

The Newcastle upon Tyne Hospitals NHS Foundation Trust

Acute Pain Service

Guideline for Peripheral Nerve Blockade in Adults

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1 Introduction

Peripheral nerve blockade is the abolition of sensation in a specific area of the body through the targeted injection of local anaesthetic, with the aim of providing either anaesthesia for a surgical procedure or analgesia for post-operative/traumatic pain. This can be achieved through either an isolated one-off injection –referred to as a ‘single shot block’ – or following the insertion of a per-neural or fascial plane catheter for continuous infusion of local anaesthetic agent.

2 Guideline Scope and Purpose

This guideline applies to all adults receiving peripheral (i.e. non-neuraxial), regional anaesthesia and analgesia, within the Newcastle upon Tyne Hospital NHS Foundation Trust. All practitioners of single shot blocks should be familiar with the best practice for this procedure as described in this guideline.

3 Process of Delivering Peripheral Nerve Blockade

3.1 Indications and contraindications

- Peripheral nerve blocks may be used for
 - Sole anaesthetic technique or in combination with sedation or general anaesthesia
 - Perioperative analgesia
 - Acute analgesia
 - Facilitation of physiotherapy
- They can be delivered as
 - Single injection (often called ‘single shot’)
 - Continuous infusion or intermittent bolus via a catheter
- Contraindications
 - Absolute
 - Patient refusal
 - Anaphylaxis

- Consideration of risk and benefit required
 - Anticoagulated patient
 - Risk of compartment syndrome
 - Patients at risk of significant physiological compromise from inducing a state of nerve palsy, for example phrenic nerve palsy in patients with significant respiratory disease.

3.2 Consent / Pre-operative

- AAGBI safety Guidelines¹ 'Consent for Anaesthesia 2017' provide detailed guidelines for the consent process.
- The option of regional anaesthetic techniques should be discussed as early as possible and ideally written information provided. This may include:
 - At preassessment for elective surgery
 - During plastics trauma clinic and during ward 39 preassessment
 - During surgical clinics for upper and lower limb, breast and vascular/vascular access surgery
 - Written information is available in the form of the RCOA/RA-UK² booklet and specific advice for day case shoulder surgery.
- For day surgery involving regional anaesthesia, specific instructions to inform the patient's expectations and support safe care should be given – we would recommend that this information be discussed at Preassessment clinic, with supportive written literature provided and then further discussed by the anaesthetist performing the procedure on the day of surgery. Specifically patients should be made aware of:
 - practical aspects of the conduct of a peripheral nerve block
 - not providing General Anaesthesia –ie. Being fully conscious during surgery (if indicated)
 - need for analgesia cover in the 'wear-off' period
 - limb protection until normal sensory and motor function resumes
 - any non-threatening expected physiological changes specific to the block (eg Horner's Syndrome in ISC block).
 - any concerning features that should prompt them to seek advice or review (eg. Signs of infection at the injection site, failure of the return of normal sensory/motor function beyond the expected duration of the block)
 - details of how to access advice/support.
- Alteration of a planned anaesthetic technique immediately prior to induction or during procedure is not best practice. This should only occur in exceptional circumstances e.g. patient preference changes, pain occurs during surgery, or emergency develops.

¹ Association of Anaesthetists: Consent for Anaesthesia 2017. *Anaesthesia* 2017; 72: 93-105

² RA-UK: Consent for Peripheral Nerve Blocks 2015. <https://www.ra-uk.org/>

- Information should be tailored to the patient and cover the following;
 - Rationale and benefits of the technique proposed
 - The common components of the procedure and what the patient can expect
 - Commonly occurring risks and side effects
 - Rare complications that are serious or potentially life threatening
 - All possible alternatives:
 - Valid consent requires the patient to understand the treatment, alternatives and not feel coerced into regional anaesthesia against their wishes.
 - Many patients are apprehensive or anxious about the concept of awake surgery, and benefit from reassurance +/- sedation during the block.
 - Patient's decisions must be respected and facilitated where ever possible.
 - It might be appropriate to advise patients that appropriate expertise may not always be available to offer regional anaesthesia, particularly out of hours.
 - Appendix A summarises suggested framework of discussion.
 - There are modifiable paperlite frameworks to enable accurate documentation of discussion.

- The consent process should always be documented in the patient's notes.
 - The AAGBI suggest that signed consent is required when the procedure is not part of another related process (i.e. to facilitate surgery or labour analgesia).
 - Acute pain or concurrent opioid use for the treatment of acute pain does not necessarily impair mental capacity. Analgesic regional anaesthetic techniques are used extensively within the trust, and considered to be gold standard treatments in many circumstances (rib fractures, hip fractures, amputation pain). Given the urgent nature, clinicians will have to use judgement to assess capacity, to ensure that patients are given sufficient opportunity to consider treatment options whilst also ensuring that analgesia is provided in a timely manner. This decision making should be clearly documented and whilst it could be argued that these procedures are part of an interrelated pathway, a signed record of discussion probably reflects best practice.
 - If a formal consent document with patient signature is required, the appropriate Trust consent form should be used.

- Capacity should always be presumed, and assessed as set out in the Mental Capacity Act 2005³.

- A comprehensive anaesthetic assessment should be performed prior to performance of regional anaesthesia.

³ Mental Capacity Act 2005. <https://www.legislation.gov.uk/ukpga/2005/9/contents>

- Disorder of a patient's coagulation state may present a relative contra-indication to a single shot block due to an increased risk of causing unintentional peri/intra-neural haematoma. The AAGBI guideline 'Regional Anaesthesia and Patients with Abnormalities of Coagulation' (2013)⁴ provides a guide to further assessing this risk when considering a single shot block.
- Regional anaesthesia may be performed awake, with sedation or following general anaesthetic, based on risk benefit judgement and patient preference.
 - It is standard practice to perform nerve blocks following induction of general anaesthesia and there is some evidence that this is safer in children.
 - There is expert opinion that interscalene and supraclavicular brachial plexus blocks are safer performed on awake or sedated patients.
- The anaesthetic technique should be discussed at the team briefing. This is particularly important if the technique is unfamiliar to members of the theatre team or falls outside normal practice.

3.3 Infection control

- No specific national guidelines exist for infection control however advice is available in 'Skin antisepsis for central neuraxial blockade' 2014⁵ and 'Infection Control in Anaesthesia' 2008⁶.
- Hand hygiene is the single most evidence based intervention to reduce transmission of healthcare associated infection, and the anaesthetist must ensure that hands are fully washed prior to commencement of any peripheral nerve technique.
- Chlorhexidine 0.5% in 70% alcohol should be applied to the skin by the use of multi-use spray bottle.
 - 0.5% chlorhexidine is considered to be less neurotoxic than 2% chlorhexidine and probably no less effective.
 - Alcohol solutions are considered to be more effective than aqueous solutions though alcohol is known to be neurotoxic.
 - Application from a multi-use spray bottle minimises the chance of contamination of equipment or accidental injection. One spray appears to be effective, and should be allowed to dry effectively.
 - Povidone iodine solutions should be used in case of chlorhexidine allergy.

⁴ Association of Anaesthetists: Regional anaesthesia and patients with abnormalities of Coagulation 2013. *Anaesthesia* 2013; **68**: pages 966-72

⁵ Association of Anaesthetists: Skin antisepsis for central neuraxial blockade 2014. *Anaesthesia* (ePub ahead ofprint, 3 Sep 2014): doi: 10.1111/anae.12844

⁶ Association of Anaesthetists: Infection Control in Anaesthesia 2008. *Anaesthesia* Sept2008; **63**:pages 1027-1036

- ANTT should always be observed. Key parts include
 - Needle tip
 - Catheter if being used
 - Injection port
 - Syringe tips
- The ultrasound probe should be covered with a sterile dressing and decontaminated with 't spray' after use
 - A probe cover / dressing are standardly used with a film of sterile aquagel protecting the probe from the adhesive.
 - For catheter techniques either a dressing with a sterile drape to protect the cable, or a sterile probe sheath should be used. Sterile sheaths probably offer more protection against transmission of infection but image quality may be sacrificed.
- Sterile ultrasound gel must be used for all peripheral techniques and care should be made not to pass the needle tip through a large collection of gel.
- Catheter techniques
 - The same standards of asepsis are used advised as those for spinal and epidural anaesthesia
 - Full hand washing
 - Sterile gloves, gown, mask and drapes
 - Chlorhexidine skin preparation
 - Maintenance of a sterile field
- Single shot injection techniques
 - There is national consensus that techniques with no indwelling catheter do not require the same level of barrier precautions as spinal or epidural anaesthesia
 - Minimum precautions are hand washing, skin disinfection with 0.5% chlorhexidine, use of sterile gel for patient and probe, surgical gloves and probe cover / dressing.
 - Some operators may wish to consider use of sterile field and probe cover, gown, hat, and mask.

3.4 Block performance/conduct

3.41 Location

- Regional anaesthesia should be performed in an area with appropriate monitoring, staff, and equipment (including resuscitation equipment). These may include
 - Anaesthetic room
 - Theatre
 - Designated block area/room
 - Recovery room
 - Monitored Bed in ED

3.42 Personnel, Competence and Training

- Regional Anaesthesia should be performed by a competent practitioner with a competent assistant.
- There is no universally agreed definition of competence in regional anaesthesia.
- For these guidelines competence is defined as
 - Understands the relevant anatomy and sonoanatomy of the particular technique. Is able to generate and interpret the ultrasound image.
 - Is able to perform safe needling with needle tip visualisation.
 - Is able to safely administer local anaesthetics and understands pharmacology and pharmacodynamics of these drugs.
 - Is able to manage complications of the technique.
- Competence will be affirmed by previous experience, witnessed performance, self-reported abilities and prior assessments.
- In certain circumstances it may be appropriate for non-medical staff to perform single injection forms of regional anaesthesia on the basis that they have completed an appropriate training program, achieving their required competencies for safe and effective care in this area and with the agreement of the relevant clinical director. The Association of Anaesthetists and RA-UK provide a supportive statement relating to this extended scope of practice⁷.
- Regional anaesthetic techniques vary in complexity. The complexity should be considered before embarking on a technique and consideration of whether supervision or assistance is required. Some factors which may increase the complexity, difficulty and risk posed by a technique are as follows;
 - Technique specific
 - Depth of target
 - Steep needle angle
 - Small acoustic window
 - Catheter techniques (through needle)
 - Patient specific
 - Anticoagulation
 - Confused patient
 - Anxiety
 - Compromised ultrasound image (oedema, radiotherapy, obesity)
 - Anatomical variation
 - Difficulty in adopting desired position

⁷ Association of Anaesthetists: Fascia Iliaca Blocks and Non-Physician Practitioners (2013); https://www.ra-uk.org/images/Documents/Fascia_Iliaca_statement_22JAN2013.pdf

- Other factors
 - Awake surgery or perfect analgesia/ anaesthesia required
 - Time pressure
 - Trauma
 - Experience and confidence of operator
- Training in regional anaesthesia is vital to expand the service and safe delivery of regional anaesthesia. Educational opportunities should be identified and maximised, but responsible consultant must minimise the risk posed to the patient. This includes ensuring that appropriate supervision is delivered and ensuring that the complexity of the technique is appropriate for experience and ability.
- The duties of the anaesthetic assistant include
 - Performing pre procedural checks
 - Establish monitoring
 - Provide reassurance to the patient
 - Electronic recording on Surginet
 - Engagement in 'STOP BEFORE YOU BLOCK'⁸
 - Injection of local anaesthetic, if delegated and as instructed by the practitioner performing the block.

3.43 Equipment

- Whilst single shot injections can be administered using a landmark technique, we would advocate the use of ultrasound guidance and/or a peripheral nerve stimulator to guide the injection as both modalities have been shown to reduce the risk of complications and improve efficacy compared to solely using a landmark technique⁹.
- NR fit needles should be used.
- IV access should be obtained or patent.

3.44 Monitoring

- AAGBI standard –minimum requirement of SpO₂, Non-invasive BP, ECG

3.45 Anxiolysis

- Administration of an injection of local anaesthetic or undergoing awake surgery may precipitate anxiety in some patients. Consideration of distraction therapies such as ambient music or administration of sedation can be considered to alleviate this and improve the patient's experience. If sedation is

⁸ Royal College of Anaesthetists/RA-UK/Safe Anaesthesia Liaison Group. 'Stop-Before-You-Block' Campaign; <https://www.rcoa.ac.uk>

⁹ National Institute of Clinical Excellence: Ultrasound Guided Regional Nerve Block 2009 IPG285; <https://www.nice.org.uk>

utilised it should only be administered by a practitioner competent in the use of sedation.

3.46 Stop Before You Block

- Performance of the RCoA/RA-UK¹⁰ 'Stop-Before-You-Block' check to prevent wrong site injection is mandatory during the provision of regional anaesthesia in this trust.
- The guideline 'Preventing Wrong Site Analgesic Nerve Blocks' outlines the modifications to stop before you block in situations where the patient is undergoing a procedure which is not to facilitate surgery.
- Written consent forms can be draped over the ultrasound machine screen to serve as a reminder.

3.47 Safety considerations

- NR fit equipment should be used.
- Pain, paraesthesia, blood on aspiration or difficult injection should prompt repositioning of needle tip and should be documented post-procedure.
- Local anaesthetics should be injected at a maximum bolus of 5ml, before re-
aspiration to minimise risk of migration into vessels. Use of 10 or 20 ml syringes for administration is preferable as these deliver injection at lower pressures.
- Any event of Pain, paraesthesia, blood on aspiration or difficult injection should prompt repositioning of needle tip and should be documented post-procedure.
- Explanation of the conduct of the block and efforts to check the well-being of the patient during the procedure should be made where possible and as appropriate.
- If a catheter technique is used, a bolus should be delivered via the catheter and the infusion commenced in a monitored environment to ensure correct placement of the catheter.

3.48 Complications

- Any suspected serious complications should be reported to the Regional Anaesthesia Lead
- Datix should be completed
- Suspected nerve injury should be managed as per 'Nerve injury' Guideline.

3.5 Post block

The details of the procedure should be recorded in the patient's notes on an anaesthetic chart or a regional anaesthesia chart. Essential information includes:

- observations – minimum requirement of SpO₂, ECG, NIBP

¹⁰ Royal College of Anaesthetists/RA-UK/Safe Anaesthesia Liaison Group. 'Stop-Before-You-Block' Campaign; <https://www.rcoa.ac.uk>

- details of the procedure
 - patient's conscious state
 - asepsis precautions used
 - use of ultrasound guidance
 - concordance with SBYB check
 - topical analgesia details if used on skin (eg. EMLA/SC Lignocaine)
 - type and dimensions of needle used
 - type, volume and concentration of local anaesthetic used
- any other medications administered (and their timing)
- any specific complications that have occurred
- any post-procedure instructions for the patient's parent team

The patient should be continually monitored, and observations recorded, for thirty minutes after block. The time taken to perform the operation may outlast this period and we advise that observations continue to be recorded until the end of any surgical procedure. Additionally, if the thirty minute period has expired, it may be appropriate for patients to return directly to the ward, effectively by-passing any recovery/post-anaesthetic care area. This decision should be taken by the responsible anaesthetist and clearly documented in the patient's notes.

In some areas, theatre nursing staff or anaesthetic assistants are suitable to observe patients. This must be with local agreement in areas used to managing these patients.

An anaesthetist must be directly available until the case is complete and the patient has been transferred back to their ward. Further guidance on supervision of regional anaesthesia is available through RA-UK¹¹

Discussion with the relevant Acute Pain Team may be desirable for surveillance post-procedure. This may be considered appropriate if concerns exist relating to a potential complication of a block (for example respiratory issues arising from an upper brachial plexus block) or therapeutic efficacy is wished to be assessed with a view to potential further regional anaesthetic technique being undertaken, such as a peri-neural catheter. Outside of the usual hours of the pain teams' service provision, such patients should be discussed with the relevant on call anaesthetic team.

Whilst not specifically covered within the scope of this guideline, all catheters inserted through regional anaesthetic techniques should be referred to the relevant Acute Pain Team for ongoing review, as detailed in 'Monitoring' in section 5.

Documentation in the relevant departmental database should be completed to ensure continuity of care with associated clinical teams and to facilitate ongoing

¹¹ RA-UK: RA-UK guidelines for supervision of patients during peripheral regional anaesthesia (2015).
<https://www.ra-uk.org>

monitoring and quality assurance of the service. Access to and familiarity with the relevant database should be provided at departmental induction.

Management of continuous infusions by nursing and medical staff on the ward are covered by a separate guideline available on the trust intranet.

4. Training, Implementation and Resource Implications

This guideline largely reflects the current standard of practice across the trust.

Training in techniques of regional anaesthesia is incorporated into the Royal College of Anaesthetists' national training scheme for all anaesthetic trainees in the UK, with specific reference to skills and levels of supervision required respective to their stage of training. A trustwide training program exists for non-medical practitioners, such as anaesthetic nurses/operating department practitioners, to specifically provide a single shot Fascia Iliaca block for patients requiring analgesia for fractured neck of Femur injury, and must be completed with a specified number of cases directly supervised prior to them undertaking single shot blocks without direct supervision. In all cases where a doctor in a national training scheme, a trust grade doctor or a non-medical practitioner are the provider of single shot block, an appropriate level of supervision by an anaesthetic consultant is mandatory. Where any concerns or doubt exist about the practitioner's ability to perform the technique safely and effectively, they should be directly supervised by the anaesthetic consultant.

In working hours (Mon-Fri 0800-1800) a named consultant with a special interest in regional anaesthesia is available via DECT phone for assistance/advice in the provision of regional anaesthesia/analgesia on both the RVI and Freeman sites. Outside these hours, any queries should be directed to the duty consultant anaesthetist on call. Regional anaesthetic services may be available outside normal working hours and any requests should be discussed with the PINC anaesthetic registrar on call (DECT 29214) at the RVI and the 2nd Call Anaesthetist (DECT 48483) at the Freeman.

5. Monitoring Section

The organisation continually strives to achieve 100% compliance with this guideline and its intended outcomes. Where this is not met an action plan will be formulated and reviewed until completion. Please see the table below for standards and monitoring arrangements:

Standards	Monitoring and audit			
	Method	By	Group / Committee	Frequency
<p>This should be the steps that you have described in the process part of the guideline for example:</p> <p>All patients receiving a single shot nerve block will have the details recorded in their notes with reference to the particulars as detailed in the 'Process' section of the guideline. Particular emphasis will be placed on the following aspects:</p> <ul style="list-style-type: none"> -Quantity of procedures -Grade of practitioner performing procedure -Adherence with 'Stop Before You Block' check -Concordance with Infection Control protocols -Ensuring adequacy of environment and observed monitoring during and post-procedure -Efficacy of Nerve Block -Complications arising from single shot procedures -Patient satisfaction with regional anaesthesia process 	<p>This is how are you going to monitor this, for example:</p> <p>Continual Quality assurance audit</p>	<p>Who will undertake the monitoring:</p> <p>Anaesthetists providing regional anaesthesia services on either site.</p> <p>Acute Pain teams on either site.</p>	<p>Who has overall accountability:</p> <p>Named consultant lead for regional anaesthesia</p>	<p>How often are these carried out:</p> <p>Annually</p>

-Effectiveness and Safety of Peri-Neural/Fascial Plane/Nerve Plexus Catheters	Daily review Auditing of Catheter Database	Acute Pain teams on either site		Daily Monthly
Once you have pulled all the standards out of the guideline you then need to put in your outcome standards, for example: Reduction in the rate of procedure related complications, including infection, failure or nerve injury. Improvement in observed levels of patient satisfaction. Reduction in post-operative/injury pain states. Improved rates of day case surgery	Outcomes may be monitored differently for example: Review of all incidents of persistent nerve block beyond the expected period. Review of rates and reasons of possible nerve injury. Comprehensive review of any critical incidents relating to single shot nerve blocks through root cause analysis Reported Pain Scores	As above	As above	Continuously

6. Evidence Review and Evaluation

This guideline has been informed by NICE guideline Ultrasound Guided Regional Anaesthetic Nerve Block IPG285 and further informed by guidance available through the Royal College of Anaesthetists, the Association of Anaesthetists of Great Britain and Ireland and RA-UK.

The 'Stop Before You Block' Campaign is detailed on the Royal College of Anaesthetists' website.

7. References

1. Association of Anaesthetists: Consent for Anaesthesia 2017. *Anaesthesia* 2017; **72**: pages 93-105
2. RA-UK: Consent for Peripheral Nerve Blocks 2015. <https://www.ra-uk.org/>

3. Mental Capacity Act 2005.
<https://www.legislation.gov.uk/ukpga/2005/9/contents>
4. Association of Anaesthetists: Regional anaesthesia and patients with abnormalities of Coagulation 2013. *Anaesthesia* 2013; **68**: pages 966-72
5. Association of Anaesthetists: Skin antisepsis for central neuraxial blockade 2014. *Anaesthesia* (ePub 3 Sep 2014): doi: 10.1111/anae.12844
6. Association of Anaesthetists: Infection Control in Anaesthesia 2008. *Anaesthesia* Sept2008; **63**:pages 1027-1036
7. Association of Anaesthetists: Fascia Iliaca Blocks and Non-Physician Practitioners 2013; https://www.ra-uk.org/images/Documents/Fascia_Iliaca_statement_22JAN2013.pdf
8. Royal College of Anaesthetists/RA-UK/Safe Anaesthesia Liaison Group. 'Stop-Before-You-Block' Campaign; <https://www.rcoa.ac.uk>
9. National Institute of Clinical Excellence: Ultrasound Guided Regional Nerve Block 2009 IPG285; <https://www.nice.org.uk>
10. Royal College of Anaesthetists/RA-UK/Safe Anaesthesia Liaison Group. 'Stop-Before-You-Block' Campaign; <https://www.rcoa.ac.uk>
11. RA-UK: RA-UK guidelines for supervision of patients during peripheral regional anaesthesia 2015. <https://www.ra-uk.org>

Appendix A: Suggested topics to cover during preoperative discussion

	Benefits and rationale	Common Components	Common complications or side effects	Serious Complications	Alternative Treatment
<p>General considerations</p> <p>Regional anaesthesia techniques</p>	<p>Good analgesia</p> <p>Few systemic side effects</p> <p>Can be pain relief or anaesthetic</p> <p>Covers tourniquet pain during surgical procedures.</p> <p>Fit for home discharge sooner</p> <p>Lower chance of dental damage, aspiration, respiratory complications</p>	<p>Full monitoring</p> <p>Use of ultrasound</p> <p>May be performed awake or asleep</p> <p>EMLA or local to skin</p> <p>Sedation offered</p>	<p>Pain or discomfort on insertion</p> <p>Motor block</p> <p>Inadequate analgesia</p> <p>Bruising</p> <p>Mild desaturation (when using Prilocaine)</p>	<p>Nerve injury (temporary or permanent)</p> <p>Local anaesthetic toxicity</p> <p>Site Infection</p> <p>Anaphylaxis</p> <p>Pain or conversion to GA</p>	<p>General anaesthetic</p> <p>Opioid based analgesia</p>
<p>Plastics hand trauma</p> <p>Axillary block Supraclavicular block Infraclavicular block Peripheral nerve blocks</p>	<p>High patient satisfaction</p> <p>Good pain control</p> <p>Increased day case rates</p>	<p>May include 'top-up blocks'</p> <p>Follow-up via text message service</p>	<p>Horner's (supraclav only)</p> <p>Phrenic nerve block (supraclav only)</p> <p>Tourniquet pain</p>	<p>Pneumothorax (supraclav and infraclav)</p>	<p>Local infiltration</p>

<p>Neck of femur fracture And other lower limb</p> <p>Fascia iliaca block Femoral nerve block</p>	<p>Reduced opioid dosing, and avoidance of opioid side effects</p> <p>May be 'topped up' for theatre (NOF fixation) if a catheter sited</p>	<p>May include catheter</p> <p>Regular pain team review</p>	<p>Will not be total pain relief</p> <p>Catheter dislodgement or fallout (+/- re-site)</p>	<p>Apnoea</p>	<p>Epidural</p>
<p>Rib fracture</p> <p>Paravertebral block ESP block Serratus plane block</p>	<p>Possible improved outcome</p> <p>Avoidance of pain, respiratory failure, lung infection and critical care admission.</p>	<p>Will involve catheter</p> <p>May require top-ups</p> <p>Regular pain team review</p>	<p>Catheter dislodgement or fallout (+/- re-site)</p>	<p>Pneumothorax</p> <p>Paravertebral haematoma</p> <p>Epidural spread</p>	<p>Epidural</p>
<p>Breast Surgery</p> <p>Paravertebral block ESP block Serratus plane block PEC 1 & 2 blocks</p>	<p>Improved day case rate</p> <p>Reduced opioid dosing, and avoidance of opioid side effects</p>	<p>Usually performed after induction</p>		<p>Pneumothorax</p> <p>Paravertebral haematoma</p> <p>Epidural spread</p>	<p>Local infiltration</p>
<p>Shoulder and Elbow Surgery</p>	<p>Improved day case rate</p> <p>Athletic / sports injury patients may wish to watch surgery to understand injuries better</p>	<p>May involve day case shoulder surgery</p>	<p>Horner's</p> <p>Phrenic nerve block</p>	<p>Pneumothorax</p>	

Foot and Ankle Surgery	Good pain control Improved day case rate	With/without general anaesthesia	Transient period of non-weight bearing		Local Infiltration
Vascular Access Surgery	Good pain control Potential for improved surgical outcomes pertaining to fistula creation Increased day case rates	May include 'top-up blocks' Follow-up via text message service	Horner's (supraclav only) Phrenic nerve block (supraclav only)	Pneumothorax	
Peripheral Vascular Surgery	Good pain control, including reduced rate of phantom pain Reduced opioid requirement Avoid potential morbidity/mortality associated with general anaesthesia in severely co-morbid patients	May involve catheter insertion	Horner's Syndrome/Phrenic Nerve block (upper limb only) Catheter dislodgement or fallout (+/- re-site) – need for tunnelling	Pneumothorax	Neuraxial techniques including epidural/spinal catheter