ASRA Guidelines for Neuraxial Block and Anticoagulation

Unfractionated Heparin

Low Dose BID (5,000 SQ): No contraindications for BID dosing. If > 4 days of UF, check plts for HIT before pulling/placing catheter. Previous conservative recommendation: place/pull epidural 6 hrs after SQ UH and give SQ UH >1 hr after placing/pulling epidural, but this is not absolute, and we are routinely giving it just pre or post epidural in high risk DVT patients going to the OR, e.g., cancer patients.

Low Dose SQUH TID dosing: If > 4 days of UF, check plts for HIT before pulling/placing catheter. Hold one dose of UH. If the patient is < 70 kg check aPTT before pulling epidural; TID doses may stack especially if the patient is malnourished or low body weight. If normal then pull epidural; if supranormal hold next dose and check aPTT again. Resume dosing > 1 hr after pulling catheter. ASRA is confused on this subject. UW has zero restrictions.

Bolus dose: Bolus at least 1hr after needle placement
- Pull cath > 3 hrs after d/c heparin AND check PTT; PTT MUST BE NORMAL
- May again re-heparinize 1 hr after pulling catheter
- Monitor these patients Q2hr neuro exams for 12 hrs after catheter removal
- Bloody tap may still proceed but be careful (neuro checks, tell surgeon, consider local concentration to ensure pt can perform neuro exams)
- Consider other clotting inhibitors (no official recs, R/B analysis)

LMWH

No coagulation tests are useful to guide therapy. These are factor Xa inhibitors. The commonly used LMWHs are enoxaparin and dalteparin.

If other clotting inhibitors used, be careful (risks, benefits, use clinical judgment).

Bloody tap- it is suggested no LMWH for 24 hrs, tell surgeon, don’t have to cancel surgery.

Preop Enoxaparin:
- For PPx dose (40 mg SQ): don't place for 12 hrs.
- For therapeutic dose (1mg/kg): don't place for 24 hrs. We have decided that doses above 40 mg/day are to be treated as therapeutic unless there is a good reason not to treat it as such, so wait 24 hrs to place needle.

Postop Enoxaparin:
- Twice daily dosing (30mg/dose)- don't use an epidural. If you want to use catheter intra-op, pull it > 4 hours b/4 LMWH dose.
- Once day (40mg/dose)- you may use an indwelling catheter. First dose of LMWH > 8 hrs after surgery (there is no good reason given on ASRA for this, but it is also the local standard- so wait 8 hrs before giving LMWH), second dose > 24 hrs after 1st. May pull these caths 12 hrs after dose. Re-start PPx > 4 hrs after pulling cath. (This is historically the Euro dosing and has a more safe record than US dosing. It was also is more effective than US dosing if 1st dose 12 hrs preop. Why does
anyone do US dosing- no one seems to know. Probably don’t wish to admit the French are correct.

Preop Dalteparin:
- For PPx dose (5,000 Units SQ): don't place for 12 hrs.
- For therapeutic dose (Typically >100 U/kg): don't place for 24 hrs. Doses above 5,000 mg/day are to be treated as therapeutic unless there is a good reason not to treat it as such, so wait 24 hrs to place needle.

Postop Dalteparin:
- Once day (5,000 Unit dose): may use an indwelling catheter. First dose of LMWH > 8 hrs after surgery, second > 24 hrs after 1st. May pull these catheters 12 hrs after dose. Re-start PPx >4 hrs after pulling cath; ASRA says 2 hours okay; UW 4 hours; easier to stay consistent with enoxaparin recommendation.

Tinzparin: LMWH FDA approved for VTE once daily. Approved for pregnancy and in patients with renal failure. Protamine reverses 85% per package insert. For treatment doses wait 24 hours after the last dose. For QD Ppx doses wait 12 hours to do a technique; remove catheter 12 hours after last dose. You can give the med 6 hours after placing the catheter. ASRA says may restart 2 hours after catheter removal. For BID Ppx dosing don’t use an indwelling catheter. Place block 12 hours after last dose. Restart med 2 hours after catheter is out.

Warfarin
Check PT/INR (Seriously, ASRA feels it’s necessary to say this). Takes 4-5 days to normalize INR from therapeutic levels.
- If other anticoagulants, then be careful (no recs- risks vs. benefits).
- For single 5mg dose: If given < 24hrs ago go ahead; if given > 24 then check INR (takes a while to work).
- Don't remove a catheter unless INR is < 1.5 (implies factors are > 40% of normal)
- If on warfarin with a catheter then do neuro checks Q2hr
- If using an indwelling catheter, don't let INR > 3, if it does, withhold next dose (or smaller) and hold breath.
- Careful in patients with increased response to warfarin, may the force be with you

Antiplatelet Medications
- NSAIDs: If used alone there are no contraindications
- Clopidogrel (Plavix): ADP inhibitor. Don't use neuraxial technique for 7 days. Restart medication 4 hours after the epidural has been pulled. ASRA does not comment; UW agrees.
- Ticlopidine (hardly ever used): Don't use neuraxial technique for 14 days. Restart 4 hours after.
- Prasugrel (Effient): No indwelling catheters. It’s a pro-drug ADP inhibitor used for ACS and PCI; studies show has better efficacy yet more bleeding than Plavix. Wait minimum 7 days (new platelet formation). Typical dose 10 mg/day. Expect to see more of this drug. Wait 6 hours to dose this after the technique is done (UW>4; ASRA>6).
Cilostazol (Pletal): Works partially by PDE inhibition of platelets. Typical dose 100 mg PO bid. Terminal half life renal excretion 21 hrs. Wait 5 days before placing a catheter. Wait 5 hours to restart drug after pulling catheter.

Ticagrelor: ADP inhibitor like clopidogrel but is allosteric inhibition. Peak concentration 1.5 hours. Wait 7 days after dose to place technique. Wait 6 hours after technique before dosing (per ASRA, UW states 4 hrs).

Platelet GP IIb/IIIa receptor antagonists: None of these should be used with an indwelling catheter.

- Abciximab (Reopro)- wait 48 hrs before blocking. Wait 4 hours after neuraxial technique before giving next dose (time was changed based on newer LMWH ASRA recommendations). No indwelling catheters.

- Eptifibatide (Integrilin) and Tirofiban (Aggrastat)- wait 8 hrs before placing block/pulling catheter; these are renally excreted. Wait 6 hours after neuraxial technique before giving next dose. ASRA has no recommendations. They say IIb,IIIa inhibitors are contraindicated for surgery for 4 weeks.

Direct Thrombin Inhibitors: Do not use with indwelling catheter. Inhibits the enzyme thrombin (fac II). Binds active site (univalent), active and exosite (bivalent), and allosteric (newest kind).


- Dabigatran (Pradaxia): Univalent. ASRA recommends wait 5 days to place a block. We previously said wait 3.5 days with normal renal function (renal excretion: if normal renal function half-life 12-17 hrs: 5 half-lives is 3.5 days; normal dose 150mg PO BID) can use a thrombin time. If it is normal (TT<22) then it’s indicative of safe levels. Don’t use with indwelling catheters. Can restart 6 hours after the technique (new ASRA rec). This is slightly different than UW (72hrs/4hrs) This is a prodrug cleaved to active state peaks at 2 hours. Consider emergency reversal with PCC.

Other Xa Inhibitors: Xa catalyzes prothrombin to thrombin. Alternatives to vit K inh and LMWH. Advantages: quick on/off, less monitoring. Disadvantages: less experience.

- Apixaban (Eliquis): Newer drug (8/14) in US. For VTE/ AF. No antidote. Mean terminal half life 11.5 hours. May place a neuraxial technique 3 days (ASRA) after a dose if there is no renal dysfunction. Can restart the medication 6 hours (per ASRA) after neuraxial technique. No indwelling techniques.

- Rivaroxaban (Xarelto): No indwelling catheters. Inhibits Xa in free and prothrombinase complexes. Mean terminal half life 5-13 hours (if normal renal function). May place epidural 48 hours after last dose (10 mg prophylaxis dose).
Atrial fibrillation doses are often 15 mg BID; hold for 72 hours before placing epidural. Do not give again for 6 hours after catheter removal (per ASRA and manufacturer) (24 if traumatic). PTT is unreliable; there is no good test. On the chart it states 3 days regardless of dose. This is to give the surgeons a consistent message. For smaller doses it seems reasonable to allow less restrictions.

**Fondaparinux (Arixtra):** a synthetic pentasaccharide Factor Xa inhibitor similar to LMWH. Binds ATIII. It is renally excreted so increase time before starting epidural. Half life 17-21 Hrs. For a full doses of 10 mg wait 4 days before starting epidural. For ppx doses of 2.5 mg wait 48 hours. Wait 4 hours to re dose after pulling catheter. No recs from ASRA; UW uses 4 hours; we previously used 2.

**Fibrinolytics:** Clot busters, dissolve fibrin.

- **Streptokinase:** made by strep, cleaves fibrinogen to fibrin. Wait 10 days before even uttering the word streptokinase.
- **tPA (alteplase):** Same as above, wait 10 days.

**Herbals**

On your own. ASRA mentions garlic, ginkgo, and ginseng by name. They do not give specific advice.

**Notes:**

**Antiphospholipid antibodies** such as Lupus anticoagulant or Anticardiolipin antibodies may artificially prolongate the aPTT above the 33 seconds we consider to be normal. The lab can mix the patient’s serum with normal serum 80:20 or 50:50; if the aPTT is still prolonged then it is likely due to the antibody artificially prolonging the contact activation pathway. These patients are much more likely to develop clots (VTE) and are often on anticoagulants. If the patient has no bleeding history or otherwise abnormal coag lab then there is no contra indication to neuraxial anesthesia.