Upper Extremity Nerve Blocks

**SUPRACLAVICULAR NERVE BLOCK**
- "Spinal of the arm": Used for hand and arm surgery (if performed under ultrasound guidance).

**AXILLARY NERVE BLOCK**
- Used for hand, forearm, and elbow surgery.
  - Classically, performed with "transarterial approach": needle is advanced into and through the axillary artery confirmed by aspiration of arterial blood. Half the anesthetic is injected on the posterior side of the artery. The needle is withdrawn through axillary artery confirmed with cessation of blood return on aspiration. The other portion of the local anesthetic is injected.

**RADIAL NERVE BLOCK**
- Disadvantages include vascular puncture with consequent local anesthetic toxicity or hematoma.

**BRACHIAL Plexus**
- **Radial**
  - Push
  - Extend arm with triceps
- **Median**
  - Pull
  - Flex arm with biceps
- **Ulnar**
  - Pinch
  - Fifth digit
- **Median**
  - Pinch
  - Index Finger

**NERVE ASSESSMENT**

**INTERSCALENE NERVE BLOCK**
- Used for shoulder and arm surgery (ulnar i.e. hand sparing).
- Landmarks: a line extended laterally from the cricoid cartilage intersects the interscalene groove (between anterior and medial scalene muscle posterior to sternocleidomastoid) at the level of C6.
- Complications: Near 100% incidence of Horner’s syndrome and phrenic nerve block (place judiciously in patients with respiratory pathology). Rarely, recurrent laryngeal nerve block, epidural block, subarachnoid block, injection into vertebral artery.

**SUPRACLAVICULAR NERVE BLOCK**
- "Spinal of the arm": Used for hand and arm surgery (if performed under ultrasound guidance).
- Without ultrasound: block can be ulnar-sparing AND have a 1-6% incidence of pneumothorax
- Complications: phrenic nerve block (50%) Horner’s syndrome (1%)

**INFRACLAVICULAR NERVE BLOCK**
- Used for hand, forearm, and elbow surgery.
  - Spares the musculocutaneous nerve.
  - Disadvantages include vascular puncture and patient discomfort when traversing the pectoralis major and minor muscles.

**AXILLARY NERVE BLOCK**
- Used for hand, forearm, and elbow surgery.
  - Classically, performed with “transarterial approach”: needle is advanced into and through the axillary artery confirmed by aspiration of arterial blood. Half the anesthetic is injected on the posterior side of the artery. The needle is withdrawn through axillary artery confirmed with cessation of blood return on aspiration. The other portion of the local anesthetic is injected.
  - Disadvantages include vascular puncture with consequent local anesthetic toxicity or hematoma.
**Lumbar Plexus Block**

- The lumbar plexus consists of L1-L4 spinal roots with variable contributions from T12 and L5 and forms within the psoas muscle. The major branches of the lumbar plexus include genitofemoral (sensory to small anterior portion near inguinal ligament), lateral femoral cutaneous (sensory to lateral thigh), femoral (motor fibers to quadriceps muscle, sensory to antero-medial thigh, sensory to medial aspect of calf and foot), and obturator nerves (motor to hip adductors, and variable sensory to medial thigh and knee joint).

**Sciatic Nerve Block**

- The sciatic nerve arises from L4-S3 spinal roots and provides sensory innervation to posterior thigh, lateral calf, and all of the foot except the antero-medial portion.

**Femoral Nerve Block**

- The femoral nerve arises from L2-L4 spinal roots and provides sensory innervation to anterior thigh and most of the femur and knee joint.

- The **femoral nerve** can be blocked in the **inguinal region**. The mnemonic “NAVEL” is useful to remember the anatomy laterally to medially: **N**erve, **A**rtery, **V**ein, **E**mpty space, **L**ymph Nodes.

- The **saphenous nerve**, a superficial terminal extension of the femoral nerve, supplies innervation to the medial aspect of the leg below the knee joint. **Tibial tuberosity approach**: Subcutaneous infiltration of local anesthetic from the medial part of the tibial tuberosity to the gastrocnemius muscle. See “Ankle Block” for alternative approach at ankle.

**Popliteal Sciatic Block**: Useful for pain relief of distal leg/ankle. (Note that the medial portion of the leg is innervated by the saphenous n., a branch of the femoral. Consider performing a saphenous n. or femoral n. block if pain relief extends into its area of innervation.)

**Intercondylar Approach**: Landmarks include biceps femoris tendon laterally, semitendinosis/semimembranosus medially, and the popliteal crease. The sciatic nerve is typically found 7cm cephalad to the crease and 1 cm lateral.

**Ankle Block**

Requires 5 separate needlesticks for 5 nerves:

- **Deep Peroneal Nerve**: Continuation of common peroneal nerve. Between tibialis anterior tendon and extensor hallucis longus tendon. Innervates webbing between 1st/2nd toes.

- **Superficial Peroneal Nerve**: Continuation of common peroneal nerve. Anterior to lateral malleolus. Innervates anterior surface of foot.

- **Sural Nerve**: From tibial nerve. Between achilles tendon and lateral malleolus. Sensation to lateral foot.

- **Posterior Tibial Nerve**: Behind posterior tibial artery. Innervates sole of foot.

- **Saphenous Nerve**: Anterior to medial malleolus. Innervates anteromedial foot.