Notes for Friday November 8, 2002
Outline
• Respiratory mucosa
• Larynx & voice production
• Trachea & bronchial tree
• Alveoli & respiratory membrane
• Lungs

Respiration
1. Ventilation
2. External respiration
3. Internal respiration
Respiratory system function = ventilation + internal respiration
Pulmon = lungs; pulmonologist

Divisions
• Upper respiratory tract
• Lower respiratory tract
• Conducting portion
• Respiratory portion

Respiratory mucosa
• Pseudostratified columnar epithelium + cilia + goblet cells
• Lines the lumen of the conducting portion
• Functions as a “mucus elevator”

Larynx
• Glottis
• Epiglottis
• Thyroid cartilage = Adam’s apple
• Vocal cords
• Laryngitis = inflammation of the mucous membrane
Trachea

- Hollow walls supported by 15-20 C-shaped rings of hyaline cartilage connected by smooth muscle
- ANS stimulation regulates diameter of lumen

Tracheal blockage

- Aspiration
- Heimlich maneuver

Bronchial tree

- L & R primary bronchi enter L & R lung
- Secondary bronchi
- Tertiary bronchi
- Bronchioles
- Terminal bronchioles

Structural changes

- As branches become narrower the amount of cartilage decreases - none in bronchioles
- Amount of smooth muscle circling lumen increases
- Reduction in cilia & goblet cells

- Bronchodilation
- Bronchoconstriction
- Asthma: smooth muscle spasms, bronchoconstriction; increase mucus secretion obstruction of airway

Respiratory portion

- Terminal bronchioles divide into microscopic branches = respiratory bronchioles.
- Divide into alveolar ducts surrounded by ALVEOLI (2-5 alveoli = alveolar sac)
  Alveoli walls
- Type I alveolar cells (95%) simple squamous epithelium where gas exchange occurs
• Type II alveolar cells (5%) cuboidal cells that secrete alveolar fluid (includes surfactant that prevents alveoli from collapsing)

• Alveolar macrophages

**Respiratory membrane**

• Alveolar wall/epithelium
• Alveolar basement membrane
• Capillary basement membrane
• Capillary endothelium
• 0.5 micrometers thick
• 1 micrometer = 1/25,000 of an inch
• Lungs contain approx. 300 million alveoli, huge surface area for gas exchange

**Lungs**

• Pleural (serous) membranes:
• Visceral pleura; parietal pleura; pleural cavity filled with serous fluid
• Reduces friction & allows movement of lungs while breathing