



**QUEEN'S UNIVERSITY  
DEPARTMENT OF ANESTHESIOLOGY AND  
PERIOPERATIVE MEDICINE**

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<b>SUBJECT:</b>	Guidelines for the management of anticoagulant medications prior to neuraxial procedures	<b>NUMBER</b>	
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**PREAMBLE:**

Many patients are on anticoagulant medications for a variety of indications. Although minimal anticoagulant activity is desirable in the perioperative setting, discontinuing all anticoagulant medications may place the patient at an unacceptably high risk of thrombotic complications. Therefore, a thoughtful analysis of the indications for anticoagulation, risks of perioperative bleeding and pharmacodynamic properties of the drug must be taken into consideration. The following guideline, based on the most recent American Society of Regional Anesthesia (ASRA) recommendations, should be considered in this risk/benefit analysis.

**GUIDELINES:**

1. **Warfarin (Coumadin).** For moderate to high bleeding risk and for those patients who may receive neuraxial procedures, recommend holding for 5 days and repeating INR on the morning of surgery. May consider holding for longer periods if INR is unusually high (e.g. >3).
2. **Dabigatran (Pradaxa™).** Dabigatran is a direct thrombin inhibitor with an extremely variable half-life. With normal renal function the half-life is 11-22h which increases to 22-35h for those with moderate to severe renal impairment. The levels peak in 1-2 hours. For moderate to high bleeding risk and for those patients who may receive neuraxial procedures, consider holding for 5 days for those with normal renal function and 7 days for those with renal impairment. INR and aPTT do not provide a reliable measure of its activity. To confirm an absent anticoagulant effect, thrombin clotting time (TCT) can be used. However it is too sensitive, detecting clinically irrelevant drug levels and running the risk of over interpretation. TCT is not recommended for routine testing on the day of surgery. Dabigatran may be started 6h following a neuraxial procedure. Consider delaying for 24h if there was a traumatic or bloody tap. Epidural catheters should not be routinely used for postoperative analgesia while taking dabigatran.
3. **Rivaroxiban (Xarelto™).** Rivaroxiban is a direct Factor Xa inhibitor. The half life is 11-13h and is only slightly prolonged in renal impairment. For moderate to high bleeding risk and for those patients who may receive neuraxial procedures, recommend holding for 3 days prior to surgery. Rivaroxiban may be started 6h following a neuraxial procedure. Consider delaying for 24h if there was a traumatic or bloody tap. Epidural catheters should not be routinely used for postoperative analgesia while taking rivaroxaban.
4. **Apixaban (Eliquis™).** Apixaban is a reversible inhibitor of Factor Xa. The half life is 10-15h and is only slightly prolonged in renal impairment. For moderate to high bleeding risk and for those patients who may receive neuraxial procedures, recommend holding for 3 days prior to surgery.
5. **Heparin.** Unfractionated heparin, either q12h or q8h, should be held on the morning of surgery if the patient may undergo a neuraxial procedure. It may be restarted 1-2h after the neuraxial

procedure. A platelet count should be obtained prior to surgery if the patient has been on heparin for >5d as there is a risk of HIT. Unfractionated heparin may be continued during epidural analgesia provided attention is paid with regard to the timing of epidural catheter removal (ie 8-12h after the last dose).

- Low Molecular Weight Heparin (LMWH).** The most commonly used LMWH in Kingston is Dalteparin. Prior to a neuraxial procedure, it should be held for 12 hours for prophylactic doses and 24 hours for therapeutic doses. It may be restarted no earlier than 6-8 hours after a neuraxial procedure. Consideration should be given to increasing this to 24h if one has a bloody or traumatic procedure. Specific recommendations regarding timing of catheter removal and re-starting LMWH should be made on an individual basis considering dose and patient factors. Refer to the ASRA guidelines for details.

**References:**

- <https://www.asra.com/advisory-guidelines/article/1/anticoagulation-3rd-edition>
- Gulseth et al, Pharmacotherapy, 2011;31(12): 1232-49
- Llau and Ferrandis, Curr Opin Anaesthesiol 2009; 22:661-6
- van Ryn et al, Thrombosis and Hemostasis 103.6/2010; 1116-27
- Eerenberg et al. Circulation Oct 2011, 1573-9

Generic Name	Trade Name	Half Life (h)	Recommended Time Interval before Neuraxial Block	Restart Following Neuraxial Block or Catheter Removal	Reversal of drug effect
Warfarin	Coumadin	20-60	5 days	At discretion of surgeon	Vitamin K, PCC
Dabigatran ↓ CrCl	Pradaxa™	11-22 22-35	5 days 7 days	6 hours Consider longer if traumatic	Supportive See KGH guidelines
Rivaroxiban	Xarelto™	11-13	3 days	6 hours Consider longer if traumatic	PCC See KGH guidelines
Apixaban	Eliquis™	10-15	3 days	6 hours Consider longer if traumatic	PCC See KGH guidelines
Heparin sc		1-2	8-12 hours	1-2 hours	Protamine
LMWH 5000u daily >5000 daily	Dalteparin	4-6	12 hours 24 hours	6-8 hours Consider longer if traumatic  See ASRA guidelines	