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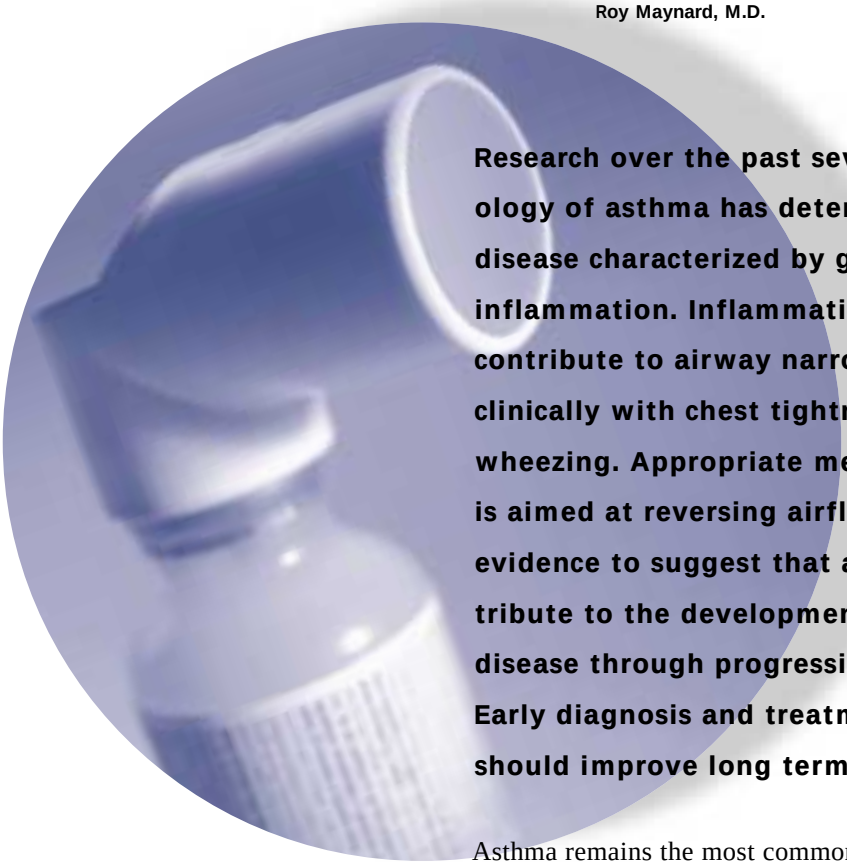
The Scope of Pediatric Asthma

Roy Maynard, M.D.



Research over the past several decades into the pathophysiology of asthma has determined that asthma is a chronic disease characterized by generalized and persistent airway inflammation. Inflammation and bronchoconstriction contribute to airway narrowing resulting in presenting clinically with chest tightness, shortness of breath and wheezing. Appropriate medical treatment of this condition is aimed at reversing airflow obstruction. There is increasing evidence to suggest that asthma left untreated may contribute to the development of chronic obstructive pulmonary disease through progressive scarring of the small airways. Early diagnosis and treatment of airway inflammation should improve long term morbidity and mortality.

Asthma remains the most common chronic illness of childhood[1]. Epidemiological variation in the prevalence of asthma in children does occur. Recent reports[2,3] describe prevalence rates that varied from 2.8 percent in Finland, 4.3 percent in the United States and 10.5 percent in Australia. A U.S. population survey[4] identified nearly five million children with asthma. Globally, asthma affects between one in 20 to one in 10 children, and a steady increase in the prevalence of asthma continues to be reported around the world.

Within the U.S. increased hospitalization rates and mortality have been documented, primarily in inner city black children. The etiology for this increase in asthma remains unclear,[5] but may be attributed to aeroallergens in the environment including dust mite, cockroach and domestic animal dander. A multitude of risk factors for the development of asthma have been described and may include: male gender, atopy, genetic and familial factors, respiratory

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Hemophilia Treatment: Past and Present

Michelle V. Gilmore, RN, MSN, NP

Hemophilia is at the forefront of early gene therapy trials that may lead to significant reductions in its complications, if not an outright cure. Under present therapy protocols, hemophilia has also become one of the most expensive chronic diseases to treat effectively. Consequently, a sound understanding of the treatment protocols and strategies is essential in managing this disease.

Hemophilia, a rare, sex-linked genetic disorder affects approximately 20,000 people in the United States. It is characterized by an inability to produce adequate quantities of clotting proteins in plasma, often resulting in spontaneous and prolonged bleeding. Although deficiencies in any of the clotting proteins are possible, Factor VIII and Factor IX deficiencies are the most common.

During the past three decades, advances in care and clinical management of this rare bleeding disorder have been extraordinary. The history of hemophilia treatment begins with the emergence of many blood science and coagulation breakthroughs after World War II, including the availability of fresh frozen plasma. Prior to 1940, there was no effective treatment for bleeding episodes other than immobilization and applications of hot or cold packs. Life expectancy was generally less than 15 years, and the quality of life was very poor due to the crippling joint disease resulting from repetitive joint bleeds.

In the 1950s the availability of plasma and the understanding of the coagulation sequence allowed some bleeding episodes to be contained if enough clotting factor could be infused within the volumetric limits of plasma administration. In the 1960s, the introduction of cryoprecipitate, a concentration of plasma containing high levels of clotting proteins, greatly improved hemophilia care.

By the 1970s, further advances produced freeze-dried plasma concentrates which featured longer shelf life, less volume per IU and easier administration. In fact, administration became so straightforward that home treatment was possible; hemophiliacs or their caregivers could administer crucial Factor VIII or Factor IX within minutes of discovering a bleeding episode. Effective home treatment is credited with greatly improving quality of life because it reduced the joint disease that was previously responsible for disabling many hemophiliacs and preventing their gainful, lifelong employment.

These breakthroughs, however, came with a significant downside. The HIV epidemic of the early 1980s dealt an unsuspecting hemophilia population a devastating blow when it was discovered that much of the lifesaving factor concentrate was a transmission medium

for HIV. Before an effective means to inactivate HIV virus in concentrated factor products could be developed, some 10,000 hemophiliacs in the United States, and thousands worldwide, (which was roughly one-third of the population) became infected. In one decade, about 7,500 hemophiliacs and many of their spouses or partners died of AIDS. (It was during this same period that approximately 90 percent of adult hemophiliacs were also infected with the hepatitis C virus.)

Various heat-treating, detergent-washing and donor-screening techniques reduced the viral transmission problem until plasma-based factors, purified through monoclonal antibody affinity techniques, were developed. Then, in the early 1990s, recombinant gene technology initiated an entirely new level of safety when recombinant factor products were produced synthetically. Recombinant factor products contain no human component other than the albumin that is used as a stabilizer for clotting proteins and greatly reduce the risk of viral transmission. They remain today's state-of-the-art treatment of hemophilia.

The combination of home treatment protocols and readily available safe factor products have markedly improved the quality of life for hemophiliacs. Treating bleeding joints immediately and as required has greatly reduced joint disease, giving hemophiliacs new opportunities for education, employment, and recreation. Recently, prophylactic treatment protocols have been designed and prescribed to prevent the life-limiting effects of joint disease in the younger population. This has proven to be so effective that many of today's teenagers can participate in school sports and other activities thought impossible just a generation ago. Adult hemophiliac care and treatment have also clearly benefited from the introduction of feasible joint replacement surgery made possible by effective factor products.

In spite of the high cost of aggressive early treatment, it is generally considered cost-effective when compared to the alternatives of hospital-based care, long-term complications of joint disease brought about by a lack of treatment and consequences of inactivity due to disability.

As improvements in the treatment and delivery of care for hemophiliacs have increased, so have the costs. It is estimated that 90 percent of the cost of care for a person with severe hemophilia can be attributed to drug cost. It is not unusual for the annual cost of product to reach $100,000, even when the patient infuses product at home. Dramatically higher medical costs are incurred if the patient receives hospital emergency room treatment.

Cost escalation also results from complications created by the rare and complex development of factor inhibitors. In a small percentage of the hemophilia population, antibodies develop and attack factor as fast as it can be infused, thereby negating its ability to assist in clotting. Therapy for immune tolerance calls for massive doses of factor to be repeatedly infused in an attempt to overwhelm and deplete the antibodies. Costly at the outset, successful administration of immune tolerance therapy restores factor recovery level and is likely to reduce future treatment costs.

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Today, there are three major goals in the treatment of hemophilia. The goals, expressed by the Medical and Scientific Advisory Committee of the National Hemophilia Foundation in conjunction with the Centers for Disease Control, are:

- Prevention of joint disease through early and adequate treatment of bleeds.
- Prevention of viral or other protein transmission through improved safety standards and products for treatment.
- Accelerated development of gene therapies intended to cure, or greatly simplify the treatment of hemophilia.

Prevention of joint disease and viral disease transmission has been an integral strategy for hemophilia treatment for many years. Recent developments in gene therapy treatment are more revolutionary. Three Phase I clinical trials, currently under way in the United States, are researching gene therapies that show great promise for bringing relief from the effects of hemophilia, perhaps even a cure.

NuFACTOR®, the Cooperative Care division of FFF Enterprises, has a contract with the ROSE® Program to provide specialized service for the procurement of antihemophilic factors required for hemophilia patients.

***Michelle Gilmore, RN, MSN, NP**, is the Director of Business Development for NuFACTOR, a home-care pharmacy company dedicated to meeting the needs of the bleeding disorders community. She has more than 10 years of experience in the arena of hemophilia as a manager of operations in home health-care, independent consultant and clinical nurse.*

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infections, outdoor air pollutants, indoor aeroallergens, smoke, prematurity, diet and climate.

The socioeconomic burden of asthma affects families and healthcare resources. Suboptimal control of asthma may contribute to frequent doctor visits, increased hospitalization and persistence of asthma symptoms. Frequent nocturnal asthma symptoms in children[6] may affect school attendance, academic and athletic performance and parent's attendance at work. In 1987 the estimated cost of health care expenditures for children with asthma was 2.8 times that of children without asthma[7]. More than half of asthma related expenditures were for hospitalizations. Within the framework of managed care[8] there appears to be room for improvement in the care of children with asthma. Routine follow-up with asthma specialists[9,10] may decrease asthma-associated morbidity and utilization of health care resources.

Asthma is a complex disease with multiple phenotypes present in the population. As a consequence, the clinical presentation, diagnostic testing and management from patient to patient may vary accordingly. In young children wheezing is quite common and often related to respiratory viral infections. Although pulmonary function testing in infants and young children can be performed, the diagnosis of asthma in young children is based on clinical signs and symptoms and the exclusion of other diagnoses.

Cough and recurrent wheezing in infants and young children, for example, are often mistaken for bronchitis or viral bronchiolitis when in fact asthma may be the underlying cause. A beneficial response to asthma therapy in these cases supports the correct diagnosis. Failure to respond to therapy in an infant with persistent symptoms warrants further diagnostic studies. Congenital malformations including vascular rings, heart disease, or severe gastroesophageal reflux may masquerade as asthma.

Table 1
Key Components for Asthma Control

1. assessment and monitoring
2. pharmacologic therapy
3. control of factors contributing to asthma severity
4. patient education

Asthma is a chronic disease affecting approximately one in 20 children and its prevalence is increasing.

Children more than five years of age may be more descriptive about difficulty with breathing and its relationship to day to day activities. Specific trigger factors may be identified such as exercise, cold air, viral upper respiratory tract infections or the neighbor's cat. Physical exams may reveal hyperinflation of the chest, wheezing, atopic dermatitis or allergic rhinitis. Older children usually can perform satisfactory pulmonary function testing which can be diagnostic of asthma when there is a significant increase in expiratory airflow following treatment with a short-acting inhaled bronchodilator or course of anti-inflammatory therapy. Some children will require more extensive diagnostic studies to identify aggravating disorders such as sinusitis, gastroesophageal reflux or allergies.

Up to 90 percent of children with asthma may have one or more positive skin tests to aeroallergen. Treatment of co-morbid diseases may improve asthma symptoms. In a patient with asthma symptoms but normal pulmonary function testing, bronchoprovocation may be helpful in supporting a diagnosis of asthma.

A guide[11] has been published for clinicians caring for asthma and includes the components needed for long-term asthma control listed in Table 1. Current recommendations include visits every one to six months, with pulmonary function tests obtained at least once a year. Frequency of visits depends on the severity of the patient's asthma and past medical history. Asthma patients may be classified according to the frequency and severity of their symptoms and changes in pulmonary function testing. This classification includes both subjective and objective assessment of lung function as shown in Table 2,

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modified from the Practical Guide for the Diagnosis and Management of Asthma.[11]

A stepwise increment in pharmacological management is used to obtain the best control of symptoms with minimal side effects. Current medications utilized include short and long-acting bronchodilators, inhaled and systemic corticosteroids, sustained release theophylline and a new class of drugs known as leukotriene modifiers. The leukotriene modifiers interfere with chemical mediators generated during the inflammatory response in asthma. These chemical mediators contribute to the pathophysiological effects in asthma that narrow airways and increase airflow obstruction.

Various other factors in the environment may contribute to asthma severity such as occupational or allergen exposures. Individuals allergic to dust mite and other indoor aeroallergens may benefit by avoidance measures after confirmation of allergies by RAST or skin prick testing. A recent review[12] of this issue delineates which methods, such as encasing bedding and pillows, are of benefit and those of less benefit, such as acaricides.

Table 2
Classification of Asthma Severity: Clinical Features Before Treatment

	Days with symptoms	Nights with symptoms	PEF or FEV_1
severe persistent	continual	frequent	≤60%
moderate persistent	daily	≥5/month	>60%-<80%
mild persistent	3-6/week	3-4/month	≥80%
mild intermittent	≤2/week	≤2/month	≥80%

PEF = percent of personal best for peak expiratory flow
FEV_1 = percent predicted values for forced expiratory volume in one second

Patient education is paramount for the successful management of outpatient asthma. This should include proper instruction in the use of metered dose inhalers, techniques to improve compliance with medications and a plan for management of

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asthma exacerbation. Patients and/or their parents must assume the burden of responsibility for recognizing deteriorating lung function and initiating early intervention to gain control of their asthma and avoid emergency room visits and hospitalizations. Use of home peak flow monitoring is helpful in selected patients.

Patient education is paramount for the successful management of outpatient asthma.

The goals of asthma therapy are to be shared between clinician and patient so shortcomings can be recognized and appropriate intervention taken. In pediatric patients these goals include maintenance of normal physical activities and school attendance. Preventing nocturnal symptoms is also paramount for enhancing school performance. Obtaining normal or near-normal lung function with optimal use of medications and avoidance of asthma triggers will allow these patients to strive for a normal quality of life.

Asthma is a chronic disease affecting approximately one in 20 children and its prevalence is increasing. The etiology of asthma is complex but gene-environment interaction plays a role. Deficiencies in the care of children with asthma do exist. Increasing education of health care providers and their patients in conjunction with newer and more novel therapies directed at the inflammatory cascade within the lung will improve the outlook for patients with asthma.

Bibliography

1. Boner AL, Martinati LC. Diagnosis of asthma in children and adolescents. *Eur Respir* Rev 1997; 7 (40) 3-7.
2. Magnus P, Jaakola JJK. Secular trend in the occurrence of asthma among children and young adults: critical appraisal of repeated cross sectional surveys. *BMJ* 1997; 314: 1795-9.
3. International Study of Asthma and Allergies in Childhood (ISAAC) Steering Committee. Worldwide variation in prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema: ISAAC. *Lancet* 1998; 351:1225-32.
4. MMWR. Asthma mortality and hospitalization among children and young adults-United States, 1980-1993. *Morb Mortal Wkly Rep* 45:350-353 (1996).
5. Crater SE, Platts-Mills TAE. Searching for the cause of the increase in asthma. *Curr Opinion in Ped* 1998; 10:594-599.
6. Diette GB, Markson LE, Skinner EA, Nguyen TTH, et al. Nocturnal asthma in children affects school attendance, school performance, and parent's work attendance. *Arch Pediatr Adolesc Med* 2000;154:923-928.
7. Lozano P, Sullivan SD, Smith DH, Weiss KB. The economic burden of asthma in US children: Estimates from the National Medical Expenditure Survey. *J Allergy Clin Immunol* 1999;104:957-63.
8. Diette GB, Skinner EA, Markson LE, Algatt-Bergstrom P, et al. Consistency of care with national guidelines for children with asthma in managed care. *J Pediatr* 2001;138:59-64.
9. Bartter T, Pratter MR. Asthma: Better outcome at lower cost? The role of the expert in the care system. *Chest* 1996; 110:1589-96.
10. Zeiger RS, Heller S, Mellon MH, Wald J, et al. Facilitated referral to asthma specialist reduces relapses in asthma emergency room visits. *J Allergy Clin Immunol* 1991; 87:1160-8.
11. Guidelines for diagnosis and management of asthma: Expert panel report 2. Bethesda, MD: *National Institutes of Health*; 1997. Publication 97-4051.
12. Tovey E, Marks G. Methods and effectiveness of environmental control. *J Allergy Clin Immunol* 1999; 103:179-91.

***Dr. Roy Maynard** is a staff neonatologist/pulmonologist at Children's Hospital and Clinics in Minneapolis. He is board certified in both neonatal medicine and pediatric pulmonary medicine. In the past he has served as Medical Director for a camp of technologically dependent children known as the SKIP (sick kids need involved people) Chapter of Minnesota. Dr. Maynard has a special interest in the long term care of NICU graduates with chronic respiratory disorders including tracheostomy and home mechanical ventilation.*

Directory of ROSE® Staff

Dan Abramowski
Second Vice President – Medical Management
(800) 767-3509
daniel.abramowski@reliastar.com

Victoria Champeau
Health Services Consultant
(800) 767-3509
victoria.champeau@reliastar.com

Deborah Clapp
Senior Health Services Consultant
(800) 767-3509
deborah.clapp@reliastar.com

Sharon Crismon
PPO Network Coordinator
(877) 767-7673 x224
sharon.crismon@reliastar.com

Julaine Crossman
Health Services Consultant
(800) 767-3509
julaine.crossman@reliastar.com

Jane Johnson
Manager, Medical Management
(800) 767-3509
jane.johnson@reliastar.com

Latrecia Jordan
Health Services Consultant
(877) 768-7673 x228
latrecia.jordan@reliastar.com

Karen Kelly
Health Services Consultant
(800) 767-3509
karen.kelly@reliastar.com

Nan Marjama
Administrative Assistant
(800) 767-3509
nancy.marjama@reliastar.com

Kathy Thiesen
Health Services Consultant
(800) 767-3509
kathleen.thiesen@reliastar.com

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