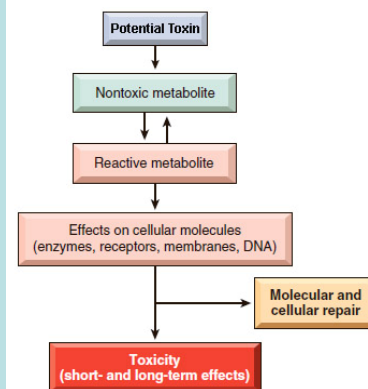
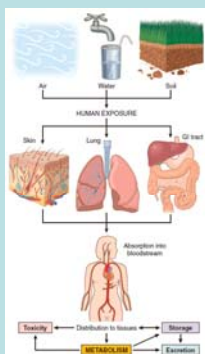


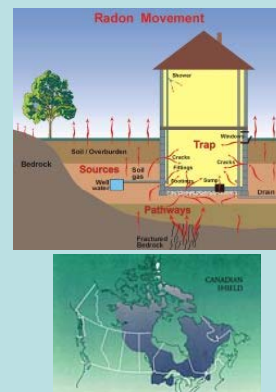
## Environmental and Nutritional Diseases

- Air pollution
- Toxic exposure
  - Air
  - Water
  - Work/domestic
- Sun light and radiation
- Trauma
- Self induced
  - Tobacco
  - Drugs



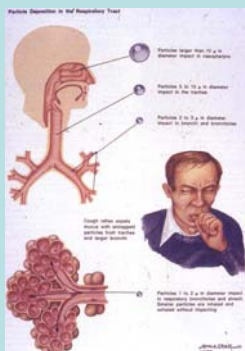
## Indoor vs. Outdoor

- Indoor
  - Radon
  - East Coast
  - Tobacco
  - Off-gassing
- Outdoor
  - Gases
  - Particulates
  - Increased UV



## Air Pollution

- Great scale
  - In door
  - Out door
  - Ozone
  - Chemicals
- 10,000 – 20,000 liters
- Particle size
  - 5-10 microns bronchi
  - 1-2 microns alveoli



## Dealing with the Agent

- Filtration
- Mucus
- Cough reflex
- If too small
  - Can't remove
  - Scarring and alveolar damage

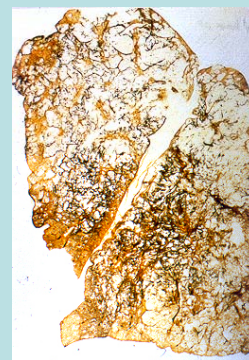
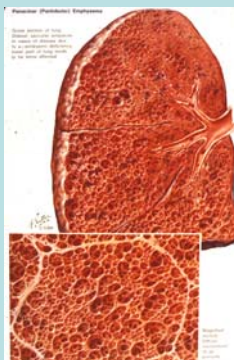


## Emphysema

- Proteolytic damage
  - Activation of inflammatory enzymes
  - Decreased inhibition
- Small airways
- Alveoli
- Loss of surface area for gas exchange



## Lung Changes of Emphysema



## Asthma

- Hypersensitivity type I
- Air passages
- Bronchoconstriction
- Permanent small airway narrowing
- Many allergens
  - Pollens
  - Mold spores
  - Dander



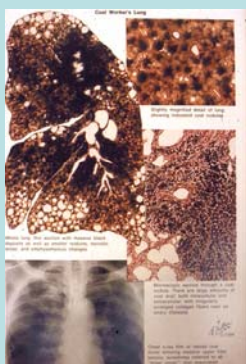
## Hypersensitivity Pneumonitis

- Interstitial tissue
- Molds and chemicals
- Injury to alveolar lining cells
- Fibrosis



## Pneumoconiosis

- Scarring secondary to inhaled particulates
  - Coal
  - Silica
  - Cotton fibers



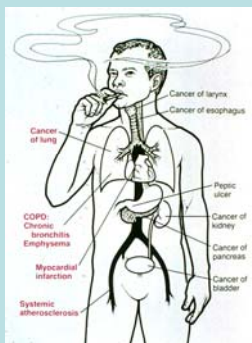
## Lung Cancer

- Tobacco smoke
- Secondhand tobacco
- Industrial agents
- Radon



## Tobacco Smoke

- Firsthand
- Secondhand
- Types of injury
  - Carcinogens
  - Cell irritants & damage
  - Poisons
  - Drug related
- Diseases
  - Multiple cancers
  - Atherosclerosis
    - Penile dysfunction
  - Emphysema
  - Bronchitis



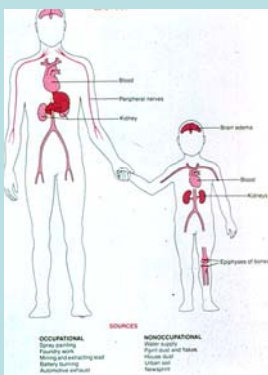
## Tobacco related tumors

- Squamous cell carcinoma of lung
- Bladder cancer
- Gastric cancer
- Pancreatic cancer



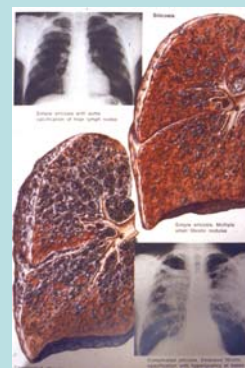
## Lead

- Paint
- Industrial
- Absorption variable
- Organs
  - Brain & peripheral n.
  - Bone marrow
  - Kidney tubules
  - Long bone growth centers in children

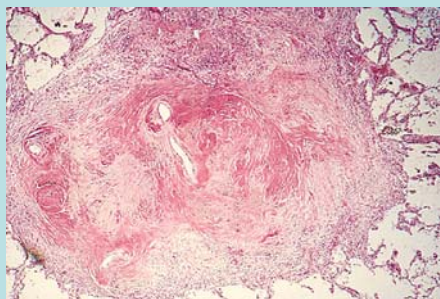


## Silicates and other Particulates

- Silica
  - Industrial
  - Sand on the streets
  - Scarring

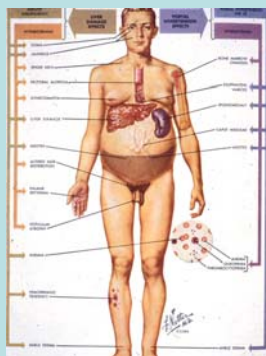


## Silica Scar

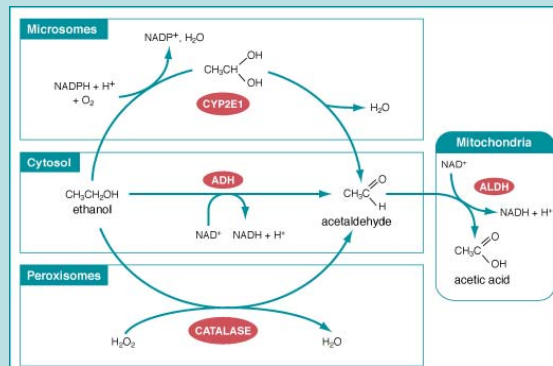


## Alcohol Related

- Ethanol & others
- May help lipid metab.
- Cellular toxin
- Acute & Chronic
- CNS depressant
  - Depresses inhibitions
- Liver cell injury
  - Acute fatty liver
  - Cirrhosis
  - Fat soluble vitamins

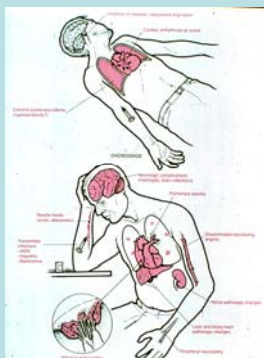


## Metabolism of ethanol



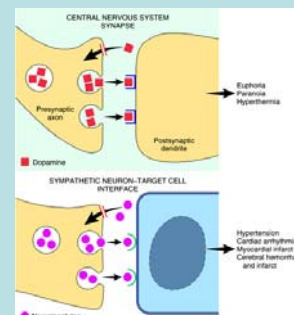
## Drug Abuse

- Crack Cocaine
  - Arrhythmia
  - Dissecting aorta
- IV drugs
  - Respiratory death
  - Endocarditis
- Social and economic
- HIV



## Cocaine

- Inhibits uptake of transmitter
- Stimulatory
  - Hypertension
  - Arrhythmia
  - MI
  - Stroke
  - Dissection of aorta





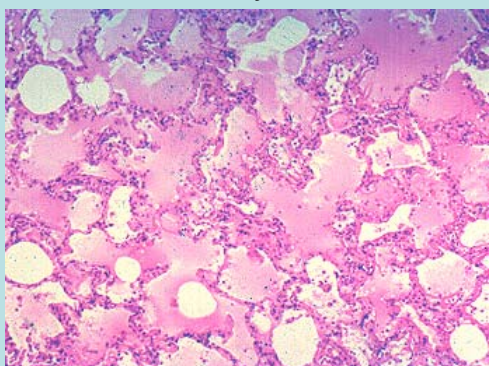
Aortic Dissection



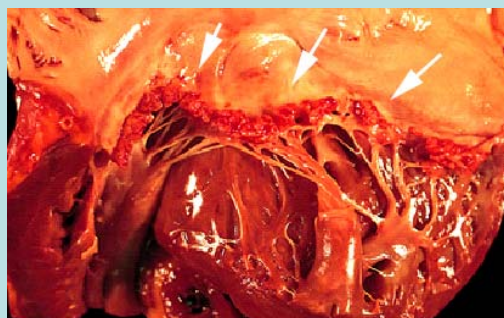
Pulmonary Edema



Pulmonary Edema

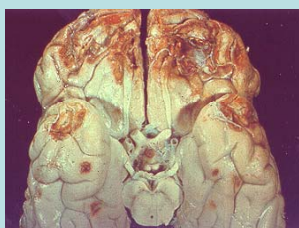


Endocarditis



Physical Agents

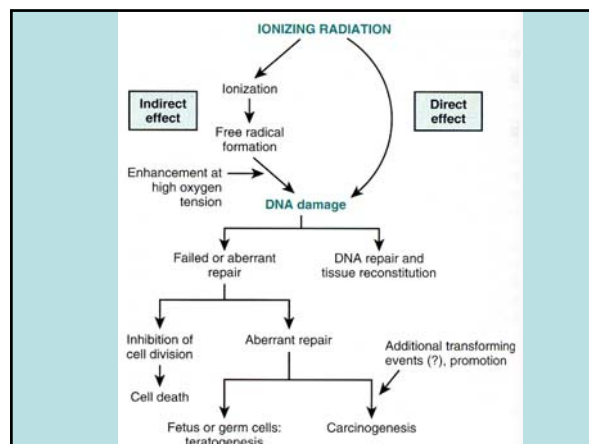
- Mechanical injury
  - Abrasions
  - Contusions
  - Lacerations
  - Incised wounds
  - Penetrating wounds



Ecchymosis



## Thermal Injury



## Nutritional Diseases

- Too little nutrient
- Isolated deficiency is rare
- Too much nutrient
  - “With French Fries?”
- How did it come to happen
  - Dietary related
  - Refined out of diet
  - Absorption problem
  - Utilization

## Protein deficit, Kwashiorkor

- Second child
- Edema
- CNS
- Skin and hair



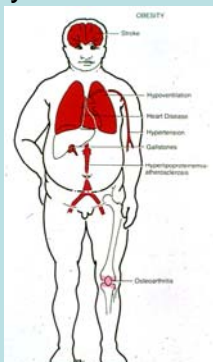
## Marasmus

- Lack of calories
- Stunting
- Loss of subcutaneous fat
- Muscular atrophy



## Obesity

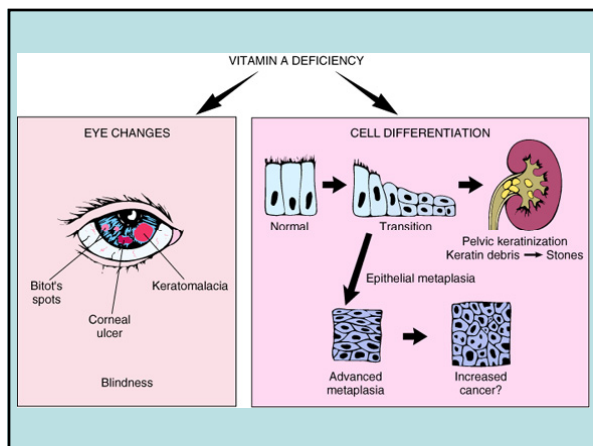
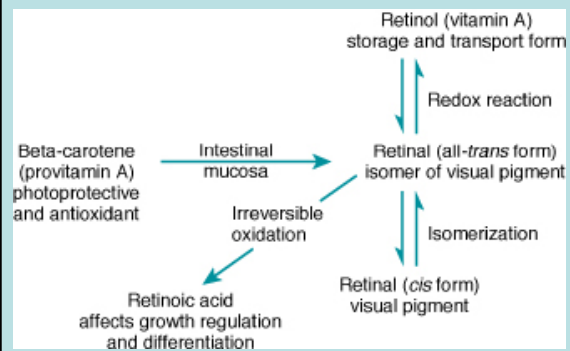
- Hypertension
  - 6 miles of capillaries
- Insulin resistance
- DM type II
- High serum lipids
- Atherosclerosis
- Gallstones
- Osteoarthritis



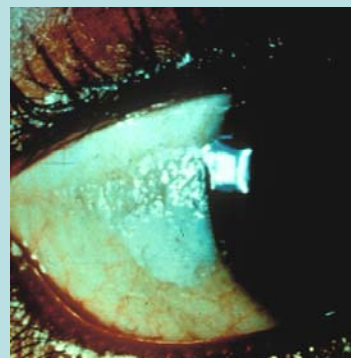
## Specific Vitamin Deficiencies

- Fat soluble vitamins
  - K, A, D, & E
  - Problems of absorption
  - Pancreatic insufficiency
  - Liver disease
  - Multiple deficiencies
- Water soluble vitamins
  - B-complex
  - C
  - Dietary absence
  - GI related

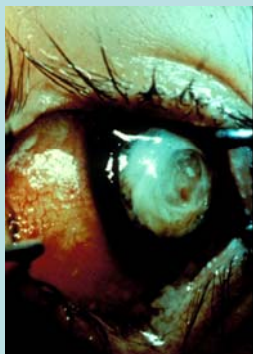
## Vitamin A



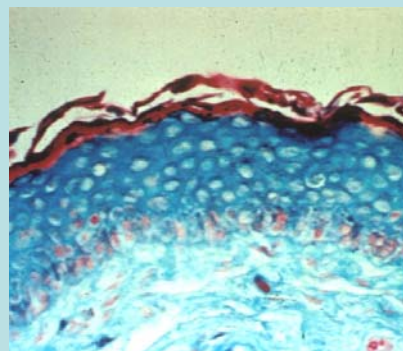
## Bitot's Spot



## Keratomalacia



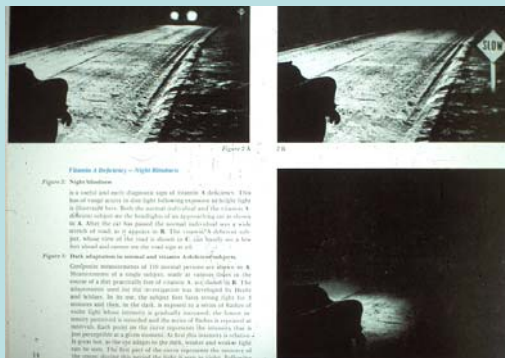
## Epithelial Changes



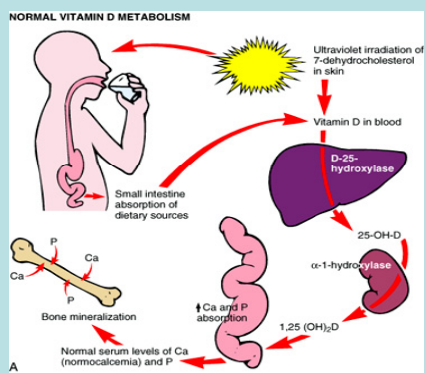
## Epithelial Changes



## Night Blindness



## Vitamin D



## Vitamin D Deficiency

- Skin in most adults
  - Renal and liver steps
- Fish oils
- Rickets in children
- Osteomalacia in adults
  - Fractures
- Excess leads to hypercalcemia
  - Renal stones





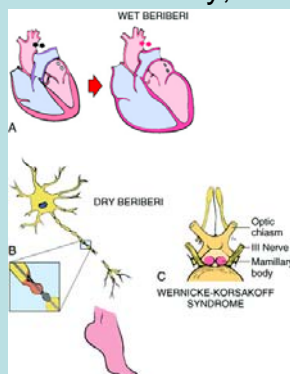
### Vitamin K Deficiency



### B Complex

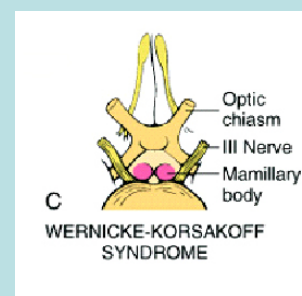
- Water soluble
- Green vegetables
- Cereals
- Deficiency states
  - Starvation
  - Refinement of food
  - Alcoholics

### Thiamine Deficiency, Beri Beri



### Thiamine Deficiency, CNS

- Alcoholism
- Wernicke's encephalopathy
  - Physical abn.
  - Mamillary body necrosis
- Korsakoff's
  - Psychiatric
  - Confabulation



### Niacin, Pellagra

- 3 D's of Pellagra
  - Dermatitis
  - Diarrhea
  - Dementia



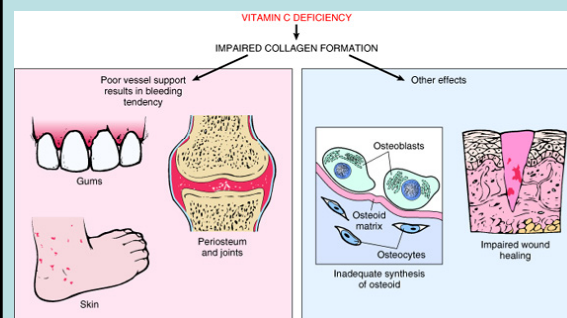
### Commercial Message

- In keeping with fat soluble vitamins.
- Fish oil supplements and the like.
- [The John West Red Salmon Company](#)

## Vitamin C

- Citrus and vegies
- Function
  - Water soluble free radical scavenger
  - Helps absorb Fe and Cu (in reduced state)
  - Collagen metabolism
    - Hydroxylation of lysine and proline
    - Scurvy

## Vitamin C deficiency



## Vitamin C deficiency



## Vitamin C deficiency

