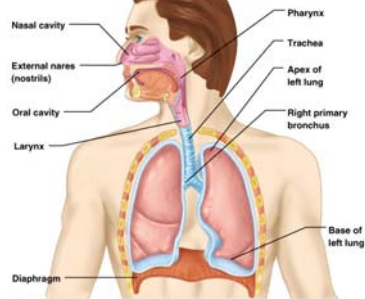


Bio 250 Respiration System

Lecture

Organs of the Respiratory system

- Nose
- Pharynx
- Larynx
- Trachea
- Bronchi
- Lungs – alveoli



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Figure 13.1 Slide 13.1

Function of the Respiratory System

- Oversees gas exchanges between the blood and external environment
- Exchange of gasses takes place within the lungs in the alveoli
- Passageways to the lungs purify, warm, and humidify the incoming air

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The Nose

- The only externally visible part of the respiratory system
- Air enters the nose through the external nares (nostrils)
- The interior of the nose consists of a nasal cavity divided by a nasal septum

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13.3a

Upper Respiratory Tract

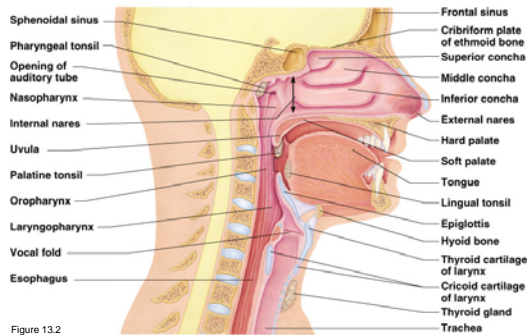


Figure 13.2

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13.3b

Anatomy of the Nasal Cavity

- Olfactory receptors are located in the mucosa on the superior surface
- The rest of the cavity is lined with respiratory mucosa
 - Moistens air
 - Traps incoming foreign particles

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Anatomy of the Nasal Cavity

- Lateral walls have projections called conchae
 - Increases surface area
 - Increases air turbulence within the nasal cavity
- The nasal cavity is separated from the oral cavity by the palate
 - Anterior hard palate (bone)
 - Posterior soft palate (muscle)

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Paranasal Sinuses

- Cavities within bones surrounding the nasal cavity
 - Frontal bone
 - Sphenoid bone
 - Ethmoid bone
 - Maxillary bone

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Paranasal Sinuses

- Function of the sinuses
 - Lighten the skull
 - Act as resonance chambers for speech
 - Produce mucus that drains into the nasal cavity

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13.5b

Pharynx (Throat)

- Muscular passage from nasal cavity to larynx
- Three regions of the pharynx
 - Nasopharynx – superior region behind nasal cavity
 - Oropharynx – middle region behind mouth
 - Laryngopharynx – inferior region attached to larynx
- The oropharynx and laryngopharynx are common passageways for air and food

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Structures of the Pharynx

- Auditory tubes enter the nasopharynx
- Tonsils of the pharynx
 - Pharyngeal tonsil (adenoids) in the nasopharynx
 - Palatine tonsils in the oropharynx
 - Lingual tonsils at the base of the tongue

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Larynx (Voice Box)

- Routes air and food into proper channels
- Plays a role in speech
- Made of eight rigid hyaline cartilages and a spoon-shaped flap of elastic cartilage (epiglottis)

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Structures of the Larynx

- Thyroid cartilage
 - Largest hyaline cartilage
 - Protrudes anteriorly (Adam's apple)
- Epiglottis
 - Superior opening of the larynx
 - Routes food to the larynx and air toward the trachea

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Structures of the Larynx

- Vocal cords (vocal folds)
 - Vibrate with expelled air to create sound (speech)
- Glottis – opening between vocal cords

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Trachea (Windpipe)

- Connects larynx with bronchi
- Lined with ciliated mucosa
 - Beat continuously in the opposite direction of incoming air
 - Expel mucus loaded with dust and other debris away from lungs
- Walls are reinforced with C-shaped hyaline cartilage

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Primary Bronchi

- Formed by division of the trachea
- Enters the lung at the hilus (medial depression)
- Right bronchus is wider, shorter, and straighter than left
- Bronchi subdivide into smaller and smaller branches

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Lungs

- Occupy most of the thoracic cavity
 - Apex is near the clavicle (superior portion)
 - Base rests on the diaphragm (inferior portion)
 - Each lung is divided into lobes by fissures
 - Left lung – two lobes
 - Right lung – three lobes

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13.12a

Lungs

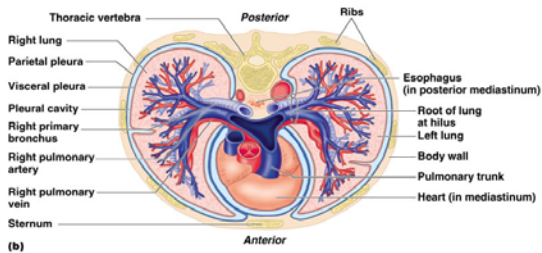


Figure 13.4b

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Coverings of the Lungs

- Pulmonary (visceral) pleura covers the lung surface
- Parietal pleura lines the walls of the thoracic cavity
- Pleural fluid fills the area between layers of pleura to allow gliding

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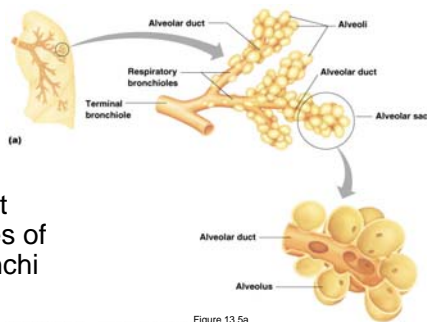
Respiratory Tree Divisions

- Primary bronchi
- Secondary bronchi
- Tertiary bronchi
- Bronchioli
- Terminal bronchioli

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Bronchioles

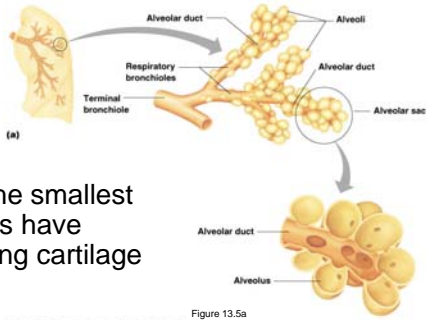


- Smallest branches of the bronchi

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13.15a

Bronchioles

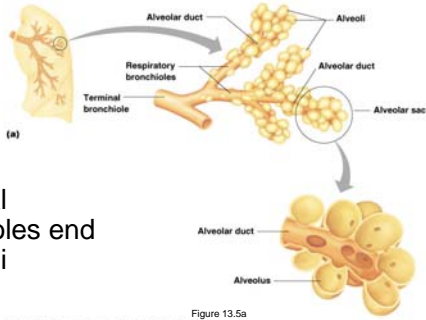


- All but the smallest branches have reinforcing cartilage

Figure 13.5a

Slide 13.15b

Bronchioles



- Terminal bronchioles end in alveoli

Figure 13.5a

Slide 13.15c

Respiratory Zone

- Structures
 - Respiratory bronchioli
 - Alveolar duct
 - Alveoli
- Site of gas exchange

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Alveoli

- Structure of alveoli
 - Alveolar duct
 - Alveolar sac
 - Alveolus
- Gas exchange takes place within the alveoli in the respiratory membrane

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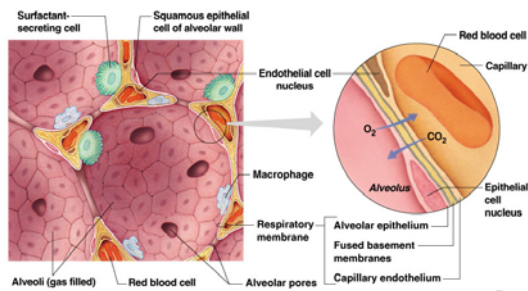
Respiratory Membrane (Air-Blood Barrier)

- Thin squamous epithelial layer lining alveolar walls
- Pulmonary capillaries cover external surfaces of alveoli

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Respiratory Membrane (Air-Blood Barrier)



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Figure 13.6
Slide
13.18b

