Anticoagulation Management

Choosing, dosing, holding, restarting · The indication decides the drug

DOACs ARE NOT UNIVERSAL
four hard exclusions

WHERE DOACs MUST NOT BE USED *learn these four before anything else*

MECHANICAL HEART VALVE

Warfarin only. DOACs were associated with excess thromboembolism and bleeding in mechanical valves and are **contraindicated**. This includes patients who seem stable on a DOAC prescribed in error — switch them.

TRIPLE-POSITIVE APS

Warfarin. The TRAPS trial in high-risk triple-positive antiphospholipid syndrome was stopped early for **excess arterial thrombotic events on rivaroxaban**. Ask about APS in young patients with unprovoked or arterial thrombosis.

PREGNANCY & SEVERE RENAL DISEASE

Pregnancy — DOACs are not used; **warfarin is teratogenic**, so the answer is **low-molecular-weight heparin**. **Severe renal impairment** — DOACs are renally cleared to varying degrees; check the threshold for the specific agent and indication.

DOSE IT CORRECTLY *dose depends on drug, indication and renal function — not on habit*

Point	Detail
Indication changes the dose	**Atrial fibrillation and VTE treatment use different regimens** for the same drug. VTE treatment typically starts with a **higher loading period** (rivaroxaban and apixaban) or a **parenteral lead-in** (dabigatran and edoxaban). Prescribing an AF dose for a new PE is a real and dangerous error.
Apixaban reduction in AF	Reduce the dose if **two of three** are present: **age ≥ 80, weight ≤ 60 kg, creatinine ≥ 1.5 mg/dL**. Reducing on one criterion alone is **under-dosing**, which is common and associated with worse outcomes.
Do not under-dose out of caution	Inappropriate dose reduction is **more common than overdosing** and leaves patients unprotected without reducing bleeding meaningfully. Use the licensed criteria, not an impression of frailty.
Check the interactions	**Strong P-glycoprotein and CYP3A4 inducers** — rifampin, carbamazepine, phenytoin, St John's wort — substantially reduce DOAC levels and are a reason to use warfarin instead. Strong inhibitors raise levels.
Warfarin targets	**INR 2.0–3.0** for most indications, **higher for some mechanical valves**. Counsel on dietary consistency rather than vitamin K avoidance, and review every new medication for interaction.

HOLDING IT FOR A PROCEDURE *most patients do not need bridging*

1. **Ask first whether it needs interrupting at all.** Many low-bleeding-risk procedures — most dental work, cataract surgery, many endoscopies without intervention, and pacemaker insertion — are safely done on continued anticoagulation.
2. **DOACs: stop based on renal function and procedural bleeding risk**, typically **24–48 hours** before, and longer with impaired clearance or high-risk surgery. **DOACs need no bridging** — their rapid onset and offset is the entire point.
3. **Warfarin: stop about 5 days before** and check the INR on the day. **Bridging with heparin is only for high thrombotic risk** — mechanical mitral valve, recent VTE or stroke, or very high CHA_2DS_2-VASc. **Routine bridging in atrial fibrillation increases bleeding without preventing stroke.**
4. **Restart deliberately and document when.** Typically **24 hours** after low-bleeding-risk procedures and **48–72 hours** after high-risk ones. **The commonest real-world harm is anticoagulation stopped and never restarted** — write the restart date in the discharge summary and tell the patient.

HOW LONG, AND WHO NEEDS SOMETHING DIFFERENT *duration and special populations*

DURATION IN VTE

Provoked by a major transient risk factor (surgery, trauma, immobility) → **3 months**, then stop. **Unprovoked** → at least 3 months, then **consider extended therapy**, often at a reduced dose, weighing recurrence against bleeding risk. **Active cancer or ongoing major risk factor** → continue while the risk persists. **Recurrent unprovoked VTE** → indefinite.

SPECIAL POPULATIONS

Cancer-associated thrombosis — DOACs are now an accepted alternative to low-molecular-weight heparin for many patients, though **caution with gastrointestinal and genitourinary tumors**, where DOACs carry more mucosal bleeding. **Obesity** — DOACs are increasingly supported at higher weights, but check current guidance at extremes. **Atrial fibrillation with recent PCI** — avoid prolonged triple therapy: short overlap, then **DOAC plus a single P2Y12 inhibitor**, dropping aspirin early.

WHEN THEY BLEED *a quick orientation — the reversal agents are drug-specific*

Agent	If bleeding is serious
Warfarin	**Prothrombin complex concentrate plus intravenous vitamin K.** PCC works within minutes and vitamin K sustains it — **both are needed**, since PCC alone wears off and the INR rebounds.
Dabigatran	**Idarucizumab** gives immediate, specific reversal. Dabigatran is also **dialysable**, unlike the factor Xa inhibitors.
Factor Xa inhibitors	**Andexanet alfa** where available; otherwise **PCC** is used. Note the **timing of the last dose** — reversal matters most within a few half-lives.
Heparin / LMWH	**Protamine** fully reverses unfractionated heparin and **partially** reverses low-molecular-weight heparin.
Always also	**Stop the drug, apply mechanical and surgical hemostasis, resuscitate, and correct the substrate** — fibrinogen, platelets, calcium and temperature. **Reversal agents do not stop surgical bleeding**, and tranexamic acid is a useful adjunct in many settings.

PEARLS & PITFALLS

- **Reversal doses, because naming the agent is not the same as ordering it: idarucizumab 5 g IV** for dabigatran; **andexanet alfa** for apixaban or rivaroxaban, low dose 400 mg then 4 mg/min, high dose 800 mg then 8 mg/min, chosen by the last dose and its timing; **4-factor PCC 25-50 units/kg** plus **vitamin K 10 mg IV** for warfarin; **protamine 1 mg per 100 units** of heparin given in the last few hours, to a maximum of 50 mg.
- **Mechanical valve and triple-positive APS mean warfarin.** These two exclusions are absolute and are regularly missed.
- **Match the dose to the indication.** An AF dose given for acute VTE under-treats a clot; the loading regimens exist for a reason.
- **Apixaban reduction needs two of three criteria**, not one. Under-dosing is the commoner error.
- **Do not bridge routinely.** In atrial fibrillation it increases bleeding without reducing stroke.
- **Document the restart date.** Anticoagulation held for a procedure and never resumed is a leading cause of preventable thrombosis.
- **Review the indication at every admission.** Patients remain on anticoagulation for years after a 3-month indication has expired.

References: ACC/AHA and ESC guidance on atrial fibrillation and periprocedural anticoagulation · ASH guidelines on management of venous thromboembolism · BRIDGE trial · RE-ALIGN and TRAPS trials for the DOAC exclusions.

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