.</p>
<b>Pain Link Nurses</b>	<p>To work together with the inpatient pain service to promote good practice in pain management, including epidural infusion.</p>
<b>Anaesthetists / Anaesthetic Trainee Doctors</b>	<p>Ensure appropriate patient selection when epidural infusions considered.</p> <p>Ensure the area receiving the patient with epidural infusion is authorised to accept them.</p> <p>Ensure the epidural infusion prescription is appropriately completed.</p> <p>Ensure their educational requirements regarding epidural infusion are met.</p> <p>Ensure the inpatient pain team (on call anaesthetist out of hours) are aware of patients with epidural analgesia and are reviewed daily.</p>
<b>Medical/Surgical Teams</b>	<p>To ensure effective communication with the inpatient pain service and anaesthetists in relation to the management and or change in condition related to pain or the epidural Infusion.</p> <p>Ensure the inpatient pain team (on call anaesthetist out of hours) are aware of patients with epidural analgesia and are reviewed daily.</p>
<b>Medical Devices Team</b>	<p>Maintain medical devices training records</p>

# 17 MONITORING THE EFFECTIVENESS OF THE EPIDURAL INFUSION GUIDELINE

Issue being monitored	Monitoring Method	Responsibility	Frequency	Reviewed by and actions arising followed up by
Appropriate epidural training levels in the wards	Teaching records. Liaise with wards and learning & development department Record keeping and monitoring the training levels on the wards accepting epidural infusion.	Staff, ward managers, inpatient pain service	2 yearly	Inpatient pain service, ward managers
Implementation of regular observation and documentation	Reviews of the observation charts.	Staff, ward managers, inpatient pain service	Daily	Inpatient pain service. ward managers
Appropriate epidural infusion training levels of anaesthetists / anaesthetic trainees	Teaching record Liaise with anaesthetic teaching coordinator	Anaesthetists, anaesthetic trainees, inpatient pain service	2 yearly for permanent anaesthetists. On induction week for anaesthetic trainees.	Inpatient pain service
Appropriate record of incidents and identifying trends in relation to the epidural guideline	DATIX Forms Inpatient audit data	Inpatient pain service, staff, ward managers	When a serious incident (potential or not)/never event occurs	Inpatient pain service, ward managers, anaesthetists, site based medicine safety committees

**APPENDIX 1: LIST OF DESIGNATED WARDS THAT CARE FOR PATIENTS WITH EPIDURAL ANALGESIA**

<b>RLH</b>	<b>SBH</b>	<b>WCH</b>	<b>NUH</b>
4E	1C	Recovery	East Ham
4F	1D	ITU/HDU	Recovery
8C	1E	Primrose ward (General surgery Male)	ITU/HDU
10F	6A	Rowan ward (Gynae/ general surgery female)	
12D	Recovery		
13C			
13D			
Recovery			

## APPENDIX 2: MANAGEMENT OF LOCAL ANAESTHETIC TOXICITY

# AAGBI Safety Guideline

## Management of Severe Local Anaesthetic Toxicity



<b>1</b> Recognition	<b>Signs of severe toxicity:</b> <ul style="list-style-type: none"> <li>• Sudden alteration in mental status, severe agitation or loss of consciousness, with or without tonic-clonic convulsions</li> <li>• Cardiovascular collapse: sinus bradycardia, conduction blocks, asystole and ventricular tachyarrhythmias may all occur</li> <li>• Local anaesthetic (LA) toxicity may occur some time after an initial injection</li> </ul>				
<b>2</b> Immediate management	<ul style="list-style-type: none"> <li>• Stop injecting the LA</li> <li>• Call for help</li> <li>• Maintain the airway and, if necessary, secure it with a tracheal tube</li> <li>• Give 100% oxygen and ensure adequate lung ventilation (hyperventilation may help by increasing plasma pH in the presence of metabolic acidosis)</li> <li>• Confirm or establish intravenous access</li> <li>• Control seizures: give a benzodiazepine, thiopental or propofol in small incremental doses</li> <li>• Assess cardiovascular status throughout</li> <li>• Consider drawing blood for analysis, but do not delay definitive treatment to do this</li> </ul>				
<b>3</b> Treatment	<table border="1"> <tr> <td data-bbox="448 1765 826 2056"> <b>IN CIRCULATORY ARREST</b> <ul style="list-style-type: none"> <li>• Start cardiopulmonary resuscitation (CPR) using standard protocols</li> <li>• Manage arrhythmias using the same protocols, recognising that arrhythmias may be very refractory to treatment</li> <li>• Consider the use of cardiopulmonary bypass if available</li> </ul> <b>GIVE INTRAVENOUS LIPID EMULSION</b> (following the regimen overleaf)           <ul style="list-style-type: none"> <li>• Continue CPR throughout treatment with lipid emulsion</li> <li>• Recovery from LA-induced cardiac arrest may take &gt;1 h</li> <li>• Propofol is not a suitable substitute for lipid emulsion</li> <li>• Lidocaine should not be used as an</li> </ul> </td><td data-bbox="826 1765 1190 2056"> <b>WITHOUT CIRCULATORY ARREST</b> Use conventional therapies to treat:           <ul style="list-style-type: none"> <li>• hypotension,</li> <li>• bradycardia,</li> <li>• tachyarrhythmia</li> </ul> </td></tr> <tr> <td data-bbox="448 2056 826 2240"> <b>CONSIDER INTRAVENOUS LIPID EMULSION</b> (following the regimen overleaf)           <ul style="list-style-type: none"> <li>• Propofol is not a suitable substitute for lipid emulsion</li> <li>• Lidocaine should not be used as an anti-arrhythmic therapy</li> </ul> </td><td data-bbox="826 2056 1190 2240"></td></tr> </table>	<b>IN CIRCULATORY ARREST</b> <ul style="list-style-type: none"> <li>• Start cardiopulmonary resuscitation (CPR) using standard protocols</li> <li>• Manage arrhythmias using the same protocols, recognising that arrhythmias may be very refractory to treatment</li> <li>• Consider the use of cardiopulmonary bypass if available</li> </ul> <b>GIVE INTRAVENOUS LIPID EMULSION</b> (following the regimen overleaf) <ul style="list-style-type: none"> <li>• Continue CPR throughout treatment with lipid emulsion</li> <li>• Recovery from LA-induced cardiac arrest may take &gt;1 h</li> <li>• Propofol is not a suitable substitute for lipid emulsion</li> <li>• Lidocaine should not be used as an</li> </ul>	<b>WITHOUT CIRCULATORY ARREST</b> Use conventional therapies to treat: <ul style="list-style-type: none"> <li>• hypotension,</li> <li>• bradycardia,</li> <li>• tachyarrhythmia</li> </ul>	<b>CONSIDER INTRAVENOUS LIPID EMULSION</b> (following the regimen overleaf) <ul style="list-style-type: none"> <li>• Propofol is not a suitable substitute for lipid emulsion</li> <li>• Lidocaine should not be used as an anti-arrhythmic therapy</li> </ul>	
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### APPENDIX 3: ADDITIONAL GUIDANCE AND INFORMATION

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13. The British Pain Society (2010). *Understanding and managing pain: information for patients*. London. [http://www.britishpainsociety.org/book\\_understanding\\_pain.pdf](http://www.britishpainsociety.org/book_understanding_pain.pdf)
14. UK Medicines Information (UKMI) (2015) what naloxone doses should be used in adults to reverse urgently the effects of opioids or opiates?

**APPENDIX 4: REGIONAL ANAESTHESIA AND PATIENTS WITH ABNORMALITIES OF COAGULATION (NOVEMBER 2013)**

Drug	Time to peak effect	Elimination half-life	Acceptable time after drug for block performance	Administration of drug while spinal or epidural catheter in place <sup>(1)</sup>	Acceptable time after block performance or catheter removal for the next drug dose
<b>Heparins</b> UFH sc prophylaxis UFH iv treatment LMWH sc prophylaxis LMWH iv treatment	< 30 minutes < 5 minutes 3-4 hours 3-4 hours	1-2 hours 1-2 hours 3-7 hours 3-7 hours	4 hours or normal APTTR 4 hours or normal APTTR 12 hours 24 hours	Caution Caution (2) Caution (3) Not recommended	1 hour 4 hours 4 hours(3) 4 hours (4)
<b>Heparin alternatives</b> Danaparoid prophylaxis Danaparoid treatment Bivalirudin Argatroban Fondaparinux prophylaxis <sup>(5)</sup>  Fondaparinux treatment (5)	4-5 hours 4-5 hours 5 minutes < 30 minutes 1-2 hours  1-2 hours	24 hours 24 hours 25 minutes 30-35 minutes 17-20 hours  17-20 hours	Avoid (consider anti-Xa levels) Avoid (consider anti-Xa levels) 10 hours or normal APTTR 4 hours or normal APTTR 36-42 hours (consider anti-Xa levels) Avoid (consider anti-Xa levels)	Not recommended Not recommended Not recommended Not recommended Not recommended Not recommended	6 hours 6 hours 6 hours 6 hours 6-12 hours  12 hours
<b>Antiplatelet drugs</b> NSAIDs Aspirin Clopidogrel Prasugrel Ticagrelor Tirofiban Eptifibatide Abciximab Dipyridamole	1-12 hours 12-24 hours 12-24 hours 15-30 minutes 2 hours < 5 minutes < 5 minutes < 5 minutes 75 minutes	1-12 hours Not relevant, irreversible effect Not relevant, irreversible effect Not relevant, irreversible effect 8-12 hours 4-8 hours (6) 4-8 hours (6) 24-48 hours(6) 10 hours	No additional precautions No additional precautions 7 days 7 days 5 days 8 hours 8 hours 48 hours No additional precautions	No additional precautions No additional precautions Not recommended Not recommended Not recommended Not recommended Not recommended Not recommended No additional precautions	No additional precautions No additional precautions 6 hours 6 hours 6 hours 6 hours 6 hours 6 hours 6 hours 6 hours
<b>Oral anticoagulants</b> Warfarin Rivaroxaban prophylaxis (5) (CrCl >30ml.min <sup>-1</sup> ) Rivaroxaban treatment (5) (CrCl >30ml.min <sup>-1</sup> )	3-5 days 3 hours  3 hours	4-5 days 7-9 hours  7-11 hours	INR ≤ 1.4 18 hours  48 hours	Not recommended Not recommended  Not recommended	After catheter removal 6 hours  6 hours

Drug	Time to peak effect	Elimination half-life	Acceptable time after drug for block performance	Administration of drug while spinal or epidural catheter in place <sup>1</sup>	Acceptable time after block performance or catheter removal for the next drug dose
<b>Oral anticoagulants</b> Diabigatran - prophylaxis or treatment (7) (CrCl >80ml.min <sup>-1</sup> ) (CrCl 50-80ml.min <sup>-1</sup> ) (CrCl 30-50ml.min <sup>-1</sup> ) Apixaban prophylaxis	0.5-2.0 hours 0.5-2.0 hours 0.5-2.0 hours 3-4 hours	12-17 hours 15 hours 18 hours 12 hours	48 hours 72 hours 96 hours 24-48 hours	Not recommended Not recommended Not recommended Not recommended	6 hours 6 hours 6 hours 6 hours
<b>Thrombolytic drugs</b> Alteplase, anistreplase, reteplase, streptokinase	< 5 minutes	4-24 minutes	10 days	Not recommended	10 days

## Notes to accompany Table 1

- (1) The dangers associated with the administration of any drug that affects coagulation while a spinal or epidural catheter is in place should be considered carefully. There are limited data on the safety of the use of the newer drugs in this Table, and they are therefore not recommended until further data become available. The administration of those drugs whose entry in this column is marked as 'caution' may be acceptable, but the decision must be based on an evaluation of the risks and benefits of administration. If these drugs are given, the times identified in the column to the left ('Acceptable time after drug for block performance') should be used as a guide to the minimum time that should be allowed between drug administration and catheter removal.
- (2) It is common for intravenous unfractionated heparin to be given a short time after spinal blockade or insertion of an epidural catheter during vascular and cardiac surgery. Local clinical governance guidelines should be followed and a high index of suspicion should be maintained if any signs attributable to vertebral canal haematoma develop.
- (3) Low molecular weight heparins are commonly given in prophylactic doses twice daily after surgery, but many clinicians recommend that only one dose be given in the first 24 h after neuraxial blockade has been performed.
- (4) Consider increasing to 24 h if block performance is traumatic.
- (5) Manufacturer recommends caution with use of neuraxial catheters.
- (6) Time to normal platelet function rather than elimination half-life.
- (7) Manufacturer recommends that neuraxial catheters are not used.

## APPENDIX 5: PRESCRIPTION STICKERS EPIDURAL INFUSIONS

stick on prn side of drug chart pharmacy

**Epidural infusion prescription**

**BUPIVACAINE 0.1% with  
FENTANYL 4mcg/ml (480ml bag)**

Continuous infusion .....to .....ml/hr Starting rate .....ml/hr  
Usual prescription range: 0-15ml/hr  
Epidural top-up: up to 10ml pre-filled solution to be given by trained HCP only

Signature ..... Date.....

**No other opiates to be given with epidural  
unless agreed by the Pain Service (or on-call anaesthetist)**

stick on prn side of drug chart pharmacy

**Epidural infusion prescription**

**BUPIVACAINE 0.1% (250ml bag)**

Continuous infusion .....to .....ml/hr Starting rate .....ml/hr  
Usual prescription range: 0-15ml/hr  
Epidural top-up: up to 10ml pre-filled solution to be given by trained HCP only

Signature ..... Date.....

## APPENDIX 6: ANTI-EMETICS PRESCRIPTIONS AND EPIDURAL TOP UPS– DIFFERENT SITES

Site	Anti-emetics	Top ups
NUH	First line: Ondansetron 4mg PO/IV/IM Second line: Cyclizine 50mg PO/IM/IV	Via the epidural pump up to 10mls prefilled solution to be given by Anaesthetist or Pain CNS (with relevant competency) only
RLH and SBH	First line: Ondansetron 4mg PO/IV/IM Second line: Cyclizine 50mg PO/IM/IV	
WCH	First line: Ondansetron 4mg PO/IV/IM Second line: Cyclizine 50mg PO/IM/IV	Anaesthetist: 0.25%-0.5% Bupivacaine via epidural catheter at filter



## APPENDIX 7: MANAGEMENT OF A SUSPECTED EPIDURAL/SPINAL HAEMATOMA OR ABSCESS NEWHAM HOSPITAL (DURING OFFICE HOURS)

Patient who has/had an epidural, spinal or combined spinal/epidural anaesthetic (CSE) presents with any of the following symptoms:

- back pain/tenderness
- persistent motor block / neurological deficit
- bowel/ bladder dysfunction or priapism
- redness, tenderness or exudate from epidural or spinal insertion site
- pyrexia (if source unknown)



Anaesthetist on call (SHO) for theatres requested to review patient.

An epidural/spinal abscess or haematoma is suspected.

Further investigation is required, and the **Anaesthetist should contact/inform:**

- Patient's surgical team
- Consultant Anaesthetist on call
- Anaesthetist who inserted the epidural or performed the CSE/Spinal



**Surgical team to:**

- Arrange an **URGENT diagnostic MRI scan** in radiology department on main NUH site
- Inform anaesthetist on call of time of scan



- Patient escorted from ward to radiology department for MRI scan
- Anaesthetist on call to stay with the patient until MRI performed



Patient has MRI scan.

Consultant Anaesthetist on call and anaesthetist who performed the procedure should be informed of the scan result.



### POSITIVE MRI Result:

- Surgical team to contact neurological team on call at The Royal London Hospital (RLH).
- Anaesthetist on call to liaise with Site Practitioner (SP) at NUH to arrange transfer to RLH. *(This may involve repatriation issues which should be resolved by SP at NUH.)*
- Once patient accepted by neurological team and bed allocated at RLH, anaesthetist on call arranges emergency transport for transfer and transfers pt to RLH.

**Please note: should be treated as any acute neurosurgical epidural/spinal haematoma (spinal or supra-spinal) "the golden hour"**

### NEGATIVE MRI Result:

- Patient to be transferred from radiology back to the ward.
- Patient to be observed for any changes in condition.
- Surgical team to review the patient at least once a day, and more frequently if patient's condition deteriorates.



## APPENDIX 8: MANAGEMENT OF A SUSPECTED EPIDURAL/SPINAL HAEMATOMA OR ABSCESS NEWHAM HOSPITAL (OUTSIDE OFFICE HOURS)

Patient who has/had an epidural, spinal or combined spinal/epidural anaesthetic (CSE) presents with any of the following symptoms:

- back pain/tenderness
- persistent motor block / neurological deficit
- bowel/bladder dysfunction or priapism
- redness, tenderness or exudate from epidural/spinal insertion site
- pyrexia (if source unknown)



Anaesthetist on call (SHO) for theatres to review patient.  
An epidural /spinal abscess or haematoma is suspected.

Further investigation is required, and the **Anaesthetist should contact/inform:**

- Surgical team on call
- Consultant Anaesthetist on call and the anaesthetist who inserted the epidural or performed the CSE/spinal



**Surgical team on call to contact:**

- the neurological team on call at The Royal London Hospital (RLH) to discuss the patient
- radiology at RLH to arrange an **URGENT diagnostic MRI scan**



**Anaesthetist to:**

- arrange **emergency** transport to transfer patient from NUH to radiology at RLH for **URGENT MRI scan (must be within one hour)**
- inform consultant on call regarding transfer.
- accompany patient on to radiology department at the RLH for diagnostic investigation.

**Please note: should be treated as any acute neurosurgical epidural/spinal haematoma (spinal or supra-spinal) “the golden hour”**



Patient (accompanied by on call anaesthetist) is transferred to RLH and has MRI scan.  
Consultant Anaesthetist on call and the anaesthetist who performed the procedure should be informed of the scan result



### POSITIVE MRI Result:

- Neurological team on call at The Royal London Hospital (RLH) accept the patient.
- Anaesthetist on call accompanying the patient to liaise with Site Practitioner (SP) at NUH to advise them of outcome and plan (i.e. admission of patient to RLH).



### NEGATIVE MRI Result:

- On call anaesthetist to return to NUH with patient.
- Patient to be observed for any changes in condition.
- Surgical team to review the patient at least once a day, and more frequently if

## APPENDIX 9: POST DURAL PUNCTURE HEADACHE (PDPH)

Post Dural Puncture Headache (PDPH)	
ACTION	RATIONALE
<p>Occurs with an incidence of 0.4%-24%. and usually recognised by the immediate loss of CSF through the epidural needle (Candido and Stevens, 2003)</p> <p>Characteristics of a PDPH:</p> <ul style="list-style-type: none"> <li>• Severe headache, usually frontal.</li> <li>• Exacerbated by movement or sitting upright.</li> <li>• Photophobia.</li> <li>• Nausea and vomiting.</li> <li>• Relieved when lying flat.</li> </ul> <p>Treatment Plan:</p> <ul style="list-style-type: none"> <li>• Administer analgesics: paracetamol and NSAID's (if not contraindicated).</li> <li>• Encourage patient to drink caffeinated drinks</li> <li>• IV fluids</li> <li>• Offer reassurance to patient and relatives.</li> </ul> <p>When the headache is unresponsive to conservative measures, an epidural blood patch may be used to treat the headache.</p>	<p>The headache is thought to be due to the leakage of CSF through the puncture site.</p>

**APPENDIX 10: INPATIENT PAIN CONTACT DETAILS FOR INDIVIDUAL HOSPITALS****Whipps Cross Hospital**

- Routine Referrals: 9am - 5pm Monday - Friday, Pain CNS [REDACTED]  
Pain CNSs email: [PainNurseWCH@bartshealth.nhs.uk](mailto:PainNurseWCH@bartshealth.nhs.uk)
- Out of hours, including weekends: Anaesthetic CT1/2, [REDACTED]
- Daily pain ward rounds Monday- Friday
  - Consultant-led pain ward rounds Monday, Wednesday, Friday.
  - Pain CNS ward rounds Mon-Fri

**Newham General Hospital**

- Routine Referrals: 8am - 4pm Monday - Friday  
Main Site: Pain CNS, [REDACTED]  
Gateway Surgical Centre: Pain CNS. [REDACTED]  
Pain CNSs email: [PainNurseNUGH@bartshealth.nhs.uk](mailto:PainNurseNUGH@bartshealth.nhs.uk)
- Out of hours, including weekends:  
Main Site: Anaesthetic CT 1/2, [REDACTED]  
Gateway Surgical Centre: RMO, [REDACTED]
- Daily pain ward rounds Monday - Friday  
Consultant-led pain ward rounds Monday AM, Tuesday PM, Friday PM  
Pain CNS ward rounds Mon-Fri

**Royal London Hospital**

- Routine Referrals: 8am - 5pm Monday - Friday, Pain CNS [REDACTED]  
Pain CNSs email: [PainNurseRLHSBH@bartshealth.nhs.uk](mailto:PainNurseRLHSBH@bartshealth.nhs.uk)
- Out of hours including weekends: Anaesthetic CT1/2 [REDACTED]
- Daily Pain ward rounds Monday- Friday  
Consultant-led ward rounds Mon PM, Tue AM, Wed AM, Thurs PM, Fri PM  
Pain CNS ward rounds Mon-Fri

**St Barts Hospital**

Routine referrals: 9am- 5pm Monday – Friday, Pain CNS via mobile [REDACTED]

- Pain CNSs email: [PainNurseRLHSBH@bartshealth.nhs.uk](mailto:PainNurseRLHSBH@bartshealth.nhs.uk)
- Out of hours, including weekends: Anaesthetist On-Call [REDACTED]  
/ hospital at night
- Daily Pain ward rounds Monday- Friday  
Consultant-led ward rounds Tue PM  
Pain CNS ward rounds Mon-Fri