GUIDELINES FOR ANTICOAGULATION AND NEURAXIAL ANESTHESIA (2018)

Adapted from ASRA guidelines for use in the University of Pennsylvania Health System
By the Department of Anesthesiology and Critical Care, Penn Medicine

Medication	Hold before procedure	Restart after procedure	Hold before catheter removal	Restart after catheter removal
Heparin				
IV Heparin	4-6h **&** normal coags	1-2h	4-6h & normal coags	1-2h
SC Heparin 5000 U BID/TID	4-6h	Immediately	4-6h	Immediately
SC Heparin 7500-10000 U BID or ≤20000 U/day	12h **&** normal coags	CAUTION	CAUTION	Immediately
SC Heparin >10000 U/dose or >20000 U/day	24h **&** normal coags	CAUTION, AVOID with catheters	AVOID	Immediately
LMWH				
Enoxaparin (Lovenox®) Dalteparin (Fragmin®) Tinzaparin (Innohep®)	12h *prophylactic* 24h *therapeutic*	12h *prophylactic* 24h *therapeutic* *AVOID with catheters, (48-72h after high-bleeding-risk surgery)*	12h *prophylactic* AVOID *therapeutic*	4h (*see note 4 below*)
Warfarin (Coumadin®)	5d & INR <1.5	No delay	Once INR < 1.5, 12-24h	*No delay, may be restarted evening before catheter removal*
Fibrinolytic/Thrombolytic	AVOID *48hrs, check clotting factors & fibrinogen*	AVOID	Check fibrinogen	10 days
Platelet Inhibitors				
Clopidogrel (Plavix®)	5-7d	24h, immediate if no bolus	Can be maintain for 1-2d if no bolus dose	6h, immediate if no bolus dose
Prasugrel (Effient®)	7-10d	24h, immediate if no bolus; AVOID with catheters	AVOID	24h, immediate if no bolus; AVOID with catheters
Ticagrelor (Brilinta®)	5-7d	24h, immediate if no bolus; AVOID with catheters	AVOID	24h, immediate if no bolus; AVOID with catheters
Ticlodipine (Ticlid®)	10d	24h, immediate if no bolus	Can maintain for 1-2d (if no bolus dose)	6h, immediate if no bolus
Cilostazol (Pletal®)	2d	6h, AVOID with catheters	AVOID	6h
Cangrelor (Kengreal®)	3h	8h, AVOID with catheters	AVOID	8h
Dipyridamole (Aggrenox®)	24h	6h, AVOID with catheters	AVOID	6h
Aspirin	No restrictions	No restrictions	No restrictions	No restrictions
NSAIDs	No restrictions	No restrictions	No restrictions	No restrictions
Direct Thrombin Inhibitors				
Dabigatran (Pradaxa®)	3-5d, check CrCl (*note 6*)	6h, AVOID with catheters	36h, *check dTT/ECT*	6h
Argatroban (Acova®) Bivalirudin (Angiomax®) Desirudin (Revasc®)	AVOID	AVOID	AVOID	AVOID
Factor Xa Inhibitors				
Fondaparinux (Arixtra®)	CAUTION	AVOID	AVOID	6h
Apixaban (Eliquis®)	72h	6h, AVOID with catheters	26-30h or anti-factor Xa	6h
Rivaroxaban (Xarelto®)	72h	6h, AVOID with catheters	22-26h or anti-factor Xa	6h
Edoxaban (Savaysa®)	72h	6h, AVOID with catheters	20-28h or anti-factor Xa	6h
Betrixaban (Bevyxxa®)	72h	5h, AVOID with catheters	72h	5h
GP IIb/IIIa Inhibitors				
Abciximab (Reopro®) Eptifibatide (Integrilin) Tirofiban (Aggrastat®)	AVOID	AVOID	AVOID	AVOID

1. ***Risks and Benefits*** *have to be assessed on case-by-case basis.* ***Guidelines are for reference only****.*
2. ***Concurrent therapies*** *with multiple agents or classes of medications are associated with greater risks. Use caution while epidural catheter in place.*
3. ***When using postop warfarin:*** *PT/INR should be monitored daily. Routine neurological testing for 24h should be performed after catheter removal. Dilute local anesthetic solution is recommended to minimize sensory/motor blockade and facilitate neurologic evaluation.*
4. ***Post op LMWH:*** *1st dose should be at least 12h the following day for BID dosing regardless of type of anesthesia. 12h postop for QD dosing and the 2nd dose should be no sooner than 24 hours after 1st dose. Catheters should be removed before starting enoxaparin BID prophylaxis.*
5. ***Renal impairment*** *may require longer waits with factor Xa inhibitors, direct thrombin inhibitors and LMWH.*
6. ***Dabigatran before procedure:*** *If no bleeding risk, 72h for CrCl ≥ 80, 96h for CrCl 50-79, 120h for CrCl 30-49, AVOID for CrCl < 30.*