Abstract

Objective: To provide a review of pharmacists’ role in assisting patients in preventing and managing symptoms of the common cold and allergic rhinitis.

Summary: The common cold and allergic rhinitis are among the most common conditions that patients seek to self-treat. Because the two conditions have overlapping symptoms, distinguishing among the conditions and recommending appropriate therapies can be difficult. Ocular symptoms generally are only present with allergies, and symptoms of the cold typically resolve within 2 weeks, whereas allergies can persist much longer. Medications used in treating colds and allergies include decongestants, analgesics, antitussives, expectorants, and antihistamines. Several nonpharmacologic approaches, as well as herbal remedies and dietary supplements, also are used by patients to manage symptoms and may provide benefit. In addition to assisting patients with selecting products that are appropriate to manage their symptoms, pharmacists also can ensure that treatment is individualized for special populations, including children, older adults, and patients with other underlying conditions.

Conclusion: Pharmacists can help self-treating patients with the common cold or allergic rhinitis select appropriate products to manage their symptoms, educate patients about the appropriate use of these products, and refer patients for further evaluation when needed.

Keywords: Upper respiratory symptoms, common cold, seasonal allergic rhinitis, patient education.
The common cold and allergic rhinitis are two of the most common conditions for which patients seek treatment. Estimates indicate that as many as 1 billion cases of the cold occur each year in the United States. Allergic rhinitis affects an estimated 20% of adults and 40% of children in the United States, and the prevalence of this condition has increased steadily in recent decades.

OTC products are widely used in the management of both the common cold and allergic rhinitis. Patients often self-treat; approximately $4.2 billion was spent on nonprescription cough/cold and related products in 2011. Colds are a leading cause of work and school absenteeism. According to CDC, 22 million school days are lost annually in the United States due to the common cold.

An estimated $1.4 billion is spent annually on nonprescription allergy/sinus medications in the United States. Annual direct costs of allergic rhinitis (e.g., medications, office visits) and indirect costs (e.g., lost school and work days) are estimated to be between $2 billion and $5 billion.

Cold or allergy?

Although some differences exist, cold and allergy symptoms overlap. Thus, accurately assessing symptoms can be difficult. Common symptoms of the common cold, allergies, and other respiratory disorders are listed in Table 1.

The common cold is characterized by a predictable sequence of upper respiratory symptoms that begins 1 to 3 days after infection. Sore throat typically is the first symptom to appear, followed by nasal symptoms, which are predominant by the second or third day. The symptom of coughing may emerge by day 4 or 5. During the first 2 days of a cold, patients may report clear, thin, and/or watery nasal secretions. As the cold progresses, the secretions become thicker (resulting in congestion) and the color may change to yellow or green. When the cold begins to resolve, the secretions may return to being clear, thin, and/or watery. Patients may have low-grade fever, which is more common in children. Patients also may report headache and tiredness. Symptoms generally resolve in 1 to 2 weeks.

Allergic rhinitis is characterized by the presence of one or more of the following symptoms: nasal congestion, rhinorrhea, sneezing, and pruritus. The symptoms of allergic rhinitis result from an immunoglobulin E (IgE)-mediated reaction to allergens that produce a complex cascade of inflammatory mediators (including cytokines) and inflammatory cells that produce mucosal inflammation. Symptoms appear during early- and late-phase allergic responses. Sneezing, congestion, pruritus, and rhinorrhea are present in both responses; congestion is the dominant symptom in the late phase.

The most important difference between colds and allergies is that colds typically resolve within 2 weeks, whereas allergic rhinitis persists as long as exposure to allergens continues. In addition, ocular symptoms and pruritus are more common with allergies.

High fever, considerably swollen glands, severe sinus pain, and/or a cough that produces mucus may be signs of a more serious illness and may warrant referral.

The common cold

The common cold is a viral infection of the upper respiratory tract. More than 200 different viruses can cause cold symptoms. Some, such as rhinoviruses, which cause an estimated 30% to 50% of all colds, seldom produce serious illnesses. Others, such as respiratory syncytial virus, produce mild infections in adults but can lead to severe lower respiratory tract infections in young children.

Preventing transmission of colds

Viruses that cause the common cold are spread by physical contact (e.g., shaking hands, touching doorknobs) and through airborne transmission (e.g., after a sneeze). Increased susceptibility to cold viruses has been associated with time spent in crowded indoor environments (e.g., classrooms, day care centers). Other factors that can increase susceptibility include allergic disorders affecting the nose or pharynx, less diverse social networks, and a weakened immune system resulting from smoking, sedentary lifestyle, chronic psychological stress, or sleep deprivation.

Seasonal changes in relative humidity also may affect the occurrence of colds. The most common cold-causing viruses survive better when humidity is low, which occurs during the colder months of the year. Cold weather also may make the nasal lining drier and more vulnerable to viral infection.
Research indicates that individuals who exercise regularly have a significantly reduced number of respiratory tract infections, such as the common cold, compared with those who do not exercise. Studies show that appropriate hand hygiene reduces the transmission of cold viruses, and CDC encourages frequent hand cleansing with soap or soap substitutes (e.g., hand sanitizers) to help prevent transmission of cold viruses. When using soap and water, patients should be encouraged to wash their hands for at least 15 seconds. Surface cleaning with antiviral disinfectants and use of antiviral tissues also may help prevent virus transmission.1

Treatment of colds

No cure exists for the common cold; treatment focuses on managing symptoms with nonpharmacologic approaches and OTC products. However, not all patients should self-treat colds. Exclusions to self-treatment include the following1:

- Fever greater than 101.5°F (38.6°C)
- Chest pain
- Shortness of breath
- Worsening of symptoms or development of additional symptoms during self-treatment
- Concurrent underlying chronic cardiopulmonary diseases (e.g., asthma, chronic obstructive pulmonary disease [COPD], congestive heart failure)
- AIDS or chronic immunosuppressant therapy
- Frail patients of advanced age
- Infants younger than 9 months of age
- Hypersensitivity to recommended OTC medications

In addition, colds occasionally can lead to bacterial infections of the middle ear or sinuses, requiring referral to a prescriber.

Nonpharmacologic therapy. Nonpharmacologic therapy includes maintenance of fluid intake, adequate rest, and increased humidification with steamy showers, humidifiers, or vaporizers. Saline nasal sprays or drops or a neti pot can be used to moisten irritated mucosal membranes and loosen encrusted mucus; saline gargles may ease sore throats.

Food products such as tea with lemon and honey, chicken soup, and hot broths are soothing. Limited in vitro evidence suggests that a number of substances in chicken soup could have anti-inflammatory activity and may provide symptom relief.12

Devices, such as nasal strips that lift and open nasal passages, can be used for temporary relief from nasal congestion and stuffiness. For infants, nonpharmacologic therapy also can include upright positioning to enhance nasal drainage and irrigating the nose with saline drops. Also, because children typically cannot blow their own noses until about 4 years of age, carefully clearing the nasal passageways with a bulb syringe may be beneficial.1

Pharmacologic therapy. Because symptoms appear, peak, and resolve at different times, symptom-specific therapy with single-entity rather than combination products is recommended.7 However, many OTC medications used to manage colds are marketed in combination with each other for convenience. In addition, products marketed for nighttime use usually contain a sedating antihistamine. Combination products may provide increased convenience, but their benefits must be weighed against the risks of adverse events from unnecessary drugs.

Treatment of congestion. Topical and systemic decongestants can be used to treat sinus and nasal congestion associated with the common cold. Decongestants stimulate alpha-adrenergic receptors, constricting blood vessels and decreasing sinusoid vessel engorgement and mucosal edema. Adhering to FDA-approved doses of decongestant products is very important, given that acute overdose, especially in children, can be life threatening.

Systemic nonprescription decongestants include pseudoephedrine and phenylephrine. Because of regulations re-
stricting the sale of pseudoephedrine, many manufacturers have reformulated OTC products with phenylephrine. The comparative efficacy and safety of systemic decongestants remain unclear. A higher dosage of pseudoephedrine is used: 60 mg every 4 to 6 hours compared with 10 mg every 4 hours for phenylephrine.

Topical intranasal nonprescription decongestants include the short-acting decongestants ephedrine, epinephrine, levmetamfetamine (l-desoxyephedrine), naphazoline, phenylephrine, propylhexedrine, and tetrahydrozoline and the long-acting decongestants xylometazoline and oxy-metazoline.

Adverse effects associated with decongestants include cardiovascular and central nervous system (CNS) stimulation, which are more common with systemic than topical formulations. Children and older adults are more likely to experience adverse effects than other age groups. Decongestants may exacerbate diseases sensitive to adrenergic stimulation, such as hypertension, hyperthyroidism, diabetes, coronary heart disease, ischemic heart disease, elevated intraocular pressure, and prostatic hypertrophy.

Adverse effects associated with topical decongestants include propellant- or vehicle-associated adverse effects (e.g., burning, stinging, sneezing, local dryness) and trauma from the administration device. Rhinitis medicamentosa (also referred to as rebound congestion) has been associated with prolonged use of topical decongestants. Currently, 3 to 5 days is the accepted duration of therapy to avoid rhinitis medicamentosa. Decongestants are contraindicated in patients receiving MAOIs.

Treatment of sore throat, aches, and pain. Sore throat associated with the cold can be treated with products containing local anesthetics (e.g., benzocaine, dyclonine hydrochloride). Health care providers should counsel patients with a history of allergic reactions to anesthetics to avoid products with benzocaine. Certain products contain local antiseptics (e.g., cetylpyridinium chloride, hexylresorcinol) and/or menthol or camphor.

Headache, systemic aches, and fever associated with the common cold can be treated with systemic analgesics (e.g., aspirin, acetaminophen, ibuprofen, naproxen). Aspirin-containing products should not be used in children with viral illnesses because of the risk of Reye’s syndrome. Patients using acetaminophen-containing products should be cautious not to exceed the maximum daily dosage of acetaminophen. Patients taking multisymptom cough and cold products that contain acetaminophen should be advised not to also take single-ingredient acetaminophen. Patients should carefully read labels to avoid therapeutic duplication with other products as well. NSAIDs are associated with gastrointestinal (GI) bleeding and renal toxicity. Some may have adverse cardiovascular effects.

Treatment of cough. Cough associated with colds is usually nonproductive. (A productive cough—a wet or “chesty” cough—expels secretions from the lower respiratory tract.) Antitussives (cough suppressants [e.g., dextromethorphan]) help control or minimize cough and are the drugs of choice for nonproductive coughs. However, use of antitussives has questionable efficacy in colds. Antitussives should not be used to treat productive cough unless the potential benefit outweighs the risk (e.g., significant nighttime coughing interfering with sleep). Suppressing productive coughs may lead to retention of lower respiratory tract secretions, increasing the risk of airway obstruction and secondary bacterial infection. Dextromethorphan should not be taken concurrently with MAOIs.

Camphor and menthol are the only two FDA-approved topical antitussives. Vapors from these stimulate sensory nerve endings within the nasal mucosa, creating a local anesthetic sensation and a sense of improved airflow. However, little objective evidence of clinical efficacy exists. Children should be supervised closely when using these products. Aromatic oils can be eye and skin irritants, and ingesting large quantities is toxic. Antihistamines also may have antitussive properties.

Guaifenesin is the only FDA-approved expectorant. It is indicated for the symptomatic relief of acute, ineffective productive coughs. Guaifenesin has not been proven effective in colds.

Honey also is used to treat cough and to soothe a sore throat. One study compared the effectiveness of buckwheat honey before bedtime with that of either no treatment or dextromethorphan. The results of the study suggested that honey may be useful to relieve coughing, but the researchers need to do additional studies. Honey should never be given to children younger than 1 year because of the risk of infantile botulism.

Guidelines from the American College of Chest Physicians state that central cough suppressants are ineffective in cough associated with the common cold and recommend a combination of a first-generation antihistamine plus a decongestant (brompheniramine and sustained-release pseudoephedrine) to treat the virus-induced postnasal drip that is most likely the cause of the cough. They also suggest that the NSAID naproxen may reduce viral-associated cough.

Herbal remedies and dietary supplements. Numerous herbal remedies and dietary supplements therapies are marketed for the prevention or treatment of colds. Some of the most commonly used products include echinacea, vitamin C, and zinc. In addition, some patients use probiotics.

Although echinacea is widely used to prevent or treat the common cold, evidence to support this practice is mixed. In vitro research suggests that echinacea stimulates the immune system, and several clinical studies have reported a benefit. For example, one study investigated the safety and efficacy of prophylactic echinacea use in 755 healthy patients during a 4-month period. Echinacea reduced the total number of cold episodes, number of episode days within the group, and painkiller-mediated episodes. Echinacea showed maximal effects on recurrent infections, and preventive effects increased with adherence. The incidence of adverse events was similar to that with placebo.
ever, three large studies funded by the National Center for Complementary and Alternative Medicine (of the National Institutes of Health) found that echinacea did not reduce the severity or length of the common cold.4 Conflicting evidence may possibly occur as a result of poor characterization of the extracts investigated and the use of different species and/or plant parts for the preparations investigated in the various trials.22,23

The effectiveness of zinc also is controversial. A meta-analysis of 15 trials concluded that oral zinc (lozenges or syrup) was effective in reducing cold symptoms or duration of the cold if started within 24 hours of symptom onset and administered every 2 hours while awake. The study also reported that prophylaxis with zinc for at least 5 months reduced the incidence of colds in healthy individuals.24 Cough and cold products containing zinc include tablets, capsules, chews, lozenges, syrups, oral sprays, and nasal sprays/gels. Nasal formulations have been linked to anosmia (loss of smell) and are not recommended.25 Lozenges may be associated with GI adverse effects (e.g., nausea, upset stomach, bitter taste).

The efficacy and safety of high-dose (e.g., ≥2 g/d) vitamin C supplementation for prophylaxis and treatment of colds have been debated for more than 60 years. A meta-analysis of 30 trials that included more than 11,000 individuals found that high-dose vitamin C does not appear to prevent colds in the general population.26 However, it did appear to reduce cold incidence in individuals exposed to intense physical stress (e.g., marathon running, soldiers on subarctic exercises). With regard to reducing the duration of a cold, vitamin C prophylaxis reduced the duration of colds by 8% in adults and 13.6% in children. However, using vitamin C as treatment after the onset of a cold was not effective at reducing severity or duration of symptoms. Doses of vitamin C ≥4 g/d or greater are associated with diarrhea and other GI symptoms and should be avoided.26

Probiotics are gaining interest for reducing the risk of upper respiratory tract infections such as the common cold. Some research suggests that milk fortified with a specific strain of probiotic, Lactobacillus rhamnosus GG, may stimulate immune function, and in one study this probiotic was found to reduce the incidence of respiratory infections in young children in day care.27-29

**Allergic rhinitis**

Allergic rhinitis is classified as seasonal allergic rhinitis and perennial allergic rhinitis based on the temporal pattern of symptoms. Seasonal allergic rhinitis is caused by an IgE-mediated reaction to seasonal allergens such as pollen, mold spores, or grasses. The length of seasonal exposure to these allergens is dependent on geographic location and climatic conditions. Perennial allergens may include dust mites, molds, animal allergens, cockroaches, pet dander, or certain occupational allergens, as well as pollen in areas where pollen is prevalent year-round.

Acute complications of allergic rhinitis may include sinusitis and otitis media with effusion. Chronic complications can include nasal polyps, sleep apnea, and hyposmia (diminished sense of smell).30 Allergic rhinitis and asthma share a common pathology, and allergic rhinitis has been implicated in the development of asthma and exacerbations of preexisting asthma in children and adults. Depression, anxiety, delayed speech development, and facial or dental abnormalities also have been linked to allergic rhinitis.30

**Risk factors for allergic rhinitis**

No strategy is proven to prevent the development of allergic rhinitis. Risk factors for developing allergic rhinitis include family history of atopy (allergic disorders) in one or both parents, filaggrin (skin barrier protein) gene mutation, elevated serum IgE greater than 100 IU/mL before age 6 years, higher socioeconomic class, eczema, and positive reaction to allergy skin tests.30 The influence of early childhood exposure to infections (the hygiene hypothesis), animals, and secondary tobacco smoke on the development of atopy and allergic rhinitis remains unclear.31

**Treatment of allergic rhinitis**

The goals of treatment for allergic rhinitis are to reduce symptoms and improve the patient’s functional status and sense of well-being. Treatment is individualized to provide optimal symptomatic relief and control. Allergic rhinitis is treated in three steps: (1) allergen avoidance, (2) pharmacotherapy (nonprescription and prescription), and (3) immunotherapy.30

**Nonpharmacologic therapy.** Allergen avoidance to prevent triggering an allergic reaction and the resulting symptoms is the primary nonpharmacologic measure for allergic rhinitis. Avoidance strategies depend on the specific allergen (Table 2).

Nasal wetting agents (e.g., saline, propylene, polyethylene glycol sprays or gels) or nasal irrigation with warm saline (isotonic or hypertonic) delivered via a syringe or neti pot may relieve nasal mucosal irritation and dryness, thus decreasing congestion, rhinorrhea, and sneezing. This process also aids in the removal of dried, encrusted, or thick mucus from nasal passages.

Ventilation systems with high-efficiency particulate air (HEPA) filters can remove pollen, mold spores, and cat allergens from indoor air but not house dust mite allergens, which settle to the floor too quickly to be filtered. These systems are expensive and not effective for all patients. HEPA filters also are found in some vacuum cleaners. Weekly vacuuming of carpets, drapes, and upholstery with a HEPA filter–equipped vacuum cleaner may help reduce household allergens, including dust mite allergens.32

**Pharmacologic therapy.** Allergen avoidance strategies often are inadequate to eliminate allergic rhinitis symptoms, and pharmacologic treatment often is necessary for optimal management. Drugs with different mechanisms of action or delivery systems may be added if the single-drug therapy does not provide adequate relief or if the symptoms are mod-
Nonprescription options include ocular and oral antihistamines, topical and oral decongestants, and mast cell stabilizers. To prevent and control symptoms, antihistamines and mast cell stabilizers should be used prophylactically. For seasonal allergies, patients should start taking antihistamines and/or mast cell stabilizers for at least 1 week before symptoms are expected to appear or as soon as possible before anticipated allergen exposures. Duration of therapy should be individualized based on timing and severity of symptoms and pattern of allergen exposure (episodic or continuous).1

Antihistamines compete with histamine at binding sites, which prevents histamine from triggering the release of allergic mediators and the resulting symptoms. Antihistamines are indicated for relief of symptoms of allergic rhinitis (e.g., itching, sneezing, rhinorrhea), as well as other histamine-mediated hypersensitivity reactions (e.g., chronic idiopathic urticaria). Antihistamines are classified as sedating (first generation, nonselective) or nonsedating (second generation, peripherally selective) (Table 3). Ocular antihistamines also are available for patients who experience red, watery, itchy eyes.1

The primary adverse effects of antihistamines are CNS effects and anticholinergic effects. First-generation antihistamines often are associated with sedation (and are marketed as OTC treatments for insomnia). Other CNS adverse events also may occur, and paradoxical hyperactivity is more common in children. These adverse effects are more common

### Table 2. Avoidance strategies for common allergens

<table>
<thead>
<tr>
<th>Allergen source</th>
<th>Features</th>
<th>Avoidance strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>House dust mites</td>
<td>Found in all but the driest regions of the United States and thrive in warm, humid household environments.</td>
<td>(1) Lower the household humidity to less than 40%. (2) Apply certain pesticides. (3) Reduce mite-harboring dust by removing carpets, upholstered furniture, stuffed animals, and bookshelves from the patient’s bedroom and other areas of the house, if possible. (4) Mite populations in bedding can be reduced by encasing the mattress, box springs, and pillows with mite-impermeable materials. Bedding that cannot be encased should be washed at least weekly in hot (130°F [54.4°C]) water. (5) Bedding that cannot be encased or laundered should be discarded.</td>
</tr>
<tr>
<td>Mold spores</td>
<td>Outdoors: prevalent in late summer and fall, especially on calm, clear, dry days.</td>
<td>Outdoor: Avoid activities that disturb decaying plant material (e.g., raking leaves). Indoor: Lower household humidity, remove houseplants, vent food preparation areas and bathrooms, repair damp base- ments or crawl spaces, frequently apply fungicide to obviously moldy areas.</td>
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<tr>
<td>Cat-derived allergens</td>
<td>Cat allergens can be found in the house months after the cat is removed.</td>
<td>Although unproven, weekly cat baths may reduce the allergen load.</td>
</tr>
<tr>
<td>Cockroaches</td>
<td>Major urban allergens. Infestations in multiple-family dwellings are difficult to eliminate.</td>
<td>Keep areas clean, keep food stored tightly sealed, treat infested areas with baits or pesticides.</td>
</tr>
<tr>
<td>Pollutants (e.g., ozone, diesel fumes)</td>
<td>Concern in urban environments. Diesel exhaust particles are especially irritating to the respiratory tract and have been shown to increase the severity of allergic rhinitis.</td>
<td>Patients whose allergies are triggered by air pollutants should be aware of the air quality index (AQI; a measure of five major air pollutants per 24 hours) and plan outdoor activities when the AQI is low.</td>
</tr>
<tr>
<td>Pollen</td>
<td>Trees pollinate in spring, grasses in early summer, and ragweed from mid-August to the first fall frost.</td>
<td>Use pollen counts to help plan outdoor activities; avoid outdoor activities when pollen counts are high. Close house and car windows to reduce pollen exposure.</td>
</tr>
</tbody>
</table>

Source: References 8 and 30.
with first-generation antihistamines. Patients who experience sedation should be advised to take the medication at bedtime; tolerance to sedation develops over time. Anticholinergic effects include dry eyes and mucous membranes (mouth, nose, vagina), blurred vision, urinary hesitancy and retention, constipation, and tachycardia. Second-generation antihistamines (sometimes called nonsedating antihistamines) are less likely to cross the blood–brain barrier and therefore are less likely to be associated with these adverse events, though cetirizine is associated with sedation.

Congestion associated with allergic rhinitis can be treated with systemic decongestants or short-term topical nasal decongestants (i.e., up to 5 days). Antihistamines are marketed as single-entity products and in combination with decongestants and analgesics. These combinations also are available in sustained-release formulations, which may be preferred by some patients for convenience. However, these combination products should be used with caution because of the increased risk of adverse effects, especially insomnia, which compounds daytime fatigue already associated with this disease. Intranasal antihistamines are another option for patients with nasal congestion.

Another anti-inflammatory medication sometimes used for preventing and treating allergic rhinitis symptoms is the mast cell stabilizer cromolyn sodium. Cromolyn sodium is more effective when used prophylactically and may take 3 to 7 days for initial response and up to 4 weeks of continued use for maximum benefits. The most common adverse effect of intranasal cromolyn is sneezing. Other adverse effects include nasal stinging and burning. Intranasal cromolyn has no known drug interactions.

If these options fail to provide optimal symptomatic relief, patients may be referred to a prescriber to assess whether intranasal corticosteroids (or other prescription medications) are appropriate. Intranasal corticosteroids, including dexamethasone, triamcinolone acetonide, budesonide, fluticasone propionate, and mometasone furoate are the most effective medications for controlling allergic rhinitis symptoms. These agents are generally not associated with systemic adverse effects. A short course of oral corticosteroids may be considered for patients with very severe symptoms.

Other situations in which patients with allergies should be referred to a prescriber include:

- Symptoms of otitis media, sinusitis, bronchitis, or other infection.
- Symptoms of undiagnosed or uncontrolled asthma (e.g., wheezing, shortness of breath), COPD, or other lower respiratory disorders.
- Moderate to severe symptoms or symptoms that are unresponsive to treatment.
- Severe or unacceptable adverse effects of treatment.
- Children younger than 12 years and pregnant or lactating women should be evaluated by a primary care provider and have nonprescription therapy approved before proceeding with treatment.

### Table 3. Systemic nonprescription antihistamines

<table>
<thead>
<tr>
<th>First-generation antihistamines</th>
<th>Second-generation antihistamines</th>
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<tbody>
<tr>
<td>Brompheniramine maleate</td>
<td>Cetirizine</td>
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<tr>
<td>Chlorocyclizine HCL</td>
<td>Fexofenadine</td>
</tr>
<tr>
<td>Chlorpheniramine maleate</td>
<td>Loratadine</td>
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<tr>
<td>Clemastine fumarate</td>
<td></td>
</tr>
<tr>
<td>Dextromethorphan maleate</td>
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<tr>
<td>Dextchlorpheniramine maleate</td>
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<tr>
<td>Diphenhydramine citrate</td>
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<tr>
<td>Diphenhydramine HCl</td>
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<td>Doxylamine succinate</td>
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<td>Phenindamine tartrate</td>
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<tr>
<td>Pheniramine</td>
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<tr>
<td>Phyralmaleate</td>
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<tr>
<td>Thonzyllamine HCl</td>
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<tr>
<td>Triprolidien HCl</td>
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Source: Reference 1.

### Considerations for special populations

Selection of products for patients with upper respiratory symptoms should be individualized based on patient symptoms and by clinical considerations. For example, many multisymptom cough and cold products contain NSAIDs or first-generation antihistamines, which may not be appropriate for older adults.

The Beers Criteria have been widely used and often are cited when discussing inappropriate prescribing in older patients. The Beers Criteria were updated in 2012 to include important new information and consider challenges of individualized therapy decisions. This update included the addition of ingredients found in some OTC products used for treating allergies or cough and cold (first-generation antihistamines and NSAIDs). NSAIDs are associated with increased risk of GI bleeding in older adults and are also associated with renal toxicity. Further, older adults are more likely to have chronic conditions (e.g., hypertension) that affect the selection of products for treating cough and cold. Thus, first-generation antihistamines and NSAIDs should generally be avoided in older adults. Systemic decongestants should be used with caution or avoided if the patient has other contraindicated chronic conditions.

Considerable confusion exists about treatment of cold and allergies in children, particularly young children. Based on a survey from 1999 to 2006, approximately 10% of American children use OTC cough and cold medications on a weekly basis. In October 2007, a joint meeting of the FDA Nonprescription Drugs Advisory Committee and Pediatric Advisory Committee discussed the use of cough and cold products in children. Committee members voted 21 to 1 not to use cough and cold products in children younger than 2 years and 13 to 9 against their use in children 2 to 6 years, and they supported their use by a vote of 15 to 7 in children 6 to 12 years.

In October 2007, OTC manufacturers voluntarily with-
drew products marketed for the treatment of cough and cold in children younger than 2 years.\textsuperscript{35} In January 2008, FDA issued a statement not to use these products in children younger than 2 years “because serious and potentially life-threatening adverse effects can occur from such use” and that “these medicines, which treat symptoms and not the underlying condition, have not been shown to be safe or effective in children under 2.”\textsuperscript{36} This conclusion was reaffirmed in a 2010 update statement from FDA.\textsuperscript{37}

The American Academy of Pediatrics concurs that cough and cold medications should not be given to infants and children younger than 2 years because of the risk of life-threatening adverse events. They also note that several studies show that cold and cough products are not effective in children younger than 6 years and can have potentially serious adverse effects when used in children that age.\textsuperscript{38}

After market withdrawal of products specifically marketed to children younger than 2 years, the number and proportion of emergency department visits for adverse events related to the products in this age group was less than one-half of that in the prewithdrawal period. (Two-thirds of these visits were caused by unsupervised ingestions.)\textsuperscript{39}

Children younger than 12 years who have allergies should be evaluated by a primary care provider to rule out concomitant asthma before proceeding with treatment. The sedating antihistamines are contraindicated in newborns or premature infants, lactating women, and patients with narrow-angle glaucoma. Additional contraindications for sedating antihistamines include acute asthma exacerbation, stenosing peptic ulcer, symptomatic prostatic hypertrophy, bladder neck obstruction, pyloroduodenal obstruction, and concomitant use of MAOIs. Formulations of 12- and 24-hour sustained-release loratadine/pseudoephedrine combination products are contraindicated in patients with esophageal narrowing, abnormal esophageal peristalsis, or a history of difficulty swallowing tablets.\textsuperscript{13}

Patients with lower respiratory tract diseases (e.g., emphysema, chronic bronchitis) should use sedating antihistamines with caution. Patients requiring mental alertness should not use sedating antihistamines and should use cetirizine with caution.\textsuperscript{1}

**Patient education considerations**

The pharmacist often is the only health care provider patients consult before selecting a product for the treatment of a common cold or allergic rhinitis. With the large number of nonprescription products available for treating these conditions and the large number of patients who use these products, pharmacists must be familiar with the risks and benefits of various options for self-treating patients.

Nondrug measures may be effective in relieving the discomfort of cold symptoms. The provider should explain the appropriate nondrug measures for the patient’s particular symptoms. For patients who prefer to use nonprescription medications, the purpose of each medication should be described, and patients should be counseled to use only medications that target their specific symptoms. Patients need an explanation of possible adverse effects, drug interactions, and precautions or warnings. Finally, the provider should explain the signs and symptoms that indicate the disorder is worsening and that medical care should be sought.\textsuperscript{1}

Pharmacists can assist patients in determining whether they have symptoms related to a cold or allergies and guide them to select products that will address their symptoms. Pharmacists can instruct patients in the appropriate use of these products and recommend nondrug measures that may provide additional symptom relief. Pharmacists also can answer patient questions about the use of various dietary supplements and herbal remedies marketed for preventing or treating the common cold. Finally, pharmacists play an important role in screening self-treating patients for the signs and symptoms of more serious conditions that warrant referral.

**References**


CPE assessment

Instructions: This exam must be taken online; please see “CPE information” for further instructions. The online system will present these questions in random order to help reinforce the learning opportunity. There is only one correct answer to each question.

1. Which symptom is usually the first to appear in patients who have the common cold?
   a. Sore throat
   b. Headache
   c. Congestion
   d. Cough

2. Which of the following statements about symptoms associated with the common cold is true?
   a. Adults are more likely than children to experience fever.
   b. Nasal secretions generally are clear and thin throughout the course of the cold.
   c. Symptoms of a cold generally resolve within 2 weeks.
   d. Patients with a cold generally experience a productive cough.

3. Which symptom is more common in patients with allergic rhinitis than those with the common cold?
   a. Congestion
   b. Sore throat
   c. Pruritus
   d. Headache

4. Which of the following symptoms is a sign of a more serious illness that warrants referral?
   a. High fever
   b. Severe sore throat
   c. Symptoms lasting more than 1 week
   d. Sneezing

5. Which of the following conditions is associated with increased susceptibility to the common cold?
   a. Increased time spent in crowded indoor environments
   b. Increased time spent in humid environments
   c. Having diverse social networks
   d. Frequent hand washing

6. Which of the following nonpharmacologic products has data suggesting that it has anti-inflammatory activity?
   a. Saline nasal sprays, drops, or irrigation
   b. Humidifiers
   c. Aromatic oils
   d. Chicken soup

7. Which of the following statements about the use of systemic decongestants is true?
   a. They are the preferred treatment for children younger than 2 years who have congestion.
   b. They can exacerbate diseases sensitive to adrenergic stimulation.
   c. Their primary adverse events are gastrointestinal (GI) upset and diarrhea.
   d. They can be used concomitantly with MAOIs.

8. Which of the following statements about the use of multisymptom products for the treatment common cold is true?
   a. Patients who use them must carefully avoid therapeutic duplication with other products.
   b. They are less convenient than single-ingredient products.
   c. They are less effective than single-ingredient products.
   d. They are well suited to the time course of symptoms throughout the common cold.

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9. Which of the following agents used in the treatment of cough is an expectorant?
   a. Dextromethorphan
   b. Menthol
   c. Camphor
   d. Guaifenesin

10. According to the American College of Chest Physicians, first-line treatment of cough associated with the common cold should include:
   a. A systemic antitussive.
   b. A topical antitussive.
   c. An expectorant.
   d. A first-generation antihistamine plus a decongestant.

11. Clinical evidence of the use of vitamin C suggests that:
   a. Prophylactic use has been found to prevent common colds in the general population.
   b. Prophylactic use has been found to prevent common colds in individuals under extreme physical stress.
   c. Prophylactic use has no effect on the duration of the common cold.
   d. Treatment after symptoms appear shortens the duration of the common cold.

12. Which allergen cannot be removed with high-efficiency particulate air ventilation systems?
   a. Pollen
   b. Cat dander
   c. House dust mite allergens
   d. Mold spores

13. When exposure to an allergen can be anticipated, how long in advance should patients begin prophylactic treatment with an antihistamine or mast cell stabilizer?
   a. 1 day
   b. 2 days
   c. 1 week
   d. 2 weeks

14. The primary adverse effects of first-generation antihistamines are:
   a. Anticholinergic and GI.
   b. Central nervous system (CNS) and anticholinergic.
   c. CNS and dermatologic.
   d. Dermatologic and GI.

15. Which of the following symptoms requires referral to evaluate for possible asthma?
   a. Wheezing
   b. Cervical adenopathy
   c. Halitosis
   d. High fever

16. According to the Beers criteria, which medications used in the treatment of the common cold and allergies should be avoided in older adults?
   a. First-generation antihistamines and NSAIDs
   b. First-generation antihistamines and systemic decongestants
   c. Topical or systemic decongestants
   d. Systemic decongestants and NSAIDs

17. Why should children with allergic rhinitis younger than 12 years be referred to a prescriber before initiating self-treatment?
   a. To rule out asthma
   b. To rule out otitis media
   c. Because no treatments for allergic rhinitis are approved for this age group.
   d. To assess the value of decongestant therapy