VTE: PROPHYLAXIS & TREATMENT

Risk-assess every admission · then treat by agent, by provocation, by duration

ASSESS EVERY ADMISSION
and document if you hold it

PROPHYLAXIS: WHO, AND WITH WHAT

a preventable cause of inpatient death

MEDICAL PATIENTS — PADUA

Padua ≥ 4 is high risk and earns pharmacological prophylaxis. Points come from active cancer, previous VTE, reduced mobility, known thrombophilia, recent trauma or surgery, age ≥ 70, heart or respiratory failure, acute infection, obesity and hormone therapy. **Padua < 4: mobilize, mechanical only.**

THE AGENTS

Enoxaparin 40 mg SC once daily (30 mg daily if CrCl < 30), or **unfractionated heparin 5,000 units SC every 8–12 hours. UFH is the choice in severe renal impairment** because it is not renally cleared. Consider weight-adjusted dosing or anti-Xa monitoring in obesity, where fixed doses under-treat.

BLEEDING RISK — IMPROVE

Score bleeding risk before you anticoagulate. **Absolute contraindications: active bleeding, platelets < 50, recent neurosurgery or intracranial bleed.** Then use **intermittent pneumatic compression** instead, and **reassess daily** — mechanical prophylaxis is a bridge, not a destination.

TREATMENT: PICKING THE AGENT

most stable VTE now starts on a DOAC, with no lead-in

Agent	Treatment dose	Renal limit	Where it fits
Apixaban	**10 mg BID for 7 days, then 5 mg BID.** Extended phase: 2.5 mg BID after 6 months	Avoid CrCl < 15	**Reasonable default.** No parenteral lead-in, and the **lowest major-bleeding rate of the DOACs** in head-to-head and trial data. Least renally cleared of the group.
Rivaroxaban	**15 mg BID for 21 days, then 20 mg daily with food.** Extended: 10 mg daily	Avoid CrCl < 30	No lead-in. **Must be taken with food** — absorption rises substantially and dosing on an empty stomach under-treats. Slightly higher gastrointestinal bleeding signal than apixaban.
Edoxaban	60 mg daily **after at least 5 days of parenteral heparin. 30 mg if CrCl 15–50, weight ≤ 60 kg, or on a P-gp inhibitor**	Avoid CrCl < 15	Requires the lead-in, which makes it less convenient. **The agent with the cancer-VTE evidence base** (Hokusai-VTE Cancer).
Dabigatran	150 mg BID **after at least 5 days of parenteral heparin**	Avoid CrCl < 30	Also needs the lead-in. **The one DOAC with a specific, complete reversal agent** (idarucizumab), which occasionally decides the choice.
LMWH	**Enoxaparin 1 mg/kg BID**, or 1.5 mg/kg daily	1 mg/kg **daily** if CrCl < 30, with anti-Xa monitoring	**Pregnancy, and the parenteral lead-in.** Still the fallback whenever oral absorption is unreliable.
Fondaparinux	**7.5 mg SC daily** (5 mg if < 50 kg, 10 mg if > 100 kg)	Avoid CrCl < 30	**The non-heparin option in heparin-induced thrombocytopenia**, and a once-daily parenteral alternative. **No specific reversal agent** and a 17–21 hour half-life, so it is a poor choice if bleeding risk is high or surgery is near.
Warfarin	Target **INR 2–3. Overlap with heparin for at least 5 days AND until the INR has been ≥ 2 for 24 hours**	No renal limit	**Mechanical valves, antiphospholipid syndrome, and severe renal impairment.** The overlap is not optional: protein C falls first, so stopping heparin early is transiently prothrombotic.

HOW LONG

duration is decided by what provoked it

1. **Provoked by a major transient risk factor** (surgery, trauma, hospitalization with immobility, hormone therapy): **3 months, then stop.** The provocation has resolved and the recurrence risk after stopping is low.
2. **Unprovoked: at least 3 months, then make an explicit decision about extending.** Recurrence after stopping runs at roughly 10% in the first year, so **extended therapy is often appropriate if bleeding risk is low** — and reduced-dose apixaban or rivaroxaban is the usual way to do it. **Reassess at least annually**; this is a decision to revisit, not a one-off.
3. **Cancer-associated: anticoagulate for as long as the cancer is active** or treatment continues. **DOACs are now reasonable alternatives to LMWH, with the exception of luminal gastrointestinal and genitourinary tumors**, where the bleeding rate is higher and LMWH remains preferable.
4. **Recurrent unprovoked VTE, or a persistent major risk factor** such as antiphospholipid syndrome: **indefinite therapy.** In triple-positive antiphospholipid syndrome, **use warfarin, not a DOAC** — DOACs performed worse in that population.

SPECIAL SITUATIONS

PREGNANCY

LMWH only (enoxaparin 1 mg/kg BID). **Warfarin is teratogenic and DOACs are contraindicated**, both crossing the placenta. **Hold LMWH 24 hours before planned delivery** or neuraxial anesthesia. Continue through pregnancy and **at least 6 weeks postpartum**, minimum 3 months total.

HEPARIN-INDUCED THROMBOCYTOPENIA

Platelets falling by more than 50% at day 5–10. **Stop all heparin, including flushes, and start a non-heparin anticoagulant** (argatroban or fondaparinux). **Do not simply withhold anticoagulation** — HIT is prothrombotic, and **do not give platelets.**

WHEN NOT TO USE AN IVC FILTER

Only when anticoagulation is genuinely contraindicated, and **retrieve it once it is safe to anticoagulate.** Filters do not reduce mortality, and left in place they raise the rate of recurrent DVT. They are a bridge, not treatment.

PEARLS & PITFALLS

- **Do not bridge a DOAC for surgery.** Hold apixaban or rivaroxaban 1 day before low-bleeding-risk surgery and 2 days before high risk; dabigatran is renal-dependent. The short half-life is the bridge PAUSE, 2019.
- **Bridging warfarin in AF is the error, not the omission.** BRIDGE, NEJM 2015 tripled major bleeding without preventing thromboembolism. Bridge only for a mechanical mitral valve, VTE within 3 months, or recent stroke.
- **Risk-assess on admission and document the reason if you hold prophylaxis.** Omission, not the wrong agent, is what causes preventable inpatient PE.
- **Rivaroxaban must be taken with food.** On an empty stomach absorption falls enough to matter, and this is a common outpatient failure.
- **Avoid DOACs in luminal GI and GU cancers** and in triple-positive antiphospholipid syndrome. Elsewhere in cancer they are reasonable.
- **Overlap warfarin with heparin for 5 days and until INR ≥ 2 for 24 h.** Stopping heparin at the first therapeutic INR is transiently prothrombotic.
- **Unprovoked VTE is a decision to revisit, not a fixed course.** Reassess bleeding risk and the case for extended therapy at least yearly.

References: CHEST antithrombotic therapy for VTE disease · ASH 2018–2021 VTE guidelines · ESC 2019 acute pulmonary embolism · AMPLIFY, *NEJM* 2013 · EINSTEIN-PE, *NEJM* 2012 · Hokusai-VTE Cancer, *NEJM* 2018 · Barbar et al. Padua prediction score, *J Thromb Haemost* 2010.

Educational aid; verify doses against local protocol, renal function, weight and patient factors.

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