1. **Pathophysiology**

   Chapter 2

2. **Objectives**

   - Discuss the importance of homeostasis
   - Discuss the concepts of pathophysiology
   - Briefly review normal physiology

3. **Homeostasis**

   - The body's attempt to maintain balance or equilibrium
     - fluids
     - chemicals
     - energy

4. **Homeostasis**

   - The process of shock occurs due to the body's attempt to maintain homeostasis
   - Severe bleeding can cause loss of blood volume
     - The body attempts to maintain blood flow to vital organs ➔ peripheral vasoconstriction (pale, clammy skin)
     - Low blood pressure occurs due to decreased blood volume
     - Increased heart rate (tachycardia) occurs to maintain blood flow to vital organs

5. **Pathophysiology**

   - The physiology of disease
   - Cellular mechanics of disease & their consequences

6. **Pathophysiology**

   - Disease/injury damages one or more:
     - cell structures
     - impairment of tissues
     - impairment of organ function
     - effects the associated systems

7. **Pathophysiology**

   - Cell damage initiates a response to try to:
     - limit the disease process
     - initiate cell repair
     - restore homeostasis

8. **Pathophysiology**

   - When damaged, cells either adapt or die
   - Cell adaptation
     - Atrophy –
     - Hypertrophy –
     - Hyperplasia –
     - Metaplasia –
     - Dysplasia –
Pathophysiology

- All cells respond to injury/disease with inflammation (infection)
  - local
  - systemic

Acute Inflammation

- Damaged cells release histamine, bradykinin, & prostaglandin
- These chemicals cause local vasodilation and increased cellular permeability
- Increase blood flow to the area & allows proteins and plasma to seep into the interstitial fluids
- The proteins interact with fibrin to form platelet plug & clot at damaged site

Acute Inflammation

- The chemicals released earlier now attract leukocytes from the blood
- phagocytes
- Engulf & digest cellular debris
- The proteins interact with fibrin to form platelet plug & clot at damaged site

Acute Inflammation

- The excess interstitial fluid causes an increase in tissue pressure relative to capillary pressure
- vasoconstriction
- Ischemia to normal, healthy cells
- Leads to increased cell damage
  (secondary hypoxic injury)

Acute Inflammation

- These processes produce the classic signs & symptoms of inflammation
  - redness
  - pain
  - warmth
  - swelling
- Acute phase lasts approx. 48-72 hours

Chronic Inflammation

- Very destructive to cells
- Usually have greater production of scar tissue
- Symptoms are similar but with less intensity

Infection

- The body’s response to invading microorganisms
- More systemic than typical inflammatory response
- Leukocytes activate the medulla to cause fever
- Once the microorganism has been eliminated the fever breaks

Infection
See book for s & s of fever (pg. 23)

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Tissues’ Response to Cellular Damage

• Bone
• Connective tissue, epithelium, endothelium
• Muscle & nerve

See Book

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Questions?