

## INTERSCALENE BRACHIAL PLEXUS BLOCK

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Interscalene block is the most proximal approach to the Brachial Plexus and is the most suitable block for proximal procedures on the arm or shoulder. The block is a paravertebral approach at the level of the cervical roots in the neck and can provide both brachial and cervical nerve blocks. The areas supplied by C8 and T1 nerve roots may prove difficult to block and this approach is therefore less suitable for surgery on the hand. Supplementary block of the ulnar nerve can provide the necessary analgesia for hand surgery.

### Indications

- surgery to the shoulder or upper arm
- surgery of the hand (with peripheral nerve supplement)
- reduction of a dislocated shoulder, arm or wrist fractures

**Anatomy** After leaving their intervertebral foramina, the anterior primary roots of the cervical nerves (C5, 6,7,8,T1) course anterolaterally and inferiorly to lie between the anterior scalene and the middle scalene muscles which, respectively, arise from the anterior and posterior tubercles of the cervical vertebrae. The prevertebral fascia covers both the scalene muscles fusing laterally to enclose the brachial plexus in a fascia sheath. Between the scalene muscles, these nerve roots unite to form three trunks, which emerge from the interscalene groove to lie cephaloposterior to the subclavian artery as it courses along the upper surface of the first rib.

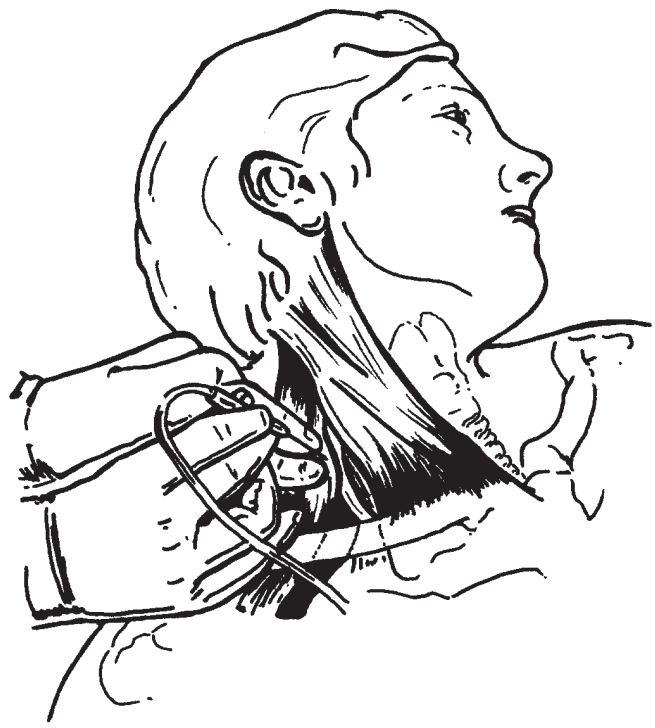
**Preoperatively** The patient is assessed for suitability for the block, the procedure is explained and consent obtained. Premedication may be given as indicated. The procedure should be conducted in the anaesthetic room or theatre after establishing venous access and monitoring of the patient. The drugs and equipment for resuscitation and airway management should be available and ready.

### Equipment

- syringes 2mls, 10mls, 20mls and a 23 gauge butterfly needle with an extension

- antiseptic skin preparation solution
- a nerve stimulator (where available) and a 22 gauge 4cm body insulated short bevel needle with connecting tubing

**Technique** The patient should be in supine position, arms by the sides and head turned away from the side to be blocked. Downward displacement of the shoulder facilitates the palpation of the landmarks. The posterior border of the sternocleidomastoid muscle is made prominent by having the patient briefly lift their head. The interscalene groove can be palpated by rolling the fingers posterolaterally from this border over the belly of the anterior scalene muscles into the groove. The intersection of this groove with a transverse plane at the level of the cricoid cartilage is the point at which the needle should enter the skin and this is about the level of the sixth cervical vertebra (C6).



The skin on the side to be blocked is cleaned with an antiseptic and draped. A skin wheal is made with lignocaine. A 22 or 23 gauge 4cm short bevelled needle is inserted perpendicularly to the skin with

a 45 degree caudad angle (towards the feet) and slightly posterior angle. The angle of approach is important to avoid accidental intravascular or intrathecal injection. The needle is then advanced carefully until a paraesthesia is elicited. A click may be detected as the needle passes through the prevertebral fascia. This usually occurs at the superficial level. The use of a nerve stimulator with a special insulated needle is very helpful in confirming the correct placement of the needle and performing the interscalene block accurately. Correct stimulation produces twitching below the shoulder. Stimulation of the diaphragm indicates too anterior an approach. Once paraesthesia is obtained, the needle is stabilised and after negative aspiration for blood, 20 to 30mls of the local anaesthetic solution is injected slowly and carefully.

**Local anaesthetic solution** Bupivacaine 0.375-0.5% solution may be used safely in the volumes between 20-40mls, but the maximum dose of 2 mg/

kg should not exceeded. Other local anaesthetic agents like lignocaine or prilocaine may be used.

### Complications

- Inadvertent epidural or subarachnoid injection is a potentially serious complication resulting from incorrect needle placement.
- Vertebral artery injection, this can result in convulsions and loss of consciousness.
- Phrenic nerve block is frequently produced, this complication precludes bilateral use of this technique.
- Recurrent laryngeal, vagus, and cervical sympathetic nerves are sometimes blocked.
- Pneumothorax is rare but can happen with deep placement of the needle and in unskilled hands.