Local Anaesthetic Wound Catheters for Post-operative Analgesia following Abdominal Surgery

<table>
<thead>
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<tbody>
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<td>Salford Royal Care Organisation</td>
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Guideline for Local Anaesthetic Wound Catheters for Post-operative Analgesia following Abdominal Surgery

1. What is this policy about?

1.1 This is a robust analgesic option for the emergency laparotomy patient group and also elective major abdominal surgery.

The use of Local anaesthesia by continuous wound infusion (CWI) is an established method of providing post-operative analgesia in abdominal and other surgeries.

This guideline provides a framework to deliver this technique as an alternative to thoracic epidural which may be inappropriate or contraindicated.

If you have any concerns about the content of this document please contact the author or advise the Document Control Administrator.

Key Messages

- Best Practice should be to communicate the most appropriate technique at WHO Team Brief with the theatre team to ensure availability of required kit and establishing familiarity of technique with anaesthetic/surgical staff. Stocked trollies of wound catheters are available on Level 1 & 3 Theatres.

- This includes Pre-peritoneal catheters usually tunnelled by the surgeon under direct vision prior to wound closure, or Rectus sheath catheters placed surgically by ‘feel’ in the correct myofascial plane of the posterior sheath or by the anaesthetist under ultrasound guidance above the ‘tram’ lines visible on ultrasound image.

- The Anaesthetist responsible for the case should ensure the CWI is prescribed on EPR and the infusion is connected to the patient before discharge from PACU.

2. Where will this document be used?

2.1 The wound catheters are sited in a Theatre environment either surgically placed or by anaesthetists under ultrasound guidance. Thereafter ongoing management is delivered by the critical care and ward based nursing staff. The Acute pain team will provide ongoing support.

Who should read this document?

- Medical staff in Anaesthesia
- Medical staff in General Surgery/Urology
- Acute Pain Nursing Team
- Surgical Ward Nursing staff

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2.2 Applies to adult patients only
   - There may be limitation in patients who have undergone multiple abdominal operations who lack tissue planes to put the catheters due to scaring.

3. Why is this document important?

3.1 This document reflects the national trend to move away from traditional thoracic epidural for abdominal surgery and use the more advanced technology of multi-holed catheters to deliver local anaesthetic infusions in and around the wound to deliver analgesia. This theoretical reduced the risk for epidural haematomas and abscess and also the report failure rate of up to 30%, and epidural associated hypotension. This document will also support standardising practice for La CWI for abdominal surgery.

3.2 AAGBI guidelines on the management of LA toxicity, as we are including an infusion technique rather than high volume bolus there is less risk of this occurring.

4. What is new in this version?

4.1 The pre-peritoneal catheter placement technique
   - Best Practice should be to communicate the most appropriate technique at WHO Team Brief with the theatre team to ensure availability of required kit and establishing familiarity of technique with anaesthetic/surgical staff.

5. Guideline

5.1 Scope of Local Anaesthetic Wound Catheters

   - CWI via wound catheters may be a more appropriate analgesic option for patients undergoing abdominal surgery in a situation where a Thoracic Epidural may be either clinically contraindicated or technically challenging to insert. Thoracic epidural analgesia may fail in up to 30% of patients.
   - CWI extends the duration of postoperative analgesia up to 72hrs, beyond the limited period of 6-12 hrs that a single injection technique provides.
   - Use of CWI helps reduce opioid requirements (opioid sparing) and subsequent opioid related side effects, a cornerstone of Enhanced Recovery After Surgery (ERAS) pathways
   - Newer multiholed catheter designs allow more even distribution of Local Anaesthesia within the myofascial plane they are inserted
   - The introduction of the Tunnelling device allows the operator to deploy the desired length of the sheath in the pre-peritoneal plane, and no longer requires advancement of the catheter beyond the needle tip.
   - The target for the LA infusion is the anterior rami of Spinal Nerves T6-T11

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Local Anaesthetic Wound Catheters for Post-operative Analgesia Following Abdominal Surgery

Reference Number: TWCG29(11)  Version Number: 4  Issue Date: 21/11/2018

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Pre-peritoneal plane for CWI catheter

Image obtained from BJA Education 2018

Abdominal Wall Anatomy-Cross Section

Pre-peritoneal plane for CWI catheter

Image from promotional literature provided by OnQ

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5.2 Guideline (Pre-Peritoneal insertion)

5.2.1

- Pre–Peritoneal insertion - use a standard 19cm catheter. This is performed by surgeons under direct vision.
  - Please refer to the image above, the black dots represent the correct tissue plane for catheter insertion. Please ensure the catheters are placed away from midline.
  - Introduce sheathed tunnelling device see images below, from cranial end of wound, aiming for anterior superior iliac spine away from midline.
  - Check the depth and position from inside abdominal wall to ensure that all the holes throughout the length of the catheter are in the tissue plane.
When tunnelling device has been advanced to desired length, keep sheath in position but remove sharp tunnelling device, this can be re-used for contralateral side of wound.

The multiholed catheter can now be advanced till the end of the sheath (BUT does NOT need to be advanced beyond the tip). The sheath is then removed by splitting at flanged proximal end and peeling back.

Remember to secure the catheter to the skin (eg suture/sticker)

Slowly inject 20mls 0.25% Levobupivacaine down each catheter before applying Y-Connector, which is connected to LA Pump in PACU.

**TOP TIP:** If the catheters are primed before wound closure a ‘sausage’ of LA should appear in the pre-peritoneal space after injection to help confirm correct placement.
5.3 Rectus Sheath Catheter insertion (Surgical or Ultrasound guided)

5.3.1 Inserting Rectus sheath catheter (surgical or ultrasound guided). A standard epidural set could be used if longer catheters not available.

Position of probe and needle for rectus sheath catheter insertion

Imaged sourced from Webster, K 2010
Updates in Anaesthesia FOAM
Rectus Sheath catheter can be inserted either **surgically** prior to wound closure by the surgical team under direct vision, using feel to best confirm placement in posterior rectus sheath. Ultrasound guided placement may be performed pre-incision in the anaesthetic room after induction of General anaesthesia, or at the end of the procedure prior to emergence from GA.

**Top Tip:** Rectus Sheath does not require Long catheters so this can be performed using either a short multi-holed catheter or a traditional epidural catheter. Unlike the Sheathed Tunnel device this technique requires advancement of the catheter 3-5cm beyond the needle tip to lie in the posterior rectus sheath. Hydro dissection of the space with saline may help create a space to thread and advance the catheter more easily.

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**Table 2** Advantages and disadvantages of rectus sheath catheter placement techniques. LA, local anaesthetic; RS, rectus sheath; US, Ultrasound

<table>
<thead>
<tr>
<th>Placement technique</th>
<th>Advantages</th>
<th>Disadvantages</th>
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<tbody>
<tr>
<td>US-guided insertion</td>
<td>Enables real-time confirmation of catheter placement within posterior RS</td>
<td>Requires appropriate US equipment and skills</td>
</tr>
<tr>
<td></td>
<td>May enable identification and avoidance of blood vessels within the RS</td>
<td>Usually takes longer than surgical placement</td>
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<tr>
<td></td>
<td>Pre-incision RS block can be provided</td>
<td>Usually requires longer duration of anaesthesia</td>
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<td>Can be performed in awake patient if original post-laparotomy anaesthesia inadequate</td>
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<tr>
<td>Surgical insertion</td>
<td>Usually quicker to perform than US-guided placement</td>
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</tr>
<tr>
<td></td>
<td>No requirement for US equipment and associated skills</td>
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<tr>
<td></td>
<td>Surgical placement is relatively straightforward to master</td>
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<tr>
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<td>Placement of catheters towards the end of surgery avoids them encroaching the surgical field</td>
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Image obtained from  BJA Education 2018 Rucklidge,

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5.4 Standards

5.4.1 Standards
- Consider this technique at the WHO Team brief NOT when the surgeon is closing the wound
- Ensure Electronic prescription is completed on EPR.

- The LA Pump should be connected to the Y-connector of the catheters BEFORE the patient is discharged from PACU by the Anaesthetist responsible for the case.
- Intravenous access should be maintained for duration of CWI use.
- Qualified nurses who have undertaken pump competency/CWI training are permitted to change bags of LA infusions (0.125% Levobupivacaine)
- Local anaesthetic infusion bags MUST be stored separately from iv infusions as per NPSA guidelines (2007)

5.5 Observations Nursing Care and Management

Observations Nursing Care and Management
Respiratory rate, heart rate and blood pressure pain and sedation scores should be recorded:
- Every 15 minutes for the 1st hour, in Theatre PACU
- Hourly for next 4hrs
- Then 4 hourly provided observations remain stable

Process and Procedures
Nursing management guidelines for the care of indwelling local anaesthetic infusion (CWI) catheter will be attached to the LA infusion pump and will be available in the clinical areas caring for patient with CWI for post-operative pain management. Wards B1, B2, Critical care & H4 & H6 (Appendix I)
5.6 Monitoring and Management of Local Anaesthetic Toxicity

AAGBI guidelines on the management of LA toxicity will also be attached to the pump indicating the location of Intralipid® solution (Appendix 1). Problems with CWI catheters should be referred to the Acute Pain service or 1st on call Anaesthetist as per instructions on the laminated CWI catheter instructions card (Appendix 1).
6. Roles and responsibilities

6.1 The Anaesthetist who initiated / inserted the CWI catheter has overall responsibility for the CWI technique. They should be informed of any significant or persistent pain issues.

6.2 Nursing ward staff: recording observations and monitoring the infusion.

6.3 Acute Pain team: Training and support will be provided by the Acute Pain Service for designated wards caring for patients with CWI catheters.

6.4 Acute Pain service or 1st on call Anaesthetist will be contacted regarding problems with the catheter.

7. Monitoring document effectiveness

7.1 Key standards:

- Perioperative analgesia has been included in the NELA data set for which continuous CWI is an option along with Thoracic Epidural and intrathecal opiates.

- Prescribed appropriately on EPR as per prescription example on page ....

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100% of catheter to be connected to La pump before the patient leaves PACU by Anaesthetist responsible for the patient.

**Method(s)**: NELA data already collected. EPR prescribing is reviewed bt the Pharmacists and Acute pain team on the ward rounds. these will be monitored, e.g. clinical audit, spot checks, direct observation,

- Team responsible for monitoring: Ward staff supported by the Acute pain team.
- Frequency of monitoring: continually.
- Process for reviewing results and ensuring improvements in performance: The ongoing PQIP (Perioperative quality improvement programme) provides continuous data on patient outcomes including pain management. This information is presented to the Anaesthetic department regularly.
  Datix submissions for poorly stocked trollies level 1&3 and for pumps that have not been connected.

### 8. Abbreviations and definitions

- CWI catheter - Continuous wound infusion
- LA – Local Anaesthetic
- NELA National Emergency Laparotomy Audit
- EPR Electronic patient record

### 9. References and Supporting Documents

#### 9.1 References


9.2 Related SRFT/PAT documents

None

9.3 Acknowledgement of sources

All freedom of access article has been used for images.
## 10. Document Control Information

It is the author’s responsibility to ensure that all sections below are completed in relation to this version of the document prior to submission for upload.

Remove instructions once completed.

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<td>Role Lead Clinician for the Pain Management Centre</td>
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<td>Please indicate which Care Organisation(s) this document applies to: Salford CO</td>
<td>Oldham CO</td>
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<tr>
<td>Keywords/ phrases:</td>
<td>Insert keywords: Local Anaesthetic, continuous wound infusions, wound catheters, Rectus sheath catheters</td>
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<tr>
<td>Communication plan:</td>
<td>This is already embedded in clinical practice and is a technique familiar to general surgeons and Anaesthetic staff and theatre staff within the organisation. Presented at the Anaesthetic audit meetings, Clinical Governance meetings for pain and Neurosciences. General Surgical meetings. Support and education sessions for the nursing staff monitoring this patient group will be provided by Acute Pain Nursing team.</td>
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<tr>
<td>Document review arrangements:</td>
<td>This document will be reviewed by the author, or a nominated person, at least once every three years or earlier should a change in legislation, best practice or other change in circumstance dictate.</td>
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<tr>
<td>Approval:</td>
<td>Clinical lead Pain 13/10/18 Medicines management, Lindsay Harper,</td>
<td></td>
</tr>
<tr>
<td>How approved:</td>
<td>Chair’s actions - none</td>
<td>Formal Committee decision - Approved</td>
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11. **Equality Impact Assessment (EqIA) screening tool**

Legislation requires that our documents consider the potential to affect groups differently, and eliminate or minimise this where possible. This process helps to reduce health inequalities by identifying where steps can be taken to ensure the same access, experience and outcomes are achieved across all groups of people. This may require you to do things differently for some groups to reduce any potential differences.

1a) Have you undertaken any consultation/involvement with service users, staff or other groups in relation to this document? If yes, specify what.  

**no**

1b) Have any amendments been made as a result? If yes, specify what.  

**no**

2) Does this policy have the potential to affect any of the groups listed below differently?  

*Place an X in the appropriate box: Yes, No or Unsure*

This may be linked to access, how the process/procedure is experienced, and/or intended outcomes. Prompts for consideration are provided, but are not an exhaustive list.

<table>
<thead>
<tr>
<th>Protected Group</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
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<tbody>
<tr>
<td><strong>Age</strong> <em>(e.g. are specific age groups excluded? Would the same process affect age groups in different ways?)</em></td>
<td>✓</td>
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<td><strong>Sex</strong> <em>(e.g. is gender neutral language used in the way the policy or information leaflet is written?)</em></td>
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<td>✓</td>
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<tr>
<td><strong>Race</strong> <em>(e.g. any specific needs identified for certain groups such as dress, diet, individual care needs? Are interpretation and translation services required and do staff know how to book these?)</em></td>
<td>✓</td>
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<td><strong>Religion &amp; Belief</strong> <em>(e.g. Jehovah Witness stance on blood transfusions; dietary needs that may conflict with medication offered.)</em></td>
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<td><strong>Sexual orientation</strong> <em>(e.g. is inclusive language used? Are there different access/prevalence rates?)</em></td>
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<td><strong>Pregnancy &amp; Maternity</strong> <em>(e.g. are procedures suitable for pregnant and/or breastfeeding women?)</em></td>
<td>✓</td>
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<td><strong>Marital status/civil partnership</strong> <em>(e.g. would there be any difference because the individual is/is not married/in a civil partnership?)</em></td>
<td>✓</td>
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<td><strong>Gender Reassignment</strong> <em>(e.g. are there particular tests related to gender? Is confidentiality of the patient or staff member maintained?)</em></td>
<td>✓</td>
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<td><strong>Human Rights</strong> <em>(e.g. does it uphold the principles of Fairness, Respect, Equality, Dignity and Autonomy?)</em></td>
<td>✓</td>
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<td><strong>Carers</strong> <em>(e.g. is sufficient notice built in so can take time off work to attend appointment?)</em></td>
<td>✓</td>
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<tr>
<td><strong>Socio/economic</strong> <em>(e.g. would there be any requirement or expectation that may not be able to be met by those on low or limited income, such as costs incurred?)</em></td>
<td>✓</td>
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<tr>
<td><strong>Disability</strong> <em>(e.g. are information/questionnaires/consent forms available in different formats upon request? Are waiting areas suitable?)</em> Includes hearing and/or visual impairments, physical disability, neurodevelopmental impairments e.g. autism, mental health conditions, and long term conditions e.g. cancer.</td>
<td>✓</td>
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</tbody>
</table>
Are there any adjustments that need to be made to ensure that people with disabilities have the same access to and outcomes from the service or employment activities as those without disabilities? (e.g. allow extra time for appointments, allow advocates to be present in the room, having access to visual aids, removing requirement to wait in unsuitable environments, etc.)

| ✔ |

3) Where you have identified that there are potential differences, what steps have you taken to mitigate these?
(what action has been taken or will be taken, who is responsible for taking a future action, and when it will be completed by – may include adjustment to wording of policy or leaflet to mitigate)

Age group excluded children
Maternity / Pregnancy: may be considered in emergency surgery where benefits outweigh risks this in not a population group that we deal with regularly as Maternity services were relocated in 2011

4) Where you have identified adjustments would need to be made for those with disabilities, what action has been taken?
(what action has been taken or will be taken, who is responsible for taking a future action, and when it will be completed by – may include adjustment to wording of policy or leaflet)

Will this policy require a full impact assessment? No
(a full impact assessment will be required if you are unsure of the potential to affect a group differently, or if you believe there is a potential for it to affect a group differently and do not know how to mitigate against this - Please contact the Inclusion and Equality team for advice on equality@pat.nhs.uk)

Author: Type/sign: R Makin

Date: 3/10/2018

Sign off from Equality Champion: A Dwyer, Divisional Director of Nursing, Neurosurgery

Date: 3/10/18
Appendix 1  AAGBI guidelines on the management of LA toxicity

**Management of Local Anaesthetic Wound Infusion (LAWI)**

**What is it?**
A local anaesthetic infusion around the surgical site, or into a nerve plexus, blocks the generation and conduction of pain impulses. A wound catheter is placed into the subcutaneous tissue, muscle layers or nerve sheath to infuse continuously. This provides the patient with the benefit of a longer acting local anaesthetic block.

**The Local Anaesthetic Infusion should be connected before the patient is transferred out of the theatre department**

**Drugs:**
- Levobupivacaine 0.125%
  - Infused via a dedicated LA pump & yellow infusion line
  - This will be supplied from pharmacy via recovery.

**Observations:**
- Respiratory rate, Heart rate, Blood pressure, Pain & Sedation should be recorded on EPR on the NEWS chart.
- Every 15 minutes for the first hour.
- Hourly for the next 4 hours.
- Then 4 hourly provided observations remain stable.

**Local Anaesthetic Toxicity**
- Any signs or complaints of symptoms which are - Ipsilateral numb tongue, light headiness, tinnitus.
- Stop infusion immediately give oxygen and support airway.
- Call on-call anaesthetist or medical team urgently.
- Cardiac arrest: Commence BLS/ALS procedures.
*See Association of Anaesthetists Guidelines (2007)*

**Removal of Catheter**
- The LA infusion catheter should be removed by 72hrs, or if required longer assessment by the pain team.
- The pump should be returned to pharmacy.

**Emergency Orders:**
- For any symptoms described below, urgent medical attention is required.

**Ensure familiarity with nearest storage of Intalipid**
- Stored on the crash trolley on Critical Care Pods A, B, C, H6, H4, B2, B1

**Catheter Occlusion**
- Check for any kinks in line and correct accordingly.
- If persists contact Pain Team / Anaesthetist on Call.

**Leaking Regional Anaesthetic Catheter**
- If patient is comfortable dressing should be reinforced.
- If patient is in pain then assess and convert to alternative analgesia.

**Infection**
- Impact site for any signs of infection such as swelling and document findings in evaluation.
- Record temperature 4 hourly.
- Redress only when necessary or when any evidence of leaking or if dressing blood stained.
- Send catheter tip for CBS only if infection expected.

**ANY PROBLEMS PLEASE CONTACT: SACT PEU 07623623167 ON CALL ANAESTHETIST RATION BEEP 81852**

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