

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

Asthma Care in Chicago-Area MCOs*

A self-administered survey of 19 managed care organizations (MCOs) was used in this study to evaluate asthma services within the Chicago area. Thirteen plans responded. Overall, benefit coverage for essential items (peak flow meters, spacer devices, asthma medications) was high. Most plans offered some type of asthma education program, although they were offered much less frequently in nonstaff-model capitated and noncapitated plans. Some plans also offered case management programs. However, other aspects of asthma care have not been fully implemented such as covering allergen avoidance materials (eg, pillow and mattress covers) or smoking cessation programs. Also, many of the programs have not adopted any guidelines for asthma care. Approximately one third of the plans were conducting some type of asthma improvement project in response to National Committee for Quality Assurance accreditation in 1996; it was rare in 1995. Many of the plans expressed an interest in participating in collaborative asthma care improvement activities with other MCOs. These data show that many but not all aspects of asthma care are offered by MCOs in the Chicago area but they also point to specific areas in need of improvement.

*This paper was one of a series in a dedicated supplement to *Chest*, Volume 116. This issue reviewed numerous aspects of asthma care delivery in Chicago via the Chicago Asthma Surveillance Initiative. Nelson SG, Grant EN, Trubitt MJ, Foggs MB, Weiss KB, for the Chicago Asthma Surveillance Initiative Project Team. A survey of asthma care in managed care organizations: Results from the Chicago Asthma Surveillance initiative. *Chest* 1999;116(Suppl):173S-178S.

Large-Volume Spacers Increase the Bioavailability of Fluticasone Propionate

This study compared the effect of a large-volume spacer (750 mL) with inhaled fluticasone propionate (FP) using a pressurized metered-dose inhaler (pMDI) compared with FP by pMDI alone and placebo. Fourteen healthy volunteers were used in this open, randomized, 3-way crossover design; overnight and early morning urinary cortisol/creatinine ratios, and 8:00 AM serum cortisol were measured to assess adrenal suppression. Active treatment groups showed significant suppression compared with placebo. A significant difference in suppression was noted between FP by pMDI plus spacer and FP by pMDI alone. Geometric mean differences were 1.94-fold between FP by pMDI alone and FP by pMDI plus spacer (urinary cortisol/creatinine) and 1.98-fold for 8:00 AM serum cortisol. Also, 86% of patients receiving FP by pMDI plus spacer showed uncorrected urinary free cortisol less than 10 nmol/10 h, versus 43% of those receiving FP by pMDI alone and 100% for those receiving placebo. These data point to 2-fold increased systemic bioavailability of FP by pMDI with a large-volume spacer compared with FP by pMDI alone. This reflects a 2-fold increase in respirable dose with the spacer device. Future studies should look for clinical effects with a large-volume spacer.

Dempsey OJ, Wilson AM, Coutie WJR, Lipworth BJ. Evaluation of the effect of a large volume spacer on the systemic bioactivity of fluticasone propionate metered-dose inhaler. *Chest* 1999;116:935-940.

Practices of Chicago-Area Asthma Specialists

Chicago has one of the highest asthma mortality rates in the United States. Asthma care specialists (pulmonologists and allergists) in the Chicago area were surveyed (72% response rate) to assess current knowledge, attitudes, and beliefs regarding asthma treatment. According to the survey results, the majority of asthma specialists in Chicago are providing care that is consistent with the recently published guidelines from the National Heart, Lung, and Blood Institute. Discrepancies were noted in the use of peak flow meters or spirometry for primarily symptomatic patients and for the moderate use of inhaled corticosteroids for mild intermittent asthma. Allergists and pulmonologists differed significantly from each other in the use of immunotherapy and diagnostic tests. The danger of subspecialty differences lies in the mixed messages being sent to community primary care physicians and asthma educators; Chicago-area asthma specialists are widely involved in community education and asthma program development. A majority of the respondents also indicated that their patients with managed care coverage encountered barriers in seeking the care of a specialist.

Moy JN, Grant EN, Turner-Road K, Li T, Weiss KB, for the Chicago Asthma Surveillance Initiative Project Team. Asthma care practices, perceptions, and beliefs of Chicago-area asthma specialists. *Chest* 1999;116:154S-162S.

Identifying Factors for Noncompliance in Asthma Patients

Noncompliance with medication is a major problem in many chronic illnesses, including asthma. It can be one of 2 types: unintentional and intentional. Patients who are unintentionally noncompliant are unaware that they are not complying with the recommended dosing. Reasons may include misunderstanding the dosing regimen, poor device technique, stress, a busy schedule, or language barriers. Intentionally noncompliant patients choose not to follow medical advice to some degree. Common reasons for intentional noncompliance include a too-frequent or too-complicated dosing schedule and the route of administration. Sometimes the mere act of monitoring compliance will increase compliance. Similarly, providing feedback on compliance at follow-up visits will improve compliance. These data are in line with the philosophy of assessing, monitoring, and educating patients at all visits, as described in the recently published guidelines. Reviewing inhaler technique can also increase compliance by answering patients' questions and increasing the therapeutic effect (a result of proper dosing with better technique). Patients' beliefs about the illness or its treatment (eg, inhaled corticosteroids will stunt growth in children) may be obstacles to compliance. Facilitating compliance will require a tailored approach to each patient, by addressing the patient's motivation and their ability to follow treatment advice.

Cochrane GM, Horne R, Chanez P. Compliance in asthma. *Respir Med* 1999;93:763-769.

β_2 -Agonist and Inhaled Corticosteroid Use in an MCO Population

A longitudinal survey of adult asthma patients from 15 managed care organizations (MCOs) analyzed the factors associated with β_2 -agonist overuse and inhaled corticosteroid (ICS) underuse. The data were collected before the publication of the National Heart, Lung, and Blood Institute asthma guidelines, so the percentage of those considered to be overusers may be underestimated based on current recommendations. Sixteen percent reported overusing β_2 -agonists (≥ 9 puffs/d) and 64% reported underuse of ICS (≤ 4 d/wk or ≥ 4 puffs/d). β_2 -agonist overuse was most strongly associated with using several other classes of asthma medications, increased asthma symptom severity, problems in obtaining asthma medication, and male sex. Other factors included owning a peak flow meter and higher levels of satisfaction with care. Underuse of ICS was associated with younger age, nonwhite race, lower symptom severity, lower use of inhaled β_2 -agonist, and not owning a peak flow meter. Other associated factors included less asthma education and lower satisfaction with care. Rates of medication misuse also varied by physician specialty (allergist, pulmonologist, or generalist) but not significantly by MCO plan type. These data may have implications for measures of MCO performance, which currently assess the number of prescriptions for an asthma controller. Future measures may assess actual medication use.

Diette GB, Wu AW, Skinner EA, et al. Treatment patterns among adult patients with asthma: Factors associated with overuse of inhaled beta-agonists and underuse of inhaled corticosteroids. *Arch Intern Med* 1999;159:2697-2704.

A Pilot Program to Streamline Asthma Care in a Hospital Setting

A pilot program for asthma was developed as a model for hospitalwide care delivery redesign aimed at providing better and more standardized care. The asthma care program was redesigned to: 1) establish a pulmonary unit with expanded bed capacity; 2) implement standardized treatment protocols; 3) offer direct admission by primary care physicians (PCPs) who maintained management of their patients in the hospital; and 4) use of case managers. Approximately 50 families from each site (allergy clinic, emergency department (ED), and pulmonary floor) were interviewed after the redesign; before redesign 48, 22, and 32 families were interviewed, respectively. The data revealed no significant changes in the proportion of admissions coming from PCPs and the proportion of parents reporting adherence problems. However, the number of educational topics covered in the asthma education program and the number of parents discussing adherence increased significantly. The average length of stay decreased significantly after redesign and the ED returns and early readmissions also declined (inpatient unit and ED). Use of the observational unit increased, and parent satisfaction with treatment was maintained. These results suggest that long-term costs may be reduced by replacing high-cost services (such as intensive care units) with lower cost services (case managers, more beds in a specified pulmonary unit).

Evans R III, LeBailly S, Gordon KK, Sawyer A, Christoffel KK, Pearce B. Restructuring asthma care in a hospital setting to improve outcomes. *Chest* 1999;116(Suppl):210S-216S.

Asthma Patients Find Multiple Types of Inhalers Confusing

This study evaluated the ability of 321 adult outpatients with moderate to severe asthma to properly use one or more inhalers—a metered-dose inhaler (MDI) or one of several dry powder inhalers (DPIs). The results indicate that, overall, 67.6% of patients made no errors regarding essential inhalation techniques with their inhaler or combination of inhalers. Seventy-one percent of patients with one type of inhaler showed perfect inhalation technique, as did 65% of those with 2 different inhalers, and 36% of those using 3 inhalers (although the number of patients in the last group was small). Using one type of inhaler seems to be preferable, although the difference between using 1 and 2 types is small. Using a combination of DPI and MDI is more difficult than using 2 different DPIs (54% versus 68% with correct technique, respectively). Adjustments for age, sex, and educational level did not alter the results to a large extent. Incorrect use of inhalers can have serious consequences: suboptimal delivery of drug dose perhaps leading to noncompliance; possible prescription of unnecessarily higher doses to compensate; higher costs due to increased medication needs.

Van der Palen J, Klein JJ, van Herwaarden CLA, Zielhuis GA, Seydel ER. Multiple inhalers confuse asthma patients. *Eur Respir J* 1999;14:1034-1037.

Outpatient Management of Severe Asthma Does Not Meet International Guideline Standards

In 1992, the "International Consensus Report on the Diagnosis and Management of Asthma" was published; it included 6 aspects of asthma management, each focusing on increasing patient involvement in their asthma care. The 6 parts include the main characteristics of the most recent US guidelines published by the National Heart, Lung, and Blood Institute. The International Consensus calls for: patient education on asthma pathophysiology and pharmacotherapy, chronic allergens, and inhaler and peak flow meter technique; assessment and monitoring; knowledge of asthma triggers and exposure avoidance; stepwise medication plans; a written "plan of action" for managing exacerbations; and regular follow-up care (every 1 to 6 months for nonresponders and severe asthmatics). This prospective, observational study assessed a convenience sample of 85 asthmatic patients presenting for asthma treatment at an emergency department (ED). The results were discouraging in that many patients presenting to an ED appear to lack basic knowledge of the disease and its treatment. Of note, 40% smoked (a higher proportion in than the general population) and 58% did not know that bronchospasm occurs in asthma. Many patients did not identify a primary care practitioner for their asthma care and were reviewed by a physician once a year or less.

Taylor DM, Auble TE, Calhoun WJ, Mosesso VN Jr. Current outpatient management of asthma shows poor compliance with international consensus guidelines. *Chest* 1999;116:1638-1644.

Asthma Management for Primary Care Physicians

This paper provides practical and clinically relevant advice to primary care physicians on the diagnosis and management of asthma. Primary care physicians are often the front line of asthma management, which can be effectively achieved given the right tools and information. Many of the 10 directives are taken from the salient points of the 1997 Guidelines for the Diagnosis and Management of Asthma from the National Heart, Lung, and Blood Institute. These 10 directives help to dispel myths about asthma (eg, absence of wheezing does not rule out asthma) and take into account the latest clinical studies on the different types of pharmacotherapies for asthma at all levels: intermittent and persistent (mild, moderate, and severe). The directives also emphasize patient education regarding the use of metered-dose inhalers and how improper technique can affect both the diagnosis (eg, pulmonary function testing after bronchodilator use) and morbidity.

Kuschner WG. Ten asthma pearls every primary care physician should know. *Postgrad Med* 1999;106:99-104.

Medium-Dose Inhaled Corticosteroids vs Combination Low-Dose Inhaled Corticosteroids and Bronchodilators

This study is the first to compare the efficacy of medium-dose fluticasone propionate (FP) (440 µg/day), medium-dose triamcinolone acetonide (TAA) (1200 µg/day), and combination therapy using low-dose FP (88 µg/day) and salmeterol (SL) (40 µg/day) in patients with uncontrolled asthma. In this randomized, double-blind, triple-dummy, 12-week study of 680 patients, statistically significant improvements in morning predose forced expiratory volume in one second (FEV₁) were greater for FP alone and FP plus SL than for TAA. The improvements were observed by the first week and continued to the study endpoint. For morning predose peak expiratory flow (PEF), these statistically significant differences were observed by week 2 and continued to the endpoint. Fluticasone propionate and FP plus SL significantly reduced albuterol use, nighttime awakenings requiring inhaled albuterol, and overall symptom score, and increased the percentage of symptom-free days compared with TAA at the study endpoint. Fluticasone propionate plus SL was significantly more effective than FP alone for increasing FEV₁, reducing albuterol use, and increasing the percentage of rescue-free days. Although no significant differences were observed between FP and FP plus SL for PEF, overall symptom scores, or nighttime awakenings, the trend generally favored combination therapy. Interestingly, medium doses of FP and TAA were not therapeutically equivalent based on physician global assessment, which may have implications for dosing recommendations of inhaled corticosteroids.

Baraniak J, Murray JJ, Nathan RA, et al. Fluticasone alone or in combination with salmeterol vs triamcinolone in asthma. *Chest* 1999;116:625-632.