Guidelines for Neuraxial Techniques in the Patient Receiving Anticoagulation
April 2015

This anticoagulation table is a guideline. The purpose of this table is to provide consistency among providers regarding acceptable criteria for neuraxial techniques. Ultimately, the provider must make a medical decision based on risk versus benefit utilizing this guideline as a tool to assist them. The medical decision should also include discussion with the surgeon and the patient.
These recommendations also apply to Deep Plexus and Paravertebral Blocks/Catheters.
Wait times include placement, removal and any manipulation of neuraxial, deep plexus or paravertebral catheters.

Agent	Wait time for placement or removal of epidural/spinal	Wait time to restart agent after epidural/spinal placement or removal
Unfractionated Heparin		
SC Heparin 5000U q12h	No Restrictions[1]	No Restrictions[1]
SC Heparin >10,000U/day (e.g. 5000U q8h, 7500U q12h or 7500U q8h)	4 hours[1] 7500U q8h obtain normal PTT	2 hours
Continuous IV Heparin infusion	4 hours, check PTT[1]	1 hour[2]
Warfarin (Coumadin)	4-5 days[3,4]	Not recommended
LMWH		
DVT Prophylaxis: Enoxaparin (Lovenox) 30-40mg Once Daily	10-12 hours	After catheter placement: 1st dose 6-8 hours 2nd dose 24 hours after the 1st dose **Indwelling neuraxial catheters may be safely maintained**[5] After catheter removal: 4 hours[6]
LMWH Therapeutic and Twice-daily dosing regimen	Delay needle insertion at least 24 hours	Indwelling catheters should be removed before initiation of LMWH treatment.[7] After catheter removal: 4 hours[6]
Antiplatelet agents		
NSAIDS	No Restrictions[8]	No Restrictions[8]
Aspirin	No Restrictions[8]	No Restrictions[8]
Aggrenox (aspirin/dipyridamole)	No Restrictions[8]	No Restrictions[8]
Ticlopidien (Ticlid)	14 days	Not Recommended[9]
Clopidogrel (Plavix)	7 days	Not Recommended[9]
Ticlopidine (Brilinta)	7 days	Not Recommended[9]
Prasugrel (Effient)	7 days	Not Recommended[9]
New Oral Anticoagulants (NOACs)		
Dabigatran (Pradaxa)	Half-life 12-17 hours 5 half-lives ~4 days Renal excretion 80%	Not Recommended[9]
Rivaroxaban (Xarelto)	Half-life 5-13 hours 5 half-lives~3 days Renal excretion 66%	Not Recommended[9]
Eliquis (Apixaban)	Half-life 8-15 hours 5 half-lives ~3 days Renal excretion 25%	Not Recommended[9]
Edoxaban (Savaysa)	Half-life 10-14 hours 5 half-lives ~3 days Renal excretion 35%	Not Recommended[9]
Factor Xa inhibitor		
Fondaparinux (Arixtra)	Prophylactic dose: 4 days Treatment dose:7 days	Not Recommended[12]
Thrombin inhibitors		
Argatroban IV (Acova)	Not Recommended[10]	Not Recommended[10]
Lepirudin (Refludan)	Not Recommended[10]	Not Recommended[10]
Desirudin (Iprivask)	Not Recommended[10]	Not Recommended[10]
Bivalirudin (Angiomax)	Not Recommended[10,13]	Not Recommended[10,13]
Glycoprotein IIb/IIIa inhibitors		
Abciximab IV (Reopro)	24-48 hours	Not Recommended[9]
Eptifibitide IV (Interrilin)	4-8 hours	Not Recommended[9]
Trofiban IV (Aggrastat)	4-8 hours	Not Recommended[9]
Selective Phosphodiesterase inhibitor		
Cilostazol (Pletal)	48 hours	Not Recommended[9]
Profibrinolytic Coagulation inhibitor		
Drotrecogin (Xigris)	2 hours, check PTT	Not Recommended[9]
Herbal (Garlic, Gingo, Ginseng, Saw Palmetto)	No Restrictions[11]	No Restrictions[11]

[1] Due to risk of heparin-induced thrombocytopenia, check platelet count if SC heparin>4days before neuraxial block and catheter removal
[2] May consider continuing epidural with *"Low dose Heparin Infusion PTT≤50";* if *"High Dose PTT>50"* would recommend removing epidural prior to initiation of heparin infusion. Neurologic testing q2 hours with indwelling epidural/spinal catheter; continue for at least 12 hours after removal of catheter.
[3] ASRA recommendations: INR <1.5 for placement/removal of epidural/spinal
[4] ASRA recommendations: INR of 1.5 correlates with clotting factors activity levels greater than 40%, which is associated with normal hemostasis. First 1-3 days after discontinuation of warfarin therapy, the coagulation status may not be adequate for hemostasis despite a decrease in INR. Therefore, therapy must be stopped for 4-5 days and INR checked.
[5] ASRA recommendations: LMWH overview: Avoid these medications (e.g. antiplatelet drugs, standard heparin or dextran) regardless of the LMWH dosing regimen. Plasma half-life increases in patients with renal failure.
[6] FDA Drug Safety announcement: delay dosing of LMWH after spinal injections, including epidural procedures and lumbar punctures. A post procedure dose of LMWH should usually be given no sooner than 4 hours after catheter removal.
[7] ASRA recommendations: Therapeutic dosing: Enoxaparin (1mg/kg every 12 hrs or 1.5mg/kg daily), Dalteparin (120U/kg every 12 hrs or 200 U/kg daily), Tinzaparin (175 U/kg daily) If continuous technique, epidural catheter may be left indwelling overnight, but must be removed before the first dose of LMWH
[8] ASRA recommendations: Used alone, there is no added significant risk of spinal hematoma. Recommend against neuraxial technique if concurrent use of other anticoagulants in the early postoperative period due to potential increased risk of bleeding complications.
[9] Avoid medication with indwelling catheter. Actual risk of spinal hematoma is unknown.
[10] The anticoagulation effect is present for 1-3 hours after IV administration. Anticoagulation parameters generally return to baseline within 2-4 hours after discontinuation. Patients with severe renal impairment the half-life may be prolonged to 2 days. Effect monitored by aPTT.
[11] No increased risk of spinal hematoma. Recommend against mandatory discontinuation of medication.
[12] Mass General recommendations. Prophylactic dose (2.5mg) wait 4 days to insert and wait 12 hrs to start after catheter removed. Treatment dose (5-10mg) wait 7 days to insert and wait 24 hrs to start after catheter removed.
[13] Exception: Patients with indwelling epidural/spinal catheters and new diagnosis of HIT. Patients require neurologic testing q2 hours with indwelling catheters and continuous infusion of bivalirudin. For removal of catheter, will need to hold bivalirudin for 4 hours and obtain INR and aPTT. Continue neurologic testing for 12 hours after removal of catheter.