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Rhinitis

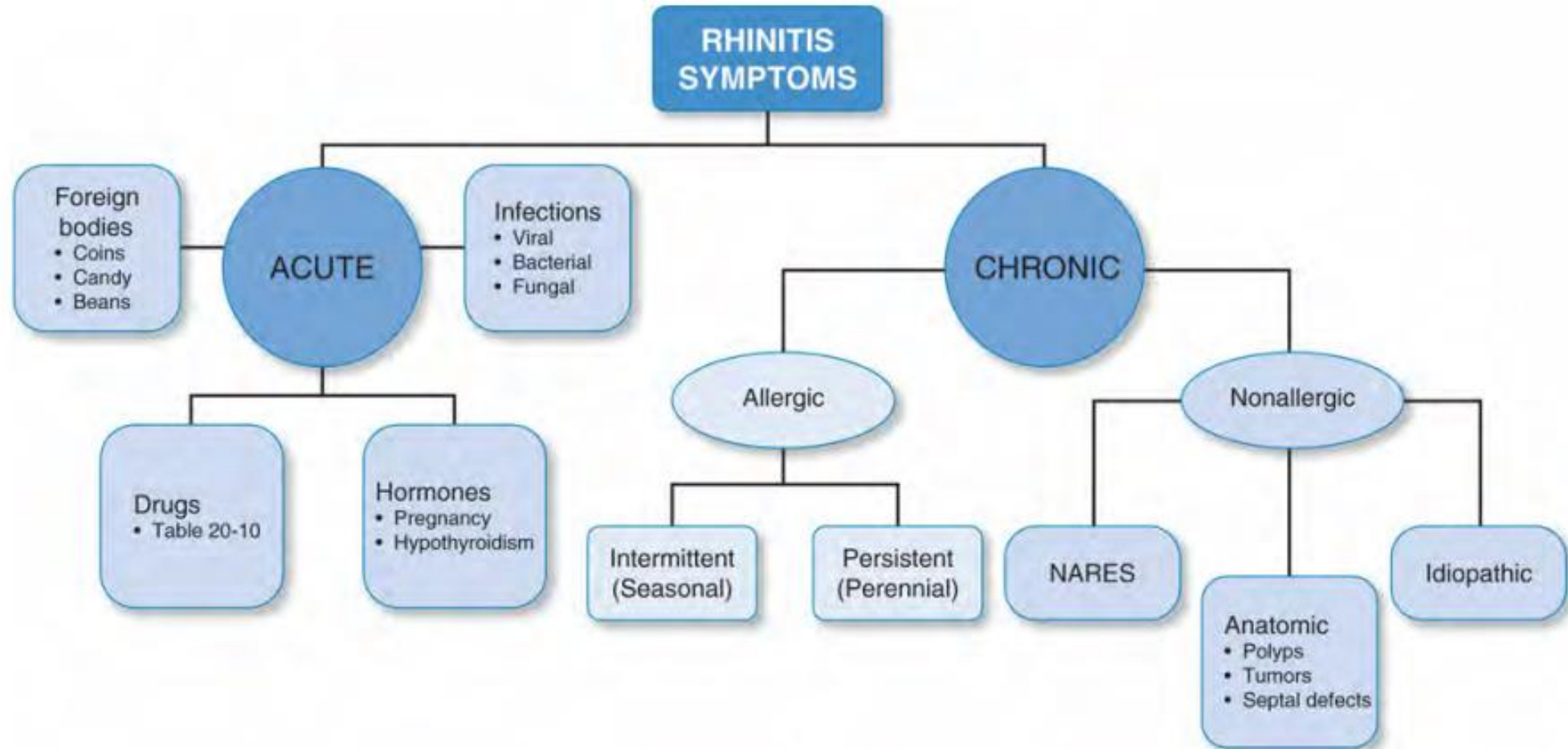
Rhinitis

- Rhinitis is defined as an **inflammatory condition** affecting the **mucous membranes** of the **nose** and **upper respiratory system**



- In clinical practice, however, the term is used broadly to encompass a heterogeneous group of nasal disorders characterized by periods of rhinorrhea (nasal discharge), pruritus (itching), sneezing, congestion, and postnasal drainage (postnasal drip)

CAUSES AND CLASSIFICATIONS




- **NARES:** Nonallergic Rhinitis with Eosinophilia Syndrome

Table 11–12 Causes of Nonallergic Rhinitis

Hormonal
Pregnancy, puberty, thyroid disorders
Structural
Septal deviation, adenoid hypertrophy
Drug-Induced
Cocaine, beta blockers, ACEIs, chlorpromazine, clonidine, reserpine, hydralazine, oral contraceptives, aspirin or other NSAIDs, overuse of topical decongestants
Systemic Inflammatory
Eosinophilic nonallergic rhinitis (NARES)
Lesions
Nasal polyps, neoplasms
Traumatic
Recent facial or head trauma
Autonomic (Vasomotor)
Age-related; physical or chemical agent causing parasympathetic hyperactivity

Local Inflammatory Mechanisms
Aspirin
Nonsteroidal anti-inflammatory drugs
Neurogenic Mechanisms
Centrally Acting Sympatholytics
Clonidine
Methyldopa
Reserpine
Peripherally Acting Sympatholytics
Prazosin
Guanethidine
Doxazosin
Phentolamine
Vasodilators
Sildenafil
Tadalafil
Vardenafil

Idiopathic Mechanisms
Antihypertensives
Amiloride
Angiotensin-converting enzyme inhibitor class
β -Blocker class
Calcium-channel blockers
Chlorothiazide
Hydralazine
Hydrochlorothiazide
Hormonal Products
Exogenous estrogens
Oral contraceptives
Neuropsychotherapeutic Agents
Alprazolam
Amitriptyline
Chlordiazepoxide
Chlorpromazine
Gabapentin
Risperidone
Perphenazine
Thioridazine

Intermittent ^a Disease	Persistent ^b Disease
Symptoms occur: Fewer than 4 days/week <i>or</i> for fewer than 4 weeks	Symptoms occur: At least 4 days/week <i>and</i> for at least 4 weeks
	
Mild	Moderate–Severe
All of the following:	At least <i>one</i> of the following:
• Normal sleep	• Impaired sleep
• No impairment of usual daily activities, sports, and leisure	• Impairment of daily activities, sports, and leisure
• No interference with work or school	• Interference at work or school
• No troublesome symptoms	• Troublesome symptoms

^aFormerly “seasonal” symptoms.

^bFormerly “perennial” symptoms.

Episodic	
Symptoms occur if an individual is in contact with an exposure that is not normally a part of the individual's environment. (i.e., a cat at a friend's house).	Can be mild, moderate, or severe—based on symptoms

Epidemiology

- Incidence and prevalence rates for rhinitis are difficult to quantify because the condition is often undiagnosed, different definitions are used, and data collection methods vary

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Incidence

- An estimated 8% of adults and 10% of children in the United States are newly diagnosed with allergic rhinitis annually

Prevalence

- A conservative estimate suggests that the prevalence of allergic rhinitis is approximately 15% (via physician diagnosis), but it may be as high as up to 30% in adults (and even more children), based on self-reported nasal symptoms making it the **fifth most common chronic illness** in the United States

IMPACT

- Rhinitis can lead to poor sleep, decreased work productivity, headache or fatigue, irritability, and rhinitis patients are typically less attentive in school because of decreased concentration, and difficulty learning
- It is estimated that 10.7 million workdays are missed because of allergic rhinitis in the United States per year

IMPACT

- **Annual direct costs** (e.g., medications, office visits) are estimated to be **\$3.4 billion**.
- **Addition of indirect costs** (e.g., related to work and school absenteeism) increases this estimate to **\$11 billion**

- A patient with allergic rhinitis will **visit** the **provider approximately three more times per year** and fill **nine more prescriptions yearly** compared to a patient without rhinitis



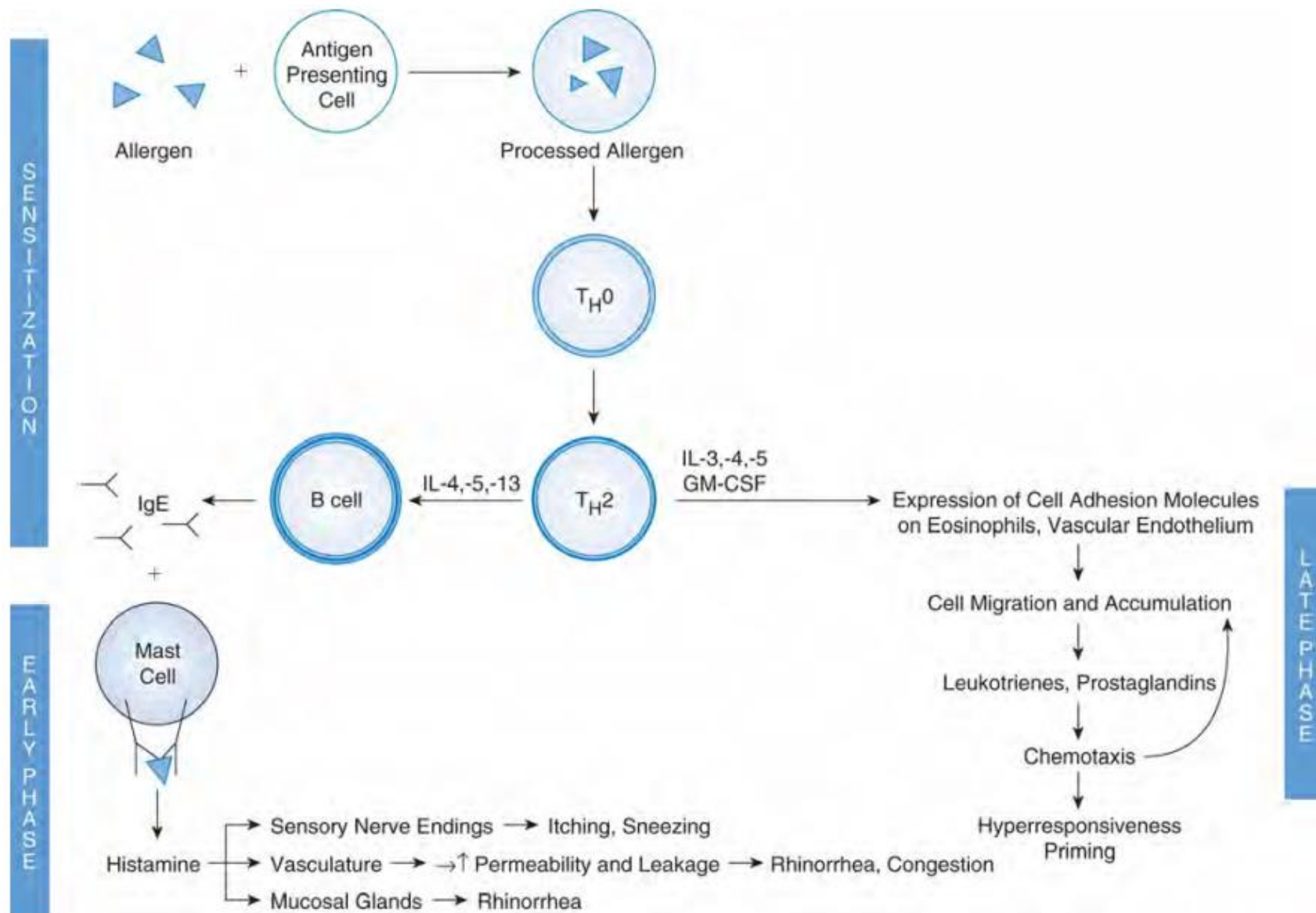
PATHOPHYSIOLOGY

PATHOPHYSIOLOGY

- “one airway, one disease.”
- Numerous areas of **commonality** with pathogenesis of **asthma**
- Rhinitis is a known **risk factor** for **asthma**

PATHOPHYSIOLOGY

- IgE-mediated response that involves three primary steps:
 - Sensitization
 - Early-phase events
 - Late-phase events



Risk factors

- Family history of atopy (allergic disorders) in one or both parents
- Filaggrin (skin barrier protein) gene mutation
- Elevated serum IgE greater than 100 IU/mL before the age of 6 years
- Higher socioeconomic level
- Eczema
- Positive reaction to allergy skin tests

Risk factors

- **Diet** may be a **risk factor** in children and adolescents
- Three or more **fast-food** meals per week showed an increased incidence of allergic disorders  **trans fatty acids**

Triggers

- Common outdoor aeroallergens (airborne environmental allergens) include **pollen** and **mold spores**.
- **Pollutants** (e.g., ozone, tobacco smoke, diesel exhaust particles)

Triggers

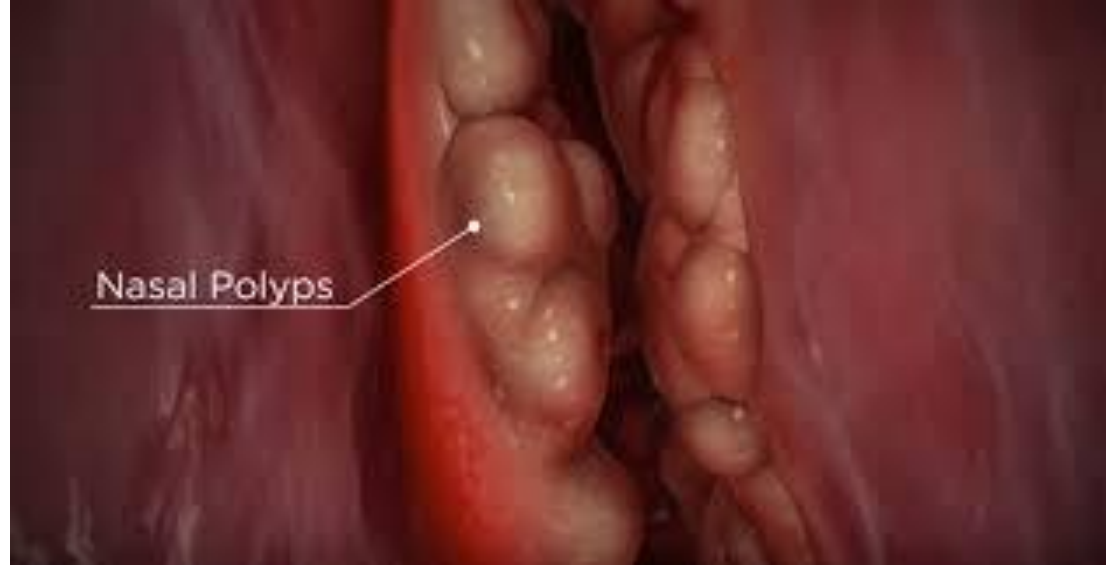
- Common indoor aeroallergens include those from house-dust mites and cockroaches, mold spores, and pet dander.
- Occupational aeroallergens include wool dust, latex, resins, biologic enzymes, organic dusts (e.g., flour), and various chemicals (e.g., isocyanate, glutaraldehyde).

Clinical Presentation of Allergic Rhinitis

<i>Symptoms/Findings</i>	<i>Allergic Rhinitis</i>	<i>Nonallergic Rhinitis^a</i>
Symptom presentation	Bilateral symptoms that are worst upon awakening, subside during the day, then may worsen at night	Unilateral symptoms common but can be bilateral; constant day and night
<div> <div>Sneezing</div> <div>Rhinorrhea</div> </div>	<div> <div>Frequent, paroxysmal</div> <div>Anterior, watery</div> </div>	<div> <div>Little or none</div> <div>Posterior, watery or thick and/or mucopurulent (associated with an infection)</div> </div>
Pruritus (itching) of eyes, nose, and/or palate	Frequent	Not present

<i>Symptoms/Findings</i>	<i>Allergic Rhinitis</i>	<i>Nonallergic Rhinitis^a</i>
Nasal obstruction	Variable	Usually present and often severe
Conjunctivitis (red, irritated eyes with prominent conjunctival blood vessels)	Frequent	Not present
Pain	Sinus pain due to congestion may be present; throat pain due to postnasal drip irritation may be present.	Variable depending on cause
Anosmia	Rare	Frequent
Epistaxis	Rare	Recurrent

<i>Symptoms/Findings</i>	<i>Allergic Rhinitis</i>	<i>Nonallergic Rhinitis^a</i>
Facial, nasal, or throat features	<p>“Allergic shiners” (periorbital darkening secondary to venous congestion)</p> <p>“Dennie’s lines” (wrinkles beneath the lower eyelids)</p> <p>“Allergic crease” (horizontal crease just above bulbar portion of the nose secondary to the “allergic salute”)</p> <p>“Allergic salute” (patient will rub the tip of the nose upward with the palm of the hand)</p> <p>“Allergic gape” (open-mouth breathing secondary to nasal obstruction)</p> <p>Nonexudative cobblestone appearance of posterior oropharynx</p>	<p>Nasal polyps</p> <p>Nasal septal deviation</p> <p>Enlarged tonsils and/or adenoids</p>



Systemic symptoms

- Systemic symptoms include:
- Fatigue
- Irritability
- Malaise
- Cognitive impairment

Complications of allergic rhinitis

Acute complications

- Sinusitis
- Otitis media with effusion

Complications of a chronic nature

- Nasal polyps
- Sleep apnea
- Sinusitis
- Hyposmia (diminished sense of smell)

Complications of a chronic nature

- **Asthma:**
 - Allergic rhinitis and **asthma** share a **common pathology**, and allergic rhinitis has been implicated in the **development of asthma** and in **exacerbations of preexisting asthma** in children and adults.
- **Depression, anxiety, delayed speech development,** and **facial or dental abnormalities** have also been linked to allergic rhinitis

Diagnosis

- **Diagnostic criteria suggestive** of allergic rhinitis include:
 - Nasal itching
 - Sneezing
 - Nasal congestion
 - Clear rhinorrhea
 - occasionally a decreased sense of smell
 - Symptoms of allergic **conjunctivitis** (itchy, watery eyes)

- Persistent congestion and/or rhinorrhea in response to nonallergic triggers like:
 - Weather changes
 - Perfumes/odors
 - Smoke/fumes
- are consistent with nonallergic rhinitis

- Clinicians should make the clinical diagnosis of AR when patients present with a **history** and **physical exam consistent** with an **allergic cause** and one or more of the following symptoms:
 - Nasal congestion
 - Runny nose
 - Itchy nose
 - Sneezing

Treatment of Allergic Rhinitis

Treatment Goals

- To reduce symptoms and to improve the patient's functional status and sense of well-being.
- Treatment is individualized to provide optimal symptomatic relief and/or control

General Treatment Approach

- Allergic rhinitis is treated in three steps:
 - Allergen avoidance
 - Pharmacotherapy
 - Immunotherapy

- Patient education


- Patient education is an important part of all three steps, especially regarding continuous allergen avoidance and the administration of nonprescription medications

- When to start pharmacotherapy?
- Because **allergen avoidance alone** typically is **not sufficient** to provide complete relief of allergic rhinitis, targeted therapy with **single-entity drugs** is **usually initiated**

- Nonprescription therapy with:
 - Intranasal corticosteroids (INCS)
 - Antihistamines
 - Decongestants
- usually can control most symptoms

Nonpharmacologic Therapy

Allergen avoidance

- Reducing the mite population  lowering the household humidity to less than 40%, applying acaricides, and reducing mite-harboring dust by removing carpets, upholstered furniture, stuffed animals, and bookshelves from the patient's bedroom and other rooms if possible

- Mite populations in bedding are reduced by encasing the mattress, box springs, and pillows with mite-impermeable materials
- Bedding that can not be encased should be washed at least weekly in hot (131°F [55°C]) water.
- Bedding that can not be encased or laundered should be discarded



Outdoor mold spores

- Outdoor mold spores are prevalent in late summer and fall, especially on calm, clear, dry days

- **Avoiding** activities that **disturb decaying plant material** (e.g., raking leaves) lessens exposure to outdoor mold

□ Indoor mold exposure is minimized by:

- Lowering household **humidity**
- Removing **houseplants**
- **Venting** food preparation areas and bathrooms
- **Repairing** damp basements or crawl spaces
- Frequently applying **fungicide** to obviously moldy areas

- **Cat-derived allergens** (the Fel d1 family of proteins, secreted through **sebaceous glands in the skin**) are small and light, and they **stay airborne for several hours**.
- Cat allergens can be found in the home **months after the cat is removed**. Although unproven, **weekly cat baths** may reduce the allergen load



- **Cockroaches** are a major source of urban allergens; their **saliva**, **feces**, and **body parts** all have been implicated.
- To eliminate cockroaches, patients should be encouraged to:
 - keep kitchen areas clean
 - keep stored food tightly sealed
 - Treat infested areas with baits or pesticides

- Pollutants (e.g., ozone, diesel fumes)
- Patients whose allergies are triggered by air pollutants should be aware of the **air quality index (AQI)**, (a measure of five major air pollutants per 24 hours) and should plan **outdoor activities when the AQI is low**

- Weekly vacuuming of carpets, drapes, and upholstery with a HEPA filter– equipped vacuum cleaner

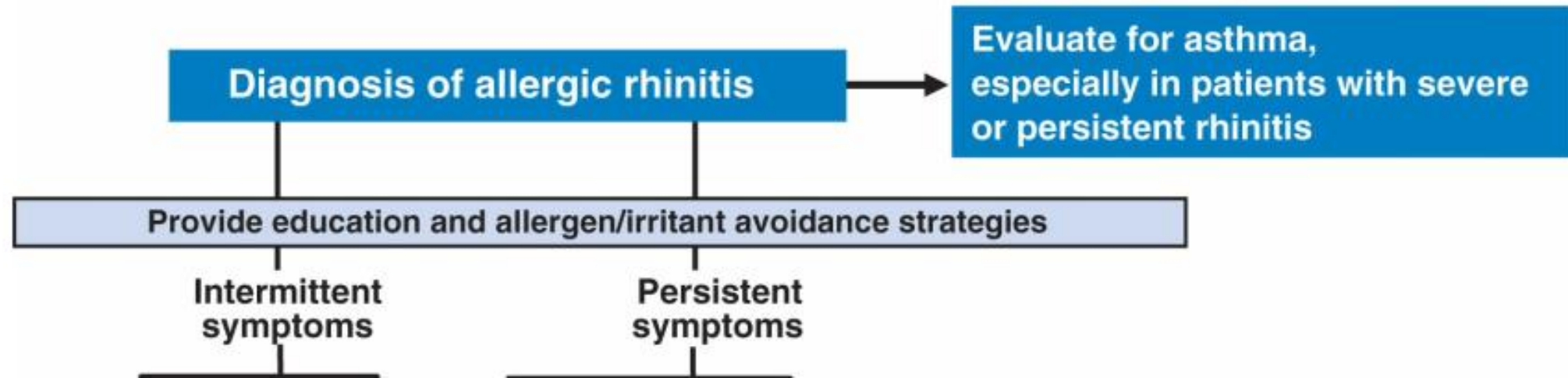


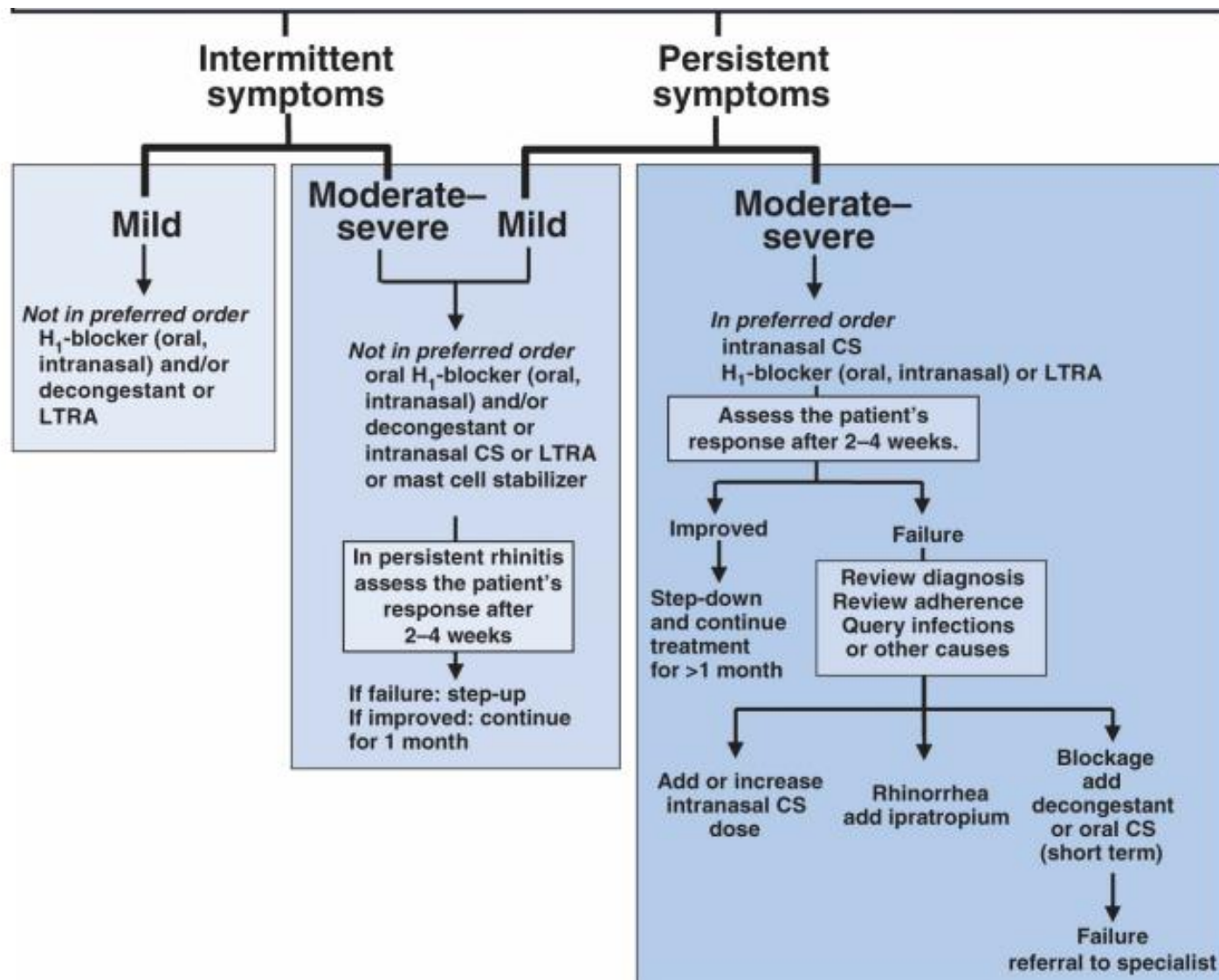
- **Nasal wetting agents** (e.g., saline, propylene, polyethylene glycol sprays, gels) or nasal irrigation with warm saline (isotonic or hypertonic) delivered using a syringe or Neti pot may **relieve nasal mucosal irritation and dryness**



- Only distilled, sterile, or boiled tap water should be used to prepare nasal irrigation solutions

Pharmacologic Therapy





If conjunctivitis

Add

H₁-blocker (intraocular, oral)
or intraocular mast cell stabilizer
or intraocular saline

Consider specific immunotherapy

- INCS, antihistamines, and mast cell stabilizers should be used regularly rather than episodically

- With these products, patients should start taking the medication at least 1 week before symptoms typically appear or as soon as possible before expected allergen exposures

- Length of therapy with those medications should be individualized according to duration and severity of symptoms, pattern of allergen exposure (episodic or continuous), and geographic location

INCS

- INCS has been shown to be the **most effective** treatment for **most symptoms** of allergic rhinitis (itching, rhinitis, sneezing, and congestion)

Effectiveness of Agents^a Used in the Management of Allergic Rhinitis

	Rhinorrhea	Nasal Pruritus	Sneezing	Nasal Congestion	Eye Symptoms	Onset
Corticosteroids						
Nasal	High	High	High	High	High	Slow (days)
Ophthalmic	0	0	0	0	High	Slow (days)

- Until 2013, INCS were available only by prescription, but **four nonprescription** intranasal preparations are now offered:
 - Budesonide,
 - Fluticasone furoate
 - Fluticasone propionate
 - Triamcinolone acetonide

<i>Drug</i>	<i>Brand Name</i>	<i>Strength</i>	<i>Dosage^a</i>
Budesonide	Rhinocort Allergy Spray	32 mcg/spray	<i>Adults and children ≥12 years:</i> Use 2 sprays in each nostril once daily; once allergy symptoms improve, reduce to 1 spray in each nostril per day.
			<i>Children 6–11 years:</i> Use 1 spray in each nostril once daily; if allergy symptoms do not improve,

may increase to 2 sprays in each nostril per day.
Once allergy symptoms improve, reduce to 1 spray in each nostril per day.

Children <6 years: Do not use.

[Fluticasone furoate	Flonase Sensimist	27.5 mcg/spray	<i>Adults and children ≥ 12 years:</i> Week 1: Use 2 sprays in each nostril once daily. Weeks 2–26: Use 1 or 2 sprays in each nostril once daily. After 26 weeks of daily use without improvement, consult an HCP.]
		Children's Flonase Sensimist		<i>Children 2–11 years:</i> Use 1 spray in each nostril once daily. After 8 weeks of daily use without improvement, consult an HCP. <i>Child <2 years:</i> Do not use.	

Fluticasone
propionate

Flonase
Allergy Relief

50
mcg/spray

Adults and children ≥ 12 years: Week 1: Use 2 sprays in each nostril once daily. Weeks 2–26: Use 1 or 2 sprays in each nostril once daily. After 26 weeks of daily use without improvement, consult an HCP.

Children's
Flonase
Allergy Relief

Children 4–11 years: Use 1 spray in each nostril once daily. After 8 weeks of daily use, consult a health care provider.

Child <4 years: Do not use.

Triamcinolone
acetonide

Nasacort
Allergy 24HR

55
mcg/spray

Adults and children ≥ 12 years: Use 2 sprays in each nostril once daily; once allergy symptoms decrease, reduce to 1 spray in each nostril per day.

Children's
Nasacort
Allergy 24HR

Children 6–11 years: Use 1 spray in each nostril once daily; if allergy symptoms do not subside, may increase to 2 sprays in each nostril per day. Once allergy symptoms decrease, reduce to 1 spray in each nostril per day.

Children 12–17 years: Use 1 spray in each nostril once daily.

Children < 2 years: Do not use.

Adverse effects

- INCS usually are **well tolerated**.
- Adverse effects typically are **minor** and include **nasal discomfort** or **bleeding, sneezing, cough, and pharyngitis**.

Adverse effects

- INCS have **low systemic absorption**, however; patients who are **sensitive to INCS** or **use higher-than-recommended doses** may experience systemic effects such as **headache**, **dizziness**, **nausea**, and **vomiting**.
- Additionally, **long-term use** has been linked to **changes in vision**, **glaucoma**, **cataracts**, increased risk of **infection** (e.g., *Candida*), and **growth inhibition** in children.

Antihistamines

- **Sedating** (first-generation, nonselective)
- **Non-sedating** (second-generation, peripherally selective)

Sedating antihistamines

- Adv & disadv ?
- The role of sedating antihistamines in treating allergic rhinitis is controversial
- Risks of anticholinergic effects?

Non-sedating antihistamines

- second-generation antihistamines inhibit the release of mast cell mediators and may decrease cellular recruitment.

Effectiveness of Agents^a Used in the Management of Allergic Rhinitis

	Rhinorrhea	Nasal Pruritus	Sneezing	Nasal Congestion	Eye Symptoms	Onset
Antihistamines						
Nasal	Moderate	High	High	Moderate	0	Rapid
Ophthalmic	0	0	0	0	Moderate	Rapid
Oral	Moderate	High	High	0/Low	Low	Rapid

Drug	Dosage^a (maximum daily dosage)		
	Adults/Children ≥12 Years	Children 6 to <12 Years	Children 2 to <6 Years^b
Brompheniramine maleate	4 mg every 4–6 hours (24 mg)	2 mg every 4–6 hours (12 mg)	1 mg every 4–6 hours (6 mg)
Cetirizine HCl ^c	10 mg every 24 hours (10 mg)	5–10 mg every 24 hours (10 mg)	2.5 mg every 12 hours or 2.5–5.0 mg every 24 hours (5 mg)
Chlorcyclizine HCl ^d	25 mg every 6–8 hours (75 mg)	Not recommended for children <12 years except under advice of PCP	—
Chlorpheniramine maleate	4 mg every 4–6 hours (24 mg)	2 mg every 4–6 hours (12 mg)	1 mg every 4–6 hours (6 mg)
Dexbrompheniramine maleate	2 mg every 4–6 hours (12 mg)	1 mg every 4–6 hours (6 mg)	0.5 mg every 4–6 hours (3 mg)
Dexchlorpheniramine maleate	2 mg every 4–6 hours (12 mg)	1 mg every 4–6 hours (6 mg)	0.5 mg every 4–6 hours (3 mg)
Diphenhydramine citrate	38–76 mg every 4–6 hours (456 mg)	19–38 mg every 4–6 hours (228 mg)	9.5 mg every 4–6 hours (57 mg)

Drug	Dosage^a (maximum daily dosage)		
	Adults/Children ≥12 Years	Children 6 to <12 Years	Children 2 to <6 Years^b
Diphenhydramine HCl	25–50 mg every 4–6 hours (300 mg)	12.5–25 mg every 4–6 hours (150 mg)	6.25 mg every 4–6 hours (37.5 mg)
Doxylamine succinate	7.5–12.5 mg every 4–6 hours (75 mg)	3.75–6.25 mg every 4–6 hours (37.5 mg)	1.9–3.125 mg every 4–6 hours (18.75 mg)
Fexofenadine ^e	60 mg every 12 hours or 180 mg every 24 hours (180 mg)	30 mg every 12 hours (60 mg)	30 mg every 12 hours (60 mg)
Levocetirizine ^e	5 mg every 24 hours (5 mg)	2.5 mg every 24 hours (2.5 mg)	1.25 mg every 24 hours (1.25 mg)
Loratadine	10 mg every 24 hours (10 mg)	10 mg every 24 hours (10 mg)	5 mg every 24 hours (5 mg)
Phenindamine tartrate ^d	25 mg every 4–6 hours (150 mg)	12.5 mg every 4–6 hours (75 mg)	6.25 mg every 4–6 hours (37.5 mg)
Pheniramine maleate	12.5–25 mg every 4–6 hours (150 mg)	6.25–12.5 mg every 4–6 hours (75 mg)	3.125–6.25 mg every 4–6 hours (37.5 mg)

Drug	Dosage^a (maximum daily dosage)		
	Adults/Children ≥12 Years	Children 6 to <12 Years	Children 2 to <6 Years^b
Pyrilamine maleate	25–50 mg every 6–8 hours (200 mg)	12.5–25 mg every 6–8 hours (100 mg)	6.25–12.5 mg every 6–8 hours (50 mg)
Thonzylamine HCl ^d	50–100 mg every 4–6 hours (600 mg)	25–50 mg every 4–6 hours (300 mg)	12.5–25.0 mg every 4–6 hours (150 mg)
Tripolidine HCl ^d	2.5 mg every 4–6 hours (10 mg)	1.25 mg every 4–6 hours (5 mg)	<p><i>Age 4–6 years:</i> 0.938 mg every 4–6 hours (3.744 mg)</p> <p><i>Age 2 to <4 years:</i> 0.625 mg every 4–6 hours (2.5 mg)</p> <p><i>Age 4 months to <2 years:</i> 0.313 mg every 4–6 hours (1.25 mg)</p>

Interaction with allergy skin testing

- All antihistamines decrease or prevent immediate dermal reactivity and should be discontinued at least 4 days before scheduled allergy skin testing

- Sedating antihistamines are **contraindicated** in:
- **newborns** or premature infants, **lactating** women, and patients with **narrow-angle glaucoma**. Additional contraindications include acute **asthma exacerbation**, **stenosing peptic ulcer**, symptomatic **prostatic hypertrophy**, bladder neck and pyloroduodenal obstruction, and concomitant use of **MAOIs**

- Patients with **lower respiratory tract diseases** (e.g., emphysema, chronic bronchitis) should use **sedating antihistamines with caution**.
- People whose **activities require mental alertness** should not use **sedating antihistamines** and should use levocetirizine and cetirizine with caution. Function may be impaired **even if the patient does not feel drowsy** or took the dose the **previous evening**.

- The sedating antihistamines are **photosensitizing** drugs. Patients should be advised to use **sunscreen** and to wear protective clothing

Cromolyn Sodium

Effectiveness of Agents^a Used in the Management of Allergic Rhinitis

	Rhinorrhea	Nasal Pruritus	Sneezing	Nasal Congestion	Eye Symptoms	Onset
Mast-cell stabilizers						
Nasal	Low	Low	Low	0/Low	Low	Slow (weeks)
Ophthalmic	Low	Low	Low	Low	Moderate	Slow (weeks)

Indication

- Mast cell stabilizer
- Preventing and treating the symptoms of allergic rhinitis

Pharmacokinetic

- **Absorption:** Less than 7% of an intranasal cromolyn dose is absorbed systemically, and what little is absorbed has no systemic activity
- **Elimination:** The absorbed drug is rapidly excreted unchanged in the feces and urine
- **Half-life:** 1–2 hours

Dose

- Cromolyn is approved for use in patients 2 years of age or older; the recommended dosage is:
 - 1 spray in each nostril 3–6 times daily at regular intervals

- Treatment is more effective if started before symptoms begin. It may take **3–7 days for initial clinical improvement** to become apparent and **2–4 weeks** of continued therapy to achieve **maximal therapeutic benefit**

ADR

- **Sneezing** is the most common adverse effect reported for intranasal cromolyn.
- Other adverse effects include **nasal stinging and burning**.

Drug interactions

- No drug interactions have been reported with intranasal cromolyn

Decongestants

Decongestants						
Nasal	0	0	0	High	0	Rapid
Ophthalmic	0	0	0	0	Moderate	Rapid
Oral	0	0	0	High	0	Rapid

Effectiveness of Agents^a Used in the Management of Allergic Rhinitis

	Rhinorrhea	Nasal Pruritus	Sneezing	Nasal Congestion	Eye Symptoms	Onset
Decongestants						
Nasal	0	0	0	High	0	Rapid
Ophthalmic	0	0	0	0	Moderate	Rapid
Oral	0	0	0	High	0	Rapid

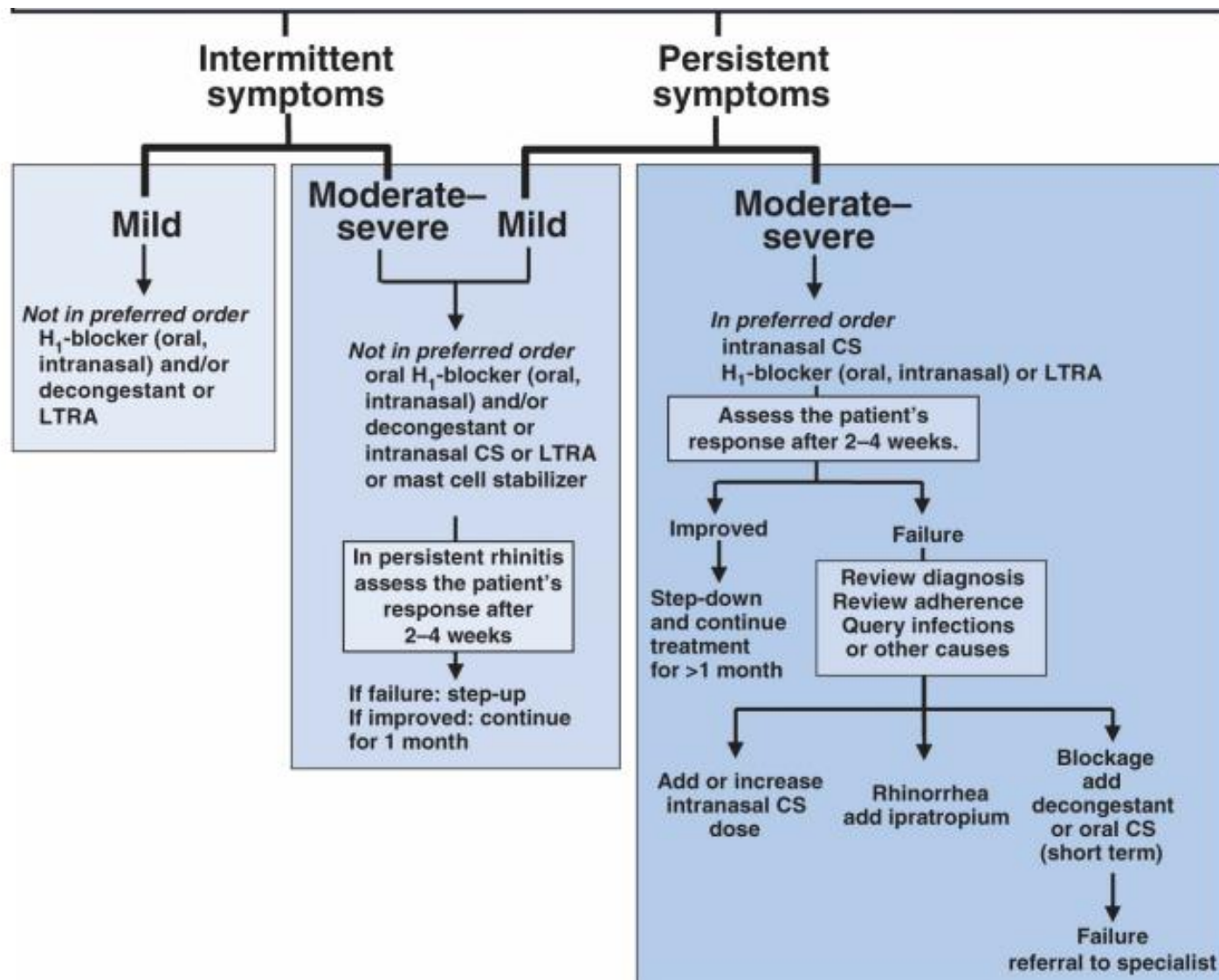
- Congestion is a common allergic rhinitis symptom controllable with systemic decongestants or with short-term (~5 days) use of topical nasal decongestants.


Pharmacotherapeutic Comparison

Effectiveness of Agents^a Used in the Management of Allergic Rhinitis

	Rhinorrhea	Nasal Pruritus	Sneezing	Nasal Congestion	Eye Symptoms	Onset
Antihistamines						
Nasal	Moderate	High	High	Moderate	0	Rapid
Ophthalmic	0	0	0	0	Moderate	Rapid
Oral	Moderate	High	High	0/Low	Low	Rapid
Decongestants						
Nasal	0	0	0	High	0	Rapid
Ophthalmic	0	0	0	0	Moderate	Rapid
Oral	0	0	0	High	0	Rapid
Corticosteroids						
Nasal	High	High	High	High	High	Slow (days)
Ophthalmic	0	0	0	0	High	Slow (days)
Mast-cell stabilizers						
Nasal	Low	Low	Low	0/Low	Low	Slow (weeks)
Ophthalmic	Low	Low	Low	Low	Moderate	Slow (weeks)
Anticholinergics						
Nasal	High	0	0	0	0	Rapid
Leukotriene Modifiers						
Oral	Low	0/Low	Low	Moderate	Low	Rapid



- Monotherapy Vs combination therapy ?
- First line?
- Oral or topical (nasal spray)?



- INCS have been shown to be the **most effective** agents for treatment of moderate–severe IAR and both types of PER
- INCS  first-line (monotherapy)

Monotherapy Vs combination therapy

- Agents with different mechanisms of action or delivery systems may be added if single-drug therapy does not provide adequate relief, or if symptoms are already moderately severe, particularly intense, or long-lasting

- Oral antihistamines  first-choice agents for symptom control
in  episodic allergic rhinitis
- Sedating or nonsedating?

- **Cetirizine** has been shown to be a **more potent** antihistamine than either loratadine or fexofenadine. However, unlike loratadine and fexofenadine, cetirizine causes **sedation** (in approximately **10%** of patients)

Product Selection Guidelines

Special Populations

- **Pregnancy**
- **Lactation**

Pregnancy

- Because pregnancy is a common cause of nonallergic rhinitis, pregnant women should be referred for differential diagnosis
- Intranasal cromolyn?
- Antihistamines?
- INCS ?
- Systemic corticosteroid?

Pregnancy

- Intranasal cromolyn is considered compatible with pregnancy and is a first-line option
- Because of minimal systemic absorption, **INCS** are considered **compatible** with pregnancy
- **Systemic corticosteroid** has been linked to **cleft lip** and **palate** and **low birth weight**

- Nonprescription allergy products do not appear to affect male reproduction

Lactation

- Intranasal cromolyn?
- Antihistamines?
- INCS ?
- Systemic corticosteroid?

Lactation

- Intranasal cromolyn is a good choice, and adverse effects in nursing infants have not been reported
- INCS have low molecular weights and are thought to be excreted in breast milk. Reports of INCS causing harm in nursing infants are lacking, however, and they are considered “probably compatible
- Antihistamines are contraindicated during lactation because of their ability to pass into breast milk

Lactation

- If an oral antihistamine is used during lactation, the mother should avoid long-acting and high-dose antihistamines and should take the dose at bedtime after the last feeding of the day

Children

- Because of concerns regarding undiagnosed asthma, children younger than 12 years should be referred to a PCP for differential diagnosis
- Relationship between INCS and growth inhibition?
- FDA-mandated **labeling for the nonprescription products** encourages parents to **speak to an HCP** if they plan to use these products in children for **longer than 2 months per year**

Tolerance to antihistamines?

- Some patients report that antihistamines are less effective after prolonged use?
- This decline is most likely not indicative of true tolerance but rather stems from several factors, including patient nonadherence to dosing regimens, an increase in antigen exposure, worsening of disease, limited effectiveness of antihistamines in severe disease, or the development of similar symptoms from unrelated diseases.

- **Switching** between different classes of **antihistamines**?
- Chemical class differences make it **reasonable** to suggest switching to a different class of antihistamine if a patient has a **less-than-optimal response to one class of antihistamine**

Complementary Therapies

- Ephedra (ma huang) and feverfew?
- Ephedra (ma huang)  banned by FDA owing to their serious adverse effects (e.g., stroke)

Exclusions for Self-Treatment

- Children <12 years^a
- Pregnant or lactating women^a
- Symptoms of nonallergic rhinitis (see Table 11-12)
- Symptoms of otitis media, sinusitis, bronchitis, or other infection
- Symptoms of undiagnosed or uncontrolled asthma (e.g., wheezing, shortness of breath), COPD, or other lower respiratory disorder
- Moderate-to-severe persistent allergic rhinitis or symptoms unresponsive to treatment
- Severe or unacceptable side effects of treatment

^a Excluded from self-treatment unless already diagnosed with allergic rhinitis and nonprescription therapy approved by a PCP.

Source: Reference 39.

Effectiveness of Agents^a Used in the Management of Allergic Rhinitis

	Rhinorrhea	Nasal Pruritus	Sneezing	Nasal Congestion	Eye Symptoms	Onset
Antihistamines						
Nasal	Moderate	High	High	Moderate	0	Rapid
Ophthalmic	0	0	0	0	Moderate	Rapid
Oral	Moderate	High	High	0/Low	Low	Rapid
Decongestants						
Nasal	0	0	0	High	0	Rapid
Ophthalmic	0	0	0	0	Moderate	Rapid
Oral	0	0	0	High	0	Rapid
Corticosteroids						
Nasal	High	High	High	High	High	Slow (days)
Ophthalmic	0	0	0	0	High	Slow (days)
Mast-cell stabilizers						
Nasal	Low	Low	Low	0/Low	Low	Slow (weeks)
Ophthalmic	Low	Low	Low	Low	Moderate	Slow (weeks)
Anticholinergics						
Nasal	High	0	0	0	0	Rapid
Leukotriene Modifiers						
Oral	Low	0/Low	Low	Moderate	Low	Rapid

Clinical Practice Guideline: Allergic Rhinitis

Executive Summary

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STATEMENT 7. ORAL ANTIHISTAMINES: Clinicians should recommend oral second-generation/less sedating antihistamines for patients with allergic rhinitis and primary complaints of **sneezing** and **itching**. *Strong Recommendation based on randomized controlled trials with minor limitations and a preponderance of benefit over harm.*

Effectiveness of Agents^a Used in the Management of Allergic Rhinitis

	Rhinorrhea	Nasal Pruritus	Sneezing	Nasal Congestion	Eye Symptoms	Onset
Antihistamines						
Nasal	Moderate	High	High	Moderate	0	Rapid
Ophthalmic	0	0	0	0	Moderate	Rapid
Oral	Moderate	High	High	0/Low	Low	Rapid
Decongestants						
Nasal	0	0	0	High	0	Rapid
Ophthalmic	0	0	0	0	Moderate	Rapid
Oral	0	0	0	High	0	Rapid
Corticosteroids						
Nasal	High	High	High	High	High	Slow (days)
Ophthalmic	0	0	0	0	High	Slow (days)
Mast-cell stabilizers						
Nasal	Low	Low	Low	0/Low	Low	Slow (weeks)
Ophthalmic	Low	Low	Low	Low	Moderate	Slow (weeks)
Anticholinergics						
Nasal	High	0	0	0	0	Rapid
Leukotriene Modifiers						
Oral	Low	0/Low	Low	Moderate	Low	Rapid

STATEMENT 6. TOPICAL STEROIDS: Clinicians should recommend intranasal **steroids** for patients with a clinical diagnosis of allergic rhinitis whose symptoms **affect their quality of life** (QOL). *Strong Recommendation* based on randomized controlled trials with minor limitations and a preponderance of benefit over harm.

STATEMENT 8. INTRANASAL ANTIHISTAMINES:

Clinicians may offer intranasal antihistamines for patients

with seasonal, perennial, or episodic allergic rhinitis.

Option based on randomized controlled trials with minor limitations and observational studies, with equilibrium of benefit and harm.

Effectiveness of Agents^a Used in the Management of Allergic Rhinitis

	Rhinorrhea	Nasal Pruritus	Sneezing	Nasal Congestion	Eye Symptoms	Onset
Antihistamines						
Nasal	Moderate	High	High	Moderate	0	Rapid
Ophthalmic	0	0	0	0	Moderate	Rapid
Oral	Moderate	High	High	0/Low	Low	Rapid
Decongestants						
Nasal	0	0	0	High	0	Rapid
Ophthalmic	0	0	0	0	Moderate	Rapid
Oral	0	0	0	High	0	Rapid
Corticosteroids						
Nasal	High	High	High	High	High	Slow (days)
Ophthalmic	0	0	0	0	High	Slow (days)
Mast-cell stabilizers						
Nasal	Low	Low	Low	0/Low	Low	Slow (weeks)
Ophthalmic	Low	Low	Low	Low	Moderate	Slow (weeks)
Anticholinergics						
Nasal	High	0	0	0	0	Rapid
Leukotriene Modifiers						
Oral	Low	0/Low	Low	Moderate	Low	Rapid

STATEMENT 10. COMBINATION THERAPY:
Clinicians may offer combination pharmacologic therapy
in patients with allergic rhinitis who have inadequate
response to pharmacologic monotherapy. *Option based on*
randomized controlled trials with minor limitations and
observational studies, with equilibrium of benefit and harm.

STATEMENT 9. ORAL LEUKOTRIENE RECEPTOR ANTAGONISTS (LTRAs): Clinicians should *not* offer oral leukotriene receptor antagonists **as primary therapy** for patients with allergic rhinitis. Recommendation against based on randomized controlled trials and systematic reviews, with a preponderance of benefit over harm.

Effectiveness of Agents^a Used in the Management of Allergic Rhinitis

	Rhinorrhea	Nasal Pruritus	Sneezing	Nasal Congestion	Eye Symptoms	Onset
Antihistamines						
Nasal	Moderate	High	High	Moderate	0	Rapid
Ophthalmic	0	0	0	0	Moderate	Rapid
Oral	Moderate	High	High	0/Low	Low	Rapid
Decongestants						
Nasal	0	0	0	High	0	Rapid
Ophthalmic	0	0	0	0	Moderate	Rapid
Oral	0	0	0	High	0	Rapid
Corticosteroids						
Nasal	High	High	High	High	High	Slow (days)
Ophthalmic	0	0	0	0	High	Slow (days)
Mast-cell stabilizers						
Nasal	Low	Low	Low	0/Low	Low	Slow (weeks)
Ophthalmic	Low	Low	Low	Low	Moderate	Slow (weeks)
Anticholinergics						
Nasal	High	0	0	0	0	Rapid
Leukotriene Modifiers						
Oral	Low	0/Low	Low	Moderate	Low	Rapid

Thank you