King Saud University
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431 Histology team

Respiratory system

Conductor portion

1- Nasal cavity.

2- Nasopharynx.

3- Larynx.

4- Trachea.

5- Primary bronchi (extrapulmonary bronchi).

6- Intrapulmonary bronchi:

- 2ry bronchi (lobar bronchi).

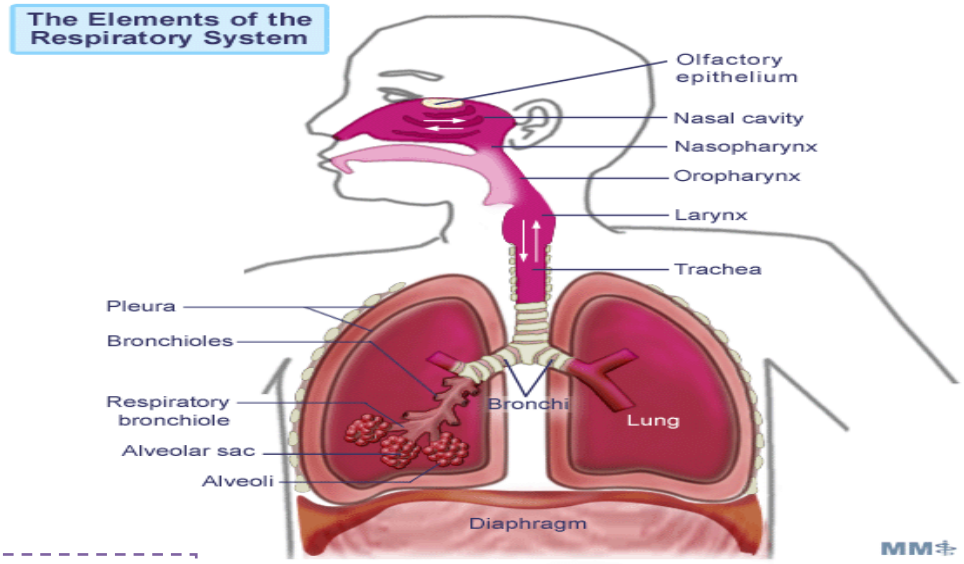
- 3ry bronchi (segmental bronchi).

7- Primary bronchioles (preterminal bronchioles).

8- Terminal bronchioles.

Respiratory portion

1- Respiratory bronchioles.
2- Alveolar ducts .
3- Alveolar sacs.
4- Pulmonary alveoli



*This lecture will be about:

1-Nasal cavity.

2-Larynx.

1-NASAL CAVITY (N.C.)

	Structure	N.B. The nasal septum divides the nasal cavity into two halves (right and left).
Anterior portion of N.C	**Vestibule**	
Posterior portion of N.C	A. **respiratory region.** B. **Olfactory region**	

VESTIBULE OF N.C.

Lining	thin skin 1- Epidermis: (Keratinized stratified Squamous epithelium). 2- Dermis
Contents	1- **Vibrissae**: stiff hairs. 2- Sebaceous glands 3- Sweat glands.
Wall	1- Hyaline cartilage. 2- Cancellous (spongy) bone.

RESPIRATORY REGION (AREA) OF NASAL CAVITY

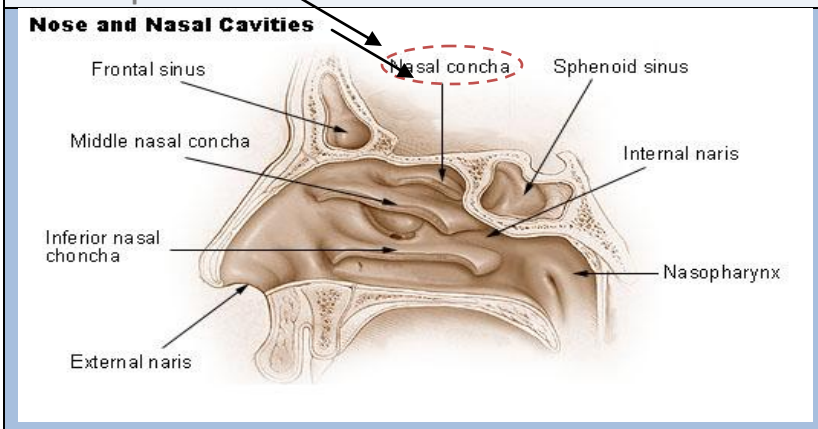
MUCOSA (MUCOUS MEMBRANE)

CONTAIN	
A- **Epithelium**	Pseudo-stratified ciliated columnar epithelium with goblet cells (Respiratory epithelium).
B- **Lamina propria (Sub-epithelial C.T.**)	1- Large arterial plexuses & venous sinuse (Highly vascularized C.T.) 2- Many seromucous glands (acini). 3- Abundant lymphoid elements: Including occasional lymphoid nodules, plasma cells & mast cells.

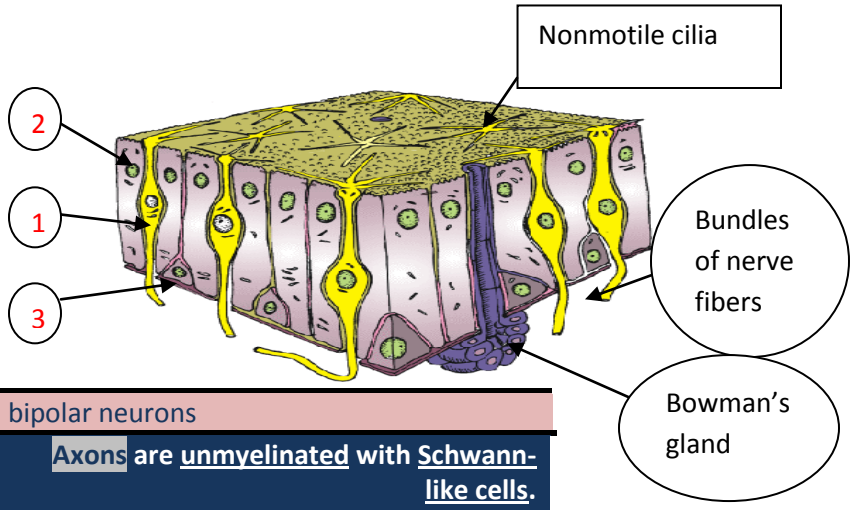
PARANASAL SINUSES

LINING	1- Respiratory epith. (Mention…….) 2- Lamina propria
Clinical application	Sinusitis : inflammation of sinuses.

OLFACTORY REGION (AREA) OF NASAL CAVITY (OLFACTORY MUCOSA)

Site	Structure:	
1-Roof of nasal cavity. 2-Upper part of nasal septum. 3-over superior concha.	Olfactory epithelium	Lamina propria
	**Pseudo-stratified columnar epithelium.** 1- **Olfactory cells** (olfactory nerve cells) 2- **Sustentacular** (supporting) **cells.** 3- **Basal cells:** Pyramidal in shape, basal in position and act as stem cells. **Explanation: not as respiratory epithelium (it has 3 types of cells that gives you the appearance of pseudo-statified)**	**Highly (richly) vascularized loose to dense C.T.** **- Contents:** **a) Bowman's glands** (olfactory glands) : are serous acini. **b) Bundles of unmyelinated nerve fibers:** Are axons of olfactory nerve cells + Schwann-like cells (glial cells). **c) Rich vascular plexus.** **d) Numerous lymphoid elements.**

OLFACTORY REGION



1. Olfactory cells : bipolar neurons

Dendrite has olfactory vesicle that has nonmotile cilia.	**Axons are unmyelinated with Schwann-like cells.** **Axons will collect in the lamina propria to form bundles of nerve fibers.** **Bundles will collect to form the olfactory nerve.**

2. *Sustentacular (supporting) cells : columnar cells.

***Function: Physical support and nourishment for olfactory cells.**

2-Larynx

<table>
<tr><td rowspan="4">1-Mucosa</td><td rowspan="3">(Mucous membrane):</td><td>1- Epithelium.</td><td>a- Respiratory epithelium: Pseudostratified ciliated columnar epithelium with goblet cells.</td><td rowspan="4">N.B.

-No lymphoid nodules,
-No seromucous glands.</td></tr>
<tr><td></td><td>b- Non keratinized stratified squamous epithelium:
In: -Vocal folds.
- Superior surface of epiglottuis</td></tr>
<tr><td>2- Lamina propria.</td><td></td></tr>
<tr><td>(cont.):
There are 2 pairs of shelf-like mucosal folds:</td><td>1- Vestibular folds:</td><td>immovable.
L/M:
• Respiratory epithelium.
• Lamina propria: Loose C.T. with seromucous glands lymphoid elements & adipose cells.</td></tr>
<tr><td></td><td>2- VOCAL FOLDS (CORDS):</td><td>a- Epithelium: non keratinized stratified squamous.
b- Lamina propria: C.T. containing bundles of elastic fibers and skeletal muscle .</td></tr>
<tr><td rowspan="2">2. Cartilages</td><td>1- Hyaline cartilages:</td><td colspan="3">e.g. Thyroid cartilage</td></tr>
<tr><td>2- Elastic cartilages:</td><td colspan="3">e.g. Epiglottis.</td></tr>
<tr><td>3.Extrinsic and intrinsic muscles.</td><td colspan="4">All are skeletal</td></tr>
<tr><td colspan="5">4. Ligaments</td></tr>
</table>

RESPIRATORY EPITHELIUM

Pseudo-stratified ciliated columnar epithelium with goblet cells.

Main Types of cells

(all touch the basement membrane)

1- Ciliated columnar cells.	**2- Goblet cells.**	**3- Basal cells** stem cells.	**4- DNES cells:** e.g. serotonin.