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Perioperative Management of Anticoagulation

For all anticoagulated patients, assess bleeding vs thrombotic risk:

- CHA2DS2-VASc vs HAS-BLED for Afib, OBRI for VTE, etc
- Indication of anticoagulation; high risk if:
  - Mechanical valve, mitral > aortic; particularly older models (e.g. tilting disc, cage) or recent placement (last 3 months)
  - History of multiple VTEs, DVT/PE in last 3 months, TIA/stroke in last 6 months, unprovoked > provoked
  - Coagulopathies (e.g. Protein C/S deficiency, Factor V Leiden, APS)
- Risk of the procedure

Warfarin

Often bridge with LMWH, depending risk assessment above.

Warfarin held usually 3-5 days prior, sometimes up to 7 days, depending on the pre-procedure INR; no concern about renal function except in considering LMWH dose

- In-range INR (~2-3): hold 3-5 days
- Above-range (~3-4.5): hold ~5-7 days
- Way above-range (>4.5): hold ~7 days, consider vit K

If bridging:

- Usually start LMWH (1 mg/kg BID or 1.5 mg/kg QD if normal renal function, or 1 mg/kg QD for impaired renal function) ~2 days after last warfarin dose
- Last dose of LMWH ~24 hours pre-procedure
- Resume LMWH ~24 hours post-procedure
- Resume warfarin evening after procedure, pending surgeon approval
- Overlap warfarin and LMWH until INR back into range (usually ~5-7 days)

DOAC

DO NOT bridge with LMWH except for very rare exceptions.

DOAC usually held 24-48 hours pre-procedure, depending on agent, renal function, age, bleed risk, etc:

- Eliquis (min-mod/mod-high risk)
  - SCr <1.5 = 24hr/48hr
  - SCr >1.5 = 48hr/72hr
- Xarelto (min-mod/mod-high risk)
  - CrCl >30 = 24hr /48hr
  - CrCl <30 = 48hr/72hr
- Pradaxa (min-mod/mod-high risk)
  - CrCl >50 = 1-2 days/2-4 days
  - Cr Cl <50 = 3-5 days/>5 days
- Savaysa (min-mod/mod-high risk)
  - CrCl >50 = 24hr/48hr
  - CrCl <50 = 48hr/72hr

Resume DOAC within 24hr post-procedure (if min/mod risk) or within 72 hours (if high risk), pending surgeon approval

Exceptions for Epidurals:
DOACs - hold 3 days before
Enoxaparin - hold 12-24 hours before (pending renal function)
Warfarin - hold/reverse until INR <1.5

When to hold for a procedure? When to bridge for a procedure?

- Determining whether to continue vs interrupt is typically the decision of the performing surgeon, based on their comfort level with the procedure's bleed risk and/or their ability to handle intra-op bleeding. May also request a specific INR goal.
- Determining whether to bridge is typically the decision of the anticoagulation referring provider, often cardiology, hematology, or PCP, based on the bleed-vs-clot risk of the patient.
- It is NOT recommended to bridge DOACs. Given DOAC's significant shorter time-to-onset and half-life compared to warfarin, this negates the need for any overlapping or "bridging" anticoagulation. DOACs can be thought of as similar to an "oral LMWH" because of its similar kinetics profile.