

**GUIDELINES FOR PERIPHERAL NERVE / PLEXUS BLOCK
CATHETER MANAGEMENT
DEPARTMENT OF ANAESTHESIOLOGY AND INTENSIVE CARE
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INTRODUCTION

Regional block provides superior pain relief, compared to opioid-based analgesic techniques alone. However, performance of peripheral nerve / plexus block requires certain amount of skill and appropriate training to achieve a level of competency to avoid unnecessary morbidity or mortality

The aim of performing regional techniques is mainly to achieve optimum postoperative pain management, so as to be able to undergo physiotherapy comfortably, reduced length of stay and for faster resumption of daily activities.

Various approaches of brachial plexus blocks are commonly used for upper limb surgery, and peripheral nerve blocks, namely femoral and sciatic nerves are the usual lower limb blocks done in practice.

This document outlines the recommended guidelines of management and follow up care, for patients undergoing surgery under peripheral nerve / plexus blocks.

PREPARATION FOR CATHETER TECHNIQUE

- Selection of appropriate cases

- cases of prolonged duration (at least >4H)
- require postoperative analgesia for >24H, whereby oral analgesics at maximum doses alone will be inadequate
- reconstructive limb or joint surgery
- no contraindications to regional techniques: patient refusal, coagulopathic patients, patients on anticoagulants,

- **Preparation and performance of catheter insertion** is under standard protocol
 - no contraindication to drugs, technique: done in OT or induction room
 - standard monitoring – NIBP, ECG, SpO2
 - Emergency drugs drawn (midazolam/ thiopentone, intubation drugs)
 - nasal prong oxygen 2L/min
 - done under strict aseptic technique
 - *povidone and or chlorhexidine
 - *gowning of person performing the block
 - *draping of block area
 - *with or without nerve stimulator and or US guided
 - *use of transducer cover or transparent occlusive dressing (tegaderm) with draping of transducer cable
 - *ensure catheter integrity using saline or local anaesthetic
- distension of fascial space with 10ml of D5% or LA (concentration depending on indication: as anaesthesia or analgesia) ; while monitoring for signs/symptoms of inadvertent IV injection
 - for **anaesthesia- 0.5% Ropivacaine**
 - **analgesia- 0.375% Ropivacaine or 0.2% Ropivacaine**
 - at least 3 cm of catheter length in fascial space: not more than 5cm
 - catheter must be held securely onto the skin, either by tunnelling, or by using two-layered transparent occlusive dressing('sandwich'technique). Note the length of catheter inserted on the APS form (marking on the catheter when it first emerge from the skin)
 - catheter **MUST** be labeled '**NERVE / PLEXUS BLOCK**' to avoid wrong drug being infused.
 - if clinically catheter technique is successful, start infusion of 0.2% ropivacaine without fentanyl at 5ml/h in recovery area
 - if not successful clinically, consider alternative technique

MONITORING OF PATIENTS (as per MSA /ANZCA monitoring standards)

- Standard monitoring of cases**, with or without nerve stimulator or US. (blood pressure, pulse rate, oxygen saturation, respiratory rate)
- Maintain verbal communication during procedure
- assess distribution of sensory block to cold pre-prepared ice pack
- assess distribution of motor block to groups of affected muscles
- monitoring of symptoms of LA toxicity, catheter migration, infection, bleeding from site of puncture, LA leak or occlusion
- Ideally all procedures should be done awake with:
 - Nerve stimulator
 - Ultrasound
 - Injection pressure monitor
- In cases where prior anaesthesia is given, (general anaesthesia or spinal/epidural) use all of the above (when available) or at least 2 out of 3 apparatus as additional monitoring modality.

POSTOPERATIVE CARE OF PATIENT AFTER NERVE / PLEXUS BLOCK +/- CATHETER INFUSION

Prevent trauma to the weak and insensate limb, as pain sensation is blocked and injury can occur to vital structures without the patient realization until the block wears off.

- i. always keep the weak and insensate arm in a sling and protect the elbow with a pillow placed under the arm to prevent ulnar nerve injury. Patients must be warned that the upper limb is still weak.
- ii. always keep the weak and insensate leg adequately padded and on a pillow to prevent injury to the common peroneal nerve at the proximal head of the fibula.
- iii. ensure the patient avoids walking on the blocked leg until the block dissipates.
- iv. avoid contact of the insensate limb with hot or cold objects.

APS Assessment Guideline for nerve / plexus catheter infusion

1. If VAS pain score of >3/10 at rest and >5/10 on movement (Please see Scenario 1 and 2)
2. Presence of excessive numbness and motor blockade
3. Monitor symptoms of LA toxicity (lightheadedness, blurred vision, tinnitus, circumoral numbness, disorientation, LOC)
4. Check dressing site and look for bleeding, excessive leaking, catheter dislodgement, inflammation and infection.

BOLUS / INFUSION STEP-UP STEP-DOWN PROTOCOL

SCENARIO 1:

- **increase** infusion by **2-3ml** when **VAS > 3**, and **review after 30 minutes**
- repeat increase of infusion rate **until VAS < 3** or **until maximum of 15ml/h**
- if **VAS > 3** with **maximum infusion dose**, consider a **failure of catheter** technique and review analgesic requirement
- **consider alternative** technique for pain relief

SCENARIO 2:

- if pain is **severe (intolerable) VAS > 6**, administer **bolus 5ml of lignocaine 2%**
- if after 5min, **no improvement** is seen, **rule out catheter failure**, ie:
 - * dislodged
 - * significant leak with high infusion pressure
 - * occlusion
 - * if available, re-stimulate catheter to ascertain correct placement
- **no relief + catheter failure**, **abandon** technique and consider alternative
- **inadequate relief and no catheter failure**, **repeat bolus** lignocaine →
SCENARIO 1
- if there is **relief**, **go to SCENARIO 1**
- continue to **monitor sensory and motor involvement** during review
- if **persistent motor weakness**, with **VAS < 3**, **reduce infusion** volume by 2-3ml
- when above situation arises, **+ infusion is 5ml/h**, **withhold** subsequent infusions and **review after 1 hour**
- if still **persist**, **stop technique** and **consider alternative** analgesic modality
- if **motor weakness present**, but **VAS > 3**, **stop infusion** and **consider alternative** technique
- in cases where **motor weakness and /or paraesthesia** is present and persistent, consider nerve injury (for **neurology consult**)
- see flow-chart.

CESSATION OF REGIONAL ANAESTHESIA

- Consider stopping therapy when patients can be changed to systemic oral analgesia(overlap)
- stop infusion and wait for at least 4 hours before removing catheter
- if analgesia is required beyond > 72 H, consider risk v benefit

ANTICOAGULATION AND PERIPHERAL REGIONAL CATHETER

- insertion and removal of catheter is to follow the American Society of Regional Anesthesia and Pain Medicine Evidence-Based Guidelines (Third Edition)‡
- Unfractionated heparin (bolus or infusion): insertion/removal to be done at least 4 h after the previous dose or stoppage of infusion. Give UFH / re-heparin > 1h after insertion/removal.
- LMWH: doses >12h before insertion/removal. Give LMWH > 2h after catheter removal (for once daily doses)
- Fondaparinux: removal of catheter to be done after 36 h after previous dose
- Warfarin: removal within 12 h of first dose; for insertion/ removal INR < 1.5
- Antiplatelets: No concerns with NSAIDS including Aspirin.
- Caution with Clopidogrel (recommended interval 7 days) and Ticlopidine (discontinue for 14 days)
- For superficial blocks where external pressure can be applied in case of bleeding or haematoma (neck or femoral region), removal of catheter in patients with anticoagulation can be considered earlier than the recommended interval. (for interscalene, axillary, femoral and popliteal)
- For deep plexus blocks (paravertebral block, lumbar plexus block), removal of catheters should follow the guidelines for central neuraxial blocks.

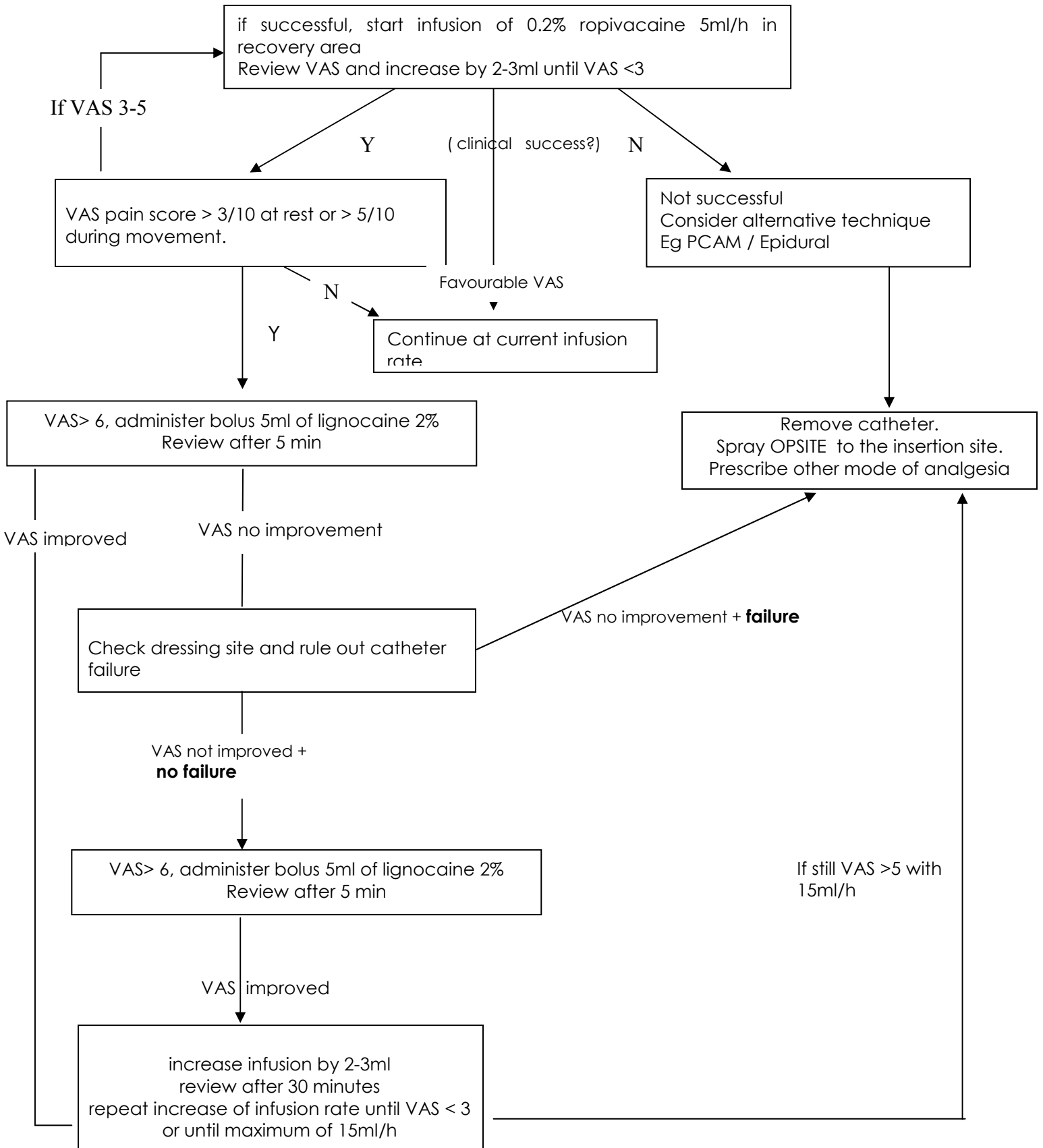
All reviews will be done by APS staff
Contact number 5529

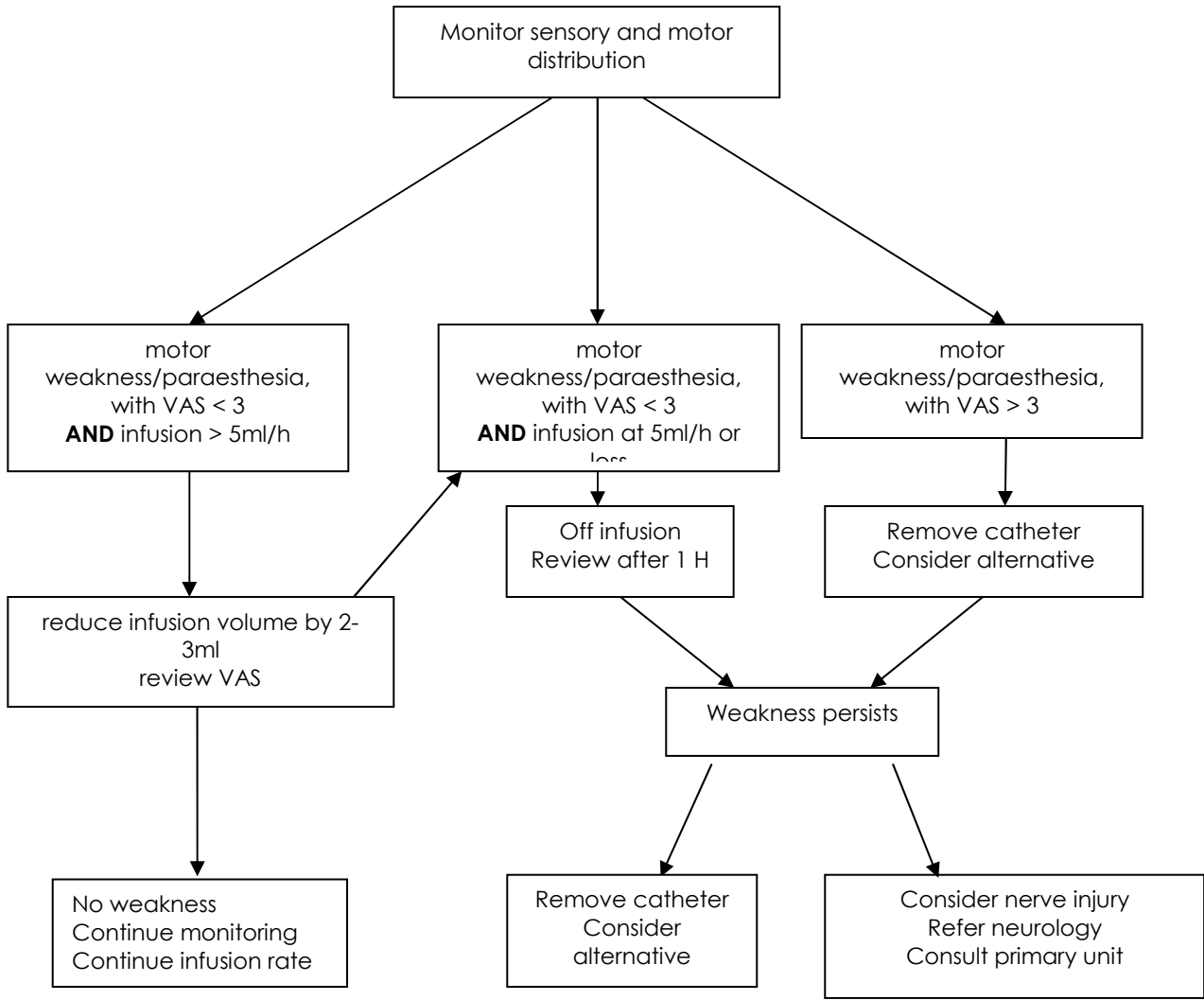
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¥(Reg Anesth Pain Med 2010;35: 64-101)

FLOWCHART FOR PERIPHERAL NERVE/PLEXUS BLOCK CATHETER MANAGEMENT





Monitor sensory and motor distribution

motor weakness/paraesthesia,
with VAS < 3
AND infusion > 5ml/h

motor weakness/paraesthesia,
with VAS < 3
AND infusion at 5ml/h or less

motor weakness/paraesthesia,
with VAS > 3

reduce infusion volume by 2-3ml
review VAS

Off infusion
Review after 1 H

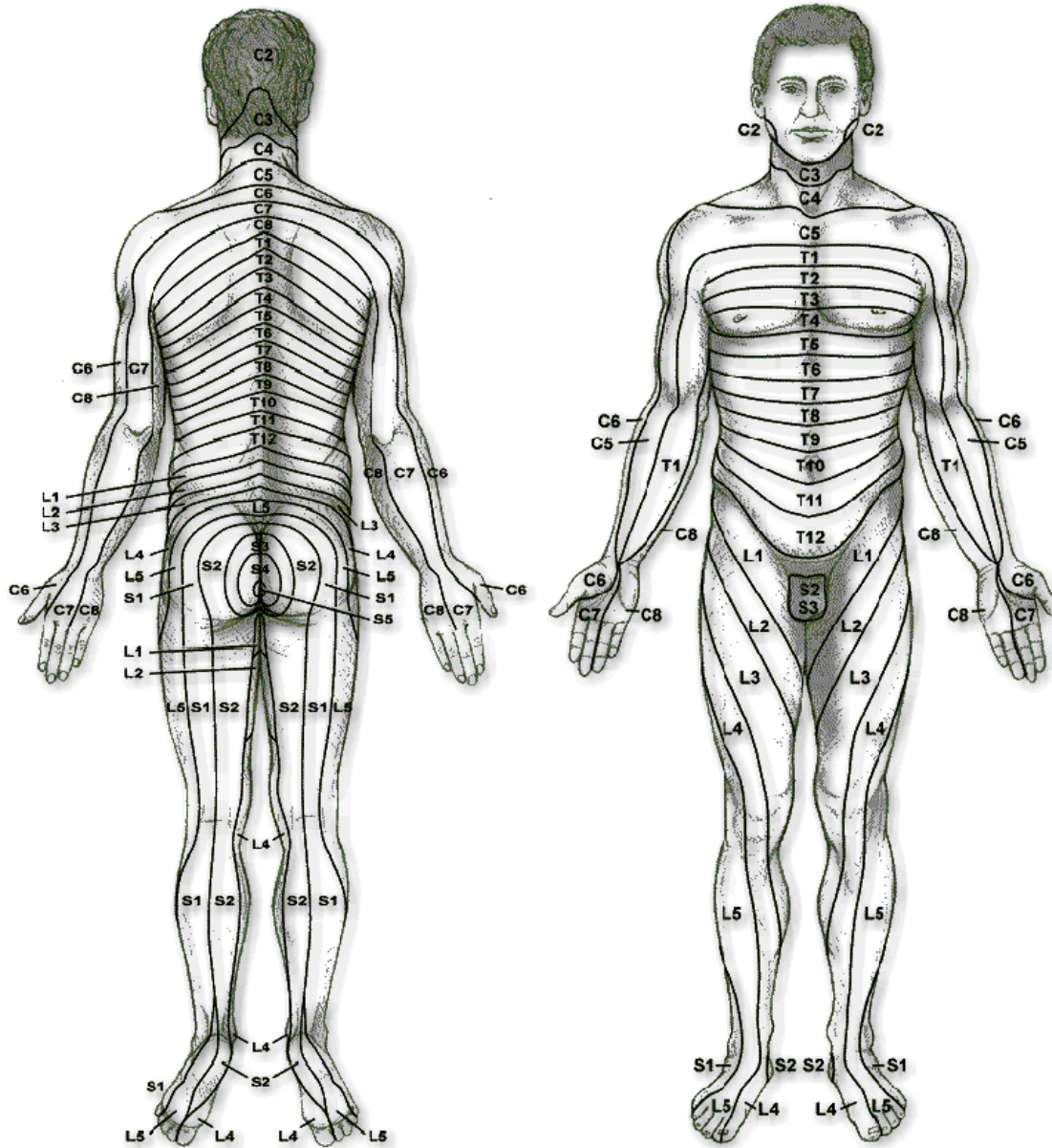
Remove catheter
Consider alternative

No weakness
Continue monitoring
Continue infusion rate

Weakness persists

Remove catheter
Consider alternative

Consider nerve injury
Refer neurology
Consult primary unit



Appendix 1: Distribution of sensory dermatomes

Acknowledgement

- Royal Perth Hospital Pain Service, Standard Operating Procedures, Peripheral Regional Anaesthetic (RA) Infusions.