

HUMAN ANATOMY AND PHYSIOLOGY-I, BP-101(T)

UNIT-IV (Special Senses)

CLASS:3

TOPIC –Structure, functions and disorders of Nose

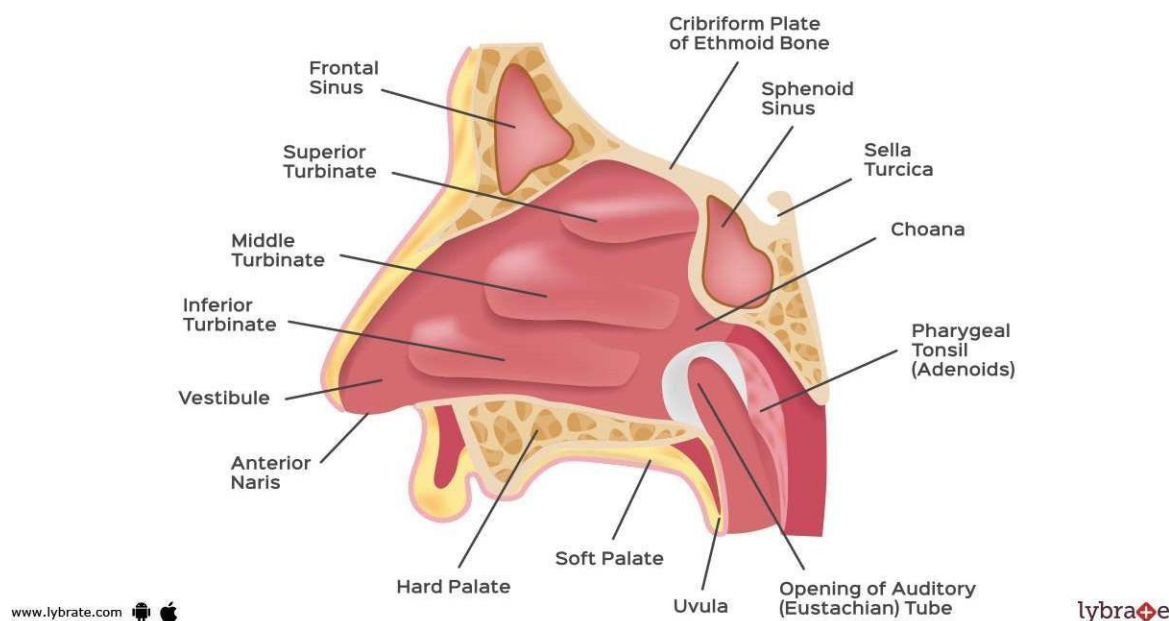
Introduction

The nose is the primary organ of smell and functions as an important respiratory organ in the body. Besides this, it is also involved in functions such as tasting.

The air that we breathe is filtered through the nasal hair. The inhaled air is warmed and humidified before it enters the lungs.

The shape of the nose is due to the bones and cartilage. The nasal septum separates the nostrils and divides the nasal cavity into two.

Structure of Nose:



- Bones and cartilages render the shape of the nose.
- Nasal anatomy includes both the external and internal structures of the nose.
- The three sections of the external nose are the frontal, lateral and basal views.
- The nose is supported in the upper frontal region by two nasal bones that form the nose's bridge.

1. Bone

The nasal bone is a small, flat skull bone. It is part of the facial skeleton and provides support for the nose bridge.

2. Mucous membrane

The nose, sinuses and throat are all lined with a mucous membrane. This membrane humidifies and warms the air we breathe.

It also produces a sticky mucus that keeps dust and other small particles from entering the nose. Cilia are hair-like structures that work with mucus to trap foreign particles that enter the nose while breathing.

3. Nasal cavities

The nasal cavity is the empty, hollow space through which air flows. It is divided into two parts known as nasal passages. While breathing, air passes through these passages.

4. Nerve cells

The olfactory nerve is a pair of cranial nerves. They transmit information from smell receptors in the nose to the brain.

5. Nostrils

Nostrils are either of two external openings of the nasal cavity.

6. Septum

The septum separates the two chambers of the nose. It is a thin bone and cartilage wall.

7. Sinuses

Sinuses are hollow, air-filled chambers in the bone surrounding the nose. The sinuses send mucus into the nasal cavity.

8. Turbinates

Turbinates are tiny structures inside the nose that clean and humidify the air entering the lungs through the nostrils.

9. The external nose

- The external nose is a prominent feature of the face that projects out. It has an entrance to the nasal cavity. The shape of the external nose is compared to that of a pyramid.
- The external nose's skeleton is composed of both bony and cartilaginous components.

- The nasal root is located superiorly and connects to the brow. The nose's apex terminates inferiorly in a rounded tip. The dorsum of the nose extends between the root and the apex.
- The nares or the nostrils are openings into the nasal cavity located immediately inferior to the apex.

Functions of Nose:

Following are the important functions of the nose:

1. Helps in Inhalation:

The process of **respiration** starts in the nose. The oxygen **enters** the nose through the nostrils and exits the same way during exhalation. The nasal cavities open into a space called choana, which further opens into the nasopharynx. The air then enters the oropharynx and finally reaches the lungs via the larynx, trachea and bronchi.

2. Purification of Inhaled Air:

The walls of the nasal cavity are covered with hair or cilia that trap the dust and harmful particles and purify the inhaled air. The back and forth movement of cilia helps in moving the dust particles to the throat where they are swallowed or excreted through the nasal cavity.

The nose hair also moisturizes and warms the air, so that it resembles the air temperature and moisture within the lungs. During exhalation, the heat and moisture present in the carbon dioxide is absorbed by the nasal hair and then released into the atmosphere.

The nasal conchae, which are spiral in structure, keep whirling the air for a longer time within the nasal cavity so that it is humidified and purified properly.

3. Organ of Smell:

The inhaled air comes in contact with the olfactory epithelium and the nerve fibres extending from the olfactory receptors accumulate the molecules containing the odour to send the signals to the olfactory bulbs through the receptors. These signals are carried to the olfactory region of the brain and are decoded so that the smell is identified.

4. Sense of Taste:

While chewing, the food releases certain chemicals that travel up to the nose and activate the olfactory receptors inside the nose. They work in coordination with the taste buds to identify the actual flavour of the food.

Disorders of Nose:

Many problems besides the common cold can affect the nose. They include:

1. Deviated septum - a shifting of the wall that divides the nasal cavity into halves. Deviated septums can cause congestion and breathing problems. When symptomatic, deviated septums can be corrected with surgical procedures such as a septoplasty or a rhinoplasty (nose job). Rhinoplasty, a cosmetic procedure, is often done to improve breathing through the nose.
2. Nasal polyps - soft growths that develop on the lining of your nose or sinuses. Polyps are painless, but they block airflow through the nose leading to congestion and decreased or absent sense of smell and taste. When polyps are severe, surgery is generally indicated.
3. Nasal trauma

Acute injuries affecting the nasal area can include:

- Nasal fractures, also known as a broken nose
- Nosebleed (epistaxis)
- Nasal valve collapse
- Cuts, abrasions and burns involving the nose and face

Treatment depends on the type and severity of the nasal injury or infection, and can range from medication to reconstructive surgery.

4. Rhinitis - inflammation of the nose and sinuses sometimes caused by allergies. The main symptom is a runny nose.
5. Swollen turbinates- Respiratory infections, allergens and airborne irritants like smoke can cause turbinates to swell, which can block the flow of air and make it difficult to breathe or smell.
6. Sinonasal cancer- Symptoms of sinonasal cancers often initially present like other types of sinus disease and can be hard to identify in the early stages.

Signs and symptoms of sinonasal cancer can include:

- Blocked nasal breathing or congestion
- Frequent sinus infections that don't get better with antibiotics
- Headaches
- Frequent nosebleeds
- Changes in eyes such as double vision or protrusion of one eye

7. Sinus infections- Sinus infections can range from acute to chronic. Acute sinus infections are most often viral, but can be bacterial, symptoms last less than 4 weeks.

Symptoms of acute sinusitis include discolored nasal drainage, congestion, decreased or absent sense of smell, discomfort in the cheeks, teeth, or around the eyes, fatigue, and possibly fever.

Chronic sinusitis is most commonly an inflammatory issue in which patients have symptoms of sinus infections that last at least 12 weeks or more. Often the prominent signs of a chronic sinus problem are nasal congestion and decreased smell and taste.

IMPORTANT QUESTIONS:

2M QUESTIONS:

1. Explain the bones present in human ear.

5M QUESTIONS:

1. Draw a well labelled diagram of ear with its parts and function.

10M QUESTIONS:

1. Draw a well labelled diagram of ear with its parts and function.