

# Treatment Guidelines

from The Medical Letter®

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# Treatment Guidelines

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## Drugs for Allergic Disorders

The use of drugs to prevent and control symptoms of allergic disorders can be optimized when patients avoid exposure to specific allergens and/or environmental conditions that trigger or worsen their symptoms.

### ALLERGIC RHINITIS

Allergic rhinitis can be seasonal/intermittent or perennial/persistent. It is often associated with allergic conjunctivitis, rhinosinusitis and asthma.<sup>1,2</sup>

**H<sub>1</sub>-ANTI-HISTAMINES — Oral** – Orally administered second-generation H<sub>1</sub>-antihistamines are the preferred first-line therapy for relief of the itching, sneezing and rhinorrhea that characterize mild to moderate allergic rhinitis. They are less effective for nasal congestion. Second-generation H<sub>1</sub>-antihistamines penetrate poorly into the central nervous system and are significantly less likely than the first-generation agents to impair CNS function and cause sedation.<sup>3,4</sup>

**Intranasal** – Intranasal H<sub>1</sub>-antihistamines have a rapid onset of action. Their clinical efficacy in allergic rhinitis, including relief of nasal congestion, is equal or superior to that of oral H<sub>1</sub>-antihistamines.<sup>5</sup> A combination of the H<sub>1</sub>-antihistamine azelastine and the corticosteroid fluticasone propionate provides greater symptom improvement than either medication alone; the drugs can be delivered as 2 separate generic sprays or as a fixed-dose combination in a single intranasal spray delivery device.<sup>6,7</sup>

**Adverse Effects** – The oral second-generation antihistamine fexofenadine is nonsedating and free of CNS-impairing effects, even in higher-than-recommended doses. Loratadine and desloratadine are nonimpairing and nonsedating in recommended doses, but may cause sedation with higher doses. Cetirizine can be more sedating than other second-generation agents.

First-generation H<sub>1</sub>-antihistamines such as diphenhydramine (*Benadryl*, and generics) or chlorpheniramine (*Chlor-Trimeton*, and generics) can cause impairment of CNS function with or without sedation. They can interfere with learning and memory, impair performance on school examinations, decrease work productivity, and increase the risk of on-the-job injuries. Impairment is particularly evident during performance of multiple concurrent tasks or of complex sensorimotor tasks such as driving, and can occur before drowsiness or sedation.<sup>8</sup> When these medications are taken at night, adverse effects on wakefulness and psychomotor performance can persist the next day.<sup>9</sup> With regular use, tolerance to both sedation and performance impairment can develop.<sup>10</sup> First-generation H<sub>1</sub>-antihistamines can also cause anticholinergic effects such as dry mouth and urinary retention.

Intranasal antihistamines can cause nasal discomfort, epistaxis and headache, and may cause somnolence. Nasal mucosal ulceration can occur with long-term use. Some patients complain about the taste of intranasal azelastine.

**INTRANASAL CORTICOSTEROIDS** — Intranasal corticosteroids are the most effective drugs available for prevention and relief of allergic rhinitis symptoms, including itching, sneezing, discharge and congestion, and are the drugs of choice for moderate to severe disease. Most of these agents are effective when given once daily. The onset of action typically occurs within 12 hours, but maximal effects may not be achieved for ≥7 days. In patients with seasonal allergic rhinitis, intranasal corticosteroid sprays can decrease ocular as well as nasal symptoms.

**Adverse Effects** – Intranasal corticosteroids can cause mild dryness, irritation, burning or bleeding of the nasal mucosa, sore throat, epistaxis and headache.<sup>11</sup> Ulceration, mucosal atrophy and septal perforation

## Drugs for Allergic Disorders

**Table 1. Some Oral Drugs for Allergic Rhinitis**

Drug	Formulations	Adult Dosage	Pediatric Dosage	Cost <sup>1</sup>
<b>Oral Second-Generation H<sub>1</sub>-Antihistamines</b>				
Cetirizine <sup>2</sup> – generic <i>Zyrtec Allergy or Hives Relief, Children's Zyrtec Allergy or Hives Relief</i> (McNeil Consumer)	5,10 mg tabs and caps; 5, 10 mg chewable tabs; 5 mg/5 mL syrup	5 or 10 mg once/d	6-11 mos: 2.5 mg once/d 12-23 mos: 2.5 mg once/d-bid 2-5 yrs: 2.5 or 5 mg once/d or 2.5 mg bid 6-11 yrs: 5 or 10 mg once/d	\$14.39 <sup>3,4</sup> 22.99 <sup>3,4</sup>
Cetirizine/pseudoephedrine <sup>2</sup> – generic <i>Zyrtec-D 12 hour</i>	5 mg/120 mg ER tabs	1 tab bid	≥12 yrs: 1 tab bid	34.80 39.00
Desloratadine – generic <i>Clarinet, Clarinet Reditabs</i> (MSD)	5 mg tabs; 2.5, 5 mg disintegrating tabs; 5 mg tabs; 2.5, 5 mg disintegrating tabs; 0.5 mg/mL syrup	5 mg once/d	6-11 mos: 1 mg once/d 1-5 yrs: 1.25 mg once/d 6-11 yrs: 2.5 mg once/d ≥12 yrs: 5 mg once/d	112.90 150.81
Desloratadine/pseudoephedrine – generic <i>Clarinet-D 12 hour</i> <i>Clarinet-D 24 hour</i>	2.5 mg/120 mg ER tabs 5 mg/240 mg ER tabs	1 tab bid 1 tab once/d	≥12 yrs: 1 tab bid ≥12 yrs: 1 tab once/d	207.00 161.70
Fexofenadine <sup>2</sup> – generic <i>Allegra Allergy or Hives Relief, Children's Allegra Allergy or Hives Relief</i> (Sanofi)	30, 60, 180 mg tabs; 30 mg disintegrating tabs; 30 mg/5 mL susp	60 mg bid or 180 mg once/d	6-23 mos: 15 mg bid <sup>5</sup> 2-11 yrs: 30 mg bid	14.33 <sup>4,6</sup> 19.99 <sup>4,6</sup>
Fexofenadine/pseudoephedrine – generic <sup>7</sup> <i>Allegra-D 12 hour</i> <sup>2</sup> <i>Allegra-D 24 hour</i> <sup>2</sup>	60 mg/120 mg ER tabs 180 mg/240 mg ER tabs	1 tab bid 1 tab once/d	≥12 yrs: 1 tab bid ≥12 yrs: 1 tab once/d	107.40 124.20 124.20
Levocetirizine – generic <i>Xyzal</i> (Sanofi)	5 mg tabs; 2.5 mg/5 mL oral soln	5 mg once/d	6 mos-5 yrs: 1.25 mg once/d <sup>8</sup> 6-11 yrs: 2.5 mg once/d	36.90 85.20
Loratadine <sup>2</sup> – generic <i>Alavert</i> (Pfizer) <i>Claritin, Claritin Hives Relief, Claritin Reditabs, Claritin Hives Relief Reditabs, Children's Claritin</i> (MSD Consumer)	10 mg tabs; 10 mg disintegrating tabs; 1 mg/mL syrup and susp 10 mg disintegrating tabs 10 mg tabs and caps; 10 mg disintegrating tabs; 5 mg chewable tabs; 1 mg/mL syrup	10 mg once/d	2-5 yrs: 5 mg once/d ≥6 yrs: 10 mg once/d	13.19 <sup>4</sup> 9.43 <sup>4</sup> 23.99 <sup>4</sup>
Loratadine/pseudoephedrine <sup>2</sup> – generic <i>Alavert-D 12 hour</i> <i>Claritin-D 12 hour</i> generic <i>Claritin-D 24 hour</i>	5 mg/120 mg ER tabs 10 mg/240 mg ER tabs	1 tab bid 1 tab once/d	≥12 yrs: 1 tab bid ≥12 yrs: 1 tab once/d	22.20 28.80 38.76 13.80 29.50
<b>Leukotriene Modifier</b>				
Montelukast – generic <i>Singulair</i> (Merck)	10 mg tabs; 4, 5 mg chew tabs; 4 mg granule packets	10 mg once/d	6 mos-5 yrs: 4 mg once/d 6-14 yrs: 5 mg once/d	25.46 157.15

ER = Extended release

- Wholesale acquisition cost (WAC) for 30 days' treatment at the lowest adult dosage. When multiple formulations are listed, price is for the first formulation unless otherwise indicated. Source: Monthly (Selected from FDB MedKnowledge™) April 5, 2013. Reprinted with permission by FDB, Inc. All rights reserved. ©2013. [www.fdbhealth.com/policies/drug-pricing-policy](http://www.fdbhealth.com/policies/drug-pricing-policy). Actual retail prices may be higher.
- Available without a prescription. Products containing pseudoephedrine are subject to sales restrictions.
- Price for a 10-mg dose.
- Price according to [cvs.com](http://cvs.com) or [walmart.com](http://walmart.com) (*Alavert*). Accessed April 15, 2013.
- Only approved for treatment of chronic idiopathic urticaria in this age group; the oral suspension is available by prescription only for this indication.
- Price for a 180-mg dose.
- The 60 mg/120 mg generic ER tab formulation is available by prescription.
- Not approved for treatment of seasonal allergic rhinitis in children <2 years old.

can occur. Increased intraocular pressure has been reported.<sup>12</sup> Growth suppression in children has not been reported with newer intranasal corticosteroids such as ciclesonide, fluticasone propionate and mometasone.

**MONTELUKAST** — Cysteinyl leukotrienes released in the nasal mucosa during allergic inflammation lead to nasal congestion. The leukotriene receptor antagonist montelukast is approved in the US for treatment of seasonal and perennial allergic rhinitis. It provides modest relief of sneezing, itching, discharge and con-

gestion, but it is less effective than an H<sub>1</sub>-antihistamine or an intranasal corticosteroid.

**Adverse Effects** – Montelukast is generally considered safe, but the FDA has received postmarketing reports of psychiatric symptoms (including suicidality) and sleep disturbances. A causal relationship has not been established.

**DECONGESTANTS** — **Oral** – Oral decongestants such as phenylephrine and pseudoephedrine act as vasoconstrictors in the nasal mucosa primarily through stim-

**Table 2. Some Nasal Sprays for Allergic Rhinitis**

Drug	Formulations	Adult Dosage	Pediatric Dosage	Cost <sup>1</sup>
<b>H<sub>1</sub> -Antihistamines</b>				
Azelastine – generic	Metered-dose pump spray	1-2 sprays per nostril bid	5-11 yrs: 1 spray per nostril bid	\$76.55
<i>Astelin</i> 0.1% (Meda) <sup>2</sup>	(137 mcg/spray)			134.93
<i>Astepro</i> 0.1%, 0.15% (Meda)	Metered-dose pump spray	1-2 sprays per nostril once/d-bid <sup>2</sup>	≥12 yrs: 1-2 sprays per nostril once/d-bid <sup>4</sup>	117.87 <sup>3</sup>
Olopatadine – <i>Patanase</i> (Alcon) <sup>5</sup>	Metered-dose pump spray	2 sprays per nostril bid	6-11 yrs: 1 spray per nostril bid	154.55
	(665 mcg/spray)		≥12 yrs: 2 sprays per nostril bid	
<b>Corticosteroids</b>				
Beclomethasone dipropionate – <i>Beconase AQ</i> (GSK)	Metered-dose pump spray	1-2 sprays per nostril bid	6-11 yrs: 1-2 sprays per nostril bid	163.15
<i>Qnasl</i> (Teva)	HFA metered-dose aerosol	2 sprays per nostril once/d	≥12 yrs: 2 sprays per nostril once/d	116.62
Budesonide – <i>Rhinocort Aqua</i> (AstraZeneca)	Metered-dose pump spray	1-4 sprays per nostril once/d	6-11 yrs: 1-2 sprays per nostril once/d	126.29
Ciclesonide – <i>Omnaris</i> (Sunovion)	Metered-dose pump spray	2 sprays per nostril once/d	≥6 yrs <sup>6</sup> : 2 sprays per nostril once/d	114.04
<i>Zetonna</i> (Sunovion)	HFA metered-dose aerosol	1 spray per nostril once/d	≥12 yrs: 1 spray per nostril once/d	114.04
Flunisolide – generic	Metered-dose pump spray	2 sprays per nostril bid-tid	6-14 yrs: 1 spray per nostril tid or 2 sprays per nostril bid	48.00
Fluticasone furoate – <i>Veramyst</i> (GSK)	Metered-dose pump spray	2 sprays per nostril once/d	2-11 yrs: 1-2 sprays per nostril once/d	111.18
Fluticasone propionate – generic	Metered-dose pump spray	1-2 sprays per nostril once/d or 1 spray per nostril bid	≥4 yrs: 1-2 sprays per nostril once/d	22.00
<i>Flonase</i> (GSK)	(50 mcg/spray)			85.16
Mometasone furoate – <i>Nasonex</i> (Merck) <sup>7</sup>	Metered-dose pump spray	2 sprays per nostril once/d	2-11 yrs: 1 spray per nostril once/d	133.40
	(50 mcg/spray)		≥12 yrs: 2 sprays per nostril once/d	
Triamcinolone acetonide – generic	Metered-dose pump spray	2 sprays per nostril once/d	2-5 yrs: 1 spray per nostril once/d	100.12
<i>Nasacort AQ</i> (Sanofi)	(55 mcg/spray)		6-11 yrs: 1-2 sprays per nostril once/d	113.59
<b>H<sub>1</sub> -Antihistamine/Corticosteroid</b>				
Azelastine/Fluticasone propionate – <i>Dymista</i> (Meda) <sup>5</sup>	Metered-dose pump spray	1 spray per nostril bid	≥12 yrs: 1 spray per nostril bid	139.00
	(137 mcg/50 mcg per spray)			
<b>Mast-Cell Stabilizer</b>				
Cromolyn sodium – <i>Nasal crom</i> <sup>8</sup> (Bausch & Lomb)	Metered-dose pump spray	1 spray per nostril tid-qid	≥2 yrs: 1 spray per nostril tid-qid	11.59
	(5.2 mg/spray)			
<b>Anticholinergic</b>				
Ipratropium bromide – generic	Metered-dose pump spray	2 sprays per nostril bid-qid <sup>10</sup>	≥5 yrs: 2 sprays per nostril bid-qid <sup>10</sup>	20.98 <sup>9</sup>
<i>Atrovent</i> (Boehringer Ingelheim)	(21 or 42 mcg/spray)			103.40 <sup>9</sup>

HFA = Hydrofluoroalkane

- Wholesale acquisition cost (WAC) for one bottle of nasal spray or aerosol. Source® Monthly (Selected from FDB MedKnowledge™) April 5, 2013. Reprinted with permission by FDB, Inc. All rights reserved. ©2013. www.fdbhealth.com/policies/drug-pricing-policy. Actual retail prices may be higher.
- FDA-approved for treatment of seasonal allergic rhinitis and vasomotor rhinitis.
- Price for 0.15% formulation.
- Dosage for seasonal allergic rhinitis is 1-2 sprays per nostril bid or, with 0.15% formulation, 2 sprays per nostril once daily. Dosage for perennial allergic rhinitis is 2 sprays per nostril bid (0.15% formulation).
- FDA-approved only for treatment of seasonal allergic rhinitis.
- Not approved for treatment of perennial allergic rhinitis in children <12 years old.
- Also FDA-approved for prophylaxis of seasonal allergic rhinitis in patients ≥12 years old.
- Available without a prescription.
- Price for 21 mcg/spray formulation.
- Dosage of 0.03% formulation is 2 sprays (42 mcg) per nostril bid-tid in patients ≥6 years old with perennial rhinitis; dosage of 0.06% formulation is 2 sprays (84 mcg) per nostril qid in patients ≥5 years old with seasonal allergic rhinitis.

## Drugs for Allergic Disorders

ulation of alpha-1 adrenergic receptors on venous sinusoids. They only relieve congestion, not sneezing, itching or discharge. They are often used in combination with an H<sub>1</sub>-antihistamine. Tachyphylaxis to the decongestant effect can occur.

Phenylephrine, which is much less effective (in usual doses it may be no more effective than a placebo), has replaced pseudoephedrine in many oral decongestant formulations because illicit pseudoephedrine use has resulted in sales restrictions, including behind-the-counter status, limitations on amounts that can be purchased, and requirements for photo ID and signature before purchase.

Potential adverse effects of oral decongestants include insomnia, excitability, headache, nervousness, anorexia, palpitations, tachycardia, arrhythmias, hypertension, nausea, vomiting and urinary retention. These drugs should be used cautiously in patients with cardiovascular disease, hypertension, diabetes, hyperthyroidism, closed-angle glaucoma or bladder neck obstruction.

**Intranasal** – Intranasal decongestants are less likely than oral decongestants to cause systemic adverse effects, but they can cause stinging, burning, sneezing and dryness of the nose and throat. In order to avoid rebound congestion (rhinitis medicamentosa), they should not be used for more than 3-5 consecutive days. Rhinitis medicamentosa associated with prolonged use is treated by discontinuing the topical decongestant and using intranasal corticosteroids, or possibly a short course of oral corticosteroids, to control symptoms.

In one study, oxymetazoline (*Afrin*, and generics) given concurrently with intranasal fluticasone furoate once daily for 4 weeks relieved congestion more effectively in patients with allergic rhinitis than treatment with either medication alone, without causing rhinitis medicamentosa.<sup>13</sup>

**CROMOLYN** — When used before allergen exposure, intranasal cromolyn sodium inhibits mast cell degranulation and mediator release and prevents allergic rhinitis symptoms. It is relatively free from adverse effects, but must be used four times daily and is considerably less effective than an intranasal corticosteroid.

**IPRATROPIUM** — Ipratropium bromide, a quaternary amine antimuscarinic agent, is poorly absorbed systemically and does not readily cross the blood-brain barrier. Given as a nasal spray, it can be useful in patients whose primary symptom is nasal discharge. It does not relieve sneezing, itching or congestion.

**Adverse Effects** – Ipratropium can cause dry nose and mouth, epistaxis and pharyngeal irritation. After inadvertent instillation in the eye, it can increase intraocular pressure and should be used with caution in patients with glaucoma.

**OMALIZUMAB** — Omalizumab (*Xolair*), a monoclonal antibody approved by the FDA for treatment of allergic asthma, is injected subcutaneously every 2-4 weeks; it decreases free IgE levels in serum and the number of IgE receptors on mast cells and basophils. It has a dose-dependent beneficial effect in seasonal allergic rhinitis.<sup>14</sup> How its efficacy in this disorder compares to that of H<sub>1</sub>-antihistamines and intranasal corticosteroids remains to be determined, but it costs much more. Omalizumab is not approved by the FDA for treatment of allergic rhinitis.

**Adverse Effects** – Omalizumab is generally well tolerated, but it has caused anaphylaxis in about 0.1% of patients with asthma. Some of these reactions occurred more than 2 hours, and sometimes days, after the injection.<sup>15</sup> Patients being treated with omalizumab should carry an epinephrine auto-injector. The results of a pooled analysis of data from clinical trials indicate that omalizumab does not increase the risk of malignancy.<sup>16</sup>

**SYSTEMIC CORTICOSTEROIDS** — Patients with severe allergic rhinitis or rhinitis medicamentosa who cannot tolerate or do not respond to other drugs can sometimes be treated effectively with a short course of an oral corticosteroid.

**ALTERNATIVE TREATMENTS** — In some placebo-controlled clinical trials, acupuncture or herbal remedies such as butterbur have been reported to relieve allergic rhinitis symptoms,<sup>17,18</sup> but in general the evidence supporting the efficacy and safety of complementary and alternative treatments for allergic rhinitis is weak at best.

**PREGNANCY** — Treatments considered safe for pregnant patients with allergic rhinitis include nasal saline irrigations, the second-generation H<sub>1</sub>-antihistamines cetirizine and loratadine, the mast-cell stabilizer cromolyn sodium, and intranasal corticosteroids.<sup>19</sup>

## ALLERGIC CONJUNCTIVITIS

Allergic conjunctivitis, the most common form of ocular allergy, is often associated with seasonal allergic rhinitis.

**ORAL H<sub>1</sub>-ANTI-HISTAMINES** — Itching, redness and tearing are usually relieved by an oral H<sub>1</sub>-antihis-



tamine, preferably one of the second-generation drugs (see Table 1), which cause minimal impairment of CNS function.

**OPHTHALMIC DRUGS** — Ophthalmic **antihistamines** are as effective, or more effective, than oral H<sub>1</sub>-antihistamines. Onset of action occurs within a few minutes. Starting treatment before the pollen season may be more beneficial in controlling symptoms than waiting for them to occur.<sup>20</sup> Alcaftadine,<sup>21</sup> azelastine, bepotastine, epinastine and olopatadine are marketed as having both H<sub>1</sub>-antihistamine and mast-cell-stabilizing activity, as is ketotifen, which is available over the counter. Although all H<sub>1</sub>-antihistamines likely have these properties, clinically relevant mast cell stabilization occurs most consistently after direct application of relatively high H<sub>1</sub>-antihistamine concentrations to the conjunctiva. These high concentrations are difficult to achieve with oral dosing.

The ophthalmic **mast cell stabilizers** cromolyn, lodoxamide, nedocromil and pemirolast have a slower onset of action than ophthalmic H<sub>1</sub>-antihistamines, and are mostly used for treatment of mild to moderate symptoms. The topical **nonsteroidal anti-inflammatory**

drug ketorolac is less effective than ophthalmic H<sub>1</sub>-antihistamines.

Ophthalmic **decongestants** such as pheniramine and antazoline reduce erythema, congestion, itching and eyelid edema, but they are not drugs of choice because of their short duration of action and adverse effects, including burning, stinging, rebound hyperemia and conjunctivitis medicamentosa. **Antihistamine/decongestant combination** eye drops available over the counter such as pheniramine/naphazoline (*Visine A*, and generics) and antazoline/naphazoline (*Vasocon-A*) have similar adverse effects.

Ophthalmic **corticosteroids** such as low-dose loteprednol etabonate (*Alrex*, *Lotemax*) that are inactivated rapidly in the anterior chamber should be considered for use in allergic conjunctivitis that fails to respond to other medications.<sup>22</sup> The course of treatment should be limited to 1-2 weeks, and even during this brief exposure, an ophthalmologist should monitor the patient for potential exacerbations of conjunctival or corneal viral infections and for increased intraocular pressure.<sup>23</sup> With longer-term treatment, cataract formation is an additional concern.

**Table 3. Some Ophthalmic Drugs for Allergic Conjunctivitis**

Drug	Some Formulations	Available Sizes	Usual Dosage	Pediatric Age Range	Cost <sup>1</sup>
<b>H<sub>1</sub>-Antihistamines</b>					
Alcaftadine – <i>Lastacaft</i> (Allergan)	0.25% soln*	3 mL	1 drop once/d	≥2 yrs	\$115.26
Azelastine – generic <i>Optivar</i> (Meda)	0.05% soln*	6 mL	1 drop bid	≥3 yrs	83.25 139.35
Bepotastine – <i>Bepreve</i> (Ista)	1.5% soln*	5, 10 mL	1 drop bid	≥2 yrs	127.37 <sup>2</sup>
Emedastine difumarate – <i>Emadine</i> (Alcon)	0.05% soln*	5 mL	1 drop qid	≥3 yrs	91.05
Epinastine – <i>Elestat</i> (Allergan)	0.05% soln*	5 mL	1 drop bid	≥3 yrs	140.87
Ketotifen fumarate <sup>3</sup> – generic <i>Zaditor</i> (Novartis)	0.025% soln*	5 mL	1 drop bid (q8-12h)	≥3 yrs	9.14 8.13
<i>Alaway</i> (Bausch and Lomb)		10 mL			8.63
Olopatadine – <i>Pataday</i> (Alcon)	0.2% soln*	2.5 mL	1 drop once/d	≥3 yrs	119.25
<i>Patanol</i> (Alcon)	0.1% soln*	5 mL	1 drop bid (q6-8h)	≥3 yrs	133.50
<b>Mast-Cell Stabilizers</b>					
Cromolyn sodium <sup>4</sup> – generic	4% soln*	10 mL	1 drop q4-6h	≥4 yrs	22.71
Lodoxamide tromethamine – <i>Alomide</i> <sup>4</sup> (Alcon)	0.1% soln*	10 mL	1 drop qid	≥2 yrs	117.45
Nedocromil – <i>Alocril</i> (Allergan)	2% soln*	5 mL	1 drop bid	≥3 yrs	118.78
Pemirolast potassium – <i>Alamast</i> (Vistakon)	0.1% soln**	10 mL	1 drop qid	≥3 yrs	103.90
<b>Nonsteroidal Anti-Inflammatory Drug (NSAID)</b>					
Ketorolac tromethamine – <i>Acular</i> (Allergan)	0.5% soln*	3, 5, 10 mL	1 drop qid	≥3 yrs	154.77 <sup>2</sup>

\* Contains benzalkonium chloride. \*\* Contains lauralkonium chloride.  
 1. Wholesale acquisition cost (WAC) for one bottle. Source© Monthly (Selected from FDB MedKnowledge™) April 5, 2013. Reprinted with permission by FDB, Inc. All rights reserved. ©2013. www.fdbhealth.com/policies/drug-pricing-policy. Actual retail prices may be higher.  
 2. Cost of a 5-mL bottle.  
 3. Available without a prescription.  
 4. Approved by the FDA for treatment of vernal keratoconjunctivitis, vernal conjunctivitis and vernal keratitis.

## Drugs for Allergic Disorders

Patients who find that application of any topical ophthalmic preparation leads to stinging or burning should try refrigerating the drug before use.

### ATOPIC DERMATITIS

Atopic dermatitis (also known as atopic eczema) is a highly pruritic inflammatory skin disease that commonly presents in infancy and early childhood and is frequently associated with allergic rhinitis, asthma and food allergy.<sup>24</sup> It has a chronic or relapsing course, often improving by adolescence. In infants, atopic dermatitis characteristically involves the face and extensor surfaces of the limbs. In older patients, it characteristically involves the flexural areas.

**TOPICAL DRUGS — Corticosteroids** – A medium- or high-potency topical corticosteroid may be needed to achieve control of skin inflammation in atopic dermatitis. For maintenance treatment, the topical corticosteroid with the lowest potency that is effective in a given patient should be used. High-potency corticosteroids such as betamethasone dipropionate 0.05% ointment or cream should never be applied to the face or intertriginous areas such as the axillae and groin and should be applied only for short periods of time to the trunk and extremities. Low-potency corticosteroids such as hydrocortisone cream are safe for use on the face and intertriginous areas.

Use of topical corticosteroids can lead to development of striae and skin atrophy. When applied to the eyelids for prolonged periods, they could possibly cause glaucoma and cataracts. The risks of systemic adverse effects, including adrenal suppression and possibly lymphoma, increase with corticosteroid potency, percentage of body surface covered, and duration of treatment. The risks are greatest when a high-potency corticosteroid is applied under occlusive dressing in infants and young children with widespread skin involvement who require long-term treatment.

**Calcineurin Inhibitors** – Topically applied tacrolimus (*Protopic*) and pimecrolimus (*Elidel*) are microbial-derived macrolides with a mechanism of action similar to that of cyclosporine (*Sandimmune*, and generics). They can reduce inflammation and itching within a few days. Topical tacrolimus 0.1% is similar in efficacy to a topical corticosteroid with moderate potency and may be considered for long-term use in patients with topical corticosteroid-resistant atopic dermatitis, especially on the face or intertriginous areas where corticosteroid adverse effects can be troublesome. After control of inflammation is achieved, intermittent applications of tacrolimus ointment 2-3 times weekly increase the number of flare-free days and the time to

relapse.<sup>25</sup> Pimecrolimus is not as effective as a moderately potent topical corticosteroid, but it can be useful as steroid-sparing therapy for mild to moderate atopic dermatitis.

Tacrolimus and, less often, pimecrolimus, can cause mild transient local itching, burning, stinging and erythema, and both have been associated with an increased risk of viral skin infections such as herpes simplex and varicella zoster, but they do not cause cutaneous atrophy. Although evidence is insufficient to establish an increased risk, there have been rare post-marketing reports of malignancies in patients treated with topical calcineurin inhibitors and the FDA has added a boxed warning to their labels about the possible risk of lymphoma and other cancers with prolonged treatment.

**Coal Tar** – Coal tar preparations have anti-pruritic and anti-inflammatory effects, but they are messy and odoriferous and are now seldom recommended except in shampoo formulations. Adverse effects include skin irritation, folliculitis and photosensitivity.

**SYSTEMIC DRUGS — H<sub>1</sub>-antihistamines** have not been shown to be effective for atopic dermatitis in randomized controlled trials. Nevertheless, some clinicians use first-generation H<sub>1</sub>-antihistamines such as diphenhydramine (*Benadryl*, and generics) or hydroxyzine (*Vistaril*, and generics) for their sedative effects to help control nocturnal itching.<sup>26</sup> Topical H<sub>1</sub>-antihistamines should be avoided in these patients because they can cause sensitization.

Short courses of an **oral corticosteroid** such as prednisone may be needed in severe acute exacerbations of atopic dermatitis, but the drug should be tapered quickly and intensified treatment with topical corticosteroids and calcineurin inhibitors should be started.

**Anti-Infective Therapy** – If secondary infection develops with methicillin-susceptible *Staphylococcus aureus*, a semi-synthetic penicillin or a first-generation cephalosporin such as cephalexin (*Keflex*, and generics) should be given orally for 7-10 days. The topical anti-staphylococcal antimicrobial mupirocin (*Bactroban*, and generics) applied three times daily to affected areas for 7-10 days can be effective for mild infections. Twice-daily treatment for 5 days with a nasal preparation of mupirocin may reduce intranasal carriage of *S. aureus*. Maintenance antimicrobial therapy should be avoided because it can result in colonization with methicillin-resistant *S. aureus*.

Some other interventions that have been reported to reduce *S. aureus* colonization of the skin in patients

Table 4. Some Topical Drugs for Atopic Dermatitis

Drug	Vehicle	Cost <sup>1</sup>	Drug	Vehicle	Cost <sup>1</sup>
<b>CALCINEURIN INHIBITORS</b>			<b>Medium Potency</b>		
Pimecrolimus 1% <i>Elidel</i> (Novartis)	cream	\$171.57	Betamethasone valerate 0.12% <i>Luxiq</i> (Stiefel)	foam	185.89
Tacrolimus 0.03%, 0.1% <i>Protopic</i> (Astellas)	oint	175.85	Fluocinolone acetonide 0.025%	oint	57.12
<b>CORTICOSTEROIDS</b>			<b>Medium-Low Potency</b>		
<b>Super-High Potency</b>			<b>Low Potency</b>		
Betamethasone dipropionate augmented 0.05%	oint, gel	75.31	Betamethasone dipropionate 0.05%	lotion	84.86
Clobetasol propionate 0.05% generic	cream, oint, gel	11.48	Betamethasone valerate 0.1%	cream	25.04
	lotion, soln	226.95	Desonide 0.05%	oint	21.92
	shampoo	303.58	Fluocinolone acetonide 0.025%	cream	57.12
	foam	124.81	Flurandrenolide 0.05% <i>Cordran</i> (Aqua)	lotion	198.00
	<i>Clobex</i> (Galderma)	lotion	372.70	<i>Cordran SP</i> (Aqua)	cream
<i>Olux</i> (Stiefel)	shampoo	496.95	Fluticasone propionate 0.05% generic	cream	23.67
	spray	279.35	<i>Cutivate</i> (PharmaDerm)		113.14
foam	240.97	Hydrocortisone butyrate 0.1% generic	cream	53.68	
Fluocinonide 0.1% <i>Vanos</i> (Valeant)	cream	343.74	oint	53.68	
Halobetasol propionate 0.05% generic	cream, oint	35.05	soln	37.32	
		137.72	<i>Locoid</i> (Onset)	cream, oint	108.58
<b>High Potency</b>			<i>Locoid Lipocream</i>	cream	150.08
Amcinonide 0.1%	oint	324.00 <sup>2</sup>	Hydrocortisone valerate 0.2%	cream	27.32
Betamethasone dipropionate 0.05% augmented	cream	50.62	Prednicarbate 0.1%	cream, oint	36.92
Betamethasone dipropionate 0.05%	oint	75.30	Triamcinolone acetonide 0.025%	oint	9.92
Desoximetasone 0.25% generic	cream, oint	70.40	Triamcinolone acetonide 0.1%	lotion	52.33
		103.62	<b>Lowest Potency</b> (may be ineffective for some indications)		
Desoximetasone 0.05%	gel	122.58	Hydrocortisone 0.5% <sup>5</sup>	cream	4.49 <sup>6</sup>
Diflorasone diacetate 0.05%	oint	87.81	Hydrocortisone 1.0% <sup>5</sup>	cream, oint	7.99 <sup>6</sup>
Fluocinonide 0.05%	oint, gel	18.52	lotion	8.99 <sup>6</sup>	
		47.29	cream, oint	108.30	
		10.78	cream	25.18	
Halcinonide 0.1% <i>Halog</i> (Ranbaxy)	cream, oint	96.97	lotion	167.94	
		30.52	gel	319.25 <sup>2</sup>	
Mometasone 0.1%	oint	16.36	<i>Verdeso</i> (Stiefel)	foam	175.42
Triamcinolone acetonide 0.5%	oint	16.36	Fluocinolone acetonide 0.01%	cream	74.58
<b>Medium-High Potency</b>			soln	150.00	
Amcinonide 0.1%	cream	110.05	Triamcinolone acetonide 0.025%	cream	7.32
		271.44	lotion	44.55	
Betamethasone dipropionate 0.05%	cream	62.74	<b>Lowest Potency</b> (may be ineffective for some indications)		
Betamethasone valerate 0.1%	oint	32.54	Hydrocortisone 0.5% <sup>5</sup>	cream	4.49 <sup>6</sup>
		99.88	Hydrocortisone 1.0% <sup>5</sup>	cream, oint	7.99 <sup>6</sup>
Desoximetasone 0.05%	cream	103.67	lotion	8.99 <sup>6</sup>	
Diflorasone diacetate 0.05%	cream	15.73	Hydrocortisone 2.5%	cream, oint	4.90
Fluocinonide emollient 0.05%	cream	15.73	lotion	29.74	
Fluticasone propionate 0.005% generic	oint	22.25			
Triamcinolone acetonide 0.1%	oint	7.15			
Triamcinolone acetonide 0.5%	cream	17.44			

1. Wholesale acquisition cost (WAC) Source® Monthly (Selected from FDB MedKnowledge™) April 5, 2013. Reprinted with permission by FDB, Inc. All rights reserved. ©2013. www.fdbhealth.com/policies/drug-pricing-policy. When multiple formulations are listed, the price of the first formulation is provided (30 g of cream, ointment or gel, 50 or 60 mL for lotion, solution or spray, 118 mL for shampoo, and 50 g for foam). Actual retail prices may be higher.

2. Cost of 60 g.

3. Cost of a 430-g jar.

4. Cost of an 85-g tube.

5. Available without a prescription.

6. Price according to cvs.com (1% cream and lotion) or walgreens.com (0.5% cream). Accessed April 15, 2013.



## Drugs for Allergic Disorders

with atopic dermatitis include wet-wraps, baths with highly diluted bleach (sodium hypochlorite), silver-impregnated garments, and topical antimicrobials. Reduction in *S. aureus* colonization may or may not be associated with significant clinical improvement.<sup>27</sup>

**OTHER TREATMENTS** — Skin hydration and application of moisturizers and emollients is highly recommended. Products that contain ceramides such as *EpiCeram* and *CeraVe* may be more effective than traditional moisturizers.<sup>28</sup> Avoidance of irritating soaps, detergents or clothing, extremes of temperature and humidity or anything else that triggers the itch/scratch cycle, and keeping fingernails trimmed are all helpful in the management of atopic dermatitis. In selected patients with atopic dermatitis exacerbated by food or other allergens, confirmation of the trigger and elimination of the relevant allergen may be helpful. Phototherapy in moderation has been effective in some patients.<sup>29</sup> In one randomized, placebo-controlled trial, acupuncture significantly reduced allergen-induced itch in patients with atopic dermatitis.<sup>30</sup>

## URTICARIA

**Acute urticaria** is a self-limited condition that responds well to treatment with an oral H<sub>1</sub>-antihistamine.<sup>31</sup> **Chronic urticaria** (≥6 weeks) can last for months, years or decades.

**H<sub>1</sub>-ANTI-HISTAMINES** — Randomized controlled trials have shown that oral second-generation H<sub>1</sub>-antihistamines consistently decrease itching and reduce the number, size and duration of wheals. Taken regularly, they can prevent new wheals from appearing. Higher doses (up to 4-fold) of a second-generation H<sub>1</sub>-antihistamine such as desloratadine or levocetirizine are recommended (off-label) for treatment of chronic urticaria that does not respond to standard doses.<sup>32,33</sup> Despite decades of use in urticaria, first-generation H<sub>1</sub>-antihistamines have never been optimally studied in randomized controlled trials, and they can cause CNS impairment with or without sedation. Nevertheless, when even higher-than-usual doses of a second-generation oral H<sub>1</sub>-antihistamine fail to adequately control symptoms, some clinicians have found that hydroxyzine or diphenhydramine can be helpful.<sup>34</sup>

**OTHER DRUGS** — In chronic urticaria, if up-dosing with a second-generation H<sub>1</sub>-antihistamine fails, randomized controlled trials have confirmed that it may be helpful to add (off-label) the leukotriene receptor antagonist **montelukast**, which has a limited beneficial effect but a good safety profile, or **cyclosporine**, which is effective but potentially toxic; patients taking cyclosporine require regular monitoring of blood pres-

sure and renal function, with dose adjustments as needed.<sup>35</sup> In the past, some experts recommended adding an H<sub>2</sub>-antihistamine to an H<sub>1</sub>-antihistamine, but the evidence supporting such a regimen is weak.<sup>36</sup> A 3-7 day course of an **oral corticosteroid** can be helpful in treating exacerbations. Topical corticosteroids are not effective in urticaria.

The anti-IgE monoclonal antibody **omalizumab** has been used off-label in patients with chronic urticaria. In a double-blind trial, 323 patients with chronic urticaria refractory to standard doses of H<sub>1</sub>-antihistamines were randomly assigned to receive three subcutaneous injections of omalizumab 75, 150 or 300 mg spaced four weeks apart, or placebo, followed by a 16-week observation period. Patients receiving the 150- and 300-mg doses showed clinically relevant improvements in their itch severity score and other outcomes. Improvement in scores was detectable within one week. During the follow-up, protection against itch and hives slowly wore off.<sup>37</sup> Omalizumab is generally well tolerated, but it has caused an anaphylactic reaction in about 0.1% of patients with asthma. Some of these reactions occurred more than 2 hours, and as long as 4 days, after the injection.<sup>15</sup>

## ANAPHYLAXIS

Anaphylaxis, a serious multi-system allergic reaction that is rapid in onset and may cause death, often occurs in community settings where it is typically triggered by a food, insect sting or medication.<sup>38,39</sup> Patients at increased risk for anaphylaxis in the community should receive printed information about how to avoid their relevant triggers. FARE (Food Allergy Research and Education [www.foodallergy.org]; formerly The Food Allergy and Anaphylaxis Network) provides support for patients with food allergy-triggered anaphylaxis. Patients with anaphylaxis triggered by stinging insects should be instructed in insect avoidance measures and referred to an allergy/immunology specialist for immunotherapy with standardized extracts of insect venom.

**EPINEPHRINE** — All patients and caregivers of children at risk of anaphylaxis should be equipped with one or more epinephrine auto-injectors such as *EpiPen* or *Auvi-Q*<sup>40</sup> and trained to recognize anaphylaxis and use the auto-injector correctly and safely.<sup>41,42</sup>

Injection of epinephrine 0.3 mg from either *Auvi-Q* or *EpiPen* results in similar peak epinephrine levels and total epinephrine exposure.<sup>43</sup> *Auvi-Q* appears to be more convenient to carry and easier to use than *EpiPen*.<sup>44</sup>

The recommended dose of epinephrine is 0.01 mg/kg intramuscularly. All epinephrine auto-injectors provide epinephrine in fixed doses of 0.15 or 0.3 mg. Auto-injec-

tors containing 0.15 mg are optimal for young children weighing about 15 kg, and those containing 0.3 mg for children weighing around 30 kg or more. No auto-injector provides an optimal dose for most children weighing between 15 and 30 kg; some clinicians prescribe auto-injectors containing 0.3 mg epinephrine for children who have attained a weight of 22 or 23 kg. Since no weight-appropriate low dose for infants is available in any auto-injector, many physicians prescribe a 0.15-mg auto-injector (off-label) for this age group.

After injection of epinephrine, patients should be taken to the nearest emergency department for observation because anaphylaxis symptoms can recur within hours in up to 20% of patients. H<sub>1</sub>-antihistamines are not recommended for treatment of anaphylaxis; they do not prevent or relieve airway obstruction, hypotension or shock, or prevent death.

### STINGS AND BITES

Small local allergic reactions (itchy red swellings) are self-limited. Large local reactions that occur at the sites of stings from honeybees, yellow jackets and wasps, or bites from mosquitoes, deer flies, fire ants and other insects, can involve a large portion of the face or an entire extremity and cause extreme discomfort. For prevention and treatment of large local reactions to mosquito bites, an oral second-generation H<sub>1</sub>-antihistamine such as cetirizine or levocetirizine should be used.<sup>45</sup> For treatment of mild or moderate large local reactions from any trigger, a topical corticosteroid cream such as mometasone 0.1% can be applied to the affected area for 5-7 days, but for severe large local reactions such as those from hymenoptera stings, oral prednisone 1 mg/kg once daily (maximum daily dose, 50 mg) may be needed for 5-7 days.

### ALLERGEN IMMUNOTHERAPY

Allergen-specific immunotherapy (“allergy shots”) for allergic rhinitis, allergic conjunctivitis, and selected patients with allergic asthma involves subcutaneous injection of gradually increasing doses of the relevant inducing allergen such as tree, grass or weed pollen.<sup>46</sup> Subcutaneous injections of standardized extracts of insect venom prevent recurrence of anaphylaxis from stings of honeybees, yellow jackets, wasps, and hornets. Fire ant whole body extract immunotherapy prevents recurrence of anaphylaxis from fire ant bites.<sup>47</sup> Allergen immunotherapy alters the natural history of these allergic diseases, and the benefits last for years after injections are discontinued. Limitations include the need for regular (usually monthly) maintenance injections for years, and potential local or systemic adverse effects, including, rarely, anaphylaxis.

Sublingual allergen immunotherapy for treatment of allergic rhinitis and allergic conjunctivitis induced by airborne allergens is widely available in Europe and has been used off-label in the US.<sup>48</sup>

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**CORRECTION:** Drugs for Psychotic Disorders. *Treat Guidel Med Lett* 2010; 8:61. Table 2 on page 63 has been revised in the online version on our website.

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**AANP and AAPA:** The American Academy of Nurse Practitioners (AANP) and the American Academy of Physician Assistants (AAPA) accept *AMA Category 1 Credit* for the Physician's Recognition Award from organizations accredited by the ACCME.

**AOA:** This activity, being ACCME (AMA) approved, is acceptable for Category 2-B credit by the American Osteopathic Association (AOA).

**Physician Assistants:** The National Commission on Certification of Physician Assistants (NCCPA) accepts *AMA PRA Category 1 Credit(s)*<sup>™</sup> from organizations accredited by ACCME. NCCPA also accepts AAFP Prescribed credits for recertification. *Treatment Guidelines* is accredited by both ACCME and AAFP.

**Physicians in Canada:** Members of **The College of Family Physicians of Canada** residing in the US are eligible to receive Mainpro-M1 credits (equivalent to AAFP Prescribed credits), and members residing in Canada are eligible to receive Mainpro-M2 credits due to a reciprocal agreement with the American Academy of Family Physicians. *Treatment Guidelines* CME activities are eligible for either Section 2 or Section 4 (when creating a personal learning project) in the Maintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada (RCPS(C)).

Physicians, nurse practitioners, pharmacists and physician assistants may earn 2 credits with this exam.

#### MISSION:

The mission of The Medical Letter's Continuing Medical Education Program is to support the professional development of healthcare professionals including physicians, nurse practitioners, pharmacists and physician assistants by providing independent, unbiased drug information and prescribing recommendations that are free of industry influence. The program content includes current information and unbiased reviews of FDA-approved and off-label uses of drugs, their mechanisms of action, clinical trials, dosage and administration, adverse effects and drug interactions. The Medical Letter delivers educational content in the form of self-study material.

The expected outcome of the CME Program is to increase the participant's ability to know, or apply knowledge into practice after assimilating, information presented in materials contained in *Treatment Guidelines*.

The Medical Letter will strive to continually improve the CME program through periodic assessment of the program and activities. The Medical Letter aims to be a leader in supporting the professional development of healthcare professionals through Core Competencies by providing continuing medical education that is unbiased and free of industry influence. The Medical Letter is supported solely by subscription fees and accepts no advertising, grants or donations.

#### GOAL:

Through this program, The Medical Letter expects to provide the healthcare community with unbiased, reliable and timely educational content that they will use to make independent and informed therapeutic choices in their practice.

#### LEARNING OBJECTIVES:

The objective of this activity is to meet the need of healthcare professionals for unbiased, reliable and timely information on treatment of major diseases. The Medical Letter expects to provide the healthcare community with educational content that they will use to make independent and informed therapeutic choices in their practice. Participants will be able to select and prescribe, or confirm the appropriateness of the prescribed usage of the drugs and other therapeutic modalities discussed in *Treatment Guidelines* with specific attention to clinical evidence of effectiveness, adverse effects and patient management.

Upon completion of this program, the participant will be able to:

1. Explain the current approach to the management of a patient with an allergic disorder.
2. Discuss the pharmacologic options and treatment regimens available for patients with an allergic disorder and compare them based on their efficacy, dosage and administration, potential adverse effects and drug interactions.
3. Determine the most appropriate therapy given the clinical presentation of an individual patient.

**Privacy and Confidentiality:** The Medical Letter guarantees our firm commitment to your privacy. We do not sell any of your information. Secure server software (SSL) is used for commerce transactions through VeriSign, Inc. No credit card information is stored.

**IT Requirements:** Windows 98/NT/2000/XP/Vista/7/8, Pentium+ processor, Mac OS X+ w/ compatible process; Microsoft IE 6.0+, Mozilla Firefox 2.0+ or any other compatible Web browser. Dial-up/high-speed connection.

**Have any questions?** Call us at 800-211-2769 or 914-235-0500 or e-mail us at: [custserv@medicalletter.org](mailto:custserv@medicalletter.org)

**Questions start on next page**



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## Issue 129 Questions

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| <p>1. In allergic rhinitis, second-generation H<sub>1</sub>-antihistamines are least effective for:</p> <ol style="list-style-type: none"><li>itching</li><li>nasal congestion</li><li>rhinitis</li><li>sneezing</li></ol> <p>2. Compared to oral H<sub>1</sub>-antihistamines for treatment of allergic rhinitis, intranasal H<sub>1</sub>-antihistamines are:</p> <ol style="list-style-type: none"><li>much less effective</li><li>slightly less effective</li><li>equal or superior</li><li>vastly superior</li></ol> <p>3. A 54-year-old truck driver with allergic rhinitis and an enlarged prostate tells you that he takes 25 mg of <i>Benadryl</i> to control his symptoms. You could tell him that diphenhydramine:</p> <ol style="list-style-type: none"><li>could cause sedation</li><li>could impair his driving performance without causing sedation</li><li>could cause urinary retention</li><li>all of the above</li></ol> <p>4. The most effective drugs available for prevention and treatment of allergic rhinitis are:</p> <ol style="list-style-type: none"><li>second-generation oral H<sub>1</sub>-antihistamines</li><li>intranasal antihistamines</li><li>intranasal corticosteroids</li><li>leukotriene receptor antagonists</li></ol> <p>5. Ophthalmic antihistamines are most effective in controlling the symptoms of allergic conjunctivitis if they are:</p> <ol style="list-style-type: none"><li>taken year-round</li><li>started before the pollen season</li><li>started when symptoms begin</li><li>started after symptoms have persisted for <math>\geq 7</math> days</li></ol> <p>6. Ophthalmic corticosteroids can:</p> <ol style="list-style-type: none"><li>exacerbate viral infections</li><li>increase intraocular pressure</li><li>promote cataract formation</li><li>all of the above</li></ol> | <p>7. An 8-month-old boy has severe atopic dermatitis on his face and less severe involvement of the extensor surfaces of his arms. To arrive at a clinical decision about his treatment, you could consider which of the following:</p> <ol style="list-style-type: none"><li>high-potency topical corticosteroids are safe for use on the face and intertriginous areas</li><li>topical tacrolimus is no more effective than a low-potency topical corticosteroid</li><li>topical tacrolimus does not cause skin atrophy</li><li>topical antihistamines are effective and safe for use in atopic dermatitis</li></ol> <p>8. A secondary staphylococcal infection in a patient with atopic dermatitis calls for:</p> <ol style="list-style-type: none"><li>a short course of an oral corticosteroid</li><li>maintenance treatment with an appropriate antibiotic</li><li>7-10 days of an appropriate oral antibiotic</li><li>all of the above</li></ol> <p>9. When chronic urticaria fails to respond to standard doses of an oral second-generation H<sub>1</sub>-antihistamine, the next step should be:</p> <ol style="list-style-type: none"><li>higher doses (up to 4-fold) of an oral second-generation H<sub>1</sub>-antihistamine</li><li>addition of an H<sub>2</sub>-antihistamine</li><li>switching to a first-generation H<sub>1</sub>-antihistamine</li><li>use of a high-potency topical corticosteroid</li></ol> <p>10. Use of omalizumab for treatment of chronic urticaria:</p> <ol style="list-style-type: none"><li>is not approved by the FDA</li><li>can relieve itch within a week of starting treatment</li><li>was effective in a double-blind, placebo-controlled trial</li><li>all of the above</li></ol> <p>11. An 11-year-old girl with severe food allergies sometimes carries an <i>EpiPen</i>, but finds it inconvenient and embarrassing. You could tell her that:</p> <ol style="list-style-type: none"><li><i>Auvi-Q</i> appears to be more convenient to carry and easier to use</li><li><i>EpiPen</i> is the only epinephrine auto-injector shown to be effective when severe reactions occur</li><li><i>Auvi-Q</i> delivers less epinephrine than <i>EpiPen</i></li><li>all of the above</li></ol> <p>12. Allergen-specific immunotherapy can protect against:</p> <ol style="list-style-type: none"><li>symptoms of allergic rhinitis</li><li>recurrence of anaphylaxis from bee stings</li><li>recurrence of anaphylaxis from fire ant bites</li><li>all of the above</li></ol> |
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