

# Effects of Epidural Test Dose

## Anesthetic Pearls: Anesthetic Implications and Manifestations of the Epidural Test Dose

An epidural test dose is intended to detect unintentional placement of an epidural needle or catheter 1) into an epidural vein, or 2) through the dura into the subarachnoid space. **Intravascular injection** is the most serious threat during epidural anesthesia because of the large volumes of concentrated local anesthetic solution employed. Venous penetration or cannulation can rapidly lead to CNS and / or cardiac toxicity. Failure to recognize the misplacement of a needle or catheter into the **subarachnoid space** followed by injection of the usual epidural dose of local anesthetic results in total spinal anesthesia.

In the past, drugs as different as Isoproterenol to Succinylcholine were suggested for use as the epidural test drug. Currently, Epinephrine combined with local anesthetic is the most widely used form of an epidural test dose.

Research has shown that an effective single test dose should contain 15-mcg Epinephrine and a milligram dose of a local anesthetic drug that rapidly results in evidence of spinal anesthesia. Approximately 3 ml of 1.5% or 2% Lidocaine with 1:200,000 Epinephrine (5 mcg/ml) serves this purpose well in adults. In the pediatric population, 2% Lidocaine with 1:200,000 Epinephrine (5 mcg/ml) at 0.05 – 0.1 ml / kg has been shown to be an appropriate epidural test dose.

If the epidural test dose is administered in the subarachnoid space, **two full minutes** may be required to detect the onset of sensory anesthesia. The patient may report sensations of warmth and numbness before symptoms of motor impairment become evident.

If the test epidural dose is administered intravenously, typical responses to Epinephrine include pallor, circumoral dysesthesia, palpitations / tachycardia, lightheadedness, and nervousness. A 15-mcg intravascular dose of Epinephrine typically produces an increase in heart rate of approximately 30 beat/min and an average 20 mmHg systolic blood pressure increase within 20 – 40 seconds. These signs and symptoms last approximately 3 – 5 minutes. However, nervousness and lightheadedness may last up to 10 minutes. A prototypical question about an intravascular epidural test dose injection cruxes on the ECG; which may show arrhythmias, T-wave flattening / inversion, or ST-depression.

Beta-blockers can negate the increase in heart rate from Epinephrine but not the blood pressure rise. Therefore, blood pressure should be monitored at 2 – 3 minute intervals during administration of the test dose (particularly in patients taking beta-blockers). An additionally point in patients taking beta-blockers, reflex bradycardia may occur and therefore a systolic blood pressure rise greater than 20 mmHg is a more reliable indicator of intravascular epidural test dose.

