Allergic Rhinitis

Allergic Rhinitis Guideline Team

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Patient population:
Adults and pediatrics

Objectives:
Assist in the diagnosis and cost-effective treatment of allergic rhinitis.

Key Aspects & Recommendations:

Diagnosis. Allergic rhinitis is an antigen-mediated inflammation of the nasal mucosa that may extend into the paranasal sinuses. Diagnosis is usually made by history and examination ("itchy, runny sneezy, stuffy"). A symptom diary and a trial of medication may be helpful to confirm a diagnosis. Allergy testing is not commonly needed to make the diagnosis, but may be helpful for patients with multiple potential allergen sensitivities

Therapy. The goal of therapy is to relieve symptoms.

1. Avoidance of allergens is the first step *[I A*]*. (See text for details). If avoidance fails:
2. An over-the-counter (OTC), non-sedating antihistamine (loratadine [Claritin], cetirizine ([Zyrtec], fexofenadine [Allegra]) should be tried initially. They provide relief in most cases. They prevent and relieve nasal itching, sneezing, and rhinorrhea, and ocular symptoms, but tend to be less effective for nasal congestion *[I A*]*. If symptoms persist consider the following options:
3. Other medications:
   - Intranasal corticosteroids (prescription only) are the most potent medications available for treating allergic rhinitis *[I A*]*. They control itching, sneezing, rhinorrhea, and stuffiness in most patients, and may help ocular symptoms. They have a relatively good long-term safety profile. Generic intranasal corticosteroids for adults and children are: fluticasone (Flonase), triamcinolone acetonide (Nasalcort AQ), and flunisolide (Nasarel).
   - Oral decongestants (OTC) decrease swelling of the nasal mucosa which, in turn, alleviates nasal congestion *[I A*]*. They can be combined with oral antihistamines or other agents. However, they are associated with appreciable side effects, especially in geriatric patients, and should only be considered when congestion is not controlled by other agents. They are contraindicated with monoamine oxidase inhibitors (MAOIs), in uncontrolled hypertension, and in severe coronary artery disease and benign prostatic hyperplasia (BPH).
   - Leukotriene inhibitors (prescription-only) are less effective than intranasal corticosteroids *[II A*]*. Consider using for patients who cannot tolerate first line agents or have co-morbid asthma.
   - Intranasal cromolyn (OTC) is less effective than intranasal corticosteroids *[II A*]*. Cromolyn is a good alternative for patients who are not candidates for corticosteroids. It is most effective when used regularly prior to the onset of allergic symptoms.
   - Intranasal antihistamines (azelastine), while effective in treating the nasal symptoms associated with seasonal and perennial rhinitis and nonallergic vasomotor rhinitis, offer no therapeutic benefit over conventional treatment and incur additional cost *[II A*]*.
   - Ocular preparations should be considered for patients with allergic conjunctivitis who are not adequately controlled with or cannot tolerate an oral antihistamine or high dose nasal steroids, which do provide some improvement in ocular symptoms *[II A*]*.

Referral. Appropriate criteria for referral may include identification of specific allergens through testing, intolerance to or failure of medical therapy, severe reactions, associated comorbid conditions, or desire for immunotherapy *[I D*]*.

Controversial Issues

Medication vs. immunotherapy. A formal cost-benefit analysis of medication therapy versus immunotherapy (allergy shots) has not been performed; however, patients with moderate to severe symptoms that continue year round (seasonal or perennial allergic rhinitis) may benefit most from immunotherapy *[II D*]*. Allergen immunotherapy can be cost effective in children with asthma.

Special Considerations. Certain patient groups (pediatrics, geriatrics, and severe asthmatics) may pose diagnostic and therapeutic challenges.

* **Strength of recommendation:**
I = generally should be performed; II = may be reasonable to perform; III = generally should not be performed.
Level of evidence supporting a diagnostic method or an intervention:
A=randomized controlled trials; B=controlled trials, no randomization; C=observational trials; D=opinion of expert panel.

Figure 1. Treatment of Allergic Rhinitis

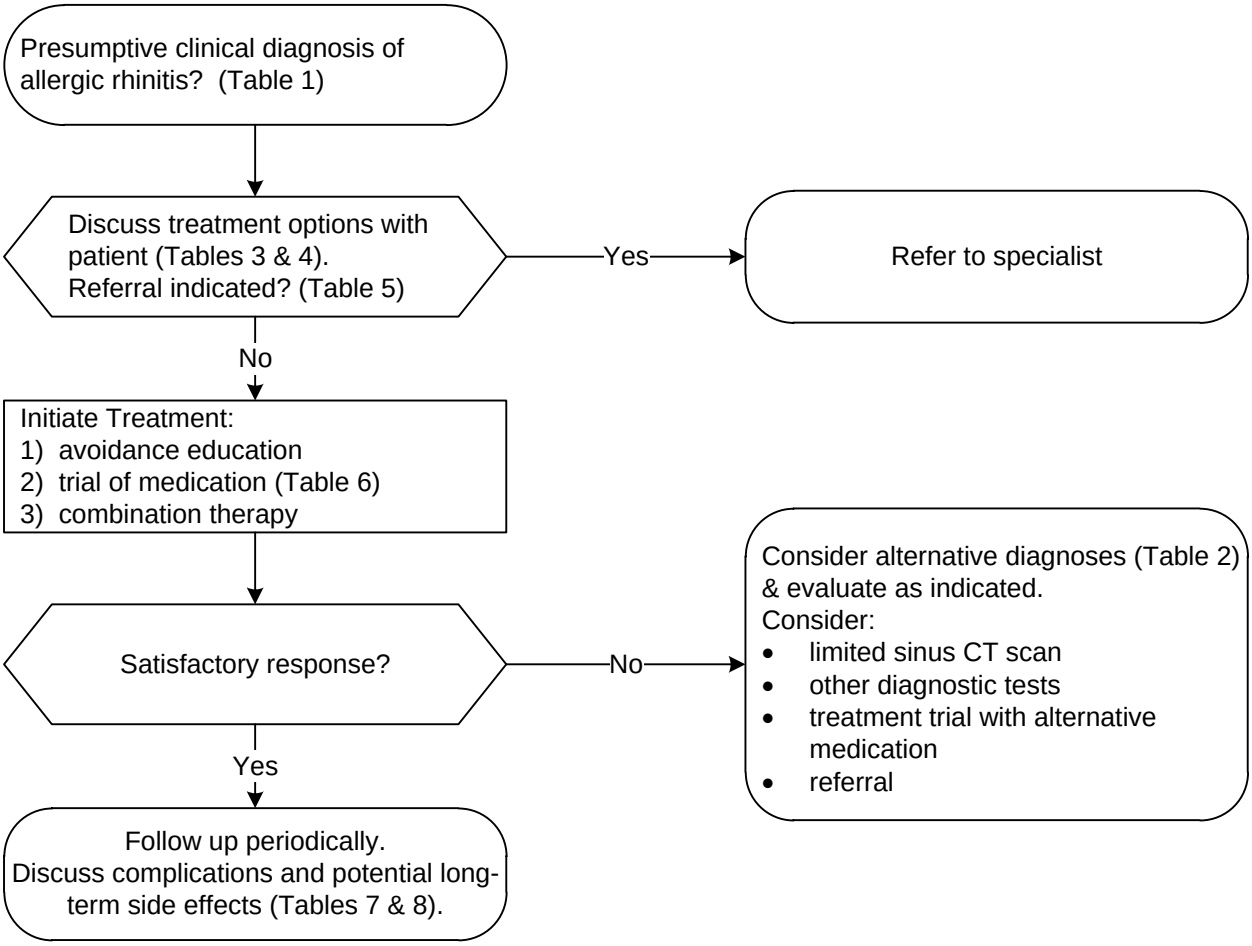

Table 1. Complications of Allergic Rhinitis

General Concerns / Complications	Adults	Children
Progression to and exacerbation of asthma	X	X
Deviations in facial growth		X
Hyposmia	X	X
Incisor protrusion		X
Malocclusion (crossbite, high palatal arch)		X
Nasal polyps	X	?
Middle ear effusion: hearing loss	X	X
Sinusitis	X	X
Sleep disorders	X	X

X = Possible; ? = Uncertain

Table 2. Symptoms and Signs Suggestive of Allergic Rhinitis

Symptoms	Seasonal, perennial or episodic (associated with exposure, e.g., cat) itching of eyes, ears, nose, palate; sneezing, nasal congestion, chronic sniffling, clear rhinorrhea, post nasal drip, pressure of nose or over paranasal sinus, morning cough. Red, watery eyes or ropy discharge.
Family or personal history	Atopic dermatitis, asthma, food allergy.
Physical findings	Ocular-allergic shiners, Dennie's lines, scleral injection with corkscrewing of vessels, conjunctival erythema with possible cobblestoning. Nasal-transverse nasal crease (salute), congestion, pale pink or bluish mucosa, clear or thick mucoid discharge, structural issues such as deviated septum, turbinate hypertrophy, presence of nasal polyps, pharyngeal cobblestoning.

Table 3. Alternative Diagnoses with Typical Characteristics

Alternative Diagnosis	Typical Characteristics
Acute rhinosinusitis	Facial pressure or pain, purulent nasal discharge; maxillary toothache; failure to respond to decongestants; fever or cough may be present; typically follows an allergy flare-up or a viral URI
Chronic rhinosinusitis	Facial pressure or pain, purulent discharge; fever often absent; may be present in addition to allergic rhinitis; symptoms may wax and wane over time; chronic hyposmia.
Viral URI	Self-limited course with symptoms (clear rhinorrhea, cough, ache, low grade fever) usually resolving within 3-7 days
Structural abnormalities	Include nasal septal deviation, nasal polyps, enlarged turbinates, adenoidal hypertrophy. Obstruction may be unilateral or bilateral and may or may not be seen on routine nasal examination.
Gustatory rhinitis	Clear rhinorrhea caused by hot (i.e. soup) or spicy foods, may have prominent nasal congestion as a symptom.
Rhinitis medicamentosa	Also called "rebound rhinitis;" caused by overuse of topical decongestants; diagnosis is easily made by history; may mask another underlying condition such as septal deviation or allergic rhinitis.
Autonomic dysfunction (vasomotor rhinitis)	Clear rhinorrhea, nasal obstruction, often depends on position (*e.g.*, supine), may be episodic. Pregnancy may exacerbate symptoms. Common in geriatric patients
Medication side effect	Common medications causing rhinitis symptoms include calcium channel blockers, beta blockers, ACE inhibitors and alpha blockers
Atrophic rhinitis	Also called "ozena", caused by over-resection of nasal turbinate tissue or poor mucus production, resulting in nasal dryness and crusting. Foul odor may be present.
Gastroesophageal reflux	Under-recognized cause of post-nasal drip, cough, and globus sensation; hoarseness or frequent throat clearing may also be present
Non-allergic rhinitis	Post-nasal drip sensation often with morning phlegm

Table 4. Advantages & Disadvantages of Treatment Options

Treatment Options	Advantages	Disadvantages
Environmental Control / Avoidance of Allergens	• Beneficial with minimal ongoing cost (may be an initial cost to modify environment)	• Difficult to assess with certainty whether exposure has been controlled • Effectiveness of chemical barriers requires repeated application? • Effective mite eradication requires repeated treatment
Medications **(See also: Tables 7 & 8)**	• Patient preference • Rapid onset • May control non-allergic rhinitis symptoms • Many choices (See Tables 7 & 8)	• Cost of medication • Medication side effects (e.g., sedation, impaired performance, local irritation and epistaxis from topical agents, nasal septal perforation with nasal steroids [rare])
Allergy Testing, Skin Testing (preferred) or RAST Testing	• Beneficial in defining allergens in complex patients or to institute immunotherapy • May help direct avoidance therapy	• Cost of treatment • Patient discomfort • Must temporarily stop oral antihistamines
Subcutaneous Immunotherapy	• Only disease remitting therapy available • Medication requirements usually reduced • Benefits may persist after therapy stopped • May be less costly in long term • May prevent polysensitization and onset of asthma in children	• Benefits of therapy not seen until several months of treatment • Requires patient commitment • Anaphylaxis (rare)

Table 5. Order of Medication Addition Based on Presenting Symptoms

Addition Sequence	Nasal Obstructive Symptoms	Rhinorrhea without Obstruction	Comorbid Persistent Asthma
First	Intranasal corticosteroid	Antihistamine	Intranasal corticosteroid
Second	Antihistamine +/- decongestant	Intranasal corticosteroid	Leukotriene inhibitors OR antihistamine +/- decongestant
Third	Leukotriene inhibitors	Leukotriene inhibitors	If intranasal corticosteroid use above, ADD antihistamine +/- decongestant If antihistamine +/- decongestant, ADD intranasal corticosteroid
Fourth	Intranasal antihistamine	Intranasal antihistamine	Intranasal antihistamine
Fifth	Intranasal mast cell stabilizer	Intranasal mast cell stabilizer	Intranasal mast cell stabilizer
Sixth	Intranasal anticholinergics	Intranasal anticholinergics	Intranasal anticholinergics

Table 6. Pharmacologic Therapy for Allergic Rhinitis in Children and Adolescents, Age 6 months-17 years

Generic Name	Brand Name	Initial Dose	Avail-ability	30-day	
				Generic	Brand
Intranasal Corticosteroids					
flunisolide *spray*	Nasarel	6 to 14 yrs: 2 sprays EN 2x/day ≥ 15 yrs: 2-4 sprays EN 2x/day	Rx	$32	$66
triamcinolone acetonide *spray* *aerosol spray*	Nasacort AQ	2-12 yrs: 1 spray EN 1x/day ≥ 12 yrs: 2 sprays EN 1x/day	Rx	$40	$123
fluticasone propionate *spray*	Flonase	≥ 4 yrs: 1–2 sprays EN 1x/day	Rx	$55	$90
fluticasone furoate *spray*	Veramyst	≥ 4 yrs: 1–2 sprays EN 1x/day	Rx	n/a	$120
beclomethasone dipropionate *aerosol spray*	Qnasl	≥ 12 yrs: 2 sprays EN 1x/day	Rx	n/a	$126
mometasone *spray*	Nasonex AQ	2 to 11 yrs: 1 spray EN 1x/day ≥ 12 yrs: 2 sprays EN 1x/day	Rx	n/a	$133
budesonide *spray*	Rhinocort Aqua	≥ 6 yrs: 1 spray EN 1x/day	Rx	n/a	$137
beclomethasone dipropionate *spray*	Beconase AQ	≥ 6 yrs: 1–2 sprays EN 2x/day	Rx	n/a	$176
Oral Antihistamines – 2nd Generation, with and without decongestant					
loratadine *tablet 10 mg* *solution 5mg/5ml* *disintegrating tab 10 mg* *chewable tabs 5 mg*	Claritin	2-5 yrs: 5 mg once daily ≥ 6 yrs: 10 mg once daily	OTC	$2	$21
cetirizine *syrup 5mg/5ml* *chewable tab 5,10 mg* *disintegrating tab 10 mg* *tablet 10 mg*	Zyrtec	2 to 5 yrs: 2.5 or 5 mg once daily ≥ 6 yrs: 10 mg once daily or divided BID	OTC	$4	$20
fexofenadine and pseudoephedrine *extended rel tab 60 mg-120 mg* *extended rel tab 180 mg-240 mg*	Allegra D-12 Allegra D-24	≥ 12 yrs: 60 mg/120 mg every 12 hr ≥ 12 yrs: 180 mg/240 mg every 24 hr	OTC	$16 $13	$20 $50
loratadine and pseudoephedrine *extended rel tab 5 mg-120 mg* *extended rel tab 10 mg-240 mg*	Claritin D-12 Claritin D-24	≥12 yrs:5 mg/120 mg every 12 hrs ≥12 yrs: 10 mg/240 mg every 24 hrs	OTC	$13-25 $45	$22 n/a
levocetirizine *solution 2.5 mg/5ml* *tablet 5 mg*	Xyzal	6 months to 5 yrs: 1.25 mg once daily in evening 6 to 11 yrs: 2.5 mg once daily in evening ≥ 12 yrs: 5 mg once daily in the evening	Rx	$22	$92
cetirizine and pseudoephedrine *extended rel tab 5 mg-120 mg*	Zyrtec D-12	≥ 12 yrs: 5 mg/120 mg every 12 hr	OTC	$25	$25
fexofenadine *suspension 30 mg/5 ml* *disintegrating tab 30 mg* *tablet 60, 180 mg*	Allegra	6 to 11 yrs: 30 mg 2x/day ≥ 12 yrs: 60 mg 2x/day or 180 mg 1x/day	OTC	$33	$77
desloratadine *syrup 0.5 mg/ml* *disintegrating tab 2.5, 5 mg* *tablet 5 mg*	Clarinex	6 to 11 months: 1 mg once daily 1-5 yrs: 1.25 mg once daily 6-11 yrs: 2.5 mg once daily ≥ 12 yrs: 5 mg once daily	Rx	$50	$136

* Pricing information for brand products based on average wholesale price (AWP) – 10% found in the RedBook 1/2013 catalog. Pricing information for generic products is based on the Blue Cross Blue Shield Maximum Allowable Cost (MAC) price + $3 as posted on 1/2013. Pricing for OTC products is based on http://www.drugstore.com/

EN=each nostril

Table 6. Pharmacologic Therapy for Allergic Rhinitis in Children & Adolescents, Age 6 months-17 years, cont'd

Generic Name	Brand Name	Initial Dose	Avail-ability	30-day Generic	30-day Brand
Oral Antihistamines – 2nd Generation, with and without decongestant, continued					
desloratadine and pseudoephedrine *extended rel tab 2.5 mg-120 mg* *extended rel tab 5 mg-240 mg*	Clarinex D-12 Clarinex D-24	≥ 12 yrs: 2.5 mg/120 mg every 12 hrs ≥ 12 yrs: 5 mg/240 mg every 24hrs	Rx	n/a n/a	$112 $170
Oral Antihistamines (1st Generation) (For use only in special circumstances as described)					
clemastine [a] *syrup 0.5 mg/5 ml (Rx)* *tablet 1.34 (OTC),* *tablet 2.68 mg (Rx)*	Tavist Allergy	6 to 12 yrs: 0.67-1.34 mg BID syrup ≥ 13 yrs: 1.34 mg BID	Rx, OTC	$5 $40 $14	$22 $150 $65
chlorpheniramine[a] *solution 2 mg/5 ml* *tablet 4 mg*	Chlor-Trimeton, others	2 to 5 yrs: 1 mg every 4-6 hr 6 to 12 yrs: 2 mg every 4-6 hr > 12 yrs: 4 mg every 4-6 hr or 12 mg ER every 12 hrs	OTC	$10	$15
diphenhydramine[a] *solution 12.5 mg/5 ml* *tablet 25 mg*	Benadryl, others	2 to 5 yrs: 15 mg every 6 hrs 6 to 12 yrs: 30 mg every 6 hrs ≥ 12 yrs: 25 mg every 6 hrs, SR 120 mg every 12 hrs or 240 mg once daily	OTC	$10	$15
Oral decongestants					
pseudoephedrine *liquid 30 mg/5 ml, 7.5 mg/0.8 ml* *solution 15 mg/5 ml* *tablets 30, 120, 60 mg*	Sudafed, others	2 to 5 yrs: 15 mg IR every 4-6 hrs, max 60 mg/day 6 to 12 yrs: 30 mg IR every 4-6 hrs, max 120 mg/day ≥ 12 yrs: 60 mg IR every 4-6 hrs, max 240 mg/day or 120 mg SR every 12 hrs or 240 mg SR every 24 hrs	OTC	$13	$20
Leukotriene Inhibitors					
montelukast sodium *chewtab 4, 5 mg* *granule pckt 4 mg* *tablet 10 mg*	Singulair	6 months to 5 yrs: 4 mg daily 6 to 14 yrs: 5 mg daily ≥ 15 yrs: 10 mg daily	Rx	$24 $200 $22	$170 all
Intranasal Antihistamine					
azelastine hydrochloride *spray*	Astelin, Astepro	5 to 11 yrs: 1 spray EN 2x/day ≥ 12 yrs: 1-2 sprays EN 2x/day	Rx	$95	$145 $132
olopatadine hydrochloride *spray*	Patanase	6 to 11 yrs: 1 spray EN 2x/day ≥ 12 yrs: 2 sprays EN 2x/day	Rx	n/a	$167
Intranasal Mast Cell Stabilizers					
cromolyn sodium *spray*	Nasalcrom	≥ 2 yrs: 1 spray EN 3-6 x/day	OTC	$15	$30
Intranasal Anticholinergic					
ipratropium bromide *spray*	Atrovent 0.03% Atrovent 0.06%	≥ 6 yrs: 0.03% solution, 2 sprays EN 2-3x/day 5-11 yrs: 0.06% solution, 2 sprays EN 3x/day for up to 4 days ≥ 12 yrs: 0.06% solution, 2 sprays EN 3-4x/day for up to 4 days	Rx	$6 $11	$17 $30
Ocular Antihistamines					
ketotifen fumarate *solution*	Zaditor, Alaway, Claritin Eye, Zyrtec Itchy Eye	≥ 3 yrs: 1 drop affected eye(s) 2-3x/day	OTC	$11	$13-15

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EN=each nostril

Table 6. Pharmacologic Therapy for Allergic Rhinitis in Children & Adolescents, Age 6 months-17 years, cont'd

Generic Name	Brand Name	Initial Dose	Avail-ability	30-day Generic	30-day Brand
Ocular Antihistamines, continued					
azelastine *solution*	Optivar	≥ 3 yrs: 1 drop affected eye(s) up to 2x/day max 8 weeks	Rx	$19	$158
olopatadine hydrochloride 0.2% *solution*	Pataday	≥ 3 yrs: 1 drop into affected eye once daily	Rx	n/a	$130
olopatadine hydrochloride 0.1% *solution*	Patanol	≥ 3 yrs: 1-2 drops in affected eye(s) 2x/day at interval of 6-8 hrs for up to 6 weeks	Rx	n/a	$145

[a] Typically sedating however may cause paradoxical excitation in children

Table 7. Pharmacologic Therapy for Allergic Rhinitis in Adults age 18 and Above

Generic Name	Brand Name	Initial Dose	Avail-ability	30-day Generic	30-day Brand
Intranasal Corticosteroids					
flunisolide *spray*	Nasarel	2 sprays EN 2x/day	Rx	$32	$66
triamcinolone acetonide *spray*	Nasacort AQ	2 sprays EN 1x/day	Rx	$40	$123
fluticasone propionate *spray*	Flonase	1 spray each nostril (EN) 2x/day or 2 sprays EN 1x/day	Rx	$55	$90
fluticasone furoate *spray*	Veramyst	1 spray each nostril (EN) 2x/day or 2 sprays EN 1x/day	Rx	n/a	$120
beclomethasone dipropionate	Qnasl	2 sprays EN 1x/day	Rx	n/a	$126
mometasone *spray*	Nasonex AQ	2 sprays EN 1x/day	Rx	n/a	$133
budesonide *spray*	Rhinocort Aqua	1 spray EN 1x/day (max. 4 sprays/day)	Rx	n/a	$137
beclomethasone dipropionate *spray*	Beconase AQ	1-2 sprays EN 2x/day	Rx	n/a	$176
Oral Antihistamine (2nd Generation)					
cetirizine	Zyrtec	10mg once daily	OTC	$10	$20
loratadine	Claritin	10mg once daily	OTC	$10	$21
fexofenadine and pseudoephedrine	Allegra D-12 Allegra D-24	1 tab (60-120mg) every 12 h 1 tab (180-240mg) every 24 h	OTC	$16 $13	$20 $50
loratadine and pseudoephedrine	Claritin D-12 Claritin D-24	1 tab (5-120mg) every 12 h 1 tab (10-240mg) every 24 h	OTC	$13-25 $45	$22 n/a
levocetirizine	Xyzal	5mg once daily in the evening	Rx	$22	$92
cetirizine and pseudoephedrine	Zyrtec D-12	1 tab (5-120mg) every 12 h	OTC	$25	$25
fexofenadine	Allegra	60 mg twice daily or 180mg once daily	OTC	$33	$77
desloratadine	Clarinex	5mg once daily	Rx	$50	$136
desloratadine and pseudoephedrine	Clarinex D-12 Clarinex D-24	1 tab (2.5-120mg) every 12 h 1 tab (5-240mg) every 24 h	Rx	n/a n/a	$112 $170

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EN=each nostril

Table 7. Pharmacologic Therapy for Allergic Rhinitis in Adults age 18 and Above, cont'd

Generic Name	Brand Name	Initial Dose	Avail-ability	30-day Generic	30-day Brand
Oral Antihistamine (1st Generation)					
chlorpheniramine [b]	Chlor-Trimeton	4mg every 4-6 h or 12mg ER 2x/day (max. 24mg/day)	OTC	$10	$15
diphenhydramine [b]	Benedryl, various brands	25-50mg every 6-8 h	OTC	$10	$15
clemastine	Tavist Allergy	1.34mg 2x/day	OTC	$11	$15
Oral Decongestants					
pseudoephedrine	Sudafed	60 mg every 4-6 h 120mg ER every 12h 240mg ER once daily	OTC	$13	$20
Leukotriene Inhibitors					
montelukast sodium	Singulair	10mg HS	Rx	$22	$170
Intranasal Antihistamine					
azelastine hydrochloride *spray*	Astelin	1-2 sprays EN 2x/day	Rx	$95	$145
olopatadine hydrochloride *spray*	Patanase	2 sprays in each nostril 2x/day	Rx	n/a	$167
Intranasal Mast Cell Stabilizers					
cromolyn sodium *spray*	Nasalcrom	1 spray EN 3-6x/day	OTC	$15	$30
Intranasal Anticholinergic					
ipratropium bromide *spray* *spray*	Atrovent 0.03% Atrovent 0.06%	2 sprays EN 2-3x/day 2 sprays EN 4x/day (max. 3 weeks)	Rx Rx	$32 $55	$90 $161
Ocular Antihistamines					
ketotifen fumarate *solution*	Zaditor, Alaway, Claritin Eye, Zyrtec Itchy Eye	1 drop into affected eye every 8-12 h (max. 8 weeks)	OTC	$11	$$13-15
azelastine *solution*	Optivar	1 drop into affected eye 2x/day (max. 8 weeks)	Rx	$19	$158
olopatadine hydrochloride 0.2% *solution*	Pataday	1 drop into affected eye once daily	Rx	n/a	$130
olopatadine hydrochloride 0.1% *solution*	Patanol	1-2 drops into affected eye 2x/day at 6-8 h interval (max. 6 weeks)	Rx	n/a	$145
Ocular Mast Cell Stabilizers					
cromolyn sodium 4% *solution*	Opticrom	1-2 drops into affected eye 4-6x/day	Rx		$33
lodoxamide tromethamine *solution*	Alomide	1-2 drops into affected eye 4x/day	Rx	n/a	$126
nedocromil sodium 2% *solution*	Alocril	1-2 drops into affected eye 2x/day	Rx	n/a	$128

[b] Typically sedating medications

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Table 8. Common or Serious Side Effects Associated with Medical Therapy for Allergic Rhinitis

Oral Antihistamines (1st generation)

Anticholinergic effects
- blurred vision
- dry mouth
- urinary retention

Central nervous system
- drowsiness (increased accidents)
- cognitive impairment (any age)

Gastrointestinal
- constipation
- GI upset
- nausea

Sensory
- taste: bitter taste, loss of taste

Oral Antihistamines (2nd generation)

General (rare)
- GI upset
- headache
- drowsiness (1-3%)
- myalgias

Intranasal Products (corticosteroids, antihistamines, mast cell stabilizers):

Nasopharyngeal
- nasal irritation
- epistaxis
- pharyngitis, coughing
- septal perforation

Sensory
- smell: reduced sense of smell
- taste: unpleasant taste, loss of taste
- global: headache with intranasal steroids

Oral Decongestants

General
- dizziness
- headache
- nervousness
- tachycardia
- insomnia
- palpitations
- weakness
- urinary retention

Leukotriene Inhibitors

General
- headache
- rash (uncommon)
- dream abnormalities
- gastritis, dyspepsia
- dental pain
- respiratory tract infections

Ocular Preparations
- headache
- ophthalmic irritation: burning, dryness, pruritus, stinging
- possible contact lens irritation (consult with eye care provider)

Table 9. Possible Indications for Referral to Specialist

- Identify specific allergens for patients
- Intolerance to, contraindication of, or failure of medical management (See Table 9)
- Symptoms interfere with daily activities, or sleep
- Associated comorbidities such as chronic or recurrent bacterial rhinosinusitis, or recurrent otitis media, nasal polyps, asthma, atopic dermatitis, ocular symptoms, sleep apnea
- Need for improved allergen avoidance education
- Moderate to severe symptoms of seasonal or perennial rhinitis
- Any severe allergic reaction that causes patient or parental anxiety
- Immunotherapy is a consideration (See also: Table 4)
- Persistent nasal obstruction despite medical therapy

Clinical Background

Clinical Problem and Management Issues

Incidence. Allergic rhinitis, the most common form of rhinitis, affects 20-40 million people in the United States annually, including 10-30% of adults and up to 40% of children. Although the disease tends to be more prevalent among males during childhood, the gender ratio among adults is approximately equal.

The severity of allergic rhinitis ranges from mild to seriously debilitating; its social and financial impact is significant. Allergic rhinitis accounts for 4.5 billion dollars annually in direct costs with prescription medications accounting more than for half of this cost. Indirect costs from work productivity losses due to drowsiness and cognitive/motor impairment from sedating antihistamines are estimated to 6.7 billion dollars annually (adjusted to 2013 dollars).

Untreated allergic rhinitis can lead to multiple complications as outlined on Table 1. These include progression to and exacerbations of asthma, deviations in facial growth, nasal polyps, and recurrent sinusitis.

Diagnosis. Allergic rhinitis is primarily diagnosed on the basis of history, with physical examination providing additional clues. Because of the significant overlap of its symptoms with those of other nasal conditions, diagnosis may not be straightforward. Allergy testing may help in the diagnosis but must be properly performed in order to avoid false negative results.

Testing/referral. When history is not adequate for diagnosis, skin or RAST (radioallergosorbent test) testing is helpful to (a) differentiate allergic from non-allergic rhinitis symptoms and (b) to identify specific allergens that may cause symptoms. Skin tests are more sensitive, faster, and more cost-effective than RAST. However, skin testing needs to be performed by a physician trained in using a well-controlled process and in interpreting results relevant to the patient.

Treatment. Treatment options for allergic rhinitis include environmental control (allergen avoidance), pharmacotherapy, and immunotherapy ("allergy shots"). Most treatment regimens employ one or a combination of these options. While each option has been shown to be effective in treating allergic rhinitis, they have significant costs as well. Medications and changes in the home environment can result in sizable direct expenditures, while immunotherapy necessitates frequent office visits, often over a number of years.

Rationale for Recommendations

Definition

Allergic rhinitis is an IgE-antigen and mast cell mediated inflammation of the membranes lining the nose. The disease is characterized by sneezing, congestion, clear rhinorrhea, and nasal or palatal itching. The disease may also coexist with allergic conjunctivitis (characterized by itchy, watery eyes that may also be red or swollen). Allergic rhinitis may be seasonal, perennial, or may occur sporadically after specific exposures.

Epidemiology

Allergic rhinitis manifests in two forms. Seasonal allergic rhinitis tends to be associated with cyclical changes in the environment. In contrast, perennial allergic rhinitis does not exhibit a seasonal pattern; this may reflect the patient's continuous exposure to the offending allergen (e.g., animal, house dust mites, occupational exposures).

Distinguishing prevalence rates of seasonal versus perennial allergic rhinitis is complicated by two factors: first, epidemiologic studies have focused primarily on seasonal allergic rhinitis (e.g., hay fever), and second, the symptom complex of perennial allergic rhinitis overlaps with those of seasonal allergic rhinitis, chronic sinusitis, recurrent upper respiratory infections, and vasomotor rhinitis.

Diagnosis

Common symptoms and signs suggestive of allergic rhinitis are summarized in Table 2. More detailed information about relevant aspects of the history and physical examination are presented below. Common alternative diagnoses are summarized in Table 3.

History Assessment of a patient who presents with symptoms of allergic rhinitis begins with a detailed history regarding the pattern, frequency, duration, severity, and seasonality of symptoms (or lack thereof), response to medications, presence of coexisting conditions (especially atopic conditions, eczema, and asthma), occupational exposure, environmental history, and identification of precipitating factors. Family history of atopic disease is often positive in patients with allergic rhinitis. An integral part of the assessment is an evaluation of the degree to which symptoms affect the patient's quality of life, physical and social functioning, mental health, energy level, sleep, and general health perception. Response to previous medication trials should be assessed.

Physical examination. Examine the mouth, eyes, ears, nose, and lungs:

Mouth: breathing, shape of jaw (i.e. elongated maxilla for adenoidal facies, narrow arched palate, dental malocclusion, overbite, crossbite, presence and size of tonsils, cobblestoning of the posterior nasal pharynx, secretions (post nasal drip).

Eyes: presence of allergic shiners and Dennie's lines (infraorbital discoloration and lines caused lower lid edema), conjunctival erythema, or cobblestoning, corkscrewing of scleral blood vessels.

Ears: look for effusion.

Nose: presence of nasal crease (allergic salute in children) congestion, turbinate size, color (pale or bluish is more likely to be allergic, atrophic may be very pale, infection is typically red), physical obstruction i.e. polyps, nasal septal deviation, presence and color of mucus (clear-white is usually allergy, green/yellow suggests infection. Having the patient sniff may demonstrate internal valve collapse.

Testing

Testing is not indicated in mild, easy to control allergic rhinitis patients. For more severe patients, skin tests and RAST (radioallergosorbent test) identify the presence of IgE antibody to a particular allergen. Testing is helpful to:

- Differentiate allergic from non-allergic rhinitis symptoms
- Identify specific allergens where avoidance may help
- Identify allergens for immunotherapy.

Skin tests are more sensitive, faster, and more cost-effective than RAST testing. Antihistamines should be stopped 7-10 days before skin testing, but do not need to be stopped prior to RAST serum tests. Intranasal corticosteroids, leukotriene inhibitors, decongestants, oral corticosteroids **do not** need to be stopped for skin testing. Patients who cannot stop their antihistamines because of symptoms should keep their appointment with the allergist.

Skin testing should be performed by a physician trained in allergy testing and interpretation. Effective testing requires a well-controlled process with consistent application

technique and proper precautions for patients who react to skin testing (approximately 1-10% of patients). Proper technique is vital to producing accurate and reproducible results. Interpreting skin or in-vitro tests for a specific IgE requires knowledge of locally-present aeroallergens, their clinical importance, and their cross-reactivity with botanically-related species. The number of skin tests needed may vary with the patient's age, potential allergen exposures, and geographic region.

Treatment

Figure 1 presents an overview of considerations and steps in treating allergic rhinitis. Table 4 summarizes advantages of the major treatment options. Of these allergy testing (skin testing, RAST testing) was discussed immediately above and environmental control/avoidance of options, medications, and subcutaneous immunotherapy are discussed below.

Treatment by avoidance or environmental control. Avoidance of inciting factors (e.g., allergens, irritants, medications) is fundamental to the management of allergic rhinitis.

Triggers for allergic rhinitis may be grouped into five major categories: pollens, molds, house dust mites, animals, and insect allergens (e.g., cockroaches, bee venom). Exposure to tobacco smoke can also increase symptoms of allergic rhinitis, so this exposure should be eliminated or minimized. The effectiveness of control measures instituted is assessed primarily by patient symptoms and the necessity of medications.

Pollens. Pollen-triggering allergic rhinitis is principally derived from wind-pollinated trees, grasses, and weeds. In Michigan, (and the northern United States in general), the predominant sources of pollen vary with the season:

- April – May = tree pollen
- May – June – early summer = grass pollen
- August – September = weed pollen
- September – October = seasonal mold

Reducing pollen exposure is important to the effective management of allergic rhinitis; this can be accomplished by closing doors and windows, using air conditioning on an indoor cycle, minimizing the use of window or attic fans, and limiting outdoor activity. Showering or bathing after outdoor activity removes pollen from the hair and skin and helps avoid contamination of bedding. Nasal saline rinses can be used after being outdoors to help minimize exposure. In highly sensitive patients, effective allergen avoidance may require severely curtailing the patient's outdoor activity.

Molds. Molds proliferate in both indoor and outdoor environments. Most mold allergens are encountered through inhalation of mold spores. Patients can avoid outdoor molds by remaining indoors and using air conditioning on an indoor cycle; however, it is important to note that air conditioning units themselves may be heavily contaminated with mold. Indoor mold is influenced by the age and construction of the building, presence of basement or crawl space, type of heating system, and use of humidifiers and air conditioning. Indoor mold can be controlled somewhat via chemical and physical measures such as fungicides, careful cleaning of humidifiers and vaporizers, and placement of a plastic vapor barrier over exposed soil in crawl spaces. Dehumidifiers in basements and other damp areas may help reduce mold levels. The overall effectiveness of these measures, however, is condensation levels.

House dust mites. Fecal residue from dust mites is the primary allergen in household dust. The dust mites' principle food source is exfoliated human skin; as such, mite concentrations are highest in bedding, fabric-covered furniture, soft toys, and carpeting. While no effective means currently exist in the US for permanently eliminating mites from upholstered furniture and carpeting, physical and chemical barriers offer some relief. Physical barriers may include allergen-proof encasings for mattresses, pillows, box springs, and bedding; using plastic, wood, or leather furniture in lieu of upholstered furniture, and replacing carpeting with wood or vinyl flooring. Homes should be dusted and vacuumed frequently and bedding should be washed in hot water on a weekly basis. It is best to eliminate stuffed animals from the affected child's room.

Chemical treatments include using 3% tannic acid solution (e.g., Allersearch® ADS Anti-Allergen Dust Spray) to denature dust mites in upholstered furniture and treating carpeting with a compound containing benzyl benzoate (e.g., Arcarosan®). The effectiveness of chemical treatments depends upon their repeated application. Lowering indoor humidity to less than 50% is recommended.

Regarding indoor air, lowering humidity to less than 50% is recommended. Evidence regarding the effect of air purifiers on alleviating dust mite allergy symptoms is either nonexistent (for electrostatic purifiers) or conflicting (for HEPA air purifiers). Similarly, cleaning heating ducts is of no demonstrated value.

Animal allergens. All warm-blooded animals, including birds, are capable of sensitizing a susceptible allergic patient. While exposures to mice, rats, guinea pigs, and farm animals constitute occupational hazards for some, the most common manifestations of animal allergy are to cats and dogs. Cat and dog allergens are notable for the ease and extent of their dissemination, particularly through passive means (i.e., transport on clothing). Removing the offending animal from the household is preferred. Because significant cleaning measures are required to reduce cat and dog allergen levels to those found in environments not inhabited by cats or dogs, if the animal is still present, the effectiveness of cleaning is limited. Cleaning may include washing the animal itself on a weekly basis. Evidence in

support of this practice is mixed, but washing should never be attempted by the allergic patient. If the allergenic animal is not to be removed from the home, confining it to an uncarpeted room with an electrostatic or HEPA air purifier may markedly reduce airborne allergens in the rest of the home. Reduce exposure by keeping the animal out of the patient's bedroom. Families can also consider an Allerca cat, which is hypoallergenic, but more studies need to be done on these animals. (Although some dog breeds are said to be hypoallergenic, this has not been demonstrated.)

Insect allergens. Sources of insect allergens include cockroaches, crickets, flies, midges, Asian ladybugs, and moths. Debris from these insects is associated with allergic rhinoconjunctivitis and asthma. The most common of these, the cockroach allergen, is found on the insect's body and in its feces. While careful sanitation practices are often effective in reducing or eliminating cockroaches, heavy infestation may require application of pesticides by a professional exterminator. To prevent insects entering the home, make sure that windows and walls are tightly sealed. Pyrethroid chemical can also be applied to the outside of the home prior to the start of cold weather.

Tobacco smoke. Exposure to tobacco smoke should be eliminated or minimized, since it can increase allergic symptoms. Individuals (e.g., family members) who frequently smoke around an allergic patient should be encouraged to quit (see UMHS Tobacco Use Cessation guideline) or smoke outside the home. Allergic patients should avoid environments with tobacco smoke.

Pharmacological therapy. Several classes of drugs comprise the mainstay of treatment of allergic rhinitis; of these, the primary ones are intranasal corticosteroids and oral antihistamines. Table 5 summarizes the order of medication addition based on presenting symptoms. Tables 6 and 7 summarize information on specific drugs, their dosing, and costs for pediatric and for adult populations, respectively. Table 8 summarizes common and serious side effects associated with medical therapy for allergic rhinitis. In addition to safety and effectiveness, ongoing cost of medication should also be considered. Before considering each class of drugs individually, a broader context for cost-effective prescribing is summarized.

Cost-effective prescribing. Treatment choices for individual patients are driven by several factors beyond drug safety and effectiveness. Because of the over-the-counter availability of many oral and topical agents, a history of a patient's attempts at self-care should be obtained. Cost of therapy can vary widely, depending on drugs chosen and whether the patient has drug coverage or not. Generic drug products should be used whenever possible to reduce medication costs. Most prescription drug plans cover certain agents preferentially at a lower copay than others. While they often do not cover nonprescription products, patients can submit receipts for over-the-counter allergy products for reimbursement through flexible spending accounts.

Using lowest effective doses and minimizing medications can also reduce medication costs. This can be accomplished by stepdown therapy after a patient has been well-controlled. Symptom control may be possible a lower dose of medications than needed to gain control. Patients and providers should be vigilant in stopping unneeded or ineffective medications. If a patient is not well-managed with non-sedating antihistamine alone and an intranasal steroid is added, the antihistamine may possibly be stopped after good symptom control is achieved. Additionally, some patients may be able to reduce or stop therapy seasonally when their symptoms are absent or less severe.

Intranasal corticosteroids. A number of studies have shown these drugs to be the most effective treatment of the itching, sneezing, rhinorrhea, and stuffiness associated with allergic rhinitis. Their effect is not immediate, however. Onset of relief is seen on day 2 to 3 with effects reaching their peak at 2 to 3 weeks. Regular, consistent use is required to maintain a maximum effect. Patient education for the correct use of intranasal pump sprays is essential. Some evidence indicates that intranasal corticosteroids improve ocular symptoms.

Intranasal corticosteroids are well tolerated and have a relatively good safety profile. Newer, more potent formulations offer the advantages of once daily dosing, minimal to no systemic absorption, and demonstrated tolerability in pediatric patients. The incidence of adverse effects is between 5-10%. Local effects most commonly reported include sneezing, stinging, and burning or irritation. However, these effects are generally mild and do not preclude the use of intranasal preparations. Aqueous formulations are preferred because they are less irritating to the nasal mucosa. A deviated septum may obstruct the distribution of medicated nasal sprays and reduce their potential effectiveness.

Oral antihistamines. Antihistamines are effective in reducing symptoms of itching, sneezing, and rhinorrhea and should be tried with most patients as first-line therapy for allergic rhinitis. Oral antihistamines also reduce symptoms of allergic conjunctivitis, which are often associated with allergic rhinitis. While they tend to be less efficacious overall compared to the intranasal steroids, antihistamines appear to be equally effective in blocking histamine-mediated responses to allergens.

All antihistamines appear to be equally effective; however, first generation agents adversely affect cognition and performance. It is therefore recommended that therapy be initiated with generic loratadine or fexofenadine. Some patients may get better symptom relief with cetirizine. For patients that cannot afford OTC loratadine, fexofenadine, or cetirizine, chlorpheniramine is inexpensive and effective. It is the least sedating of the 1st generation antihistamines;

however, it must still be used with caution in patients requiring mental alertness.

Decongestants. Decongestants act on adrenergic receptors to produce vasoconstriction and decrease swelling of the nasal mucosa which, in turn, alleviates nasal congestion. Oral decongestants may be used until symptoms resolve. Oral decongestants (including combination products containing a decongestant—see below) should be used with caution in patients with hypertension, ischemic heart disease, glaucoma, prostatic hypertrophy, or diabetes mellitus. Oral decongestants are contraindicated in patients using monoamine oxidase inhibitors (MAOIs) or having uncontrolled hypertension or severe coronary artery disease. In addition, geriatric patients may be more sensitive to the side effects of oral decongestants. Topical decongestants do not exhibit significant systemic absorption in usual doses, but due to the risk of rebound vasodilation (*rhinitis medicamentosa)* or atrophic rhinitis with chronic use, these agents have no role in the maintenance treatment of allergic rhinitis. They may be used short-term (3-5 days) for the severely congested patient to improve initial drug delivery with intranasal corticosteroids.

Combination antihistamine/decongestant. Patients for whom an antihistamine or decongestant alone fails to provide complete relief may benefit from an antihistamine/ decongestant combination. Studies have shown improved allergy symptom control when a decongestant has been added to antihistamine therapy. Decongestant-containing products are approved only for patients 12 years of age and older; however, pseudoephedrine can be added as a separate agent in children as young as 2 years of age. The cautions enumerated above for decongestant use also apply to combination products.

Leukotriene inhibitors. Leukotriene inhibitors reduce allergy symptoms through inhibition of inflammation and also have proven efficacy for control of asthma. Several large studies have evaluated montelukast and have shown a reduction in itching, sneezing, rhinorrhea, and congestion. Efficacy appears comparable to oral antihistamines but multiple studies demonstrate that inhaled corticosteroids have superior improvement in nasal obstructive symptoms compared to leukotriene inhibitors. Combination therapy of leukotriene inhibitors and antihistamines improved intranasal symptom compared to monotherapy, but were again less effective when compared to inhaled nasal steroids alone. Leukotriene inhibitors may have a role as second line therapy in patients with comorbid persistent asthma to control both diseases and reduce medication costs.

Nasal cromolyn. Nasal cromolyn is reserved for patients who are not well-controlled or do not tolerate oral antihistamines or intranasal steroids. It is most effective when used regularly prior to the onset of allergic symptoms. The four times daily dosing can cause compliance problems.

Anticholinergics. Ipratropium bromide (Atrovent) is an effective anticholinergic spray for patients with severe vasomotor symptoms (profuse thin rhinorrhea). Anticholinergics decrease the production of mucus and diminish rhinorrhea.

Nasal Antihistamines. Intranasal antihistamines are effective in treating the nasal symptoms associated with seasonal and perennial rhinitis and nonallergic vasomotor rhinitis. When administered intranasally, the primary adverse effects are nasal burning and altered taste (i.e. bitter or metallic taste). While effective in the symptomatic treatment of seasonal allergic rhinitis, intranasal antihistamines offer no therapeutic benefit over conventional treatment. More recent evidence suggests that combination of intranasal antihistamines and intranasal corticosteroids are synergistic and provide greater benefit than monotherapy in the treatment of seasonal allergic rhinitis.

Ocular Medications. Ocular medications for allergic conjunctivitis are available as topical solutions or suspensions. They contain antihistamines or mast cell stabilizers. Side effects of ocular medications are generally mild and include a brief stinging, burning sensation. Ocular antihistamines can be used as needed for acute symptomatic relief and prophylaxis of allergic symptoms with minimal systemic side effects.

Sodium cromolyn has been shown to be effective for the treatment of seasonal allergic conjunctivitis and should be administered on a regular basis. Lodoxamide has been shown to be as effective as or more effective than sodium cromolyn in vernal (spring) conjunctivitis. Soft contact lens users and patients with sensitivities to certain preservatives should consult their eye care provider or refer to specific product information regarding the use of these products. Intraocular corticosteroids are best left for ophthalmologists to prescribe.

Nasal saline. Saline sprays theoretically moisten the nasal cavity and promote mucociliary clearance. Saline solutions also contain magnesium, which possibly reduces inflammation in the nasal mucosa. Note that saline irrigation solutions should be prepared with purified water, not tap water.)

One small comparative study showed that intranasal hypertonic saline spray improved symptoms of allergic rhinitis, but saline was not as effective as intranasal corticosteroids. Therefore, saline solution can be an effective adjunctive medication for mild-to-moderate allergic rhinitis.

A Cochrane database study evaluated the use of nasal irrigations for the treatment of chronic rhinosinusitis (CRS). The evidence suggests that saline irrigations provide benefit in the treatment of chronic rhinosinusitis as monotherapy or as an adjunct to other therapies. Because a significant

number of patients with CRS have coexistent allergic rhinitis, the addition of saline irrigations may provide benefit and be adjunctive to other treatments such as intranasal corticosteroids and antihistamines.

Immunotherapy. Allergen immunotherapy is the repeated administration of specific allergens to patients with IgE mediated conditions for the purpose of desensitizing them to the offending allergens. It is the only disease remitting agent available. Well controlled clinical trials have demonstrated its effectiveness for seasonal and perennial allergic rhinitis, seasonal asthma, ocular allergy, and in patients with eczema and positive skin tests. It may prevent polysensitization to other allergens in children and prevent the development of asthma. No long term negative effects have been reported.

Sublingual immunotherapy (drops, tablets applied orally) is a new modality, is less efficacious then subcutaneous, is currently not approved for use by the FDA, but is available in Europe.

Omalizumab (Xolair). A recombinant DNA derived IgG1 monoclonal antibody that selectively binds to circulating IgE and limits the amount of IgE available to bind to FCR1 receptors on mast cells. This limits the release of mediators and modifies the allergic response. It decreases the number of FCR1 receptors on basophils. Studies in patients with allergic rhinitis have shown a decrease in mediators released, decrease in symptoms and need for rescue medication, and improved quality of life scores. Long term effects are not known. The drug is expensive and is currently not approved for use in patients with allergic rhinitis.

Surgical therapy. For patients who have persistent nasal obstruction after adequate trial of medical therapy (with or without immunotherapy), referral to a surgical specialist should be considered for possible reduction of the inferior turbinates, which has been demonstrated to lead to objective and subjective improvements in airflow symptoms. Occasionally, a septoplasty is necessary to allow for proper steroid and other medicated nasal sprays to pass beyond a severe septal deviation. Other sites of obstruction should also be considered. Internal nasal valve collapse may also be important sites of anatomic obstruction.

Follow Up

Short term reevaluation should be done to assess response to a change in therapy or to review symptoms during seasonal worsening.

Periodic assessment of patients should be performed every six months to a year, depending on severity and treatment. Assess for symptom control and for complications and side effects of treatment.

Referral/Consultation

Appropriate criteria for referral to a colleague who specializes in the diagnosis and treatment of allergies are summarized in Table 9. Criteria for referral include identification of specific allergens, intolerance to or failure of medical therapy, severe reactions, associated comorbid conditions, or desire for allergen immunotherapy.

Special Considerations

Pediatrics

For children with occasional symptoms, antihistamines can be taken on days when symptoms are present or expected. Children experiencing daily symptoms achieve the most relief when taking antihistamines continuously throughout the pollen season. Second-generation, less-sedating, antihistamines should be used for school-age children. Intranasal corticosteroids, especially fluticasone and mometasone have demonstrated an excellent safety profile in children with minimal systemic absorption and no evidence of growth retardation.

Consider referring children with moderate to severe allergic rhinitis to an allergist for evaluation for possible immunotherapy. Treatment may alter progression of allergic disease and development of asthma in addition to reducing frequency and severity of flares in patient with comorbid asthma.

Geriatrics

An accurate diagnosis of allergic rhinitis in the elderly can be difficult because many factors may cause chronic rhinitis symptoms (see Table 2). In this population alternate diagnoses include non-allergic or atrophic rhinitis, Medication side effects (particularly from antihypertensive medications such as ACE inhibitors and beta blockers), include autonomic dysfunction, gustatory rhinitis, and acute angle glaucoma.

Older adults with allergic rhinitis can present special treatment challenges. In particular, medication safety can be problematic, owing to increased pharmacodynamic sensitivity to sedating side effects of antihistamines, or presence of contraindicating or precautionary conditions (e.g., cardiac disease, prostatic hypertrophy) from use of some medications. While topical medications have a better safety profile in general, difficulties with manual dexterity can impair ability to use nasal and ophthalmic products.

Pregnancy

Allergic rhinitis does not follow a predictable pattern during pregnancy; it may worsen, improve, or stay the same. Hormonal changes associated with pregnancy may exacerbate symptoms. Rising progesterone and estrogen levels may increase glandular secretions and vasodilation,

and increased blood volume may cause nasal vascular pooling. In contrast, increased serum free cortisol during pregnancy could improve symptoms.

Medications should be prescribed during pregnancy when the apparent benefit of the drug outweighs the apparent risk. Agents used to treat allergic rhinitis in pregnancy should be either category B (presumed safe based on animal studies, but without adequate data in humans), or category C (of uncertain safety, with no demonstrated adverse effects in animals or humans). If possible, medication should be avoided in the first trimester because of the potential risk of congenital malformations. In general, it is considered safe to continue immunotherapy during pregnancy.

For mild to moderate nasal symptoms of allergic rhinitis, nasal saline irrigation should be recommended as first line therapy given its proven safety and efficacy. For more severe or persistent symptoms, intranasal budesonide (category B) can be prescribed; all other intranasal corticosteroids are rated category C. A study showed no increased risk of adverse fetal outcomes with maternal exposure to inhaled budesonide, and intranasal budesonide should be at least as safe because of the lower systemic exposure. Providers could also choose intranasal cromolyn (category B) but this is not as effective as intranasal corticosteroids.

If prescribing an oral antihistamine, providers should choose either:

- first-generation antihistamine chlorpheniramine (category B) or
- second-generation agents, loratadine or cetirizine (both category B).

Severe Asthmatics

Rhinosinusitis can exacerbate asthma. Desensitization can improve asthma control for those patients with allergic asthma. Consider referral if rhinitis or asthma is poorly controlled.

Severe Atopic Dermatitis Patients

Patients with atopic dermatitis tend to be severely allergic and should be referred if initial therapy is unsuccessful.

Complementary and Alternative Medicine

Complementary and alternative medicine (CAM) is widely practiced by patients to treat allergic rhinitis. Many patients that use CAM report improvement in symptoms. However, no evidence definitively supports the efficacy of CAM in the treatment of allergic rhinitis. In addition, CAM may have side effects and some of the medications used may interact with other drugs. Some studies have shown some decrease in symptoms with acupuncture and probiotics; however medication therapy has not been able to be decreased. More studies need to be done in this area.

Controversial Areas

Testing

Cytotoxicity testing, provocative and neutralization testing carried out by either intracutaneous or subcutaneous injection or sublingual administration, and measurement of specific and non-specific IgG4 have not been validated by accepted standards of scientific evaluation and as such are considered unproven, controversial, and inappropriate for diagnostic use.

Treatment, Cost, Strategy

Pharmacologic control of allergic rhinitis is expensive for ongoing treatment.

Immunotherapy (allergy shots) may provide significant long-term control of symptoms at a reduced cost and without the risks of medication, but requires multiple office visits, which compromises patient compliance. These issues must be weighed when considering treatment options.

For children with allergic rhinitis and comorbid asthma, immunotherapy is cost beneficial.

Strategy for Literature Search

The literature search for this update began with the results of the literature searches performed for the 2002 and 2007 versions of this guideline. Also referenced was the search performed for Allergic Rhinitis and its Impact on Asthma (ARIA) 2010 revision. Geneva: World Health Organization (WHO), which included literature through Aug. 2007. A search for literature published since that time was performed. The search on Medline was conducted prospectively for literature published from 8/1/07 to 3/30/12 using the major keywords of: *allergic rhinitis, human (adult and pediatric), English language, clinical guidelines, controlled trials and meta analyses, and cohort studies.* Separate searches were performed for: *history ((inciting factors, seasonality, family history, severity & severity scoring), physical exam, signs, symptoms (nasal exam for changes in mucosa, conjunctival changes), laboratory (nasal smear for presence of eosinophyls, skin testing; RAST), Diagnosis – other references, control triggers, corticosteroids (intra-nasal, ocular), antihistamines (intra-nasal, oral, ocular), leukotriene inhibitors/modulators, decongestants (intra-nasal, ocular, oral), mast cell stabilizers (intra-nasal, ocular), non-steroidal anti-inflammatory (ocular), anticholinergics (intra-nasal), omalizumab, saline irrigation to remove allergens (nasal spray, eye wash), immunotherapy/allergy shots or inhaler, turbinate reduction surgery, integrative/ alternative/ complementary medicine, pregnancy & lactation), treatment or management – other references, geriatric patients, cost and cost-effectiveness, other references.*

The search was conducted in components each keyed to a specific causal link in a formal problem structure (available upon request). The search was supplemented with recent clinical trials known to expert members of the panel. Negative trials were specifically sought. The search was a single cycle. Conclusions were based on prospective randomized clinical trials if available, to the exclusion of other data; if RCTs were not available, observational studies were admitted to consideration. If no such data were available for a given link in the problem formulation, expert opinion was used to estimate effect size.

Related National Guidelines

The UMHS Clinical Guideline on Allergic Rhinitis is consistent with:

Allergic Rhinitis and its Impact on Asthma (ARIA) 2010 revision. Geneva: World Health Organization (WHO).

The Diagnosis and Management of Rhinitis: An Updated Practice Parameter, AAAAI, 2008

Measures of Clinical Performance

At this time no major national programs have clinical performance measures specifically for the diagnosis and treatment of otitis media.

Disclosures

The University of Michigan Health System endorses the Guidelines of the Association of American Medical Colleges and the Standards of the Accreditation Council for Continuing Medical Education that the individuals who present educational activities disclose significant relationships with commercial companies whose products or services are discussed. Disclosure of a relationship is not intended to suggest bias in the information presented, but is made to provide readers with information that might be of potential importance to their evaluation of the information.

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Review and Endorsement

Drafts of this guideline were reviewed in clinical conferences and by distribution for comment within departments and divisions of the University of Michigan Medical School to which the content is most relevant: Allergy, Family Medicine, General Internal Medicine, General Pediatrics, and Otolaryngology. The guideline was approved by the UM C. M. Mott Children Hospital's Pediatric Medical Surgical Joint Practice Committee and Executive Committee. The final version was endorsed by the Clinical Practice Committee of the University of Michigan Faculty Group Practice and the Executive Committee for Clinical Affairs of the University of Michigan Hospitals and Health Centers.

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2002: Richard Orlandi, MD, Otolaryngology; James Baker, MD, Allergy; Margie Andreae, MD, Pediatrics; Daniel Dubay, MD, General Medicine; Steve Erickson, PharmD, Pharmacy.

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Annotated References

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