

Epidemiology:

- Relatively common.
- M sl> F unless pregnant or using OCP or HRT.
- ~80% VTE (DVT & PE) remain undiagnosed

Risk factors

The risk factors for DVT (and hence VTE) arise from Virchow triad.

- Venous stasis
- Hypercoagulability
- Injury to the intima of veins

May be due to acute provoking or chronic predisposing risk factors:

Acute Provoking RF

Hospitalisation

Surgery

Trauma or fracture of lower limbs or pelvis

Immobilisation (includes plaster cast)

Long haul travel

Recently started oestrogen therapy

Intravascular device (e.g. venous catheter)

Inherited or acquired

- High plasma homocysteine, factor VIII, IX, XI
- Antiphospholipid syndrome (APS)/SLE
- Polycythaemia rubra vera

Acquired

- Age
- Smoking
- Obesity
- Cancer (chemotherapy)
- Leg paralysis
- Oestrogen therapy
- Pregnancy or puerperium
- MI & CCF
- Nephrotic syndrome
- Previous VTE

Chronic RF**Inherited**

- Protein C, protein S or AT III deficiency
- Factor V Leiden
- Prothrombin G20210A mutation

Clinical features

In those with classic clinical signs, only ~50% have DVT. Signs of DVT in <40% cases of PE. Limb pain and tenderness deep veins. Swelling of calf or thigh (usually unilateral though DVT of iliac bifurcation, pelvic veins, or IVC → bilateral), distension of superficial veins, warmth, erythema. Homan's sign (pain on foot dorsiflexion) is not sensitive or specific. May have low grade fever. Cellulitis may co-exist.

Wells Criteria for DVT (A1+2ECTOPICS)

Criterion	Score
Alternative diagnosis to DVT as or more likely	-2
Entire leg swollen	+1
Cancer (active)	+1
Tenderness - localized along deep veins	+1
Oedema (pitting), greater in symptomatic leg	+1
Paralysis, paresis, or recent plaster cast to leg	+1
Immobile (>3d) or surgery (<4wk)	+1
Collateral (non-varicose) superficial veins	+1
Swelling of calf >3cm compared to other leg 10cm below tibial tuberosity	+1

Score: -2 to 0 low probability (<5%), 1-2 mod probability (14%), ≥3 high probability (50-80%)

Modified Wells score adds +1 for PHx of DVT. Then likely if score ≥2 (20-35%), or unlikely if <2 (3-9% DVT).

Investigations

D-Dimer: Raised when ↑thrombosis or fibrin. High sensitivity but low specificity as raised also in cancer, pregnancy, surgery, trauma, CCF, MI, CVA, CRF/ARF, sickle cell crises, infection, aortic dissection, with ↑age, and in other conditions where clots form, as after surgery.

Normally $<0.25\mu\text{g/ml}$, VTE threshold normally $>0.5\mu\text{g/ml}$ (in pregnancy probably $>1.0\mu\text{g/ml}$.)

ELISA test better than latex agglutination test versions though more expensive & slower.

Can exclude DVT in low pre-test prob cases or confirm when high pre-test prob.

USS: Compressibility (good for above knee DVT) or colour Doppler ($>95\%$ sens & spec). Not so good for smaller pelvic/iliac DVTs.

MRI: 80% sensitive for below knee DVT. Also can show alt. Dx.

MRI venography: Approaches 100% sens & spec. Also can show alt. Dx.

Venography: very sensitive but painful, req contrast and may cause DVT in 1%. Was gold standard but now largely replaced by USS or MRI venography.

Plethysmography: Size of swollen limb measured by a number of techniques. Replaced by USS.

Thrombophilia screen if no provoking cause found.

In Pregnancy: USS first line, D-dimer considered if in 1st/2nd trimester and low pre-test prob, MRA.

Management

All DVTs

- Elevation
- TEDS (for 2yrs!) unless CI
- Analgesia

Above knee DVT

- ~50% → PE if untreated
- Initial anticoagulation: Until stable INR >2.0
 - LMWH first line. **enoxaparin** 1.5mg/kg SC od or 1mg/kg SC bd in high risk pats. If eGFR <30 then halve dose, if <60 max 100mg bd. Allows 80% outpatient Rx.
 - **UFH** if renal failure or high risk of bleeding. 80IU/kg IV then 18IU/kg/hr.
- Ongoing anticoagulation: **Warfarin**ise (delay couple of days if large pelvic/iliac DVT) to INR 2.0-3.0 (3.0-4.0 if APS) for 3mo (provoked) or ≥ 6 mo (chronic risk).
- Admit if: Massive DVT + CVS compromise, needs UFH, pregnancy (?), child, PE, significant co-morbidities, unable to treat at home.
- Thrombolysis: CI limits use. Consider if extensive proximal DVT and CVS compromise or venous gangrene - **streptokinase** 250,000U IV over 30mins, then 100,000U/hr x 24hr.
- Caval filter: in high risk patients or unable to be anticoagulated.

Isolated below knee DVT

- Rarely embolise especially if asymptomatic, so anticoagulation not routinely given.
- 20-25% extend (more likely if symptomatic) to become above knee DVT.
- Anticoagulate: if ongoing risk (continued immobility, Ca, etc) else aspirin (though little evidence for venous thrombosis prevention) & rpt USS in 3-7d to check for propagation.

Post-thrombotic syndrome

- Chronic pain, oedema, hyperpigmentation and ulceration from destruction of venous valves occur in 20-40% of symptomatic DVTs.

Prognosis

- Recurrence ~10% if treated with 6mo anticoagulation. ~5% mortality.

