



# Rx Update

Nov/Dec 2009

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## NEURAXIAL ANESTHESIA & ANTICOAGULATION

Spinal/epidural (neuraxial) hematoma, defined as bleeding into the spinal canal or epidural space, is a rare complication of neuraxial anesthesia. **A spinal/epidural hematoma may cause spinal cord compression, leading to neurologic ischemia, and long-term or permanent paralysis.** Patients often initially complain of back pain, numbness, muscle weakness, or urinary retention due to motor and sensory deficit. Upon confirmation by diagnostic tests, the appropriate treatment relies on an emergency surgical removal of the hematoma to prevent permanent neurologic damage.

Anticoagulants (e.g., enoxaparin, heparin, warfarin) or antiplatelet medications (e.g., clopidogrel, prasugrel, ticlopidine, eptifibatide, tirofiban, abciximab) can increase the risk of developing an epidural or spinal hematoma if they are used concomitantly with epidural/spinal anesthesia or spinal puncture. The risk of hematoma is increased by the use of post-operative indwelling epidural catheters or by the concomitant use of drugs affecting hemostasis. The risk also appears to be increased by traumatic or repeated epidural or spinal puncture. **Patient management is based on appropriate timing of needle placement and catheter removal relative to the timing of the anticoagulant/antiplatelet drug administration.**

### Enoxaparin

**Low-molecular weight heparins (LMWH) (e.g., enoxaparin) should not be administered to patients who have an epidural catheter in place.** Doses of enoxaparin should be delayed until at least 2 hours after epidural catheter removal or spinal puncture. An epidural catheter should not be placed or a spinal puncture done until at least 10 to 12 hours after a prophylactic dose of enoxaparin (e.g., 40 mg daily) or 24 hours after a treatment dose of enoxaparin (e.g., 1.5 mg/Kg/dose daily or 1 mg/Kg/dose twice daily).

### Heparin

Prophylactic doses of heparin (5,000 units SQ BID) may be used with neuraxial techniques. The risk of neuraxial bleeding may be reduced by inserting epidural catheters just prior to the next dose and removing epidural catheters an hour prior to the next scheduled dose of heparin. The safety of higher prophylactic doses of heparin (TID or >5,000 unit doses) with neuraxial techniques has not been established and is not currently recommended. Because heparin-induced thrombocytopenia may occur during heparin administration, patients receiving heparin for greater than 4 days should have a platelet count assessed prior to neuraxial block and catheter removal.

**Treatment or intraoperative doses of heparin are generally not recommended with an epidural catheter.** If heparin is used, epidural catheter removal should be delayed for 2 to 4 hours after heparin infusion has stopped and normal coagulation is documented. Initiation of heparin therapy should be delayed until at least 1 hr after an epidural catheter is placed or removed.

### Warfarin

**Epidural placement or removal should only occur with an INR  $\leq$  1.4.** Chronic warfarin therapy should be stopped 4 to 5 days prior to a procedure and the INR should be verified prior to epidural needle placement. The catheter should be pulled within 48 hours of starting warfarin therapy.

### Antiplatelet Drugs

NSAIDs and aspirin alone do not appear to present significant risk to patients for developing spinal/epidural hematomas. However, when NSAIDs and aspirin are used concurrently with other anticoagulants or thrombolytics, they have been demonstrated to increase the frequency of spinal hematomas. Neuraxial techniques should be avoided until platelet function has been recovered for patients receiving other antiplatelet agents; **abciximab should be stopped 48 hours, clopidogrel 7 days, eptifibatide 8 hours, prasugrel 7 days, ticlopidine 14 days, and tirofiban 8 hours prior to neuraxial blockade.**

The American Society of Regional Anesthesia and Pain Medicine Guidelines (*Reg Anesth Pain Med.* 2010;35:1-38) should be consulted for the use of other agents that affect hemostasis (e.g., herbal medications, thrombin inhibitors, fondaparinux) with neuraxial anesthesia. The Pain Service (pager 3832) must be consulted for guidance when an anticoagulant is ordered in a patient with an epidural or peripheral nerve catheter. Also, refer to [Guide to the Preventions and Treatment of Venous Thromboembolism in Adults](#).