MULTIDISCIPLINARY GUIDELINES FOR ADULT PERIPHERAL NERVE BLOCK & CONTINUOUS WOUND INFILTRATION

Policy Owner:	**SBU HB Pain Management Service**
Approved by:	**Clinical Support Services Directorate - Anaesthetics & Critical Care**
Ratified by:	**SBUHB Medicines Management Group**
Issue Date:	**November 2013 [1]**
Revision Date:	**June 2022**
Review Date:	**June 2025**

Summary of updates:

Section/Page	Update
2017 changes	Section 2: Page 3 - Change of wording to Acute-on-chronic pain Section 4: Page 4 - Removal of detail regarding Paracetamol & NSAIDs, references to specific guidelines on COIN Section 7: Page 6 - Added detail on changing infusions with Grey McKinley device
2022 changes	- All reference to ABMU HB has been changed to SBU HB. - All reference to Princess of Wales Hospital specific guidelines have been removed - Content page amended to reflect page changes Section 1 – Page 5 - Removal of 'Quadratus Lumborum as an example of compartment block - Addition of ESP and removal of pectoralis as an example of inter fascial plane blocks - Addition of Local infiltration analgesia (LIA) or intra-articular catheter as an example of direct infusion into surgical wound - Addition of reference to ESP COIN Guidelines (pending publication) Section 3 – Page 6 - Coagulation considerations changed to include new anti-coagulation medication Section 4 – Page 7 & 8 - Addition of requirement for separate chart for each individual infusion used - Hyper links to other APS guidelines removed as out of date Section 5 – Page 8 & 9 - Addition of grey PNB electronic pump labeled CADD-Solis to the infusions devises section - Change the maximum fill volume to minimum fill volume of 80% of the device capacity (e.g. minimum 220ml for a 275ml device) for the elastomeric pump - Addition of requirement for elastomeric device to be labeled with patients details - Addition of details requiring that 'the regulating filter' must be placed outside of clothing and bedding

	- Addition of detail specifying that 'bacterial/viral filter' should be securely taped to the patient, in a similar way to the epidural filter - ANTT added as the recommended way to fill the elastomeric pump Section 7 – Page 8 - Replacement of 'grey McKinley@ device' with 'PNB labelled CADD-Solis' pump Section 13 - Contact details moved to the beginning of the document on to the content page - Remaining sections relabeled to reflect removal of section 13 Appendix 2 Page 17 - Continuous Nerve Block elastomeric pump filling procedure for anesthetists and APS has been changed to reflect current ANTT practices and the current recommended procedure for filling the pump

Contact Details

For advice and training regarding this guideline, contact SBUHB Acute Pain Service at Morriston Hospital.

Office/direct line	34612
CISCO	23997

Out-of-hours contact the hospital on-call anaesthetists via switchboard

NERVE BLOCK / WOUND INFILTRATION

Epidural infusions are not included in this procedure [for epidural analgesia refer to specific SBUHB Guidelines for Epidural Analgesia in Adults].

1. Introduction

This procedure relates to the administration of a peripheral infusion of Local Anaesthetic [LA] infused either for nerve/plexus/compartment block or wound infiltration for peri-operative analgesia in adults. Local anaesthetics exert their effect as analgesics by blocking sodium channels and hence impeding neuronal excitation and/or conduction.

To optimise the analgesia from a LA infusion, the catheter for LA infusion must be placed in close proximity to the nerve or nerve plexus to be blocked. This is generally achieved by the anaesthetist [or surgeon] at time of surgery. The nerve or nerve plexus may be located either by use of ultrasound, electrical stimulation, landmark or direct vision at the time of surgery.

The following are suitable for continuous block by LA infusion:

- Plexus e.g. brachial or lumbar plexus
- Compartment e.g. Fascia Iliaca Block [FICB] **[see COIN for FICB Guideline]**
- Inter-fascial planes e.g. Transversus Abdominis Plane [TAP], Serratus Anterior Plane [SAP] and Erector Spinae Plane [ESP] **[see COIN for ESP Guideline]**
- Individual peripheral nerve blocks e.g. Sciatic, femoral etc.
- Other site of infusion as indicated e.g. Paravertebral, intrapleural, intercostal
- Direct infusion into a surgical wound e.g. Local Infiltration Analgesia (LIA) or intra-articular catheter

2. Indications

Regional anaesthetic blocks/infusions are used to provide LA to a discrete area of body for the management of postoperative pain in adults. It may also be helpful for pain management of non-surgical patients.

- Acute postoperative pain
- Acute pain following trauma
- Acute-on-chronic pain

3. Contraindications

- Infection over insertion site
- Allergy to local anaesthetic drugs
- Inability to consent e.g. cognitive impairment or refusal

3.1 Coagulation Considerations[1]

- Anticoagulation with Warfarin [INR≥1.4] – relative contraindication depending on the site of the nerve block, decision to be made by anaesthetist on benefit versus risk rationale.

- Anti-platelet therapy with Aspirin is acceptable, with no additional precautions necessary; however, other anti-coagulation therapy depends on the following considerations:
  - Dipyridamole – No additional precautions required after drug administered for block performance or whilst LA catheter in place; however, **need to delay drug administration for 6-hours following block performance or LA removal**
  - Clopidogrel – **Must be omitted for 7 days prior to block performance;** Not recommended whilst LA catheter in place and need to delay drug administration for 6-hours following block performance or LA catheter removal
  - Rivaroxaban prophylaxis [CrCl>30ml.min [1,2]]
    - Not to be administered 18-hours before the block performance
    - Do not administer drug whilst LA catheter in place
    - Wait 6-hours following catheter removal before next dose
  - Rivaroxaban treatment [CrCl>30ml.min [1,2]]
    - Not to be administered 18-hours before the block performance
    - Do not administer Rivaroxaban whilst LA catheter in place
    - Wait 6-hours following catheter removal before next dose
  - Dabigatran prophylaxis or treatment
    - CrCl > 80 ml.min[1]
      Not to be administered 48 hours before the block performance
    - CrCl 50 - 80 ml.min[1]
      Not to be administered 72 hours before block performance
    - CrCl 30 – 50 ml.min[1]
      Not to be administered 96 hours before block performance
    - Do not administer Dabigatran whilst LA catheter in place
    - Wait 6-hours following catheter removal before next dose

4. Prescription

In addition to the patient's own prescription chart, the dedicated **Adult Continuous Peripheral Nerve Block / Wound Infiltration Supplementary Administration Chart [see appendix 1]** must be completed by the prescribing anaesthetist and be available for the nurse to check against the disposable elastomeric device**. If multiple infusion devices are to be used, a separate chart is required for each device.**

Regular balanced analgesia, i.e. Paracetamol +/- NSAID should be prescribed for all patients receiving LA infusion[2].

- **Refer to CID 1246: Multidisciplinary Clinical Guidelines for the use of Paracetamol in adult over 16 years[3]**
- **Refer to CID 1272: Multidisciplinary Clinical Guidelines for the management of Acute and Complex Pain in Patient over 16 years[4]**

Other systemic opioids [IV or PO] may be administered as prescribed by the anaesthetist whilst the patient is receiving LA infusion if required for additional pain relief.

- The anaesthetist should ensure **naloxone and antiemetic's** have been prescribed to combat potential side effects [respiratory depression and nausea & vomiting] associated with the use of strong opioids.
  Pre-printed labels are available in Recovery Room or refer to IV PCA chart [if patient also receiving PCA opioids].

Please refer to the British National Formulary [BNF] for further drug information

5. Equipment

5.1 Infusion Devices[5]

- Continuous nerve block infusions are delivered via a disposable elastomeric device i.e. Blue Box Medical Ltd 'Autofuser': 275ml volume and fixed infusion rate [5ml/hr] or using a grey 'PNB' labelled CADD Solis pump.
- Elastomeric devices have to be filled to minimum volume of 220ml [80% of their capacity] using Aseptic Non Touch Technique (ANTT) in the theatre environment by the initiating anaesthetist / surgeon or Acute Pain team CNS and labelled appropriately with patients details **[see appendix 2 for instructions how to fill Autofusers]**
- Elastomeric devices need to be connected to the patient by the initiating

anaesthetist or surgeon initially, the bacterial filter should be connected to the regional anaesthesia catheter and the administration line should be connected to the filter. The regulating filter on the administration line must be placed outside of the patients clothing and bedding

- These disposable elastomeric devices run within ±15% accuracy of the set rate

5.2 Regional Anaesthesia Catheters

A variety of catheters can be used including epidural catheter kit, or similar device, inserted by anaesthetists / surgeons to deliver the LA infusion via one of the aforementioned infusion devices.

- An occlusive clear dressing must be placed over the catheter
- Any loose catheter tubing should be securely taped to prevent kinking and/or disconnection
- The bacterial / viral filter should be securely taped to the patient, in a place where it is comfortable, to avoid dislodgement of the catheter in a similar way to an epidural filter
- Routine dressing changes are not indicated and are only to be undertaken by a member of the Acute Pain Team / anaesthetist as required

6. Designated Clinical Areas

Patients on LA infusions must be nursed in clinical areas where nursing staff are familiar with the equipment and the management of this type of infusion.

7. Monitoring

Refer to the regional analgesia monitoring and assessment record:

- Hourly observations of vital signs for 4 hours after insertion of regional analgesia catheter or at the end of operation
- Observation of vital signs and regional analgesia observations to be made 4 hourly once back to the ward area:
    - Temperature must be recorded to aid detection of potential infection
    - Motor block assessment, using motor block scoring tool
    - The LA catheter insertion site must be inspected 4 hourly, for the presence of inflammation, tenderness, leakage from site or exudate / discharge from site. The condition of the site must be documented on the monitoring chart
    - Any concerns must be reported to the anaesthetist/ Acute Pain Service and documented in the patient notes

- ♦ At night [i.e. 22.00-08.00h], after the first 24 hours post regional analgesia catheter insertion, the patient's normal sleep pattern should not be disrupted for observations unless there is a cause for concern. However, routine oxygen saturation, respiratory rate and heart rate must continue

- Acute Pain Service staff will visit all patient receiving a LA infusion on a daily basis, more often if deemed necessary
- LA infusions should be replenished on instruction from the anaesthetist and will require a new elastomeric device and two 200ml 0.125% plain Levobupivicaine bag, filled under ANTT precautions in the theatre environment or if using the grey CADD-Solis pump, the bag will be replenished by using one 200ml 0.125% plain Levobupivicaine bag and can be done by appropriately trained staff.
- LA infusions should only be stopped and catheter removed on instruction from the anaesthetist or Acute Pain Team – see supplementary administration record **[refer to section 9]**

7.1 Pressure Area Care

It is important that pressure area care is meticulous for all patients receiving LA infusions:

- The decreased sensation produced by analgesia removes the usual warning signs that prompt patients to move, whilst significant motor block may limit patient movement; both factors may contribute to the development of pressure areas
- Adults with femoral nerve catheters must be encouraged to change position 2-3 hourly, have extra pressure control devices in place and their skin regularly checked for signs of pressure
- Particular attention to pressure care should be given to the region or limb affected by the LA blockade

7.2 Nerve Compression

- It is vital, during regular pressure area care that special attention is made to avoid nerve compression
- Superficial nerve [e.g. common peroneal nerve, ulnar nerve] are vulnerable to damage from unrecognized pressure due to decreased sensation

7.3 Intravenous Access

- All patients with a LA infusion must have intravenous [IV] access at all times, until the infusion is finished and the catheter removed

8 Leaking or disconnected regional anesthesia catheter

- If the patient is comfortable [suggesting the regional anaesthetic block is providing adequate analgesia] the dressing should be reinforced and the leakage observed
- If the patient is uncomfortable and there is a leak, contact Acute Pain Team / on-call anaesthetist to consider re-siting or removing the catheter
- If there is an un-witnessed disconnection of the catheter from the device, then discontinue LA infusion and remove catheter. Contact Acute Pain Team / on-call anaesthetist for alternative analgesia

9 Discontinuing LA infusion and removing the catheter

- Refer to section 3.1 Coagulation Considerations, for guidance on the timings of next dose administration of oral anticoagulation following LA catheter removal
- LA infusion should only be discontinued following the written instructions or consultation with the initiating anaesthetist / on-call anaesthetist / Acute Pain Team
- When it is decided the nerve block / wound infiltration is no longer required, the LA infusion is stopped and alternative analgesia administered
- If significant pain occurs after stopping the LA infusion, and despite alternative analgesia given, contact the Acute Pain / on-call anaesthetist
- Document LA catheter removal, noting the condition of the catheter tip and the patient's skin at the entry site, on the relevant section of the LA monitoring chart
- If the catheter is broken or damaged document accordingly and inform the initiating anaesthetist / Acute Pain Team immediately

Paravertebral catheters and anticoagulation [higher risk] [1]

- Removal of the LA catheter should be delayed for 12 hours after the administration of DVT **prophylacti**c doses of LMWH e.g. tinzaparin (3500 - 4500 units once a day) or enoxaparin (20 – 40mg once a day), whereas patients receiving **higher doses** of LMWH (e.g. tinzaparin 175mg/kg once a day or enoxaparin 1.5mg/kg once a day) will require longer delays (24 hours)[1]
- The next dose of LMWH can be administered 4 hours post removal

- **If the patient has known coagulation disorder, including thrombocytopenia, the removal of the catheter MUST be discussed with the anaesthetist**

10 **Troubleshooting**

PROBLEM	ACTION
Inadequate Analgesia	- Check infusion device, catheter site and connections for leakage - If the patient also has access to IV Patient Controlled Analgesia [PCA], check their understanding and compliance with use of the PCA handset - Administer prescribed analgesia – regular simple oral analgesia [Paracetamol / NSAIDs] & weak/strong opioid if required - Seek APS advice if pain persists, despite above action
Suspected Site Infection	- **Stop infusion. Contact APS/ on-call anaesthetist for advice** - The catheter must be removed - Send the catheter tip and a wound swab from the insertion site to microbiology for culture and sensitivity - The patients surgical team will need to be informed of the suspected infection and action taken which need to be clearly documented in the nursing and medical records - Antibiotic therapy may be need to be prescribed and administered accordingly
Suspected LA Toxicity [see appendix 1]	- **Stop infusion. Contact the on-call anaesthetist immediately** ✓ Arrest call if cardiovascular collapse ✓ Fast bleep the on-call anaesthetist or medical team ✓ Locate Intralipid 20% [available in locally agreed areas with AAGBI Guideline] ✓ Follow AAGBI Guidelines **[see appendix 3]**

PROBLEM	ACTION
Loss of Motor Function	- **If not previously present, stop the infusion** - Call APS or on-call anaesthetist
Catheter Disconnection	- Seek immediate advice from APS / on-call anaesthetist - The LA infusion should be discontinued and removed - **Do not reconnect the LA catheter / infusion**
Catheter Dressing Dislodged	- Reinforce / change dressing if requires - Seek advice from the APS/on-call anaesthetist if necessary

11 Education and Training

All staff involved in the care of patients receiving LA infusions must undertake specific training/education in this area of pain management.

All staff using infusion devices for the delivery of LA infusions must receive pump training and be assessed as competent in their use and should remain updated by attending or accessing refresher sessions, as per individual practitioner's needs, but at least every 3-years according to Health Board policy. It is the responsibility of Ward Managers and Matrons that adequate time is given to attend the required training.

A record of training and education will be retained within the Health Board by the ward/department manager and the Acute Pain Service/ infusion Device Trainers.

12 Equality Impact Assessment Statement

This guideline has been subject to a full equality assessment and no impact has been identified.

13 References

1. Association of Anaesthetists of Great Britain and Ireland, Obstetric Anaesthetists' Association and Regional Anaesthesia UK. Regional anaesthesia and patients with abnormalities of coagulation. ***Anaesthesia* 2013; 68: 966-72**

2. Rivaroxaban [2009] Protection by Xarelto. *Bayer Schering Pharma*

3. Kehlet H, Werner M & Perkins F. Balanced Analgesia: what it is and what are its advantages in postoperative pain? ***Drugs 1999; 58: 793-97***

4. Swansea Bay University Health Board CID 1246: Multidisciplinary Clinical Guidelines for the use of Paracetamol in adult patients over 16 years

5. Swansea Bay University Health Board CID 1272: Multidisciplinary Clinical Guidelines for the management of acute and Complex Pain in patients over 16 years

6. Medicines and Healthcare Products Regulatory Agency [2007] *Making regulatory decisions about medicines & medical devices*. MHRA

Bliography

7. Grant SA, Nielson KC, Greengrass RA et. al. [2001] Continuous peripheral nerve block for ambulatory surgery. ***Reg Anaesth. Pain Med. 26: 209-214***

8. Hoenecke HR, Pulido PA, Morris BA et. al. [2002] The efficacy of continuous bupivacaine infiltration following anterior cruciate ligament reconstruction. ***Arthroscopy. 18: 854-858***

9. Klein SM, Bergh A, Steele SM et. al. [2000] Thoracic paravertebral block for breast surgery. ***Anaesth Analog. 90: 1402-1405***

10. Klein SM, Grant SA, Greengrass SA et. al. [2000] Interscalene brachial plexus block with a continuous catheter insertion system and a disposable infusion pump. ***Anaesth Analog. 91: 1473-1478***

11. Leong WM, Lo WK, Chiu JW [2002] Analgesia efficacy of continuous delivery of bupivacaine by elastomeric balloon infusor after abdominal hysterectomy: a prospective randomized controlled trial. ***Aust NZ J Obstet Gynaecol. 42: 515-518***

12. Morau D, lopez S, Bidoulet P et. al. [2003] Comparison of continuous 3 in 1 and fascia iliaca compartment blocks for postoperative analgesia: feasibility, catheter migration, distribution of sensory block and analgesia efficacy. ***Reg Anaesth Pain Med. 28: 309-315***

13. Williams BA [2006] Anaesthesia and Pain Management in Peripheral orthopaedic surgery – New Considerations and a Call for Partnership between Physicians and Hospital Administrators. ***Business Briefing: US Orthopaedic Review. 60-64***

FLOWCHART FOR ADMINISTRATION OF A NERVE BLOCK CATHETER BOLUS TO ADULTS 16-YEARS AND OVER BY STAFF WHO HAVE RECEIVED TRAINING AND ASSESSED AS COMPETENT

PAIN SCORE 2–3

1. Assess location of pain
2. Check catheter level with documentation in medical notes / nerve block chart

Has consideration been given to IV Paracetamol and/or NSAIDs And/or opioids where appropriate?

YES

Give:

- Manual top-up of 5 -10 ml Levobupivacaine 0.25% [10 - 20ml for paravertebral catheters]
- Maximum 2 x boluses in 40-minutes
- Follow the above with an increase of the infusion rate by 2ml/hr [Only applicable if adjustable rate device in use]

Note:

- For neuropathic pain / chronic pain patients consider 5 -10ml Levobupivacaine 0.5%

YES

Monitor BP / Pulse / AVPU Score / Respiratory Rate / PainScore:
At 5-minutes post bolus dose and repeat at 20-minutes
Check and document pain level on chart & in medical notes

Continue the loop a second time

NO

PainScore 2-3
Have you given 2 x bolus doses in 40-minutes?

YES

PainScore 0-1
EXIT LOOP
See Below

EXIT LOOP

- **Consider alternate analgesia [e.g. oral or PCA]**
- **Discuss with Acute Pain Team before removing catheter**

ADULT CONTINUOUS PERIPHERAL NERVE BLOCK / WOUND INFILTRATION SUPPLEMENTARY ADMINISTRATION RECORD

GIG CYMRU NHS WALES
Bwrdd Iechyd Prifysgol Bae Abertawe
Swansea Bay University Health Board

HOSPITAL: .....
WARD: .....
CONSULTANT: .....

HOSPITAL NO: .....
SURNAME: .....
FIRST NAMES: .....
ADDRESS: .....
.....
.....
DATE OF BIRTH: .....

ADDRESSOGRAPH

NERVE BLOCK: Right ☐ / Left ☐ / Bilateral ☐ : ..... Catheter length at skin ..... cm

Catheter kit used: ..... **Placement:** US ☐ LM ☐ NS ☐ DV ☐

Initial Bolus dose: **Drug:** ..... **Concentration:** ..... **% Volume** ..... ml

Comments/problems with insertion: ..... **Filter position check:** ☐

Device identity: Elastomeric ☐ Electronic Pump Identity: ..... Other (specify): .....
Set up by: ..... (Signature) ..... (Name)
Checked by: ..... (Signature) ..... (Name)

Prescription/Pump check on hand over: (Name) ..... (Signature) .....
Checked by: (Name) ..... (Signature) .....

CONTINUOUS INFUSION

DATE		Dose / Medicine Change Date ..... Sign	DATE	TIME GIVEN	DOSE	GIVEN BY	DATE	TIME GIVEN	DOSE	GIVEN BY	DATE	TIME GIVEN	DOSE	GIVEN BY
	LEVOBUPIVACAINE ..... %	..... %												
	DILUENT NaCl 0.9% ..... ml	..... ml												
	RATE ..... ml/hr	..... ml/hr												

Special Instructions:

Suggested rate range: Peripheral nerve: 2 - 10 ml per hour
Paravertebral: 10 - 15 ml per hour
For neuropathic pain or chronic pain patients higher concentrations may be required, i.e. 0.25% – 0.5 %

DOCTOR'S SIGNATURE
BLEEP NO:

PHARMACIST
SUPPLY

Special instructions / Comments:

An administration record is required for every infusion pump.
Regular oral analgesia to be prescribed including opioids if required, prescribe accordingly on the patient's drug administration chart
Elastomeric pumps should be filled as per manufactures recommendations (e.g. to their capacity) using an ANTT technique

Manual Top-up Bolus

Only to be given by Anaesthetists / Acute Pain Team

	Dr. Signature	Suggested volumes for Manual Top-up:	DATE	TIME GIVEN	DOSE	GIVEN BY	DATE	TIME GIVEN	DOSE	GIVEN BY
Manual Top-Up: Levobupivacaine 0.25%: 5 -10ml Max 20ml in 40-minutes [20-minutes interval between each dose]		> Peripheral Nerve Block x 5-10ml								
Pump Top-up: 5-10 ml local anaesthetic solution via **Pump** [Max of 10 ml to be given at any one time] If more than 2x10 ml doses required within 40	**Dr. Signature**	> Paravertebral Block x 10-20ml								
		> TAP/FICB x 10-20 ml								

REMOVAL INSTRUCTIONS

1) Renew pump when empty: **No** ☐ **Yes** ☐ (only by Anaesthetist or Acute Pain Team)
2) Catheter to be removed: **When empty** ☐ **Specify** ☐ **Date:** ..... **Time** .....
3) Acute pain team / Anaesthetic review prior to removal: **Date:** ..... **Time** .....

Paravertebral Blocks & LMWH (Higher Risk):

Placement or removal of a catheter should be delayed for 12-hours after administration of DVT prophylactic doses of LMWH e.g. tinzaparin (3500 – 4500 units once daily) or enoxaparin (20-40mg once daily), whereas patients receiving higher doses of LMWH (e.g. tinzaparin 175 units/kg once daily or enoxaparin 1.5mg/kg once daily) will require longer delays (24-hours).
LMWH should be given no sooner than 4-hours after catheter insertion or removal. Should this recommendation not apply to this patient, a Consultant / ST Anaesthetist must endorse the patient's drug chart as appropriate.

Time LMWH last given: ..... Dosage given: ..... Time next dose to be given: .....

REMOVAL DETAILS:

Removed by:
..... (Sign)
..... (Name)

Date: .....
Time: .....
Catheter intact ☐

Patient & Infusion Monitoring

Routine Observations:	Routine Observations as follows:
> One-hourly for 4-hours > Four-hourly until infusion discontinued	> Pulse, blood pressure, temperature, respiratory rate, oxygen saturations, AVPU score - **record on the NEWS chart** > Pain scores, site and pump checks - **record on chart below and All Wales Risk Assessment Tool for Pain**

Pain Score	Sedation Score	Site Check
0 = No pain 1 = Slight pain 2 = Moderate pain **3 = Severe pain**	A = Awake and alert V = Drowsy, responds to voice **P** = Very drowsy, Responds to pain / shaking only	0 = Ok / Non Tender 1 = Red / Tender 2 = Leaking from the site (clear fluid) **3 = Discharge from site [Exudate]** **Refer to next page – Troubleshooting 3b) Catheter insertion site issues**

Date	Time	Pain Score	Site Check Score	Filter Check	Pump Rate	Volume Remaining in Device	Sign	Date	Time	Pain Score	Site Check Score	Filter Check	Pump Rate	Volume Remaining in Device	Sign

Recommendations for the management of continuous nerve block catheters/infusions

TROUBLESHOOTING

Continuous nerve block infusion catheters run via 1) Elastomeric device or 2) Electronic pump dedicated for adult local anaesthetic use.

Elastomeric device is SINGLE USE and needs to be filled to maximum volume under aseptic conditions in theatre environment.

A filter must be attached to the catheter and securely taped to the patient.

These devices need to be secured to the patient, but do not need to be elevated above the patient.

1. ALARM

a) Seizure or cardiac arrhythmias

- Arrest call if cardiovascular collapse
- Fast bleep the on-call anaesthetist and medical team
- Locate Intralipid 20% [available in locally agreed areas with the AAGBI Guideline]
- This complication is most likely to occur during insertion, during initial bolus or during local anaesthetic top-ups and represents systemic toxicity
- Intralipid is the treatment of choice, using 1.5ml/kg as a bolus and further boluses / infusion as per response

[Refer to AAGBI protocol located with the Lipid Rescue Bag]

b) Shortness of breath

- May indicate pneumothorax due to paravertebral or supraclavicular catheters
- May be of slow onset, hours after block insertion
- Oxygen, full monitoring, contact on-call anaesthetist and medical team
- Chest X-Ray may be required

2. INADEQUATE PAIN CONTROL

Check catheter position and connections; check oral analgesia given

a) Pain score 3 [severe]

- Check line clamp is open
- If adjustable rate device, increase rate **[as per prescription]**
- Contact APS / on-call anaesthetist for review and to administer bolus

> **Reassess pain score 20-minutes after a bolus**

b) Pain score 1-2 [mild – moderate]

- If adjustable rate device, increase rate by 2ml increments every 30-60 minutes [up to maximum prescribed rate]
- If no improvement, contact APS / on-call anaesthetist for review
- Bolus top-up may be required

> **Reassess pain score 20-minutes after a bolus**

Catheters may be adequately blocking a specific nerve and thereby contributing to pain relief, but pain may be from a different nerve territory, therefore **catheters should not be removed unless patient has been assessed by the APS / Anaesthetist**.

3. CATHETER INSERTION SITE ISSUES

a) Leakage:

- Change dressing & continue to monitor site; contact APS / on-call Anaesthetist if further assistance required

b) Inflamed site / Exudate:

- Remove catheter & send tip for microbiology; inform APS/on-call Anaesthetist
- Contact on-call anaesthetist or APS to consider re-insertion of catheter
- Check oral analgesia prescribed and given
- Monitor temperature and site

4. COAGULATION ISSUES

> For further information refer to: The Association of Anaesthetists of Great Britain and Ireland, Obstetric Anaesthetists' Association and Regional Anaesthesia UK. Regional anaesthesia and patients with abnormalities of coagulation. Anaesthesia 2013; **68**: pages 966-72

Table 2: Relative risk related to neuraxial and peripheral nerve blocks in patients with abnormalities of coagulation [p7]

Contact Numbers: Acute Pain Service

Singleton Hospital: Cisco 25752 Morriston Hospital: Cisco 23997

Appendix 2

Continuous Nerve Blocks Volumetric pump filling procedure [Anaesthetist and APS only]

A Jayakumar, Consultant Anaesthetist [May 2017]
Updated by Jane Jones [March 2021]

In order to utilise continuous infusions of local anaesthetic safely and efficiently via a disposable elastomeric volumetric pump, the following steps have to be followed: -

1. **Sterility**: this must be adhered to in order to prevent possible infection issues via the infusion. This includes an aseptic catheter insertion procedure, the use of a bacterial filter, equipment check and aseptic non touch technique (ANTT) used when filling the pump.

2. Equipment needed:

a. Levobupivicane 0.125% 200ml bags [2 bags are needed to fill the 275ml pump]

b. Autofuser

c. 1-three way tap; 1-Extra-Spike[red]; 1-male-2-male connector & 50ml Luerlock syringe

d. Sterile dressing field

e. Sterile gloves

3. **Filling procedure**:

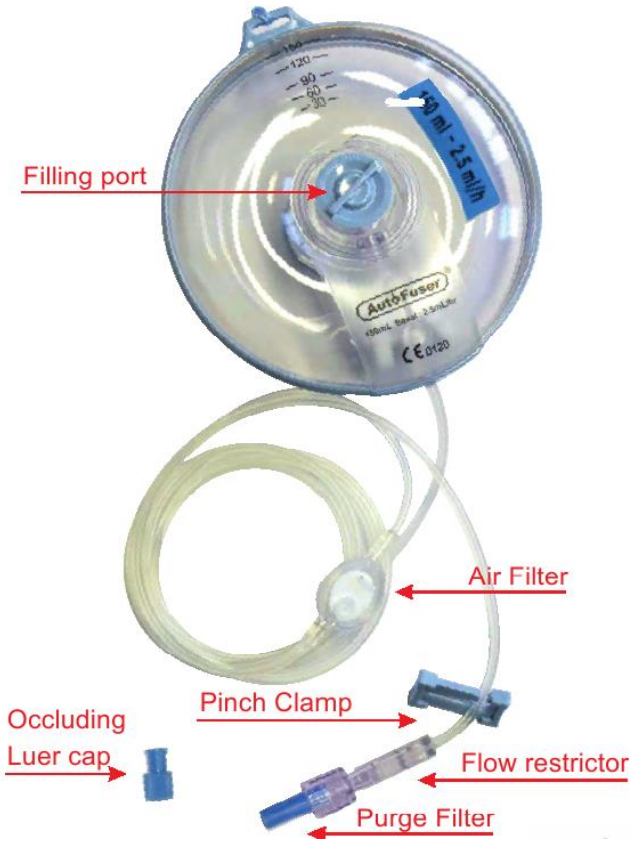
a. Check the packaging is secure, undamaged and within expiration date

b. Check LA bags for absence of clouding/particulate material, expiration date

c. Using ANTT precautions set out the sterile field

d. Open the LA bags, elastomeric pump, three way tap; Extra-Spike[red]; male-2-male connector, 50ml Luerlock syringe and gloves onto sterile field

e. Clamp the line as close as possible to the flow restrictor



f. Place the device on a hard surface, with the filling port facing upwards

g. Unscrew and remove the light blue filling port cap (keep to one side)

h. Assemble the, three way tap; Extra-Spike[red]; male-2-male connector &

50ml Luerlock [see photo 2]

i. Fill the syringe from LA bag using a closed circuit technique

j. Turn the 3 way tap to allow the LA to be injected into the elastomeric pump, change the bag when empty and fill the remainder from the second bag [the 275ml autofusor needs a minimum fill volume of 220ml (80%)

k. Replace the filling port cap

l. Release the pinch clamp

m. Wait for the medication to prime throughout the length of the line

n. Once primed, clamp the line close to the flow restrictor and seal with the occluding blue cap

o. Label the Elastomeric pump with the patients details and the details of what the pump has been filled with

4. Connecting to the patient: Using ANTT, sterile gloves and sterile field:

a. Using a small Clinell swab clean the filter connection to the old line and use it as a clean field to protect the cleaned line, loosen the old line

b. Remove the luer cap from the extension line

c. Remove the old line and connect the new clean autofusor to the filter, making sure it is securely in place

d. Release the clamp. Medication will now begin to flow at the stated rate

e. Place the pump in a carry-bag, when available

f. Document the procedure on the prescription chart and sign the box

5. Documentation:

a. Add label to advise how much and what concentration is contained, when it was set up, and include the patient details.

b. Complete supplementary continuous nerve block infusion chart

c. Pumps should **not be refilled** and a new pump will need to be used if infusion is planned for a longer period, the chart should indicate how long the infusion should continue.

6. Disconnecting from the patient and disposing of the pump:

a. Clamp the extension line at the distal end.

b. Disconnect the luer from the patient line.

c. Dispose of the pump in accordance with hospital protocols

Appendix 3

AAGBI Safety Guideline

Management of Severe Local Anaesthetic Toxicity

1 Recognition

Signs of severe toxicity:

- Sudden alteration in mental status, severe agitation or loss of consciousness, with or without tonic-clonic convulsions
- Cardiovascular collapse: sinus bradycardia, conduction blocks, asystole and ventricular tachyarrhythmias may all occur
- Local anaesthetic (LA) toxicity may occur some time after an initial injection

2 Immediate management

- Stop injecting the LA
- Call for help
- Maintain the airway and, if necessary, secure it with a tracheal tube
- Give 100% oxygen and ensure adequate lung ventilation (hyperventilation may help by increasing plasma 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
- Consider drawing blood for analysis, but do not delay definitive treatment to do this

3 Treatment

IN CIRCULATORY ARREST

- Start cardiopulmonary resuscitation (CPR) using standard protocols
- Manage arrhythmias using the same protocols, recognising that arrhythmias may be very refractory to treatment
- Consider the use of cardiopulmonary bypass if available

GIVE INTRAVENOUS LIPID EMULSION
(following the regimen overleaf)

- Continue CPR throughout treatment with lipid emulsion
- Recovery from LA-induced cardiac arrest may take >1 h
- Propofol is not a suitable substitute for lipid emulsion
- Lidocaine should not be used as an anti-arrhythmic therapy

WITHOUT CIRCULATORY ARREST
Use conventional therapies to treat:

- hypotension,
- bradycardia,
- tachyarrhythmia

CONSIDER INTRAVENOUS LIPID EMULSION
(following the regimen overleaf)

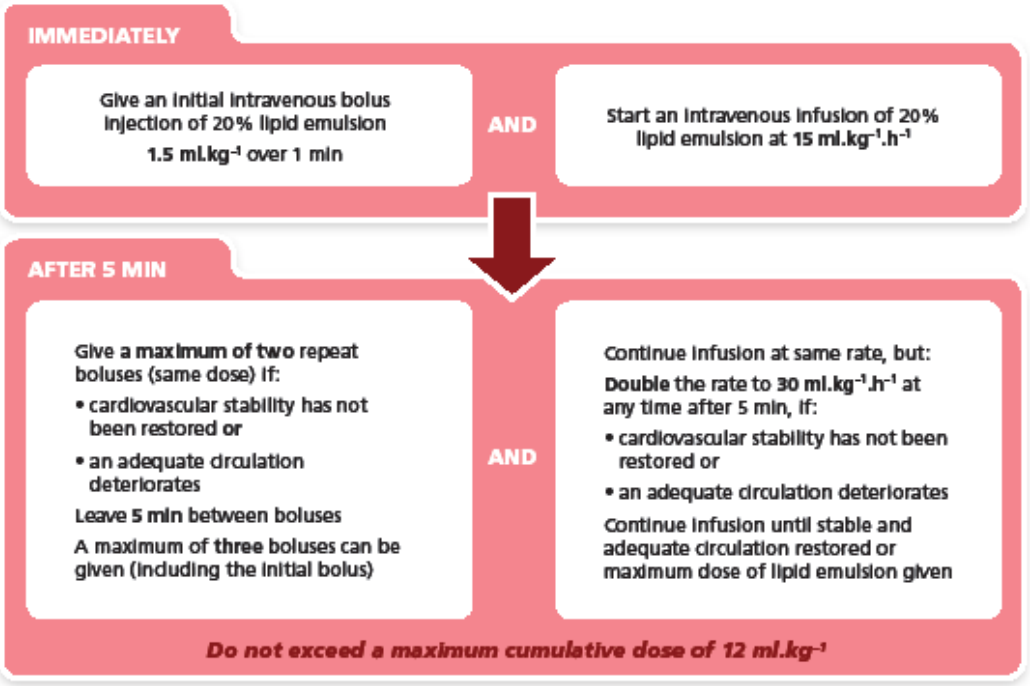
- Propofol is not a suitable substitute for lipid emulsion
- Lidocaine should not be used as an anti-arrhythmic therapy

4 Follow-up

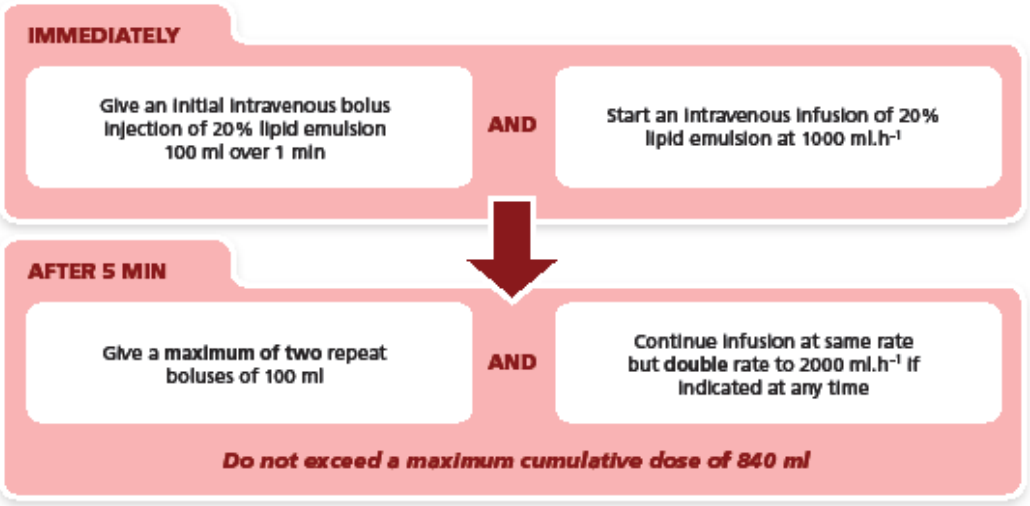
- Arrange safe transfer to a clinical area with appropriate equipment and suitable staff until sustained recovery is achieved
- Exclude pancreatitis by regular clinical review, including daily amylase or lipase assays for two days
- Report cases as follows:
  - In the United Kingdom to the National Patient Safety Agency (via www.npsa.nhs.uk)
  - In the Republic of Ireland to the Irish Medicines Board (via www.imb.ie)

If Lipid has been given, please also report its use to the international registry at www.lipidregistry.org. Details may also be posted at www.lipidrescue.org

Your nearest bag of Lipid Emulsion is kept .....



An approximate dose regimen for a 70-kg patient would be as follows:



This AAGBI Safety Guideline was produced by a Working Party that comprised:
Grant Cave, Will Harrop-Griffiths (Chair), Martyn Harvey, Tim Meek, John Picard, Tim Short and Guy Weinberg.

This Safety Guideline is endorsed by the Australian and New Zealand College of Anaesthetists (ANZCA).

COIN clinical online information network

Swansea Bay University Health Board

Authorisation Form for Publication onto COIN

PLEASE ENSURE THAT ALL QUESTIONS ARE ANSWERED – IF NOT APPLICABLE PLEASE PUT N/A

COIN ID.	CID1294
Document Title.	Multidisciplinary Guidelines for Adult Peripheral Nerve Block & Continuous Wound Infiltration.
Name of Author.	Acute Pain Service Lead CNS: 
Name of Lead Pharmacist.	Acute Pain Service Lead Pharmacist
Is the document New, Revised or a Review of a previous version.	Revised
Where on COIN do you want the document to be published.	Pain Management – Adult Epidural and Regional Anaesthesia
Is the document relevant to the GP Portal.	No
Sign to confirm that the document has been authorised by an approved governance process in a specialty or delivery unit.	Dr. W.T. Rushesha, Consultant Anaesthetist & Acute Pain Lead
If NICE guidance been considered/referenced when producing this document, please provide the title or reference number.	No
Please provide a brief description/abstract of the document.	Procedure for administration of a peripheral infusion of Local Anaesthetics for peri-operative analgesia in adults.
Equality Statement. *(All policies and procedures need to comply with CID76 Policy for the Management of Heath Board Wide Policies, Procedures and other Written Control Documents (WCD).*	Yes
Published Date.	June 2014
Last Reviewed Date.	July 2022
Next Review Due/Expiry Date.	June 2025