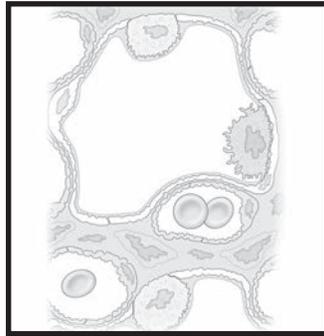
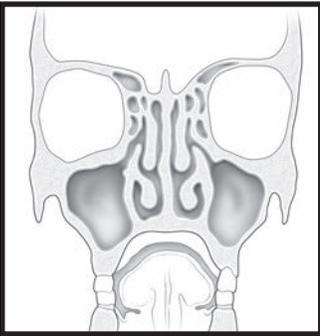
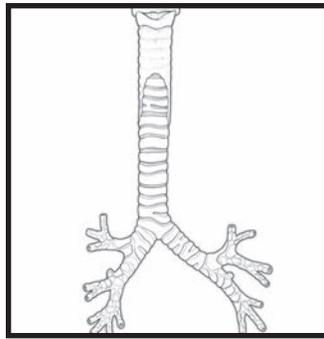
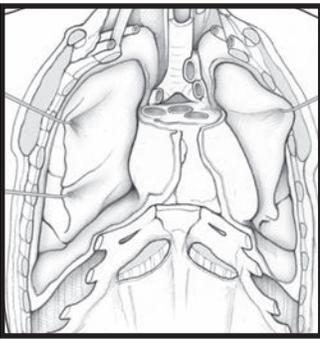

Chapter 7 **Respiratory System**



The respiratory system provides the body with oxygen for its metabolic needs and eliminates carbon dioxide. Structurally, the respiratory system includes the:

- Nose and paranasal sinuses
- Pharynx and its subdivisions, the nasopharynx, oropharynx, and laryngopharynx
- Larynx
- Trachea
- Bronchi, bronchioles, alveolar ducts and sacs, and alveoli
- Lungs

Functionally, the respiratory system performs five basic functions:

- Filters and humidifies the air and moves air into and out of the lungs
- Provides a large surface area for gas exchange with the blood
- Helps to regulate the pH of the body fluids
- Participates in vocalization
- Assists the olfactory system with the detection of smells

Histologically, the respiratory epithelium largely is ciliated, pseudostratified columnar epithelium with a few exceptions (vocal folds and epiglottis are stratified squamous epithelium, and the transition to small bronchioles is from respiratory to simple cuboidal epithelium). Alveoli are lined with thin squamous cells (**type I pneumocytes**) and simple cuboidal cells (**type II pneumocytes** that secrete surfactant).

The epithelial lining of the respiratory tract is important in warming, humidifying, and filtering the air before it reaches the sensitive lung alveoli. A rich vascular network helps to warm

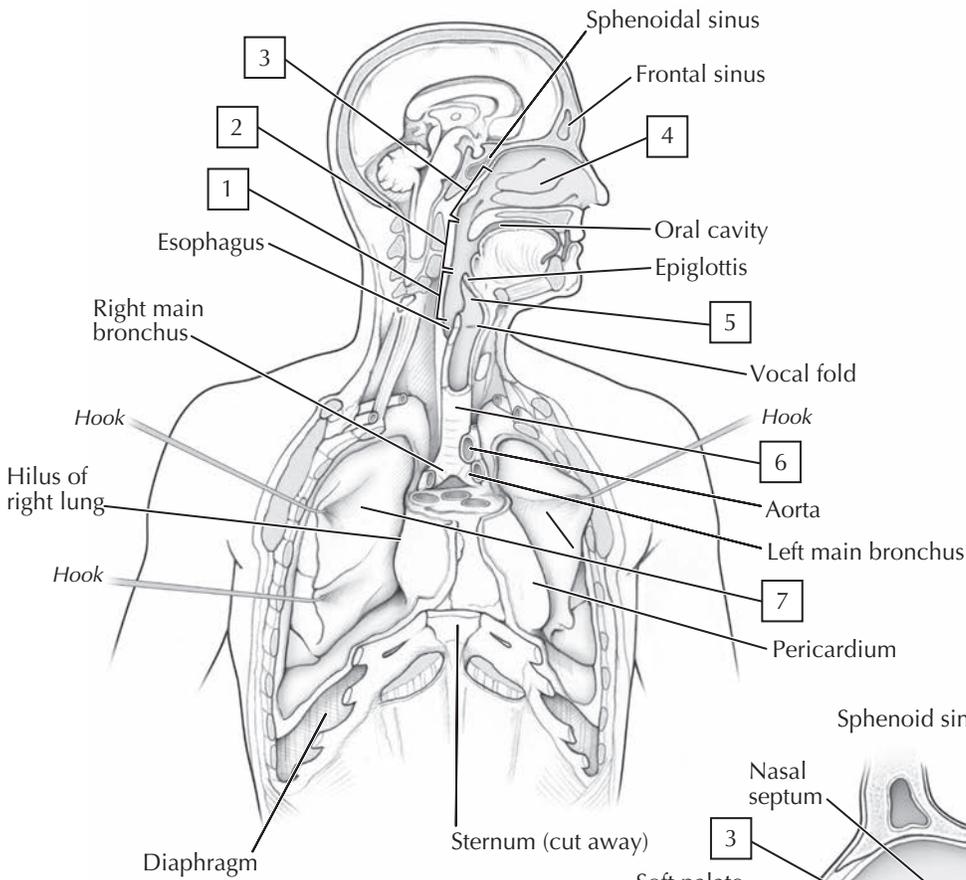
the air, while the ciliated epithelium and presence of mucous cells (goblet cells) helps humidify the air and capture particulate material that is then “swept” away by the cilia, to be swallowed or expectorated.

COLOR each of the following features of the respiratory system, using a different color for each feature:

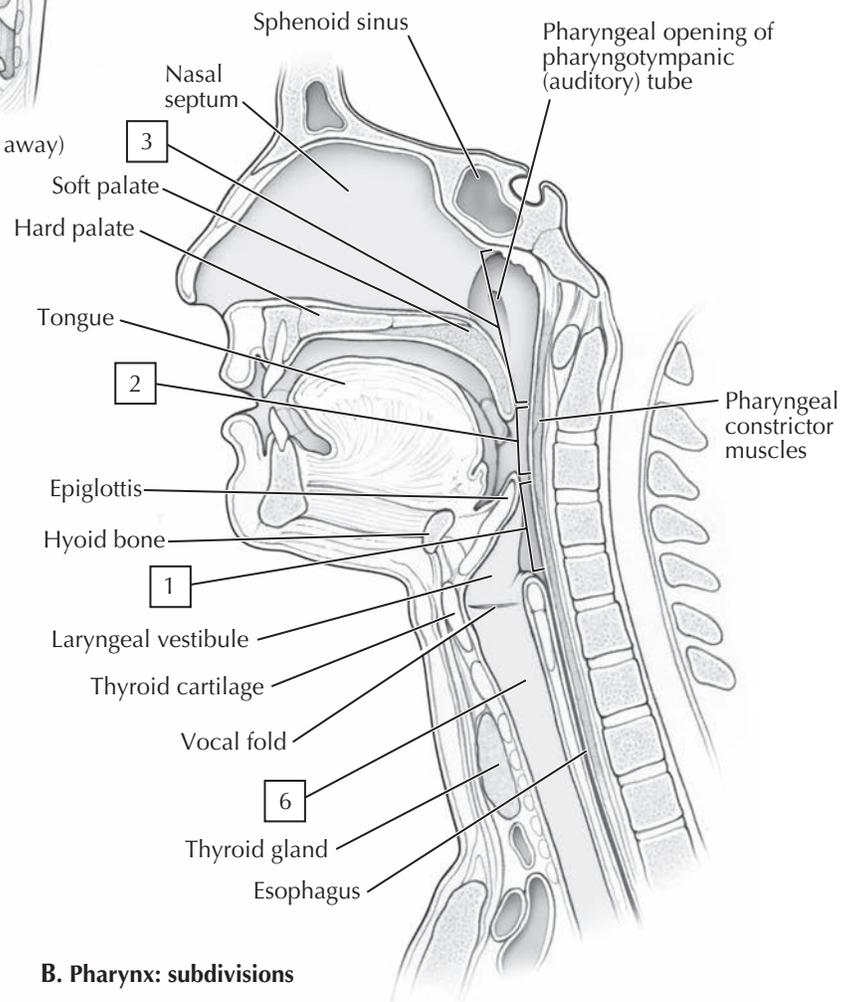
- 1. Laryngopharynx
- 2. Oropharynx
- 3. Nasopharynx
- 4. Nasal cavity
- 5. Larynx
- 6. Trachea
- 7. Lungs

Clinical Note:

Asthma can be intrinsic (no clearly defined environmental trigger) or extrinsic (has a defined trigger). Asthma usually results from a hypersensitivity reaction to an allergen (dust, pollen, mold), which leads to irritation of the respiratory passages, smooth muscle contraction (narrowing of the passages), swelling (edema) of the epithelium, and increased production of mucus. Presenting symptoms are often wheezing, shortness of breath, coughing, tachycardia, and feelings of chest tightness. Asthma is a pathological inflammation of the airways and occurs in both children and adults.



A. Organization of respiratory system



B. Pharynx: subdivisions