**Upper Extremity Nerve Blocks**

**Interscalene Block**
Indications: Surgery on shoulder, distal clavicle, proximal humerus

- **Patient Position:** Supine, head turned, or semi-lateral
- **Transducer:** 10-15 MHz, linear array
- **Transducer Placement:** In suprascapular fossa, lateral to SCM, on the vertebral border of SCM
- **Needle:** 22G 5 cm short bevel needle
- **Nerve stimulation response:** Forearm, hand

**Initial depth setting:** 3 cm

**Local Anesthetic (LA):** 20-25 mL

**Key anatomy:** Scalenus anterior, articularis, dorsal scapular nerve, subclavian artery and vein, pectoralis minor muscle

**Ideal spread of LA:** Between ASM and MSM around the trunks

**Number of injections:** As few as possible, based on spread

**Ideal LA deposit:** Within the interscalene groove

**Needle insertion:** In plane, lateral to medial

**Tips:**
- Avoid axillary (Subclavian) artery or vein puncture and pneumothorax
- Begressive to injection and needle angle
- Avoid Abdominal Nerve of Bell
- Release transducer pressure before injection to detect axillary vein
- Injection site should result in swelling of the sheath and separation of the nerves within it

**Supraclavicular Block**
Indications: Surgery on humerus, elbow, hand

- **Patient Position:** Supine, same-sided
- **Transducer:** 10-15 MHz, linear array
- **Transducer Placement:** In suprascapular fossa, lateral to clavicle, head of SCM, pointed caudally
- **Needle:** 22G 5 cm short bevel needle
- **Nerve stimulation response:** Forearm, hand

**Initial depth setting:** 3 cm

**Local Anesthetic (LA):** 25-25 mL

**Ideal view:** Subclavian artery, a transversely hypechoic structure (divisions) lateral and superficial to the artery

**Ideal spread of LA:** Posterior and lateral to the artery

**Number of injections:** 2-3

**Ideal LA deposit:** Within the tissue sheath encompassing brachial plexus

**Needle insertion:** In plane, lateral to medial

**Tips:**
- Avoid pneumothorax, TCA, DSA, subclavian artery puncture
- Use lower Doppler to detect and avoid TCA, DSA
- Needle angle should be shallow to avoid pneumothorax

**Infraclavicular Block**
Indications: Surgery on humerus, elbow, hand

- **Patient Position:** Supine with arm abducted and fixed at elbow
- **Transducer:** 10-15 MHz, linear array
- **Transducer Placement:** Perpendicular to and below clavicle, medial to coronary process
- **Needle:** 22G 5 cm short bevel needle
- **Nerve stimulation response:** Hand/switch

**Initial depth setting:** 3 cm

**Local Anesthetic (LA):** 20-25 mL

**Ideal view:** Subclavian artery and vein below the fascia of pectoralis minor muscle

**Key anatomy:** Subclavian artery, fascia of pectoralis minor muscles

**Ideal spread of LA:** Around AA, within the sheath; separate injection required around McN

**Number of injections:** 2-3 + McN

**Ideal LA deposit:** Within the tissue sheath encompassing brachial plexus

**Needle insertion:** In plane, lateral to medial

**Tips:**
- Avoid pneumothorax, TCA, DSA, subclavian artery puncture
- Use lower Doppler to detect and avoid TCA, DSA
- Needle angle should be shallow to avoid pneumothorax

**Axillary Block**
Indications: Surgery on elbow, forearm, hand

- **Patient Position:** Supine with arm abducted and fixed at elbow
- **Transducer:** 10-15 MHz, linear array
- **Transducer Placement:** Perpendicular to humerus in the axillary fossa
- **Needle:** 22G 5 cm short bevel needle
- **Nerve stimulation response:** Hand/switch

**Initial depth setting:** 3 cm

**Local Anesthetic (LA):** 20-25 mL

**Ideal view:** Axillary artery and its sheath, separate view usually required for McN

**Key anatomy:** Median, ulnar, radial nerves scattered around AA, Nerve outside the sheath

**Ideal spread of LA:** Around AA, within the PNI sheath

**Number of injections:** 3-4

**Ideal LA deposit:** Within the interscalene groove

**Needle insertion:** In plane or out of plane

**Tips:**
- Avoid concomitant nerve block individual nerves, except for McN

**Suggested Standard Monitoring For Nerve Blocks**
Continued Monitoring: Ultrasound + Nerve Stimulation + Resonance to injection

**TREATMENT OF LOCAL ANESTHETIC TÓXICITY**
- Patient consent obtained
- Lateralization checked
- Resuscitative equipment present
- Patient monitored with ECG, BP, Pulse Oximetry
- Skin disinfection
- Premedication, Medications, dose(s)
- Local anesthetic type, volume(s), concentration (%)
- Injection monitoring
- Motor response
- Sensory response
- Hypotension
- Hypoxia
- Injection pressure monitoring
- Aspiration before injection

**DOCUMENTATION AND MONITORING CHECK-LIST**
- Patient consent obtained
- Lateralization checked
- Resuscitative equipment present
- Patient monitored with ECG, BP, Pulse Oximetry
- Skin disinfection
- Premedication, Medications, dose(s)
- Local anesthetic type, volume(s), concentration (%)
- Injection monitoring
- Motor response
- Sensory response
- Hypotension
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- Injection pressure monitoring
- Aspiration before injection

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