

# **Regional Anesthesia in the Emergency Department**

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#### **Overview**

- Providing regional anesthesia is within emergency medicine's scope of practice, and facilitates the care of painful injuries or procedures
- Regional anesthesia is one aspect of delivering analgesia. It works best in conjunction with standard oral or intravenous analgesics.
- Regional anesthesia can be performed with landmark guidance, but ultrasound improves the success and safety of nerve blocks. Ultrasound guidance also improves provider confidence.

#### **Equipment**

- Local anesthetic for skin anesthesia and nerve block
- Tuberculin (or other narrow gauge needle & syringe) for skin anesthesia
- Ultrasound probe cover and gel
- Spinal needle or other needle sufficiently long to reach the target nerve
- Chlorhexidine

#### **Contraindications**

- Absolute: compartment syndrome, infection at site, inability to obtain consent
- Relative: coagulopathy, distal infection, prior nerve injury

#### **Preparation**

- For blocks proximal to the elbow or knee, place the patient on a monitor. This helps with early recognition of potential toxicity.
- Position the patient and ultrasound so that the proceduralist has a direct line of sight between the field and the ultrasound screen
- Identify the target nerve with ultrasound
- Provide local anesthesia at the anticipated point of entry
- Prepare skin with chlorhexidine

#### **Anesthetic**

- Choice of anesthetic is driven by the goal of the block.
- Brief procedures (eg laceration repair) can usually be accomplished with lidocaine.
- For longer duration blocks, use bupivacaine or ropivacaine
- Ropivacaine has a slightly safety advantage but is not routinely available in most EDs.

#### **Nerve Identification**

- Use a high frequency linear transducer
- Look for a structure with the appearance of a honeycomb.

- Nerves look relatively hyperechoic below the clavicle, and relatively hypoechoic above the clavicle
- Move the transducer along the suspected nerve to ensure it retains the appearance of a nerve and is following the anticipated course
- Note the presence of any blood vessels that might preclude performing the block at a given site.

### **Performing the Block**

- Introduce the needle in the plane of the ultrasound beam. This allows you to see the needle as it approaches the target nerve.
- Inject local anesthetic adjacent to the nerve. Block success and duration will increase if you re-orient the needle to deposit anesthetic to surround as much of the nerve as feasible.
- If the patient complains of paresthesias or a shooting neuropathic pain, stop the injection and withdraw the needle slightly.
- If you need both hands to control the needle and ultrasound transducer, connect the syringe to extension tubing and have an assistant inject the anesthetic while you control the needle.
- Smaller peripheral nerves will typically need a volume of 5 – 10 mL. Larger nerves may require 10 – 15 mL.

### **Local Anesthetic Systemic Toxicity (LAST)**

- Rare complication of anesthetic administration
- Thought to be related to intra-vascular administration of anesthetic.
- Initial symptom is typically tachycardia. Other symptoms include metallic taste, dysrhythmias, or seizures.
- The antidote is intralipid 1.5 mL/kg as a bolus, then an infusion of 0.25 – 0.5 mg/kg over 60 minutes.