The Respiratory System

- The respiratory system is divided into conducting and respiratory portions.
- The CP includes nasal cavities, nasal sinuses, nasopharynx, larynx, trachea, bronchi, bronchioles, and terminal bronchioles.
- The respiratory portion is formed of respiratory bronchioles, alveolar duct, alveolar sacs, and alveoli.



The nasal cavity, nasopharynx, larynx

- The NCs are divided into: vestibule, respiratory part (RP), and olfactory part (OP).
- The vestibule is lined by stratified squamous keratinized.
- The RP is lined with respiratory epithelium.
- The OP is lined with olfactory epithelium.
- The nasopharynx is lined with pseudostratified columnar ciliated epithelium with goblet cells (respiratory epithelium).
- The larynx is formed of plates of cartilage and is lined with respiratory epithelium.





Aspect	Trachea (Extra-pulmonary bronchus)	Intrapulmonary bronchus	Bronchioles
Mucosa	Smooth	Folded	Highly folded
Epithelium	Respiratory epithelium	Respiratory epithelium, less tall and contains fewer goblet cells	Simple columnar ciliated and non- ciliated (Clara) cells. Goblet cells are absent.
Lamina propria	Loose CT rich in elastic fibers, blood vessels, and lymphatic nodules	Loose CT	Thin and contains elastic fibers
Elastic membrane	Present and act as a line of demarcation between lamina propria and submucosa	Absent	Absent
Lamina muscularis	Absent	Consists of smooth muscles completely surround the lumen.	Consists of thin layers of circularly arranged smooth muscles.
Submucosa	Loose CT contains tracheal mucous- secreting glands and lymphatic nodules.	Loose CT contains bronchial mucous secreting glands.	Fuse with lamina propria forming one layer.
Cartilage	C-shaped plates of hyaline cartilage attached posteriorly by smooth muscles and CT,	Irregular plates of hyaline cartilage separated by mucous glands and lymphatic nodules.	Absent
Glands	Mucos-secreting tracheal glands in the submucosa, the duct of which open onto the tracheal lumen.	Fewer, mucos-secreting bronchial glands between the cartilage plates.	Absent
Lymph nodules	Present in the submucosa.	Present in between the cartilage plates.	Absent

Trachea H&E



cosa

respiratory epithelium

lamina propria 🛪

tracheal cartilage

nucosa

Ps. str. col. Goblet cil. epith. cilia VUCOS Conium Elastic membrane đ ubmuco5 OL.V. Tracheal glands ro-cartilaginou Hyaline cartilage 200 C.t. Bl.v. 9 2.00 LL TRACHEAL WALL







smooth muscle

bronchiole

connective tissue



Respiratory Portion

- Respiratory bronchioles are lined with simple cuboidal epithelium which have in their wall sac-like structures called alveoli.
- Alveolar duct, alveolar sac and alveoli are lined by 2 types of epithelial cells:

1.

2.

- Type I Pneumocytes: Simple squamous epithelium responsible for gas exchange between air inside the lumen and blood in the surrounding pulmonary capillaries.
 - Type II Pneumocytes: large rounded cells, less in number responsible for secretion of a substance called surfactant which lower the surface tension so facilitates inflation of alveoli and prevent their collapse.

