ACUTE PAIN SERVICE
GUIDELINES
(ADULT)

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## CONTENTS

1. Introduction 4
2. Aims 4
3. Objectives 4
4. Patient Controlled Analgesia (PCA)
   - When to discontinue PCA 4
   - Problems with PCA
   - Bibliography
5. Epidural analgesia 14
   - Skin preparation prior to epidural insertion
   - Management of complications or side effects in ward area
   - Discontinuing epidural analgesia
   - The removal of epidural catheter in patient receiving concurrent intravenous heparin infusion
   - Flow chart for the administration of an epidural bolus dose
   - Guidelines for the management of severe local anaesthetic toxicity
   - Bibliography
6. Hourly administration of opioid analgesics 28
   - Intramuscular / subcutaneous / oral analgesia algorithm
   - Bibliography
7. Guidelines for the administration of Intravenous Morphine 33
8. Entonox 36
   - Bibliography
9. Intrathecal Morphine / Diamorphine 39
   - Bibliography
10. Postoperative analgesia in opioid tolerant patients 43
    - Bibliography
11. Management of Sickle Cell Crisis with PCA 45
    - Bibliography
12. Intravenous Ketamine for adults 49
    - Bibliography
13. Peripheral infusion of local anaesthetic in adults 54
    - References
    - Bibliography
14. Storage of Epidural and Peripheral infusion bags 60
1. INTRODUCTION

These guidelines relate to adult acute pain management practices. They are required in order to facilitate safe practice and manage the risks associated with some of the pain relieving strategies that are utilised.

2. AIMS

For patients to receive safe, appropriate pain management tailored to suit the individual patients’ needs.

3. OBJECTIVES

- To promote safe practice that is evidence based and standardised within the clinical areas.
- To provide clinical areas with appropriate information with regards to acute pain management

4. PATIENT CONTROLLED ANALGESIA (PCA)

4.1 Definition

PCA in this instance refers to the self-administration of intravenous opioids for the relief of acute pain in adults. Using a device specifically designed for the purpose (electronic or disposable), the patient is able to administer a predetermined dose of painkiller at frequent intervals, allowing for the wide variation in analgesic requirements.

4.2 Indications

- For the management of acute postoperative pain.
- For the management of those patients who are unable to tolerate oral medication and require frequent intramuscular / subcutaneous injections of opioids to control their pain.
- For the management of pain associated with sickle cell crisis. (see section 11)

  NB. Caution with known opioid dependent patients (see section 10).

  **Inappropriate candidates for PCA are:**

  - Patients who are physically incapable of using the device.
  - Patients who have difficulty in understanding the concept of PCA.
  - Patients who appear reluctant to use the device.

4.3 a Prescription

In addition to the patient’s own drug chart, a dedicated PCA prescription chart should also be completed by the prescriber.

A standard prescription for morphine PCA would be:
Morphine 2mg/ml: 1mg bolus: 5 minute lockout

Morphine pre-filled syringes (2mg/ml) are supplied by pharmacy. The Alaris PCA infusion device has pre-programmed protocols for the use of Morphine, Pethidine, Fentanyl, Remifentanil (for use on obstetrics only) and Ketamine (continuous infusion only). A ‘general’ protocol is available for other drugs that may be used. A paediatric protocol is also available for paediatric use (see separate paediatric guidelines).

University Hospital of Wales (UHW) site: Patients with sickle cell anaemia have individual patient profiles detailing individual analgesic requirements, copies of which are kept on the Haematology Ward (B4H), Acute Pain Service and the Emergency and Assessment Unit.

As a general rule, no other systemic opioids (strong/weak) should be prescribed whilst the patient is using PCA. However, there may be exceptions to this rule in certain patient groups e.g. patients with chronic pain, patients who are under the care of the palliative care team or patients who are opioid tolerant. To ensure that clinical risk is managed effectively, these individual cases must be discussed with the Acute Pain Service so that adequate provision may be made for the follow up of the patient. Naloxone and Cyclizine should be prescribed to combat the potential side effects associated with the use of opioid drugs. Pre-printed labels are available in the anaesthetic rooms and recovery room of the operating theatres for use by the prescriber.

4.3b Balanced analgesia

Balanced analgesia should be considered for all patients receiving PCA. Paracetamol and Diclofenac (if not contraindicated) should be prescribed as a regular prescription. Contraindications to non-steroidal anti-inflammatory drugs (NSAID’s):- known allergy, renal impairment, hypotension, history of peptic ulceration, aspirin sensitive asthma and marked dehydration. Use with caution in the elderly and in those patients with potential or actual coagulopathy.

4.4 Equipment

The Alaris P5000 PCA infusion device is used at the University Hospital of Wales (UHW) and University Hospital Llandough (UHLL). PCA infusion pumps are stored in the main recovery room. A dedicated infusion set with an anti-reflux and anti-syphon valve must be used with all electrical pumps. When the PCA infusion device is no longer required, ward staff should contact the pump library for it to be collected, checked and cleaned prior to return to the recovery room.

Disposable PCA devices are used in the UHW obstetric unit for some patients following Caesarean section. The disposable devices will only require an anti-reflux valve.

4.5 Designated clinical areas & responsibilities

UHLL
Patients receiving PCA may return to the following clinical areas only: W2, W3, W5, Delyth, Anwen, Bethan, HDU, ITU and Cardiff and the Vale Orthopaedic centre (CAVOC).

**UHW**

Patients receiving PCA may return to the following clinical areas only: Trauma wards, surgical wards, B4 Neurosurgery, B5T, B4H, C4 Thoracic, A5 Urology, General Critical Care, Cardiac Critical Care and Ambulatory Care. Nursing staff within these clinical areas are familiar with the management of patients using PCA and the equipment used. Instruction and assessment in the use of PCA infusion devices is mandatory for staff caring for patients with PCA in accordance with the Cardiff and Vale University Health Board Infusion Device Policy 2008.

### 4.6 Initiating treatment & monitoring patients whilst using PCA

As a general rule and in order that patients may obtain maximum benefit from the PCA, they should whenever possible be instructed in the use of PCA prior to surgery. Patients should have access to the relevant patient information leaflet.

The setting up and programming of a PCA device is the responsibility of the anaesthetist, recovery room nurse, the Acute Pain Service and designated trained nursing staff within the Critical Care Areas, in accordance with the Cardiff and Vale Trust Infusion Device Policy. ODPs may not set up and programme the PCA infusion device but they may check the settings with designated staff (see above).

Following surgery, nursing staff in the recovery room will programme the device according to the doctor’s prescription. The patient should be made comfortable using incremental doses of IV analgesia. PCA may then be commenced once the patient is awake and orientated. **On returning the patient to the clinical area, recovery room staff should check the PCA infusion pump settings with the nurse accepting the patient and sign in the appropriate section of the PCA record of administration chart.**

Should PCA be initiated in the ward area, these responsibilities fall to the Acute Pain Service or Obstetric on-call anaesthetist (UHW) or Duty on-call anaesthetist (UHLL).

On return to the ward a PCA care plan should be followed. For the initial 2-hour period, pulse, blood pressure, respiratory rate (recorded over a full minute), oxygen saturation, *pain on movement* and sedation levels should be assessed and recorded every 1/2 hour for 2 hours, 1 hourly for 2 hours then every 2 hours for 48 hours and 4 hourly thereafter if previous observations have been satisfactory.

In the unusual circumstance of patients receiving a concurrent background infusion with PCA, these patients should have their oxygen saturation monitored continuously. If the oxygen saturation level of the patient falls below 94%, the advice in the PCA care plan or troubleshooting guide for PCA must be followed. (The baseline oxygen saturation level of the patient should however be taken...
into consideration and the Acute Pain Service/on-call anaesthetist should be contacted for advice if staff have any concerns). If during the night, the patient is asleep and observations have been satisfactory, it is acceptable to record the respiratory rate only. A recording should be entered on the sedation score chart (S) to indicate that the patient was asleep at the time the observation was made.

The amount of drug used should be recorded hourly on a dedicated PCA record of administration chart by the nurse responsible for the patient. The infusion site should be checked for pain; swelling and leakage of fluid. The PCA infusion device settings should be checked at shift handover and signed in the appropriate section of the PCA record of administration chart.

As a general rule, patients receiving PCA are not nursed in side rooms/cubicles.

Patients using PCA should remain in the ward area and are not permitted to visit other areas unless accompanied by a nurse.

The Acute Pain Service / Obstetric or Duty on-call anaesthetist may be contacted if any problems are encountered.

4.7 Management of complication or side effects

Should any of the following complications or side effects occur, the PCA care plan/guidelines provided in the ward area must be followed and the appropriate action taken.

- Inadequate pain relief.
- Respiratory depression.
- Excessive sedation.
- Nausea and vomiting.
- Itching.

4.8 Discontinuing PCA

The length of time for which patients require PCA is variable. Before deciding to stop PCA, the following points should be considered:

- Level of pain.
- The amount of drug used in the previous 12 hours.
- The patient’s ability to use PCA.
- Patients’ wishes.
- Ability to tolerate free fluids and to absorb alternative prescribed analgesia.

Most patients will require an alternative form of analgesia once the PCA has been discontinued. An initial dose should be given and its effect monitored prior to the PCA being discontinued.

4.9 When to discontinue PCA
The length of time for which patients require PCA after major surgery is variable; 48 hours is average but this will differ between patients and according to the type of surgery. Before deciding to stop PCA, consider the following points:

- **Patient selection:** If the patient is physically incapable of using the device or has poor understanding of the concept after careful explanation, stop PCA and prescribe alternative analgesia.

- **After abdominal surgery:** In most cases, continue until the patient is tolerating free fluids and can absorb oral analgesia.

- **Mobilisation:** Good analgesia can speed mobilisation, (e.g. in patients following spinal surgery) so it is helpful to encourage the patient to use PCA to assist initial attempts to mobilise. If the patient appears too drowsy to mobilise then refer to ‘PCA trouble-shooting guide’.

- **Assess amount of drug used:** The amount of drug used by the patient within the last 12 hours will influence the decision of when to stop PCA.

- **Patient’s wishes:** Ask the patient what he or she feels. If a patient decides that they do not need the machine any longer then respect their wishes, similarly they may need to use the machine for longer than you expect; take into account the amount used during the past 12 hours before making a decision.

Prior to PCA being discontinued, alternative analgesia should be prescribed. A dose should be administered and the effect evaluated.

If in doubt as to whether a patient should continue PCA, please contact:

**UHW**

Acute Pain Service - Bleep 5414

Obstetric on call anaesthetist (out of hours) - Bleep 5101

**UHLL**

Acute Pain Service - Bleep 4560

Duty on-call anaesthetist (out of hours) - Bleep 4800
4.10 PROBLEMS WITH PCA - A trouble-shooting guide for medical & nursing staff

1. What to do if analgesia is inadequate

BEGIN

- Pain score 2 or 3?
  - NO
    - Routine observations.
  - YES
    - Sedation score 0 or 1 +/- Respiratory rate >10?
      - NO
        - Consider Naloxone and seek advice about analgesia*
      - YES
        - Is PCA machine switched on and are the settings correct?
          - NO
            - Call Acute Pain Service or Obstetric / Duty on-call anaesthetist to reset machine.
          - YES
            - Is the patient's intravenous cannula patent?
              - NO
                - Resite cannula.
              - YES
                - Is the patient using the PCA often enough?
                  - NO
                    - Repeat explanation and encourage the patient to use PCA appropriately.
                  - YES
                    - Is the patient receiving regular Paracetamol, Diclofenac or other NSAID (if not contraindicated) in addition to PCA?
                      - NO
                        - Ensure prescribed regularly.
                      - YES
                        - Seek advice from the Acute Pain Team or Obstetric / Duty on-call anaesthetist.

*Refer to Part 2 of ‘Problems with PCA’
2. **Respiratory depression or excessive sedation**

- If the respiratory rate drops to 9/10 per minute, remove PCA button from the patient, give oxygen 15L via a well fitting non-rebreather reservoir mask (ensure reservoir bag inflated) and reassess every 5 minutes until respiratory rate is over 12 per minute.

- If the respiratory rate drops to ≤8 per minute or the sedation score is 3, remove PCA button, give oxygen 15L via a non-rebreather reservoir mask. Support ventilation with a pocket mask/bag valve mask where necessary. Give naloxone in 50mcgs increments* until respiratory rate is 12 or over and sedation level is 0-1. Monitor continuously. Seek advice from the Acute Pain Service or on-call Anaesthetist.

- If patient is not immediately post operative and the sedation score has increased to 2-3 give naloxone in 50mcgs* increments until sedation level is 0-1. Seek advice from the Acute Pain Service or on-call Anaesthetist and inform the surgical team.

- If the SaO₂ falls below 94%, give oxygen 15L via a non-rebreather reservoir mask, if there is no improvement after 5 minutes seek advice from the Acute Pain Service or on-call anaesthetist. (The baseline oxygen saturation level of the patient should be taken into consideration and the Acute Pain Service/on-call anaesthetist should be contacted for advice if staff has any concerns).

*1ml ampoules of Naloxone contain 400mcg
Dilute with 3mls of Normal Saline to make a total of 4mls.
Administer in 50mcg (0.5ml) intravenous increments
- until respiratory rate increases to ≥ 12 / min
- And sedation score is 0-1.

NOTE: Naloxone has a short duration of action. Therefore, the patient should be
Monitored closely for 2 hrs following its administration.
Contact Acute Pain Service or on-call anaesthetist if Naloxone is given.

3. **Itching**

Occasionally opioid drugs may cause itching, particularly of the face. If this distresses the patient it can be treated by:

- IV Naloxone 50mcg used with caution will reverse this side effect of opioids without reversing analgesia.

- Changing the opioid drug from Morphine to Pethidine or vice versa often solves the problem.

- Anti-histamines Chlorphenaramine (Piriton) 4 mg, 4 hourly prn orally (max 24 mg in 24 hours), or if the patient cannot absorb tablets, 10-20 mg
intramuscularly, (max 40 mg in 24 hours) or 10-20mgs intravenously given over 1 minute.

4. **Nausea or vomiting**

   If using PCA causes the patient to feel nauseated:
   
   - *Do not* stop or discourage use of PCA - pain can also cause nausea.
   
   - Do give regular anti-emetic medication (postoperative nausea and vomiting protocol available in clinical area); *Do not* wait until the patient actually vomits.
   
   - If anti-emetic treatment fails, changing from Morphine to Pethidine or vice versa may reduce or eliminate nausea.
   
   - Give regular Paracetamol plus regular Diclofenac if not contraindicated. This may have an opioid sparing effect.

### ANTI-EMETICS & DOSE REGIMEN

See attached postoperative nausea and vomiting protocol Appendix 1 and also in Cardiff & Vale University Health Board - Good prescribing guidelines

5. **Hallucinations**

   This condition may occur as a side effect of opioids. If the patient is distressed by this problem, seek advice from the Acute Pain Service.
BIBLIOGRAPHY


5. EPIDURAL ANALGESIA

5.1 Definition

A low concentration of local anaesthetic usually with an opioid, infused into the epidural space to provide pain relief, without loss of motor function.

5.2 Indications

- Acute postoperative pain.
- Clinical conditions where epidural analgesia is considered to be of benefit to the patient.

Absolute contraindications

- Coagulopathy
  - APTT ratio or INR > 1.4
  - Platelet count < 100
  - Low molecular weight heparin (e.g. Enoxaparin, Clexane) given within last 12 hours if on prophylactic dosing (20 or 40mg) or within last 24 hours if on therapeutic dosing (>40mg)
  - Clopidogrel given within the last 7 days
- Local sepsis
- Allergy to amide local anaesthetics.

Relative contraindication

- If APTT ratio or INR 1.2-1.4.

5.3 Prescription

Epidural analgesia should be prescribed either as a continuous infusion or as Patient Controlled Epidural Analgesia (PCEA). In addition to the patient’s own drug chart, the prescriber should also complete a dedicated epidural prescription chart.

The following pre-filled bags of epidural solution are available for use:

- Bupivacaine 0.1% with either Fentanyl 2mcg or 5mcg per ml
- And
- Bupivacaine 0.1%

No other systemic opioids (strong/weak) should be prescribed whilst the patient is receiving epidural analgesia. However, there may be exceptions to this rule in certain patient groups e.g. patients with chronic pain, patients who are under the care of the palliative care team or patients who are opioid tolerant. Additionally, some patients may receive a local anaesthetic only epidural with a concurrent prescription of an opioid via an alternative route. To ensure that clinical risk is managed effectively, these individual cases must be discussed with the Acute...
Pain Service so that adequate provision may be made for follow up of the patient.

Naloxone and cyclizine should be prescribed to combat the potential side effects associated with the use of opioid drugs. Pre-printed labels are available in the anaesthetic rooms and the recovery rooms for use by the prescriber.

The bags of epidural solution should be clearly labelled, indicating that they are for epidural use only.

Storage of bags of epidural solution. - This differs between UHL and UHW. Please see section 14.0 for specific storage instructions of solution bags.

No bags of epidural analgesia solution should be stored in the operating theatres.

5.4 Equipment

The Abbott Gemstar infusion machine with dedicated infusion line is used across the Trust in designated clinical areas for the delivery of epidural analgesia.

A bacterial filter must always be used. An intravenous cannula must be in situ at all times whilst the patient is receiving epidural analgesia.

When the Gemstar infusion device is no longer required, ward staff should contact the Pump library for it to be collected. Here it will be checked and cleaned prior to return to the Recovery room.

5.5 Designated clinical areas & responsibilities

Adult patients receiving epidural analgesia are able to return to the following wards only:

UHLL - W2, W3, W5, Delyth, Anwen, HDU, ITU and CAVOC.

UHW - B6 trauma, surgical wards, B5T, C4 Thoracic, A5 Urology, General Critical Care and Cardiac Critical Care.

The Acute Pain Service will provide education for nursing staff related to the care of patients receiving epidural analgesia.

Staff should have received the appropriate training and assessment for the use of the specific high-risk infusion device in accordance with the Cardiff and Vale University Health Board policy for the Use of Parenteral Infusion Devices. The nursing staffs is responsible for changing the infusion rates, infusion bags / syringes etc. and for removing the epidural catheter once treatment has been discontinued. There may be occasions when the Acute Pain Service / Obstetric on call anaesthetist will be asked for assistance with these tasks.

Patients with epidural analgesia must not return to any other clinical area other than those specified above.
If a patient is outlying on any other ward pre-operatively, or if epidural analgesia is considered to be the chosen method of analgesia for painful conditions other than for the relief of postoperative pain, then arrangements must be made for the patient to be transferred to one of the designated clinical ward areas listed above. Bed management should be contacted who can assist in resolving any difficulties.

5.6 Initiating treatment and monitoring of patients whilst receiving epidural analgesia

Epidural catheters should ideally be inserted in the recovery room or an anaesthetic room. It may sometimes be necessary to perform this technique in the critical care areas. (A urinary catheter should also routinely be inserted except in orthopaedic patients where this decision will be made at the discretion of the team).

The setting up and programming of the epidural infusion device is the responsibility of the recovery room nurse, the Acute Pain Service or appropriately trained anaesthetist in accordance with the Cardiff and Vale Trust Infusion Device Policy. ODP’s may not set up and programme the infusion device but they may check the settings with designated staff.

In the immediate postoperative period, if the patient is complaining of moderate to severe pain, nursing staff in the Recovery room should contact the appropriate anaesthetist or a member of the Acute Pain Service as a bolus of epidural solution or local anaesthetic may be necessary to settle the patient.

Following appropriate training, nursing staff in the Recovery room and General Critical Care areas will be able to give prescribed boluses (see Section 5.11a and b).

On returning the patient to the clinical area, recovery room staff should check the epidural infusion pump settings with the nurse accepting the patient and sign in the appropriate section of the epidural record of administration chart.

On return to the ward area the epidural care plan should be followed carefully. Observations of pulse, blood pressure, respiration and oxygen saturation level should be initiated at ½ hourly intervals for 2 hours, 1 hourly for 2 hours and then 2 hourly until the epidural analgesia is discontinued. Patients receiving epidural analgesia should have their oxygen saturation levels monitored at the same time as their other observations. If the oxygen saturation level falls below 94%, oxygen should be administered at 15L via a non-rebreather reservoir mask. If there is no improvement after 5 minutes, seek advice from the Acute Pain Service or Obstetric/ Duty on-call anaesthetist. (The baseline oxygen saturation level of the patient should however be taken into consideration and the Acute Pain Service/ Obstetric or Duty on call anaesthetist should be contacted for advice if staff have any concerns).
Pain on movement and sedation levels should also be assessed and recorded on the postoperative observation chart. The patient should be asked to ‘straight leg raise’ each leg 2 hourly to monitor the possible development of excessive motor block. This should be recorded on the observation chart. If the patient is unable to straight leg raise either one or both legs, the Acute Pain Service/On call anaesthetist should be contacted for advice.

The epidural catheter insertion site should be covered with an IV 3000 dressing and should be inspected every 8 hours for presence of pus, inflammation, swelling, tenderness and leakage. The condition of the site should be recorded on the patient’s observation chart and documented in the nursing notes. The patient’s temperature should also be recorded 4 hourly to aid detection of infection. If the epidural catheter insertion site displays any signs of infection, the site is exposed or the filter becomes disconnected, the epidural catheter should be removed (see section 5.9 / 5.10) and the advice on the epidural care plan followed.

The amount of drug infused epidurally should be recorded hourly on the appropriate chart as per infusion device policy by the nurse responsible for that patient.

A member of the Acute Pain Service will visit the patient on the day of epidural insertion, day 1, day 3 and daily thereafter until treatment is discontinued. Patients will be visited more frequently if necessary.

Following insertion of epidural catheter – Miniheparin / low molecular weight heparin (LMWH) should not be administered for 4 hours or Rivaroxaban given for 6 hours.

5.7 Skin preparation prior to epidural insertion

Patient
Explain procedure to patient and position patient

Anaesthetic Assistant

Wear mask
Wash hands thoroughly
Wash procedure trolley with soap and water
Clean trolleys with alcohol wipes and allow to dry before placing pack on trolley
Open all packs and solutions using aseptic technique

Equipment and drugs required for technique

Sterile pack
Sterile gown
Sterile gloves (2 pairs)
Theatre hat and mask
Pink chlorhexidine in 70% alcohol delivered by a pump-squirt bottle
Local anaesthetics – Sterile wrapped lignocaine 1% or 2%
Sterile wrapped 0.9% Saline
Portex minipack plus required needles and syringes
IV 3000 dressing
4 inch Mefix. (Sleek should not be used)
Steri strips

**Anaesthetist**

Wear theatre hat and mask
Identify the anatomy **prior** to skin preparation
Surgical scrub, then wear sterile gown and **‘double’ sterile glove**.
Assistant to squirt back with pink chlorhexidine in 70% alcohol, including the area on the upper back where epidural catheter is to be taped to skin.
Rub the back for ~30 seconds using foam sticks or forceps and sterile swabs, in a circular motion from the centre to the periphery.
Anaesthetist then removes outermost pair of sterile gloves prior to drawing up solutions.
Assistant to squirt area again with pink chlorhexidine in 70% alcohol solution.

Skin must be allowed to dry for **2 minutes** before commencing the procedure.

Use sterile drapes
Following insertion, fix to skin using 2 steristrips, cover with a sterile, transparent, occlusive dressing.
Use 4 inch Mefix to make a window around the dressing and secure epidural catheter up the back.
Ensure that the filter is secured to the front of the patient
Dispose of sharps safely

### 5.8 Management of complications or side effects in ward area

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<tr>
<th>Problem</th>
<th>Action</th>
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<tbody>
<tr>
<td>Inadequate analgesia</td>
<td>Check pump, catheter site and connections for leakage. Increase infusion rate within prescribed limits. If PCEA is being used check patient understanding of using the demand button and ask patient to press the button (perhaps more frequently) Check level of sensory block using ice / ethyl chloride. Seek advice if pain persists despite epidural analgesia infusing at maximum prescribed rate.</td>
</tr>
<tr>
<td>Motor loss</td>
<td>See care plan advice.</td>
</tr>
<tr>
<td>Respiratory rate 9/10 per minute or sedation score 2</td>
<td>Opioid concentration in infusing epidural solution may need decreasing. Give oxygen 15L via a non-rebreather reservoir mask, check and record oxygen saturation and monitor closely. Record respiratory rate and sedation score every 5 minutes until respiratory rate is ≥12 and sedation improves. <strong>Contact APS / Obstetric or Duty on-call</strong></td>
</tr>
<tr>
<td><strong>Respiratory rate ≤8 or sedation score 3.</strong></td>
<td><strong>anaesthetist for advice.</strong></td>
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<tr>
<td>Switch off infusion, give oxygen 15L via non-breather reservoir mask, support ventilation with a pocket mask/bag valve mask where necessary, check and record oxygen saturation and respiratory rate and monitor closely. Give IV naloxone (*refer to section 4.2, re administration), until sedation score 0-1 and respiratory rate &gt; 12. Monitor continuously. <strong>Contact APS/Obstetric or Duty on-call anaesthetist for advice.</strong></td>
<td></td>
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| **Hypotension** | **Do not assume that epidural is causing hypotension. Inform H/O Check for signs of hypovolaemia. Increase IV infusion rate if necessary and as prescribed. **Call APS / On call Obstetrics or Duty Anaesthetist Ephedrine may be required. Ensure available. (**To dilute Ephedrine:** Into a 10ml syringe dilute 1ml of Ephedrine 30 mgs/ml with 9mls of Normal Saline). This would be administered by a Doctor in 3mg (1 ml) increments. To evaluate effect blood pressure should be recorded in two minute cycles. |

| **Nausea & Vomiting** | **Give anti-emetic as prescribed, according to postoperative nausea and vomiting protocol and reassess.** |

| **Itching** | **Give IV Naloxone 50mcg if epidural analgesia is thought to be responsible. This may need to be repeated p.r.n. **Seek advice from APS/On-call anaesthetist if the problem persists. |

| **Urinary retention where patient has not routinely been catheterised** | **Insert urinary catheter, however if orthopaedic patient, discuss firstly with orthopaedic team as antibiotic cover will be required.** |

| **Inflamed epidural insertion site / pus at epidural site / back pain.** | **Stop infusion Seek advice from APS / on call anaesthetist and refer to epidural care plan. If it is necessary to remove the epidural catheter then remove according to section 2.9 / 2.10. Send catheter tip and wound swab from epidural site to microbiology for culture and sensitivity, ensure all clinical details are documented. Inform H/O.** |
Suspected epidural site infection.

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<tr>
<td>Contact APS / Obstetric or Duty on-call anaesthetist for advice. The epidural catheter will need to be removed according to section 5.9 / 5.10. Vancomycin or Teicoplanin should be started along with either a Cephalosporin or Ciprofloxacin and reviewed when C+S results are available. The patient will be reviewed regularly by the APS.</td>
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Confirmed epidural site infection

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<tr>
<td>Treat with antibiotics as per microbiology advice in accordance with C+S results. The APS will review the patient regularly.</td>
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Epidural catheter disconnected from filter.

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<tr>
<td>Seek immediate advice from APS / On call anaesthetist. The epidural will need to be discontinued and removed and must not be reconnected. See epidural care plan.</td>
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Epidural dressing becomes removed/dislodged.

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<tr>
<td>Refer to the epidural care plan. Seek advice from the APS/On-call anaesthetist if necessary.</td>
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5.9 Discontinuing Epidural Analgesia

Epidural catheters should be removed after a maximum of 5 days because of the risk of infection. However, in exceptional circumstances it may necessary to delay removal; this should be managed on an individual patient basis and the APS must be involved. Before removing the catheter, the following points should be considered and the APS informed.

- Level of pain & infusion rate.
- Ability to tolerate free fluids and tolerate analgesia via alternative routes.
- At least 12 hours should elapse between the removal of the epidural catheter and the last prophylactic dose of Low Molecular Weight Heparin (e.g. enoxaparin = clexane 20mg or 40mg) or 4 hours if Minihep is being used.
- If the patient is receiving a therapeutic dose of LMWH (e.g. enoxaparin >40mg) then 24 hours should elapse between the last dose given and the time that the epidural catheter is removed.
- The next dose of LMWH (enoxaparin) or Mini-hep should not be administered for at least 4 hours following the removal of the epidural catheter.
- At least 18 hours should elapse between the removal of the epidural catheter and the last dose of rivaroxaban.
- The next dose of rivaroxaban should not be administered for at least 6 hours following the removal of the epidural catheter.
• If the patient has a coagulopathy or is receiving an intravenous heparin infusion, seek advice from the APS. See 5.10.

• The epidural catheter should not be removed if the platelet count is less than 100. However, if there is a high risk of epidural related infection, specific advice should be sought from the Consultant Obstetric Anaesthetist.

• Prior to removal of the epidural catheter the epidural infusion should be stopped for approximately 4 hours, alternative analgesia should be prescribed and administered and its efficacy assessed. If the patient is comfortable, the epidural catheter may then be removed.

• Consideration may be given to the removal of the patient’s urinary catheter once the epidural catheter has been removed.

The nurse responsible for the patient should check the epidural site every day for 3 days and conduct SLR for 24 hours post removal of the epidural catheter. The APS should be contacted regarding any concerns.

If the patient is discharged before this time, it is the responsibility of the discharging nurse to ensure that either the district nurse conducts this check or the patient / carer is educated to check the site and seek medical advice if necessary. If the patient experiences any new back pain, altered sensation to lower limb and or any unexpected urinary incontinence then they should present themselves to Accident and Emergency immediately.

5.10 REMOVAL OF EPIDURAL CATHETER IN PATIENT RECEIVING CONCURRENT INTRAVENOUS HEPARIN INFUSION
• Liaise with the surgical team regarding the proposed removal of the epidural catheter.

• Stop intravenous heparin for 2 hours.

• Obtain blood sample for APTT.

• APTT ratio should be 1.4 or less. If APTT ratio is greater than 1.4 send further sample for repeat APTT in 1 hour. (Keep heparin switched off).

• If APTT ratio is 1.4 or less, remove epidural line as per guidelines.

• Restart heparin 2 hours following the removal of the epidural catheter.

Clopidogrel or warfarin should not be commenced whilst a patient is receiving epidural analgesia.

Any queries contact Acute Pain Service:
5.11a **Epidural bolus dose (Anaesthetic staff)**

Anaesthetic staff administering epidural boluses in the clinical areas should observe the following points:

- A test dose should be administered initially.
- 0.1% Bupivacaine plus Fentanyl from the infusion pump should be used initially and particularly if the reason for pain is secondary to inadequate spread of LA.
- 0.25% Bupivacaine solution should only be used if the above has not worked and the patient describes breakthrough pain despite adequate spread of LA.
- The visit and the administered epidural top-up should be documented in the medical notes and on the patient’s prescription chart.
- **The anaesthetist should stay on the ward for at least 15 minutes following the administration of a top-up, to manage any subsequent hypotension.**

If it is necessary to leave to attend an emergency, please ensure that the ward nursing staff have the correct bleep number and also that of the duty anaesthetist, in case further help or assistance is required.
5.11b FLOW CHART FOR THE ADMINISTRATION OF AN EPIDURAL BOLUS DOSE

Bolus doses may be given by Acute Pain Services nurses, and nurses who have received specific training and been assessed as competent by the Acute Pain Service. The patient should be in bed when a bolus dose is given. The patient must have patent IV access.

START

Pain score 2 or 3?

Yes

No

Continue to assess pain with other observations.

Maximum rate infusing and patient using bolus facility (if applicable)?

Yes

No

Consider increasing infusion rate +/- encourage patient to use the bolus facility.

Check epidural site, catheter intact.

Yes

No

Contact Acute Pain Service or Obstetric/Duty on-call anaesthetist.

Patient able to Straight Leg Raise (SLR)?

Yes

No

Seek advice from Acute Pain Service or Obstetric/Duty on-call anaesthetist.

Patient’s respiratory rate 10 or over per minute and/or patient’s sedation score 0 or 1?

Yes

No

Consider administering IV Naloxone.

Patient’s blood pressure >100 mm HG systolic or within 20% of their pre-operative blood pressure?

Yes

No

Assess location of pain. Check level of block using ice/ethyl chloride. Either administer 3 ml bolus test dose if infusion only is used. Document time given. Or if PCEA being used then administer 5ml bolus, document time given. Reassess after 5 minutes. Administer further 5 ml bolus

Monitor pain score, respiratory rate, sedation score, blood pressure and pulse every 5 minutes for 20 minutes.

Pain score 2–3?

Has patient received 2 bolus doses in 1 hour?

Yes

No

Contact Acute Pain Service or Obstetric/Duty on-call anaesthetist.
5.12 Guidelines for the Management of severe local anaesthetic toxicity

5.12a Signs of severe toxicity:
- Sudden loss of consciousness, with or without tonic-clonic convulsions
- Cardiovascular collapse: sinus bradycardia, conduction blocks, asystole and ventricular tachyarrhythmia’s may also occur
- Local anaesthetic (LA) toxicity may occur some time after the initial injection

5.12b Immediate management plan:
- Stop injecting the LA/or stop the infusion
- Call for help
- Maintain the airway and, if necessary, secure it with a tracheal tube
- Give oxygen 15L via a non-rebreather reservoir mask and ensure adequate lung ventilation (hyperventilation may help by increasing pH in the presence of metabolic acidosis)
- Confirm or establish intravenous access
- Control seizures: give a benzodiazepine, thiopental or propofol in small incremental doses
- Assess cardiovascular status throughout

5.12c Management of cardiac arrest associated with LA injection:
- Start cardiopulmonary resuscitation (CPR) using standard protocols
- Manage arrhythmias using the same protocols, recognising that they may be very refractory to treatment
- Prolonged resuscitation may be necessary; it may be appropriate to consider other options:
  - Consider the use of cardiopulmonary bypass if available
  - Consider treatment with lipid emulsion.

5.12d Intralipid 20% is available in the following clinical areas:

**UHW:**
- MAIN THEATRE RECOVERY (2 x 500ml bags)
- SURGICAL SHORT STAY UNIT, RECOVERY (2 x 500 ml bags)
- EMERGENCY UNIT, RESUS AREA (2 x 500 ml bags)
- DELIVERY SUITE, THEATRE 1 & 2 (1 bag each)
- OPHTHALMIC THEATRE, THEATRE SUITE 1 (2 x 500 ml bags)

**UHLL:**
- CAVOC THATRES, RECOVERY AREA (2 bags)
- GYNAECOLOGY THEATRE, RECOVERY AREA (2 bags)
- THEATRES GROUND FLOOR, RECOVERY AREA (1 bag)
- THEATRES 1ST FLOOR, RECOVERY AREA (1 bag)

5.12e Treatment of cardiac arrest with lipid emulsion:
- Give an intravenous bolus injection of intralipid® 20% 1.5 ml per kg given over 1 min
- Continue CPR
- Start intravenous infusion of intralipid® 20% at 0.25 ml per kg per min
- Repeat the bolus injection twice at 5 minute intervals if an adequate circulation has not been restored
• After another 5 minutes, increase the rate to 0.5 ml per kg per min if an adequate circulation has not been restored
• Continue infusion until a stable and adequate circulation has been restored

5.12f Remember
• Continue CPR throughout treatment with lipid emulsion
• Recovery from LA-induced cardiac arrest may take > 1 hour
• Propofol is not a suitable substitute for intralipid®
• Replace your supply of Intralipid® 20% after use

5.12g Follow up action:
• Report cases to the National Patient Safety Agency (via www.npsa.nhs.uk).
• If possible, take blood samples into a plain tube and a heparinised tube before and after lipid emulsion administration and at 1 hourly intervals afterwards. Ask the laboratory to measure LA and triglyceride levels (these have not been reported in a human case of LA intoxication treated with lipid).
• Please read the following notes.

5.12h Notes
• Intralipid® 20% has been shown to reverse LA-induced cardiac arrest in animal models and in human case reports and its use has been reported in the treatment of life-threatening toxicity without cardiac arrest. Its therapeutic potential has been highlighted by National Patient Safety Agency.
• Intralipid® 20% 1000 ml should be immediately available in all areas where potentially cardiotoxic doses of local anaesthetics are given, along with guidelines for its use.
• The use of intralipid® in this way is relatively novel. Therefore, future laboratory and clinical experiences are likely to dictate further refinement of the method.
• The guideline document will be reviewed regularly and updated when necessary. Updated versions will be available on http://www.aagbi.org and http://lipidrescue.org.
• Further educational matter is available at http://lipidrescue.org.

Bibliography


Hosein IK. (Director of Infection Prevention and Control and Associate Medical Director, Cardiff and Vale NHS Trust) (2005).  *Personal Communication by letter to I. Bowler (Consultant Anaesthetist, Cardiff and Vale NHS Trust)*


Royal College of Anaesthetists, Royal College of Nursing, the Association of Anaesthetists of Great Britain and Ireland, the British Pain Society and the European Society of Regional Anaesthesia and Pain Therapy. (2004). *Good Practice in the Management of Continuous Epidural Analgesia in the Hospital Setting*. London: RCA


6. **HOURLY ADMINISTRATION OF OPIOID ANALGESICS**

6.1 **Definition**

The safe administration of intramuscular / subcutaneous / oral opioid analgesics (Pethidine should not be administered subcutaneously) on an hourly p.r.n. basis, using an algorithm driven by information derived from pain assessment and recorded observations of pulse, blood pressure, respiration and level of sedation. *Please use morphine as first choice.*

6.2 **Indications**

- For the management of severe acute pain, in particular for those patients where PCA or epidural analgesia is not suitable.

6.3a **Prescription**

Morphine, Oxynorm or Pethidine should be prescribed 1 hourly p.r.n. according to the patient’s weight, age and physical condition. For example:

<table>
<thead>
<tr>
<th>Oral Morphine: (sevredol/oramorph)</th>
<th>Morphine IM / SC</th>
<th>Pethidine IM</th>
</tr>
</thead>
<tbody>
<tr>
<td>(starting) Dose: 5-10mg</td>
<td>Weight 40-65kg</td>
<td>Weight 40-65kg</td>
</tr>
<tr>
<td>Oral Oxynorm: (Starting) Dose: 2.5 – 5mg (liquid 5mgs/5mls)</td>
<td>Dose 7.5mg</td>
<td>7.5mg</td>
</tr>
<tr>
<td></td>
<td>66-100kg 10mg</td>
<td>50mg</td>
</tr>
<tr>
<td></td>
<td>(Use 10mgs/1ml concentration)</td>
<td>100mg</td>
</tr>
</tbody>
</table>

If the patient’s weight falls outside these limits, advice should be sought from the Acute Pain Service:

**UHLL:** Bleep 4560  **UHW:** Bleep 5414

Naloxone and Cyclizine must also be prescribed to combat the potential side effects associated with the use of opioid drugs. Pre-printed labels for the prescription of IM/SC analgesia are available on the surgical wards and in the Recovery room for the prescriber. The route via which these drugs are administered must not be altered on the prescription chart.

6.3b **Balanced analgesia**

Balanced analgesia should be considered for all patients receiving intramuscular / subcutaneous / oral analgesia. Paracetamol and Diclofenac (if not contraindicated) should be prescribed as a regular prescription. Contraindications to NSAID’s:- known allergy, renal impairment, hypotension, history of peptic ulceration, aspirin sensitive asthma and marked dehydration. Use with caution in the elderly and in those patients with potential or actual coagulopathy.

6.4 **Equipment**
It is recommended that every patient receiving strong opioid analgesia **must have an intravenous cannula in situ** via which to administer Naloxone. Should the patient require frequent injections, a subcutaneous needle (e.g. 21/23 gauge ‘Butterfly’) may be inserted into the subcutaneous tissue over the deltoid muscle to avoid repeated needle stabs. Please refer to Section 6.8.

### 6.5 Designated clinical areas & responsibilities

The algorithm (Section 3.6) may be used on surgical wards where staffs have been instructed in its safe use. It is the nursing staff’s responsibility to make the appropriate observations / pain assessment and record on the observation chart before administering each dose of opioid. Nursing staff should not use the algorithm if they have not received appropriate instruction.

### 6.6 Initiating treatment & monitoring of patients receiving hourly opioids

The prescriber may prescribe hourly intramuscular/subcutaneous/oral opioids. If a subcutaneous needle is thought to be of benefit, a trained nurse who has received instruction may insert it.

Observations of blood pressure, respiratory rate (respirations should be counted for a full minute) and sedation levels should be made and **recorded** together with pain assessment before each dose of opioid is given. Pain assessment should be maintained 2 hourly whilst the algorithm (Section 6.9) is being used.

### 6.7 Management of complications or side effects

Should the patient develop hypotension, respiratory depression or have a sedation score of 2 or over, the instructions on the algorithm should be followed immediately.

If the patient complains of severe pain despite repeated hourly injections/oral doses of opioids, check that pr/po/iv Paracetamol and pr/po Diclofenac (if not contraindicated) have been prescribed and administered as a regular prescription.

Seek advice from the Acute Pain Service or Obstetric / Duty on-call anaesthetist if these measures do not resolve the problem.

### 6.8 Opioid analgesia via in-dwelling subcutaneous ‘butterfly’ needle

If a patient is requiring frequent injections, a 21/23G Butterfly needle may be used to avoid frequent needle stabs. This should be sited in the subcutaneous tissue over the deltoid muscle of the arm. It should be secured with a transparent dressing so that the skin entry site can be seen. A label “Subcutaneous needle” should be attached to avoid any confusion with an IV cannula.

**Procedure for administration of analgesia via sub-cutaneous needle:**

1. Draw up the appropriate dose of Morphine (10mgs/1ml) and label clearly. Only morphine should be used by this route, Pethidine is too irritant.

2. in a separate 1ml syringe draw up normal saline.
3. Attach the Morphine syringe to the tubing of the ‘Butterfly needle’ and inject drug very slowly.

4. Exchange the empty Morphine syringe for the one containing saline. Slowly flush the cannula then replace and re-secure the blind hub.

If the injection site becomes inflamed, the needle should be replaced. If you need instruction in either inserting the needle or administering the drug via this route, please contact:

**Acute Pain Service**

UHW

Acute Pain Service - Bleep 5414

Obstetric on call anaesthetist (out of hours) - Bleep 5101

UHLL

Acute Pain Service - Bleep 4560

Duty on-call anaesthetist (out of hours) - Bleep 4800

**The Acute Pain Service algorithm for the hourly administration of intra-muscular/subcutaneous/oral opioids should be followed to ensure the safe administration of opioid analgesia.**
6.9 Intramuscular/Subcutaneous/Oral Opioid Algorithm Guidelines for Analgesia

It is recommended that patients receiving strong opioid analgesics should have an intravenous cannula in situ

Please use morphine as first choice

(Seek advice if weight less than 40kg or more than 100kg)

<table>
<thead>
<tr>
<th>Oral Morphine hourly dose as prescribed. (Starting dose 5-10mgs)</th>
<th>Morphine hourly IM/SC dose</th>
<th>Pethidine hourly IM dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Oxynorm hourly as prescribed: (Starting dose 2.5 –5mg)</td>
<td>Weight</td>
<td>Dose</td>
</tr>
<tr>
<td></td>
<td>40-65 kg</td>
<td>7.5 mg</td>
</tr>
<tr>
<td></td>
<td>66-100 kg</td>
<td>10 mg</td>
</tr>
</tbody>
</table>

Maximum 1grm/24 hours

BEGIN

Pain score 2 or 3

YES

Routine Observations

NO

Count resp. rate. Seek advice re. analgesia

Sedation Score 0 or 1?

YES

If resp. rate ≤ 8 and/or sedation score 2-3 give Naloxone (* see below). Contact Acute Pain Service or on-call anaesthetist.

NO

Respiratory rate greater ≥ 10.

YES

Systolic blood pressure greater than 100?

YES

Has more than 60 minutes elapsed since last dose of analgesia?

YES

Give further IM/SC/Oral dose of analgesia as prescribed. Regular paracetamol and diclofenac should be prescribed and given if not contraindicated. Contraindications to NSAID's: - known allergy, renal impairment, hypotension, history of peptic ulceration, aspirin sensitive asthma and marked dehydration.

NO

Wait until 60 minutes has elapsed or if necessary contact the Acute Pain Service/obstetric on-call anaesthetist for advice.

NO

Resp. rate < 8/min +/- sedation score 2 or over.

Into a 5ml syringe – dilute 1ml Naloxone (400mcg) with 3ml Normal Saline (=total 4ml). Give in 0.5ml (50mcg) increments, until patient’s respiratory rate is ≥ 12/min and sedation score is 0-1 oxygen 15L via reservoir mask, support ventilation with a pocket mask/bag valve mask where necessary.

Begin

YES

NO

YES

NO
Observations required when using IM / SC / oral routes of administration of strong opioids. Pulse, blood pressure, respiratory rate, sedation and pain scores should be recorded before every administration of opioid and maintained 2 hourly whilst algorithm in use.

**Bibliography**


7. GUIDELINES FOR THE ADMINISTRATION OF INTRAVENOUS MORPHINE

7.1 Definition
The safe administration of Intravenous Morphine using an algorithm driven by information derived from documented pain score, sedation score, respiratory rate, pulse, blood pressure, nausea score and oxygen saturation levels.

7.2 Indications
For the management of severe acute pain in patients who are unable to tolerate oral analgesia.

7.3 Prescription
Morphine should be prescribed, the dose depending on the patient’s age and clinical condition. Naloxone and Cyclizine must also be prescribed to combat the potential side effects associated with the use of opioids.

Examples of suitable prescriptions are:
Morphine 1mg – 5mg every 2 ½ minutes. Maximum 10mg in 30 minutes.

7.4 Balanced analgesia
Balanced analgesia should be considered for all patients receiving intravenous opioid analgesia. Paracetamol and Diclofenac (if not contraindicated) should be prescribed as a regular prescription and wherever possible should be given orally. Rectal preparations are available for both medications and an IV preparation of Paracetamol is also available.

Contraindications to NSAID’s:- known allergy, renal impairment, hypotension, history of gastric ulceration, clotting disorder, aspirin sensitive asthma and marked dehydration.

7.4 Equipment
Every patient receiving Morphine analgesia, must have an intravenous cannula in situ – not only for the administration of the opioid, but also for administration of Naloxone if necessary.

7.5 Designated clinical areas & responsibilities
Intravenous morphine may be administered in the Recovery room, Critical Care Unit, Emergency Unit, and Coronary Care Unit. Staff should have been instructed in the safe administration of intravenous strong opioids.

7.6 Initiating treatment & monitoring of patients receiving intravenous Morphine
The doctor may prescribe the appropriate dose of intravenous Morphine analgesia and the trained nurse may administer it following the IV Morphine administration algorithm.

It is the responsibility of the nursing staff to monitor and document pain assessment, respiratory rate (respiratory rate should be recorded for a full minute),
sedation score, pulse, blood pressure, oxygen saturation level and nausea and vomiting level prior to administering each dose of Morphine. These observations and recordings should continue at 5 minute intervals for 10 minutes after each Morphine dose or for longer if the patient's condition dictates.

7.8 Management of complications or side effects

The Acute Pain Service algorithm (Section 7.10) should be followed to ensure the safe administration of intravenous Morphine. Should the patient develop hypotension, respiratory depression or have a sedation score of 2 or more, the instructions on the algorithm should be followed immediately.

7.9 Procedure for drawing up intravenous Morphine:

- In a 10ml syringe
- Draw up Morphine 10mg/10ml (= 1mg/ml)
- Label clearly

Contact numbers for Acute Pain Service and out of hours cover

UHW

Acute Pain Service - Bleep 5414

Obstetric on call anaesthetist (out of hours) - Bleep 5101

UHLL

Acute Pain Service - Bleep 4560

Duty on-call anaesthetist (out of hours) - Bleep 4800
7.10 Intravenous Morphine administration algorithm
(Seek advice if weight less than 40kg or more than 100kg)

*Respiratory rate < 8/min +/- sedation score >2.*
Into a 5ml syringe, draw up 400mcg (1ml) of Naloxone, add 3mls normal saline and give in 50 microgram (0.5ml) increments until respiratory rate >12/minute and sedation score is less than 2. Give oxygen 15L via a reservoir mask, use pocket mask/bag valve mask to support ventilation where necessary.

BEGIN

Pain score
2 or 3

NO

Routine Observations

YES

Sedation score <2

NO

Count resp. rate. Seek advice re. analgesia

YES

Respiratory rate greater than 10/min.

NO

Consider giving Naloxone (see * top left hand box).
Seek medical advice

YES

Systolic blood pressure greater than 100?

NO

Seek medical advice

YES

Has more than 2.5 minutes elapsed since last dose of analgesia?

NO

Wait until 2.5 minutes has elapsed or if necessary seek medical advice.

YES

Give further IV opioid analgesia as prescribed.
Regular Paracetamol and Diclofenac should be prescribed and given if not contraindicated.
Contraindications to NSAID’s (eg Diclofenac): - known allergy, renal impairment, hypotension, history of peptic ulceration, aspirin sensitive asthma, clotting disorder and marked dehydration.

IV Morphine
Dose 1 - 5mg
Given at
2.5 – 5 minute intervals
Max of 10mg in 30mins

WAIT
2.5 minutes
Monitoring patients while receiving intravenous morphine

Respiration rate, sedation and pain scores, pulse and blood pressure should be recorded before administration of Morphine and at 5 minute intervals for 10 minutes following administration. A patient should remain in the area where the IV Morphine has been administered for 30 minutes following the last dose administered.

8. ENTONOX

8.1 Definition

Entonox consists of 50% oxygen: 50% nitrous oxide. It is a powerful painkilling gas that can be self-administered by the patient through a special demand apparatus. With a rapid onset of action and short duration, Entonox is an extremely safe method of pain relief with minimal side effects.

8.2 Indications

- Short painful procedures e.g.
  - Removal of surgical drain.
  - Removal or insertion of wound packs.
  - Physiotherapy.
  - Painful examination/treatment.

Contraindications

- Impaired conscious level / head injury.
- Pneumothorax.
- Suspected intestinal obstruction.
- Decompression sickness.
- Chronic lung disease.
- Maxillo facial injuries.

8.3 Prescription

It is not necessary for Entonox to be prescribed by a doctor. However, Entonox may only be used by a qualified nurse who has received training and is competent in its administration.

8.4 Equipment

UHLL: Entonox demand apparatus is stored on W2. Other areas that require Entonox should complete the appropriate lending book and ensure the safe return of the cylinder. A nurse or porter should transport the cylinder.

UHW: Entonox is available in the treatment room of most surgical wards. Most patients prefer to use a mouthpiece rather than a facemask. These are available from CSSD; a sterile mouthpiece should be used for each patient. A disposable, single use bacterial filter should be used with the Ohmeda or Oxylitre
demand valve and the Sabre Ease equipment to prevent cross infection. These are a non-stock item available from procurement. After use the Sabre Ease demand valve parts should be dismantled and washed according to the manufacturer's instructions. The hose can be cleaned if necessary with soap and water. The black anti-static tubing of the Ohmeda system should be cleaned regularly and/or washed immediately if visibly contaminated.

8.5 Designated clinical areas & responsibilities

Entonox may be used anywhere within the hospital if there are suitably trained qualified nurses to supervise its administration. As Entonox is a form of patient-controlled analgesia, it is the nurse's responsibility to instruct the patient in its use.

8.6 Initiating treatment & monitoring of patients

If Entonox is thought to be of benefit, treatment may be initiated by a qualified nurse, particularly in those situations indicated above. No specific observations should be made, as side effects are minimal. However, it is extremely important that the patient, rather than the nurse, hold the facemask or mouthpiece during administration of the gas. If excessive sedation does occur, the patient will drop the mask or mouthpiece and immediately breathe room air.

As a safety precaution, it is recommended that driving or the use of machinery should not be undertaken until 12 hours have elapsed after Entonox administration. The patient may drive home 30 minutes after being administered Entonox, provided you have assessed their competence to drive and the patient feels fit and well enough to do so. Care is needed if they have had other medication.

Please refer to the Entonox data sheet for more information should Entonox be required for any situation other than those indicated above.
Bibliography


Latto IP, Molloy MJ, Rosen M (1973). Arterial concentration of nitrous oxide during intermittent patient controlled inhalation of 50% nitrous oxide in oxygen (Entonox) during the first stage of labour. British Journal of Anaesthesia. 45: 1029-34


9. **INTRATHECAL MORPHINE / DIAMORPHINE.**

9.1 **Definition**
Intrathecal Morphine/Diamorphine (spinal Morphine/Diamorphine) is given into the cerebro spinal fluid (CSF).

9.2 **Indications**
- Patients likely to experience moderate severe postoperative pain following surgery under sub-arachnoid anaesthesia;
- Patients able to tolerate oral analgesia 18-24 hours postoperatively following sub-arachnoid anaesthesia and intrathecal Morphine / Diamorphine.

9.3 **Prescription**
The dose of intrathecal opioid given will depend on age, weight and procedure, at the discretion of the anaesthetist.

*Morphine 100 -750mcg or Diamorphine 500mcg – 1mg (used more frequently at UHLL)*

- The intrathecal Morphine / Diamorphine must be the sterile solution prepared by the Trust pharmacy.
- Each ampoule should be double wrapped and only used as a single dose.

The anaesthetist must place a sticker on the patient’s drug chart to indicate that the patient has received spinal Morphine / Diamorphine.

The following should also be prescribed:

Diclofenac (Voltarol) 50mg tds po / pr for 48 hours as a **regular prescription**.

*Contraindications* to Diclofenac are:
- Known allergy
- Renal impairment
- History of peptic ulceration
- Asthma which is sensitive to Aspirin/ NSAID’s (asthmatics who have previously taken NSAID’s without exacerbation of their asthma may have diclofenac)
- Patients who are markedly dehydrated (e.g. decreased urine output +/- decreased blood pressure).

N.B. Diclofenac should be used with caution in the elderly and in those patients with potential or actual coagulopathy.

Paracetamol 1g QDS (at 06.00, 12.00, 18.00, 22.00), iv / po / pr as a regular prescription.

Tramadol 50-100mg 4-6 hourly prn for rescue analgesia.
9.4 Designated clinical areas and responsibilities

Patients who have received intrathecal opioids may return to:
UHW - Trauma wards, surgical wards, ambulatory care and critical care areas.
UHLL - W2, Delyth ward, Anwen ward, Bethan ward, W3, W5, ITU, HDU and CAVOC.

Patients should not be returned to any other clinical area and they should not be nursed in single rooms unless there are extenuating circumstances.

The patient must have an intravenous cannula in situ for the 24 hours following the administration of intrathecal Morphine/Diamorphine.

N.B. Separate guidelines exist for patients who have undergone Caesarean section.

9.5 Monitoring of patients

On return to the ward area, observations of pulse, blood pressure, pain, sedation, nausea scores, respiratory rate and oxygen saturation level should be initiated ½ hourly for 2 hours, 1 hourly for 2 hours and then 2 hourly thereafter for 24 hours as per intrathecal analgesia care plan.

9.6 Thromboprophylaxis

Following intrathecal anaesthesia/analgesia wait at least 6 hours before administering the first rivaroxaban dose.
### 9.6 Management of complications and side effects within 18 hours of receiving intrathecal Morphine / Diamorphine.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td>Inadequate analgesia Pain score &gt; 2</td>
</tr>
<tr>
<td><strong>2</strong></td>
<td>Sedation score 2-3, +/- respiratory rate &lt;8 /min</td>
</tr>
<tr>
<td><strong>3</strong></td>
<td>Nausea and vomiting</td>
</tr>
<tr>
<td><strong>4</strong></td>
<td>Itching</td>
</tr>
<tr>
<td><strong>5</strong></td>
<td>Urinary retention.</td>
</tr>
</tbody>
</table>

**Intrathecal (spinal) opioids and subsequent administration of other strong opioids.**

If analgesia is still inadequate following the above action (1) please contact the Acute Pain Service / Obstetric / Duty Anaesthetist. It may be necessary to set up a PCA or give IM / SC or oral strong opioids.

*Patients can develop respiratory depression up to 18 hours after receiving intrathecal morphine/diamorphine.

** Refer to Section 5.10 re: administration of Naloxone for respiratory depression / sedation.
Bibliography


10. POSTOPERATIVE ANALGESIA IN OPIOID TOLERANT PATIENTS (THERAPEUTIC AND NON THERAPEUTIC).

Patients who are already receiving opioid drugs either for therapeutic or non-therapeutic reasons pose a particular problem. Whatever the reason for the opioid use, it is important to continue that administration during the postoperative period. Patients receiving opioids for chronic painful conditions should continue to receive their drugs in a suitable format. Advice should be sought from the Acute Pain Service regarding the best way of managing these patients so that their analgesic requirements are met and to also ensure that clinical risk is managed effectively in the area that the patient is returning to postoperatively. As normal bodily function returns (in particular gut function), it should be possible to convert the patient back to their existing route and type of medication. This assumes that the operation was not intended to eliminate the underlying chronic painful condition.

For patients taking opioids for non-therapeutic uses, the principle is the same, except there may be a need for an initial period of titration and conversion to ‘standard opioids’. Postoperative management is similar but care is needed regarding the security of the opioid availability as abuse by the patient and their visitors is possible. The Acute Pain Service also liaises with Darren Robertson Substance misuse Nurse and the Community Drug and Alcohol team regarding the management of these patients.

If regional or other local anaesthetic techniques are to be used, it is important to remember that if that technique obliterates the underlying painful condition, the respiratory side effects may be unmasked. Careful observation is necessary and such techniques may be best avoided. It is essential that the patients be nursed in a High Dependency setting with regular observations. A similar problem can arise with non-therapeutic users but is less likely as there is no painful focus on which the local anaesthetic may act. It is essential to recognise that opioid users have a need to continue on their medication but at the same time have the same postoperative requirements as any other patient.
Bibliography


11. MANAGEMENT OF SICKLE CELL CRISIS WITH PATIENT CONTROLLED ANALGESIA (PCA)

11.1 Definition

PCA in this instance refers to the self-administration of intravenous opioids for the relief of pain during sickle cell crisis. Using an infusion device specifically designed for the purpose, the patient is able to administer a predetermined dose of painkiller at frequent intervals, whilst in some circumstances, simultaneously receiving a background infusion.

11.2 Indications

- For the management of pain associated with sickle cell crisis.

11.3a Prescription

Patients who have been previously admitted to UHW with sickle cell crisis have individual protocols for their pain management. Copies of these are kept on B4H, Emergency Unit, and Assessment Unit and by the Acute Pain Service.

Not all patients with sickle cell crisis require PCA.

On admission, the Acute Pain Service or Obstetric on-call anaesthetist should be contacted to prescribe and set up the PCA machine. In addition to the patient’s own drug chart, a dedicated Sickle Cell PCA prescription chart should also be completed. Only a member of the Acute Pain Service or the On-call anaesthetist should make amendments to the PCA prescription or the settings of the PCA infusion device. Naloxone and Cyclizine should also be prescribed to combat the potential side effects associated with the use of opioid drugs.

11.3b Balanced analgesia

Balanced analgesia should be considered for all patients receiving PCA. Paracetamol and Diclofenac should be prescribed (if not contraindicated) as a regular prescription. Contraindications to NSAID’s: - known allergy, renal impairment, hypotension, history of peptic ulceration, aspirin sensitive asthma and marked dehydration. Use with caution in the elderly and in those patients with actual or potential coagulopathy.

11.4 Equipment

The P5000 PCA infusion devices are kept in the recovery room. A dedicated infusion set with an anti-reflux and anti-syphon valve must be used. Morphine pre-filled syringes (2mg/ml) are supplied by pharmacy. The Alaris PCA infusion device has pre-programmed protocols for the use of Morphine, Pethidine, Fentanyl, and Remifentanil (for use on obstetrics only) and Ketamine (continuous infusion only). A ‘general’ protocol is available for other drugs that may be used. A paediatric protocol is also available for paediatric use (see separate paediatric guidelines)
When the PCA infusion device is no longer required, ward staff should contact the pump library for it to be collected, checked and cleaned prior to return to the Recovery room.

11.5 Designated clinical areas & responsibilities

Patients admitted with sickle cell crisis should ideally be nursed on B4 Haematology. If PCA is required then nursing staff on B4 Haematology are familiar with the management of patients using PCA and the equipment used. Instruction and assessment in the use of PCA infusion devices is mandatory for staff caring for patients with PCA in accordance with the Cardiff and Vale University Health Board Infusion Device Policy 2008. Only staffs who have received appropriate training in the use of the PCA infusion device may change syringes. There may be times when the Acute Pain Service/On-call anaesthetist may be asked to perform this task.

(If PCA is required and a bed is unavailable on B4H then the patient may be admitted to the following clinical areas only: - Trauma wards, Surgical wards, General Critical Care and Cardiac Critical Care.)

11.6 Initiating treatment & monitoring of patient using PCA

Patients admitted with sickle cell crisis requiring PCA should be referred to the Acute Pain Service or the Obstetric on-call anaesthetist who will prescribe and set up the PCA. For optimal benefit to be obtained from the PCA, instruction in its use must be provided and reiterated intermittently. A sickle cell care pathway document should also have been commenced.

Oxygen therapy should be commenced. Pulse, blood pressure, respiratory rate (respirations counted for a full minute) oxygen saturation, pain, sedation and nausea levels should be monitored and recorded 1/2 hourly initially and then 1 hourly. Once stable, respiratory rate, oxygen saturation levels, pain, sedation and nausea scores, should be recorded 2 hourly in addition to any other necessary observations. If during the night, the patient is asleep and observations have been satisfactory, it is acceptable to record the respiratory rate only. A recording should be entered on the sedation score chart (S) to indicate that the patient was asleep at the time the observation was made.

In patients receiving a concurrent background infusion with PCA, oxygen saturation levels should be monitored continuously. If their oxygen saturation level falls below 94%, the advice in the PCA care plan or Section 4.10.2 of these guidelines should be followed. (The baseline oxygen saturation level of the patient should however be taken into consideration before the Acute Pain Service / Obstetrics on-call anaesthetist is contacted for advice).

It is very important that these patients are observed closely as some patients will be receiving very high doses of opioids.

Patients using PCA should remain in the ward area and are not permitted to visit other areas unless accompanied by a nurse.
The amount of drug used should be recorded hourly on a dedicated PCA record of administration chart by the nurse responsible for the patient. The infusion site should be checked for pain, swelling and leakage of fluid. The PCA infusion device settings should be checked at shift handover and signed in the appropriate section of the PCA record of administration chart.

Following the commencement of PCA, patients will be visited regularly by a member of the Acute Pain Service. However, the Acute Pain Service / Obstetrics Anaesthetist may also be contacted if any problems are encountered.

11.7 Management of complications or side effects

Should any of the following complications or side effects occur, the guidelines provided in the ward areas must be followed and the appropriate action taken.

- Inadequate pain relief.
- Respiratory depression.
- Excessive sedation.
- Nausea and vomiting.

11.8 Discontinuing PCA

The length of time for which patients require PCA is variable, it is the decision of the Acute Pain Service in consultation with the ward team when the PCA should be discontinued, the following points would be considered:

- Level of pain.
- The amount of drug used in the previous 12 hours.
- The patient’s ability to use PCA
- Patients’ wishes.
- Ability to tolerate free fluids and to absorb alternative prescribed analgesia.

Most patients will require an alternative form of analgesia once the PCA has been discontinued. An initial dose should be given and its effect monitored prior to the PCA being discontinued.

Bibliography


12. INTRAVENOUS KETAMINE FOR ADULTS: AN ADJUVANT FOR SHORT TERM USE IN ACUTE PAIN

12.1 Introduction

Ketamine is an anaesthetic which if used in sub anaesthetic doses has analgesic properties. Opioids when used alone in large doses for a prolonged period may induce tolerance which can lead to increased postoperative pain. Ketamine can prevent the development of tolerance and hyperalgesia by reducing the incidence of wind up.

**Summary of Evidence on Ketamine analgesia in Acute Pain**

Level 1 (*Evidence obtained from a systematic review (or meta-analysis) of all the relevant RCTs)*:
- Ketamine is most effective as a continuous low-dose infusion for acute pain management.
- Ketamine has “preventive” but not “pre-emptive” analgesic effects.

Level II (*Evidence obtained from at least one properly designed RCT)*:
- Ketamine is most effective as an “antihyperalgesic”, “antiallodynic”, or “tolerance-protective” treatment.
- Ketamine is effective as a “rescue analgesic” for acute pain unresponsive to opioids.
- Ketamine reduces acute wound hyperalgesia and allodynia.
- Ketamine may reduce the incidence of chronic post surgical pain following laparotomy, thoracotomy and mastectomy.
- Ketamine reduces lower-limb ischaemic rest pain, peripheral neuropathic pain, and spinal cord injury pain.

Level III (*Evidence obtained from non-randomised controlled trials)*:
- Ketamine may reduce severe chronic phantom limb pain.

Level IV (*Evidence obtained from case series)*:
- Ketamine improves analgesia in Opioid-tolerant patients

(Source: Adapted from: National Health and Medical Research Council (NHMRC). How to use the evidence; assessment and application of scientific evidence. 2000).

12.2 Aim

The procedure is to aid the safe and effective administration of ketamine as a continuous intravenous infusion. This procedure is for short term use in adult patients (over the age of 16 years) for acute pain.

12.3 Objectives
• To promote safe practice that is evidence based and standardised within the clinical areas

• To provide clinical areas with appropriate education and information with regards to this mode of analgesia.

12.4 Definition

This procedure is defined as a continuous titratable intravenous infusion of ketamine.

12.5 Indications

• Severe ischaemic pain,
• Postoperative amputation,
• Opioid tolerant patients
• Pain that is not opioid responsive
• Neuropathic pain

Contraindications

• Hypertension
• Severe cardiac disease,
• Stroke
• Raised intracranial pressure,
• Head trauma,
• Pre-eclampsia and eclampsia.
• Epilepsy

Caution

• Renal failure
• Liver failure
• Predisposition to hallucinations or nightmares
• Pregnancy
• Alcoholism
• Confirmed or suspected drug abuse.

12.6 Prescription

Ketamine must be prescribed by an anaesthetist or intensivist using the pre-printed label and affixed on the as required side of the drug chart. A standard prescription for the ketamine infusion is:
• 200 mg ketamine in 50 mls of Normal Saline.
• Concentration: 4 mg/ml
• Continuous rate range 2-8 mgs/hr (0.5-2 mls/hr).
• Maximum limit of 32 mg in 4 hours.

The Alaris P5000 infusion device has a pre-programmed protocol for a ketamine infusion, which can be titrated according to the patients’ pain score and analgesic requirements.

The ketamine infusion should not exceed 5 days unless the acute pain service stipulate otherwise.
12.7 Balanced analgesia

The ketamine infusion will be used as an adjuvant to opioids. Paracetamol, strong or weak opioids, non-steroidal anti-inflammatory drugs, (if appropriate) and local anaesthetics will be used concurrently with the ketamine infusion.

As ketamine has an opioid sparing effect, the opioid dose may need to be decreased in order to avoid over sedation or respiratory depression.

12.8 Resources & equipment

- In order to prevent unauthorised access of ketamine the Alaris P5000 pump must be used. The P5000 infusion device has a pre-programmed protocol for the use of Intravenous ketamine.
- An anti-syphon infusion set must be used.
- Staff must have received training and have been assessed on the use of this specific device.
- The patient must have intravenous access.

12.9 Responsibilities & training

Patients who require Intravenous ketamine need to be cared for in surgical wards where nursing staff have received education in regards to the use of Intravenous ketamine via the Alaris P5000.

Patients should not be returned to any other clinical area and they should not be nursed in single rooms unless there are extenuating circumstances.

12.10 General principles

The setting up and programming of the intravenous ketamine infusion via the Alaris P5000 is the responsibility of the Acute Pain Service or an appropriately trained anaesthetist in accordance with the Cardiff and Vale University Health board Infusion Device Policy.

12.11 Nursing management

- Following connection of the Alaris P5000, the person responsible for setting up the device should check the infusion device against the qualified nurse caring for the patient.
- On commencing the ketamine infusion a ketamine care plan must be followed. For the initial 2 hours following the commencement of the infusion: pulse, blood pressure, respiratory rate (recorded for a full minute) oxygen saturations, pain on movement and sedation levels should be assessed and recorded every ½ hour, then every 1 hour until the ketamine infusion has been discontinued.
- The patient will be reviewed at least once a day by a member of the acute pain team until the ketamine infusion has been discontinued.

- Any confusion that is observed in the patient should be documented and reported to the Acute Pain Service/Obstetric Anaesthetist.

- The infusion rate and the amount left in the syringe should be recorded hourly on a dedicated infusion chart by the nurse responsible for the patient.

- The infusion site should be checked for pain swelling and leakage of fluid.

- The P5000 infusion device settings should be checked at shift handover and on changing the syringe and signed on the infusion chart.

- Patients are not permitted to leave the ward with a ketamine infusion.

### 12.12 Management of complications and side effects

<table>
<thead>
<tr>
<th>Problem</th>
<th>Action</th>
</tr>
</thead>
</table>
| Inadequate analgesia                         | - Check infusion device, catheter site and connections for leakage  
                                              - Administer prescribed analgesics e.g. Paracetamol, NSAID, weak/strong opioid if not contra-indicated  
                                              - Has the infusion been increased?  
                                              - Seek advice if pain persists                                                                                                                                 |
| Over sedation or suspected respiratory depression | - **Stop the Ketamine infusion.** Contact Acute Pain Service – Bleep 5414/Obstetric anaesthetist – Bleep 5101 or duty on-call anaesthetist for advice – Bleep 6000.  
                                              - Stop all other medication that could be contributing to sedation  
                                              - Attempt to rouse the patient  
                                              - If apnoeic: call the arrest team on 2222, administer bag valve mask/pocket mask ventilation with 15L oxygen attached.  
                                              - If breathing; maintain airway, monitor oxygen saturations and administer oxygen via non-rebreather reservoir mask at 15L.  
                                              - Check circulation. If there are no signs of life: call the arrest team on 2222 and resuscitate as per CPR guidelines.  
                                              - Administer naloxone if opioid toxicity is suspected and the patient is receiving |
<table>
<thead>
<tr>
<th>Concurrent Opioids.</th>
<th>Dysphoria problematic or distressing</th>
</tr>
</thead>
</table>
| • Call APS /Obstetric Anaesthetist for urgent review. | • Reduce ketamine infusion rate  
| | • Contact APS/obstetric anaesthetist to review. |

12.13 Potential side effects
- Changes in sensory perception
- Increased confusion.
- Hypertension
- Nausea and Vomiting.

12.14 Discontinuing the Ketamine infusion
- The decision to cease the ketamine infusion should be made in consultation with the Acute Pain Team/ Obstetric Anaesthetist.
- When ketamine is used the order in which the analgesia is being weaned must be discussed with the Acute Pain Team.
- When the infusion has been discontinued the ketamine must be disposed of according to the trust infusion policy.

Bibliography


*National Health and medical Research Council (NHMRC)*. (2000). How to use the evidence: assessment and application of scientific evidence. AusInfo, Canberra, Australia


13. **PERIPHERAL INFUSION OF LOCAL ANAESTHETIC IN ADULTS**

13.1 **Introduction**

This procedure relates to the administration of a peripheral infusion of Local Anaesthetic (LA) infused into an area of the body.

Epidural infusions are not included in this procedure.

Local anaesthetics exert their effect as analgesics by the blockade of sodium channels and hence impeding neuronal excitation and/or conduction.

This procedure is required in order to facilitate safe practice and manage risks associated with this pain relieving strategy.

13.2 **Aim**

The aim of this procedure is for adult patients (over the age of 16 years) to receive a safe and effective peripheral infusion of local anaesthetic for the relief of acute postoperative pain or following trauma.

13.3 **Objectives**

- To promote safe practice that is evidence based and standardised within the clinical areas
- To provide clinical areas with appropriate education and information with regards to this mode of analgesia.

13.4 **Definition**

This procedure is defined as a continuous infusion of local anaesthetic (LA) into an area of the body that excludes epidural infusions.

13.5 **Indications**

- Acute postoperative pain
- Acute pain following trauma
- Adult patients over the age of 16 years

**Absolute contraindications**

- Patient refusal
- Local sepsis
- Allergy to local anaesthetics

**Relative contraindications**

- Coagulopathy (including thrombocytopenia)
13.6 Prescription

- A pre-printed label will be available to stick on the PRN side of medication chart
- Additional analgesia and anti-emetics should be prescribed
- Any specific monitoring other than routine observations as described in section 7.1 must be specified
- Infusion rate will be prescribed by an anaesthetist

13.7 Resources & equipment

- A dedicated infusion device must be used. Staff must have received training for this specific device
- If a disposable device is used, it must be primed by pharmacy and made available by local arrangement with pharmacy.
- The use of either an epidural type catheter or a Soaker Catheter are acceptable for the delivery of LA
- An intravenous cannula must be in situ at all times whilst the patient is receiving LA analgesia.

13.8 Responsibilities & training

Adult patients receiving continuous LA analgesia should return only to wards where staff have been appropriately trained. It is a mandatory requirement within Cardiff & Vale University Health Board that any personnel using infusion devices must undergo training and competency assessment (please refer to Policy for the Use of Parenteral Infusion Devices). Training is available via Clinical Engineering (UHW, Ext. 5678).

Pain study days are provided by the Acute Pain Team every month for Registered Nurses. In addition, training opportunities for Health Care Support Workers are provided every 2 months.

13.9 General principles

- Due consideration must be given to the practice of obtaining consent and ascertaining the mental capacity of the patient prior to the procedure. Information on consent and Mental Capacity Act toolkits are available on the Trust intranet system and within relevant policies
- The LA catheter will be inserted under aseptic conditions
- If a disposable device is used, the priming of the pump will be carried out by pharmacy in accordance with the Medicines and Healthcare products Regulatory Agency recommendations (MHRA, 2007).
- The LA catheter insertion site must be covered with an IV 3000 dressing unless the wound dressing is covering the site.
• The anaesthetist or surgeon is responsible for attaching the infusion device to the catheter.

13.10 Nursing management

• On returning the patient to the clinical area, recovery room staff must check the infusion device against the prescription with the nurse accepting the patient and sign in the appropriate section of the record of administration chart. Check that alternative analgesia and anti-emetics have been prescribed.

• On return to the ward area, the care plan for the delivery of LA must be followed carefully. Observations of pulse, blood pressure, respiration and oxygen saturation level should be undertaken at ½ hourly intervals for 2 hours and then 4 hourly until the LA analgesia is discontinued. Other observations must be monitored and documented as required by the clinical condition of the patient. Temperature monitoring requirements are described below.

• Pain on movement and sedation levels should also be assessed and recorded on the postoperative observation chart.

• The LA catheter insertion site must be inspected 4 hourly and at each shift change for presence of pus, inflammation, tenderness and leakage. The condition of the site must be recorded on the patient's observation chart and documented in the patient’s medical records. Any concerns must be reported to an appropriate member staff in order that action can be taken.

• The patient's temperature must also be recorded 4 hourly to aid detection of infection. If the LA catheter insertion site displays any signs of infection, or the catheter becomes disconnected from the infusion device at any time, the LA catheter should be removed.

• A member of the Acute Pain Service will usually visit the patient on the day of LA catheter insertion and day 1. Patients will be visited more frequently if necessary.

• Any clinical concerns about the LA catheter or insertion site must be reported to an appropriate member of staff in order that action can be taken at the earliest opportunity.

13.11 Management of complications or side effects in ward area

<table>
<thead>
<tr>
<th>Problem</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate analgesia</td>
<td>• Check infusion device, catheter site and connections for leakage</td>
</tr>
<tr>
<td></td>
<td>• If IV PCA is also being used, check the patient’s understanding and compliance</td>
</tr>
</tbody>
</table>
| Suspected site infection | **Stop infusion. Contact APS/Obstetric or Duty on-call anaesthetist for advice**  
| | - The catheter will need to be removed (Refer to the Nursing Care Plan). Send the catheter tip and wound swab from the insertion site to microbiology for culture and sensitivity. Ensure all clinical details are documented on the request form.  
| | - It may be necessary for antibiotics to be prescribed and administered accordingly.  
| | - The patient will be reviewed regularly the APS.  
| | - The patient’s surgical team will need to be informed of the suspected infection and action taken which will also need to be clearly documented in the nursing and medical records. |

| Suspected Local Anaesthetic Toxicity (refer to the Nursing Care Plan) | **Stop infusion and contact the Duty on call Anaesthetist** |

| Loss of motor function | **Stop Infusion**  
| | **Call APS or Duty on-call Anaesthetist** |

| Catheter disconnected from infusion device | **Seek immediate advice from APS / On-call anaesthetist**  
| | - The LA infusion should be discontinued and removed. It must not be reconnected.  
| | Refer to the Nursing Care Plan. |

| Catheter dressing becomes removed/dislodged | **Refer to the Nursing Care Plan**  
| | **Seek advice from the APS / On-call anaesthetist if necessary** |

### 13.12 Discontinuing LA analgesia
- LA catheters should be removed on instruction from an Anaesthetist or Acute Pain Service  
- Inform the patient that the return of normal sensation may take several hours  
- Ensure the patient has appropriate analgesia to maintain adequate pain relief following removal of the catheter
• Remove the catheter under strict aseptic conditions and apply an IV 3000 dressing

• At least 12 hours should elapse between LA catheter removal and the most recent prophylactic dose of Low Molecular Weight Heparin (LMWH) e.g. enoxaparin (Clexane) 20mg-40mg. If the patient is receiving a therapeutic dose of LMWH e.g. enoxaparin >40mg, 24 hrs should elapse between the most recent dose and catheter removal. The next dose of LMWH should not be administered for at least 4 hours following catheter removal. If the catheter has been placed in a patient with a known coagulation disorder, including thrombocytopenia, the timing of removal of the catheter must be discussed with the Anaesthetist who prescribed the LA infusion. If this is not possible, the situation must be discussed with the on-call Anaesthetist or the Acute Pain Service.

• The coloured tip of the LA catheter must be noted to be present at removal of the catheter as this indicates complete removal. If, on removal of the catheter, the coloured tip is absent the on-call anaesthetist must be informed immediately.

Document actions including the presence of the coloured catheter tip on removal in the medical records.

References


Bibliography


Hoenecke HR, jr, Pulido PA, Morris BA et al. (2002). The efficacy of continuous bupivicaine infiltration following anterior cruciate ligament reconstruction. *Arthroscopy.* 18 : 854-858


Klein SM, Grant SA, Greengrass SA et al. (2000). Interscaline brachial plexus block with a continuous catheter insertion system and a disposable infusion pump. *Anaesth Analg.* **91** : 1473-1478


### 14. STORAGE OF LOCAL ANAESTHETIC SOLUTIONS FOR EPIDURAL AND PERIPHERAL NERVE BLOCK INFUSIONS

#### University Hospital of Wales

<table>
<thead>
<tr>
<th>WARD AREA</th>
<th>RECOVERY</th>
</tr>
</thead>
</table>
| **FENTANYL 2 / 5 micrograms/ml with 0.1% BUPIVACAINE**  
- Solution bags to be stored in a dedicated CD cupboard | **FENTANYL 2 / 5 micrograms/ml with 0.1% BUPIVACAINE**  
- Solution bags to be stored in a dedicated CD cupboard |
| **0.1% BUPIVACAINE only**  
** (for epidural use only)**  
- Solution bags NOT to be stored on the ward  
- Solution bags available day and night from the recovery room | **0.1% BUPIVACAINE**  
** (for epidural use only)**  
- Solution bags to be stored in a clearly labelled, dedicated, secure cupboard  
- Not to be stored in anaesthetic rooms or theatres |
| **0.125% / 0.25% BUPIVACAINE**  
** (for peripheral nerve block infusions only)**  
- Solution bags NOT to be stored on the ward  
- If an additional bag of solution is required in the ward area this must be ordered from pharmacy on a named patient basis  
- To minimise the risk of wrong route error the solution bag must be used immediately when it arrives on the ward. | **0.125% / 0.25% BUPIVACAINE**  
** (for peripheral nerve block infusions only)**  
- Solution bags to be stored in a clearly labelled, dedicated, secure cupboard  
- Not to be stored in anaesthetic rooms or theatres |

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#### University Hospital of Llandough

<table>
<thead>
<tr>
<th>WARD AREA</th>
<th>RECOVERY</th>
</tr>
</thead>
</table>
| **FENTANYL 2 / 5 micrograms/ml with 0.1% BUPIVACAINE**  
- Solution bags to be stored in a dedicated CD cupboard | **FENTANYL 2 / 5 micrograms/ml with 0.1% BUPIVACAINE**  
- Solution bags to be stored in a dedicated CD cupboard |
| **0.1% BUPIVACAINE**  
** (for epidural use only)**  
- Solution bags NOT to be stored on the ward  
- Solution bags available from | **0.1% BUPIVACAINE**  
** (for epidural use only)**  
- Solution bags to be stored in a clearly labelled, dedicated, secure cupboard |
the recovery area during day time
- Out of hours please contact site practitioner to retrieve bag from Emergency cupboard.

<table>
<thead>
<tr>
<th>0.125% / 0.25%BUPIVACAINE (for peripheral nerve block infusion only)</th>
<th>0.125% / 0.25%BUPIVACAINE (for peripheral nerve block infusions only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Solution bags NOT to be stored on the ward.</td>
<td>- Solution bags to be stored in a clearly labelled, dedicated, secure cupboard</td>
</tr>
<tr>
<td>- If an additional bag of solution is required in the ward area this must be ordered from pharmacy on a named patient basis</td>
<td>- Not to be stored in anaesthetic rooms or theatres</td>
</tr>
<tr>
<td>- To minimise the risk of wrong route error the solution bag must be used immediately when it arrives on the ward.</td>
<td></td>
</tr>
<tr>
<td>- Out of hours please contact site practitioner to retrieve bag from Emergency cupboard.</td>
<td></td>
</tr>
</tbody>
</table>

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**NO BAGS OF SOLUTION CONTAINING LOCAL ANAESTHETIC SHOULD BE STORED IN THE OPERATING THEATRES OR ANAESTHETIC ROOMS**

15. **RESOURCES**
- Administrative time
- Infusion devices – pump library, maintenance, upgrading and consumables

16. **TRAINING**

It is a mandatory requirement within Cardiff & Vale NHS Trust that any personnel using infusion devices, including PCA and PCEA, undergo training and competency assessment (please refer to Policy for the Use of Parenteral Infusion Devices). Training is available through Clinical Engineering (UHW 5678).

Pain Study Days are provided by the Acute Pain Team every month primarily for Registered Nurses however these can be multi professional if required. Study days are also provided for Health Care Support Workers.

14. **IMPLEMENTATION**

These guidelines are an update to previous guidelines. Throughout the training days reference is made to the document. These guidelines are written for the multidisciplinary team.
18. EQUALITY IMPACT AND ASSESSMENT

An equality impact assessment has been undertaken to assess the relevance of this policy to equality and potential impact on different groups, specifically in relation to the General Duty of the Race Relations (Amendment) Act 2000 and the Disability Discrimination Act 2005 and including other equality legislation. The assessment identified that the policy presented a low risk to the Trust.

19. FURTHER INFORMATION

For any further information or clarification in relation to Acute Pain Service Guidelines (Adult) pain management practices please contact Susan Mogford Lead Nurse Pain Management Services extension 5449 or the Acute Pain Team on Bleep 5414.

20. AUDIT

Compliance with these guidelines will be audited continuously using a formic database. Findings of the audit will be discussed with each relevant Directorate.

21. DISTRIBUTION

These guidelines will be available on the Trust Intranet.
APPENDIX 1
Treatment of PONV in adults

**Potential causes of nausea:**
- Dehydration
- Low/high blood glucose
- U&E imbalance
- Morphine sensitivity (contact acute pain service)
- Antibiotic/drug therapy
- Pain
- Anxiety
- Hypotension
- Hypoxia
- Ileus

**Please allow a minimum of 1 hour to establish treatment failure.**
Regular assessment of treatment is essential.
N.B PONV should only affect the patient for around 72 hours post op.
**APPENDIX 2: Abbreviations and acronyms**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>APS</td>
<td>Acute Pain Service</td>
</tr>
<tr>
<td>APTTT</td>
<td>activated partial thromboplastin time</td>
</tr>
<tr>
<td>CAVOC</td>
<td>Cardiff and Vale Orthopaedic Centre</td>
</tr>
<tr>
<td>CSF</td>
<td>cerebrospinal fluid</td>
</tr>
<tr>
<td>GRM</td>
<td>gram</td>
</tr>
<tr>
<td>HO</td>
<td>House Officer</td>
</tr>
<tr>
<td>IM</td>
<td>intramuscular</td>
</tr>
<tr>
<td>INR</td>
<td>international normalised ratio</td>
</tr>
<tr>
<td>IV</td>
<td>intravenous</td>
</tr>
<tr>
<td>KG</td>
<td>kilogram</td>
</tr>
<tr>
<td>LA</td>
<td>local anaesthetic</td>
</tr>
<tr>
<td>LMWH</td>
<td>low molecular weight heparin</td>
</tr>
<tr>
<td>Mcg</td>
<td>microgram</td>
</tr>
<tr>
<td>Mg</td>
<td>milligram</td>
</tr>
<tr>
<td>Min</td>
<td>minute</td>
</tr>
<tr>
<td>MI</td>
<td>millilitre</td>
</tr>
<tr>
<td>NSAID</td>
<td>non-steroidal anti-inflammatory drug</td>
</tr>
<tr>
<td>ODP</td>
<td>operating department practitioner</td>
</tr>
<tr>
<td>PCA</td>
<td>patient-controlled analgesia</td>
</tr>
<tr>
<td>PCEA</td>
<td>patient-controlled epidural analgesia</td>
</tr>
<tr>
<td>PO</td>
<td>oral route</td>
</tr>
<tr>
<td>PONV</td>
<td>postoperative nausea and vomiting</td>
</tr>
<tr>
<td>PR</td>
<td>rectal route</td>
</tr>
<tr>
<td>Prn</td>
<td>as needed</td>
</tr>
<tr>
<td>QDS</td>
<td>four times daily</td>
</tr>
</tbody>
</table>

**UHB Ref No:** UHB 011  
**Version No:** 1
SC  subcutaneous
SLR  straight leg raise
TDS  three times daily
UHLL  University Hospital LLandough
UHW  University Hospital of Wales