Table 20-4

Anticoagulation Monitors and Discontinuation Guidelines Before Neuraxial Analgesia

Agent	Coagulation Monitor		Time to Effect	Discontinuation Before Regional Anesthesia
	PT	aPTT		
Intravenous heparin	↑	↑↑↑	Minutes	6 to 8 hours
Subcutaneous heparin	↑	↑↑↑	40 to 50 minutes	6 to 8 hours
LMWH	—	—	3 to 5 hours	24 hours
Warfarin	↑↑↑	↑	3 to 5 days	4 to 6 days
Dabigatran	↑↑↑	↑↑↑	0.5 to 2 hours	2.5 to 5 half-lives
Rivaroxaban	↑↑↑	↑↑↑	2 to 4 hours	2.5 to 5 half-lives
Antiplatelet Agents				
Aspirin	—	—	Hours	Not needed*
Clopidogrel	—	—	Hours	7 days
NSAIDs	—	—	Hours	Not needed*

*According to the 2010 ASRA guidelines, NSAIDs, including aspirin, do not create a level of risk that will interfere with neuraxial blockade. However, they recommend that neuraxial blockade not be performed in patients taking NSAIDs who will be given other medications that affect clotting mechanism in the early postoperative period.[26]

PTT is currently the recommended assay to test for the presence of dabigatran. There is no reliable test to detect the presence of rivaroxaban, although the PT may be increased.

antithrombotic therapy, it is advisable to carefully evaluate the associated cardiac risks and seek guidance from the patient's cardiologist or primary care provider.

Although current ASRA guidelines do not yet address the newer oral agents, a discussion of perioperative anticoagulants would not be complete without mention of dabigatran and rivaroxaban, which are becoming increasingly popular. Dabigatran (Pradaxa, Boehringer Ingelheim, UK) is an oral direct thrombin inhibitor primarily used in patients with a history of heparin-induced thrombocytopenia or with atrial fibrillation. It is used both for DVT and PE prophylaxis and in patients with atrial fibrillation for thrombus prophylaxis, as well as for secondary prevention of cardiac events in patients with acute coronary syndrome.[33] Peak plasma levels are reached in 30 to 120 minutes, which coincides with the maximum effect on clotting. The optimal timing of performance of neuraxial techniques in a patient receiving dabigatran is not clear but because its half-life is 14 to 17 hours, the safest approach would be to avoid neuraxial techniques until further data are available. If an atraumatic spinal anesthetic has been performed for THA, dabigatran may be given 4 hours after surgery for prophylaxis; epidural catheter placement is not recommended if postoperative dabigatran use is planned.[33]

Rivaroxaban (Xarelto, Janssen Pharmaceuticals, Leverkusen, Germany) is an oral factor Xa inhibitor approved for prevention of thromboembolism associated with THA. Peak levels are reached in 2 to 4 hours, which correspond to maximum anticoagulation effects; half-life is 5 to 9 hours. Performance of neuraxial techniques is not recommended in patients already taking it until further data are available. If an atraumatic spinal anesthetic is performed, rivaroxaban may be given 6 to 8 hours after the dose[33]; epidural catheters may be placed preoperatively in the setting of postoperative rivaroxaban administration but the catheter must be removed 24 hours after the previous dose and the next dose after removal may be safe after 4 hours.[34]

In addition to these suggestions, many physicians recommend caution when removing epidural catheters and will generally not remove a catheter from a patient whose INR is above 1.5. The 2010 ASRA guidelines recommend removing epidural catheters when the INR is less than 1.5,[31] as