

# Nerve Blocks

## Introduction

- Wash hands, Introduce self, Patients name & DOB & wrist band, Explain procedure and get consent
- Explain risks and benefits
- Check for contraindications
  - Local anaesthetic allergy
  - Neurovascularly compromised limb
  - Infection at insertion site
  - Therapeutic anti-coagulants (e.g. warfarin) or clotting abnormality (relative contraindication)

## Preparation

- Wash hands
- Put on apron
- Clean a trolley
- Gather equipment onto bottom of trolley (think through what you need in order)
  - Sterile pack
  - Anti-septic cleansing snap-sponge (alcohol/chlorhexidine)
  - Cotton gauze swabs
  - Needles/syringes as described in specific block sections below
  - Equipment to be kept outside of the sterile field:
    - Sterile gloves
    - 10ml 1% lidocaine (maximum 3mg/kg – note 10ml 1% lidocaine = 100mg) – lasts 30-60 mins (for procedures) OR 30ml 0.25% bupivacaine (maximum 2mg/kg – note 10ml 0.25% bupivacaine = 25mg) – lasts 3-8 hours (for analgesia)
- Walk to patient
- Wash hands
- Open sterile pack to form a sterile field on the top of the trolley
- Open packets (without touching the instruments themselves) and drop sterile instruments neatly into the sterile field

### Positioning and exposure

- Expose the site
- Position patient
- Locate insertion point

### Preparation

- Wash hands
- Apply sterile gloves (but note, it's not a sterile procedure)
- Sterilize area – work from middle outwards in a spiral motion (using cleansing snap-sponge)
- Draw up anaesthetic
  - Snap open local anaesthetic bottle and hold open upside-down
  - Draw up local anaesthetic using a green needle on 10-20ml syringe

## Block administration

*Notes: 1. if paraesthesia occur during procedure, withdraw needle 2-3mm before injecting local anaesthetic; 2. always aspirate before injecting local anaesthetic to ensure you are not in a vessel; 3. If you enter a vessel, withdraw needle, apply pressure and re-attempt after 5-10 minutes*

### Digital nerve ('ring') block – used for analgesia for any finger procedures

- Use an orange needle on 10ml syringe to infiltrate anaesthetic
- Options
  1. Digital nerve block at base of finger (DORAL APPROACH): use two entry points – one on each side of the base of the digit between the MCPJ and PIPJ. Insert needle perpendicular to finger (with a slight medial angulation) and infiltrate **2-3ml 1% lidocaine** either side when the needle is close to the flexor surface
  2. Digital nerve block at metacarpal level (PALMAR APPROACH): use two entry points – one to each side of the flexor tendon on the digit in the distal palmar crease. Insert needle perpendicular to skin and infiltrate **3-4ml 1% lidocaine** either side
- Always aspirate before injecting to confirm the needle is not in a vessel

### Colles' fracture haematoma block – used for analgesia for Colles' fracture manipulations (not technically a 'nerve' block)

- During preparation
  - Explain it's painful!
  - Apply 3-lead cardiac monitoring to patient

- Palpate the fracture step on the dorsal surface of the forearm
- Ensure complete asepsis (you are technically converting a closed fracture into an open one)
- Infiltrate a small amount of subcutaneous local anaesthetic with orange needle
- Change to green needle and insert at about 45-90°, at or just slightly proximal to the fracture site on the dorsal surface of the forearm
- Step down the bone with the needle until you get to the break
- Aim to penetrate the needle in between the fractured ends (may need to dig around a bit)
- Aspirate frequently – when you are in the haematoma, altered blood will be aspirated
- Infiltrate the lidocaine, keeping an eye on the cardiac monitor
- Aim to infiltrate around **10ml 1% lidocaine** total into the haematoma (always aspirating when you move the needle to check you are in the haematoma)

**Fascia iliaca compartment block – used for analgesia for neck of femur fractures (a safer way to block the femoral nerve which is in the compartment)**

- During preparation
  - Check patient is not on therapeutic anticoagulants (e.g. warfarin)
  - Prepare equipment
    - Blunt the end of a green needle by slightly bending the end away from the bevel by pressing it on the inside of its plastic sheath on a hard surface
    - Draw up bupivacaine, into one 20ml and one 10ml syringe
    - Attach needle to octopus extension line then a bupivacaine filled syringe and flush to expel air
  - Locate insertion site (image below)
    - Palpate the anterior superior iliac spine and the pubic tubercle
    - Visualise line between and divide into thirds
    - Insertion point is 1cm below the point between the lateral third and the medial two thirds
  - Palpate the femoral pulse to ensure you are not too close to it
  - Mark insertion side with an indentation using a nail/biro
- Insert needle perpendicular to skin
- Advance the needle slowly until 2 ‘pops’ are felt (as the needle penetrates the fascia lata and then fascia iliaca)
- Aspirate to confirm the needle is not in a vessel
- Infiltrate around **30ml 0.25% bupivacaine** (re-aspirate after every 5ml to check not in a blood vessel)
- When first syringe empty, hold needle steady and change to second syringe to continue infiltrating bupivacaine



**Bier's block – sometimes used for Colles' fracture manipulations or minor surgery below the elbow (this is a regional IV block, not a 'nerve' block, so is completely different to other blocks described)**

- A doctor who can deal with severe toxic reactions must be present
- During preparation
  - Perform pre-op assessment (ensure patient has been NBM for 4 hours, perform pre-procedure observations etc)
  - Ensure no contraindications: severe hypertension/obesity, peripheral vascular disease, Raynauds, sickle cell trait/disease, methaemoglobulinaemia, age <7 years, uncooperative patient, procedure will take >30 mins or need tourniquet to be released, epilepsy is relative contraindication
  - Obtain written consent
  - Prepare equipment
    - Special tourniquet (with 15cm wide cuff)
    - 40ml 0.5% prilocaine (30ml if elderly/frail)
    - Ensure intralipid and resuscitation equipment is closely available
  - Apply cardiac leads, BP and oxygen saturation monitoring
- Insert cannula into dorsum of hand on affected side and ensure there is one on the other side if it is needed for toxic reactions
- Place tourniquet around upper arm over padding but do not inflate yet
- Elevate arm for 3 minutes while occluding the brachial artery
- While arm is still elevated, inflate cuff to 300mmHg or 100mmHg above SBP
- Record the tourniquet time and ask somebody to observe tourniquet patency throughout
- Bring arm back down and inject **40ml 0.5% prilocaine (30ml if elderly/frail)** – arm will become mottled
- Flush with 10-15ml saline if anaesthesia is inadequate
- Remove the cannula
- Complete the procedure
- Note the cuff must be inflated for a minimum of 20mins and maximum of 45mins.
- Deflate tourniquet slowly and record the time
- Perform post-procedure observations and observe patient for at least 30 minutes post-procedure

### Other nerve blocks (injection sites)

Almost any nerve can be blocked by infiltrating 1% lidocaine around the nerve using a small needle (e.g. orange). You must know the cutaneous innervation of the nerve you intend to block and the regional anatomy well. Insert the needle with the bevel in the line of the nerve (reduces risk of transecting nerve fibres). For deeper nerves, the needle is usually inserted vertically, but for superficial nerves (subcutaneous nerve blocks) it is inserted at  $<30^\circ$ .

- Wrist
  - Median nerve (ask patient to flex wrist slightly and touch thumb to little finger – insert needle vertically to depth of 1cm at proximal wrist skin crease on volar surface of wrist between palmaris longus and flexor carpi radialis tendons which should now be visible – carpal tunnel syndrome is contraindication)
  - Ulnar nerve (insert needle vertically on volar surface of wrist between ulnar artery and flexor carpi ulnaris tendon at level of ulnar styloid process – check radial artery patency first)
  - Radial nerve (infiltrate subcutaneously around radial side of dorsum of wrist from flexor carpi radialis tendon to radio-ulnar joint)
- Leg
  - Femoral nerve block (insert needle vertically 1cm lateral to femoral pulse, to a depth of ~3cm)
- Ankle
  - Saphenous nerve (infiltrate subcutaneously anterior to and just above the medial malleolus)
  - Superficial peroneal nerve (infiltrate subcutaneously above ankle joint from lateral malleolus to anterior tibial border)
  - Deep peroneal nerve (above the ankle joint between the tibialis anterior and extensor hallucis longus tendons)
  - Sural nerve (insert needle just lateral to the Achilles tendon and infiltrate subcutaneously while advancing to lateral malleolus)
  - Tibial nerve (palpate posterior tibial artery then insert needle just medial to the Achilles tendon, at level of the upper border of the medial malleolus and infiltrate 5-10ml just lateral to the artery)
- Ear
  - Greater auricular nerve (1cm below ear lobe from posterior SCM border to angle of mandible)
  - Lesser occipital nerve (just behind ear)
  - Auriculotemporal nerve (just anterior to external auditory meatus – warning – it's close to the superficial temporal artery)
- Forehead
  - Supraorbital and supratrochlear nerves (infiltrate subcutaneously above medial border of eyebrow by inserting needle in midline and directing it laterally)

### **To complete**

- Ask nurse to perform post-procedure observations
- Document procedure in notes (including consent) and prescribe and sign for local anaesthetic on drug chart