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A Handbook on Allergic Rhinitis



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CHAPTER 5

Clinical Diagnosis: Rhinitis and Comorbidities

Dinesh Naik

INTRODUCTION

Diagnosis of rhinitis may appear obvious from the chief complaints, but a detailed, accurate history and a complete thorough examination is required for better phenotyping of rhinitis. Understanding the triggers, family history, comorbid conditions, and response to earlier treatment helps in better and holistic management.

A detailed history not only helps in diagnosis but also aids in selecting allergens for allergy testing and correlations of the results of the tests.

History could be taken in following headings, presenting complaints, past history, treatment history, socioeconomic history, family and personal history, and clinical review of systems.

The presenting complaints include:

- Nasal congestion
- Sneezing
- Itching
- Rhinorrhea
- Postnasal drip
- Conjunctival irritation

NASAL CONGESTION

Nasal congestion can make toddlers struggle to breath with sniffing and snorting or may have sneezing, elder ones tend to repeatedly blow their nose. More the exposure to the allergen, greater and severe are the symptoms. Nasal congestion tends to be more severe in the night, causing snoring and leading to breathing through the mouth. Sometimes, it is so severe that not only sleep is disturbed but children may have apnea episodes and wake up with a gasp. Also lack of proper sleep can lead to tiredness, easy fatigability, daytime somnolence, headache, increased irritability, and even cognitive impairment. It is imperative to know that normally the nose gets blocked on one side for some time followed by spontaneously opening but closure of other side which is called nasal cycle or nasal pulse. Also, it is known that the nose can get blocked on the side, one is turning while sleeping (dependent side). Nasal septal deviation and hypertrophied inferior turbinate can commonly cause persistent unilateral nasal congestion; some other causes

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could be nasal polyp, foreign body (especially with foul smell and fairly recent history), or rarely, even a tumor.

SNEEZING

Allergic rhinitis is often marked by outbursts of 5–10 sneezes. Sneezing is often noticed in the morning hours. Early morning sneezing is found to be typical of house dust mite allergy.

ITCHING

Besides itching of nose, patient may also complaint itching of eyes, oral mucosa, and face and itchy ears. Nasal pruritus and sneezing are hallmark of histamine-mediated response.

RHINORRHEA

Rhinorrhea or nasal discharge is usually clear to little opaque liquid and bilateral. Thick yellowish purulent secretions are usually seen in chronic sinusitis or atrophic rhinitis. Unilateral clear rhinorrhea could be due to cerebrospinal fluid (CSF) leak.

POSTNASAL DRIP

Postnasal drip is one of the most common characteristics of chronic rhinitis, and over a prolonged period of time, it may lead to a chronic sore throat, a chronic cough, or recurrent throat clearing.

CONJUNCTIVAL IRRITATION

The eyes symptoms include itching, redness, and watering, which probably arise, in part, from a naso-ocular reflex besides allergic response to direct exposure of eyes to the same allergen and are found in 50% of allergic rhinitis cases. Presence of atopic conjunctivitis determines choice of treatment.

When other symptoms such as cough, headache, altered smell, and bad breath are present, check for any coexistent conditions which will alter the treatment decision.

SEASONALITY OF SYMPTOMS

Perennial symptoms are quite often because of house dust mites, cockroach allergens, and few molds. Seasonal symptoms usually indicate an outdoor allergen as a potential culprit. Differentiating into seasonal and perennial allergic rhinitis may be tricky at times as seasonal allergens may vary from year to year, in some countries pollens may be present for up to 10 months per year. Conversely, patients' exposure to perennial factors may be intermittent, for example, with only occasional contact with

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domestic pets. Also many patients may be allergic to multiple allergens; so the seasonal symptoms to each allergen will lead to prolonged duration of the symptoms, presenting as persistent nasal complaints. As human travel has become more accessible and affordable, they get exposed to different aeroallergens leading to unique pattern of symptoms including the severity and the duration. Hence, understanding migration history of patient is also relevant here.

DIURNAL VARIATION

Rhinitis symptoms worsen during the early morning hours due to circadian variations in inflammation. House dust mite allergy typically presents as morning symptom. Pollen-related allergy tends to get better as day progresses.

LOCATION OF SYMPTOMS

Indoor allergens such as house dust mite, animal dander, cockroach, or mold trigger symptoms at home, whereas pollens are more responsible for symptoms in outdoor environment.

FAMILY HISTORY

Allergic rhinitis is known to have strong genetic component. Having a first-degree relative with atopic allergic conditions it increases the risk of suffering from allergic symptoms. If either mother or father is affected, the chance of child having atopy is 30–50%, and risk increases to 60–80%, if both parents are affected. There is 25–35% risk in the presence of an atopic sibling. 12% of children with allergic rhinitis have no family history of allergic rhinitis suggesting other etiological factors.

ENVIRONMENTAL HISTORY

The patient's home *environment details* should be sought to identify any potential triggers as it is crucial in establishing a clinical correlation. If symptoms arise promptly on exposure to allergen, it suggests immunoglobulin E (IgE)-mediated allergy. Dust mites are commonly found in warm, humid areas, and on curtains, beds, mattresses, and carpets. Child sleeping with soft toys or favorite blankets is also prone to exposure to dust mites. Mold mainly grows in damp environment, over walls containing water pipes, and around air-conditioner vents.

Environmental history of school or place at work is also very important to know. Exposure to occupational allergens or irritants, such as perfumes, gases, dough, sawdust, plastic, and animal products can be responsible for the allergic symptoms. Also, if symptoms occur only during work or immediately after work or only at workplace and if one is free of symptoms during weekends or holidays, it may strongly indicate allergen exposure at

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work. A person's exposure to allergens may also depend on where he spends lot of his time, such as for studies, sports, gym, or any other activity; so this history also is pertinent toward the diagnosis.

NONALLERGIC TRIGGERS

Sometimes, other *triggers* may be responsible for allergy-like symptoms (nonallergic rhinitis), namely the airborne substances considered as irritants, including volatile organic compounds such as detergents, paints, perfumes, fumes and particulate air pollutants, such as smoke, fumes, and gases released on burning fuel. Weather changes and climatic conditions, such as sudden change of temperature, water vapor content, or different altitude are also contributing factors in nonallergic rhinitis.

DRUG HISTORY

A thorough recent *drug history* is mandatory as some drugs, such as β-blockers, nonsteroidal anti-inflammatory drugs (NSAIDs), salicylates, angiotensin-converting enzyme (ACE) inhibitors, and certain hormones can lead to symptoms of rhinitis. Also assessing patient response to over-the-counter antihistamines and intranasal steroids may help in diagnosis of allergic rhinitis and creating proper management plan. Any history of being on alternative medicine should be noted **(Table 1)**.

TABLE 1: Medications associated with chronic nasal symptoms.

Antihypertensives	Angiotensin-converting enzyme inhibitors
	β-adrenergic blockers
	Amiloride
	Prazosin
	Hydralazine
Psychotropics	Risperidone
	Chlorpromazine
	Amitriptyline
Phosphodiesterase-5 inhibitors	Sildenafil
	Tadalafil
	Vardenafil
Nonsteroidal anti-inflammatory drugs	Ibuprofen
Others	Gabapentin

Source: Adkinson NF Jr, Bochner BS, Burks AW, Busse WW, Holgate ST, Lemanske RF Jr, et al. Middleton's Allergy: Principles and Practice, 8th edition. Philadelphia, PA: Elsevier/Saunders; 2013. p. 670.

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Consistent, reproducible symptoms associated with particular allergen or trigger and symptom-free period in the absence of exposure help in establishing a potential trigger.

COMORBIDITIES

Any patient suffering from one allergic disease has high chances of having another allergic disease, such as allergic rhinoconjunctivitis, acute and chronic sinusitis, nasal polyps, acute and chronic otitis media, asthma, food allergy, drug allergy, and atopic dermatitis. According to Bousquet J et al. 2001, around 40% of patients with chronic rhinitis have asthma, and 80% of patients with asthma have allergic rhinitis like symptoms. Fokkens et al. 2007 found that allergic rhinitis was noted in 30% of patients with acute sinusitis, 67% with unilateral chronic sinusitis, and 80% with bilateral chronic sinusitis **(Fig. 1)**.

Child with respiratory allergies may frequently also have food allergy, which is considered a risk factor for other allergic diseases. The concept of atopic march states that usually infants who have food allergy and atopic dermatitis in infancy may develop asthma and allergic rhinitis in later life but it is found commonly that it may not follow any particular order rather all allergic conditions come under one umbrella of atopic diseases. Goksör et al. concluded in his study that 40% of children with history of food allergies in

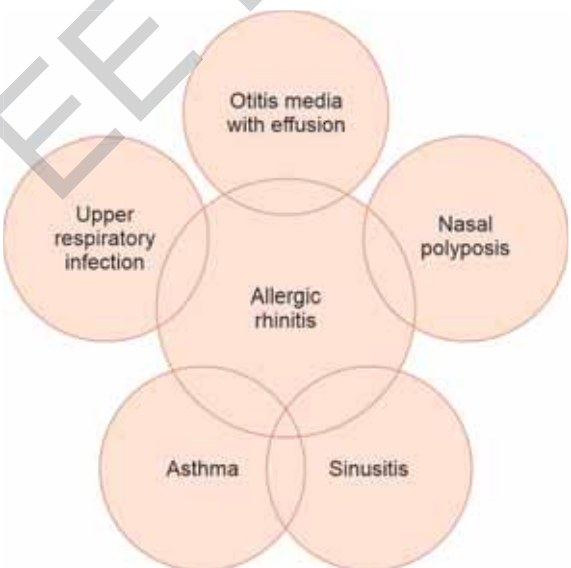


Fig. 1: Allergies coexist.
Source: Spector SL. Overview of comorbid associations of allergic rhinitis. J Allergy Clin Immunol. 1997;99(2):S773-80.

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infancy developed allergic rhinitis by 8 years of age. Allergic rhinitis, asthma, and eczema are 2–4 times more common in children with food allergies. One study showed that 77.4% of children with food allergies developed rhinitis or asthma by 7 years of age compared to 45.5% without food allergies.

Rhinitis may also be one of several manifestations of true food allergy. Food allergies can trigger allergic symptoms in the nose, eyes, or throat along with gastrointestinal symptoms but respiratory allergies are usually <6%. Eating hot and spicy foods can cause watering of eyes and running nose. Also, certain foods may directly stimulate the autonomic nervous system leading to rhinitis like symptoms. This is called gustatory rhinitis. It is nonimmunological in origin.

In some cases, when one is sensitized to some allergens may develop oral symptoms on eating food with similar structural allergen. This is called *oral allergy syndrome*. It is a separate and distinct IgE-mediated syndrome. For example, patient sensitized to an Inhalant allergen Birch pollen can have oral/pharyngeal itching and swelling after the ingestion of certain foods, especially apples, hazelnuts, and stone fruits. In a study, 17% of the patients with pollen allergy developed allergic reaction to some fruits and vegetables. It is a manifestation of cross-reactivity between inhaled allergens and certain heat-labile ingested proteins. Similar symptoms are seen on eating seafood such as shrimps and crabs in dust mite allergic patients.

Sleep disorders are commonly seen in allergic rhinitis with severe nasal obstruction present as lack of quality sleep, repeated arousals from sleep, apneas leading to daytime drowsiness, and other symptoms. Also migraines are commonly seen in allergic rhinitis patients.

The patients with chronic problem may also lose their sense of smell and taste. Onset of hyposmia/anosmia indicates polypoidal changes around middle turbinate and hence demands endoscopic examination. Many allergic rhinitis patients may develop otitis media with effusion (OME) and also it is noted that atopic children have more incidence of bilateral OME with more noticeable hearing loss comparatively. Hence in persistent or recurrent OME, any associated allergic rhinitis should be identified and treated.

It is important to ask about the effects of allergic rhinitis on the patient's quality of life, school, or work absenteeism, without which complete and accurate assessment of clinical picture is not possible.

Allergic Rhinitis and its Impact on Asthma (ARIA) group reclassified allergic rhinitis (2001) as "Intermittent" (symptoms <4 days per week or <4 weeks per year) and "Persistent" (symptoms >4 days per week and >4 weeks per year) category. On the basis of severity of symptoms, such as performance at work or in school, daily activities, and quality of sleep, it was further categorized as "mild" and "moderate-severe" **(Fig. 2)**.

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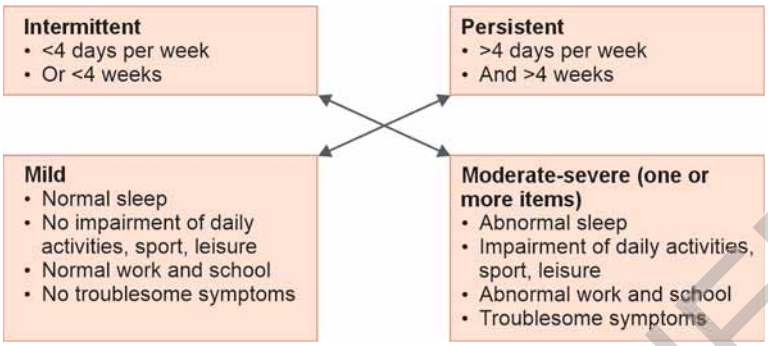


Fig. 2: Classification of allergic rhinitis.
Source: Min YG. The pathophysiology, diagnosis and treatment of allergic rhinitis. Allergy Asthma Immunol Res. 2010;2:65-76; Gupta N. Allergy in a Nutshell, Kindle edition. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd.; 2019. p. 83.

PHYSICAL EXAMINATION

The routine physical examination should be done to assess the cause or triggers of rhinitis and gauge the severity of symptoms, as well as identify other comorbidities and complications. The nose need to be primarily examined, but one should also look at the face, eyes, ears, throat, and neck. Chest and dermatological examination also need to be done.

Facial Features

When the nose is itchy and dripping due to allergies, people with allergic rhinitis tend to wipe or rub their nose upward with an open palm or fingers to relieve the itching or the blockage. This often becomes habitual gesture and is called *allergic salute* **(Figs. 3A and B)**. It leads to upward tilting of the tip of the nose and creating a prominent transverse fold of skin over the bridge of the nose called *nasal crease*. Other signs include facial dysmorphism, dental crowding, and malocclusion of jaw. The continuous mouth breathing gives a distinct appearance to face which is often referred to *allergic gape* **(Fig. 4)**. Prolonged nasal congestion leads to venous stasis under the eyes leading to dark boggy appearance below the eyes which is called *allergic shiners* **(Fig. 5)**.

Nose

Examine the nasal cavity with a nasal speculum or some may use an otoscope with nasal adapter. If experienced and trained, flexible rhinolaryngoscope may be used to evaluate nasal septum, turbinate, middle meatal area, and nasopharynx.

The nasal mucosa over the turbinates is usually swollen with a pale, bluish-gray color in allergic rhinitis, whereas in nonallergic rhinitis cases, it

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Figs. 3A and B: Allergic salute and nasal crease.
Source: [online] Available from https://qph.cf2.quoracdn.net/main-qimg-14afe257e1f6a3f75f6c21bd33fd1e99-lq [Last accessed July, 2024].

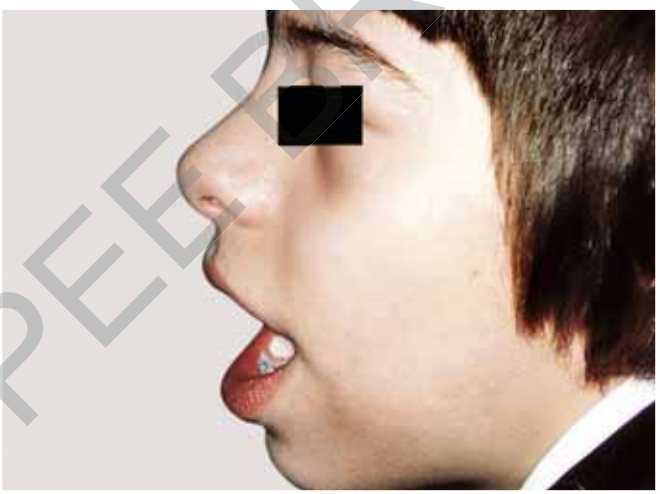


Fig. 4: Allergic gape.
Source: [online] Available from https://obgynkey.com/wp-content/uploads/2016/07/B9780323079327000053_f004-016-9780323079327.jpg [Last accessed July, 2024].

is pink or erythematous but these changes cannot differentiate between both the entities **(Figs. 6A and B)**.

Note the consistency and amount of nasal mucus. Thin and clear watery secretions are usually seen in allergic rhinitis, while white or thick yellow secretions are common with sinusitis. Crusting may indicate atrophic rhinitis.

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Fig. 5: Allergic shiners.
Source: [online] Available from https://upload.wikimedia.org/wikipedia/commons/thumb/b/b6/Allergic_shiner_in_pediatric_patient.png/440px-Allergic_shiner_in_pediatric_patient.png [Last accessed July, 2024].

Examine the nasal septum for any deviation or perforation, which is seen in chronic or atrophic rhinitis, certain granulomatous disease, topical decongestant, or steroid misuse.

Examine the nasal cavity for polyps, foreign body, or tumors. Polyps are gray masses hanging by a stalk, which can be differentiated from turbinate by their gray, shiny grape-like and cystic appearance **(Fig. 7)**. Also, topical decongestant shrinks the turbinates but not the polyps. Polyps are insensitive to touch unlike the turbinates. One can probe around the polyps whereas turbinates are attached to lateral wall **(Table 2)**.

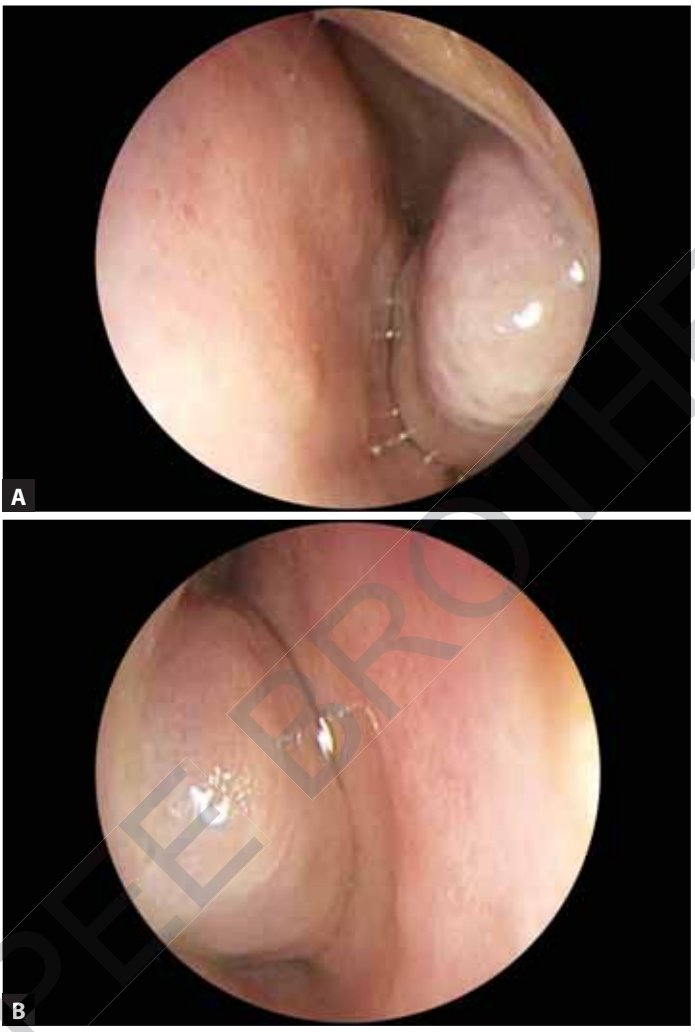
Ears, Eyes, and Oropharynx

Examine the tympanic membrane with the otoscope. Normal tympanic membrane will appear pearly white with shiny cone of light. Look for abnormalities such as retraction of the tympanic membrane, air bubbles, or fluid levels which is seen in dysfunction of eustachian tube or otitis media secondary to allergic rhinitis. Also look for tympanic membrane mobility with pneumatic otoscopy.

Eyes may show erythema and swelling of the conjunctivae, with excessive watering. Do not miss the Dennie-Morgan lines which are the creases seen below the lower eyelid **(Fig. 8)**.

Check the throat for tonsillar enlargement and "cobblestoning"—bulgings in the posterior pharynx mucosa due to enlargement lymphoid tissue on the

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Figs. 6A and B: Endoscopic image of nasal cavity in allergic rhinitis. Pale and boggy nasal mucosa is seen in a case of allergic rhinitis. The nasal airway is blocked as inferior turbinates touch the nasal septum bilaterally left (A) and right (B) nasal cavity.
Source: [online] Available from https://doctorlib.info/pediatric/pediatric-otorhinolaryngology-diagnosis-treatment/pediatric-otorhinolaryngology-diagnosis-treatment.files/image030.jpg [Last accessed July, 2024].

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posterior pharynx. Notice any malocclusion or a high-arched palate as it is commonly seen in mouth breathers **(Fig. 9)**.

Neck

Palpate the neck for lymph nodes or examine the thyroid gland.

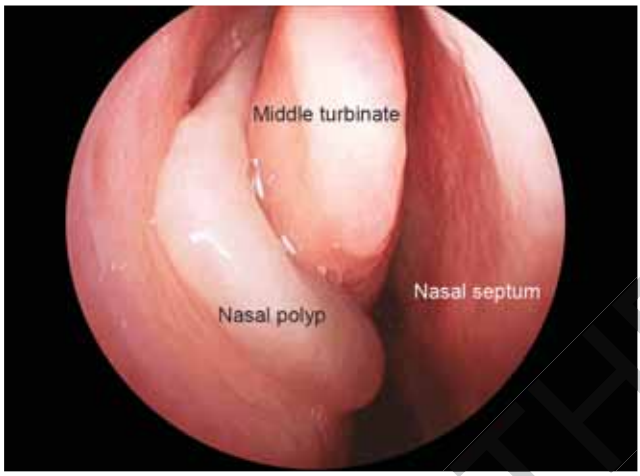


Fig. 7: Nasal polyp.
Source: [online] Available from https://b35-2508914.smushcdn.com/2508914/wp-content/uploads/2021/08/image019.png?lossy=1&strip=1&webp=1 [Last accessed July, 2024].

TABLE 2: Pattern of rhinitis.

Feature	***Seasonal allergic***	***Perennial allergic***	***Nonallergic***
Symptoms	Rhinorrhea, sneezing, itchy nose, watery and itchy eyes	Rhinorrhea, sneezing, itchy nose, watery and itchy eyes	Nasal blockage and postnasal drainage prominent
Other atopic diseases	Common	Common	Less common
Age of onset	Most before 20 years	Most before 20 years	Over 20 years
Timings	During affected seasons only	Throughout the year	Perennial, can coexist with allergic rhinitis
Triggers	Grass cutting, windy weather, walking out of house, walking through parks, gardening	Vacuuming, dry dusting, pet exposure, opening old cupboards	• No readily identifiable aeroallergens • *Respiratory irritants:* Cigarette smoking, strong scents, fragrances • *Weather changes:* Temperature, humidity • *Others:* Spicy foods, medications, infections
Likely allergens	Grass, weed, tree, pollens	House dust mite, cats, dogs, fungus	None

Source: Gupta N. Allergy in a Nutshell, Kindle edition. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd.; 2019. p. 83.

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Fig. 8: Dennie–Morgan lines.
Source: [online] Available from https://upload.wikimedia.org/wikipedia/commons/8/83/Dennie-Morgan-Falte.jpg [Last accessed July, 2024].

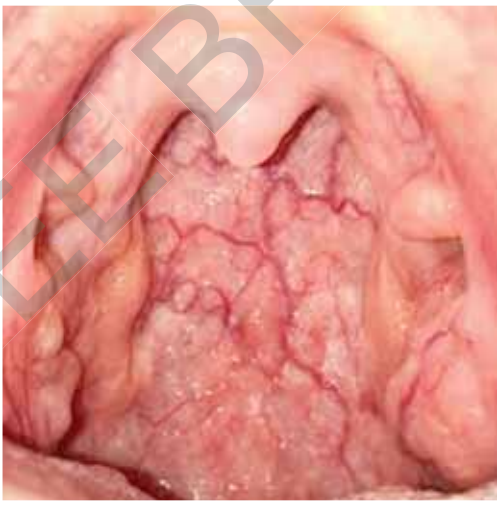


Fig. 9: Cobblestone appearance of pharynx.
Source: [online] Available from https://qph.cf2.quoracdn.net/main-qimg-049d80380c58589c8c126483c29e8d96-lq [Last accessed July, 2024].

Chest

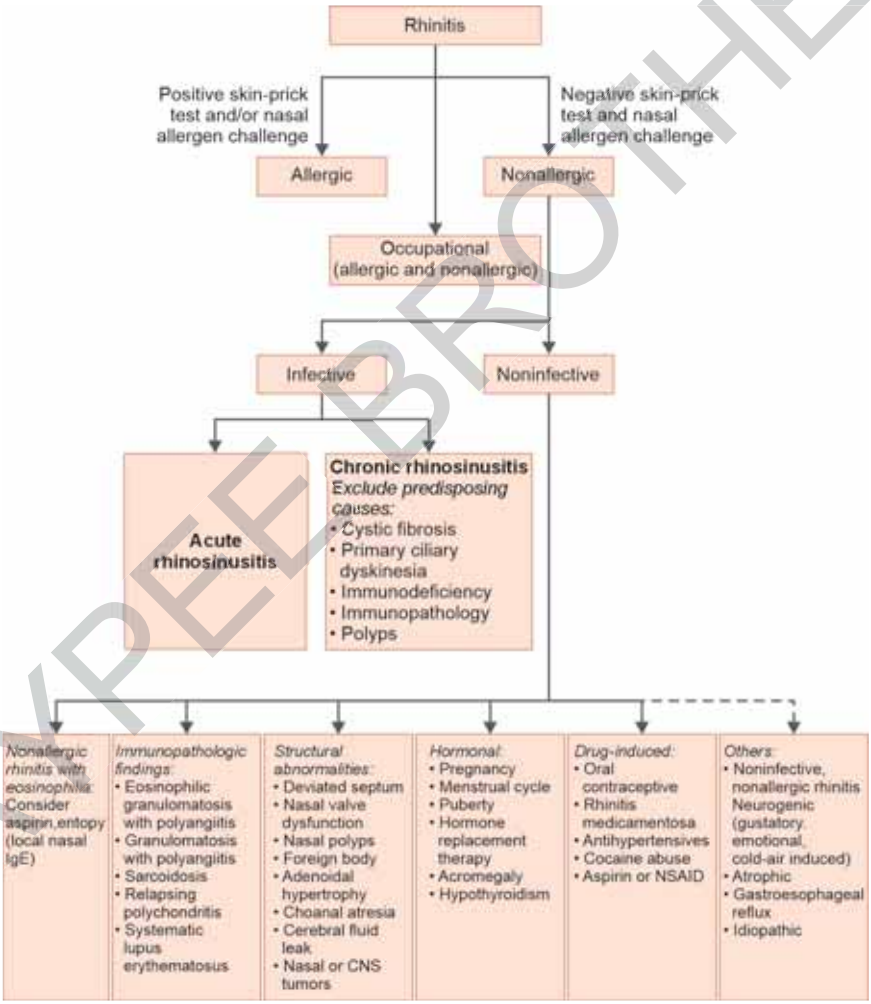
Examine the chest for wheezing, crackles, pronged expiratory phase, use of accessory muscles, hyperinflation, and rubs.

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SYSTEMIC EXAMINATION

Search for any signs of systemic diseases which also have nasal symptoms, such as cystic fibrosis, immunodeficiency, primary ciliary dyskinesia, thyroid disorders, rheumatic disorders, examination of skin, cardiovascular system, and abdomen and central nervous system (CNS) should be part of systemic examination **(Flowchart 1)**.

Flowchart 1: Diagnostic algorithm for rhinitis.



(CNS: central nervous system; IgE: immunoglobulin E; NSAID: nonsteroidal anti-inflammatory drug)

Source: Adapted from Greiner AN, Hellings PW, Rotiroti G, Scadding GK. Allergic rhinitis. Lancet. 2011;378(9809):2112-22.

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SUMMARY

History taking and physical examination help the clinician to diagnose allergic rhinitis, differentiate between allergic and nonallergic rhinitis, categorize it and thus guide in the formulation of treatment strategy and plan.

KEY POINTS

- Allergic rhinitis is the diagnosis based on history. Therefore, history taking is pivotal in the management.
- The typical spectrum of symptoms in allergic rhinitis includes nasal blockage and itching, sneezing, nasal discharge, postnasal drip and conjunctival redness, and itching.
- History should include detailing of environmental history, drug history, social history, and family history as well as seasonality, location of symptoms, triggering factors, and response to earlier medications.
- Examination should not only aid in diagnosis of allergic rhinitis but also should aim at identifying comorbidities.

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A Handbook on Allergic Rhinitis

Salient Features

- *Comprehensive coverage:* The handbook provides an in-depth exploration of allergic rhinitis, including its epidemiology, pathophysiology, diagnostic methods, and treatment options, ensuring a well-rounded understanding of the condition
- *Evidence-based insights:* Each chapter is grounded in the latest research and clinical guidelines, offering evidence-based insights and recommendations for effective management of allergic rhinitis
- *Patient-centered approach:* Emphasizing the importance of individualized care, the book includes strategies for tailoring treatment plans to meet the unique needs of each patient and enhancing outcomes and quality of life
- *Practical applications:* The inclusion of case studies, clinical scenarios, and practical tips bridges the gap between theory and practice, providing readers with actionable knowledge that can be directly applied in clinical settings
- *Interdisciplinary perspectives:* Contributions from experts in various fields, including immunology, otolaryngology, and primary care, offer diverse perspectives and a holistic approach to understanding and managing allergic rhinitis
- *Accessible language:* Written in clear, accessible language, the handbook is designed to be a valuable resource for healthcare professionals, medical students, patients, and caregivers alike
- *Visual aids and illustrations:* Richly illustrated with diagrams, flowcharts, and images, the book enhances comprehension and retention of complex concepts, making it easier to visualize and understand the underlying mechanisms and treatment strategies.



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