

## Diseases of Arteries and Veins

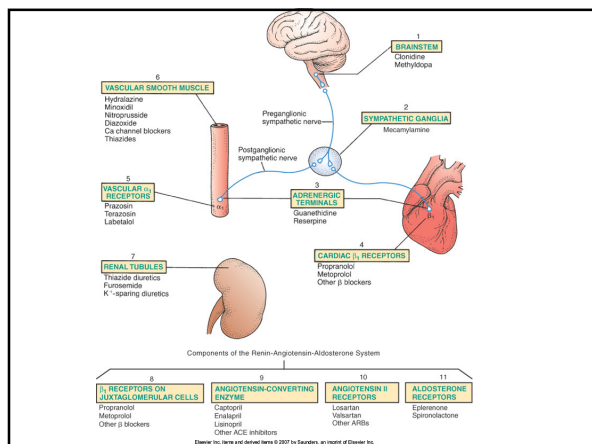
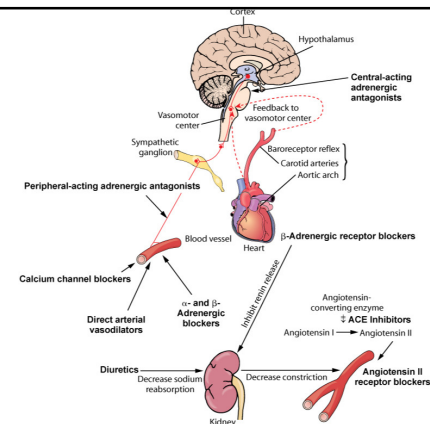
- Atherosclerosis
- Hypertension
- CAD: Stable and Unstable angina
- Dyslipidemia
- DVT, PE
- Clotting Medications Review

## Hypertension

- Primary
- Secondary
- Isolated Systolic hypertension (aortic sclerosis in elderly)
- Postural (orthostatic)
- Malignant (DBP > 120)
  - Causes encephalopathy
  - Associated with general anesthesia

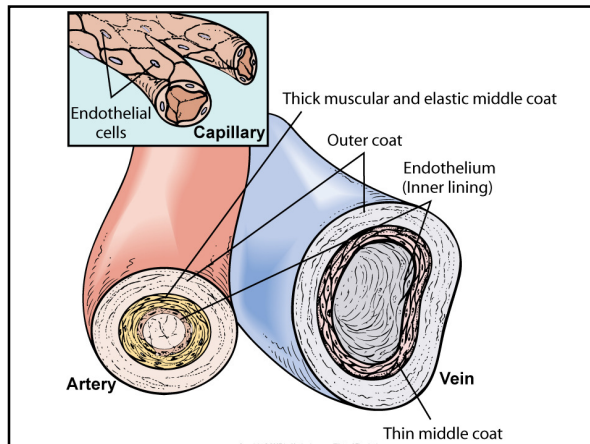
## Hypertension

- Pathophysiology
  - Vasoconstriction
  - Increased contract
  - Increased HR
  - Increased volume
  - Arterial & Heart remodeling
  - RAAS activation
- Drugs
  - Alpha-1 blockers
  - Beta blockers
  - ACE inhibitors
  - ARBs
  - Calcium channel blockers
  - Diuretics
  - Other



## Embolus

- Thromboembolism
- Air Embolism (diving, trauma, injection)
- Amniotic
- Bacterial Embolism
- Fat embolism
- Foreign matter (usually from injection)
  - Drug precipitate, glass, linen fibers

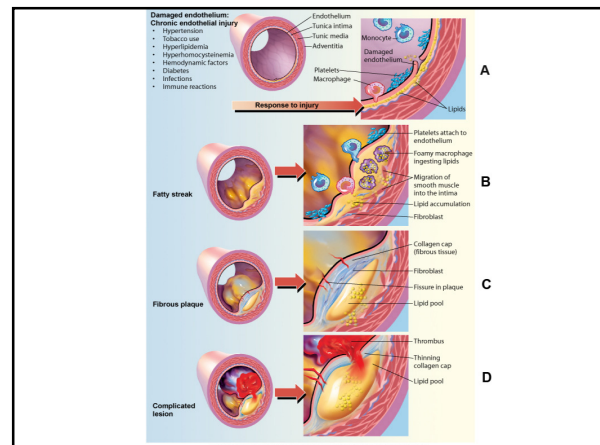


## Arteriosclerosis

- Hardening of arteries
  - Fibrotic
  - Atherosclerotic
- Shape
  - Eccentric
  - Concentric

## Atherosclerosis

- Inflammatory disease
  - Endothelial injury
  - Fatty streak formation
  - Fibrotic plaque
  - Complicated lesion



## Endothelial Dysfunction

- Risk factors
  - Smoking
  - High blood pressure
  - Cholesterol
  - Sedentary life
  - Homocysteine
  - Turbulent blood flow
- “Novel” Risk factors
  - CRP
  - Serum fibrinogen
  - Insulin resistance
  - Oxidative stress
  - Infection
  - Periodontal Disease

## Injured Endothelium

- Inflamed
  - Produces less vasodilating hormones
  - Produces less antithrombotic hormones
  - Inflammatory molecules cause damage
  - Growth factors released (SMCs)
  - Macrophages adhere
    - Oxidation of LDL
    - Foam Cell formation

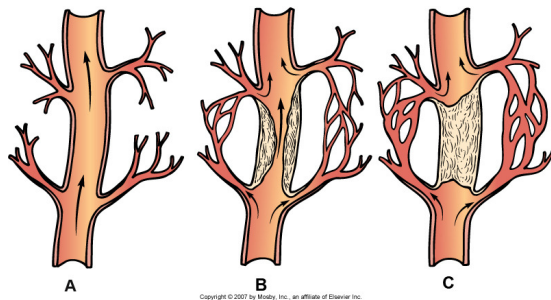
## Atherosclerotic Plaque

- Fatty streaks found in children as young as ten years old
- Develops fibrous cap
  - Hard candy coating on the outside
  - Delicious liquid center
- Complicated lesion
  - Fibrous cap breaks
  - Contents spill out
  - Thrombus forms
    - Partial or complete occlusion or embolus

## Manifestations of Atherosclerosis

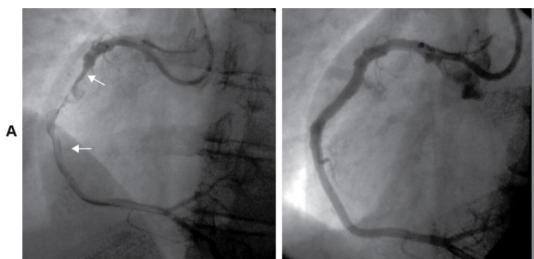
- None until severe or event
  - Collateral circulation
- Legs: Claudication
- Coronary: Reduced exercise tolerance
- Renal artery: hypertension
- CV Event (complicated lesion)
  - Stroke, MI
  - Death

## Collateral Circulation



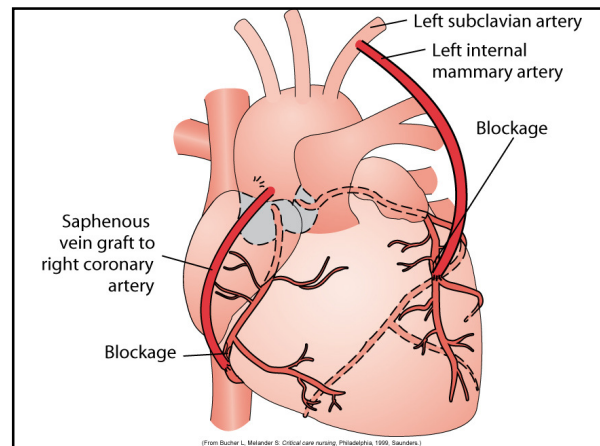
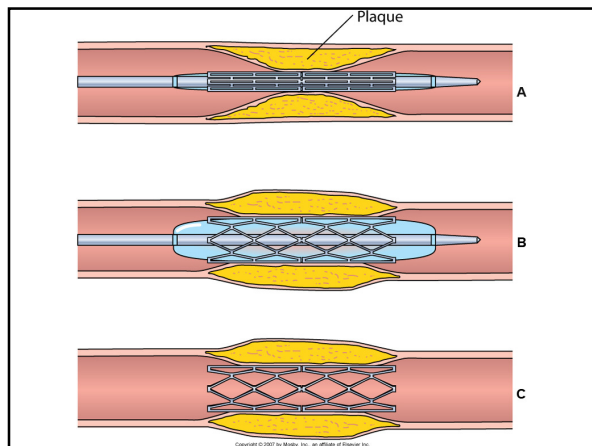
## Eval & Tx of Atherosclerosis

- Risk factors risk factors
- Family history
- Endothelium function test
- Localized perfusion studies
  - Doppler
  - ECG, Echo, Angiogram, Stress test
- Tx:
  - Tx BP & cholesterol, anticoagulant
  - Life style
  - Treat localized ischemic lesions



## Treatment of Localized Lesions

- Bypass surgery
  - Use another artery
  - Use a piece of vein
  - CABG, Fem-pop
- Heart catheterization (PCI)
  - Percutaneous Transluminal Angioplasty- PCTA
  - Stent
  - Thrombolysis



## Peripheral Arterial Disease

- Atherosclerotic
- Thromboangitis obliterans (Buerger's Disease)
- Raynaud's disease/phenomenon
  - Peripheral vasospasm
  - Treat with alpha-blockers
  - Raynaud's phenomenon often accompanies other illnesses
    - E.g., SLE

## Diseases of the Veins

- Varicose veins & Venous insufficiency
  - Enlarged tortuous veins
  - Failure of valve
  - May lead to insufficient venous return
    - Functional decrease in preload
    - Hyperpigmentation of feet
    - Edema
    - Sluggish circulation in lower extremities
    - Venous stasis ulcers

## DVT

- ~10-26% of hospitalized patients may develop
  - Highest risk for shock, stroke, MI, CHF, malignancy
- ~100% risk in
  - Orthopedic trauma/surgery
  - Spinal cord injury
  - Some OB/gyn conditions
- Patient with coagulation disorders

## DVT

- Factors that promote DVT
  - Venous stasis
    - Immobility, meds, posture
  - Venous endothelial damage
  - Hypercoagulable states
    - Inherited, malignancy, pregnancy, OCs, HRT
- Manifestations & Eval
  - Pain, Swelling, Redness, +Homan's sign
  - Doppler ultrasound
- Tx: Prevention, Anticoagulation