Venous Disorders – 2022

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.

immobility, and other factors can lead to the formation of a blood clot ❷ inside a leg vein. This is called a deep-vein thrombosis. Sometimes a piece of the clot breaks away ❸ (this is called an embolus) and enters the circulation. If it lodges in the lungs, it can cause a potentially deadly pulmonary embolism.

Deep Venous Thrombosis (DVT)

Risk Factors (Table 37-8)

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

DVT: Clinical Manifestations

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

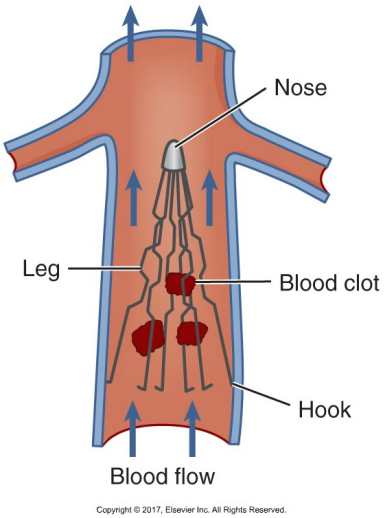
Drug Therapy

- 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

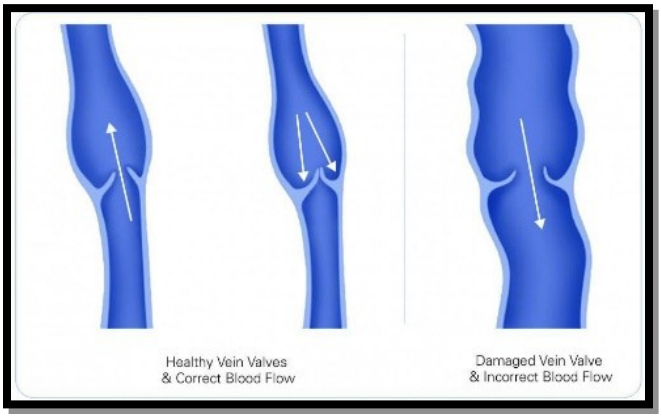


VTE: Ambulatory and Home Care

- 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, and 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 heart
  - Fluid & RBC's leak out into tissues→edema & inflammation

- Enzymes break down RBC's (hemosiderin)= brown discoloration
- 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) https://www.youtube.com/watch?v=9Wf8bLXVwFI

- Dilated (greater than or equal to 3mm in diameter), tortuous superficial veins

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 – ablates vein by injection of sclerosis agent
- Laser/Pulsed Light Therapy
- Surgical Intervention – Ligation vs ambulatory phlebectomy
        - Surgical removal of large varicose veins

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)