



Pretoria ENT

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## Nose and Sinuses

### Anatomy

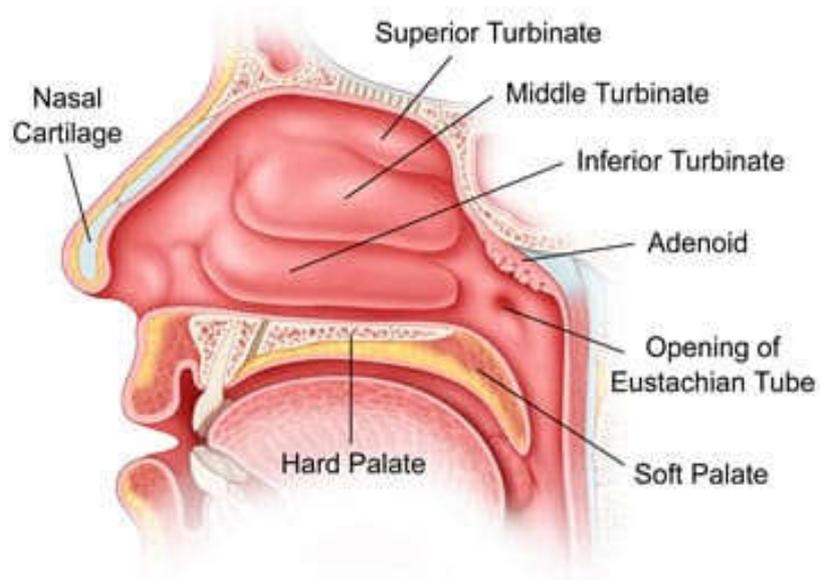


Image source: lasinus.com

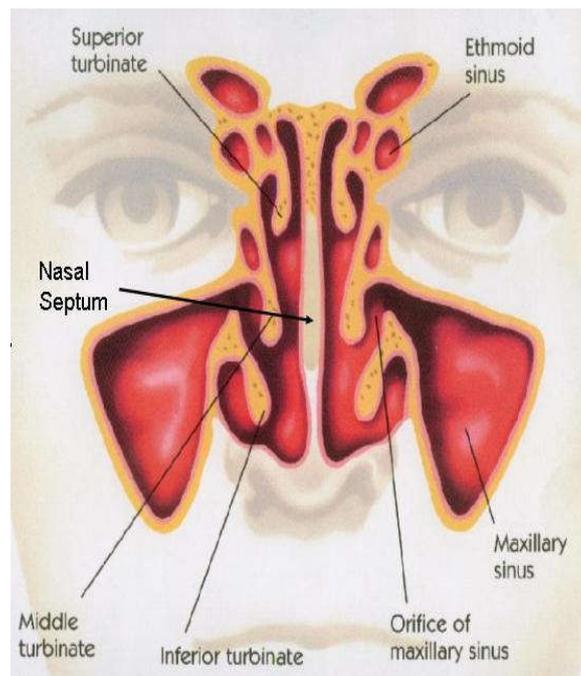


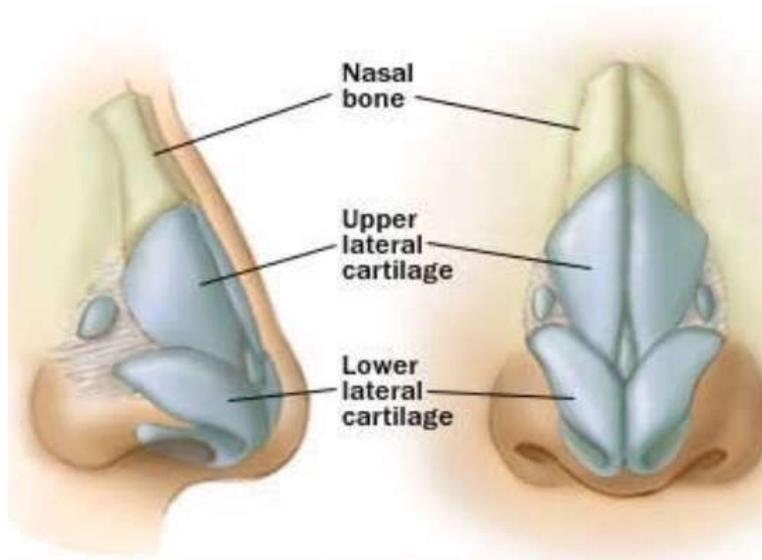
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*Image source: truestrange.com*

The nose can be divided into the external structures and the internal structures. The external structures form the outside of the nose (the part you can see projecting from the face) and it stretches from the nasal bridge to the nasal tip and nostrils. The internal structures can be divided into the nasal vestibule (the inside of the nostrils), the nasal cavity, and the opening of the nasal cavity into the throat at the back (posterior choanae). The left and right nasal cavities are divided by the septum. The nasal cavity is lined with a soft tissue covering called the mucous membrane. There are three wing-like structures inside each nasal cavity, which assists with nasal airflow and they are also covered by the mucous membrane.

There are several sinuses (as seen on the illustration) located in the areas surrounding the nasal cavity. They are called the:

- **Maxillary sinuses**, which are situated within the part of the cheek bones that sit close to the nose.
- **Frontal sinuses**, which are situated within the bone above the nasal bridge and eyes.
- **Ethmoid sinuses**, which are situated deeper into the nose, above and on the sides of the nasal cavities.
- **Sphenoid sinuses**, which are situated behind and above of the nasal cavity.

The mucous membrane in the nasal cavity lines all the structures and sinuses. It produces mucous in the nasal cavity and sinuses. The mucous produced in the sinuses drain into the nasal cavity through specific openings (ostia). This mucous help the nasal cavity to moisturise and warm the air. The lining of mucous also trap many of the impurities in the air that we inhale. The mucous is then transported to the back of the nose and empties



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into the upper part of the throat.

The nasal structures enable us to smell, breath, as well as moisturising, warming and cleaning the air we inhale.

## Common Conditions of the Nose and Sinuses

### Chronic rhinitis

Rhinitis refers to a chronic inflammation of the soft tissues in the nasal cavity. It most often presents with a runny nose (rhinorrhea), a blocked nose, a postnasal drip, sneezing, nasal irritation, and/or a chronic cough. There are many different causes for rhinitis, including:

- **Allergic reactions** to inhaled allergens.
- **A reaction to irritants** (dust/smoke/pollution/air conditioning/cold air/perfumes and other strong smells).
- Certain **medications**.
- The **overuse of nasal decongestants**.
- **Pregnancy** and **other hormonal changes**.
- **Age-related** changes.
- **Strong, spicy foods**.
- **Salicylate allergies**.
- **Unknown**.

The treatment for rhinitis depends on the cause of the problem.

### Chronic rhinosinusitis

Chronic rhinosinusitis is a complex problem of increased levels of inflammatory components within the soft tissue located in the nasal cavities and sinuses. This process is not yet fully understood. There are many elements that can contribute to the problem. The inflammation results in swelling and irritation of the soft-tissue lining in the nose, as well as an increase in the mucous production. The inflammation damages the transport mechanism by which nasal mucous is cleared and, therefore, the secretions are usually thickened and difficult to expel. It most commonly presents with a runny nose (rhinorrhea), a blocked nose, a postnasal drip, and/or a chronic cough.



There are two forms of chronic rhinosinusitis:

1. **Chronic rhinosinusitis without nasal polyps.**
2. **Chronic rhinosinusitis with nasal polyps.**

A nasal polyp is a pale-pink soft tissue overgrowth that can arise from the nasal cavity or sinuses. Chronic rhinosinusitis with nasal polyps and chronic rhinosinusitis without nasal polyps are caused by different disease processes. In the case of chronic rhinosinusitis with nasal polyps, there are often a strong element of salicylate allergy, co-existing problems like asthma or chronic systemic diseases (like sarcoidosis). Nasal polyps are often recurrent.

The treatment for chronic sinusitis may include an intranasal steroid spray/drops, nasal washes, and treating aggravating factors. Sometimes the treatment may include a course of antibiotics and/or steroids.

## Adenoid enlargement

Adenoidal tissue is situated behind the nasal cavity in the upper part of the throat. This tissue is very similar to tonsillar tissue. It can also become chronically infected or enlarged. In children it is common to have enlargement of the adenoidal tissue to a certain degree. Adenoidal tissue usually regress in size with age, and is very rarely seen in adults.

Very enlarged adenoidal tissue can cause nasal obstruction, snoring and nasal discharge. Children often breathe through an open mouth chronically.

Enlarged or infected adenoids can also contribute to chronic middle ear infections.

Adenoids are usually removed if they cause breathing problems, chronic nasal symptoms and when a child has recurrent ear infection associated with a need for multiple grommet insertions.



## Chronic adenoiditis

The lymphoid tissue of the adenoids can become chronically infected in the same way that the tonsils can. It then forms a reservoir for organisms, which can cause chronic nasal obstruction, nasal discharge and recurrent otitis media.

## Other causes of nasal obstruction

- Abnormally shaped or narrow nostrils.
- Collapse of the nostrils during inhalation.
- Deviated (skew) nasal septum.
- Enlarged turbinates (wing-like structures in the nose).
- Abnormal masses in the nasal cavity.
- Abnormally narrowed outlet of the nasal cavity posteriorly (at the back).
- Foreign body in the nose.

## Less common nasal conditions

- Fungal infections.
- Masses in the sinonasal region (benign or malignant).
- Ciliary dyskinesia.
- Cystic fibrosis.
- Congenital abnormalities of the nose.
- Auto-immune conditions.
- Atrophic rhinitis.
- Complications of previous surgery.
- Complications of previous facial/skull trauma.

## Deviated nasal septum

The structure in the nose that divides the nasal cavities is called the nasal septum. It consists of a thin plate of cartilage and bone, which is covered with a soft tissue lining called a mucous membrane.

Abnormalities of the nasal septum can cause nasal obstruction, turbulent airflow (causing dryness, crusting and nosebleeds), a deviated external nose or rhinosinusitis (blocking the sinus drainage pathways). Most people with a deviated septum have no symptoms at all. A patient can be born with an abnormally shaped septum or it can be deformed due to a previous traumatic fracture of the nose.



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## Abnormally shaped outer/external nose

The outer/external nose consists of the:

- Nasal bones.
- Septum.
- Alar cartilages.
- Medial and lateral crurae.

The nose can be abnormally shaped due to previous nasal injuries or it can be congenital (patient is born with it). Some inflammatory and infective conditions can cause destruction of the nasal septum and outer nasal structures (septal abscess, tuberculosis, syphilis, fungal infections).