ICU PROTOCOL BUNDLE

VTE Prophylaxis

Risk-stratified prevention of venous thromboembolism in the critically ill adult.

Critical care | Thromboprophylaxis | Daily review

KEY POINTS

- An effective bundle integrates **risk assessment, pharmacologic prophylaxis, mechanical prevention, bleeding-risk management,** and **daily reassessment**.
- **LMWH** (enoxaparin `40 mg SC daily`) is first-line in critically ill adults without renal dysfunction or high bleeding risk.
- **UFH** `5,000 units SC q8–12h` is preferred in renal impairment (`CrCl < 30 mL/min`) or when rapid reversal may be needed.
- **Mechanical prophylaxis** (IPC or graduated compression) is indicated when anticoagulation is contraindicated; continue until full mobility returns.
- **Daily reassessment** of both VTE and bleeding risk individualises therapy and prevents complications (HIT, haemorrhage).

01 Risk assessment & screening

Perform on ICU admission and **daily** thereafter, using a validated tool — the **Padua Prediction Score** or institutional risk stratification. Evaluate concomitant bleeding risk at the same time.

THROMBOSIS RISK ENHANCERS

Immobilisation > 3 days | Mechanical ventilation | Sepsis | Trauma | Active cancer | Prior VTE

CONCOMITANT BLEEDING RISKS

Recent surgery | Thrombocytopenia | Active bleeding | DIC

Pregnancy | Thrombophilia

02 Pharmacologic prophylaxis

Select the agent by renal function and bleeding risk. Continue until discharge or independent ambulation — typically 7–14 days. Consider **extended prophylaxis** for persistent immobility or active malignancy.

Enoxaparin (LMWH)

First-line — ICU without high bleeding risk

DOSE	ROUTE
40 mg SC once daily	SC

Reduce to 30 mg SC daily if CrCl < 30 mL/min. Longer half-life and lower HIT incidence than UFH. Hold for active bleeding.

Unfractionated heparin

Renal impairment or anticipated rapid reversal

DOSE	ROUTE
5,000 units SC every 8–12 h	SC

Preferred when CrCl < 30 mL/min; fully reversible with protamine sulfate. Monitor for HIT; lower efficacy than LMWH.

Fondaparinux

HIT history or heparin contraindicated

DOSE	ROUTE
2.5 mg SC once daily	SC

Potent factor-Xa inhibition. Avoid if CrCl < 30 mL/min or body weight < 50 kg. No antidote available.

HOLD PHARMACOLOGIC PROPHYLAXIS

Withhold anticoagulation for platelets < 50,000/mm³, active bleeding, or any new haemorrhage — switch to mechanical prophylaxis until risk resolves.

03 Mechanical prophylaxis

Use when anticoagulation is contraindicated, or as an adjunct in the highest-risk patients.

Intermittent pneumatic compression

Apply bilaterally as the preferred device. First choice when pharmacologic prophylaxis is withheld.

Graduated compression stockings

Alternative when IPC is unavailable or poorly tolerated.

Continue until mobility improves and reassess daily for skin integrity and correct fit.

04 Monitoring & safety

Platelets	Baseline, then every `2–3 days` for the first `10 days` to detect heparin-induced thrombocytopenia.
Bleeding	Trend haemoglobin and haematocrit; check for visible bleeding and occult blood in stool/urine.
Renal function	Adjust LMWH and fondaparinux dosing for `CrCl < 30 mL/min`.
Reversal	Protamine sulfate — **full** reversal for UFH, **partial** for LMWH.

SUSPECT HIT

A platelet fall of `> 50%` from baseline, or a new thrombosis, between days 5–10 of heparin exposure should trigger HIT workup and immediate cessation of all heparin.

05 Adjunctive & supportive measures

- **Early mobilisation** and physiotherapy whenever feasible to enhance venous return.
- Avoid dehydration; optimise fluid balance and haemodynamic support.
- Withhold **estrogen therapy** and **erythropoietin** in patients at thrombotic risk.
- Embed VTE-prevention elements into the ICU daily safety checklist or electronic order set.

06 Daily review algorithm

#	DECISION	ACTION	RATIONALE
1	**Assess VTE risk**	Moderate–high risk → proceed; low risk → mobility only.	ICU immobility drives DVT incidence up to 30%.
2	**Assess bleeding risk**	High → mechanical only; low → pharmacologic ± mechanical.	Avoid haemorrhage in high-risk patients.
3	**Select prophylaxis**	LMWH preferred; UFH if `CrCl < 30`; mechanical if contraindicated.	Guideline-supported first-line choices.
4	**Monitor therapy**	Track platelets, bleeding, and renal function.	Prevent HIT, overdose, or haemorrhage.
5	**Reassess daily**	Modify the plan as risk evolves.	ICU risk states are dynamic.

IMPLEMENTATION OUTCOMES

40–60%

Lower VTE incidence with consistent bundle adherence.

Balanced

Fewer bleeding complications by matching anticoagulation to real-time risk.