



PERIPHERAL REGIONAL /
LOCAL ANAESTHESIA
CATHETERS

STANDARD OPERATING
PROCEDURE
(SAPPHIRE PUMP)



TABLE OF CONTENTS

| Topic | Page |
|---|-------------|
| Application and Use Case | 3 |
| One Page Summary | 4 |
| Prescribing | 5 |
| Onward Referral | 6 |
| Pump User Guide | 7 |
| SOP 1: Setting Up Intermittent Bolus ('Intermittent') Infusions On The Sapphire Pump | 8 |
| SOP 2: Setting Up Continuous Infusions ('PCEA') On The Sapphire Pump | 9 |
| SOP 3: Setting Up Continuous Infusions ('PCEA') On The Sapphire Pump For Patients Under 50kg | 10 |
| Troubleshooting <ul style="list-style-type: none">- Clinical- Equipment | 11 |
| Appendix 1: CCA Programmes for Patients Over 50kg | 12 |
| Appendix 2: CCA Programmes for Patients Under 50kg | 13 |
| Appendix 3: Manufacturer Tip Cards for Epidural and Multi-Therapy Pumps | 14 |



APPLICATION AND USE CASE

This guidance is designed for anaesthesia/critical care physicians and specialist prescribers using regional anaesthesia catheter techniques to support patient care.

This includes the following techniques:

- Rectus sheath catheters
- Transversus abdominis plane catheters
- Peripheral nerve catheters (single and double catheters)
- Chest wall catheters (including but not limited to paravertebral, serratus anterior, and erector spinae plane catheters; single and double catheters)
- Any other fascial plane catheters

For guidance on how these catheters should be sited, assessed, and reviewed, please refer to the clinical guideline titled ‘Clinical Guidelines for the Management of Continuous Peripheral Nerve Catheter Local Anaesthetic Infusions for Pain Relief in Adult Patients’. This can be found on the Barts Health Intranet.



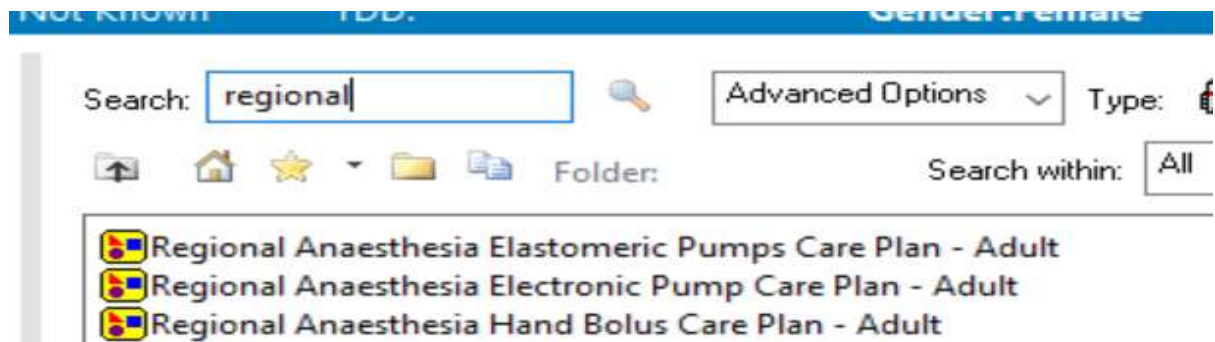
SUMMARY: PRESCRIBING AND SET-UP

This one-page summary is intended as an aide-memoire or refresher for the prescription and set-up of the Sapphire local anaesthetic infusion pumps. For more detailed information, please refer to the rest of this guideline.

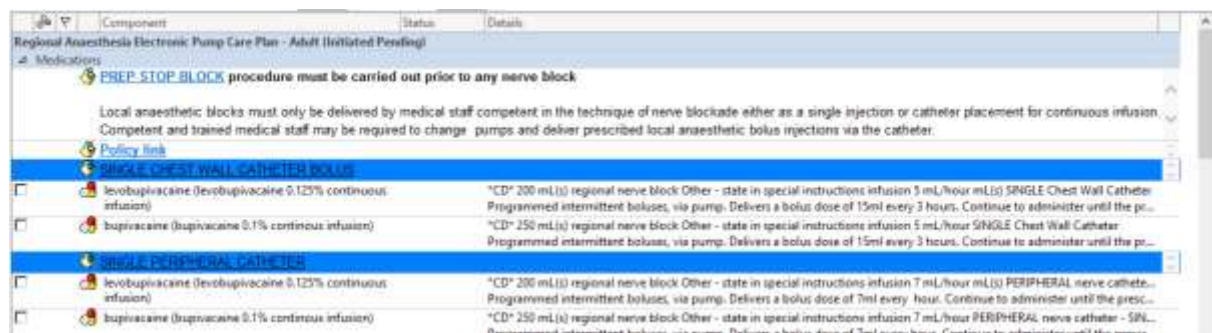
- 1. Confirm availability of Sapphire adult regional anaesthesia pump** and desired local anaesthetic prior to siting a peripheral nerve or fascial plane catheter.
- 2. Site an appropriate catheter** according to the acuity of patient need and clinical guidelines.
- 3. Complete EPMA prescription and Acute Pain team referral:**
 - a. Use the 'Regional Anaesthesia Electronic Pump – Adult' care plan on CRS
- 4. Set-Up Sapphire Pump:**
 - a. On/Off switch
 - b. Select appropriate Clinical Care Area (CCA) for catheter technique and patient weight
- 5. Confirm the prescription** on the pump and EPMA match
- 6. Prime the Sapphire pump** with the appropriate NRFit giving set and local anaesthetic
- 7. Ensure that the patient's infusion pump is connected** prior to them leaving the operating theatre or anaesthetic room

PRESCRIBING

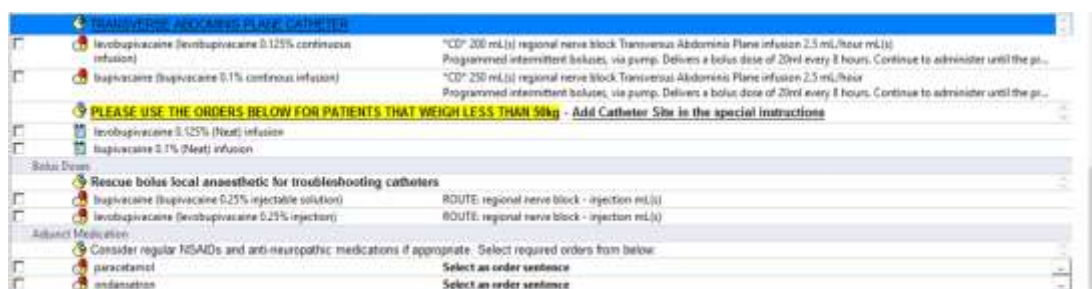
1. All local anaesthetic infusions should be prescribed via EPMA using the care plan labelled 'Regional Anaesthesia Electronic Pump – Adult'.



2. Please complete the prescription prior to programming the pump.
 - a. This will allow prescribers to confirm the dose (continuous infusion rate, or bolus dose and delivery interval) administered against the prescription.
 - b. Please see appendices 1 and 2 for the prescriptions for each CCA.



3. The same care plan should be used to prescribe:
 - a. Rescue boluses delivered by specialist healthcare professionals to troubleshoot catheters





ONWARD REFERRAL

All patients having an indwelling regional anaesthesia catheter technique should be referred to the Acute Pain team via the 'Regional Anaesthesia Electronic Pump – Adult' care plan on CRS. This will be linked in all appropriate care plans as per Fig. 1.

Alternatively, an electronic referral can be completed by using the form 'Refer to Pain Team – Inpatient' on Millenium. Out of hours, clear handover to the on-call anaesthetic resident doctor should be undertaken.



LOCAL ANAESTHETIC DOSING AND CONSIDERATIONS

The prescriptions have been calculated to accommodate both a single-shot bolus and the cumulative twenty-four hour dose according to BNF and manufacturer guidance.

For fascial plane blocks, it is worth considering the total *volume* if a bolus dose has been administered before connecting the pump.

| Type of Programme | Bolus Dose | Infusion Dose |
|---|--------------------------------------|---|
| Patients Over 50kg: Continuous Infusions | | |
| Peripheral Nerve Catheters | Follow normal practice | Follow normal practice (connect pump after loading) |
| Patients Over 50kg: Intermittent Bolus | | |
| Rectus Sheath Catheter | Consider reducing volume to 20-30mls | Follow normal practice (connect pump after loading) |
| TAP catheter Chest wall catheter | Follow normal practice | Follow normal practice (connect pump after loading) |
| Patients Under 50kg | | |
| All clinical applications | Follow normal practice | Follow normal practice (connect pump after loading) |

| LEVOBUPIVACAINE | BUPIVACAINE |
|---|--|
| Maximum bolus dose: 3mg/kg Maximum total 24 hour dose 400mg | Maximum bolus dose: 2mg/kg Maximum total 24 hour dose 400mg |
| There is little guidance on how best to modify toxic doses for lower weights; but this paper would suggest reducing total dose by 20-30%. | |



INFUSION PUMP (SAPPHIRE) USER GUIDE

For local anaesthetic infusions (*not* an epidural catheter), please ensure the pump has a grey face, and is labelled ‘Multi therapy’.

Please note that although this is a multi-therapy pump, the system always turns on in ‘Epidural’ mode – the word ‘Epidural’ is in a yellow box in the top right corner of the pump face at all times. Users should select ‘Epidural’ when prompted to by the pump system (see step by step guides below). Accordingly, the system’s terminology for continuous infusions is ‘PCEA’; and the term for intermittent bolus regimes is ‘Intermittent’.




The following represent a step-by-step guide to setting up infusions on the Sapphire pumps. Please make sure you check Appendices 1 and 2 to confirm whether your infusion is an intermittent bolus (‘Intermittent’) or a continuous infusion (‘PCEA’) regime.

SOP 1: Setting Up Intermittent Bolus (‘Intermittent’) Infusions On The Sapphire Pump

SOP 2: Setting Up Continuous Infusions (‘PCEA’) On The Sapphire Pump

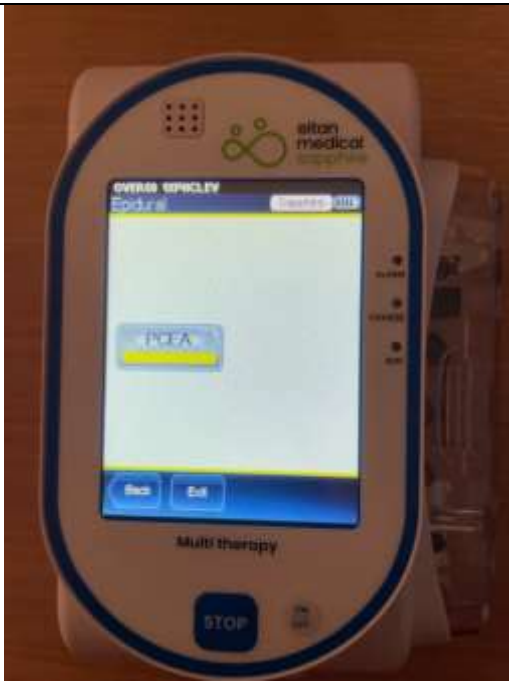
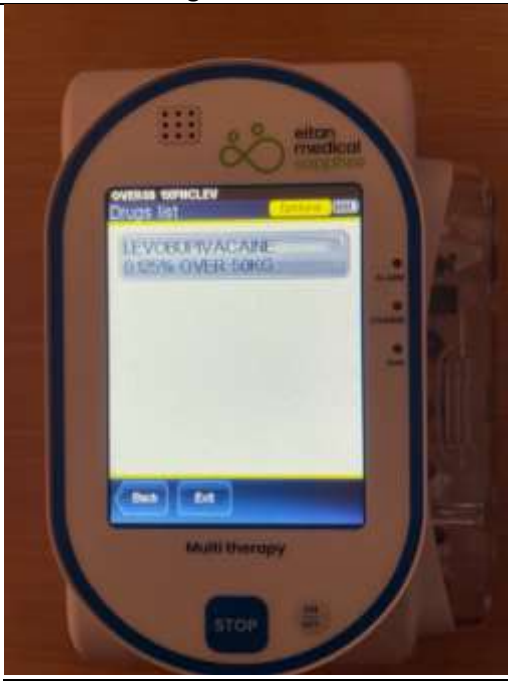
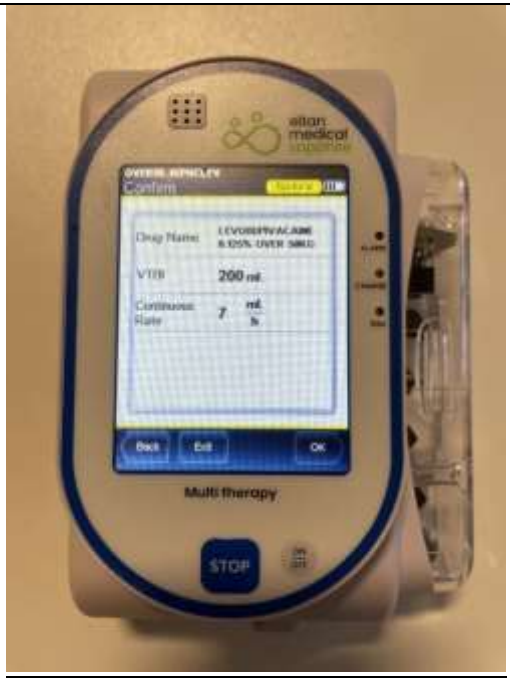
SOP 3: Setting Up Continuous Infusions (‘PCEA’) On The Sapphire Pump For Patients Under 50kg

SOP 1: Setting Up PIEB Infusions On The Sapphire Pump
Using OVER50 1xCWC BUP as an example

| Correct CCA Selection | Using the Drug Library | Confirming the Correct Prescription |
|---|---|--|
| <ol style="list-style-type: none"> 1. Turn Pump On 2. Confirm / select CCA- the CCA name will be displayed in the top left hand corner 3. Select 'Epidural' and 'Intermittent' if prompted | <ol style="list-style-type: none"> 4. Select 'New Infusion' 5. Confirm 'New Patient' 6. Use the 'Find' button or the alphanumeric keypad to select the appropriate drug 7. Confirm the drug + concentration | <ol style="list-style-type: none"> 8. Enter the correct VTBI 9. Confirm the dose (mls) and the time interval 10. Do not enter a continuous rate 11. Confirm the settings match the EPMA prescription |
|  |  |  |



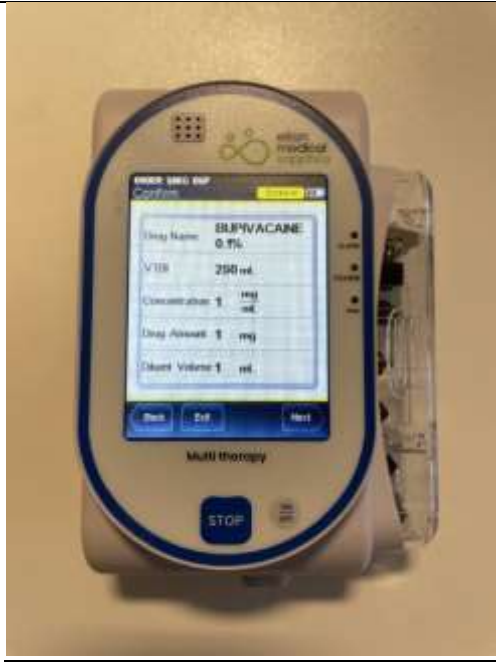
Start the infusion; priming beforehand if needed

SOP 2: Setting Up Continuous Infusions On The Sapphire Pump
Using OVER 50 1xPNC LEV as an example

| Correct CCA Selection | Using the Drug Library | Confirming the Correct Prescription |
|---|--|--|
| 1. Turn Pump On 2. Confirm / select CCA- the CCA name will be displayed in the top left hand corner 3. Select 'Epidural' and 'PCEA' if prompted | 4. Select 'New Infusion' and enter passcode 5. Confirm 'New Patient' 6. Use the 'Find' button or the alphanumeric keypad to select the appropriate drug 7. Confirm the drug + concentration | 8. Enter the correct VTBI 9. Confirm the dose (ml/hour) 10. Confirm the settings match the EPMA prescription |
|  |  |  |

Start the infusion; priming beforehand if needed

SOP 3: Setting Up Continuous Infusions On The Sapphire Pump For Patients Under 50kg
Using UNDER 50KG BUP as an example

| Correct CCA Selection | Using the Drug Library | Confirming the Correct Prescription |
|--|---|---|
| 1. Turn Pump On 2. Confirm /select CCA – the CCA name will be displayed in the top left hand corner | 3. Select 'New Infusion' 4. Confirm 'New Patient' 5. Use the 'Find' button or the alphanumeric keypad to select the appropriate drug 6. Confirm the drug + concentration | 7. Enter the correct VTBI 8. Confirm the dose (ml/hour) 9. Confirm the settings match the EPMA prescription (scroll through to next page to confirm rate) |
|  |  |  |

Start the infusion; priming beforehand if needed



TROUBLESHOOTING

Clinical Concerns: Escalation

For all issues related to the clinical management of peripheral nerve or fascial plane catheters, please escalate to:

- In hours: the Acute Pain team
- Out of hours: the anaesthesia resident on call

Equipment / Drug Shortage

In the event of a shortage of local anaesthetic infusion bags or pump delivery systems, the second line local anaesthetic delivery modality is via hand boluses. This should only be undertaken on a critical care or renal high dependency unit setting, with appropriately trained staff and adequately monitored patients.

An appropriate care plan can be found on EPMA using the label **‘Regional Anaesthesia Hand Bolus – Adult’**.

Equipment Failures

For all issues related to equipment failure, please isolate the relevant piece of equipment and contact the Service Manager for Medical Equipment and Pain Management or Medical Engineering.



Appendix 1: CCA Programmes For Patients Over 50kg

Please note that this list matches the order of the CCAs on the Sapphire Pump. Please ensure that you have selected the correct technique as well as local anaesthetic depending on availability.

| CCA Programmes For Patients Over 50kg | | | |
|--|-----------------|--------------------|---|
| Technique | CCA Name | Delivery Mode | Prescription |
| Chest Wall Catheter x1 (Bupivacaine) | OVER50 1XCWCBUP | Intermittent Bolus | 15 mls 0.1% bupivacaine every 3 hours |
| Chest Wall Catheter x1 (Levobupivacaine) | OVER50 1XCWCLEV | Intermittent Bolus | 15 mls 0.125% levobupivacaine every 3 hours |
| Peripheral Nerve Catheter x1 (Bupivacaine) | OVER50 1XPNCBUP | Continuous (PCEA) | 7mls/hour 0.1% bupivacaine |
| Peripheral Nerve Catheter x1 (Levobupivacaine) | OVER50 1XPNCLEV | Continuous (PCEA) | 7mls/hour 0.125% levobupivacaine |
| Chest Wall Catheter x2 (Bupivacaine) | OVER50 2XCWCBUP | Intermittent Bolus | 20 mls 0.1% bupivacaine every 3 hours |
| Chest Wall Catheter x2 (Levobupivacaine) | OVER50 2XCWCLEV | Intermittent Bolus | 20 mls 0.125% levobupivacaine every 3 hours |
| Peripheral Nerve Catheter x2 (Bupivacaine) | OVER50 2XPNCBUP | Continuous (PCEA) | 14mls/hour 0.1% bupivacaine |
| Peripheral Nerve Catheter x2 (Levobupivacaine) | OVER50 2XPNCLEV | Continuous (PCEA) | 14mls/hour 0.125% levobupivacaine |
| Rectus Sheath Catheter (Bupivacaine) | OVER50 RSC BUP | Intermittent Bolus | 30 mls 0.1% bupivacaine every 3 hours |
| Rectus Sheath Catheter (Levobupivacaine) | OVER50 RSC LEV | Intermittent Bolus | 30 mls 0.125% levobupivacaine every 3 hours |
| TAP Catheters (Bupivacaine) | OVER50 TAP BUP | Intermittent Bolus | 20 mls 0.1% bupivacaine every 8 hours |
| TAP Catheter (Levobupivacaine) | OVER50 TAP LEV | Intermittent Bolus | 20 mls 0.125% levobupivacaine every 8 hours |



Appendix 2: CCA Programmes For Patients Under 50kg

| CCA Programmes For Patients Under 50kg | | | |
|--|----------------|-------------------|--|
| Technique | CCA Name | Delivery Mode | Prescription |
| All patients under 50kg (Bupivacaine) | UNDER 50KG BUP | Continuous (PCEA) | 0.125mg/kg/hour 0.1% bupivacaine |
| All patients under 50 kg (Levobupivacaine) | UNDER 50KG LEV | Continuous (PCEA) | 0.125mg/kg/hour 0.125% levobupivacaine |



Appendix 3: Manufacturer's Quick Reference Tip Card for MultiTherapy Pumps



Sapphire™ Tip Card

| Action | Instruction |
|-----------------|---|
| Lock | Lock > Lock Screen OR Patient Lockout |
| Unlock | Screen Lock: Press to unlock screen > ok Patient Lock: Press to unlock patient > enter password ok |
| Pause Infusion | Request Pause > ok |
| Resume Infusion | Request Continue > ok |
| Review Program | View/Edit > review parameters > ok |
| Edit Program | Request Pause > ok > View/Edit > select parameter and input new value > ok > ok > Request Continue > ok |