

Epidural anesthesia

1. Anatomy and placement

a. Inserting an epidural needle is similar to placing a spinal needle except that the **epidural needle is not advanced through the dura**. No CSF is obtained. The tip of the epidural needle lies in the epidural space between the ligamentum flavum posteriorly and the dura mater anteriorly. Local anesthetic solution can then be injected.

b. The **needle is either removed** (single-shot method), or, more commonly, a **flexible catheter is passed through the needle** into the space and the needle is withdrawn over the catheter (continuous catheter technique). Local anesthetics or opiates can be dosed intermittently or infused as needed.

2. **Level of analgesia** a. Once injected into the epidural space, the local anesthetic solution diffuses through the dura and into the spinal nerve roots, resulting in a **bilateral dermatomal distribution of analgesia**.

b. The spread of nerve root blockade is primarily determined by the **volume** of injection and, to a lesser degree, by patient **position, age, and area of placement**.

3. Onset and duration of analgesia

a. **Epidural anesthesia develops more slowly than does spinal anesthesia**, because the local anesthetic solution must diffuse farther. The rate of onset of sympathetic blockade and hypotension also is slowed, enabling more precise titration of hemodynamic therapy compared to spinal anesthesia.

b. The **dosing interval** depends on the agent used.

4. **Complications** are similar to those that are encountered with spinal anesthesia.

a. **Spinal headache** may result from inadvertent perforation of the dura.

b. **Epidural hematoma** is rare and usually occurs with coexisting coagulopathy. Emergent laminectomy may be required to decompress the spinal cord and avoid permanent neurologic injury.