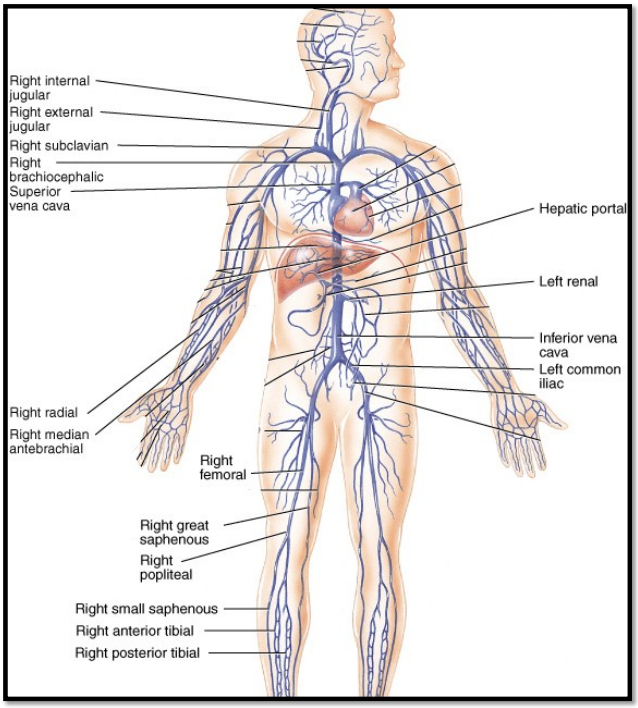
Venous Disorders – 2023

Veins and Valves

- Unidirectional blood flow back to the heart
- Abnormal valve allows for
  - Back flow of blood
  - Pooling of blood behind valves
- Normal blood flow depends on
  - Extremity muscle action
  - Adequate, unidirectional valves



Venous Thrombosis

- Formation of a thrombus (clot) w/ vein inflammation
  - Most common venous disorder
- Superficial vein thrombosis
- Deep vein thrombosis (DVT)
  - See Table 37-7 for comparison pg. 814
- Venous thromboembolism (VTE)
  - DVT to pulmonary embolism (PE)

Virchow's Triad:

1.

2.

3.

Thrombus Formation
Pathophysiology

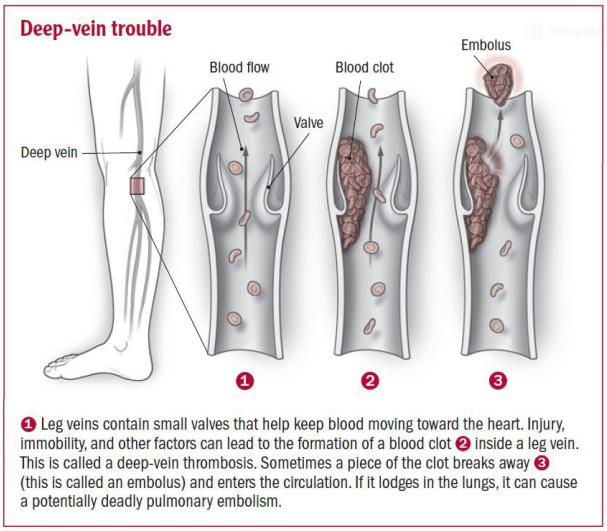
- Trigger
- A thrombus is made up of RBC, WBC, platelets entrapped by fibrin
- Commonly occurs at valve cusps of vein
- As the thrombus enlarges, it produces a "tail" and eventually occludes vein

Then what happens to the thrombus?

1) One option is to undergo lysis

2) Becomes firmly organized and adherent within 5-7 days – becomes a part of the vessel wall

3) It may detach and result in emboli. Turbulent bld flow is major contributing factor for detachment.



Deep Venous Thrombosis (DVT)

Risk Factors (Table 37-8)

Stasis	Endothelial Damage	Hypercoagulability of Blood
• D • A • P • O • P • L • L	• I • L • P • T • I	• S • H • O • C • H

- Others have:
  - Unilateral edema
  - Pain, tenderness
  - Full sensation in thigh/calf
  - Skin warm, red
  - Temperature over 100.4 F (38.0 C)
  - + Homans Sign

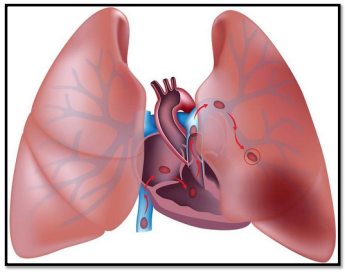
DVT: Diagnostic Studies (Table 37-9)

- Clinical assessment
- D-Dimer
- Venous Duplex Ultrasound

DVT Complication #1

Pulmonary Embolism or "PE"

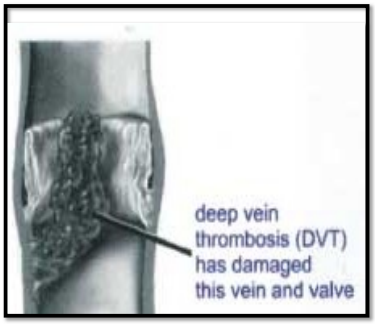
- A clot that travels to the lung
- Acute and potentially life- threatening



DVT Complication #2

Post-Thrombotic Syndrome (PTS)

- Chronic inflammation & venous hypertension
- Residual damage to vein walls and valves
    - Persistent edema
    - Tenderness, aching, heaviness
    - Ulcers
    - Looks like chronic venous insufficiency



DVT: Interprofessional Care

Prevention

- Early and aggressive mobilization
    - Bed rest – reposition every 2 hours
    - Flex and extend feet, knees and hips every 2 to 4 hours while awake
    - OOB to chair
    - Walk 4 to 6 times/day
- Graduated compression stockings
    - Thromboembolic deterrent (TED)
    - Often used with anticoagulation
    - Fit and wear correctly:
        - Toe hole under toes, heel patch over heel
        - No wrinkles; don't roll down, cut, or alter
    - Not recommended if VTE already exists
- Intermittent pneumatic compression devices (IPCs)
    - Also called SCD's or EPCs
    - Promotes venous return
    - Use with graduated compression stockings
    - Fit and apply correctly; wear continuously except for bathing, skin assessment, and ambulation
    - Do not use with active VTE; risk of PE

Positioning

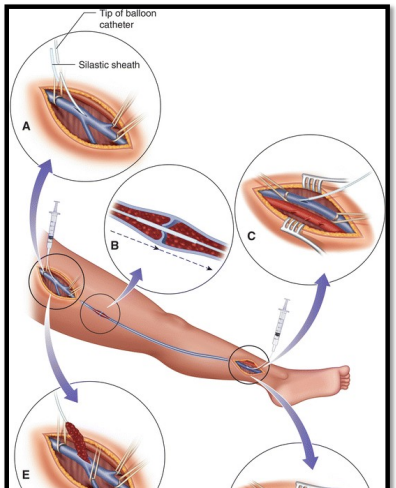
- Keep supine to avoid clot dislodging initially
- Legs elevated above level of the heart
- Calf flat on pillow – knees not flexed!

Drug Therapy

- Anticoagulants
    - Prevent new clot formation, enlargement of clots, and embolization
    - Do not dissolve clots
- Dissolution of clots:
    - Thrombolytics IV
        - AKA "Clot busters"

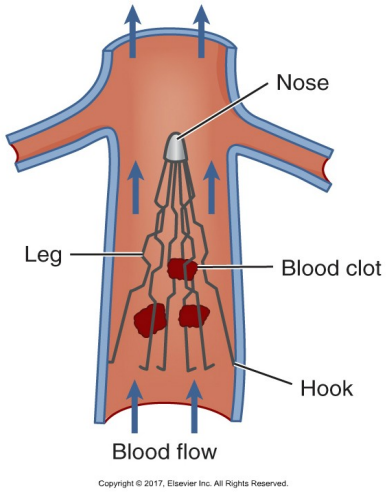
Surgical Management

- Venous Thrombectomy
    - Incise vein and extract clot
    - Best for short clots
    - Will need anticoagulant therapy



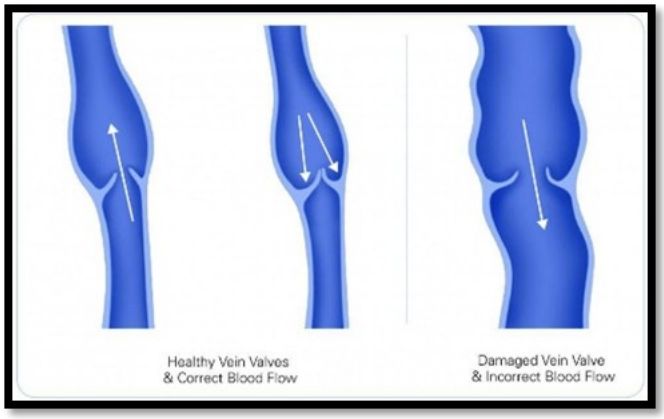
- Inferior Vena Cava Interruption Device

- Filters placed via right femoral or internal jugular veins
- (Fig. 37-11) to trap clots without impeding blood flow



VTE: Ambulatory and Home Care

- Modifying Risk Factors:
  - Stop smoking
  - Caution with birth control pills and/or hormone replacement therapy
  - Travel/prolonged sitting
- Continue TEDs as ordered
- Medications – Doses, Actions, SEs
- Teach s/sx of PE to report



Chronic Venous Insufficiency (CVI)

- Abnormalities of venous system include:
  - edema, skin changes, & venous leg ulcers
- Painful, debilitating, costly

Etiology & Pathophysiology

- Incompetent valves in deep veins of LE's
- Blood backs up, veins dilate
- Inability to carry fluid/wastes from LE's back to hea
  - Fluid & RBC's leak out into tissues→edema
  - Enzymes break down RBC's (hemosiderin)= l
  - Tissue becomes fibrous = thick, hard contracted skin

Clinical Manifestations

- Long-term leg edema
- Lower leg skin leathery, brownish/brawny appearance
- Stasis dermatitis
  - Itchy, flaky skin
- Risk for venous leg ulcers

Complications: Venous Leg Ulcers

- Painful, especially when in dependent position
- Above medial malleolus
- Irregularly shaped, ruddy color

- Weepy edges due to extensive drainage
- Infection risk
- Costly – chronic

Interprofessional & Nursing Care
(CVI & Venous Leg Ulcers)

- *Compression stockings for life!*
- Avoid prolonged sitting/standing
- Elevate legs > heart when in bed
- Daily walking
- Avoid trauma
- Daily foot and leg care
- Moist dressings to ulcers
- Nutrition (protein, vitamins A & C, zinc) – wound healing
- Monitor for infection

Patient Problems

Deep Vein Thrombosis (DVT)

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Chronic Venous Insufficiency

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Varicose Veins (Varicosities)

- Dilated (greater than or equal to 3mm in diameter), tortuous, superficial veins occurring anywhere in the body.
    - Commonly in the lower extremities.

Pathophysiology

- Increased venous pressure
- Valves stretch and become incompetent (leaflets no longer fit together properly)
- Blood flow backs up
- Veins become enlarged and tortuous

Risk Factors

- Family history of venous problems
- Female
- Tobacco use
- Aging
- Obesity
- Pregnancy
- Hx of DVT
- Occupation requiring prolonged standing

Clinical Manifestations

- Distended, superficial veins

- Aching pain/feeling of fullness or heaviness after prolonged standing or sitting
- Muscle cramps, itchy/burning sensation

Complication (most common): Superficial venous thrombosis (SVT)

Diagnostic Studies

- Visual physical exam
- Duplex Ultrasound
    - Detects vein structure & competence

Treatment

- May not be indicated (usually cosmetic in nature)
- Conservative approach:
    - Leg elevation, compression stockings, exercise, weight loss
    - Herbal therapies – can get OTC but not FDA approved in U.S.
- Sclerotherapy-direct IV injection of a liquid or foam sclerosing substance that chemically ablates (destroys) the treated veins.
- Laser/Pulsed Light Therapy-this is when sclerotherapy is contraindicated- vascular lasers work by heating the hemoglobin in the vessels resulting in vessel sclerosis. (stiffening)
- Surgical Intervention – reserved for recurrent superficial venous thrombosis or when conservative therapy ineffective.
- Ligation-remove the incompetent branches
- Phlebectomy- excising the vein

Long-Term Management

- Improve circulation!
    - Daily walking program
    - Compression stockings
- Avoid long periods standing/sitting
    - Elevate legs when sitting
- Weight management
- Dietary & herbal supplements (with primary healthcare provider approval)