

# NASAL SEPTUM,

Authored by  
**mohammad looti**

October 30, 2025

## RECOMMENDED CITATION

mohammad looti (2025). *NASAL SEPTUM,*. PSYCHOLOGICAL SCALES. Retrieved from <https://scales.arabpsychology.com/?p=64503>

## NASAL SEPTUM

**Primary Disciplinary Field(s):** Anatomy, Physiology, Otolaryngology

### 1. Core Definition

The **nasal septum** is a critical anatomical partition located centrally within the nasal cavity, serving to divide the space into two distinct, symmetric channels known as the nasal fossae or nostrils. This structure extends from the anterior aspect of the nasal opening, deep into the nasopharynx, and forms the medial wall of each nasal passage. Functionally, it is much more than a simple dividing wall; it plays a fundamental role in regulating the laminar flow of inhaled air, contributing significantly to the processes of respiration, olfaction, and conditioning of atmospheric gases before they reach the lower respiratory tract. Structurally, the septum is a complex composite of bone, cartilage, and soft tissue, reflecting the need for both rigidity to maintain structural integrity and flexibility to withstand minor trauma and changes in pressure.

The superior portion of the septum is typically lined by specialized mucous membranes containing the **olfactory epithelium**, which is crucial for the sense of smell. While the entire septum is covered by a vascularized mucoperichondrium (over cartilage) and mucoperiosteum (over bone), the specific location and composition of this lining contribute directly to its overall function. The septum's precise midline location is essential for balanced airflow resistance and efficient gas exchange. Any deviation from this midline, a common condition known as a **deviated septum**, can profoundly affect respiratory function and overall quality of life, necessitating medical or surgical intervention.

In essence, the nasal septum acts as the primary internal barrier, ensuring that the air entering each nostril follows a structured pathway toward the turbinates and ultimately to the back of the throat (the nasopharynx). This strategic placement and composition highlight its importance not just as a static wall, but as a dynamic component of the complex upper respiratory system. Its structural integrity is maintained by a delicate balance between the rigid posterior bony components and the more pliable anterior cartilaginous components, allowing the nose to sustain external forces while preserving the patency of the internal airways necessary for continuous, unimpeded respiration.

### 2. Anatomical Structure and Composition

The nasal septum is classically described as having three main components: a bony posterior segment, a cartilaginous anterior segment, and the surrounding membranous integument. The **bony septum** forms the postero-superior and postero-inferior parts of the division. Key osseous contributions come primarily from two bones: the perpendicular plate of the ethmoid bone, which

forms the superior portion, and the vomer bone, which forms the posterior and inferior border, articulating with the maxillary and palatine crests. These bony structures provide the essential, non-yielding foundation of the septum, anchoring it securely to the skull base and floor of the nasal cavity.

Anteriorly, the septum is composed mainly of the **quadrangular cartilage** (or septal cartilage). This hyaline cartilage structure is flexible and elastic, providing the necessary resilience to the external nose and protecting the airway from minor impacts. The quadrangular cartilage articulates with the bony components posteriorly and extends forward to form the column of the nose. It is this cartilaginous portion that is most frequently involved in trauma or congenital deviations, leading to functional impairment. The juncture where the vomer, ethmoid, and septal cartilage meet is a crucial area of growth and often a site of potential deviation, particularly during developmental stages.

Overlying these skeletal components is the **mucoperichondrium** (over cartilage) and the **mucoperiosteum** (over bone). This mucosal lining is rich in blood vessels, nerves, and glands. The blood supply to the septum is extensive and complex, involving branches from both the internal and external carotid arteries, including the anterior and posterior ethmoidal arteries, the sphenopalatine artery, and the greater palatine artery. These vessels often converge at a highly vascularized area located in the anterior-inferior portion of the septum known as Kiesselbach's plexus (or Little's area), which is the most common site of epistaxis (nosebleeds). The thickness, hydration, and overall health of this mucosal lining are vital for the septum's physiological roles in air conditioning.

### 3. Physiological Function

The principal physiological function of the nasal septum is its regulatory role in **airflow dynamics**. By dividing the nasal cavity, the septum ensures that inhaled air is channeled efficiently over the convoluted surfaces of the turbinates (conchae) on the lateral walls. This directed, laminar flow is crucial for maximizing contact between the incoming air and the moist, vascularized mucosa. Optimal airflow resistance, maintained by a structurally sound septum, is necessary for pulmonary function, influencing the efficiency of gas exchange lower down in the respiratory tree.

Beyond simple division, the septum is integral to the process of **air conditioning**. As air passes along the septum and lateral walls, it is warmed, humidified, and filtered. The highly vascularized mucosal lining transfers heat to the inhaled air, raising it nearly to body temperature. Simultaneously, moisture from the mucous blanket humidifies the air, preventing desiccation of the delicate tissues in the trachea and lungs. This conditioning process is essential for protecting the lower respiratory tract from damage caused by cold or dry air, and the septum's large surface area contributes significantly to this thermoregulation and hydration.

Furthermore, the superior aspect of the septum is directly involved in the function of **olfaction**. The olfactory epithelium, containing specialized sensory neurons, is partially situated on the upper nasal septum. As air is inhaled, odorant molecules dissolve in the mucous layer covering this epithelium, allowing sensory transduction to occur. A patent, non-obstructed septum ensures that sufficient airflow reaches the olfactory region, facilitating the sense of smell. Any anatomical obstruction, such as severe septal deviation or polyps, can severely compromise the ability of odorants to reach this crucial area, leading to anosmia or hyposmia.

#### 4. Embryological Development

The formation of the nasal septum is a complex process commencing early in human embryogenesis, involving the fusion and differentiation of several facial prominences. Development begins around the fifth week of gestation when the facial primordia merge. Specifically, the septum originates from the median nasal prominence, which grows inferiorly and posteriorly between the developing nasal pits. This process is crucial as it involves the merging of the medial walls of the two nasal cavities.

The septal structure begins as a cartilaginous plate, known as the **preseptal cartilage**, which subsequently undergoes endochondral ossification to form the bony components (vomer and the perpendicular plate of the ethmoid). The precise alignment and growth rate of these various bony and cartilaginous elements must be synchronized. Differential growth rates among these components postnatally, particularly during rapid facial growth in childhood and adolescence, are often cited as the primary non-traumatic causes of septal deviation. If the cartilage grows faster than the surrounding bone or vice versa, buckling and displacement can occur.

Errors in the fusion or differential growth during this developmental period are the root cause of many congenital septal anomalies. The delicate balance required for the cartilaginous and bony components to meet and fuse in a straight line is easily disrupted, explaining why a perfectly straight septum is relatively rare in the adult population. Understanding the embryology is vital for surgeons planning corrective procedures, as the growth potential of the remaining septal tissue must be preserved, especially in pediatric patients.

#### 5. Clinical Relevance: Deviation and Pathology

The most common pathological condition associated with the nasal septum is **septal deviation**. While a completely straight septum is anatomically unusual--most individuals possess some degree of deviation--a clinically significant deviation occurs when the septum is so severely displaced from the midline that it causes functional impairment. This impairment typically manifests as chronic nasal obstruction, difficulty breathing, recurrent sinus infections (due to impaired drainage), facial pain, and frequent or loud snoring. Deviations can be caused by trauma, often

sustained during childhood or birth, or result from the natural, uneven growth of the bony and cartilaginous components as detailed in the embryological context.

Another significant pathological condition is **septal perforation**, a full-thickness hole through the septum connecting the two nasal cavities. Perforations can result from chronic inflammation, infectious diseases, repeated localized trauma (e.g., compulsive nose picking), excessive use of topical vasoconstrictive nasal sprays, or, most commonly, following surgical procedures like septoplasty or cauterization for severe nosebleeds. Symptoms of perforation include whistling noises during breathing, crusting, chronic discharge, and recurrent epistaxis. The management of perforations ranges from conservative measures, such as moisturizing ointments and saline irrigation, to surgical closure using mucosal flaps or synthetic materials.

The septum is also a primary site for **epistaxis**, or nosebleeds. As mentioned, Kiesselbach's plexus on the anterior septum is highly vulnerable to drying, trauma, and rupture. Posterior epistaxis, though less frequent, often involves larger vessels located deep within the septum, such as branches of the sphenopalatine artery, and typically requires more aggressive medical or surgical intervention due to the difficulty in direct control. Furthermore, the septum can be affected by various inflammatory conditions, including nasal polyps (though less common than on the turbinates), and, rarely, benign or malignant tumors, necessitating careful evaluation of any chronic unilateral nasal symptoms or masses.

## 6. Surgical Intervention

When septal deviation is functionally significant, causing persistent obstruction or contributing to chronic sinonasal disease, the primary treatment is surgical correction, most often performed via **septoplasty**. Septoplasty is a surgical procedure designed to straighten the bone and cartilage of the septum without altering the external appearance of the nose. During the procedure, the surgeon makes an incision within the nasal lining, lifts the mucoperichondrium and mucoperiosteum off the underlying framework, removes or reshapes the deviated segments of cartilage and bone, and then repositions the mucosal flaps. The goal is to restore the septum to the midline, optimizing the nasal airway patency.

Septoplasty is frequently performed in conjunction with other procedures, particularly **turbinate reduction** (turbinoplasty), as hypertrophy of the turbinates often coexists with septal deviation, contributing further to airway obstruction. In cases where the external appearance of the nose is also affected or requires modification (often due to trauma that caused the septal deviation), septoplasty may be combined with rhinoplasty--a procedure known as **septorhinoplasty**. This combined approach allows the surgeon to address both the internal functional deformity and the external cosmetic appearance simultaneously, ensuring both aesthetic and respiratory improvements.

The success of septal surgery relies heavily on meticulous surgical technique, particularly in preserving the integrity of the mucosal lining and ensuring adequate support for the cartilaginous nose tip. Failure to preserve sufficient structural cartilage can lead to subsequent collapse of the nasal dorsum (saddle nose deformity). Post-operative care typically involves managing swelling, preventing synechiae (adhesions) between the septum and the lateral wall, and protecting the fragile repair site until full mucosal healing has occurred, generally taking several weeks.

## 7. Key Characteristics

**Composition:** The nasal septum is a composite structure consisting of the perpendicular plate of the ethmoid (superior bone), the vomer (inferior bone), and the quadrangular cartilage (anterior cartilage).

**Lining:** It is entirely lined by a highly vascularized **mucoperichondrium/mucoperiosteum**, which serves to warm and humidify inhaled air.

**Vascularity:** The anterior-inferior aspect contains **Kiesselbach's plexus**, a major convergence of arteries that makes this region highly prone to epistaxis.

**Function:** Its primary role is to separate the nasal cavities, regulate **laminar airflow**, and contribute to the conditioning (warming and humidifying) of inspired air.

**Prevalence of Deviation:** A perfectly straight septum is anatomically rare; minor degrees of **septal deviation** are nearly universal, though clinical intervention is only required when function is compromised.

## Further Reading

[Nasal Septum \(Wikipedia\)](#)

[Otolaryngology \(Wikipedia\)](#)

[Kiesselbach's Plexus \(Wikipedia\)](#)

[Septoplasty \(Wikipedia\)](#)