Supporter

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Disclosures

- Suzanne Bollmeier "declare(s) no conflicts of interest, real or apparent, and no financial interests in any company, product, or service mentioned in this program, including grants, employment, gifts, stock holdings, and honoraria."
- Dennis Williams declares that his spouse works for and owns stock in GlaxoSmithKline.

The American Pharmacists Association is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education.

Learning Objectives

- Target Audience: Pharmacists
- ACPE#: 0202-0000-16-046-L01-P
- Activity Type: Application-based
- Discuss signs and symptoms of allergic rhinitis and how to differentiate these symptoms from those of the common cold.
- Explain how to implement trigger control strategies that may help prevent allergic rhinitis.
- Identify clinical situations that may be managed with non-pharmacologic treatment options and situations for which referral to a specialist is appropriate.
- Discuss current management strategies for allergic rhinitis, including allergen avoidance, immunotherapy, pharmacotherapy, and new and emerging dosage formulations.
- Apply counseling strategies to help patients achieve optimal symptom relief.
- Construct an individualized pharmacy care plan for a patient with allergic rhinitis who has not received relief from first-line therapies.
Which of the following symptoms is helpful in differentiating allergic rhinitis from a common cold?
A. Cough  
B. Fatigue  
C. Itchy, watery eyes  
D. Runny or stuffy nose

Which of the following techniques is recommended when using a nasal spray?
A. Direct toward septum for maximal absorption  
B. Depress the nasolacrimal duct to minimize systemic absorption  
C. Avoid shaking product prior to use  
D. Use contralateral hand to direct away from septum

The most common side effect reported with second generation antihistamines is
A. Urinary retention  
B. Skin rash  
C. Sedation  
D. Arrhythmias  
E. Insomnia

According to expert guidelines for managing allergic rhinitis, the use of combination therapies is
A. Lacking in clinical evidence  
B. Strongly supported by evidence  
C. Required for most patients

Nonallergic triggers in patients with chronic rhinitis include
A. Animal dander  
B. Various odors  
C. Cigarette smoke  
D. Each of the above  
E. Both 2 and 3 above

An usual dose for an adult from an epinephrine auto-injector is
A. 0.15 mg  
B. 0.3 mg  
C. 0.5 mg  
D. 5 mg  
E. 10 mg  
F. 100.1 mg
Cousin Brandon

• Brandon is a 9 year old boy from Wyoming who is spending a summer month with his cousins in Georgia.
• He has a history of seasonal allergies and his mom has sent loratadine along with him, with instructions to his Aunt about when to use it.
• For the last 4 days, Brandon has had a runny nose and has been sneezing. He complains that his nose feels stopped up especially in the morning.

Cousin Brandon

• His aunt indicates that one of her sons is also having similar symptoms and that he has had allergies in the past.
• She heard that there was a ‘summer version’ of the cold that was circulating.
• She doesn’t want to make a mistake with her nephew and asks for advice about what to do.

Considerations for Brandon

• Allergens (and triggers in general) can differ depending on the environment
  – Evaluate triggers that might be present (pets, smoking, pollens)
• Viral URIs can occur at any time during the year
  – Has the patient received the influenza vaccine?
• Consider the differentiating features for allergies and the common cold

Allergies vs URI: Common symptoms

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Allergic rhinitis</th>
<th>Common cold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cough</td>
<td>Sometimes</td>
<td>Often</td>
</tr>
<tr>
<td>Muscle aches &amp; pains</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>Fatigue</td>
<td>Sometimes</td>
<td>Sometimes</td>
</tr>
<tr>
<td>Fever</td>
<td>Never</td>
<td>Rarely</td>
</tr>
<tr>
<td>Itchy, watery eyes*</td>
<td>Often</td>
<td>Rarely</td>
</tr>
<tr>
<td>Sore throat</td>
<td>Sometimes</td>
<td>Often</td>
</tr>
<tr>
<td>Runny nose*</td>
<td>Often</td>
<td>Often</td>
</tr>
<tr>
<td>Congestion*</td>
<td>Often</td>
<td>Often</td>
</tr>
<tr>
<td>Sneezing*</td>
<td>Often</td>
<td>Sometimes</td>
</tr>
</tbody>
</table>

Allergies vs URI: Other differences

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Allergic rhinitis</th>
<th>Common cold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triggered by</td>
<td>Immune response to trigger</td>
<td>Virus</td>
</tr>
<tr>
<td>Symptoms begin</td>
<td>Immediately upon exposure</td>
<td>Few days following exposure</td>
</tr>
<tr>
<td>Duration</td>
<td>Days-months depending on trigger</td>
<td>3-14 days typically</td>
</tr>
</tbody>
</table>

Options for Brandon

• Depending on the information gathered from questioning, the Aunt can be advised to
  – Start loratadine if allergies appear likely, and take steps to reduce exposure to triggers.
  – Use supportive care treatments (fluids, rest) if it appears to be a cold.
  – Consider medications for specific symptoms of a cold.
When treating symptoms of a cold with an antihistamine, 2nd generation agents are generally preferred.

A. Yes  
B. No

First vs. Second Generation Antihistamines

- Antihistamines are effective for several symptoms of allergies including rhinorrhea, sneezing, itching.
- Second generation agents are generally tolerated better because of less CNS effects, and greater specificity for the H1 receptor.
- Second generation agents are preferred over first generation agents for treating allergies.
- The most common side effect of all antihistamines is sedation.

Freshman Denise

- Denise is a 19 year old female student who is looking for something to treat her allergies.
- She is looking at the options on the allergy product shelf, which seems to be connected to the cough and cold product shelf, and she finds it all a bit overwhelming.
- She indicates that she has had allergies her entire life but usually they have been associated with certain pollens outside.

Freshman Denise

- She now feels that she has allergy symptoms constantly.
- She is living in a duplex with two other students.
- In the past she has used a chlorpheniramine/phenylephrine allergy product because that is what her mother recommended.
- However, she doesn’t like the way it makes her feel.
- The patient reports that she has never been formally tested for allergies but certain pollens and some pets seem to cause her symptoms.

Impact of Allergic Rhinitis

- Incidence and prevalence rates difficult to quantify
  - Often undiagnosed
  - Self-treatment is common
- Affects more than 35 million people in the United States
- 6th most chronic illness in the United States

Symptoms of allergic rhinitis

<table>
<thead>
<tr>
<th>Nose</th>
<th>Eyes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watery discharge</td>
<td>Itching</td>
</tr>
<tr>
<td>Congestion</td>
<td>Redness</td>
</tr>
<tr>
<td>Sneezing</td>
<td>Swelling</td>
</tr>
<tr>
<td>Itching</td>
<td>“Allergic shiners”</td>
</tr>
<tr>
<td>Post-nasal drip</td>
<td></td>
</tr>
<tr>
<td>Sinus pressure and pain</td>
<td></td>
</tr>
<tr>
<td>Anosmia</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Throat</th>
<th>Ears</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>Pain and pressure</td>
</tr>
<tr>
<td>Hoarseness</td>
<td>Congestion</td>
</tr>
<tr>
<td>Itching</td>
<td>Popping/loss of hearing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sleep cycle</th>
<th>Itching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mouth breathing</td>
<td></td>
</tr>
<tr>
<td>Frequent awakenings</td>
<td></td>
</tr>
<tr>
<td>Fatigue</td>
<td></td>
</tr>
</tbody>
</table>
If Denise has an allergic basis for her rhinitis (e.g., allergic rhinitis), which of the following immunoglobulins is involved?

A. IgA
B. IgE
C. IgG
D. IgM

The Allergic Reaction

Sensitization

IgE production

Arming of mast cells

Release of mediators

Clinical effects

Mechanism of Allergic Reaction in Rhinitis

Chemical mediators

Early-phase reaction symptoms
- Itching
- Sneezing
- Rhinorrhea
- Nasal congestion

Late-phase reaction symptoms
- Nasal congestion
- Nasal hypersensitivity
- Rhinorrhea

Current Terminology for Allergic Rhinitis Conditions

- Allergic rhinitis (AR): caused by an IgE-mediated inflammatory response of the nasal mucosa membranes after exposure to inhaled allergens. Symptoms include rhinorrhea (anteror or posterior nasal drainage), nasal congestion, nasal itching, and sneezing.
- Seasonal allergic rhinitis (SAR): caused by an IgE-mediated inflammatory response to seasonal aeroallergens. The length of seasonal exposure to these allergens is dependent on geographic location and climatic conditions.
- Perennial allergic rhinitis (PAR): caused by an IgE-mediated inflammatory response to year-round environmental aeroallergens. These may include dust mites, mold, animal allergens, or certain occupational allergens.
- Intermittent allergic rhinitis: caused by an IgE-mediated inflammatory response and characterized by frequency of exposure or symptoms (<4 days per week or <4 weeks per year).
- Persistent allergic rhinitis: caused by an IgE-mediated inflammatory response and characterized by persistent symptoms (>4 days per week and >4 weeks per year).
- Epidemic allergic rhinitis: caused by an IgE-mediated inflammatory response that can occur if an individual is in contact with an exposure that is not normally a part of the individual’s environment (e.g., a cat at a friend’s house).
Intermittent (seasonal) | Persistent (perennial)
--- | ---
Symptoms occur: Fewer than 4 days/week or Fewer than for 4 weeks | Symptoms occur: At least 4 days/week AND for at least 4 weeks

**MILD** | **MODERATE-SEVERE**
--- | ---
All of the following | At least one 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 with work or school
No troublesome symptoms | Troublesome symptoms

**Considerations for Denise**
- Collect a history about possible triggers
- Set goals for management (What are we trying to achieve?)
  - Control symptoms
  - Improve quality of life
  - Prevent complications
  - Avoid exacerbation of comorbidities

**General Management Components**

**Allergen Avoidance**
- Indicated when possible

**Pharmacotherapy**
- Safety
  - Effectiveness
  - Easily administered

**Immunotherapy**
- Effectiveness
  - Specialist prescription
  - May alter natural course of the disease

**Patient Education**
- Always indicated

**How do we know if our management strategy is working?**

**Total Nasal Symptom Score (TNSS)**
- Commonly used assessment tool (composite score) in clinical studies and sometimes in practice (especially in allergy settings)
- Patient completes a questionnaire regarding the presence and severity of common symptoms of allergic rhinitis, during the past day and the past 2 weeks
  - Congestion
  - Runny nose
  - Nasal itching
  - Sneezing
  - Difficulty sleeping (sometimes)

General Guidance on Environmental Controls

- Dust mite interventions
  - Impermeable encasings for pillows and mattresses
  - Wash linens in hot water
  - HEPA filtration
- Animal allergens
  - Keep outdoors and out of bedroom
  - Similar interventions as with dust mites
- Roach control
  - Integrated pest management
  - Clean up food, spills, trash, leaks
- Mold and mildew interventions
  - Air conditioning
  - Avoid humidifiers
  - Repair pipes and leaks
- Second-hand smoke exposure
- Air pollution

Trigger control strategies

<table>
<thead>
<tr>
<th>Trigger</th>
<th>Strategies to control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust mites</td>
<td>Impermeable mattress cover, *HEPA filtration</td>
</tr>
<tr>
<td>Acaricides</td>
<td>Washing bed sheets, biweekly scalding water</td>
</tr>
<tr>
<td>Animal allergens</td>
<td>Remove upholstered furniture, carpet from bedroom, *Vacuum frequently</td>
</tr>
<tr>
<td>Pet dander</td>
<td>Wash dogs twice weekly, Cat washing – limited usefulness</td>
</tr>
<tr>
<td>Roach droppings</td>
<td>Clean up food, spills, trash</td>
</tr>
<tr>
<td>Mold and mildew</td>
<td>*Run air conditioning, Avoid humidifiers</td>
</tr>
<tr>
<td>2nd hand smoke exposure</td>
<td>*Try to avoid</td>
</tr>
<tr>
<td>Air pollution</td>
<td>Avoid exercising outdoors on poor air quality days</td>
</tr>
</tbody>
</table>

How well does allergen avoidance work?

- Single interventions for avoidance of exposure to house dust mites are not effective
- Multifaceted strategies are required
- Avoidance of exposure to indoor mold and animal dander is recommended when sensitivity is present

ARIA Guideline 2010; WHO

- May advise about avoidance of known allergens or environmental controls (e.g., removal of pets, air filtration systems, bed covers, acaricides) in patients with identified allergens known to cause their symptoms


Freshman Denise

- She now feels that she has allergy symptoms constantly.
- She is living in a duplex with two other students.
- In the past she has used a chlorpheniramine/phenylpropanolamine allergy product because that is what her mother recommended.
- However, she doesn’t like the way it makes her feel.
- The patient reports that she has never been formally tested for allergies but certain pollens and some pets seem to cause her symptoms.

Which of the following pharmacotherapies would you recommend to Denise at this time?

1. Intranasal decongestant
2. Second generation antihistamine
3. Intranasal cromolyn
4. Intranasal steroid
5. Intranasal ipratropium

Oral Antihistamines Second Generation

- Most common class of agents recommended for allergic rhinitis
- Effective for sneezing, rhinorrhea, and itching
- Not usually effective for nasal congestion
- Most common adverse effect is sedation
Second Generation Antihistamines

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Cetirizine (Zyrtec)</th>
<th>Levocetirizine (Xyzal)</th>
<th>Loratadine (Claritin)</th>
<th>Desloratadine (Clarinex)</th>
<th>Fexofenadine (Allegra)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult daily dose</td>
<td>5-10mg</td>
<td>5mg</td>
<td>10mg</td>
<td>5mg</td>
<td>60mg BID or 180mg</td>
</tr>
<tr>
<td>Pediatric use? (Age)</td>
<td>12 mo</td>
<td>2 years</td>
<td>2 years</td>
<td>6 mo</td>
<td>2 years</td>
</tr>
<tr>
<td>OTC availability</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Pregnancy Category</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Excreted in breast milk?</td>
<td>No human data</td>
<td>No human data</td>
<td>Yes</td>
<td>Yes</td>
<td>No human data</td>
</tr>
<tr>
<td>Key drug interactions</td>
<td>Ethanol</td>
<td>Amiodarone</td>
<td>Nelfinavir</td>
<td>Erythromycin</td>
<td>Grapefruit juice</td>
</tr>
<tr>
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<td></td>
<td>Ketoconazole</td>
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<td>Ritonavir</td>
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<td></td>
<td>Verapamil</td>
</tr>
</tbody>
</table>

Denise

- What about her congestion? (She was taking phenylephrine previously)

ARIA Pharmacotherapy Recommendations

- Inhaled decongestants recommended for congestion (when used for less than 5 days with other agents)—but not in preschool age
- Oral decongestants are not recommended for regular use in AR

ARIA 2010, WHO

What do we know about the effectiveness of various agents for symptoms of rhinitis?

- Should consider patient symptoms when selecting therapy
- Various sources are available to inform about the relative effectiveness for specific symptoms
- Personal experiences can also be helpful


Sneezing Rhinorrhea Itching Congestion Side Effects

<table>
<thead>
<tr>
<th>Antihistamines</th>
<th>Traditional</th>
<th>Nonsedating antihistamine (NSA)</th>
<th>Nasal antihistamine</th>
<th>Decongestants</th>
<th>NSA + Decongestants</th>
<th>Leukotriene antagonist (LTRA)</th>
<th>Inhaled Steroids</th>
<th>Immunoceuticals</th>
</tr>
</thead>
<tbody>
<tr>
<td>+++</td>
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</tr>
</tbody>
</table>

+++ = Strongly positive effect; + = Minimal effect.

Options for Denise

• Second-generation antihistamines are recommended (over first-generation agents) by expert groups and evidence-based assessments
• Second-generation agents have improved safety profile and equal effectiveness
• Use as monotherapy along with trigger avoidance
• Generally avoid regular use of oral or topical decongestants
• If congestion is a chronic problem, consider other therapies (e.g., intranasal steroid)

Carl

• Carl is a 28 year old man who is in the pharmacy today with prescriptions for a 5 day course of prednisone and an albuterol inhaler
• He reports that he was at work (he is a mechanic) when he became acutely short of breath and began wheezing
• He was treated in the urgent care center for an acute asthma episode and asked to see his physician in 5 days
• Carl reports that he had felt like he had a chest cold for a couple of days with chest tightness and some shortness of breath

Carl

• He endorses a long history of allergies which he describes as mild
• His symptoms are worse during ragweed season, and cats trigger symptoms while dogs do not seem to
• He reports that sometimes he gets rhinorrhea and congestion at work when certain chemicals are used
• He uses fexofenadine as needed

What is the likelihood that Carl has both allergic rhinitis and asthma?
1. Less than 25%
2. 50% or more
3. At least 75%
4. More than 90%

Considerations for Carl

• May have co-existing allergic rhinitis and asthma
• Depending on age, 50-80% of patients have both conditions
• Earlier episodes likely were asthma and he became asymptomatic during adolescence
Common Comorbidities with Allergic Rhinitis

Asthma and Allergic Rhinitis
- Often exist as comorbid conditions
- Allergic rhinitis often precedes asthma diagnosis and is a risk factor for asthma
- Prevalence of asthma higher in people with allergic rhinitis versus those without allergic rhinitis
- Allergic rhinitis and asthma are linked by some researchers as "One airway, One disease" but this concept is not universally accepted

Allergic Rhinitis and Asthma
- Expect to encounter patients with both conditions
  - Children and adults
- Consider strategies for optimal control of each condition

Allergic Rhinitis and Asthma Effect of Treating Allergic Rhinitis
- Can reduce asthma symptoms and decrease bronchial hyperresponsiveness
- Most data regarding improved control related to intranasal steroid therapy
- Treatment of allergic rhinitis is not a direct or definitive asthma therapy

Options for Carl
- Ensure that he understands the prednisone regimen and instruct regarding the albuterol MDI
- Anticipate that he will be starting an inhaled corticosteroid for asthma at the time of his followup
  - This would be an appropriate strategy depending on how this episode resolves and whether symptoms continue to occur
- Continue fexofenadine for allergies; if his allergies are active now, use scheduled doses
- Explore triggers for his allergies and asthma, including occupational exposures

Jennifer
- 37 year old female is referred to the pharmacotherapy clinic for recommendations regarding treatment of asthma and allergies
- Patient endorses lifelong allergies and asthma for 16 years
- Describes multiple allergies but was not formally tested until recently
- Treated with cetirizine 10 mg daily, mometasone/formoterol inhaler (100/5) 2 puffs twice daily, and albuterol PRN
  - Combo inhaler was recently initiated; previously tx with mometase
Jennifer

- Patient reports that allergies are always present but has been able to control them in the past
- Has multiple symptoms including persistent congestion
- Her asthma has not been well controlled recently and she has required two courses of prednisone during the past 7 months
- She uses her albuterol at least 5 times weekly
- She feels that her allergies are affecting her asthma

What is an appropriate treatment consideration for Jennifer at this point?

1. Omalizumab
2. Montelukast
3. Intranasal budesonide (or some INS)
4. Intranasal Cromolyn

Considerations for Jennifer

- Has the common comorbidities of asthma and allergic rhinitis
- Suboptimal control of allergic rhinitis can perturb asthma control
- Identification of specific allergens may be helpful
- Intranasal steroids are the most effective therapy for allergic rhinitis among common medications
- Ensure optimal technique with inhalational devices

Options for Jennifer

- Intranasal steroids are the most effective pharmacotherapy agents for managing allergic rhinitis
- Beneficial for multiple symptoms, including congestion
- Can be used safely with orally inhaled corticosteroids used for asthma
- Administration technique should be taught and monitored

Intranasal steroids for allergic rhinitis

<table>
<thead>
<tr>
<th>Generic name</th>
<th>Brand name</th>
<th>Pediatric use</th>
<th>Pearls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beclomethasone</td>
<td>Beconase AQ, Qnasl</td>
<td>4 and up</td>
<td></td>
</tr>
<tr>
<td>Ciclesonide</td>
<td>Omnaris Zetonna</td>
<td>6 and up</td>
<td></td>
</tr>
<tr>
<td>Flunisolide</td>
<td>Flonase</td>
<td>6 and up</td>
<td></td>
</tr>
<tr>
<td>Fluticasone propionate</td>
<td>Flonase</td>
<td>4 and up</td>
<td></td>
</tr>
<tr>
<td>Fluticasone furoate</td>
<td>Veramyst</td>
<td>4 and up OTC</td>
<td></td>
</tr>
<tr>
<td>Mometasone</td>
<td>Nasonex</td>
<td>2 and up</td>
<td></td>
</tr>
<tr>
<td>Triamcinolone</td>
<td>Nasacort Allergy</td>
<td>2 and up OTC</td>
<td></td>
</tr>
<tr>
<td>Budesonide</td>
<td>Rhinocort Aqua</td>
<td>6 and up</td>
<td></td>
</tr>
</tbody>
</table>

Intranasal Steroid Inhaler Technique

- Prime device according to the manufacturer’s instructions
- Shake before use
- Blow nose before spraying if mucus present
- Tilt head slightly forward and place nozzle into nostril
- Use contralateral hand (left hand to right nostril; right hand to left nostril)
- Spray dose while gently sniffing
- Wipe excess spray from nose if needed
What about allergy shots for Jennifer?

Adapted from Benninger MS, et al. Otolaryngol Head Neck Surg 2004;130:5-24

Step Therapy algorithm for treatment of allergic rhinitis

Allergy Testing for Allergic Rhinitis

- IgE specific testing (skin or blood) recommended for patients with a clinical diagnosis who:
  - do not respond to empiric therapy
  - do not have a certain diagnosis
  - will benefit from knowledge about the specific causative agent in order to target therapy

Seidman MD, et al. Otolaryngology-Head and Neck Surgery 2015;152(1S):S1-S43

Allergen Testing

- When indicated an IgE-specific test should be used
- Subjects should have history consistent with allergic rhinitis, and
  - skin testing (prick or intradermal) or
    - in vitro (blood) testing for specific IgE (RAST or PRIST)
- Total IgE blood testing not recommended

Jennifer's Test Results

- Skin prick testing results
  (+) feather mix, cat hair, dog hair, rat epithelial
  (+) Bermuda grass, hickory/pecan mix
  (+) Dermatophagoides farinae (dust mites)
  (-) ladybug

Seidman MD, et al. Otolaryngology-Head and Neck Surgery 2015;152(1S):S1-S43
Jennifer

• Allergen avoidance or desensitization therapy can be considered

Karen

• 59 year old woman who reports worsening problems with allergy symptoms
• Indicates that she has had lifelong allergies that were generally mild
• She uses allergen covers on her mattress and pillows, has hardwood floors, and does not have pets
• Takes loratadine PRN, but usually every other day
• Also has hypertension which is treated with HCTZ 25 mg and is well controlled

Karen

• Patient reports increasing symptoms during the past 3 months
• Attributes symptoms to certain odors (cooking, perfumes) and changes in the weather
• Reports some rhinorrhea but congestion is more problematic than in the past
• Has increased use of loratadine but finds it ineffective

Which of the following is a likely consideration for this patient (Karen)?
A. Stop the diuretic as it is implicated
B. Change the antihistamine due to tolerance
C. Consider other therapies
D. Consider other causes

Rhinitis Diagnostic Worksheet
Nonallergic/Mixed Allergic

Supports Vasomotor (non-allergic) Rhinitis
- Persistent congestion and/or rhinorrhea without itch/sneeze
- Poor response to oral antihistamines
- Symptoms exacerbated by:
  - Weather changes
  - Temperature extremes/changes
  - Perennial/dust
  - Perfumes/odors
  - Smoke/fumes
  - Late age of onset
  - Absence of certain food trigger

Supports Allergic Rhinitis
- Sneezing
- Itchy nose (the "nasal salute")
- Seasonal symptoms
- Itchy eyes/ear/eye rubbing
- Clear rhinorrhea
- Family his of allergic rhinitis
- Eczema
- Food allergy

Common Rhinitis Condition Categorization

Nonallergic Rhinitis Wears Many Hats

- Infectious – typically a viral URI
- Vasomotor – disturbance of Autonomic Nervous System (ANS) function
- Occupational – triggered by workplace irritants
- Hormonal – associated with estrogen levels
- Gustatory – triggered by taste or smell
- Drug-induced – numerous classes of drugs cause rhinitis, and then there is rhinitis medicamentosa
- Nonallergic rhinitis with eosinophilic syndrome (NARES) – possible related to prostaglandin function

Options for Karen

- Change in therapy is indicated
- Oral antihistamines are generally ineffective for nonallergic causes
- Intranasal steroids are indicated
- Combo of INS and intranasal antihistamine also has a role
- Patient should be instructed about proper use of intranasal therapy

Darby

- Darby is a 23-year-old accountant who has experienced allergic symptoms since childhood.
- Her symptoms have been worsening after she graduated from college and moved to a new area of the country.
- She has mild symptoms year-round, she has severe exacerbations during April through June and August through October each year.
- During these periods, she feels that exposure to cut grass and weeds provoke profound nasal symptoms.
- When outdoors in the spring and fall – her regular OTC therapy (Flonase) is less effective. She also uses Azelastine 0.1% 2sp EN BID but its not fully effective either.

Step Therapy Algorithm for Treatment of Allergic Rhinitis

- Provide education and allergen/irritant avoidance strategies
- Consider specific immunotherapy

Adapted from Benninger MS, et al. Otolaryngol Head Neck Surg 2004;130:5-24
DW5 wkuh#lv#vrph#hglw#uhfrpphqghg#khu#exw#L#grq
Ghqlv#Zlooldpv/#;24325348
**Combination Therapy for AR**

<table>
<thead>
<tr>
<th>Combination</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasal antihistamine + Oral antihistamine</td>
<td>No benefit</td>
</tr>
<tr>
<td>Oral antihistamine + Leukotriene Modifier</td>
<td>Evidence of benefit</td>
</tr>
</tbody>
</table>

**When is immunotherapy indicated?**

- Should be considered for patients with any of the following characteristics:
  - Documented IgE-mediated disease
  - Severe symptoms despite optimal pharmacotherapy
  - ADRs that limit treatment choices
  - Unable to avoid allergen exposure

- Immunotherapy (subcutaneous or sublingual) for patients who have inadequate response to pharmacotherapy with or without environmental controls

Seidman MD et al. Otolaryngol Head Neck Surg. 2015;152(suppl):S1-S43

**Allergic Rhinitis and Asthma Immunotherapy**

- Immunotherapy beneficial for allergic rhinitis
- Limited data available regarding role of immunotherapy for:
  - Preventing asthma development
  - Improving asthma control when present

**Allergen Testing Techniques**

- Skin testing
  - Skin-prick
  - Prick-puncture
- Wheal and flare reaction
  - 10-20 minutes later
- Total serum IgE levels

**Darby’s Test Results**

- (+) skin prick testing results to
  - Mountain cedar
  - Ragweed
  - Maple
  - Ryegrass
Immunotherapy

- Refer patient to specialist
- Subcutaneous immunotherapy (SCIT)
  - Limited by delayed onset of benefit (6-12 months)
  - Risk of allergic reactions, including anaphylaxis
- Sublingual immunotherapy (SLIT)
  - Emerging as beneficial option
  - Usually requires treatment initiation 3-4 months prior to allergen exposure
  - May have limited effectiveness if multiple allergens present
  - Risk of allergic reactions, including anaphylaxis


Sublingual Immunotherapy Products

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Allergen Targeted</th>
<th>Patient Ages Approved (in years)</th>
<th>When to Initiate Treatment in Relation to Expected Onset of Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ragwitek</td>
<td>Ragweed pollen</td>
<td>18-65</td>
<td>12 weeks</td>
</tr>
<tr>
<td>Oralair</td>
<td>Mixed grasses: sweet vernal, orchard, perennial rye, Timothy, and Kentucky bluegrass</td>
<td>10-65</td>
<td>4 months</td>
</tr>
<tr>
<td>Grastek</td>
<td>Timothy grass</td>
<td>5-65</td>
<td>12 weeks</td>
</tr>
</tbody>
</table>

Sublingual Immunotherapy Education Points

- Place under tongue 1-2 minutes before swallowing
- No titration schedule
- First dose – provider office
- Requires daily dosing
- Provide epinephrine for possible reactions and instruct regarding use
- Duration of therapy?

Injectable Epinephrine

- An endogenous catecholamine that acts as an adrenergic agonist (sympathomimetic)
- Exhibits actions at Alpha (α) and Beta (β1, β2) receptors
- Treats symptoms of anaphylaxis and asthma
- Fast onset of action

Auto-injector Epinephrine

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Dosage Form and Strength</th>
<th>Adult Dose</th>
<th>Pediatric Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>EpiPen and EpiPen Jr</td>
<td>Solution Auto-injector 0.15 mg and 0.3 mg</td>
<td>0.3 mg IM or SC into the anterolateral aspect of the thigh</td>
<td>Dosage based on patient body weight: 15-29 kg: 0.15 mg IM or SC; ≥30 kg: 0.3 mg IM or SC</td>
</tr>
<tr>
<td>Adrenaclick</td>
<td>Solution Auto-injector 0.15 mg and 0.3 mg</td>
<td>0.3 mg IM or SC into the anterolateral aspect of the thigh</td>
<td></td>
</tr>
</tbody>
</table>
Injectable Epinephrine

- A life-saving therapy when used appropriately
- Can be administered by clinician, patient, or patient agent
- Automatic injector devices facilitate administration
- Cases of administration errors are reported

Administration Errors with Injectable Epinephrine

- Dozens of reports over the past 20 years
- Involves patients and clinicians
- Reports include trauma from
  - Lacerations
  - Intense vasoconstriction (in digits)

Strategies for Safe and Effective Use of Injectable Epinephrine

- Auto-injectors may only be given IM (preferred) or SQ
- Inject into anterolateral aspect of the middle third of the thigh
  - Avoid IM administration in buttocks
  - Inject through clothing if necessary
- Obese or overweight pediatric patients
  - Inject into lower half of thigh
  - May inject into calf if necessary

Epinephrine Auto-injectors

- Store at room temperature
- Do not refrigerate or freeze
- Protect from light
  - Store in carrier tube provided
- Some products may contain sulfites
  - Not a contraindication in a life-threatening situation

Demonstration and Interactive Session
Key Points

• Allergic rhinitis is a common medical condition associated with significant morbidity
• Oral antihistamines are the most common treatment for allergic rhinitis; Intranasal steroids are the most effective medications
• Management approach should be specific for the patient’s symptoms
• Proper use of inhaled and injectable medications is important
• Immunotherapy options now include sublingual therapies
• Patients should be instructed in the use of emergency epinephrine injectors

Which of the following symptoms is helpful in differentiating allergic rhinitis from a common cold?

A. Cough
B. Fatigue
C. Itchy, watery eyes
D. Runny or stuffy nose

Which of the following techniques is recommended when using a nasal spray?

A. Direct toward septum for maximal absorption
B. Depress the nasolacrimal duct to minimize systemic absorption
C. Avoid shaking product prior to use
D. Use contralateral hand to direct away from septum

The most common side effect reported with second generation antihistamines is

A. Urinary retention
B. Skin rash
C. Sedation
D. Arrhythmias
E. Insomnia

According to expert guidelines for managing allergic rhinitis, the use of combination therapies is

A. Lacking in clinical evidence
B. Strongly supported by evidence
C. Required for most patients

Nonallergic triggers in patients with chronic rhinitis include

A. Animal dander
B. Various odors
C. Cigarette smoke
D. Each of the above
E. Both 2 and 3 above
An usual dose for an adult from an epinephrine auto-injector is
A. 0.15 mg
B. 0.3 mg
C. 0.5 mg
D. 5 mg
E. 10 mg
F. 100.1 mg