

Regional Blocks

Regional Nerve Blocks

The use of regional blocks has several advantages over the blocking of individual wounds:

- Reduced total dose of anaesthetic for multiple wounds
- Reduced risk of infection (no direct injection into wounds)
- Usually less discomfort for patient (better anaesthesia achieved)

In general, you must wait longer for a regional anaesthetic to take effect, as the agent has to diffuse into larger nerves.

If, whilst injecting local anaesthetic, the patient experiences severe pain in the distribution of the nerve, it is likely that you are injecting directly into the nerve.

- **Stop injecting immediately**
- **Withdraw needle a few millimetres and try injecting again.**

Anaesthetic Agents

The most commonly used agents in the ED are:

1. Lidocaine 1%
2. Bupivacaine 0.25% and 0.5%

Intravascular injection of local anaesthetics is potentially dangerous. Always aspirate before injecting, and do not inject if blood is aspirated. The signs of toxicity are:

- Circumoral paraesthesiae
- Confusion
- Seizures
- Cardiac arrhythmias/cardiac arrest

Severe toxicity is rare, but is more common with bupivacaine. Arrhythmias should be treated according to ALS guidelines and seizures should be treated according to the guidelines in the neurology section. **Intralipid is also indicated for treatment of local anaesthetic toxicity. Follow guideline below.**

Treatment of toxicity

- **Call for senior ED Doctor and transfer patient to Resus.**
- Stop injecting anaesthetic or re-inflate Bier's Block cuff if it has been deflated
- Apply 100 % oxygen
- Continue monitoring pulse / BP / oxygen saturation / ECG
- Turn patient into lateral position
- Treat seizures according to [adult](#) or [paediatric](#) seizure algorithms
- Treat arrhythmias as appropriate
- **Intralipid is indicated if there are signs of systemic toxicity.**

Some agents may also have adrenaline mixed with anaesthetic. This reduces systemic absorption by causing local vasospasm, and allows doubling of the maximum dose. **Never use adrenaline around an end artery (digital block, ear, etc).**

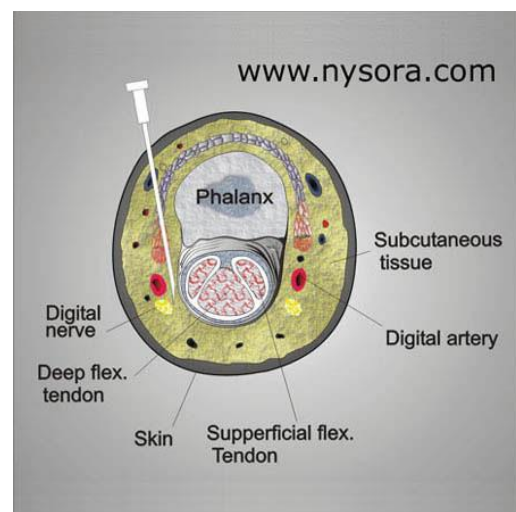
Further information can be found using the [NYSORA website](#).

Specific Blocks

Upper Limb

Digital nerve block

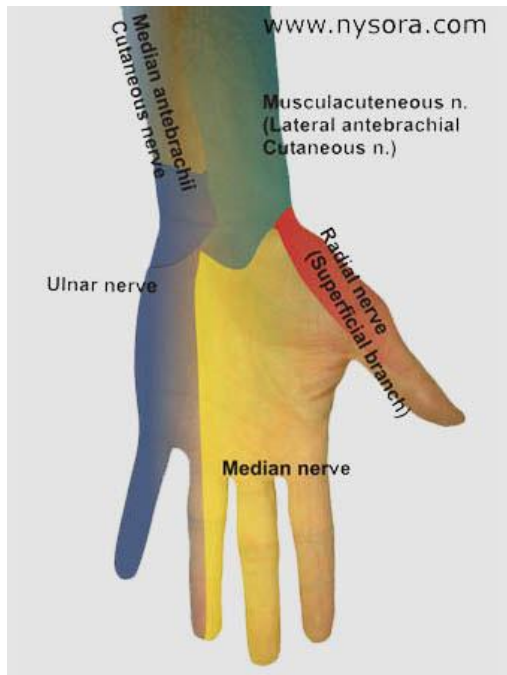
- 2mls of 0.5 % bupivacaine in preference to 1% plain lidocaine ([Bestbets](#))
- Two injections on either side of the base of the digit
- Close to the digital nerve
- Usually takes approx 5 minutes before adequate analgesia is achieved
- Digital nerve block is better than metacarpal block ([Bestbets](#)).



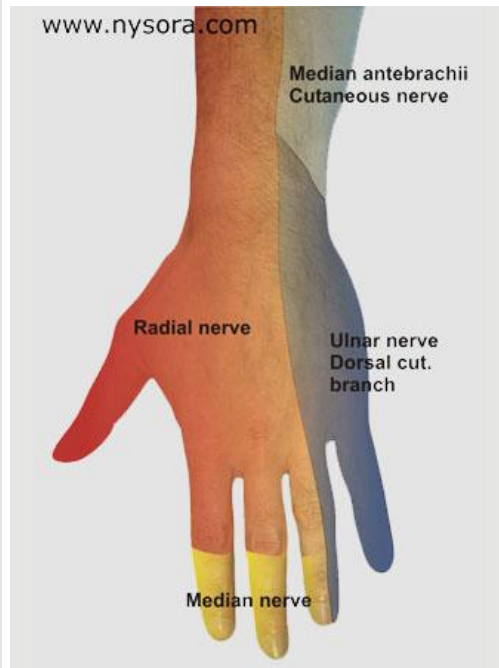
Wrist Blocks

Wrist Blocks are used to achieve anaesthesia of the hand in order to allow minor procedures (suturing, FB removal, etc.)

The areas of analgesia achieved are shown below:



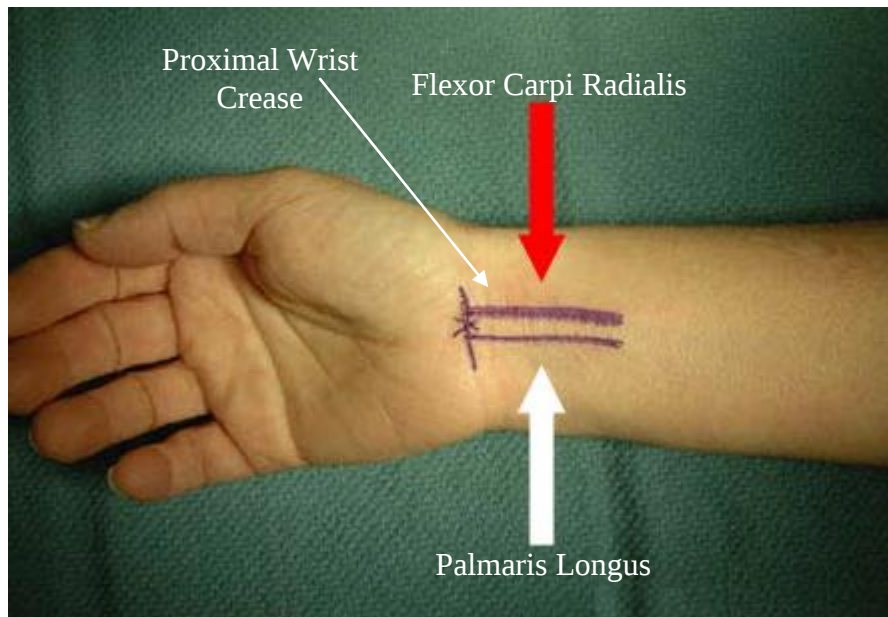
Palmar View



Dorsal View

Median Nerve Block

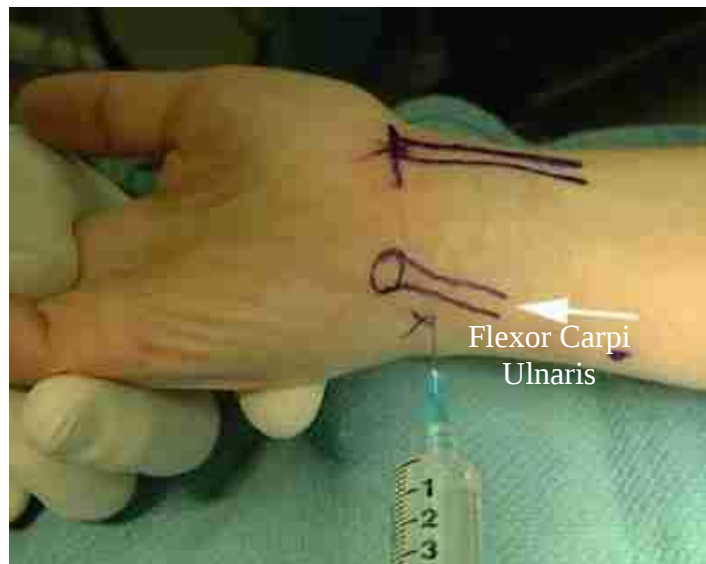
- Median nerve lies between flexor carpi radialis and palmaris longus
- Level of proximal palmar crease
- Aim under palmaris longus
- 4 - 5 mls 1% lidocaine
- If resistance - stop
- If swelling – correct



Landmarks for Median Nerve Block

Ulnar Nerve Block

- Will anaesthetise the ulnar side of the hand from wrist crease to the tips of the fingers on both palmar and dorsal sides
- Palpate the tendon of flexor carpi ulnaris at its insertion on pisiform at the distal wrist crease
- Introduce your needle deep to tendon on ulnar side and aim to inject on radial side deep to the flexor carpi ulnaris
- Aspirate first, then inject 3 to 4 ml of 2% lidocaine
- Then inject a further 2 to 3 mls just dorsal to ulnar styloid to anaesthetise the proximal dorsal sensory branch.



Landmarks for Ulnar Nerve Block

Bier's Block

Link here to [Bier's proforma](#)

This intravenous regional anaesthetic procedure is primarily used for the reduction of Colles' and other distal radial fractures. It is a safe procedure, but adequate preparation and safety precautions are essential.

Personnel

- A doctor to perform the Bier's Block and the procedure. The doctor should be experienced and competent with the technique if they are to perform it unsupervised
- A nurse who is skilled in plaster application
- Someone familiar with the technique to check the cuff pressure and provide counter-traction during manipulation
- There must be another middle grade or senior doctor present in the department throughout the procedure.
- The patient must **never** be left unattended by a member of staff whilst a Biers block is in progress.

In some cases it may be appropriate to place the patient in a backslab and bring them back the following day for the procedure.

Facial and Ear Blocks

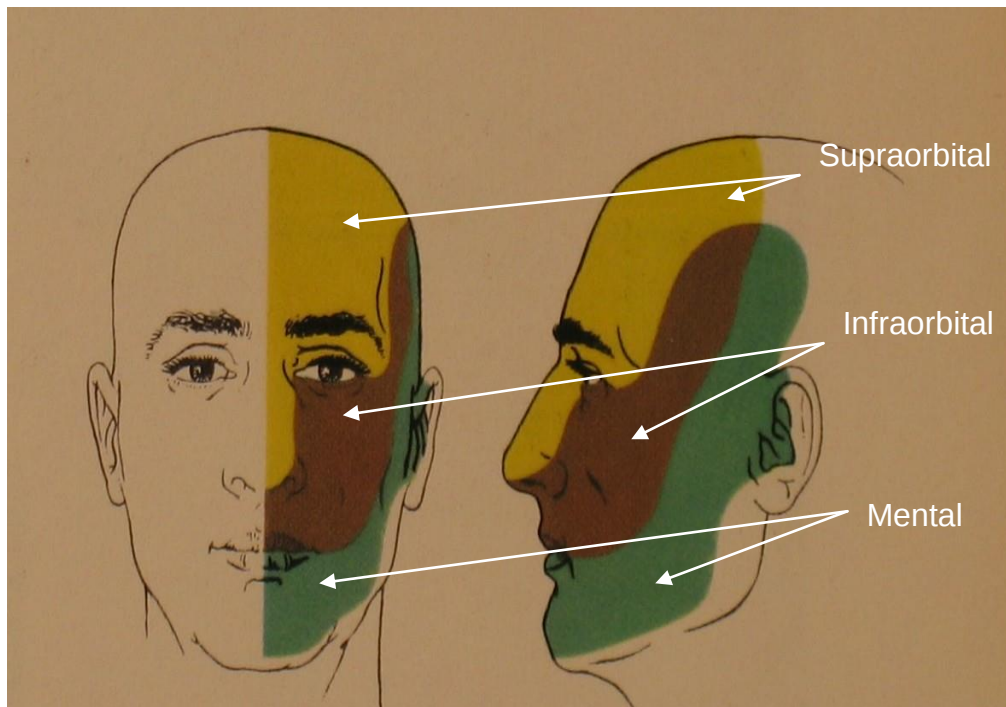
Regional Blocks of the face are quite straightforward, and are particularly useful where there are multiple injuries requiring cleaning and suturing. There are three areas on the face which, if anaesthetic is applied correctly, will result in anaesthesia from the chin to the vertex of the scalp. The only exception is the nose which is difficult to block- for complex injuries refer to ENT.

Anatomy of the nerve supply to the face

The areas which provide regional anaesthesia to the face are:

- Supraorbital
- Infraorbital
- Mental

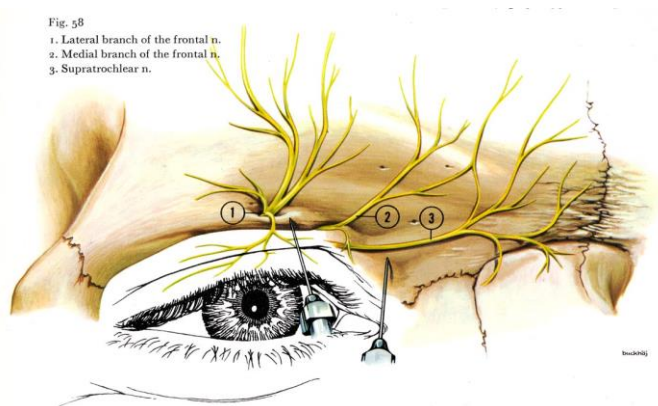
The territories which are supplied by these nerves are shown below:



Territories supplied by the main facial nerves

Techniques for facial Blocks

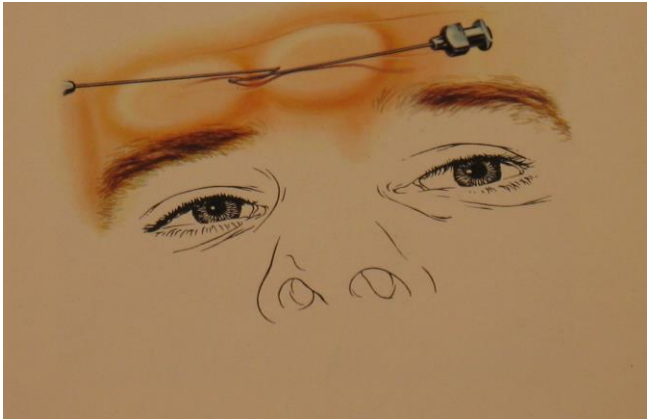
Supraorbital/supratrochlear Nerves



Anatomy of Supraorbital Nerves

Supraorbital Block

A supraorbital block is used for forehead and scalp anaesthesia. The supraorbital nerve (AKA frontal nerve) leaves the orbit through the supra orbital notch. This notch lies medially in the supra orbital rim, on a vertical line through the medial aspect of the cornea. The supratrochlear nerve exits the orbit at the junction of the superior orbital rim and the medial wall of the orbit. The two nerves have a sensory distribution from forehead to coronal suture from mid-line to temporal region. Infiltrate subcutaneously completely parallel to the supra-orbital rim above the eyebrow 5 ml of 1% lidocaine. **Do not infiltrate directly around the nerve or its foramen.**



Technique for Supraorbital Block

Infraorbital Block

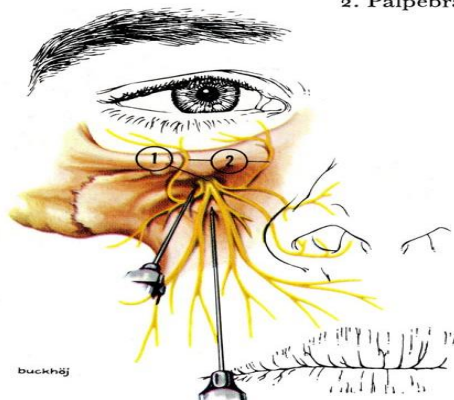
This block will achieve anaesthesia in the maxillary distribution as shown above. There are 2 approaches:

1. **External.** Palpate the infraorbital foramen which is situated on the lower margin of the orbit, below the centred pupil. Insert the needle just below the skin (the nerve is superficial) and inject 3-4ml of 1% lidocaine. **Do not inject directly into the foramen.** If the patient experiences pain/paraesthesiae in the distribution of the nerve, stop and withdraw slightly before continuing.
2. **Intraoral Approach.** Insert needle into the superior buccal groove (see picture) whilst palpating the infraorbital foramen. Approach subcutaneously (avoiding direct injection into the foramen) until the tip of the needle is palpated. Inject 3-4ml 1% lidocaine. If pain or paraesthesiae occur, **stop and withdraw slightly before continuing.**

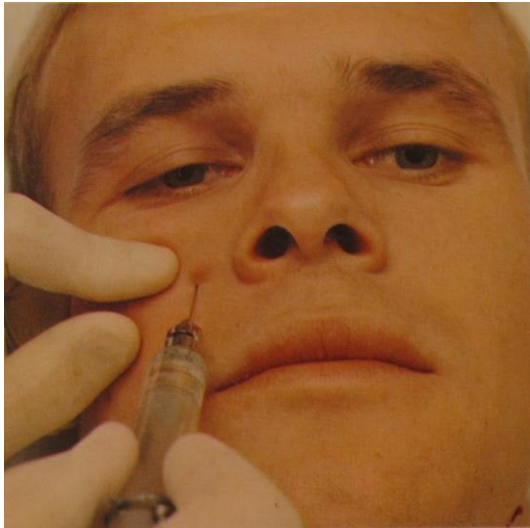
Infraorbital Nerve

Fig. 62

1. Infraorbital n.
2. Palpebral branches



Anatomy of Infraorbital Nerve



External Approach

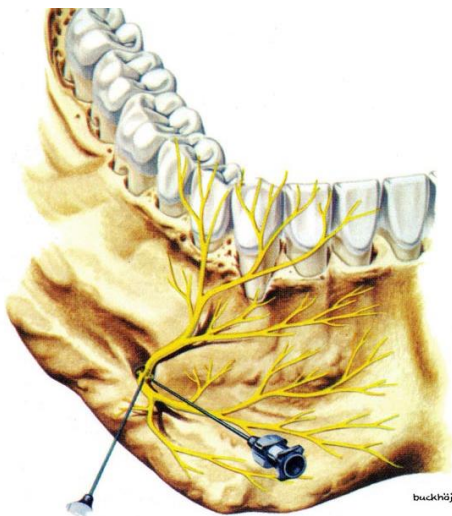


Intraoral approach
Mental Nerve

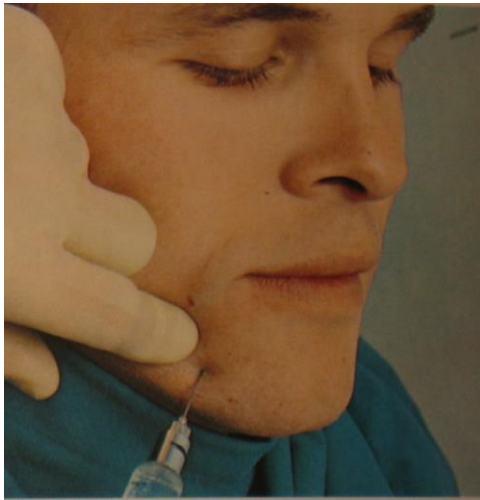
Mental Nerve Block

Blocking this nerve will give anaesthesia over the mandibular region (see diagram above). Like the other two nerves, the mental nerve is superficial. Two approaches are available:

1. **External.** Palpate the mental foramen as shown opposite (directly below the centred pupil and lateral angle of the mouth), and inject 2-3ml 1% lidocaine superficial to the foramen. **If the patient experiences pain or paraesthesiae in the nerve distribution, withdraw slightly and try again.**
2. **Internal.** Palpate the foramen and advance the needle through the inferior buccal groove (see opposite) until the needle lies adjacent to the palpating finger. Inject 2-3ml 1% lidocaine slowly. If any paraesthesiae or pain in the nerve distribution occur, stop and withdraw slightly before continuing.



Anatomy of the Mental Nerve



External Approach

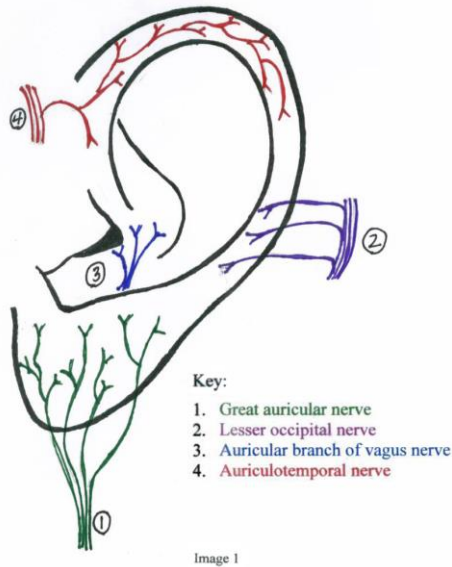


Internal Approach

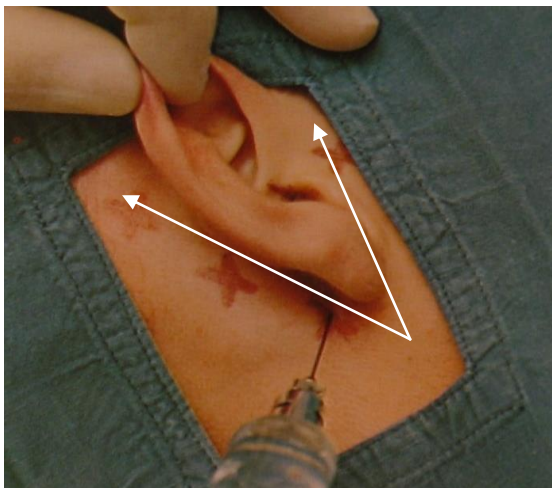
Ear Blocks

The ear may require regional anaesthesia for repair of lacerations, removal of foreign bodies ((ear studs etc). There is little subcutaneous tissue, which makes local infiltration difficult and extremely painful. Auricular blocks are straightforward, far less painful, and provide superior analgesia. The blood supply to the ear is an end artery. **Do not use any anaesthetic agents which contain adrenaline.**

There are three nerves which, if blocked, will anaesthetise the external ear (but not the external ear canal). These are shown below:



Nerve Supply to the External Ear



Single Injection Technique

Femoral Nerve Block

See link here to [FIB block guidance](#)

Technique for Ear Block

The three nerves are distributed as shown opposite. The simplest technique involves a single injection site just below the pinna. Advance the needle just above the tragus anteriorly and infiltrate 4ml 1% lidocaine. This will block the auriculotemporal nerve.

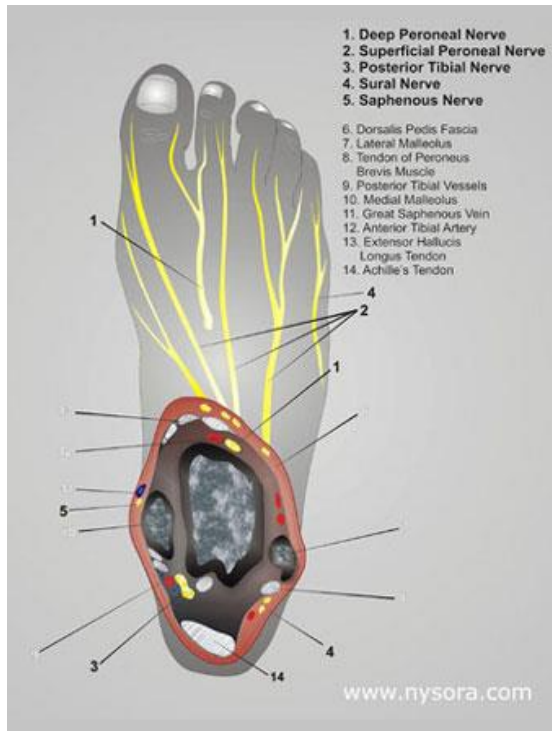
Then withdraw the needle to the entry point and redirect posteriorly to the top of the ear crease. Infiltrate 3-4ml 1% lidocaine as you withdraw: this will block the lesser occipital and great auricular nerves.

Do NOT use anaesthetics with adrenaline around the ear!

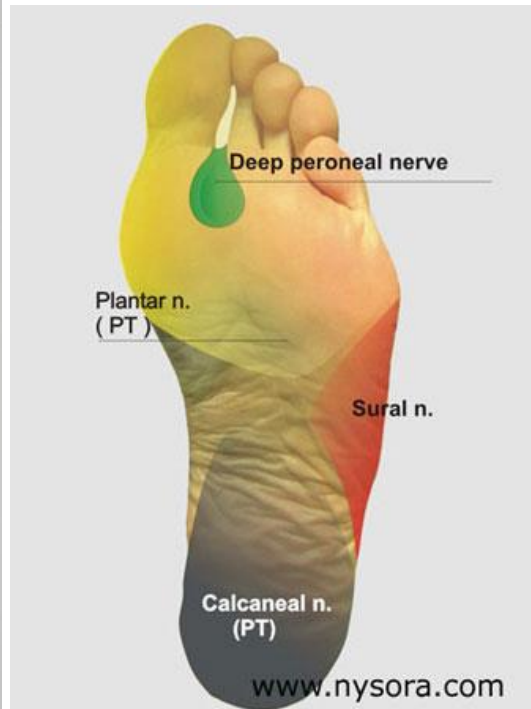
Ankle Blocks

Regional anaesthesia of the foot is particularly useful for procedures on the sole. The skin here is tough and local anaesthetic is difficult to inject, causes pain and swelling, and results in poor analgesia. Blocking the posterior tibial nerve will provide anaesthesia to the sole, allowing procedures such as FB removal.

Anatomy



Cutaneous Innervation (PT=posterior tibial nerve)



Procedure



The posterior tibial nerve lies just behind the posterior tibial artery, which is felt behind the medial malleolus.

- Draw up 5ml 1% lidocaine
- Clean skin with chlorhexidine
- Use a 23G (blue) needle
- Inject behind medial malleolus
- Advance till you hit the bone
- Withdraw 2-3mm
- Aspirate. If no blood appears:
- Inject 3-5ml lidocaine **slowly** in a fan shape