Ambit Pump Local Anaesthetic Regional Analgesia Protocol UHW

Local anaesthetic regional analgesia catheters are useful in providing post operative analgesia after abdominal surgery commonly as rectus sheath catheters, where epidurals have not been used, and when it is desirable to make efforts to minimise opioid consumption. They can also be used after thoracic trauma to avoid respiratory failure with multiple rib fractures (see rib fracture pathway)

Blue Ambit pumps are used for “Programmable Intermittent Bolus” (PIB) delivery of local anaesthetic as an intermittent bolus to a region of the body. They do not provide a background infusion & are not used in PCA mode.

They must never be connected to an intravenous cannula as wrong route administration could cause potentially fatal Local Anaesthetic Systemic Toxicity (LAST).

Ambit PIB pumps are not used at Wishaw for anything other than peripheral nerve block local anaesthetic infusion to provide analgesia/anaesthesia. Their use is as per this protocol under direction of an Anaesthetist, Intensivist or the Acute Pain Service for adult patients on ACCU or Surgical Wards where nursing staff have been trained in the use and care of PIB Ambit pumps. These pumps replace hand bolus of stronger local anaesthetic solution which required patients to be ECG monitored in a minimum level 1 care area. Hand bolus delivery of local anaesthetics was demanding of staff time with missed patient doses with resultant poor patient analgesia.

Ambit PIB pumps require only ward level 0 care however patent iv access must be maintained and ward staff trained in their use.

Intralipid Lipid rescue in case of LAST should be available in areas where local anaesthetics are used. Theatre recovery and ward 18 should have bags of intralipid on their resuscitation trolleys for this purpose.

Insertion:

- Rectus Sheath Catheters will usually be inserted in theatre at the end of a case by the surgeon. Ultrasound guided insertion can be performed by the Anaesthetist. Transversus Abdominis Plane is an alternative location for abdominal wall local analgesia catheters however “wound” or subcutaneous catheters have poor efficacy so should not be used. As such operator training and competence is essential for efficacy.
- A first dose of Local Anaesthetic will be given by the surgeon under direction of the anaesthetist.
- Erector Spinae catheters for chest wall trauma will be inserted under ultrasound by an Anaesthetist or Intensivist with AAGBI minimum monitoring.
- A loading dose of up to 2 mg/Kg of 0.25% Levobupivicaine to a maximum of 150mg (60ml total) can be given.

Prescription:

- The Anaesthetist must prescribe and record the above loading dose as being given on HEPMA and on the Ambit PIB paper chart.
- The Anaesthetist should then prescribe the bolus dose volume and interval between doses in hours on the Adult Regional Nerve Block Local Anaesthetic Infusion Chart. (see Wishaw Acute Pain site on intranet).
- Doses are 40ml 4 hourly for post operative abdominal Rectus Sheath catheters and 20ml 2 hourly for Erector Spinae catheters used for thoracic trauma. The maximum dose of 2mg/Kg 6 hourly must not be exceeded. For patients weighing less than 40Kg bolus volumes should be decreased.
- Drug is Levobupivicaine 0.125% in 200ml bags for use with Ambit PIB pumps.
- The Ambit Programmed Intermittent Bolus is prescribed on HEPMA as 0.125% Levobupivicaine 200ml bag, by route “regional anaesthesia” and as “prn infusion as per paper chart”
- Regular and prn rescue analgesia should also be prescribed on HEPMA by clinically appropriate route (preferably oral if this route is available) as visceral pain is not covered by abdominal wall local anaesthetic and as per chest wall trauma pathway e.g. Paracetamol +/- NSAID if not contraindicated and regular or at least rescue prn opioid.

- No other local anaesthetic should be given when Ambit PIB in use including lidocaine plasters.

Ambit PIP Pump programming

- An Anaesthetist, Anaesthetic Assistant, Nurse or ODP programming Ambit pump must be trained in programming pump with the drug and programming checked with another similarly trained staff member.
- The pump must be attached by an Anaesthetist or Intensivist with another trained member as above checking drug, pump programming and that attached to local anaesthetic catheter.
- 2 trained staff check at this step is essential to ensure pump is never attached intravenously.
- Ambit pumps will be stored in Theatre Recovery. When taking an Ambit pump for use with a patient, the Logbook must be completed with the patient's details (Name & CHI number), ward, date and the asset number (e.g. 121775) of the pump.
- New batteries, 2x AA, must be inserted into the ambIT pump before programming.

Ward care of the patient receiving regional analgesia with local anaesthetic via PIB Ambit pump

- Nursing staff trained in Ambit PIB pump. Materials as on intranet and below.
- At handover of patient, to ward and between shifts on ward, nursing staff to check history on pump, confirm correct connection and pump flashing green light with recording of 4 hourly observations on both Patientrack and Adult Regional Nerve Block Local Anaesthetic Infusion Chart being required.
- Changing the infusion bag. Replacing 200ml bags Levobupivicaine (0.125%) must also be documented on the chart with 2 staff check. For procedure see intranet training powerpoint "AmbIT PIB Pumps Rectus Sheath ESP Local Anaesthetic analgesia UHW" slide 17 follow step by step with picture guide as air needs to be removed from new bag before connection. Clear history and restart pump after bag change. Caution: do not press green flashing bolus button after pump restart as it is active for 30 seconds to avoid additional inadvertent bolus.
- Maximum advised duration of infusion is 5 days. Remove catheters if blocked or if infection suspected. The giving cassette does not need changed as lasts for up to 2000ml which equates to over 8 days use.

Discontinuation & Removal of catheter

- Use an aseptic non- touch technique remove the dressing. Apply gentle traction to the catheter. This should be enough to remove it. If there is any resistance inform the surgical team. The catheters should only be removed by a trained member of staff.
- Ensure the black tip is intact on the end of the catheter, document on chart.
- Cover site with a non occlusive dressing. Remove the dressing after 24 hours. Send swab from the site if signs of infection. Only send tip for culture if infection suspected.

Remember to return Ambit PIB pump to Theatre recovery ASAP.

- After use Ambit pumps must be returned to Theatre Recovery. Pause pump. Cut clear giving set tubing close to pump to act as transit cover and then wipe exterior of pump with weak hypochlorite solution or 70% alcohol. Then turn off pump by turning bottom of pump to Off position without removing battery cover. Return Ambit pump to theatre recovery asap as only limited numbers of pumps and to avoid them being lost or damaged.

In Theatre Recovery batteries to be removed for recycling ensuring battery cap is replaced on pump to avoid loss or damage. Pump should then again be exterior wiped before being stored alongside the epidural & PCA pumps. The Logbook in recovery should be updated on return of the pump.

Training

Ward nurses on wards where Ambit pumps are used require to have read and be able to refer to this guideline and the training powerpoint “AmbIT PIB Pumps Rectus Sheath ESP Local Anaesthetic analgesia UHW” training/reference materials on the intranet. Ward nurses as part of routine care of the patient receiving an Ambit PIB infusion should be able to check & chart volume infused, pause/start and check program settings (with routine charting) as well as change infusion bags along with clearing History as part of this procedure. They should be familiar with basic trouble shooting of pump (e.g. bag empty, occlusion, battery change, malfunction). They should be aware of Local Anaesthetic toxicity and its avoidance by ensuring Ambit PIB infusions are never connected to an intravenous cannula as well as its recognition as per chart. They should know when to consult or summon help from medical staff as per chart.

Anaesthetists, Theatre recovery staff and Anaesthetic nurses as well as the Acute Pain nurses and ANPCCs should be fully trained to program, load and commence Ambit PIB pump as well as the above. Only Anaesthetists can connect the Ambit PIB pump to the patient wound or ESP catheter with a witness signing the chart to eliminate risk of wrong route administration.

Training will be delivered by Pump rep or individuals who have been trained to the latter level who feel competent in delivering structured competency based training.

Infusion Chart, Training and quick reference materials are available on the intranet Acute Pain Wishaw site.

There is an Ambit pump app which should only be used to supplement hospital training and documents by trained individuals. The app is not a substitute to training or reference to this protocol.

Potential complications

Local anaesthetic toxicity can occur, especially if there is rapid absorption into the blood stream, or if inadvertently administered intravenously. This is rare but it is important that the signs are recognised (importance of ensuring wrong route avoided and charting) with prompt treatment administered to minimise risk of death or permanent harm to patients.

Recognition & Management of Local Anaesthetic Toxicity

Refer to The Association of Anaesthetists of Great Britain and Ireland safety guideline ‘Management of Severe Local Anaesthetic Toxicity’ AAGBI 2010

Mild: restlessness/confusion, light- headedness, numbness of tongue and lips (lip smacking), tinnitus, double vision, blurred vision

Moderate: heaviness of limbs, muscular twitching, convulsions

Severe: cardiac arrhythmias, hypotension, respiratory arrest, cardiac arrest

If symptoms are

Mild:

- Stop local anaesthetic infusion and inform on call anaesthetist immediately on page 003.
- Maintain oxygenation and BP. Continue to observe closely.
- Consult with Acute Pain Team or if unavailable on call anaesthetist and surgical team.

Moderate or severe:

- Stop local anaesthetic infusion
- Phone for help immediately ICM Dr / on call anaesthetist page 003 or use cardiac arrest call 2222
- Maintain airway and give high flow oxygen.
- Attach Defibrillator to monitor cardiac rhythm, monitor BP, O2 Sats and RR
- Hypotension can be treated with IV fluids, vasopressors
- Convulsions can be treated with diazepam or increments of propofol or thiopentone
- Commence CPR as ALS protocol if in cardiac arrest.
- Collect Lipid Rescue from the Theatre Recovery area or Ward 18 or Theatre 11 anaesthetic room

If patient is in local anaesthetic induced cardiac arrest, treatment will include in addition to standard ALS protocol requirement for intravenous lipid emulsion “Intralipid” 20%. The initial dose is 1.5ml/kg over 1 minute, followed by an intravenous infusion at 15ml/kg over 1 hour. For a 70kg adult this means 100mls over 1 minute followed by 1000mls over 1 hour. If peri-arrest consider treatment with lipid.

Troubleshooting

Leakage at the catheter site

If excessive leakage at site ask the surgical team or anaesthetist/ICM Dr (page 003) or Acute Pain Nurse to review.

Suspected Infection at insertion site – consult surgeon, consider catheter removal and sending tip for C & S

Occlusion Alarm: Ocl

If Ambit pump occlusion alarms (Ocl) press pause button to silence alarm then check connections all patent, & lines not kinked then restart. Pump will complete the bolus automatically. If recurs consult anaesthetist/ICM Dr who may flush catheters with bag solution. If delay & patient in severe pain (score 3 or 4), anaesthetist may flush catheters with 0.25% Levobupivicaine after calculating 6 hourly dose less than 2mg/Kg. NB Caution in restarting infusion: need to avoid a bolus too early after recommencing.

If only one catheter blocked and/or leaking in a bilateral infusion of rectus sheath catheters the Anaesthetists may consider removing that catheter along with splitter to continue with unilateral catheter along with consideration of reducing bolus volume on program.

Pump not turning on or no display – check on at battery cover, check batteries correctly inserted then try replacing with new batteries.

Blood in tubing. Pause pump and consult anaesthetist.

Continuous tone and MA in display : Malfunction Alarm. Press pause. Check cassette properly inserted on pump. Remove and replace cassette head onto pump to ensure correct fit. Consider manual anticlockwise turn of cassette shaft head. Ensure cassette head flush and engaged. Ensure clamps open. Turn off and check/replace batteries if battery icon lit/flashing. Press run to continue program to assess if clears. If persists consult Acute Pain Nurse or ICU/Anaesthetist on call.

Contacts

Acute Pain Nurse: Sharon Anderson, Linsey Steele DECT 6244 or page 021 office hours only

Resident ICU/Anaesthetist Dr: Page 003

Acute Pain Service Lead Clinician Dr Colum Slorach Page 133

Appendix on next pages: Adult Regional Nerve Block Local Anaesthetic Infusion Chart

Dr C Slorach UHW Acute Pain Service Version 1 29 June 2022 Review date 29 June 2025
Approved by Dr G Peters CD Anaesthesia

CHI no ....
First name .... DOB ..../......../........
Last name .... Sex: ☐M ☐F
Address ....
....
Telephone ....
or attach addressograph label here

University Hospital Wishaw

NHS
Lanarkshire

Adult Regional Nerve Block Local Anaesthetic Infusion Chart

Not for intravenous, epidural or paravertebral use

Site & Insertion of Regional Block Catheters

NB. Ensure full details of insertion recorded in operation note/anaesthetic chart or patient notes

Site: **Rectus Sheath, Erector Spinae** /Other_____________ Right / Left / Bilateral	Test/Loading Dose **Total of _____**ml of **0.__%** Levobupivacaine given at __:__hours on __**/**__**/20**__

Prescription – Programmed Intermittent Bolus via Ambit Pump

Prescriber complete and sign to prescribe. Prescribe in the protocol section of HEPMA as prn

Protocol (Blue Ambit Pump PIB)
Intermittent bolus of (usually 40ml) ____ml Levobupivacaine 1.25mg/ml (0.125%) administered 4 hourly (via splitter if bilateral, e.g. Rectus Sheath, catheters)
OR
If single catheter e.g. Erector Spinae
(usually 20ml) ____ml Levobupivacaine 1.25mg/ml (0.125%) administered 2 hourly.

Reduce volume if patient weight less than 40Kg. Do not exceed usual volumes/intervals above.
Prescriber to ensure Levobupivicaine dose always less than 2mg/Kg in each 6 hour period.

Name & Designation (Print) & Sign Date & Time	

Ambit Pump programming and Set up - see app / guide

Blue Ambit pump Asset number:

Ambit Pump Setting: **PIB** (Programmed Intermittent Bolus), as above prescription

Drug: 200ml pre-filled bag of Levobupivacaine 1.25mg/ml (0.125%) Batch Number:_____ Expiry date: _____

Pump set up by:

Name & Designation (Print) & Signature:	Date & Time

Pump attached to regional block catheters at filter by:
(NB Pause and check – never attach Levobupivicaine or Ambit pump to an intravenous canula)

1. Name & Designation (Print) & Sign	Date/Time
2. Witness Name & Designation (Print) & Sign	Date/Time

Symptoms & Signs of LOCAL ANAESTHETIC TOXICITY	**TREATMENT OF LOCAL ANAESTHETIC TOXICITY**
• Numbness of tongue/lips • Altered sense of taste • Tinnitus (ringing in ears) • Sudden confusion/agitation • Change in conscious level/drowsiness • Bradycardia/arrhythmias • Seizure	• STOP INFUSION • 2222 call if periarrest/Cardiac or Respiratory Arrest • Contact ward doctor, on-call Intensive Care resident (Bleep 003) • Treat with ALS and apply AAGBI guideline on the “Management of Severe Local Anaesthetic Toxicity.” • **Intralipid is located in Theatre Recovery, Theatre 11 and Ward 18.**

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Guidelines for patient care

1. **Observations:** record **4 hourly** on NEWS chart and below for duration of infusion.
2. Ensure patent iv access is maintained for duration of infusion.
3. Check the device is infusing by recording the volume infused from the pump.
4. Observe patient for any signs of local anaesthetic toxicity: see over.
5. Check catheter sites for leaks and catheter displacement. **Check Ambit <u>never</u> connected to iv canula**
6. Surgical team should review catheter sites and need for ongoing infusion daily. Max. duration 5 days.
7. Multimodal analgesia including opioids (oral, sc or PCA) may be given along with local anaesthetic infusion to aim for pain on movement less than or equal to 2 out of 4.
8. Acute Pain Team – if available to review daily. Office hours Page 022/DECT 6244. ICU Resident Page 003

Date	Time	Volume infused (Record before Hx reset at bag change)	Symptoms or Signs of Local Anaesthetic toxicity Y / N	Catheter Site inspection (tick)	Pain score (0-4)	Handover check Pump Program Rx matches Prescription Y / N	Comments e.g. bag change including batch no & expiry date.	Staff Initials
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Catheter removal Are catheters intact with black tips visible?	Right Yes / No Left Yes / No If either no retain pieces & notify ward Dr.
Name & Designation (Print) & Sign Date & Time	

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ALWAYS RETURN AMBIT PUMP AS SOON AS DISCONNECTED TO THEATRE RECOVERY