

The following abstracts, from medical journals containing literature on allergic rhinitis management, were selected for their relevance to this Special Report supplement.

Practice Guidelines Perceived as Cost-control Measures

This study measured changes over a 2-year period in physicians' attitudes regarding preventive care guidelines. A prospective cohort of physicians practicing at a managed care medical group took 2 surveys: one in 1992 and a second in 1994. A total of 62 physicians completed both surveys. The second survey revealed that more physicians agreed that guidelines served to contain costs (71% in the first survey versus 92% in the second survey); fewer physicians believed that guidelines were designed to improve quality of care (74% in the first survey versus 88% in the second survey); and fewer physicians agreed that guidelines would be used for quality assurance review (91% in the first survey versus 72% in the second survey). These findings provide insight into physicians' concerns about adopting practice guidelines and identify beliefs that serve as obstacles to their implementation.

Inouye J, Kristopatis R, Stone E, Pelter M, Sandhu M, Weingarten S. Physicians' changing attitudes toward guidelines. *J Gen Intern Med* 1998;13:324-326.

Poor Compliance With National Asthma Management Guidelines

In 1991, the National Asthma Education Program (NAEP) Expert Panel published Guidelines for the Diagnosis and Management of Asthma, which outline currently approved standards of care for patients with asthma in the United States. This study was conducted to compare the management of patients with asthma in a large health maintenance organization with the NAEP Guidelines and to identify factors associated with medical care and adherence to the Guidelines. Survey data collected in 1996 were analyzed for 5580 member patients with asthma, revealing poor compliance with the Guidelines. Despite recommendations that inhaled corticosteroids be used as first-line therapy, fewer than 72% of respondents with severe asthma reported having a steroid inhaler, and fewer than 54% who did have an inhaler used it daily. Treatment by an asthma specialist was more likely to result in a prescription for a steroid inhaler than was treatment by a generalist (81% versus 63%, respectively). Despite NAEP recommendations to avoid using a β_2 -agonist inhaler more than 8 inhalations per day, 11% of all patients with asthma and 20% of patients with severe asthma reported overusing their β_2 -agonist inhalers. The Guidelines suggest that patients monitor their lung function by using a peak flow meter twice daily; however, only 26% of patients reported having a peak flow meter at home. Care by an asthma specialist compared with care by a generalist was associated with a greater likelihood of having a peak flow meter (46% versus 19%, respectively). However, only 16% of patients who did have peak flow meters used them daily. Although the Guidelines recommend providing patient education, only 42% of respondents reported having access to self-management tools. Variations in the rate of emergency department visits were a function of younger age, having a longer duration of asthma, female sex, being African-American or Hispanic, having moderate to severe asthma, having ever smoked, and having no allergies or hay fever. Compliance with the NAEP Guidelines was generally poor, especially for preventive medication and routine use of peak-flow measurement. Treatment by specialists compared with generalists was correlated with more thorough care.

Legorreta AP, Christian-Herman J, O'Connor RD, Hasan MM, Evans R, Leung K. Compliance with national asthma management guidelines and specialty care: A health maintenance organization experience. *Arch Intern Med* 1998;158:457-464

A Review of the GINA Guidelines for the Management of Allergic Rhinitis and Asthma

Guidelines for the management of asthma have been developed to facilitate proper diagnosis and treatment. National guidelines were developed by the Expert Panel for the National Asthma Education Program (NAEP); international guidelines were developed by the Global Initiative for Asthma (GINA). The GINA guidelines offer a step-wise approach to management. Based on seasonal fluctuations in disease activity, therapy can be stepped up or stepped down. Bronchodilator therapies are referred to as "relievers," and anti-inflammatory therapies are referred to as "controllers." Clinical features of and recommendations of care for intermittent, mild-persistent, moderate-persistent, and severe-persistent asthma and appropriate relievers and controllers for each stage are outlined. Recommendations are provided for avoiding triggers, managing acute exacerbations of asthma and providing hospital treatment, assessing responses to treatment, and identifying incomplete and poor responses to treatment. Although guidelines are useful for determining appropriate treatment regimens for patients with allergic rhinitis or asthma, readers are cautioned to bear in mind that individualization of therapy is often necessary to increase efficacy and tolerability.

Lemanske RF Jr. A review of the current guidelines for allergic rhinitis and asthma. *J Allergy Clin Immunol* 1998;101:S392-S396.

Allergic Rhinitis: An Economic Burden

Direct and indirect costs of allergic rhinitis were measured to determine the impact of the condition on the US economy. Data from the National Medical Expenditure Survey, representing approximately 14,000 households and 36,259 patients, were used to determine resource use, medical expenditures, and lost productivity associated with allergic rhinitis. Findings from 1987 and 1994 were compared. Approximately 39 million people in the United States experienced allergic rhinitis in 1987. Of these, approximately 4.7 million people sought medical treatment, and 13 million missed school or work owing to symptoms. New and refill prescriptions were estimated at 11.5 million, resulting in an expenditure of \$184 million (1987 dollars). Information on total dollars spent to self-treat was unavailable. Allergic rhinitis generated 16.7 million medical office or clinic visits to medical providers; hospital outpatient and emergency department visits totaled 734,000 and 101,000 visits, respectively. Costs for outpatient and emergency department visits totaled \$96.3 million and \$10 million, respectively. Direct costs accounted for 94% of total costs, the largest component of which was medical provider visits (68%), followed by prescription medicine (26%). Allergic rhinitis resulted in 811,000 missed days from work, 824,000 missed days from school, and 4.2 million days of restricted activity, estimated at costs of \$37 million, \$13 million, and \$17 million, respectively. Although a small proportion of patients (12.3%) who experience symptoms of allergic rhinitis sought medical care in 1987, allergic rhinitis is an economic burden requiring attention.

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.

Use of Antibiotics for Adult Patients With Cough

The rise in antibiotic resistance has heightened attention on inappropriate use and overprescribing of antibiotics for outpatient illnesses. This study was conducted to examine national trends in the use of antibiotics by primary care physicians for adult patients with cough and to determine factors that influence antibiotic use in this patient population. A serial analysis was made of results from all National Ambulatory Medical Care Surveys relating to visits to US office-based physicians in 1980, 1981, and 1985, and annually from 1989 through 1994. Annual office visits for cough rose from 5.5 million in 1980 to 10.2 million in 1994, nearly double the proportion of visits. However, cough was listed more frequently as a secondary or tertiary reason for the physician visit. Bronchitis remained the leading diagnosis in each study year for visits with a chief complaint of cough. Other diagnoses included upper respiratory tract infection, asthma, sinusitis, and pneumonia. Prescriptions for antibiotics were lowest in 1981 (5.1 million) and were highest in 1992 (11.4 million). Antibiotics were more frequently prescribed for patients aged 18 to 44 years, rather than patients aged 45 to 64 years, or patients 65 years or older (74%, 72%, and 63% of the time, respectively). A diagnosis of bronchitis resulted in prescriptions for antibiotics 81% of the time, whereas upper respiratory tract infection and all other diagnoses combined resulted in prescriptions 68% and 51% of the time, respectively. Being younger than 65 years of age, being white and non-Hispanic, and having a diagnosis of bronchitis were significantly associated with receiving an antibiotic for cough.

Metlay JP, Stafford RS, Singer DE. National trends in the use of antibiotics by primary care physicians for adult patients with cough. *Arch Intern Med* 1998;158:1813-1818

Nationwide Presenting of Allergic Rhinitis

This study was conducted to determine the current national prevalence of allergic rhinitis—the most common atopic disorder in the country—by sex, age, geographic region, population density (urban or rural), and household income. A questionnaire was sent to 15,000 households selected from the National Family Opinion Inc. (NFO) database. A total of 9946 households representing 22,285 household members responded. All regions of the country were represented. The NFO sample was skewed toward white households as represented in the reporting: 92.3% of subjects were white, 4.2% were African American, 0.6% were Asian or Pacific Islander, and 2.9% were of unknown race. A total of 7009 people, a national prevalence of 31.5%, reported having nasal/ocular symptoms for ≥ 7 days in the past 12 months. This figure corresponds to 79.5 million people nationally based on 1993 census data. Findings in this study corresponded with findings of previous studies regarding increased patterns of prevalence of skin test reactions in people aged 17 to 34 years; equal risk for developing symptoms in men and women; equal risk for developing symptoms in all regions of the country; and an increasing prevalence of allergic rhinitis in the United States. Despite previous studies that supported an association between allergic rhinitis and socioeconomic status, this study did not observe any relationship between household income and prevalence of symptoms. Study coordinators concluded that the prevalence of self-reported allergic rhinitis may be 14.2%; nasal/ocular symptoms suggested rhinitis may be as high as 31.5%.

Nathan RA, Meltzer EO, Selner JC, Storms W. Prevalence of allergic rhinitis in the United States. *J Allergy Clin Immunol* 1997;99:S808-S814.

Financial Impact of Allergic Rhinitis

This study was conducted to explore the costs and patterns of use of medication associated with the management of allergic rhinitis. In 1993, 9946 households responded to a screening questionnaire, which included a series of questions designed to determine patterns of healthcare usage and the effect of symptoms on work. The socioeconomic status of respondents was determined by including questions about level of schooling and job description. Study subjects were largely white (93%); the slight majority were female (56%). Each patient spent an average of \$56 per year on prescription medication for allergic rhinitis, suggesting that prescription medication costs for treating symptoms of 35.9 million people could total \$907 million. An average per-patient expenditure of \$56 yearly on nonprescription drugs was also reported. Based on these findings, the estimated total annual medical cost associated with allergic rhinitis is \$2.4 billion. Of all respondents, 63% sought treatment from a physician for their symptoms. Of the 63%, 59% consulted a general or family practitioner; 12% consulted allergists; and 7% consulted ear, nose, and throat specialists. It was estimated that approximately 22 million people sought medical treatment for their symptoms in the past year. It was also presumed that diagnostic tests had not been conducted. Based on this assumption, each visit was estimated at \$50 per visit; total annual physician costs were estimated at \$1.1 billion. Costs associated with comorbid disease (eg, sinusitis and asthma) were not figured into the equation. Because this estimate is based solely on office visits and drug costs, it does not reveal the complete economic burden of allergic rhinitis.

Storms W, Meltzer EO, Nathan RA, Selner JC. The economic impact of allergic rhinitis. *J Allergy Clin Immunol* 1997;99:S820-S824.

Medical Care Costs of Patients With Allergic Rhinitis and Asthma

This study examined medical care costs for patients with both asthma and allergic rhinitis and compared it with costs for patients with asthma alone. A previously identified cohort of 1245 patients with asthma confirmed by medical review records was used to help establish the frequency of coexisting asthma and allergic rhinitis. A total of 653 patients also had documented allergic rhinitis: 23.9% had only seasonal allergic rhinitis; 6.4% had perennial allergic rhinitis; and 5.9% had nonallergic rhinitis. Men were slightly more likely than women to have allergic rhinitis plus asthma (55% versus 49%, respectively). Concomitant allergic rhinitis was more commonly diagnosed before age 40 (prevalence of 59%). Two thirds of patients aged 5 through 39 years in whom asthma is diagnosed have or will have allergic rhinitis. Although present in some patients with asthma, nonallergic rhinitis is less common than allergic rhinitis. For patients whose asthma was diagnosed after age 40 (prevalence of <15%), allergic rhinitis was uncommon. For patients diagnosed with asthma between the ages of 5 and 10 years, 60% developed allergic rhinitis within 15 years of the initial asthma diagnosis. Data were available for charges related to 8564 person-years of follow-up. Total medical care and respiratory-only charges for patients with asthma and allergic rhinitis were significantly higher across all age groups and in both sexes compared with men and women who had only asthma. In young men aged 25 through 34 years, total medical charges reflect an increased use of emergency department and hospital charges. Charges for the office care of children and young adults with asthma were 46% higher in patients with allergic rhinitis compared with those without allergic rhinitis. Differences in charges for respiratory care of asthma in patients older than 25 years with and without allergic rhinitis are less pronounced.

Yawn BP, Yunginger JW, Wollan PC, Reed CE, Silverstein MD, Harris AG. Allergic rhinitis in Rochester, Minnesota residents with asthma: Frequency and impact on healthcare charges. *J Allergy Clin Immunol* 1999;103:54-59.

Influence of an Interventional Program on Resource Use and Cost in Pediatric Asthma

Asthma is the most common chronic condition of childhood, for which morbidity, mortality, and cost are increasing. This study was performed to determine whether patient education and assignment to a primary care provider improve outcomes and cost in the management of pediatric asthma. A prospective pilot study of 61 patients was conducted with a retrospective review. Data were obtained from health and pharmacy records. Sixty-one unassigned pediatric asthma patients who were noted to be frequent users of emergency department services and who had no primary care provider were identified. This cohort received asthma education and was assigned a provider trained in the national asthma guidelines. Hospital admissions, emergency department and clinic visits, use of β^2 agonists and anti-inflammatory drugs, number of chest radiographs, and continuity of care were recorded for a mean of 58.1 months before and 11.2 months after the intervention. A cost analysis was done. All measured parameters showed favorable changes after intervention, with the decrease in the number of prescriptions of monthly inhaled anti-inflammatory drugs and chest radiographs ordered being statistically significant ($P = 0.007$ and $P = 0.040$, respectively). Monthly admissions, emergency department visits, and clinic visits declined after intervention when evaluated after 22.8 months of follow-up. Annual resource savings after intervention was estimated to be \$4845.29 per patient for this military hospital. A combined intervention consisting of provider and patient education and assignment to a primary care provider was associated with improved care and economic outcomes in this group.

Higgins, JC. Influence of an interventional program on resource use and cost in pediatric asthma. *Am J Managed Care* 1998;4:1465-1469.

The Cost of Allergic Rhinitis

Allergic rhinitis is a common, chronic disease that affects almost 13 million workers in the US labor force. By itself, this disease affects an estimated 6.5 million men and 6.1 million women in the labor force and contributes significantly to lost productivity in the workplace. Productivity can be reduced in at least 2 ways: (1) an employee takes a sick day from the job because of allergic rhinitis; or (2) he or she works at suboptimal efficiency because of the disease or its treatment. Although nonsedating antihistaminic drugs have been developed, half the workers with allergic rhinitis have reported relying on over-the-counter medications. These older, conventional antihistamines are known to produce drowsiness and to impair cognitive and motor function. We estimate that the annual cost of lost productivity to employers and society as a result of treating allergic rhinitis with first-generation antihistamines may be as high as \$3.8 billion.

Ross, RN. The cost of allergic rhinitis. *Am J Managed Care* 1996;2:285-290