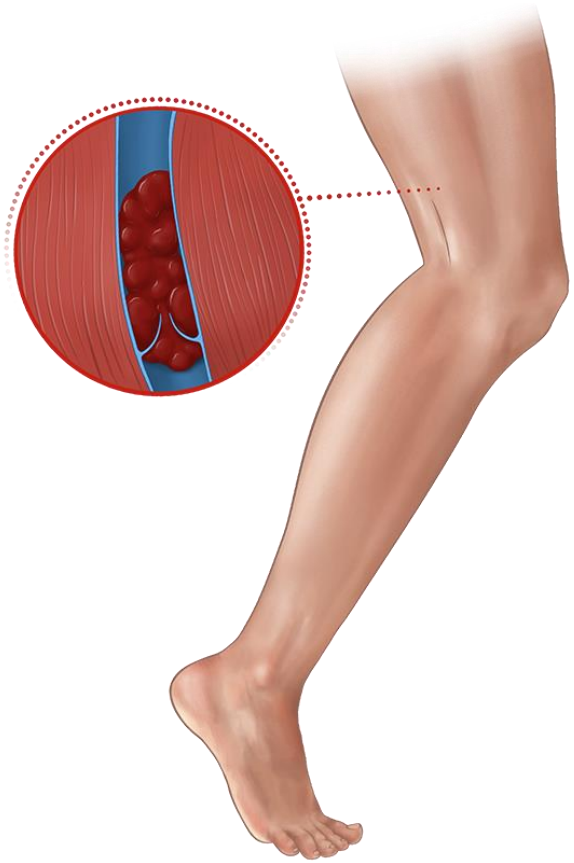
Deep Vein Thrombosis



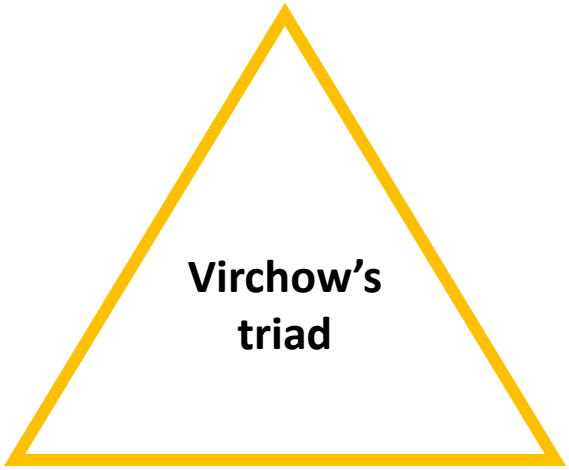
Definition

- Formation of a semi-solid coagulum within the venous system.
  - ❑Within the superficial system - superficial thrombophlebitis.
  - ❑Within the deep system - Deep venous thrombosis.

Aetiology

- DVT occurs due to abnormalities of the vein wall, blood flow, or constituents of blood (Virchow's triad).
- The most important factor is a hospital admission for the treatment of a medical or surgical condition.

Changes in the vessel wall (endothelial damage)



Changes in the blood flow (Stasis)

Coagulability of blood (thrombophilia)

Vein compression or stasis

- Immobility
- Trauma
- Mass
- Surgery
- Paralysis
- Long distance travel

Hypercoagulability

- **Inherited**
  - ❑ Factor V Leiden
  - ❑ Protein C insufficiency
  - ❑ Protein S insufficiency
  - ❑ Antithrombin insufficiency
- **Acquired**
  - ❑ Surgery
  - ❑ Antiphospholipid antibody or lupus anticoagulant
  - ❑ Malignancy
  - ❑ Polycythaemia
  - ❑ Smoking
  - ❑ Hormone replacement therapy
  - ❑ Oral contraceptive pill (OCP)
  - ❑ Dehydration
  - ❑ Pregnancy and Puerperium

Clinical features

- Clinical manifestations may be absent.
- Local features of venous engorgement and stasis.
  - ❑Limb swelling
  - ❑Pain
  - ❑Erythema and warmth to the touch
- Mild fever and tachycardia
- Pulmonary embolism - pleuritic chest pain, haemoptysis and shortness of breath.
- Homan's sign - Calf pain on dorsiflexion of the foot is very unreliable and **should NOT** be performed.

Differential diagnosis

- Cellulitis
- Bleeding into the calf muscle in patients on anticoagulant
- Torn calf muscle
- Ruptured Baker's cyst

Investigations

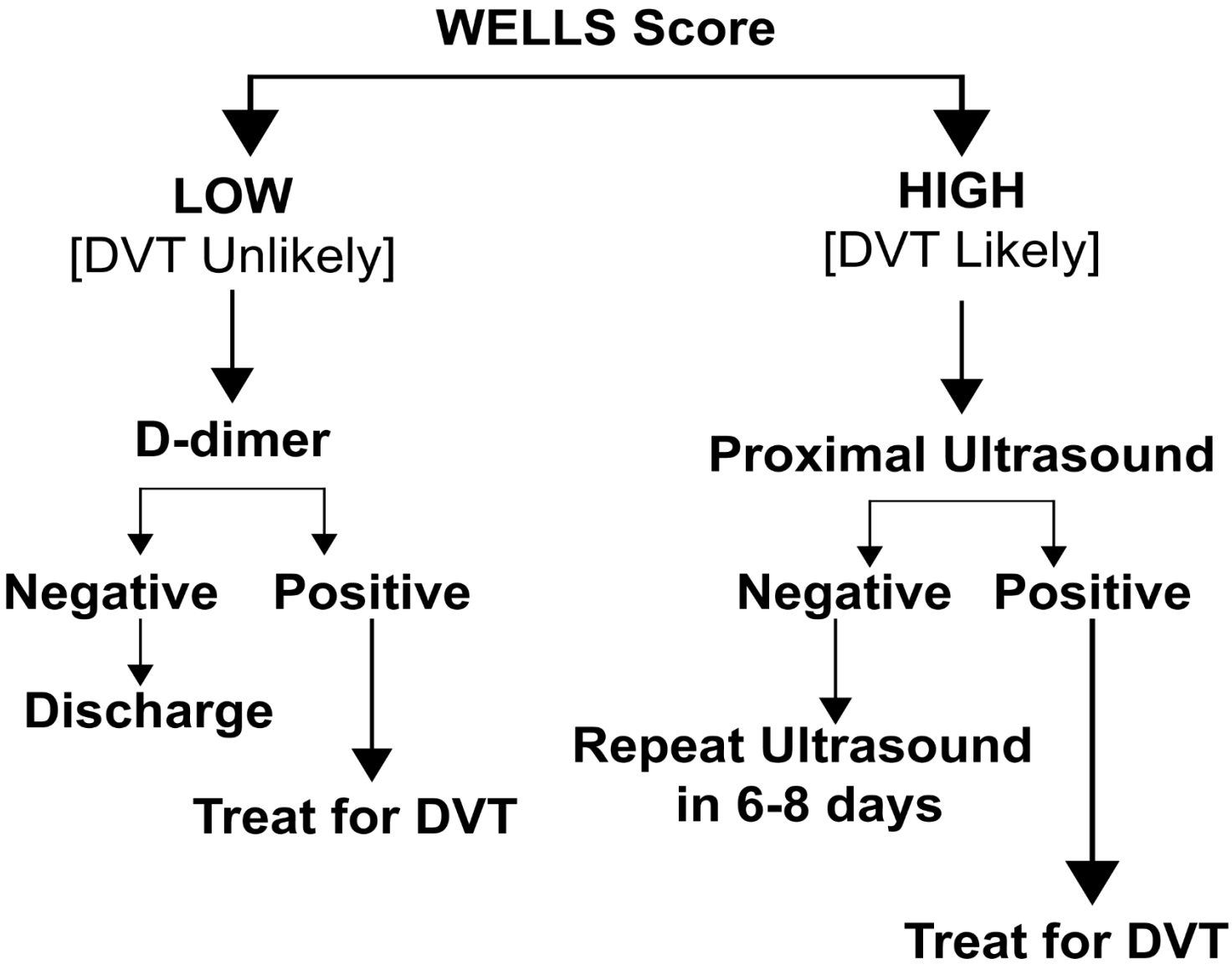
- **D-Dimer**
  - Cleavage fragment from formed thrombus – can be elevated in malignancy, infection and postoperatively.
- **Duplex scan**
  - Investigation of choice.
  - Visualizes anatomy.
  - Gives extent of thrombosis.
  - Relies on flow of blood and compressibility of vein.
- **Ascending venography**
  - Rarely used now.
- **VQ scan**
  - If suspicion of PE.
- **CT pulmonary angiography (CTPA)**
  - Most sensitive and specific investigation for suspected PE.

Wells score

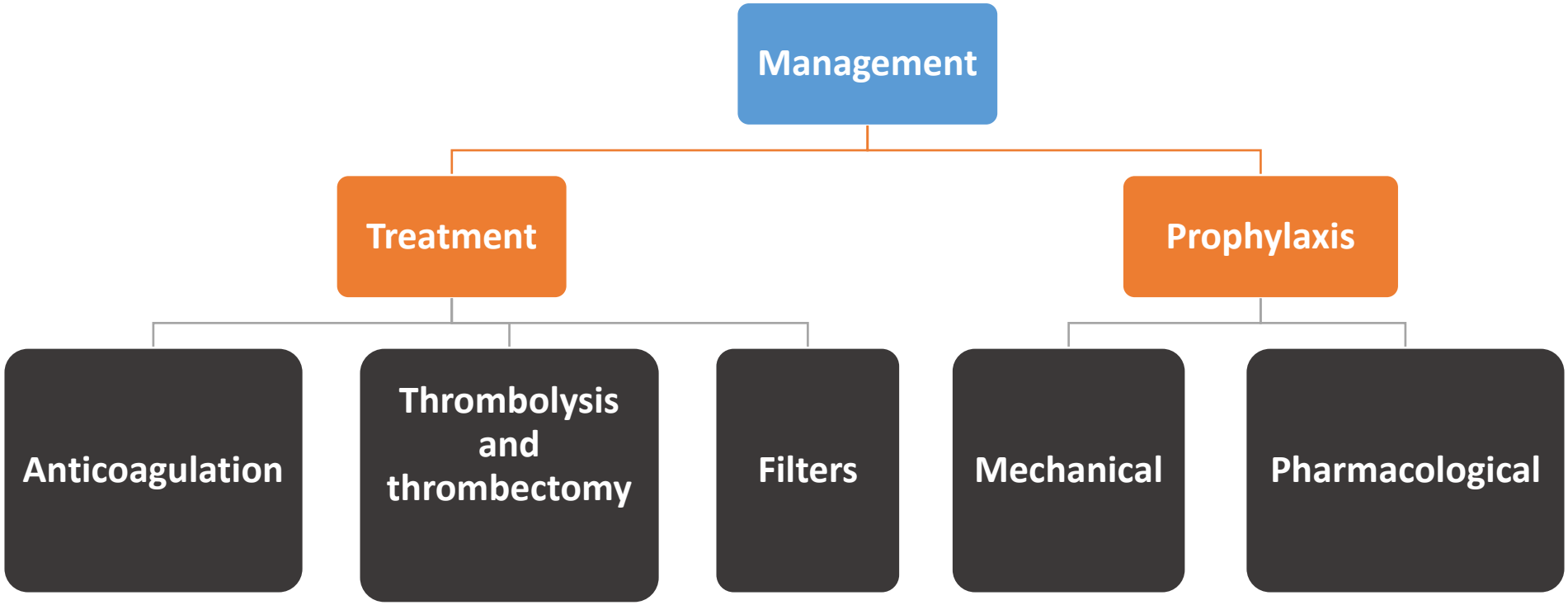
- The Wells score is used to evaluate a patient with a suspected DVT to establish the probability that this is likely or unlikely.
- The Wells score is frequently then combined with D-dimer estimation to guide further investigation/management.

Variable	Points
• Active cancer [ongoing treatment or within the previous 6 months or palliative]	1 Point
• Paralysis, paresis or recent plaster immobilisation of the lower limbs	1 Point
• Recently confined to bed for 3+ days or major surgery within the previous 12 weeks requiring general or regional anaesthesia	1 Point
• Localised tenderness along the distribution of the deep venous system	1 Point
• Entire leg swelling	1 Point
• Calf swelling at least 3cm larger that of the asymptomatic leg [measured 10cm below the tibial tuberosity]	1 Point
• Pitting oedema confined to the symptomatic leg	1 Point
• Collateral superficial veins [non-varicose veins]	1 Point
• Previously documented DVT	1 Point
• Alternative diagnosis at least as likely as DVT	-2 Point

Interpretation	
≤ 1 Point	Low probability for DVT
≥ 2 Points	Intermediate/high probability for DVT


WELLS Score
LOW
[DVT Unlikely]
HIGH
[DVT Likely]
D-dimer
Proximal Ultrasound
Negative
Positive
Negative
Positive
Discharge
Repeat Ultrasound
in 6-8 days
Treat for DVT
Treat for DVT

Management


Management
Treatment
Prophylaxis
Anticoagulation
Thrombolysis and thrombectomy
Filters
Mechanical
Pharmacological

Prophylaxis

- Patients who are being admitted for surgery can be graded as low, moderate or high risk.
- Patients in the medium or high-risk groups should be considered for anticoagulation prophylaxis.
- Mechanical method
  - ❑Graduated compression stocking
  - ❑Intermittent pneumatic compression
  - ❑Electrical stimulation devices
- Pharmacological methods
  - ❑Low molecular weight heparin given subcutaneously

Low risk

- Minor surgery <30 minutes. Any age. No risk factors
- Major surgery >30 minutes. Age <40. No other risk factors
- Minor trauma or medical illness, any age. No risk factors

Moderate risk

- Major surgery. Age 40+ or other risk factors
- Major medical illness: heart/lung disease, cancer, inflammatory bowel disease
- Major trauma/burns
- Minor surgery, trauma, medical illness in patient with previous DVT, PE or thrombophilia

High risk

- Major orthopaedic surgery or fracture pelvis, hip, lower limb
- Major abdominal/pelvic surgery for cancer
- Major surgery, trauma, medical illness in patient with DVT, PE or thrombophilia
- Lower limb paralysis (e.g. stroke, paraplegia)
- Major lower limb amputation

Treatment - Anticoagulation

- Started on subcutaneous low molecular weight heparin and rapidly anticoagulated with warfarin unless there is a specific contraindication.
- Warfarin is usually started at a dose of 10 mg on day 1, 10 mg on day 2 and 5 mg on day 3.
- A prothrombin time taken on days 2 and 3 along with a warfarin dose algorithm guides the maintenance dose of warfarin.
- Target INR – 2-3.
- Duration – 3 months(In most)

Treatment – Thrombolysis

- Used in massive iliofemoral thrombosis.
- Tissue plasminogen(tpA) activator is administered directly into the thrombus, either via the popliteal vein or by direct puncture in the groin.

Treatment – Thrombectomy

- Very rarely now carry out surgical venous thrombectomy, although it may still be attempted in patients with threatened venous gangrene and phlegmasia cerulia dolens.

Treatment - Filters

- IVC filters-
  - Patients with a contraindication for anticoagulation
  - Significant complication related to anticoagulation,
  - Recurrent thromboembolic disease on anticoagulation
  - Inability to achieve adequate anticoagulation despite patient compliance