Anticoagulants and clotting

Monitoring and reversal, bleeding watch, HIT, DVT and PE

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1 AT A GLANCE

Anticoagulants prevent clots; they don't dissolve one that's already there. They're high-alert: watch every client on one for bleeding.

Anticoagulants: monitor and reverse

Drug	Monitor	Reverse	Key points
IV heparin	aPTT or anti-Xa level, per protocol. At the start: aPTT, INR and platelets	Protamine sulfate, by slow infusion	Usually a weight-based protocol: follow each protocol rate change exactly. Open RN: aPTT 1.5 to 2 times normal
★ **Enoxaparin (LMWH)**	No routine aPTT adjustment. Monitor the CBC and platelets, bleeding and kidney function	Protamine, partly	Can build up in kidney disease
★ **Warfarin**	INR: daily at first, until stable. Usual target 2 to 3; some mechanical heart valves use 2.5 to 3.5	Vitamin K. Severe bleeding: urgent protocol with factor replacement, not vitamin K alone	Narrow range: drugs and diet change the INR
Rivaroxaban, apixaban	No routine INR checks	Current facility protocol: andexanet left the U.S. market in December 2025	Block factor Xa directly. Apixaban: don't stop early without a plan (clot and stroke risk)

Follow policy: Your protocol sets the exact range, and each result points to a protocol rate change: follow it exactly.

Bleeding watch

- Watch for new bruises, bleeding gums, and blood in urine or stool.
- ★ **Falling blood pressure with a rising heart rate** can mean internal bleeding: report it at once.
- No IM injections, and no aspirin or anti-inflammatory pain relievers, like ibuprofen, unless ordered. Clients tell the dentist before any procedure.
- Before any dose: check the latest clotting lab and platelet count, and assess for bleeding. Abnormal results: call before giving.

Heparin-induced thrombocytopenia (HIT)

- A drop in platelets on heparin, sometimes with new clots.
- ★ Platelets **under 100,000/mcL**, a fall of **more than 50%** from baseline even above that, or new clots: stop heparin promptly and evaluate for HIT. A threshold alone misses cases.

DVT or pulmonary embolism?

	DVT	Pulmonary embolism (PE)
Where	A deep vein: usually the lower leg, thigh or pelvis; sometimes the arm	A clot that breaks off and travels to the lungs: life-threatening
★ **Signs**	Swelling, redness, warmth, pain or tenderness, usually in one leg. Compare both legs	Sudden breathlessness, fast heart rate, chest pain worse with a deep breath or cough. There may be coughing up blood, low pressure, fainting, low oxygen, sudden anxiety
Action	Notify the provider at once, for urgent testing	Call for emergency help
Tests	D-dimer and ultrasound. A negative D-dimer rules it out only in a validated pathway, with low pretest probability	CT scan with contrast of the lung vessels

Watch: Homans' sign is no longer used: it isn't reliable. A PE can come with no leg signs at all.

Why clots form

Cause	Examples
Slow flow	Immobility, heart failure, bed rest, a leg cast, paralysis
Blood that clots easily	Dehydration, pregnancy (up to 3 months after birth), birth control or estrogen pills, smoking
Vein injury	Major surgery of the abdomen, pelvis, hips or legs; a fracture; a severe muscle injury
Other risks	A past clot, a clotting disorder, older age, obesity, a central line

Risks add up: Risk multiplies when factors combine, like an older client after hip surgery on bed rest.

Treating DVT and PE

- Anticoagulants stop the clot growing and stop new ones while the body reabsorbs it; usually at least 3 months.
- Warfarin for acute VTE: the injected anticoagulant continues **at least 5 days**, until the INR is **at least 2 on two readings in a row**, per protocol.
- Clot-dissolving drugs carry more bleeding risk: kept for severe cases, like a life-threatening embolism.
- Can't use anticoagulants? A filter in the vena cava traps clots before they reach the lungs.

Educational use only. Not a substitute for clinical judgment, your facility's policy or the provider's orders. Where practice varies, follow facility policy and state law. No patient information.

Anticoagulants and clotting

1 AT A GLANCE, CONTINUED

Antiplatelets and clot busters

Drug	Key points
Aspirin, clopidogrel	Stop platelets clumping. Irreversible: the effect lasts the life of the platelet, about **7 to 10 days**, so they're often held before surgery
Aspirin	Give with food. Not for children or teens who have, or are recovering from, flu-like symptoms or chickenpox: Reye's syndrome
Alteplase (thrombolytic)	Dissolves clots in a heart attack, stroke or massive pulmonary embolism. Main risk: bleeding
Screen first	Not with active internal bleeding or bleeding in the brain, a recent stroke, recent brain or spine surgery, a serious head injury, or severe high pressure

Watch: The 7 to 10 day rule doesn't apply to reversible agents, like ticagrelor and cangrelor.

Teaching: warfarin and enoxaparin

- ★ Warfarin: keep vitamin K foods, like green leafy vegetables, **about the same each week**. Don't cut them out.
- Warfarin's boxed warning is major or fatal bleeding. Teach: avoid alcohol, cranberry and grapefruit; report falls, nosebleeds, dark urine or black stools.
- Antibiotics, antifungals and herbs can change warfarin, so clients ask before starting aspirin, store-bought drugs or herbs. It isn't used in pregnancy, except for some women with mechanical heart valves.
- ★ Enoxaparin: deep under the skin of the abdomen, client lying down. **Don't expel the air bubble**; alternate sides. Pinch a skin fold, insert the whole needle, hold the fold; don't rub the site.
- Clot prevention: walk early after surgery, leg exercises in bed, devices or stockings as prescribed. On trips over 4 hours, walk every 1 to 2 hours.

2 PRIORITY AND SAFETY CALLS

Falling pressure and a rising pulse on heparin: **assess for bleeding and notify the provider promptly**.

★ One warm, swollen, painful leg: report it, and **no compression device** on that leg.

Sudden breathlessness with chest pain on breathing: possible pulmonary embolism. **Call for emergency help.**

Warfarin and severe bleeding: the urgent reversal protocol, including factor replacement, not vitamin K alone.

Reversing a factor Xa inhibitor: follow your facility's current protocol. Andexanet is no longer made or sold in the U.S.

Enoxaparin with an epidural or spinal puncture: check movement and sensation. A spinal hematoma can cause paralysis.

With a DVT, chest pain, coughing up blood, trouble breathing or fainting means calling emergency services.

3 EXAM ANCHORS

1. Antidotes: protamine for heparin, vitamin K for warfarin. Vitamin K for heparin is the trap.
2. Heparin follows the aPTT or anti-Xa level, per protocol; warfarin follows the INR.
3. Warfarin diet: keep vitamin K steady. Cutting out all greens is the trap.
4. Enoxaparin: don't expel the bubble, and don't rub the site.
5. Post-op client with one swollen, red, warm calf and compression devices on: remove the device from that leg and notify the provider.
6. Homans' sign isn't reliable, and waiting for leg signs before suspecting an embolism is a trap.
7. Highest DVT risk: combined factors, like an older client on bed rest after hip surgery.

4 SELF-QUIZ

1. Heparin is reversed by _____ sulfate.
2. Warfarin is monitored with the _____.
3. Aspirin and clopidogrel last the life of the platelet, about _____ days.
4. Don't apply a compression device to a leg with signs of a _____.
5. Starting warfarin, the injected anticoagulant continues at least 5 days, until the INR is at least _____ on two readings in a row.
6. On trips over 4 hours, get up and walk every _____ hours.
7. The boxed warning for enoxaparin is a spinal or epidural hematoma, which can cause _____.

ANSWER KEY 1. protamine · 2. INR · 3. 7 to 10 · 4. DVT · 5. 2 · 6. 1 to 2 · 7. paralysis

5 SOURCES

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4. DailyMed, Heparin Sodium Injection label. dailymed.nlm.nih.gov/dailymed/drugInfo.cfm
5. DailyMed, Lovenox (enoxaparin) label. dailymed.nlm.nih.gov/dailymed/drugInfo.cfm
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7. NICE guideline NG158, venous thromboembolic diseases: recommendations. nice.org.uk/guidance/ng158/chapter/Recommendati…
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Built from RN PocketPal course lessons: Cardiovascular drugs II: clotting, rhythm and angina (c05-l08); Venous thromboembolism and circulation (c08-l05). Every line on this sheet comes from those lesson scripts.

PHARMACOLOGY

Educational use only. Not a substitute for clinical judgment, your facility's policy or the provider's orders. Where practice varies, follow facility policy and state law. No patient information.