

The following abstracts from peer-reviewed journals containing literature on treatment of rhinitis were selected for their relevance to this roundtable symposium and to a managed care perspective.

Costs of Allergic Rhinitis in the United States

In this cost-of-illness study, the authors used data from the 1987 National Medical Expenditure Survey to provide estimates of resource utilization, medical expenditures, and lost productivity resulting from allergic rhinitis, a common condition in the United States. They estimate that approximately 39 million Americans had allergic rhinitis in 1987, but only 12.3% (4.8 million persons) sought medical treatment for the condition. They also estimate that the cost of allergic rhinitis in 1987 was \$775 million (\$1.23 billion in 1994 dollars), with direct medical expenses accounting for 94% of total costs. Direct medical expenses included prescribed and over-the-counter (OTC) medications and medical visits to a physician's office, clinic, emergency department, or hospital outpatient department. OTC medications for self-treatment were not included in the survey. Indirect costs were estimated as well. Allergic rhinitis led to approximately 811,000 lost workdays (estimated at \$37 million), 824,000 missed school days (\$13 million in lost productivity for parents or guardians), and 4,230,000 reduced activity days (\$17 million). The authors conclude that although most persons with allergic rhinitis do not seek treatment from a physician, the condition clearly creates a burden on the national economy in terms of the number of persons affected, total expenditures, and lost productivity.

Malone DC, Lawson KA, Smith DH, Arrighi HM, Battista C. A cost of illness study of allergic rhinitis in the United States. *J Allergy Clin Immunol* 1997;99:22-27

Evaluating Allergic Rhinitis

This review article, directed to primary care physicians, emphasizes the importance of the medical history in evaluating patients with rhinitis and in differentiating allergic rhinitis from the common cold. Often, a good history that includes the nature, duration, and seasonality of symptoms, the relationship of the symptoms to common indoor and outdoor allergy triggers, and the presence or absence of fever can avoid further allergy testing. Since allergic rhinitis often coexists with chronic sinusitis, the former should always be considered in patients with the latter. In the case of allergies, the cost of therapy can be relatively low if the offending allergen is identified and controlled or eliminated. Signs to look for during the physical examination and the pathophysiology of allergic rhinitis are also reviewed, as is allergy testing, which is appropriate if the diagnosis is puzzling, immunotherapy is contemplated, or the patient wants proof of the cause of any allergies. The article also discusses specific allergens—including tree and ragweed pollens, fungi, molds, dust mites, birds, and furry animals—and provides suggestions to reduce exposure.

Ferguson BJ. Allergic rhinitis: Recognizing signs, symptoms, and triggering allergens. *Postgrad Med* 1997;101:110-116

Costs of Hay Fever

This analysis estimates both the direct and indirect costs of hay fever, or allergic rhinitis, in the United States in 1990. Direct costs include physician visits, diagnostic tests, and medications. Indirect costs include absences from work and other indices of reduced productivity for those employed both in and outside the home. Data used for these estimates were derived from continuing national probability surveys of the United States civilian noninstitutionalized population and surveys of patient visits to nonfederal practicing physicians who were not in hospital-based specialties. Since cost estimates were not attempted for areas where data were not available or potentially unreliable, these estimates were relatively conservative and should be considered to be biased downward. Nevertheless, the total annual costs of hay fever in the United States in 1990 were estimated to be \$1.8 billion, with direct costs accounting for \$1.16 billion and indirect costs for \$639 billion.

Mc Menamin P. Costs of hay fever in the United States in 1990. *Ann Allergy* 1994;73:35-39.

Treatment Options for Allergic Rhinitis

With so many treatment options for allergic rhinitis, it may sometimes be difficult for physicians to choose the appropriate agent. This article reviews the safety, efficacy, dosages, and costs of various oral, nasal, and ocular medications for the treatment of allergic rhinitis, including sedating and nonsedating antihistamines, decongestants, corticosteroids, mast cell stabilizers, and anticholinergics. Also addressed are mucolytics and saline nasal sprays to thin out the thick postnasal discharge that often accompanies allergic rhinitis, as well as immunotherapy, which should be considered in patients whose symptoms last more than 6 months each year and who do not respond to environmental modifications or drug therapy. Indications for second-generation antihistamines are included as well.

Ferguson BJ. Allergic rhinitis: Options for pharmacotherapy and immunotherapy. *Postgrad Med* 1997;101:117-131.

Fluticasone Nasal Spray vs Terfenadine Tablets

This randomized, double-blind, double-dummy, parallel-group study was designed to compare the efficacy and tolerability of fluticasone nasal spray with the efficacy and tolerability of terfenadine tablets in the treatment of seasonal allergic rhinitis. In this 10-center trial, 348 teenagers and adults with moderate-to-severe allergic rhinitis were randomized to fluticasone nasal spray (200 Fg once a day, self-administered as two 50-Fg sprays per nostril at 8 a.m.) plus a placebo tablet at 8 a.m. and 8 p.m., terfenadine tablets (60 mg twice a day, at 8 a.m. and 8 p.m.) plus a placebo spray at 8 a.m., or placebo (two sprays per nostril at 8 a.m. and a tablet at 8 a.m. and 8 p.m.) for 4 weeks. Nasal symptoms—ie, sneezing, nasal obstruction, rhinorrhea, and nasal itching—were assessed and scored on a visual analog scale ranging from 0 (absent) to 100 (severe) by clinicians after 1, 2, 3, and 4 weeks of therapy and by patients throughout the treatment period. Nasal symptom scores rated by both clinicians and patients were significantly lower in the fluticasone group compared with the terfenadine and placebo groups ($P < 0.05$). Except for sneezing, terfenadine was not statistically different from placebo. Total nasal airflow was significantly improved in patients receiving fluticasone compared with those taking terfenadine or placebo ($P < 0.05$). In addition, more patients randomized to fluticasone, compared with placebo patients, had reduced nasal mucosal eosinophil counts at the end of the treatment period ($P < 0.05$). Regarding tolerability, there were no reports of any serious or unusual drug-related adverse events.

Bronsky, EA, Dockhorn RJ, Meltzer EO, et al. Fluticasone propionate aqueous nasal spray compared with terfenadine tablets in the treatment of seasonal allergic rhinitis. *J Allergy Clin Immunol* 1996;97:915-921.

Intranasal Fluticasone vs Loratadine in Adolescents

In this 4-week, multicenter, double-blind, randomized, parallel-group study, the investigators compared the efficacy of fluticasone nasal spray (200 Fg once a day) with that of loratadine tablets (10 mg once a day) in 240 adolescents with allergic rhinitis caused by ragweed. Nasal and eye symptoms—ie, nasal blockage on awakening and during the rest of the day, sneezing, nasal itch, and eye watering or irritation during the day—were recorded each day on a 4-point (0 to 3) scale, with 0 being absent and 3 being severe. Throughout the study, treatment with fluticasone nasal spray was associated with better control of nasal symptoms than was loratadine. When symptoms were present, they tended to be mild in the fluticasone group but moderate or severe in the loratadine group. No significant differences between the two groups were found for eye irritation symptoms, however. At one of the five participating centers, nasal peak inspiratory flow (PIF) was measured and recorded each morning and evening in 57 subjects. Fluticasone spray was associated with significantly higher PIF values in both the morning ($P = 0.0051$) and the evening ($P = 0.0036$) than was loratadine. In addition, a greater improvement in morning PIF values over the 4-week study course was noted in those taking fluticasone ($P = 0.0008$). Improvement in evening PIF values was not significantly different between the two treatment groups.

Jordana G, Dolovich J, Briscoe MP, et al. Intranasal fluticasone propionate versus loratadine in the treatment of adolescent patients with seasonal allergic rhinitis. *J Allergy Clin Immunol* 1996;97:588-595.

Link Between Rhinitis and Asthma

This review of epidemiologic, clinical, and laboratory studies explores the link between rhinitis and asthma. Numerous cross-sectional studies have shown that rhinitis and asthma commonly occur together, with nasal symptoms reported to occur in 28% to 78% of patients with asthma (versus approximately 20% in the general population) and asthma occurring in 19% to 38% of patients with allergic rhinitis (versus 3% to 5% in the general population). Other studies have shown that rhinitis and asthma may be temporally related, with one study finding that 59% of teenagers between 13 and 17 years of age had nasal symptoms first or symptoms of both rhinitis and asthma appear during the same year. A similar study of college students found that 64% had rhinitis before the onset of asthma and 21% had both rhinitis and asthma at the same time. In another study of 7662 patients representing a broad age range, 49% of those with both asthma and rhinitis had nasal symptoms first, and 25% had both disorders within a year of each other. These findings suggest that rhinitis may be a predictive factor for the subsequent development of asthma. The link between the two diseases is heightened by observations that treatment of rhinitis also relieves symptoms of asthma. Intranasal corticosteroids can prevent increases in nonspecific bronchial reactivity and asthma symptoms associated with seasonal exposure to pollen. Similarly, these drugs can reduce daily asthma symptoms, exercise-induced bronchospasm, and bronchial responsiveness to methacholine in patients with perennial rhinitis. In patients with both diseases, antihistamines—with or without decongestants—reduce seasonal rhinitis symptoms, asthma symptoms, and objective measurements of pulmonary function. The mechanisms that connect upper and lower airway dysfunction include a nasal-bronchial reflex, mouth breathing secondary to nasal obstruction, and pulmonary aspiration of nasal contents.

Corren J. Allergic rhinitis and asthma: How important is the link? *J Allergy Clin Immunol* 1997;99:S781-S786

Occupational Injury and Medication Use

The association between recent medication use and occupational injuries was explored in this case-control study of 3394 members of the Group Health Cooperative of Puget Sound (GHC), each of whom was compared with two controls selected from the GHC membership and matched for age, gender, and Standard Industrial Classification code of their employer. Medication use for cases and controls was determined from the GHC pharmacy database. Injuries identified in the study population during 3394 incident visits for four types of acute, traumatic, work-related injuries in 1992 and 1993 included 496 fractures or dislocations, 2728 open wounds, crush injuries, or superficial injuries, 176 burns, and 64 internal or intracranial injuries. The risk of injury was higher among users of antihistamines (almost exclusively sedating antihistamines since the less sedating agents were not on the GHC formulary during the study period), antibiotics, and diabetes medications (oral hypoglycemics and insulin). No consistent association between medication use and work-related injuries were observed for antidepressants, anxiolytics, or narcotics. Although the patterns of risk were similar in men and women, they did vary by type of injury, with antihistamine use associated with increased risk of open wounds and contusions, burns, and fractures. Antibiotic use was associated with a modestly increased risk for all four types of injuries, but was most notable for burns. Burns were also more likely to occur in those taking diabetes medications, although this association is based on a small number of cases. Interestingly, injured workers were more likely to be recent GHC enrollees (more than 90 days but less than 365 days), indicating recent hire by the employer. Thus, unfamiliarity with the workplace and/or inexperience may also have contributed to the risk of injury.

Gilmore T, Alexander BH, Mueller BA, Rivara FP. Occupational injuries and medication use. *Am J Indust Med* 1996;30:234-239

Algorithmic Approach to Chronic Cough

The dual objectives of this study were to evaluate a stepwise approach to chronic cough that emphasized initial treatment with an antihistamine/decongestant for postnasal drip and to determine the value of routine bronchoprovocation challenge in evaluating chronic cough. A total of 45 immunocompetent nonsmoking outpatients with a mean cough duration of 140 weeks (range, 3 weeks to 280 weeks) in a university-based pulmonary practice were included in the study. Postnasal drip syndrome was by far the most common cause of cough, followed by asthma and gastroesophageal reflux. Present in 39 of the patients, postnasal drip was the sole cause of cough in 27 and a contributory cause in an additional 12. Of the 27 patients in whom postnasal drip was the sole cause of cough, antihistamine/decongestant therapy was successful in 16 and antihistamine/decongestant plus nasal corticosteroid therapy was successful in 9. Of the 12 patients with postnasal drip plus other diagnoses, 3 responded to antihistamine/decongestant therapy alone, 8 responded to antihistamine/decongestants plus nasal corticosteroids, and 1 responded to antihistamine/decongestants plus nasal corticosteroids and antibiotics. Interestingly, 8 patients who responded to postnasal drip syndrome denied any awareness of throat-clearing or a sensation of drip. This suggests that there is a subset of patients whose only manifestation of the syndrome is cough. The study also found that bronchoprovocation challenge had a positive predictive value of 74% for cough caused by asthma. The authors conclude that a sequential approach to chronic cough beginning with antihistamine/decongestant therapy is effective and that bronchoprovocation challenge, while useful in evaluating chronic cough, can be delayed until after the initial response to antihistamine decongestant therapy has been assessed.

Pratter MR, Bartter T, Akers S, Dubois J. An algorithmic approach to chronic cough. *Ann Intern Med* 1993;119:977-983

Treatment of Cough

Cough—particularly chronic cough that lasts longer than 3 weeks—is one of the most common reasons for people to seek medical attention. In this review, the authors divide treatment into two broad categories: antitussive therapy that controls, prevents, or eliminates cough; and protussive therapy that renders the cough more effective or productive in clearing the airway with or without increasing cough frequency. They further define antitussive therapy as either definitive or nonspecific. Definitive therapy specifically targets either the etiology of the cough (eg, killing the pathogen causing the cough or smoking cessation to eliminate chronic bronchitis) or the presumed pathophysiologic mechanism responsible for the cough (eg, eradicating the postnasal discharge in allergic rhinitis or chronic sinusitis). Nonspecific therapy targets the symptom rather than the underlying mechanism or etiology and is thus aimed at controlling rather than eliminating the cough. It is indicated when definitive therapy cannot be given because the cause of the cough is unknown or because definitive therapy has not had a chance to work or will not work (eg, lung metastases). The authors cite a study of 49 consecutive and unselected adults in whom the causes of cough were determined to be asthma, postnasal drip syndrome due to sinusitis, postnasal drip due to allergic or perennial nonallergic rhinitis, gastroesophageal reflux, chronic bronchitis, sarcoidosis, and congestive heart failure. Definitive therapy directed toward the cough's etiology was prescribed and was immediately successful in all but one patient who had lung metastases secondary to breast cancer and therefore received nonspecific therapy with codeine. In that study, patients with postnasal drip due to sinusitis were treated with an antibiotic, a decongestant nasal spray, and an antihistamine/decongestant tablet, while those with postnasal drip due to allergic or perennial nonallergic rhinitis were treated with avoidance of environmental allergens and an H₁-receptor blocker or an H₁ blocker/decongestant tablet. The authors also cite a later and larger study by the same investigators in which definitive treatment was modified, with a success rate of 98% in 102 adults with cough. In this study, intranasal corticosteroids rather than H₁ blocker/decongestant tablets were preferentially prescribed for patients with postnasal drip syndromes not due to sinusitis.

Irwin RS, Curley FJ. The treatment of cough: A comprehensive review. *Chest* 1991;99:1477-1484.

CME QUESTIONS: TEST #0397S9

Long Island Jewish Medical Center and Johns Hopkins University School of Medicine are accredited by the Accreditation Council for Continuing Medical Education (ACCME) to sponsor continuing medical education for physicians. Long Island Jewish Medical Center, the Long Island Campus for the Albert Einstein College of Medicine, designates this continuing medical education activity for 1.0 credit hour in Category 1 of the Physician's Recognition Award of the American Medical Association. This CME activity was planned and produced in accordance with the ACCME Essentials and Standards for Commercial Support.

Instructions

After reading this Special Report, select the best answer to each of the following questions. In order to receive 1 CME credit, at least 7 of the 10 answers must be correct. Estimated time for this activity is 1 hour. CME credits are distributed on a yearly basis.

1. Subdivisions of inflammatory rhinitis include:

- a) perennial allergic rhinitis
- b) noninfectious rhinitis
- c) perennial nonallergic rhinitis
- d) a, b, and c
- e) a and b only

2. Rhinitis has been estimated to affect approximately how many people in the United States?

- a) 5 million
- b) 10 million
- c) 40 million
- d) 75 million
- e) 100 million

3. Costs of prescribed medications for rhinitis are estimated to be:

- a) \$.5 billion
- b) \$1 billion
- c) \$1.5 billion
- d) \$2 billion
- e) \$2.5 billion

4. Which of the following constitutes the largest segment of indirect costs?

- a) lost productivity
- b) missed days from work
- c) missed days from school
- d) travel to the doctor
- e) none of the above

5. Which of the following outcomes assessment instruments is most helpful for assessing rhinitis outcomes?

- a) the Health Status Questionnaire (HSQ)
- b) the Rhinitis Quality of Life Questionnaire (RQLQ)
- c) the Work Productivity and Activity Impairment Instrument (WPAI)
- d) the SF36
- e) the Rhinitis Outcomes Advisory Directive (ROAD)

6. Orthodontic malocclusions are:

- a) equally common in mouth breathers as in nose breathers
- b) twice as common in mouth breathers as in nose breathers
- c) three-and-a-half times more common in mouth breathers than in nose breathers
- d) three times more common in mouth breathers than in nose breathers
- e) none of the above

(CME QUESTIONS CONTINUED ON FOLLOWING PAGE)

<p>CME TEST FORM AJMC Test #0397S9</p> <p>Cost-Effective Treatment of Rhinitis: A Managed Care Perspective</p> <p><i>Application for 1 Credit Hour of AMA Category I</i></p> <p>(Test valid through September 30, 1998. No credit will be given after this date.)</p>	<p>Please circle your answers:</p> <p>1. a b c d e</p> <p>2. a b c d e</p> <p>3. a b c d e</p> <p>4. a b c d e</p> <p>5. a b c d e</p> <p>6. a b c d e</p> <p>7. a b c d e</p> <p>8. a b c d e</p> <p>9. a b c d e</p> <p>10. a b c d e</p>	<p>(PLEASE PRINT CLEARLY)</p> <p>Name _____</p> <p>Address _____</p> <p>City _____</p> <p>State/ZIP _____</p> <p>Phone # _____</p> <p>Please enclose a check for \$10, payable to American Medical Publishing, and mail with this form to:</p> <p>The AJMC CME Test American Medical Publishing 1816 Englishtown Road, Suite 101 Old Bridge, NJ 08857</p>
--	---	--

PROGRAM EVALUATION

Long Island Jewish Medical Center and Johns Hopkins University School of Medicine would like to have your opinion. Please fill out the questionnaire below, tear off along the dotted line, and mail along with your CME test form. We thank you for your evaluation, which is most helpful.

On the whole, how do you rate the information presented in the article?

excellent good fair poor

Is the information presented useful in your practice?

yes no

Comments:

Do you have recommendations to improve this program?

yes no

Comments:

Were any portions of this program unsatisfactory or inappropriate?

yes no

If so, which?

Do you find the information presented in these articles to be fair, objective, and balanced?

yes no

Is there subject matter you would like included in the future?

yes no

Comments:

In your opinion, were the authors biased in their discussion of any commercial product or service?

yes no

Comments:

Program Evaluation

Physician Name

Address

City, State, ZIP

Specialty

(CME QUESTIONS CONTINUED FROM PREVIOUS PAGE)

7. All of the following are direct burdens of rhinitis except:

- a) drug acquisition costs
- b) office visits
- c) orthodontia
- d) family disruption index
- e) sleep evaluation

8. Two studies comparing the effects of drug regimens on quality-of-life indices found:

- a) fluticasone and the combination of fluticasone and loratadine were not significantly different
- b) the combination of fluticasone and loratadine was far superior to fluticasone alone
- c) the combination of fluticasone and loratadine was significantly less effective than fluticasone alone
- d) loratadine alone was less effective than placebo
- e) none of the above

9. A comparison of nasal steroids with nonsedating antihistamines:

- a) included open-label and crossover studies
- b) included studies using combination products
- c) favored nasal steroids over nonsedating antihistamines for relief of all nasal symptoms
- d) favored antihistamines over nasal steroids for relief of total nasal symptoms
- e) excluded studies that used saline as a placebo

10. The treatment algorithm evaluated in this publication includes:

- a) a 7-step approach to therapy
- b) nasal steroids or nonsedating antihistamines as the second step of therapy after OTC medication
- c) nasal steroids as initial therapy
- d) nonsedating antihistamines as initial therapy
- e) combination therapy as the second step of therapy