Royal Cornwall Hospitals
NHS Trust

Acute Post-operative Adult Analgesic – Epidural Neuraxial Blockade Clinical Guideline

V4.0

February 2024

1. Aim/Purpose of this Guideline

1.1. This guideline outlines the roles, duties, and processes for the use of analgesia and analgesic techniques for the treatment of post-operative and other acute pain states at RCHT sites as agreed and delivered by the department of Anaesthesia; it incorporates recommendations of good practice from the National Patient Safety Agency and the Royal College of Anaesthetists.

1.2. This version supersedes any previous versions of this document.

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2. The Guidance

2.1. Introduction

2.1.1. The use of effective and safe post-operative analgesia is essential for delivery of surgical services and for early, pain free mobilisation of patients: delivered at the time of surgery it rests primarily with the department of Anaesthesia to recommend, deliver, develop, and oversee safe and effective practice.

2.1.2. To ensure consistent practice, audit, and education the anaesthetic department provides an acute pain team consisting of:

- Consultant leads (adult and paediatric).
- Pain specialist nurses (adult and paediatric).
- Pharmacist with an interest in Pain.

2.1.3. They, together with a wider group of colleagues and link meetings assume responsibility for:

- Policies and guideline development and implementation.
- Education and Governance to include:

- Staff education.
- Monitoring of appropriate skill provision at ward level.
- Ensuring NPSA compliance (yearly audit).
- Ensuring compliance with local guidelines.
- Local audit and feedback of practice.
- Dissemination of new advances and practices.

- Safe and Effective Delivery.
  - Equipment education.
  - Appropriate documentation for wards.
  - Daily nurse ward rounds (Monday – Friday).
  - Consultant ward rounds (Tuesday and Thursday) to promote good practice and take referrals where required.

2.1.4. The treatment of patients with acute pain problems requiring analgesia, but not surgery, would also be included in these recommendations.

2.1.5. This document collates the specific chapters recommending best practice of varying types of analgesia for RCHT and combines them in one reference document together with references and details of Trust policies, training procedures, guidelines, and algorithms.

2.1.6. **RCHT** refers to the **Royal Cornwall Hospitals Trust** which consists of:

- Royal Cornwall Hospital, Truro.
- St Michael's Hospital, Hayle.
- West Cornwall Hospital, Penzance.

2.2. Epidural Analgesia (Adults)

2.2.1. **Summary**

This guideline outlines the roles, duties, and processes for the use of epidural analgesia at RCHT sites and incorporates recommendations from the National Patient Safety Agency, (NPSA), the Royal College of Anaesthetists (RCoA) and recommendations arising from National Anaesthetic Audit, (NAP 3).

This guideline should be used alongside and in conjunction with the RCHT guideline Care of Epidural Infusions (Adult) Clinical Guideline.

2.2.2. **Introduction**

2.2.2.1. Definition: Epidural analgesia refers to the administration of a drug or drugs into the epidural space and in the context of this document refers to the continuous administration via an indwelling catheter to provide analgesia.

(single dose bolus injections are commonly used in the treatment of more chronic pain states e.g. sciatica and are not included in this document)

2.2.2.2. Epidural analgesia is considered to be highly effective for both post operative pain control following major surgery to chest, abdomen, pelvis or lower limbs and the pain relief required following significant trauma, with particular emphasis on chest and pelvic injury.

2.2.2.3. The combination of low concentrations of local anaesthetic and opioid drugs have been demonstrated to provide superior pain relief in comparison to either of the drugs used alone.

2.2.2.4. Epidural anaesthesia combines a complex amalgam of clinical judgement, technical skills, materials and equipment, drug delivery systems, patient supervision and care pathways.

2.2.2.5. In addition to inherent complications in the procedure, each of the above facets has the potential to generate patient harm through a combination of patient characteristics, human error or shortfalls in performance, equipment dysfunction and broader system failures.

2.2.2.6. To avoid the potential hazards, constant vigilance by staff with appropriate knowledge working to agreed monitoring guidelines is essential in any organisation, coupled with clear action algorithms to treat anticipated or actual complications.

2.2.2.7. This document outlines the current policies and guidelines of RCHT and will be subject to biannual review.

2.2.3. **National Patient Safety Alert (NPSA) 2007**

2.2.3.1. The NPSA issued a Patient Safety Alert in 2007 following reports of patient morbidity following epidural analgesia. **Safer Practice with Epidural and Infusions.**

2.2.3.2. The alert recommended a series of actions for NHS to undertake in order to minimise the risks associated with epidural injections and infusions.

2.2.3.3. Recommendations include rationalisation of preparations used, storage aspects, clear labelling of epidural infusions, the colour coded specific giving sets and catheters as well as the use of epidural only pumps which can be easily identified. (Yellow McKinley Bodyguard 545 pumps and giving sets).

2.2.3.4. A yearly audit is required to ensure continual compliance.

2.2.4. NPSA Rapid Response Report

2.2.4.1. The NPSA received reports of 5 deaths and over 42,000 dose related patient safety incidents between 2005 and 2008, many involved incorrect or unsafe doses of medicines, particularly opioids (not epidural specific).

2.2.4.2. Every member of the healthcare team has a responsibility for ensuring the prescribed dose is safe for the patient and to take care to avoid errors particularly when dose conversions or a change in formulation is required.

2.2.4.3. Following analysis of these incidents the NPSA issued a Rapid response report, **Reducing Dosing Errors with Opioid Medicines, NPSA 2008**, with recommendations that are applicable to all health professionals involved in prescribing, dispensing, or administering opioid medicines:

- Confirm any recent opioid dose, formulation, and frequency.
- Ensure dose increments are safe and appropriate and the patient is monitored closely.
- Ensure they (the staff) are familiar with the correct use of the drug and able to recognise common side effects and symptoms of overdose.

2.2.4.4. Whilst not epidural specific it does include both the administration of epidural opioids and particularly where additional analgesia is used.

2.2.5. National Audit of Practice, Royal College of Anaesthetists 2008 -9 (NAP 3)

2.2.5.1. The Royal College of Anaesthetists conducted a National Survey to compile data to inform:

- Types of central neuraxial blockade (CNB) used in UK.
- How often do major complications leading to permanent harm occur in association with CNB (spinal and epidural anaesthesia/analgesia).
- What happens to patients experiencing complications in long term.

2.2.5.2. Collaboration of anaesthetists throughout UK resulted in reports of major complications being submitted with particular reference to permanent harm and does not provide information on the incidence of minor complications or major complications without permanent harm.

2.2.5.3. Over 700,000 CNB reported as being performed and the complications collated, and subsequent recommendations made:

2.2.5.4. Development of a care bundle for CNB with particular regard to post operative epidural care with particular regard to:

- Balancing risk/benefit prior to insertion.
- Optimal choice of vertebrae for insertion.
- Full aseptic technique.
- Management of difficult procedure.
- Patient monitoring.
- Daily assessment of risk/benefit of continued use.
- Relevant audit.

2.2.6. Following the above the Faculty of Pain Medicine of the Royal College of Anaesthetists published the document: **Best practice In the Management of Epidural Analgesia in the Hospital Setting**

2.2.7. **Purpose**

To promote the safe and effective management of patients receiving continuous epidural anaesthesia and to implement recommendations of best practice.

2.2.8. **Objectives.**

- To provide information to all clinical and ward-based staff on the management of patients prescribed epidural analgesia.
- To ensure all patients on epidural infusions receive continuous and effective analgesia.
- To ensure patients receiving epidural analgesia are cared for in appropriate areas with appropriately trained staff and that potential complications can be anticipated, and preventative measures undertaken.
- To ensure all patients on epidural infusions receive appropriate and effective antiemetic therapy.
- To ensure all patients on epidural infusions receive appropriate information on their epidural analgesia, which should include a patient information leaflet regarding their analgesia preoperatively, and as part of the preoperative assessment, discussion of the risks and potential benefits.

- To ensure a comprehensive governance system to include teaching of all staff, specific training in caring for patients with epidural infusions and audit of patient care and staff competencies and ward provision of such over a 24-hour period.

2.2.9. Glossary of Terms

- AABGI: Association of Anaesthetists of Great Britain and Ireland.
- APT: Acute Pain team.
- APTT: Activated partial thromboplastin time (blood clotting).
- CD: Controlled Drugs.
- EPMA: Electronic Prescribing and Medicines Administration.
- FBC: Full blood count.
- INR: International normalised ratio (blood clotting).
- LA: Local Anaesthetic.
- LMWH: Low Molecular Weight Heparin
- NAP3: National Audit of Practice 3.
- NEWS: National Early warning system.
- NPSA: National Patient safety Association.
- NSAID'S: Non-Steroidal anti-inflammatory drugs.
- PONV: Post Operative Nausea and Vomiting.
- RCA: Royal college of Anaesthetists.
- RCHT: Royal Cornwall Hospitals Trust.

2.2.10. Roles and Responsibilities

2.2.10.1. Anaesthetists

- Epidurals are usually inserted by anaesthetists who are expected to follow the accepted standards of care for selecting the appropriate patients, inserting the catheter following guidelines of sterility and safety, ensuring appropriate labelling of catheter, infusion and pump, safe prescribing and following the monitoring guidelines.
- If the anaesthetist cannot ensure safe nursing care for the patient in an appropriate environment, then it becomes their responsibility to provide alternative analgesic techniques more suitable to the environment in which they may be

nursed.

- However, where it is obviously in the best interest of the patient to receive epidural analgesia, it would be expected that senior nurses and managers become involved to allow this to occur without detriment to other patients.

2.2.10.2. **Medical Prescribers**

- Prescribers are encouraged to prescribe in line with epidural guidelines as well as the current edition of the BNF, unless there are justified clinical reasons not to do so.
- Prescribing teams should review all analgesic prescriptions on a daily basis or more frequently if clinically indicated.

2.2.10.3. **Nursing Staff**

- Nursing staff are responsible for the timely administration of epidural agents in line with RCHT guideline: Care of Epidural Infusions (Adult) Clinical Guideline
- Nursing staff are responsible for the ongoing monitoring of pain scores on rest and movement, motor power and sensation and signs of local anaesthetic toxicity along with vital signs of pulse, respiratory rate, BP, oxygen saturation and urine output on a NEWS chart.
- Adverse reactions to analgesics should be reported to the prescribing team and further action on administration confirmed.
- Nurses should contact the Acute Pain team for further advice when necessary (bleep 3233).

2.2.10.4. **Pharmacists**

- As part of regular monitoring, pharmacists should ensure adherence to the epidural guidelines with regards to appropriateness, accuracy, safety, and clarity of prescribing.
- Pharmacists should challenge any inappropriate prescribing of analgesics, such as the use of combination therapy.
- Pharmacists should contact the acute pain team for further advice when necessary.

2.3. Patient Care

2.3.1. Role of Nursing Staff

2.3.1.1. Patients with epidural infusions can only be cared for on

designated surgical wards where the nursing staff have received the appropriate training for the management of epidural infusions and the technique is employed frequently enough to ensure expertise and safety.

2.3.1.2. Nursing staff managing patients with epidural analgesia should:

- Be a registered nurse (may include agency and bank staff) who has been deemed competent in the safe administration of intravenous drugs.
- Have received training and assessed as competent in the safe management of epidural infusions at RCHT or equivalent hospital.

2.3.1.3. On the designated wards there must be nurses who have received epidural training and completed their competency training from the RCHT Acute Pain Team available on the ward, on every shift throughout the 24-hour period.

2.3.1.4. In cases whereby the nurse directly caring for the patient with an epidural has not received the required training, they must be able to refer to an appropriately trained nurse at all times:

- If this is not possible then theatres and the anaesthetist should be informed at the start of the shift as it may directly affect the anaesthetic technique or allow other arrangements to be made for accommodating that patient in a safer environment. Pain team is available in the daytime to assist and advise (bleep 3233).

2.3.1.5. The focus of nursing care will be the identification and management of potential side effects and complications related to epidural analgesia which requires effective monitoring and recording on the current RCHT NEWS chart and subsequent action as per care algorithms.

2.3.1.6. Observations should be recorded at appropriate time intervals on the NEWS chart, those falling into the red zones should give rise to concern and the algorithms of care provided should be followed. (NEWS chart - algorithms for treatment of hypotension, unrelieved pain, numb legs, and local anaesthetic toxicity are provided). See Observation and Monitoring section.

2.3.1.7. Further information is provided in the acute pain section on the anaesthetic website, if there are sufficient concerns, then the Acute Pain Team should be contacted Mon – Friday 9.00 – 17.00 or the anaesthetist on call if out of hours.

2.3.1.8. Patient pain scores must be assessed and recorded using the RCHT pain assessment tools (as per NEWS chart).

2.3.1.9. Administration of non – opiate adjunctive analgesia should be given as prescribed.

2.3.1.10. Nurses should ensure that their patient is prescribed appropriate step-down analgesia once the epidural is discontinued.

2.3.1.11. Trained nursing staff should remove epidural catheters as per guideline and in line with recommendations of haematology with respect to LMWH and other anticoagulants (Rivaroxaban etc)

2.3.1.12. Nursing staff should change the epidural infusion bag as per guideline.

2.3.1.13. Nursing staff must ensure they document all medications given on the drug administration chart.

2.3.1.14. Nurses should inform the Acute Pain team if a patient with an epidural infusion is transferred to another ward.

2.3.1.15. No patient with an indwelling epidural should be transferred to another ward unless the staffing is adequate to care for it and reassurances from the bed manager must be sought prior to transfer that this is the case for the whole 24-hour shift and documented.

2.3.1.16. Patients should be nursed in open plan bays where possible to allow easier nursing observation. It would be reasonable to expect these patients with high dependency needs to be in bays near the central nursing station. However, in certain circumstances the patient may need to be nursed in a side room (e.g. need for isolation) or in more peripheral bays in which case measures must be taken to ensure the patient is supervised closely with required observations.

2.3.1.17. Resuscitation equipment including naloxone, ephedrine and other emergency drugs should be available within the patient area.

2.4. Inclusion Criteria. (excluding paediatrics and obstetrics)

Epidural analgesia is considered appropriate for patients undergoing major surgery in the following categories provided they do not have any contra indications:

- Upper gastrointestinal.
- Enhanced recovery Patients.
- Lower abdominal and major gynecological.
- Vascular surgery.
- Major Urological.
- Major orthopaedic.

- Major trauma (chest, pelvic or limb).
- Pain management of inflammatory conditions (non-surgical) or other severe pain states (ischaemia, cancer).

2.5. Contra-indications to epidural analgesia

2.5.1. Where there are the following contraindication alternative analgesic methods should be used e.g. PCA, local anaesthetic infusions if appropriate.

2.5.2. This decision usually rests with the anaesthetist responsible for anaesthesia and insertion.

2.6. Absolute Contraindications

- Patient Refusal.
- Inadequately trained staff or equipment to provide care post insertion.
- Clotting abnormalities.
- Inappropriate timing of therapeutic anticoagulation.
- Infection at catheter site.
- Sepsis.
- Raised Intracranial pressure.
- Allergy to local anaesthetics or other agents prescribed within epidural.

2.7. Relative Contraindications

- Inability of patient to understand or contribute to epidural assessment.
- Prophylactic low dose heparin (timing issue).
- Spinal deformity.
- Immunosuppression or compromise.
- Previous or recently MRSA.

2.8. Insertion Guidelines

2.8.1. Insertion should only be undertaken by doctors trained in the technique. They must have knowledge of the anatomy, dermatomes to ensure epidural analgesia is undertaken at the level appropriate for surgery and be aware of the associated risks with insertion with regards to actual or potential harm. The patient must be made aware of the potential complications and the incidence as per NAP3 guidelines and be happy to undergo the procedure.

2.8.2. Epidural catheter insertion must be performed in an environment where an aseptic technique can be performed and where there are adequate resuscitation facilities.

2.8.3. Aseptic technique should include hand washing, sterile gloves, sterile gown, hat, face mask, appropriate skin preparation and sterile drapes around the injection site.

2.8.4. A trained assistant should be present to help with trolley preparation including the use of appropriate syringes as per NPSA 2010.

2.8.5. Where chlorhexidine 0.5% is used drying time should be allowed prior to commencement of procedure – to avoid risk of spread of preparation inwards and potential neurotoxicity.

2.8.6. Insertion of epidural catheters, particularly in the thoracic area may have less associated risk of actual neural damage if performed in the awake patient. This may not be possible or appropriate, in which case the patient should be made aware of the potential risks.

2.8.7. The loss of resistance technique may be with either air or saline and the anaesthetist should be familiar with the specific techniques.

2.8.8. The tip of the epidural catheter should be positioned at a spinal level appropriate for surgery to avoid inadequate analgesia. The catheter should have been tested prior to insertion that all injection eyes are working.

2.8.9. The catheter should be secured in order to minimise movement in or out of the epidural space – RCHT currently uses ‘lock – its’ covered by a clear dressing to allow visibility of insertion site and catheter.

2.8.10. The length of catheter within the epidural space should be noted on the anaesthetic chart together with the depth of the epidural space and any complications encountered.

2.8.11. Once inserted through the epidural needle to a length greater than 10cm the catheter should not be withdrawn through the needle as there is a small risk of the catheter being traumatised.

2.8.12. Where long term use of epidural analgesia is required then consideration should be given to tunnelling the catheter to lessen risk of infection.

2.8.13. Anaesthetists should be aware of and adhere to local infection guidelines (including use of antibiotics in special circumstances).

2.8.14. Anaesthetists should be aware of guidelines in respect to insertion and removal of epidurals in patients on anticoagulation or with impaired coagulation. All staff should be aware of and adhere to these guidelines.

2.8.15. Anaesthetists should be aware of monitoring guidelines and be confident the ward has adequate staff prior to commencement of procedure.

2.8.16. The Anaesthetist should complete the appropriate audit form to ensure postoperative follow-up by the Acute Pain Nurses and enter the data on the Galaxy Theatre Data base.

2.8.17. The guideline 'Regional Anaesthesia in Patients with Abnormalities in Coagulation' (November 2013) issued by the Association of Anaesthetists of Great Britain and Ireland, will help anaesthetists decide on the timing of placement or removal of epidurals in patients taking anticoagulant type drugs.

2.9. Prescribing Guidelines

2.9.1. **Prescribing**

2.9.1.1. Prior to surgery and the initiation of the infusion the anaesthetist will consider the suitability of the patient for specific infusions based on:

- Age and physiology.
- Risk versus benefit.
- Effectiveness of analgesia with respect to type of surgery.
- Specific Contraindications.

2.9.1.2. All patients must have intravenous access maintained for the duration of the infusion and for the following 12 hours after the cessation of the infusion.

2.9.1.3. Infusions used should be either prepared in a sterile environment or pre prepared. There are strict limitations on the number of drugs and concentrations which can be used in epidural infusions.

2.9.1.4. Standard ready-to-use epidural infusion bags are available from pharmacy and should be used at all times. Variation from these bags should only occur in exceptional circumstances and should never include sufficient concentration of Local anaesthetic to cause motor blockade.

2.9.1.5. The preparations available at RCHT are: Levo-bupivacaine 0.125% with 0, 2 or 4 micrograms per ml fentanyl.

2.9.1.6. The epidural must be prescribed on the EPMA system, where the different preparations are available as standard. Pre-printed yellow prescribing labels accompany the infusion when it is attached to the epidural catheter.

2.9.1.7. All patients should have fluids (preferably crystalloid 500ml) prescribed to treat potential hypotension, with indication of systolic pressure level which should trigger the infusion as per NEWS chart.

2.9.1.8. All patients should have oxygen prescribed and given for the duration of the epidural infusion unless oxygen saturation is 98% on room air.

2.9.1.9. Oxygen should be prescribed in accordance with Trust policy.

2.9.2. Additional Opioids

No other opioids should usually be prescribed or administered whilst the patient is receiving an epidural containing an opioid unless stated otherwise by an anaesthetist or the acute pain team. This includes both oral and parenteral routes. Where this occurs monitoring should be more frequent as defined by prescriber.

2.9.3. Nausea and Vomiting

All patients receiving epidural analgesia should have appropriate antiemetics prescribed as per RCHT Post-Operative Nausea and Vomiting Clinical Guideline.

2.9.4. Fentanyl and L-Bupivacaine

Standard epidural mixes are available from pharmacy and should always be used unless there are contraindications to the above drugs. No additional drug should be added to the pre prepared bags.

2.9.5. Epidural infusion Rates

2.9.5.1. The infusion rate can vary depending on 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.

2.9.5.2. The amount of local anaesthetic delivered will determine the number of spinal nerves which will be blocked and hence the level of analgesia in corresponding dermatomes.

2.9.5.3. It is important that the hourly rate of infusion is maintained at the right level as the risk of complications may increase as the dose increases (particularly hypotension and motor blockade) and at higher level blocks.

2.9.5.4. The standard starting ranges are: 0- 15ml for L-bupivacaine 0.125% with 0 or 2mcg/ml and 0-10ml for L-bupivacaine 0.125% with 4 mcg/ml. A usual starting rate is 8 ml/hour.

2.9.5.5. Additional bolus doses can be administered from the pump if an additional code is used: this is only available to nominated staff e.g. acute pain team and anaesthetists or, it may be appropriate for an anaesthetist to give a stronger concentration bolus (0.25%) for uncontrolled pain when all appropriate aseptic technique should be observed in both drawing up, disconnecting the filter, and administering the local anaesthetic. (N.B. increased monitoring will be necessary after

administration of a bolus dose).

2.9.5.6. Once an analgesic infusion rate has been established it should be maintained at that rate until the catheter is due for removal. The infusion rate should not be titrated down (weaned down).

2.10. Adverse Effects

2.10.1. Adverse effects may occur as a result of all or any individual constituent of the epidural infusion.

2.10.2. The most common drugs used are opioids and local anaesthetics.

2.10.3. Additional drugs may occasionally be included within the mixes and, if this is the case, it is the responsibility of the prescribing doctor to note the potential hazards and side effects to be expected from this drug e.g. clonidine and any additional monitoring measures required.

2.10.4. **Opioid – Adverse Effects**

2.10.4.1. **Respiratory Depression**

- Respiratory rate should be regularly monitored as per guidelines.
- Respiratory depression is commonly a dose-related side effect and may result from the dose within the epidural or previous and /or concurrent opioid analgesia or inadvertent intrathecal administration.
- No patient receiving opioids via an epidural infusion should receive additional opioid unless specifically requested by acute pain team or anaesthetist when increased monitoring should be initiated and patient placed near the nursing station.
- Respiratory depression should be treated with naloxone as per guidelines when respiratory rate falls below 6-8 breaths per minute and administered in a dilute mix of 0.4 micrograms in 4 ml, diluted with 0.9% saline as per guidelines (see NEWS chart).
- Regular assessment of the patients' level of sedation and oxygen saturation are essential where a patient is receiving opiate therapy – over sedation can lead to respiratory depression as a direct result of the absorption of the opioids into the circulation.

2.10.4.2. **Sedation**

- Conscious levels must be assessed as a vital sign to ensure prevention of over sedation and consequent respiratory depression.

- Sedation scores should be measured using RCHT guidelines (see NEWS).

2.10.4.3. **Nausea and Vomiting**

- The cause of this is multifactorial and all patients should have the appropriate anti emetic therapy prescribed as per Post-Operative Nausea and Vomiting Clinical Guideline by the anaesthetist for the first 2 post-operative days.

2.10.4.4. **Urinary retention**

- Urinary retention is associated with epidural analgesia and inhibition of the parasympathetic nervous system on the bladder.
- Most patients with epidural catheters require catheterisation.
- Occasionally retention can be treated with low dose naloxone.

2.10.4.5. **Pruritis**

- Opioids are associated with itching which can be severe – treatment should be with a low dose of naloxone (0.1 – 0.2 microgram iv) or antihistamines.

2.11. Adverse Effects – local Anaesthetics

2.11.1. **Hypotension**

2.11.1.1. Hypotension is the most common side effect of epidural analgesia and may impair the patient's normal response to bleeding and hypovolaemia.

2.11.1.2. Sympathetic blockade by the local anaesthetic commonly results in vasodilatation below the level of the block causing loss of vascular tone and inability of the sympathetic nervous system to provide peripheral vasoconstriction and consequent hypotension.

2.11.1.3. A drop in BP due to the above should respond to intravenous fluids e.g. Hartmann's or N Saline, or vasopressors e.g. ephedrine, Metaraminol or phenylephrine.

2.11.1.4. Rescue fluid bolus should always be prescribed e.g. 500mls of Crystalloid if BP drops below defined level for defined time.

2.11.1.5. N.B Following any time of hypotension the cause should be clearly determined and the common causes of post op hypotension such as bleeding and hypovolaemia excluded.

2.11.2. **Bradycardia**

2.11.2.1. If the blockade extends to T2 the sympathetic supply to the heart is interrupted and will result in bradycardia. If combined with hypotension, inadequate perfusion of the vital organs could occur, and measures to restore cardiac output must be taken.

2.11.2.2. Atropine(0.3mg-0.6mg) should be the drug of choice to restore rate and ephedrine as a vasoconstrictor (3 – 6 mg iv bolus).

2.11.3. **Local Anaesthetic Toxicity**

2.11.3.1. This can occur due to a relative excess of local anaesthetic in the epidural space or too rapid absorption. Inadvertent placement or catheter migration into epidural veins increase the risk of local anaesthetic toxicity by direct absorption.

2.11.3.2. All staff involved in the care of local anaesthetic infusions should be aware of the signs of toxicity in both mild and severe form and the consequent treatment necessary in line with the AAGBI Quick Reference Handbook. Search for “AAGBI QRH”

2.11.3.3. Patients receiving local anaesthetic infusions should be monitored regularly.

2.11.3.4. Intralipid protocols must be distributed, and the location of the packs made clear in all areas where local anaesthetic infusions are given.

2.11.4. **Pressure Areas**

2.11.4.1. Pressure areas and sores can occur if the epidural block causes paraesthesia or if the patient is particularly debilitated and is subject to damp surfaces.

2.11.4.2. Regular pressure area care and regular movement should be encouraged.

2.12. Administration

2.12.1. **Epidural Pumps**

2.12.1.1. Continuous infusions must be given via the specific colour coded Yellow McKinley Bodyguard 545 pumps on all wards. All connections should be NR fit and there must not be any 3 way taps or other injection ports on the infusion line.

2.12.1.2. The pump and solution should be locked.

2.12.1.3. Infusion pumps must be used exclusively for epidural infusions only and be clearly labelled for epidural use only as per NPSA guidelines. All pumps should be allocated an asset number that could be used in an audit trail, and which should be noted on the pink audit forms for the acute pain team.

2.12.1.4. If, an infusion were to be prescribed that required delivery via a syringe driver then this must be clearly labelled and regulated for specific staff only to alter and adjust.

2.12.2. **Epidural infusion Bags**

2.12.2.1. All epidural infusion bags s must be clearly labelled and contain the words:

for epidural use only

2.12.2.2. An antibacterial filter must always be used in the infusion line at the junction of epidural catheter and infusion line.

2.12.2.3. Epidural infusion bags must be checked by 2 registered nurses and administered by a nurse who has undertaken RCHT training.

2.12.2.4. The use of ready-to-administer bags should be utilised at all times. These are available from pharmacy as a controlled drug and require a controlled drug requisition and appropriate secure storage separate from intravenous fluids.

2.12.2.5. There should not be addition of drugs to the pre prepared bags.

2.12.2.6. The epidural administration sets should be labelled clearly epidural and distinguishable from those used for alternative routes.

2.12.3. **Discontinuing Epidural Infusions**

2.12.3.1. Epidural infusions are normally continued until the patient is able to tolerate oral fluids and pain can be managed with simple oral or sublingual analgesia.

2.12.3.2. As a general rule they should be discontinued within 48 - 72 hours to lessen the chance of infection unless clearly authorised by the acute pain team or a consultant anaesthetist. Epidurals kept in for greater than 72 hours where patients continue with severe pain or cannot tolerate oral medications will be monitored regularly by the acute pain team during weekdays.

2.12.3.3. Weaning down the dose is not necessary and once the decision has been made to stop the epidural analgesia then the infusion should be turned off. If there is some doubt about the patient's ability to manage without, then the catheter should be left in situ until good alternative analgesia is achieved.

2.12.3.4. Registered nurses who have received RCHT epidural training are authorised to remove epidural catheters.

2.12.3.5. Following cessation of an epidural infusion with opioid disposal of the solution should be in line with RCHT policy of opioid wastage and should be recorded and witnessed.

2.12.3.6. Epidural catheters must not be removed from patients with clotting abnormalities due to risk of epidural haematoma. Patients on therapeutic anticoagulation (low molecular weight heparin) should only have the catheters removed when least risk is predicted in line with RCHT policies. See section 2.17. If unsure, please refer to the AAGBI document entitled 'Regional Anaesthesia in patients with abnormalities of coagulation' (November 2013).

2.12.3.7. **N.B.** Ideally Rivaroxaban should not be started until 48 hours post epidural as this is often prescribed prior to anaesthesia, it would be expected that the anaesthetist would check and correct this prescribing and prescribe prophylactic LMWH for 2 days during epidural period prior to Rivaroxaban.

2.12.3.8. For patients receiving treatment anticoagulation see specific guidelines.

2.13. Observations and monitoring

2.13.1. **General Observations**

2.13.1.1. Nursing staff must be aware of the potential side effects and complications of epidural analgesia and their management. Close and timely observations.

2.13.1.2. are essential to the safe delivery of this method of analgesia.

2.13.1.3. All observations will be recorded on the RCHT NEWS chart which combines the regular observations of vital functions (RR, BP, HR, oxygen saturation and urine output) with those parameters and scores necessary for safe epidural delivery (pain, sedation, sensation, power, and LA toxicity)

2.13.1.4. Scoring criteria are at the bottom of the observation chart and those scores within red area would indicate that there are potential side effects occurring and the algorithms on the reverse of the form should be referred to.

2.13.1.5. Observations should be more frequent in the first 6 hours or if the rate of infusion is changed – frequency of observations required are on the reverse of the NEWS chart.

2.13.1.6. The rate of infusion should be recorded with every observation.

2.13.1.7. Table 1. General observations:

Monitoring parameter	First hour	Following two hours	thereafter
Respiratory Rate	Every 15 minutes	Every 30 minutes	Hourly for 24 hours
Blood Pressure	Every 15 minutes	Every 30 minutes	Hourly for 24 hours
Heart Rate/sats	Every 15 minutes	Every 30 minutes	Hourly for 24 hours
Pain score at rest	Every 15 minutes	Every 30 minutes	Hourly for 24 hours
Pain score on movement	Every 15 minutes	Every 30 minutes	Hourly for 24 hours
Sedation	Every 15 minutes	Every 30 minutes	Hourly for 24 hours
Motor power	Once	*Every hour	4 hourly for 24 hours
sensation	With pain scores		
LA toxicity	Hourly	2 hourly	4 hourly

2.13.1.8. *If patient is stable and infusion rate remains unchanged monitor 4 hourly after this, if patient is in pain, the rate of epidural changes or the patient is in labile condition the continue with observations more frequently.

2.13.2. **Respiratory Rate**

2.13.2.1. Monitoring of the respiratory rate is essential to detect complications relating to the use of opioids and also to exclude an ascending epidural blockade.

2.13.2.2. If respiratory rate falls below 8 switch off epidural, give oxygen and follow algorithm on NEWS chart.

2.13.2.3. Table 2 Respiratory observations and actions

Respiratory Rate	Action to take.
≤ 10	Increase frequency of Observations.
≤ 8	Stop infusion, give oxygen, observe, and consider naloxone
≤ 5	As above and give naloxone immediately

- 400microgms of Naloxone should be diluted in 3ml of 0.9%NaCl.
- Give in 1 ml increments every 5 minutes.
- Give until respiratory rate increases to 8 and sedation score greater than 2.
- Seek medical advice if respiratory rate remains low and continue close monitoring.

2.13.3. **Management of Hypotension**

2.13.3.1. Sympathetic blockade by local anaesthetic in epidurals can cause vasodilation below the level of the block and subsequently lead to decreases in blood pressure which cannot be then corrected by the normal vasoconstriction mechanism present in individuals without epidurals.

2.13.3.2. Other causes for decreased blood pressure should be excluded before assuming they are due to the epidural.

2.13.3.3. Systolic blood pressure should be greater than 90mmHg (MAP >65mmHg) systolic unless otherwise stated. Hypertensive patients may require a higher baseline to maintain organ function – particularly urine output. It would be expected that the anaesthetist responsible for the epidural insertion would state acceptable parameters for systolic pressure (level and time period) after which intervention would be required in terms of fluid bolus as per chart.

2.13.3.4. Table 3. Treatment of hypotension

Consciousness/saturation	Action
Alert. Normal saturation.	Lie patient flat. Do not put head down.

Consciousness/saturation	Action
	Give oxygen 8 litre/min. Give iv fluid bolus – 500mls of crystalloid. Test level of block if high stop epidural and call acute pain team or on call anaesthetist.
Drowsy. Saturation less than 92%.	Lie patient flat. Do not put head down. Give oxygen @ 8 litres/min. Give iv fluid – up to 1000ml crystalloid. Call for medical help. Give ephedrine 3-9mg.

2.13.3.5. Following the administration of a bolus dose of fluid the blood pressure must be observed at 5 min intervals until increasing or for 30 minutes.

2.13.4. **Heart Rate**

2.13.4.1. Monitor heart rate as per requirements along with BP. If there is a bradycardia with normal BP ensure patient is upright to prevent block rising and check level at which patient is numb.

2.13.4.2. Call for medical help if rate 10-20 below normal base pulse rate or if assistance is required in ascertaining level of block.

2.13.4.3. Administer either ephedrine (to increase pulse and BP) 3- 6 mg bolus.

2.13.4.4. Give Atropine 600microgm for persistent bradycardia.

2.13.4.5. If heart rate falls below 40/min or patient is compromised put out urgent response bleep or, if appropriate, crash call.

2.13.5. **Pain Score and sensation**

2.13.5.1. Pain scores and sensation should be recorded and documented regularly with every observation when patient is awake – both at rest and on movement.

2.13.5.2. If patient is asleep then this may be recorded but not for more than 3 successive observations.

2.13.5.3. If pain score is 2 or more adjust rate of epidural to maximum, ensure multimodal analgesia is given and if pain continues contact medical staff for advice.

2.13.5.4. NB opioids should not be given parenterally if the epidural is still running without medical input – see algorithm on NEWS chart.

2.13.5.5. Changing sensation should be noted and if increasing to 3 or more, seek advice as per NEWS chart, if associated with loss of power turn off epidural and seek advice.

2.13.6. **Sedation**

Sedation score should not be greater than 2 when medical help should be sought.

2.13.7. **Nausea and Vomiting**

Patients should have regular antiemetics prescribed for the first 2 days post operatively and regular monitoring to ensure patient does suffer from Post-Operative Nausea and Vomiting Clinical Guideline.

2.13.8. **Epidural Blockade**

2.13.8.1. Assessment of the efficacy of the epidural is important both in the analgesia achieved and the level of motor power and sensation to assure that block is not too high to cause respiratory depression.

2.13.8.2. Sensation and motor power should be assessed on return from theatre.

2.13.8.3. If epidural rate is changed or patient reporting pain or numbness.

2.13.8.4. If the level of block is high e.g. above the nipples, then observations should remain frequent to establish block is not rising further.

2.13.8.5. If this is the case and the patient cannot feel sensation at nipple level, then the epidural should be turned off and the Acute Pain Team called or anaesthetist on call for advice.

2.13.8.6. If stable sensation need only be recorded twice daily.

2.13.8.7. Motor power should be assessed hourly for 3 hours and then if stable, every 4 hours. If the score is 3 or 4 call the acute pain team or anaesthetist on call.

2.13.9. **Non-working Epidural**

2.13.9.1. If an epidural blockade is only partially working or not effective at all then the infusion rate should be increased to maximum value, adjuvant analgesics given if appropriate: if patient is still in pain call the acute pain team or anaesthetist on call.

2.13.9.2. Bolus dose of local anaesthetic may be given by the anaesthetist when full monitoring should commence (every 15 minutes).

2.13.9.3. If unsuccessful, the epidural catheter may need readjusting or replacing, if this is not possible then the epidural should be switched off and suitable opiate analgesia given as per NEWS chart.

2.13.10. **Urinary retention**

2.13.10.1. Urinary retention is common in patients with an epidural analgesia or post spinal.

2.13.10.2. Most patients are catheterised to ensure they do not suffer discomfort but also to accurately monitor urine output during the acute post-operative period.

2.13.10.3. The urine output is usually recorded hourly in the immediate post-operative period.

2.13.11. **Pruritis**

This can be severe secondary to the opiates and can be treated with antihistamine or small doses of naloxone (0.1mg).

2.14. Local Anaesthetic Toxicity

2.14.1. The infusion rate should be regularly checked and compared with the prescription to ensure correct rate is running.

2.14.2. Local anaesthetic dosage used in epidural blockade should not cause toxicity normally, however, occasionally there may be rapid absorption or the epidural catheter may have migrated into a vein when LA may be given directly intravenously.

2.14.3. It is essential that the signs of toxicity are identified early to prevent convulsions and cardiac arrest in the latter stages.

2.14.4. Signs are classified as per NEWS chart with relevant treatment guide.

2.14.5. Table 4 Signs and symptoms of Local anaesthetic Toxicity (as shown on the NEWS chart).

Score	Signs	Action
0	Normal	Observe
1	Light-headedness, lip tingling. Tinnitus or metallic taste in mouth.	Stop LA infusion, Attach ECG monitor. Maintain oxygenation and BP.

Score	Signs	Action
		If symptoms deteriorate call for help.
2	Visual disturbance. Muscle twitching, convulsions.	Stop LA infusion, Attach ECG monitor. Maintain oxygenation and BP. Call for help, give fluids for hypotension. Treat convulsions with diazepam.
3	Cardiac arrythmias, hypotension. Respiratory and cardiac arrest.	As above and treat cardiac arrest with ECM and intralipid. Treat toxicity with Intralipid protocol.

2.14.6. Oxygen should be given immediately, and supportive treatment commenced with fluid.

2.14.7. Call for medical help and if severe the intralipid protocol should be commenced.

2.14.8. Table 5. Intralipid Rescue.

2.14.9. For LA induced cardiac arrest CPR + intralipid 20%.

Category	Information
Intralipid 20%	1.5ml/Kg over 1 minute
Immediate follow up infusion	15ml/kg/hr
Continue chest compression to circulate lipid	
Repeat bolus every 3-5 minutes	Total dose: 3ml/kg
Continue infusion until haemodynamic stability restored	Increase rate to 30ml/kg if hypotension or unstable.
Maximum total daily dose	**12ml/kg**

2.14.1. Example – 70kg adult:

Treatment of cardiac arrest with intralipid 20% emulsion:
(approximate doses are given in red for a 70-kg patient).

- Give an intravenous bolus injection of Intralipid 20% 1.5 ml.kg-1 over 1 minute.
    - **Give a bolus of 100 ml.**
- Continue CPR.
- Start an intravenous infusion of Intralipid® 20% at 15ml/kg/hour – 840ml.
    - **Give at a rate of 400 ml over 20 minutes.**
- Repeat the bolus injection twice at 5 min intervals if an adequate circulation has not been restored.
    - **Give two further boluses of 100 ml at 5 min intervals.**
- After another 5 min, increase the rate to 0.5 ml.kg-1.min-1 if an adequate circulation has not been restored.
    - **Give at a rate of 400 ml over 10 minutes.**
- Continue infusion until a stable and adequate circulation has been restored.
- Total dose 12ml/Kg – 840ml.

2.15. Medical Emergencies.

2.15.1. **Epidural haematoma**

2.15.1.1. Epidural haematoma is a rare but potentially dangerous complication of epidural anaesthesia which can lead to compression of the spinal cord and consequent paraplegia if not treated. Symptoms vary with the location and extent of spinal compression and will cause loss of sensation and motor power.

2.15.1.2. It is important that early signs are recognised, and if a patient experiences a loss of power or sensation in excess to that expected for the epidural used this should be formally assessed and documented, the infusion stopped, and patient assessed very regularly.

2.15.1.3. If there is no improvement after 1-2hours the contact the Acute pain team or anaesthetist on call who can assess.

2.15.1.4. On suspicion of the above there should be a full neurological assessment and a potential MRI arranged in consultation with the acute pain team or anaesthetist on call.

2.15.1.5. Follow NEWS chart algorithm.

2.15.2. **Epidural Abscess**

2.15.2.1. Infection is rare, particularly immediately post op, but may occur post removal of catheter and if unrecognised may cause cord compression.

2.15.2.2. Infection within the epidural space is usually accompanied by increasing back pain and an increased white cell count and pyrexia, but even in the absence of pyrexia and white cell count, increasing back pain should be treated as serious and the acute pain team asked to review urgently.

2.16. Epidural Catheter Management

2.16.1. **Epidural site Care**

2.16.1.1. Epidural catheters are not sutured in place and therefore may easily fall out.

2.16.1.2. Dressing changes to the catheter exit site should ideally be carried out by a trained nurse in this technique or an anaesthetist when it is necessary.

2.16.1.3. The aims are to ensure sterility and security of the system and prevent entry of bacteria into the epidural space and allow visibility of the epidural catheter.

2.16.1.4. If changing the dressing all sterile precautions should be taken in accordance with RCHT policy.

2.16.1.5. The catheter is fixed with a ‘lock it clip’; removal of this clip would necessitate disconnection of the epidural catheter and its threading through the lock-it port – this should only be undertaken by trained acute pain nurses and anaesthetists as there is a high risk of catheter dislodgement.

2.16.1.6. If the old dressing needs to be removed the lock it should be retained and covered with a clear adherent dressing.

2.16.1.7. The dressing should be smooth and there should be no kinks in the epidural catheter.

2.16.1.8. The epidural catheter should be secured with Mefix tape covering the full length of the catheter from the nape of the neck to the insertion point.

2.16.1.9. It is the nurses’ responsibility to check the epidural catheter site regularly-at least twice per shift to check that the dressing is secure and remains covering the catheter.

2.16.1.10. If the dressing is insecure or there is a leak of fluid it should be secured with additional tape and sterile pad.

2.16.2. **Epidural Line and Filter**

2.16.2.1. Nursing management of the epidural line and filter should aim to prevent disconnection of the filter from the catheter and maintain the integrity of the system as well as promoting comfort at the filter site.

2.16.2.2. Where the filter will be in direct contact with the skin care should be taken to avoid pressure to the skin. Gauze should be placed under the filter and taped to the shoulder or area of body which is relatively flat. It should not put the catheter under tension.

2.16.2.3. A yellow label with the words ‘epidural line’ should be placed on the catheter.

(This should have been already placed on catheter by anaesthetist but should be checked by nursing staff).

2.16.2.4. Effective management of the epidural line is essential in preventing any pulling of the connection between the filter and the catheter which could cause disconnection and could necessitate discontinuation of the epidural due to loss of sterility. The line and filter do not need to be changed unless there is suspected contamination.

2.16.2.5. If the catheter becomes disconnected from the filter and is witnessed:

- Wrap the filter and catheter in gauze.
- Stop the infusion.
- Contact the acute pain team or the anaesthetist on call.

2.16.2.6. Do not remove the epidural catheter from the patient unless the above have been contacted for advice.

2.16.2.7. If the catheter has become disconnected and the time frame cannot be clarified then it should be withdrawn, replaced or alternative analgesia provided.

2.16.3. **Removal of epidural Catheters**

2.16.3.1. Epidural catheters can be removed by registered nurses who have been trained and assessed as competent to remove epidural catheters, otherwise the acute pain team should be contacted.

2.16.3.2. Catheter removal should not occur unless the patients clotting is normal or within an accepted range (INR≤1.5. and a platelet count of ≥ 80,000). It would be expected that if the bleeding history is negative that routine coagulation screening prior to removal would not be required. (FBC prior to surgery to confirm platelet count would be acceptable).

2.16.3.3. The catheter should be removed taking into consideration the timing of any prophylactic anticoagulation. Catheter removal early in the day will ensure sufficient time to monitor patient during working hours for any signs of motor changes (12 hours post LMWH). If unsure refer to the AAGBI publication Regional Anaesthesia in patients with abnormalities of coagulation.

2.16.3.4. Do not use force in removing the catheter. If the catheter is difficult to remove contact the Acute Pain team for advice.

2.16.3.5. Check the catheter after removal to ensure the entire length has been removed. The first mark from the insertion is always 5 cm from the tip which has a rounded end. If there are concerns that the catheter is not intact contact the acute pain team for advice.

2.16.4. **Procedure for Removal of Catheter:**

- Wash hands as per RCHT hand hygiene policy.
- Gather equipment – a small dressing and gloves.
- Explain the procedure to the patient.
- Position the patient comfortably on the side with the spine flexed and knees up to open the vertebral spaces.
- Remove the catheter slowly.
- Observe the site for leakage, fluid, or signs of infection.
- Check catheter to ensure tip is complete – if not contact Acute Pain Team for advice.
- Clean with NaCl 0.9% and apply adhesive dressing over site.

Check for any signs of infection such as pus or redness at site of entry – if there are any signs save the catheter tip for Culture and sensitivity and swab the insertion site.

2.17. Anticoagulants and Epidural Catheters

2.17.1. Consideration must be paid to the patient's anticoagulation status prior to epidural removal and should be in line with RCHT anticoagulation/DVT prophylaxis policy.

2.17.2. **Prophylactic dose anticoagulation**

2.17.3. **LWMH: Dalteparin – 2,500 or 5,000 i.u. SC daily or Enoxaparin as per guideline:**

- Wait at least 12 hours after the last dose of LMWH before removal/insertion of catheter. (usually given at 10.00pm).

- Wait at least 4 hours post epidural removal/insertion of catheter before giving a prophylactic dose of LMWH.

- If traumatic puncture has occurred and blood obtained back via catheter wait at least 12 hours before giving a prophylactic dose of LMWH – it would be expected that the anaesthetist would specifically inform the ward if this were the case.

2.17.4. Rivaroxaban prophylaxis for hip and knee replacements - 10 mg orally.

2.17.5. **This should not be given to patients who have an epidural for the above until the third day post operatively as agreed with the orthopaedic directorate and initial thromboprophylaxis should be with LMWH.**

2.17.6. Rivaroxaban may have been routinely prescribed for all patients undergoing hip or knee replacements on admission it is the responsibility of the anaesthetists to ensure that the appropriate correction is made as per protocol.

2.17.7. It would be expected that nursing staff should query any prescription of Rivaroxaban for any patient with an indwelling epidural and not administer unless the indication were clear.

2.17.8. **Table 5 Post operative Regime for patients undergoing hip or knee replacement with ongoing epidural analgesia:**

Enoxaparin 22.00 day of surgery (day one).

Enoxaparin 22.00 day two.

Removal of epidural am day three at latest.

Rivaroxaban 10mg 22.00 and thereafter.

2.17.9. Therapeutic Anticoagulation.

2.17.10. The need for minimal/zero levels of LMWH prior to epidural/spinal catheter insertion/removal may not be compatible with the requirement to maintain therapeutic anticoagulation in certain situations e.g., recent VTE. An alternative analgesic regime may therefore be indicated.

2.17.11. If epidural is considered essential discuss with haematology the relatives risks and benefits and appropriate measures to ensure patient safety e.g., IVC filter where recent VTE or iv heparin.

2.17.12. See RCHT Thromboprophylaxis policy.

2.17.13. IV Heparin.

2.17.14. **Avoid IV heparin whilst epidural catheter in situ if at all possible**

- Heparin should be stopped 4-6 hours pre procedure (insertion and removal) and checking an urgent APTT ratio 2 hours prior to procedure.
- The APTT must be normal with the result checked and documented in the notes prior to an epidural catheter being inserted or removed.
- (N.B. If a patient has previously been receiving LMWH and is switched to Unfractionated Heparin then 24 hours should be allowed before neuraxial blockade techniques).
- If required, the IV heparin infusion can be restarted at least 1 hour after catheter insertion.
- Patients receiving per operative heparinsation, such as those undergoing vascular surgery, should have the insertion of an epidural catheter prior to per operative heparinsation, not have the catheter removed for at least 12 post operatively after the coagulation check is normal.
- These patients may require additional observations of motor power to ensure absence of epidural haematoma if clotting is abnormal post operatively.
- Where there has been traumatic puncture there should be 12 hours before iv heparin is recommenced. The anaesthetist must inform the ward if this is the case.

2.17.15. Treatment dose LMWH.

2.17.16. If maintenance of consistent therapeutic anticoagulation with low molecular weight heparin is not critical, then after discussion, the following regime should be agreed by anaesthetist and haematologist.

- Wait at least 24 hours after administration of treatment dose LMWH before insertion or removal of an epidural catheter.
- Wait at least 4 hours post catheter insertion before giving a dose of LMWH.

2.17.17. Warfarin

- The INR should be ≤ 1.5 before epidural/spinal catheter is inserted or removed.
- Patients should not be anticoagulated with warfarin whilst catheter in situ.

2.17.18. **Catheter Detachment in anticoagulated patient**

2.17.18.1. If an epidural catheter inadvertently falls/is removed whilst a patient is anti-coagulated there may be an increased risk of epidural haematoma and therefore increased observations should be made of motor power and sensation

2.17.18.2. Deterioration constitutes an emergency when the acute pain team or on call anaesthetist should be contacted immediately. Epidural haematoma can cause permanent neurological damage if it is not identified and managed properly as per protocol.

2.17.18.3. The degree of risk varies on the type of anticoagulation and the site of insertion.

2.18. Discontinuing epidural analgesia

2.18.1. **Timing**

2.18.1.1. Removal of epidural usually occur after 48 – 72 hours after which the risk of infection increases.

2.18.1.2. This risk may increase with immuno- compromised and diabetic patients.

2.18.1.3. There may be occasions when there needs to be more prolonged analgesia which should be discussed with consultants in charge of the care of the patients and the acute pain team as to the alternatives.

2.18.1.4. Anticipated long term epidural analgesia should have a tunnelled catheter inserted and advice of the acute pain team or pain consultants may be needed.

2.18.2. **Factors to consider prior to discontinuation**

2.18.2.1. Severity of pain expected.

2.18.2.2. Patients' ability to tolerate other routes of analgesia:

- Alternative step-down analgesia must be prescribed before the epidural is stopped and this should be prescribed as regular not prn analgesia.
- The majority of patients will converted to oral analgesia – must be able to tolerate free fluids.
- The first dose of analgesia should be given immediately prior to the cessation of the epidural infusion.
- Regular pain assessment should continue to ensure patients pain control is well managed.

2.18.2.3. Patient preference.

2.18.2.4. Patients or carers wishes should be taken into consideration. If a patient request, they no longer wish to receive epidural analgesia then alternative options should be discussed ensuring the patient is fully informed prior to making a choice.

2.19. Dissemination and Implementation

2.19.1. All healthcare professionals will be made aware of this guideline and their responsibilities as part of induction/annual update training.

2.19.2. The lead acute pain clinician, pain nurses and pharmacist should ensure the principles of this guideline are implemented through the relevant directorate and divisional meetings.

2.19.3. The principles of epidural analgesia and pain monitoring will be covered periodically at medical and nursing staff meetings and be subject to regular audit of practice.

2.19.4. Divisional governance leads, nursing staff and the pain pharmacist will be asked to inform their teams and staff in their division of this guideline and how to access it via the intranet.

3. Monitoring compliance and effectiveness

Information Category	Detail of process and methodology for monitoring compliance
Element to be monitored	Compliance with standards.
Lead	Acute Pain Team.
Tool	Daily ward round audit of practice using current audit form attached. Short audits of specific aspects of practice on specific wards or a specific action to ensure percentage compliance with safety criteria.
Frequency	Continuous post operative monitoring. Bimonthly specific audits of practice. Report to be shared at monthly governance/link nurse meetings following audit. Disseminated by e-mail to all health professionals concerned with practice as completed.
Reporting arrangements	Reviewed by Acute Pain Team. Audits will compare current and recommended practice and feedback to relevant areas and line managers for correction. Repeat audits will monitor ongoing performance.

Information Category	Detail of process and methodology for monitoring compliance
Acting on recommendations and Lead(s)	Acute Pain Team will monitor, feedback via nursing structure and Anaesthetic Care Group required actions and time frame. Acute Pain committee to oversee and report back to Anaesthetic Care Group.
Change in practice and lessons to be shared	Governance meetings, link nurse meetings and direct ward sessions and feedback where changes required. Required changes to practice will be identified and actioned within the month if urgent. A lead member of the team will be identified to take each change forward where appropriate. Lessons will be shared with all the relevant stakeholders.

4. Equality and Diversity

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the Equality Diversity And Inclusion Policy or the Equality and Diversity website.

4.2. Equality Impact Assessment

The Initial Equality Impact Assessment Screening Form is at Appendix 2.

Appendix 1. Governance Information

Information Category	Detailed Information
Document Title:	Acute Post-operative Adult Analgesic – Epidural Neuraxial Blockade Clinical Guideline V4.0
This document replaces (exact title of previous version):	Acute Postoperative Adult Analgesic – Epidural Neuraxial Blockade Clinical Guideline V3.0
Date Issued/Approved:	1 February 2024
Date Valid From:	February 2024
Date Valid To:	February 2027
Directorate / Department responsible (author/owner):	Dr Keith Mitchell, Lead Clinician, Acute Pain Team.
Contact details:	01872 252095
Brief summary of contents:	Summary of the use of neuraxial/epidural blockade for the treatment of post-operative pain and the requirements to deliver this service safely in the ward setting.
Suggested Keywords:	Epidural, Local anaesthesia, Opiate, prescribing.
Target Audience:	**RCHT:** Yes **CFT:** No **CIOS ICB:** No
Executive Director responsible for Policy:	Chief Medical Officer
Approval route for consultation and ratification:	Anaesthetic Department Governance.
Manager confirming approval processes:	Claire Blake, Head of nursing, ACCT
Name of Governance Lead confirming consultation and ratification:	James Masters
Links to key external standards:	NPSA: https://www.cas.mhra.gov.uk/ViewandAcknowledgment AAGBI Local Anaesthetic Toxicity Guidelines: https://anaesthetists.org/Home/Resources-publications/Safety-alerts/Anaesthesia-

Information Category	Detailed Information
	emergencies/Quick-Reference-Handbook-QRH/PDF-version Royal College Guidelines: https://fpm.ac.uk/sites/fpm/files/documents/2020-09/Epidural-AUG-2020-FINAL.pdf
Related Documents:	Care of Epidural Infusions in adults Clinical Guideline. Management of Leg Weakness with Epidural Analgesia Clinical Guideline.
Training Need Identified?	No.
Publication Location (refer to Policy on Policies – Approvals and Ratification):	Internet and Intranet
Document Library Folder/Sub Folder:	Clinical / Anaesthetics

Version Control Table

Date	Version Number	Summary of Changes	Changes Made by
	V1.0	Previous version history not known.	
14 February 2014	V2.0	Reformat and rewrite.	Dr Nicholas Marshall, Lead clinician, Acute Pain Team.
9 September 2019	V3.0	Reformat and minor additions.	Dr Nicholas Marshall, Lead clinician, Acute Pain Team.
22 January 2024	V4.0	Minor alterations.	Dr Keith Mitchell, Lead clinician, Acute Pain Team

All or part of this document can be released under the Freedom of Information Act 2000.

All Policies, Strategies and Operating Procedures, including Business Plans, are to be kept for the lifetime of the organisation plus 6 years.

This document is only valid on the day of printing.

Controlled Document.

This document has been created following the Royal Cornwall Hospitals NHS Trust The

Policy on Policies (Development and Management of Knowledge Procedural and Web Documents Policy). It should not be altered in any way without the express permission of the author or their Line Manager.

Appendix 2. Equality Impact Assessment

Section 1: Equality Impact Assessment (EIA) Form

The EIA process allows the Trust to identify where a policy or service may have a negative impact on an individual or particular group of people.

For guidance, please refer to the Equality Impact Assessment Policy (available from the document library) or contact the Equality, Diversity, and Inclusion Team rcht.inclusion@nhs.net

Information Category	Detailed Information
Name of the strategy / policy / proposal / service function to be assessed:	Acute Post-operative Adult Analgesic – Epidural Neuraxial Blockade Clinical Guideline V4.0
Directorate and service area:	Anaesthetics. Anaesthesia Critical Care and Theatres Care Group.
Is this a new or existing Policy?	Existing
Name of individual completing EIA (Should be completed by an individual with a good understanding of the Service/Policy):	Dr Keith Mitchell, Lead Clinician, Acute Pain Team
Contact details:	01872 252095

Information Category	Detailed Information
1. **Policy Aim - Who is the Policy aimed at?** (The Policy is the Strategy, Policy, Proposal or Service Change to be assessed)	To ensure adequate knowledge and skills to provide safe post-operative epidural analgesia.
2. **Policy Objectives**	To clarify standards and practices.
3. **Policy Intended Outcomes**	Post-operative analgesia provided to required standard and efficacy.
4. **How will you measure each outcome?**	Audit of practice.
5. **Who is intended to benefit from the policy?**	Post-operative patients.

Information Category	Detailed Information
6a. Who did you consult with? (Please select Yes or No for each category)	• Workforce: Yes • Patients/ visitors: No • Local groups/ system partners: No • External organisations: No • Other: No
6b. Please list the individuals/groups who have been consulted about this policy.	**Please record specific names of individuals/ groups:** Anaesthetic Department.
6c. What was the outcome of the consultation?	Approved.
6d. Have you used any of the following to assist your assessment?	**National or local statistics, audits, activity reports, process maps, complaints, staff, or patient surveys:** No.

7. The Impact

Following consultation with key groups, has a negative impact been identified for any protected characteristic? Please note that a rationale is required for each one.

Where a negative impact is identified without rationale, the key groups will need to be consulted again.

Protected Characteristic	(Yes or No)	Rationale
Age	No	
Sex (male or female)	No	
Gender reassignment (Transgender, non-binary, gender fluid etc.)	No	
Race	No	
Disability (e.g. physical or cognitive impairment, mental health, long term conditions etc.)	No	
Religion or belief	No	
Marriage and civil partnership	No	

Protected Characteristic	(Yes or No)	Rationale
Pregnancy and maternity	No	
Sexual orientation (e.g. gay, straight, bisexual, lesbian etc.)	No	

A robust rationale must be in place for all protected characteristics. If a negative impact has been identified, please complete section 2. If no negative impact has been identified and if this is not a major service change, you can end the assessment here.

I am confident that section 2 of this EIA does not need completing as there are no highlighted risks of negative impact occurring because of this policy.

Name of person confirming result of initial impact assessment: Dr Keith Mitchell, Lead Clinician, Acute Pain Team.

If a negative impact has been identified above OR this is a major service change, you will need to complete section 2 of the EIA form available here:
Section 2. Full Equality Analysis