Improving Quality of Care for Californians with Pediatric Asthma

July 2002

Prepared for the California HealthCare Foundation by

Denise M. Runde

POWERS & ASSOCIATES
Acknowledgments

This report would not have been possible without the help of many dedicated people. I thank all those who helped me to understand the disease of pediatric asthma, answered hours of questions, and gave of their information and knowledge freely:

The primary reviewer of this work, Dr. Guillermo Mendoza of Kaiser Permanente, who shared his time, passion for improvement. His dedication to the field of children’s health is infectious.

Jan Eldred, Vice President at the California HealthCare Foundation (CHCF), for her support in the development of our ideas, her thoughtfulness, and her leadership. Kathy Hajopoulos, Senior Policy Analyst with the Medi-Cal Policy Institute at CHCF for sharing her knowledge, time, and suggestions.

The Department of Health Services: Majel Arnold for providing data, information, and her knowledge. Ron Chapman, M.D., M.P.H., Chief, Medicine and Public Health Section (MAPS), Pat Penn, Project Coordinator, California Asthma Among the School-Aged (CAASA) project, and Charleen Gorrell, Program Manager, Childhood Asthma Initiative (CAI), who helped me negotiate the web of funding and program initiatives underway in California.

Marion Standish of the California Endowment for giving generously the Foundation’s materials on asthma and offering me an opportunity to sit in on their meetings on asthma. The expertise, assistance, and support of the other members of the writing team are also gratefully acknowledged: Rachel DuPre Brodie, Cindy Gentry, M.P.H., Alice P. Linder, Nancy Oswald, Ph.D., and Patricia E. Powers, M.P.P.

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ISBN 1-932064-12-5

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Executive Summary

Asthma is the leading serious chronic illness among children. It is the highest-ranked cause of pediatric hospitalizations, accounts for one-in-six pediatric emergency room visits, and, for children under the age of five, it is responsible for an annual rate of emergency room visits of 120.7 per 100,000—the highest rate of emergency room admissions for any age group in the United States. Not surprisingly, it is also the primary reason for school days missed per year, estimated to account for a loss of more than 10 million school days annually.\textsuperscript{1, 2} It is most prevalent in children living below the poverty line, with an estimated 15 percent of asthma cases being attributed to poverty.\textsuperscript{3}

California reports the largest number of cases in the country—more than 500,000 children with the disease. In 1997, some 16,705 children were admitted to hospitals in California for asthma.\textsuperscript{4} The mean charge for a pediatric hospitalization for asthma is reported to be approximately $6,300 per child, with Medi-Cal paying approximately one-third.\textsuperscript{5} Most experts believe that costs could be halved if care were appropriately managed.

Despite the technological sophistication of our medical care, the U.S. health care system lacks the integration and supportive infrastructure required to effectively manage the care of the chronically ill. It is not lack of knowledge or information that prevents the care from being appropriate; rather, it is the lack of implementing what we know to be best practices, the lack of infrastructure to support effective care management, and the paucity of data to identify populations and providers most in need of support.

Several initiatives in California are focused at the local level to decrease the impact of pediatric asthma in children and/or to improve the ability of the health care system to respond to their needs. The California Endowment, the California Children and Families Commission (CCFC), and the federal Health Resources and Services Administration (HRSA) support the largest initiatives.
The California Endowment’s California Asthma Among the School-Aged (CAASA) program has allocated $3.6 million over three years and is focused on improving care for school-aged children (ages 5 to 17) in seven community health centers (CHCs) across the state.

The Childhood Asthma Initiative (CAI), with funding from the tobacco tax, addresses the needs of children under age five. CAI funded 11 agencies in California and has the goal of decreasing asthma morbidity and improving the quality of life of families and their children aged five or under with asthma. The program is funded through June 2002; a proposal has been submitted for continued funding, although it is not certain that the funds will be made available.

The HRSA “Disparities in Health Initiative,” a national initiative designed to improve chronic care in CHCs, includes three community health centers in California. This initiative will be expanded in California to include four chronic conditions and additional CHCs in June 2002. This initiative has been successful in improving the knowledge, skills, and attitudes of providers caring for chronically ill persons in California and nationally, but funding is restricted to qualified federally sponsored CHCs.

The Robert Wood Johnson Foundation (RWJF) has awarded a grant to the Long Beach Alliance for Children with Asthma (LBACA) under their “Allies Against Asthma” program. This project includes the development of a “promotora program” to provide community-based education to families designed to increase the advocacy role of parents of children with asthma, to improve patient education activities through outpatient clinics, and to focus on community-based efforts to improve the environment.

Several large provider organizations such as Kaiser have the resources and infrastructure to support a focused care management initiative. Most physician organizations and health plans in the state are struggling to coordinate care, gain the attention of providers, and find the resources and data to support their efforts.

This paper makes recommendations for how the California HealthCare Foundation (CHCF) and other stakeholders can build on these initiatives to decrease the burden of asthma for children and their families in California. The recommendations include broad efforts to facilitate fundamental changes in the delivery system through implementation or support of a coordinated care model such as the Chronic Care Model. It is recognized that this type of effort is a long-term strategy and that the impact of such an initiative may be difficult to assess without specific outcome measures related to asthma care.

Throughout the paper, it is noted that guidelines have been developed and widely disseminated; yet, all indications are that few health plans, provider organizations, or programs have fully implemented them. Therefore, included in the recommendations are specific suggestions for “high leverage” components of the guidelines. High leverage components are those elements that have been found to be effective in reducing the burden of illness on children with asthma and their families. One example is a goal to increase the number of children with asthma action plans. Pediatric asthma experts and coalitions in California have reached consensus on the use of a common asthma action plan that could provide a road map for families, providers, and schools in supporting children in the management of this disease.
Several national and local organizations (e.g., the National Committee on Quality Assurance, Kaiser, Medi-Cal, pharmacy benefit management companies) recognize that the preferred treatment for chronic persistent asthma is the use of controller medications to prevent exacerbations and acute episodes of the disease. These organizations are tracking the ratios of “rescue medications to controller medications” as a measure of quality of care for asthmatics. It is recommended that CHCF provide assistance to Medi-Cal and/or other high need populations in defining, collecting, and reporting this measure to physicians, patients, and parents.

Recommendations are also made related to specific components of the delivery system. As a chronic disease there are several points along the care continuum that can be best leveraged to improve the overall care of this population. These recommendations are consistent with the recommendations of the national guidelines.
I. Introduction

This paper is one of five white papers produced at the request of the California HealthCare Foundation by Powers & Associates. Besides pediatric asthma, the other four topics are breast cancer, diabetes, heart failure, and end-of-life care. The primary purpose of each paper is to assist CHCF staff in determining priority areas for investment in quality improvement in the state of California. Although each paper stands alone, together the five form an integrated body of work.

Each paper includes the following sections: the epidemiology of the disease/condition; costs; the state of knowledge on preventing, diagnosing, treating, and monitoring the disease/condition; the gaps between knowledge and treatment; current efforts to close the gaps; and opportunities and recommendations for potential investments by the Foundation, as well as other stakeholders. To preserve the readability of the paper and limit its length, most of the sections are illustrative, rather than exhaustive. Any omission of specific information or initiative does not intentionally imply it has been deemed unworthy of acknowledgement.
II. Epidemiology

Definition of Pediatric Asthma

Asthma is a chronic inflammatory disorder that causes recurrent episodes of wheezing, breathlessness, chest tightness, and coughing, which tend to worsen at night or in the early morning. These acute episodes are usually associated with airflow obstruction that can be resolved spontaneously, but often require treatment. A multitude of factors play a role in asthma, including genetic predisposition, infections, allergies, and socio-economic and environmental conditions. Without proper management, asthma is a life-threatening disease.

A key component to the management of asthma is the use of medications to control the inflammation caused by the disease. Without proper controller medications, such as anti-inflammatory drugs, children experience acute episodes of asthma that often result in emergency room visits and the loss of sleep and school time. Most asthmatics have specific triggers that exacerbate their condition. The effects of these triggers, however, can be minimized if control medication has been taken according to a prescribed plan.

Studies indicate that control medication management is often lacking. Many factors correlate to this lack of management, among them the socio-economic status and educational level of the family, insurance coverage, availability of primary care, and physician knowledge.

Prevalence and Burden of Illness

The U.S. Department of Health and Human Services identified asthma as an epidemic in its 2000 report “Action Against Asthma.” California had the highest prevalence (7.1 percent compared with a national prevalence of 6.4 percent) and the greatest number of people with asthma (2.3 million out of 17.3 million nationally). Of the 2.3 million Californians with asthma, it is estimated that 500,000 are children.

Data from the National Health Interview Study indicate that asthma prevalence in the United States increased 75 percent during the period between 1980 and 1994. This increase in the
general prevalence of asthma is dwarfed by the increase of asthma by 160 percent during this same time period in just the 0 to 5-year-old group. It is estimated that if this trend continues, the prevalence of asthma among school-aged children will reach 14 percent by 2020.

Asthma is the leading serious chronic illness among children. It is the highest-ranked cause of pediatric hospitalizations, accounts for one in six pediatric emergency room visits, and, for children under the age of five, it is responsible for an annual rate of emergency room visits of 120.7 per 100,000—the highest rate of emergency room admissions for any age group in the United States. Not surprisingly, it is also the primary reason for school days missed per year, estimated to account for a loss of more than 10 million school days annually. It is most prevalent in children living below the poverty line, with estimates of 15 percent of asthma cases being attributed to poverty.

Not only are poor children suffering higher rates of asthma, but also African American children are more likely to have asthma than Caucasians, with prevalence rates of 58.8 per 1,000 population and 50.8 per 1,000 respectively. They are also more likely to die from asthma than Caucasians. From 1993 through 1995, African American children were more than four times as likely to die from asthma as were Caucasian children in America.

Figure 1. Rates of Death with Asthma as the Underlying Cause-of-Death Diagnosis, by Race.

Not only are African American children generally exposed to greater environmental risk due to crowded living conditions and poor housing, they are also less likely to have access to funds or insurance to cover necessary medication and, as is noted in the prior section, they are more likely to receive care in the emergency room.
African Americans’ rate of hospitalization of 35.5 per 10,000 is more than three times that for Caucasians (10.9 per 10,000); this disparity is even greater in California, as will be discussed in the next section. African American children also seek asthma care in emergency rooms five times more often than Caucasian children. Studies examining the link between socio-economic status and asthma confirm that the impacts of asthma are greatest on low-income populations. The National Cooperative Inner City Asthma study conducted in Baltimore, MD, and Washington, D.C., found that inner-city poor children with asthma had a difficult time getting follow-up appointments, were frequently undermedicated, using the wrong medication, or using none at all (despite daily symptoms). Of those that did take medication, more than 80 percent were taking only rescue medications (i.e., a “quick fix” for an acute episode) rather than the recommended anti-inflammatory medications required to control asthma.
III. Cost

In addition to the health impact, asthma takes a huge economic toll. The Asthma and Allergy Foundation of America estimates that $4.6 billion was spent caring for children with asthma in the United States in 1996. California spent $1.2 billion in direct and indirect costs on asthma in 1994, the highest in the nation.

Direct Costs

The direct costs associated with pediatric asthma include costs from prescription drugs, office visits, emergency room visits, and hospitalizations. All categories report higher utilization for children with asthma than for children with any other condition.

The cost associated with prescription drugs represents the highest direct medical cost of asthma care (39 percent). Children with asthma are much more likely to be taking a prescription drug than other children. An October 2001 report by the Center for Health Care Strategies (CHCS) comparing a number of financial measures of children with and without asthma found that 88 percent of those with asthma take one or more prescription drugs, compared to 52 percent of children who do not have asthma. The report, based on the 1996 Medical Expenditure Panel Survey, calculates median annual expenditure for prescriptions drugs for children with asthma as $75, compared to $6 for children without asthma, a 12-fold increase.

Children aged 0 to 17 in the United States made 5.8 million visits to outpatient clinics for asthma treatment in 1996, more than double the rate at which adults sought outpatient care for asthma. It is estimated that 30 percent of the direct cost of treating pediatric asthma is related to the costs of office visits.

Asthma is the primary reason for children visiting the emergency room, which they do at about twice the rate of nonasthmatic children. Children with asthma made over 867,000 trips to the emergency rooms in 1998, with the highest rate of visits made by children under the age of four. Consistent with other utilization patterns, African Americans also have higher rates of emergency room visits than Caucasians. Although there is higher utilization of the emergency
Children are hospitalized for asthma more frequently than for any other reason. In the pediatric population, asthma-related hospitalizations are the second-highest direct medical expense, after pharmaceutical costs, at 24 percent.29

In California, the rate of hospitalizations for pediatric asthma has decreased between the last two published figures for the years 1991 to 1994 and 1995 to 1997.30 The overall hospital discharge rate for children in California from 1995 to 1997 was 216 per 100,000, just under the established Healthy People 2000 objective of 225 per 100,000. However, the discharge rate for African American children in California was 678 per 100,000, well above the Healthy People 2000 rate of 225 (and just slightly lower than the 1994 rate of 704 per 100,000).31 In addition, the same report found that younger children (less than 1 year old) had a rate of hospital admission three times that of the 10 to 14-year-old group. A 1998 study on asthma hospitalizations of people under the age of 65 in California reported that African American children under 5 years of age were hospitalized 1.9 to 6.4 times more often than Caucasians, Hispanics, and Asians, regardless of income.32

Alameda, Fresno, and Imperial Counties in California have a significantly higher hospitalization rate than other California counties for children with asthma. Nationally, hospitalizations represent the single largest direct medical expense for this disease.33 The mean charges for a child hospitalized in California between 1995 and 1997 was found to be $6,300, as compared to a mean charge of $10,000 for adults. California inpatient costs were reported to be $318 million in 1996, with an average cost per stay of $9,265.34 Most recent data, from 1996, indicate that Medi-Cal was the primary payer for children hospitalized with asthma, accounting for 46 percent of all stays.35

**Indirect Costs**

According to the American Academy of Allergy, Asthma, and Immunology (AAAAI), the indirect cost associated with lost productivity due to asthma reaches more than $1 billion each year. In addition to lost productivity of parents, children in the United States miss more than 10 million days of school.

**Cost Reduction Strategies**

Experts believe that the cost of treating asthma could be reduced by more than 50 percent if the severe exacerbations of the disease were avoided. This would require a more vigilant management of the disease to prevent these acute episodes, namely to avoid environmental triggers such as dust mites, cockroaches, and secondhand smoke, and to reduce inflammation through the use of controller medications. In a 1999 presentation to the U.S. Senate Subcommittee on Health, a Harvard researcher testified that more than half of the economic impact of asthma is the result of exacerbations of the disease, rather than the management of stable chronic asthma.36
A great deal is known about pediatric asthma, the physiology and etiology, the types of environmental factors that play a role in exacerbations of the disease, and so forth. Years of research have built a significant knowledge base for parents, children, and providers of care. In the past five years this information has been compiled in treatment guidelines and clinical protocols that, if followed, could have an immediate and significant impact on the care of children with asthma.

**Treatment Guidelines**

There are numerous published guidelines for the treatment of asthma. Released in 1997 the most comprehensive and widely accepted of these is *Guidelines for the Diagnosis and Management of Asthma*, developed by the National Institutes of Health (NIH) National Heart, Lung, and Blood Institute (NHLBI) and the National Asthma Education and Prevention Program (NAEPP). Considered the gold standard of care, the NHLBI guidelines are organized into four major components:

1. Measures of Assessment and Monitoring;
2. Control of Factors Contributing to Asthma Severity;
3. Pharmacologic Therapy; and
4. Education for a Partnership in Asthma Care.

**Measures of Assessment and Monitoring**

This component provides guidance on correctly diagnosing asthma and establishes the importance of measuring the success of therapy through ongoing monitoring and periodic assessment. According to the guidelines, three primary elements must be present for an accurate diagnosis:
1. episodic symptoms of airflow obstruction;
2. airflow obstruction is at least partially reversible; and
3. alternative diagnoses are excluded.41

In addition to defining these elements of diagnosis, NHLBI created new severity-of-illness classifications along with recommendations for appropriate therapy for each category of severity. The severity levels are defined as mild intermittent, mild persistent, moderate persistent, and severe persistent.42

The guidelines also clearly define the conditions under which a referral should be made to a specialist, and information on developing a differential diagnosis for wheezing in infancy.43

Recommendations for periodic assessment and monitoring are clearly defined, including signs and symptoms of asthma, pulmonary function, the use of spirometry in the physician’s office, survey of quality of life, history of exacerbations, pharmacotherapy, and the patient-provider relationship. The guidelines also recommend that patients have instructions on how to establish their own personal best peak expiratory flow (PEF), and use it as the basis of their action plan.44

AAAAI has issued and widely disseminated Update on Pediatric Asthma: Promoting Best Practice, a user-friendly guide for clinicians and patients on the use of the NHLBI guidelines. The goal of this initiative “is to ensure that a broad spectrum of health care providers learn about, understand, and implement clinical and best practice information for diagnosing and managing pediatric asthma care. When providers deliver best care, they assist in keeping children healthy, happy, in school, and out of emergency rooms and hospitals.”45

Control of Factors Contributing to Asthma Severity

Many environmental factors can exacerbate asthma. The NHLBI guidelines recommend that the provider of care test and identify patients’ sensitivity to specific allergens and help them to understand the importance of avoiding these triggers.46 Secondhand tobacco smoke represents a major precipitant of asthma symptoms in children.47

Pharmacologic Therapy

The guidelines include a lengthy discussion and set of recommendations on the use of medications based on severity and age of the patient. The pediatric population is divided into those aged five and under and those six and above. The medications used to control and treat asthma are classified into two broad categories: control and relief medications. Each has its recommended dose, administration, and use.

In general, control medications are taken on a daily or long-term basis to “achieve and maintain control of persistent asthma.” This category of medications includes anti-inflammatory drugs (corticosteroids, prednisone, and cromolyn sodium), long-acting bronchodilators (salmeterol and methylxanthines), and leukotriene modifiers (Zafiruikast and Zileuton).48

Rescue medications, or quick relief drugs, are taken when an acute episode of asthma creates airflow obstruction and bronchoconstriction. These medications act quickly to open the bronchia and reverse the airflow obstruction. This category of medications includes short-acting bronchodilators, albuterol, anticholinergics, and corticosteroids.
Patients with persistent asthma require both control and rescue medications. For appropriate management, the long-term control medications need to be taken on a regular basis, whether symptoms exist or not, and rescue medications taken infrequently, when an acute episode requires it. The use of control medications has led to significant fear and controversy over their long-term impact. NHLBI acknowledges and discusses these issues in their recommendations, citing the vast amount of literature on the subject.49,50,51,52

**Education for a Partnership in Asthma Care**

The creators of the NHLBI guidelines recognize that optimal management of a chronic disease is based on a partnership between the patient and the health care providers, with education being the critical link. It recommends that health care providers delivering asthma care should carry out this education. Clearly defined methods and instruments to assist the care providers to integrate this education into the care process and to develop this partnership for care are provided.

**Areas of Controversy**

Several common issues in asthma management emerged in interviews in California and in the literature. Issues related to the diagnosis of asthma in young children and the fears of long-term use of anti-inflammatory therapy are most notable.

**Diagnosis**

Diagnosing asthma in very young children is a continuing challenge for many clinicians. Reasons cited for this include the fact that it is difficult to differentiate between other upper respiratory conditions and asthma. The reporting of “nocturnal awakenings,” a common diagnostic measure, is unreliable as it is dependent upon whether the symptoms were severe enough to awaken the caregiver. Another problem is the fact that a diagnosis of asthma in young children is often based on only one or two patient visits.53

**Medication Use**

As with most chronic conditions, the medication management and compliance issues for pediatric asthma care are complex and present major challenges to provider and parents. Many patients and/or their parents do not follow the recommendations of their physicians to take control medications. Patients feel that they do not need the control medication if they are not experiencing symptoms, and parents are often fearful of long-term negative effects. There has been significant controversy over the years concerning the effects of long-term asthma therapy. The most often quoted risk associated with the use of asthma medications, and often noted as a reason for noncompliance, is the potential risks of inhaled corticosteroids, which in high doses have been reported to have an adverse effect on growth in young children. However, current studies have found that “significant long-term growth suppression does not occur.” Studies of adults who received long-term beclomethasone (or other inhaled corticosteroids) treatment during childhood revealed final height measurements within the range of genetic expectations.54

The NHLBI guidelines acknowledge these issues and conclude that the majority of studies do not demonstrate a negative effect on growth with dosages of 400 to 800 mcg a day, and that monitoring growth and use of step-down therapy is prudent while this issue is studied further. It is important that physicians are aware of recent studies and the need to work with parents to help
them to understand the trade-offs associated with the risks and benefits of the medication therapy.

The Value of Peak Flow Meters

There is some controversy within the research and clinical community over the value and appropriateness of peak flow meters. The NHLBI guidelines recognize this controversy and call for more studies of daily long-term peak flow monitoring among patients with moderate and severe persistent asthma. The guidelines recommend the use of peak flow meters and the daily tracking of results. There is wide variability in the measurement of peak flow meters, and thus it is important not only to track the readings over time, but also to use the same manufacturer’s peak flow meter to minimize error rates. This is at least in part a reason why not all health plans provide or reimburse for peak flow meters.

Knowledge of Chronic Care Management

In addition to our knowledge of pediatric asthma, there is a growing recognition that all chronic conditions present similar challenges to patients, caregivers, providers, and the health care system. There have been numerous efforts to define these similarities and to create care management strategies that could be successful in managing the care of any chronic condition. One model, developed at Group Health Cooperative of Puget Sound, has recently received a great deal of support from several national organizations.

Overview of the Chronic Care Model

The Chronic Care Model contains the following six essential elements:

1. a community that provides the necessary resources to support the health system;
2. a health system with the leadership, appropriate incentives, and resources to help practices change to address the needs of the chronically ill;
3. self-management support made possible through coordinated support of the patients and their families, allowing them to actively participate in their care and treatment plans with the ability to provide feedback to their primary providers of care;
4. delivery system design that recognizes that not all care providers operate in an integrated delivery system model and that the system may have to be “created” or designed around them to provide the level of support required to provide effective chronic care management;
5. decision support provided through the availability of an accurate, appropriate, and complete care plan based on the most recent clinical guidelines; and
6. clinical information systems to provide the feedback mechanism and ability to track the success of the relevant outcome measures.

The Chronic Care Model creates the framework for an integrated and systematic approach to the care of chronic illnesses such as pediatric asthma. Most of these elements are recognized as the basis for comprehensive primary care and are represented in the NHLBI guidelines. At a recent national meeting on asthma, the following application of this model was presented for use in asthma care.
Table 1. Application of the Chronic Care Model to Asthma Care

<table>
<thead>
<tr>
<th>Component of Chronic Care Model⁵⁸</th>
<th>Application to Asthma Care</th>
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<tbody>
<tr>
<td><strong>Community</strong></td>
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<tr>
<td>• Community programs</td>
<td>• Form partnerships with schools, mental health providers, pharmacies to implement asthma guidelines and policies that support chronic care</td>
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<tr>
<td>• Senior centers</td>
<td>• Seek input from parents and teachers for assessment, diagnosis, monitoring, and treatment plans</td>
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<td>• State health department</td>
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<td>• Patient advocacy organizations</td>
<td></td>
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<tr>
<td>• Form partnerships with schools, mental health providers, pharmacies to implement asthma guidelines and policies that support chronic care</td>
<td></td>
</tr>
<tr>
<td>• Seek input from parents and teachers for assessment, diagnosis, monitoring, and treatment plans</td>
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<tr>
<td><strong>Health System</strong></td>
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<tr>
<td>• A strategic priority of management</td>
<td>• Provide resources for a care management program for asthma</td>
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<tr>
<td>• Clinicians provided incentives to meet standards of care</td>
<td>• Provide incentives to clinicians to meet HEDIS/NHLBI measures</td>
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<tr>
<td>• Access to care before complications arise</td>
<td>• Ensure HRSA paying for care of uninsured</td>
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<tr>
<td>• Provide resources for a care management program for asthma</td>
<td>• Provide referral protocols to specialists</td>
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<td><strong>Self-management Support</strong></td>
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<td>• Patient education classes about their chronic illness</td>
<td>• Emphasize the patient’s and parent’s active and central role in managing the child’s illness</td>
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<tr>
<td>• Patient education materials</td>
<td>• Develop written asthma management plans for every child with asthma and practice shared goal setting with child and family</td>
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<td>• Goal setting between provider and patient</td>
<td>• Perform assessments of self-management knowledge, skills, confidence, supports, and barriers</td>
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<td>• Follow-up visits or phone calls for re-emphasis</td>
<td>• Assure regular collaborative care planning and assistance with personalized problem solving</td>
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<tr>
<td>• Classes on “learning to live with chronic disease”</td>
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<td>• Patient equipment and supplies</td>
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<td><strong>Delivery System Design</strong></td>
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<tr>
<td>• Primary care teams with clear division of labor</td>
<td>• Define roles and delegate tasks, including “home” team (practice team, school, parents, and specialists)</td>
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<tr>
<td>• Planned visits for chronic illness to overcome the “tyranny of the urgent”</td>
<td>• Provide care in planned visits based on NHLBI guidelines</td>
</tr>
<tr>
<td>• Continuity of care so patient sees same clinicians each visit</td>
<td>• Primary care team assures continuity</td>
</tr>
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<td>• Capacity for case management</td>
<td>• Develop a written asthma action plan for every child with asthma</td>
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<tr>
<td>Decision Support</td>
<td>Clinical Information Systems</td>
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<tr>
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<tr>
<td>• Clinical practice guidelines and standards of care available to clinicians</td>
<td>• Registry (list of all patients with asthma in system)</td>
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<tr>
<td>• Special expertise available</td>
<td>• Registry includes key indicators such as severity level and medication use for all patients (dates, doses), tracks clinically useful and timely information.</td>
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<tr>
<td>• Academic detailing (presentations and meetings with primary care teams about how to care for chronic illness)</td>
<td>• Enable the identification and proactive care of relevant patient subgroups within the registry.</td>
</tr>
<tr>
<td>• Establish links with allergy, pulmonologist, and educational specialists.</td>
<td>• Reminder systems for clinicians; use form letters, mailing labels, electronic communication, or other strategies, to facilitate communication with patients to assure timely planned follow-up.</td>
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<tr>
<td>• NHLBI measures, standards of care distributed in easy format.</td>
<td>• Asthma action plan readily available for first screen on an EMR</td>
</tr>
<tr>
<td>• Embed evidence-based AAAAI guidelines for the assessment, diagnosis, and treatment of asthma into daily clinical practice.</td>
<td>• Feedback to clinicians and to patients on how they are doing</td>
</tr>
<tr>
<td>• Utilize provider education strategies proven to change practice behavior.</td>
<td>• EMR is the ideal, but an excellent care management plan for asthma can exist without an EMR</td>
</tr>
<tr>
<td>• Inform patients of guidelines pertinent to their care.</td>
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Source: Table adapted from IHI’s breakthrough series collaborative, *Improving Care for People with Chronic Conditions II*, by Dr. Ed Wagner, Group Health Cooperative of Puget Sound.

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Table 1. Application of the Chronic Care Model to Asthma Care (Cont’d)

- Ensure regular follow-up using visit and nonvisit care
- Case management for children who have more than two emergency room visits, or who use more than two rescue drugs in one month.
Quality Measures

Several organizations have enhanced our knowledge and understanding of care for asthmatics. The National Committee on Quality Assurance (NCQA) and the Agency for Healthcare Research and Quality (AHRQ) have both played significant roles in improving asthma care.

NCQA includes asthma in their annual survey of managed care organizations as a key indicator of quality of care. The measure is part of a set of indicators collected by NCQA from participating health plans, referred to as the Health Plan Employer Data and Information Set (HEDIS). This particular measure tracks the use of long-term controller medications in children and adults with asthma, based on the NHLBI treatment guidelines.\(^{59, 60}\) It is designed to identify health plans whose asthmatic populations use high rates of rescue medications. This measure is a signal that the population is not receiving appropriate care.

The pediatric population is stratified into two age groups: 5 to 9-year-olds, and 10 to 17-year-olds. Table 2 shows results from California participating managed care plans in 2000.

Table 2. Appropriate Medication Use in California Versus National Average, by Age

<table>
<thead>
<tr>
<th>Ages</th>
<th>California</th>
<th>National</th>
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<tbody>
<tr>
<td>5–9</td>
<td>54%</td>
<td>60%</td>
</tr>
<tr>
<td>10–17</td>
<td>56%</td>
<td>59%</td>
</tr>
<tr>
<td>18–56</td>
<td>64%</td>
<td>65%</td>
</tr>
</tbody>
</table>

A measure of appropriate medication use indicates, for example, that in California in 2000, children aged 5 to 9 with asthma received appropriate medications for their condition a little more than half the time.\(^{61}\) NCQA defines the numerator as "for each member in the denominator, those who had at least one dispensed prescription for inhaled corticosteroids, nedocromil, cromolyn sodium, leukotriene modifiers, or methylxanthines in the measurement year."

This measure has been collected for two years and therefore provides limited trend information. Early indications from NCQA are that the poorer performing plans in 1999 made significant improvements in 2000. In their summary of the 2000 measures, NCQA reported “there was very little improvement above the group median of HEDIS-participating managed care plans, but substantial improvement occurred in the lower half of the distribution of plans.”\(^{62}\) Specific averages for California were not available for 1999.

AHRQ, formerly known as the Agency for Health Care Policy and Research, has funded numerous studies to improve care for pediatric asthma patients as well as to understand how particular health plan policies and clinical practices can hinder or promote high-quality, cost-effective care.\(^{63}\) Several of these studies produced new measures, such as those used by NCQA in the HEDIS report. In addition, they are funding one study in California, Massachusetts, and Washington to examine how 2,700 poor children with asthma are receiving care through each state’s Medicaid program.\(^{64}\) Another study of Medicaid programs in Maryland and Florida is assessing how specific organizational policies either restrict or enable access to particular...
services for children with asthma. There are currently more than eight separate studies underway through AHRQ focused on pediatric asthma care.65

Some health plans, notably Blue Cross, Blue Shield, and Kaiser, have begun tracking the actual number of rescue medications prescribed for specific patients by individual providers. In all three health plans, the physicians are provided data on their prescribing patterns and, when appropriate, additional utilization data on patients receiving rescue medications.

Kaiser has taken the monitoring one step further by including the ratio of rescue medications to controller medications as a quality measure for all physicians treating pediatric asthma cases. Physicians are given reports indicating how their prescribing patterns compare to others in the system as well as reports on individual patients.

Blue Cross contracts with WellPoint Pharmacy Benefit Management and uses the pharmacy benefit management (PBM) data to identify patients who are using more rescue medications than controller medications and alerts the primary care physician for follow-up.

Blue Shield also identifies their asthmatics using pharmacy data and provides peak flow meters and education through grants from Shearing Plough. They currently have an estimated 1,800 pediatric asthmatics in the program, although this is a fraction of their pediatric asthmatic population. All of those identified as asthmatics through pharmacy data are invited to participate in the asthma program, but not all respond.66

Several other health plans and medical groups receive funds from Shearing Plough to support asthma education programs and/or to provide peak flow meters to children who otherwise would not have access to them.

Most large physician organizations in California rely on community-based services or hospitals to provide education to their patients. Some groups were identified as providing excellent programs, although a very small percentage of patients ever learns about these programs. One of these groups, Brown and Toland, identifies pediatric asthmatics and manages them according to the NHLBI guidelines depending upon their severity of illness. The patient is provided one-on-one education, intensive case management with a pediatric nurse practitioner, or referred to a pulmonologist at either University of California, San Francisco (UCSF) or California Pacific Medical Center. They are conducting a study to assess the efficacy of group versus individual case management, to be completed in the summer of 2002.67

Brown and Toland, like most physician organizations, has found the pharmacy data to be fairly scarce and limited. They do receive a list of patients who were prescribed rescue medications with no controller medication noted for a year to six months. The asthma coordinator estimated that 50 percent of their patients fall into this profile of using albuterol with no controller medications. She also estimates that 90 percent of emergency room visits and hospitalizations could be prevented if appropriate pharmacologic therapy were followed.68

Access and use of pharmacy data and HEDIS measures by physician organizations were found to be inconsistent across the state. Some asthma coordinators knew of these measures and their importance, while others were not aware of the measures or whether their organization tracked such data.
V. Gaps Between Knowledge and Treatment

Based upon interviews with major health plans, the largest physician organizations, health care foundations, community health centers, community agencies, state and county public health departments, and CPCA, gaps in knowledge and treatment were identified based on the four components of the NHLBI guidelines. This chapter identifies the gaps between knowledge and treatment and discusses related policy issues.

Gaps Identified

Measures of Assessment and Monitoring
While most providers and asthma coordinators are aware of the NHLBI guidelines, they are not consistently utilized. Spirometry measures and other diagnostic tools are not utilized as frequently as the guidelines recommend, most children do not have asthma action plans in their charts, and many health plans do not provide coverage for peak flow meters. There is a general lack of assessment, follow-up, and monitoring of pediatric asthma patients. Most physician organizations in the state identify high-risk patients once they are hospitalized rather than through a proactive care management approach.

Control of Factors Contributing to Asthma Severity
Many community groups focus efforts to control the factors contributing to asthma severity, although very little education or testing for allergens is being provided at the time of physician visits. Providers do not often have the support of home and school environments to remove offending allergens, and most health plans do not believe it is within their purview to provide coverage for pillow and mattress covers (protectors from dust mites).

Pharmacologic Therapy
The issues related to pharmaceutical therapy are: (1) lack of knowledge about the need for drugs and the kind to prescribe; (2) lack of insurance or the means to pay for the drugs; and (3) the most prominent of these issues, lack of compliance with what is known to be the “best care.”
Most physicians do not receive timely information on their overall prescribing patterns, how they differ from other providers, or how their patients’ outcomes compare to those of others with the same diagnosis. They do not receive this information for their own practices or to benchmark data against norms and best practices. The NCQA measures are the only measures available, and these are insufficient for physicians to assess their own practices. Health plans and their PBM companies have these data, but the medical groups in California report that they do not receive this information. Advance PCS, a national PBM, does track and report these data to the prescribing physician.  

Even when the correct medication has been prescribed (as indicated in the HEDIS measures), patients are not taking recommended doses of controller medications. The reasons given are a combination of costs, ease of use, and attitude. Rescue medications are available as generic drugs and therefore are cheaper and consumed more often than the longer-term, more effective brand-name controller medications. Some children find it difficult to use the medications and often do not have their medications with them when they need them. Many patients, and their parents, are concerned about the long-term effects of taking controller medications, especially in the absence of symptoms.

**Education for a Partnership in Asthma Care**

It is difficult for most providers to create a real partnership with their patients. The infrastructure to support and integrate this partnership into care management does not exist in most practices. Physicians in California are already financially squeezed and state that they are not paid or given the time to provide education to their patients. Several asthma coordinators noted that fewer than 10 percent of the pediatric asthma population is referred to educational classes, and even fewer have the tools to self-manage their care, such as peak flow meters, asthma action plans, appropriate drugs, and so on.

In summary, significant gaps exist in California between the knowledge and practice of what we know to be effective chronic care management, the funds and support to eradicate environmental triggers, and the health care system infrastructure required to manage the care of children with asthma.

**Policy Issues**

The California Statewide Asthma Strategic Plan outlines a number of recommendations for improved policies in California. The overarching policy goal is to advocate and support policies that promote “asthma friendly” communities, especially those that eliminate the disproportionate burden of asthma for people living in poverty. Other areas of focus include research, epidemiology, and evaluation, public education, and treatment and management. Although the state has multiple sets of data, which include the Behavioral Risk Factor Surveillance System (BRFSS), the California Youth Tobacco Survey, and the California Health Interview Survey (CHIS), such information is inadequate to fully measure the prevalence and distribution of the disease in the state. In addition to creating a prevalence rating, a statewide registry or tracking system of asthma cases would be helpful in identifying pockets of undiagnosed asthma and demonstrating the efficacy of improvement efforts in defined geographic areas.
Environmental and surveillance issues remain a critical need in California. One bill submitted to pay for surveillance was written but never funded.

There is a lack of accessible pharmacy data for many provider organizations to create a ratio of the use of rescue medications to control medications. This ratio goes beyond the current data collected by HEDIS and NCQA and identifies specific populations that are either not receiving appropriate prescriptions or are not filling the prescriptions for control medications. The Asthma Strategic Plan outlines a strategy for the state to work with Medi-Cal or another central source of data/information to determine this ratio.
VI. Current Efforts to Close the Gaps

Several initiatives underway in the state are designed to improve the quality of care for pediatric asthma patients. Foundations, the state of California, and the federal government provide the most significant funding for the public delivery system and community-based programs.

Foundations

The California Endowment awarded $3.6 million through its CAASA program to “improve knowledge and awareness among health care providers and improve the delivery of asthma care in seven California clinics.”72 The Integrating Medicine and Public Health program (IMAP), California Department of Health Services (DHS), is managing the initiative in partnership with UCSF. Awards were made to seven clinics in August 2001, with a primary focus on children ages 5 to 17. The CAASA program is a three-year program.

Each center will receive $100,000 for each of three years. The seven health providers and the counties served are: Mid-City Community Clinic (San Diego); Community Medical Centers (Fresno); Valley Family Care Centers of El Centro Regional Medical Center (Imperial); Darin M. Camarena Health Centers, Inc. (Madera); Contra Costa Health Services, Department of Public Health (Contra Costa); The Children’s Clinic (Los Angeles); and Riverside County Health Services Agency, Department of Public Health (Riverside). In addition, the California Endowment recently released funds for their CAFA initiative and has funded numerous community groups, including the Regional Asthma Management Program (RAMP)—based in Berkeley and one of the most active in the state.73

The Robert Wood Johnson Foundation has several initiatives focused on improving the care of pediatric asthma. Two of the programs include grantees in California. RWJF recently announced awards under their “Allies Against Asthma” program. The program has funded seven communities with up to $1.3 million each, with a total funding of $9.1 million. One of the communities is the Long Beach Alliance for Children with Asthma, which includes the development of a “promotora program” to provide community-based education to families
designed to increase the advocacy role of parents, improve patient education activities through outpatient clinics, and to focus on community-based efforts to improve the environment.

“Allies Against Asthma” is based at the University of Michigan School of Public Health. The goal for these three-year projects is to “implement local activities that help communities improve access to and quality of clinical care, reduce asthma symptoms, and foster patient and community education.”74,75

In addition, RWJF released more than $4 million to eight grantees in October 2001 under their “Improving Asthma Care for Children” program, designed to “test new approaches to pediatric asthma management through publicly financed models of care.” The Contra Costa County Department of Health Services will receive $500,000 over three years ending September 2004.

Their third initiative focused on pediatric asthma has awarded four grants totaling $3.5 million to “improve the way patients, parents, and health care providers monitor and manage pediatric asthma” through its Managing Pediatric Asthma: Emergency Department Demonstration Program. The program is based at AAAAI and includes grantees in Honolulu, Houston, Milwaukee, and Washington, D.C.

**State of California**

The Childhood Asthma Initiative, funded by the California Children and Families Commission (CCFC), is designed to improve the coordination of care for uninsured and underinsured children under the age of five.

A total of $6.2 million has been allocated over three years. The majority of dollars is geared toward funding clinical quality improvement efforts in local communities and coalition/partnership building. Very little of this money is spent on surveillance and environmental health issues.76 The program is administered through the Department of Health Services. A recent update on the Southern California Allergy and Asthma Web site indicated that the program, by its seventh month, had enrolled 80 children.

The goals of the initiative, based on recommendations of the National Institute of Child Health Quality (NICHQ), are to:77

1. ensure that 95 percent of patients will have a severity classification documented in the chart at every care contact;
2. prescribe the appropriate medication for asthma severity, with a goal that 95 percent of patients with persistent asthma will be on anti-inflammatory medication;
3. complete and distribute an asthma management plan, with a goal that 90 percent of patients with persistent asthma will have a written asthma management plan at home and in the medical record; and
4. reduce the number of “days with symptoms” for patients with persistent asthma, with a goal of having an average of 12 symptom-free days in the previous two weeks.

To be eligible for funding, each grantee was required to establish a local coalition with at least one community clinic. The project funded eight centers: El Centro Valley Family Health Center;
The project has contracted with an outside vendor to provide the quality improvement training to the community health workers. In addition to the local coordinators, the clinic providers and their team are also trained. The coordinators provide a focus for the partnership between the family, the physicians, and the community and provide follow-up education and home assessment for high-risk children identified by the clinics. The coordinators are improving the capacity for assessing and monitoring asthmatics through the implementation of an Asthma Action Plan (created through a collaborative effort led by RAMP). The funding for this project ends in June 2002; no additional funds have been allocated.

Federal Programs

The Health Resources and Services Administration, through their “Disparities in Health Program,” has taken a leadership role in building the knowledge and skills to improve the care of the chronically ill. The Bureau of Primary Care has funded Primary Care Associations in five regions of the country to provide infrastructure and support to CHCs. Their model is also based on the Chronic Care Model (described previously) and is supported by the Institute for Healthcare Improvement (IHI). In California, the California Primary Care Association (CPCA) manages the initiative.

Phase I of the program began in 1999. Two California clinics, Watts Health Foundation and Family Health Care Network, participated in this project. Phase II of the program began in August 2001. One clinic, the Sacramento County Clinic Services, is participating in Phase II.

Phase III of the program will be funded in June 2002. This national initiative will involve collaboratives in four chronic conditions in five clusters across the country. The conditions are asthma, depression, cardiovascular disease, and diabetes. In California, the program will again be managed through CPCA, although the initiative and collaboratives will go beyond the state to involve a cluster of states in the Western United States (Federal Regions 9 and 10). The primary focus in Phase III will be the implementation of the Chronic Care Model. Initial outcome measures on this project nationally indicate that the project is a successful model for improving care of pediatric asthma patients.

In addition to their role in supporting the Chronic Care Model, IHI has targeted pediatric asthma as a significant focus of their work over the past five to ten years. Developed through their breakthrough series, their guide outlines a step-by-step process and is a rich resource for any group undertaking an improvement effort in pediatric asthma. Their seminal work published in 1997, “Improving Asthma Care in Children and Adults,” creates the framework for their current work with HRSA.

As was previously noted, NCQA has created standards for benchmarking performance of health plans and providers based on the NHLBI guidelines for pharmaceutical treatment. Although this represents a good start in closing the gaps in knowledge and treatment, it is not sufficient to
provide necessary improvements at the local level. It does not provide feedback to the individual physician or provider groups; rather it is a more generic measure of prescribing patterns based on sample data from each health plan.

In addition to these federal, state, and foundation sponsored programs, one public private collaboration of significance is the “Inner City Asthma Project” at Children’s Hospital of Oakland. This project, initiated in 1999 to improve the health status, quality of life and health services of children with persistent asthma by improving their self-management skills, is one of the first efforts to incorporate new technology into the measurement and management of pediatric asthma. Children’s Hospital, in collaboration with Health Hero Network, designed a protocol for monitoring the health status of patients through an interactive communication device, the Health Buddy. Following medical practice guidelines, children are asked questions about their symptoms, peak flow readings, use of medications, and school attendance. This electronic “asthma management plan” shows that easy-to-use, Web-based devices can be instrumental in improving self-management and monitoring of persistent asthma. Preliminary results of a 90-day trial of 134 8 to 16-year-old inner-city patients showed a reduction in asthma symptoms, fewer urgent calls to the hospital, and improved medication management. The project is being expanded throughout Oakland. It also won the 2002 Ellwood Award for a Health Industry Organization.79

Proven Techniques and Models Adopted by Few

The NHLBI guidelines are an excellent model for pediatric asthma care. However, the infrastructure and support systems required to implement, track, and monitor the guidelines are beyond the capability of most individual providers in California. Those initiatives that have demonstrated improvements are those in a large integrated delivery system like Kaiser and participants in the HRSA/IHI initiative.

Kaiser has had remarkable and demonstrable results from the implementation of a pediatric asthma guideline in the mid-1990s. Their model of care, the ability to provide feedback to providers on an individual basis, and the professional and patient educational components necessary for effective management have all contributed to the successful outcomes.

Kaiser has evolved their care management strategy to include the use of an internally developed software program that provides algorithms and search capabilities for providers to track and compare their own patients and prescribing patterns with those within the system at large. The program is user friendly and is being widely used within Kaiser.

These data are important for a number of reasons. First, they provide indicators of the success of therapy. Second, they allow physicians or care managers to identify patients at risk for an emergency room visit or hospitalization before such an acute episode occurs. Third, the data provide feedback to individual providers on their performance.

Kaiser and other organizations would like to build on the available data in the state to create a statewide registry of pediatric asthma patients. The data currently reside in large health plans and/or PBMs that manage their pharmacy benefits. Preliminary discussions with one large PBM and Kaiser indicate an interest in such a collaborative effort.
VII. Opportunities and Recommendations

At present more than $10 million is being invested in various strategies and programs aimed at improving pediatric asthma care in California. The funds for these initiatives include those received from foundations, such as the Robert Wood Johnson Foundation ($500,000 in Contra Costa County and $1.3 million in Long Beach) and the California Endowment ($3.4 million in CAASA); federal programs, such as HRSA and the Centers for Disease Control and Prevention; and state funding through the California Children and Families Commission, totaling $6.2 million for the Childhood Asthma Initiative over two years in eight communities and eighteen clinics. All of these organizations and others have devoted millions of dollars and years of work to this effort. In spite of these good intentions and excellent programs, the solutions to the major problems of the care of children with asthma, as well as the care of people with other chronic illnesses, continue to elude us.

The California HealthCare Foundation, as well as other interested stakeholders, can make a significant contribution to the care of children with asthma by dovetailing with specific strategies underway in the state, most notably those focused on embedding the Chronic Care Model in clinical practice. Other specific strategies that would significantly advance asthma care are to provide a mechanism for alerting physicians when patients are dispensed more rescue medications than control medications, to support the state’s initiatives to secure funding to create a statewide surveillance system, and to focus on any one component of the six elements of the Chronic Care Model.

**Recommendation #1: Develop a structured collaborative of providers designed to improve the care of the chronically ill in California and focus initially on asthma.**

A structured collaborative, such as the Chronic Care Model developed by Ed Wagner and colleagues through the Robert Wood Johnson Foundation program, could provide the infrastructure to support specific initiatives designed to improve care of those with chronic illness. The collaborative model is one with demonstrated success in other parts of the country and in California within federally funded CHCs.
It is recommended that the program encompass the following participants and components:

1. Provider organizations with the resources and ability to commit to making an intervention to improve quality. The commitment must include:
   (a) specific goals;
   (b) sending a team of at least three people to learning sessions; and
   (c) periodic reporting to the collaborative on their progress.

2. An infrastructure that functions as the “glue” of the collaborative and provides:
   (a) training in quality improvement methods and tools;
   (b) support to develop the elements of a comprehensive care management program for asthma patients (using the Chronic Care Model or other comparable model); and
   (c) individualized coaching around quality improvement methodology and information technology skills.

3. Decision-support tools related to the specific chronic conditions, including:
   (a) development of a registry of patients with asthma; and
   (b) a means for collecting, monitoring, and tracking critical clinical measures such as improvements in drug therapy.

4. A network for structured learning and improvement for the care of asthma patients in the state that includes:
   (a) exchange of information on successful models of care;
   (b) identification and communication of new information from the literature and best practices in the field; and
   (c) methods for adult learning that have been demonstrated to be effective.

CHCF could create a parallel program focused on providers who are not eligible to participate in the HRSA program, but who provide care for large numbers of Medi-Cal and/or uninsured patients with asthma. Medi-Cal reportedly provides care for 46 percent of the children hospitalized with asthma in California.

Recommendation #2: Identify pockets of need in the state where focused improvement efforts in the care of asthma patients would make a significant impact.

Examples of high-need areas are geographic areas with hospitalization rates for pediatric asthma significantly higher than the state average and/or counties with poor appropriate medication ratios as measured by HEDIS or Medi-Cal.

The counties with the highest hospitalization rate for pediatric asthma are Fresno and Alameda. These counties also count among those with a high number of Medi-Cal enrollees. Other areas of high Medi-Cal enrollees (Medi-Cal payments account for 46 percent of the hospitalizations for pediatric asthma) are Los Angeles (home to more than 30 percent of the Medi-Cal enrollees), Riverside, Sacramento, San Bernardino, San Diego, and Santa Clara.
Focused improvement efforts could include:

1. Work with local pharmacies to identify children who do not fill or refill prescriptions. Create a program of outreach to contact families to identify why the prescriptions are not being filled and make recommendations to Medi-Cal and or health plans about strategies to reduce the number of unfilled prescriptions.

2. Create a program in high-need counties or geographically defined areas that would provide for a trained “asthma coordinator” to be contacted when a child has an acute asthma attack, either at school or in an emergency room. These children would then be assessed to see if they qualify for “children with special health care needs” (CSHCN) status, or to triage them into some other focused program where they and their parents or caregivers will receive more coordinated care and focused attention. It is also recommended that key indicators be tracked before implementation and after implementation of such a program to demonstrate results of the intervention, to see if improvement effort has had an impact on one or more indicators. Examples of such indicators could be days missed from school, emergency room visits, and number of rescue medications used.

Recommendation #3: Support the Department of Health Services to develop components of the state Strategic Plan for Asthma.

The effective management of pediatric asthma, like most chronic diseases, requires a multidisciplinary and multifaceted approach. The Department of Health Services has defined this integrated approach to include: the home and community, the educational system, the health care delivery system, and the environment. This approach is outlined in the statewide Strategic Plan for Asthma created in 2000 through an advisory group that included asthma experts, state health department leadership, and community-based organizations. The group has not had the resources to continue meeting and/or to implement components of the plan.

It is recommended that CHCF work with DHS and others involved in the development of the strategic plan to identify one or two high-leverage interventions to improve asthma care in the state.

Recommendation #4: Develop a toolkit for statewide use by health plans, provider organizations, and DHS to measure appropriate medication management.

Through its HEDIS measure, NCQA requires that accredited health plans report a measure of the ratio of controller medications to relief medications in children with asthma. Several organizations in the state, including Kaiser and Medi-Cal, are interested in developing a measure of medication management that would be useful to compare quality and outcomes across plans and provider organizations in the state and to identify individual patients at high risk of declining health status. CHCF can convene a group to include individuals from Medi-Cal and other payer or provider organizations in the state to investigate the feasibility of developing a toolkit.

Small provider organizations often lack the technical resources or number of patients to collect or interpret meaningful numbers to create this measure. Collaboration with others can provide the necessary skills, tools, and numbers required to achieve this goal. The exact definition and
data elements included in this ratio are different from the HEDIS measure and will require agreement and collaboration. Such collaboration already has begun between Medi-Cal and Kaiser. Pharmacy benefit management companies are also a good source of data. Advance PCS reports such a ratio to its providers and has expressed an interest in collaborating on such a measure.

**Recommendation #5: Create a statewide registry that can track the prevalence and incidence of pediatric asthma and/or other chronic conditions.**

Any improvement effort requires a starting point. In the case of pediatric asthma, this starting point could be a database documenting the prevalence of the disease, the incidence (new cases) of the disease, location, and demographic information such as age, race, and income. Given the importance of the home and school environment, or in the case of children under five years old, the caregiver environment, it would be helpful to track the type of environmental structure, presence of smokers, and the like for each individual. At a minimum, the prevalence data are critical to identify high-need areas, focus improvement efforts, and measure the impact of these efforts over time. Without such measures it will be difficult to assess the impact of interventions, except for the crude numbers such as hospitalization and mortality rates.

There are obvious technical challenges to achieving this goal. However, the Foundation could start small, with an experimental/demonstration effort working with their information technology group to create a voluntary, open-architecture project where providers, payers, and asthma projects such as the HRSA initiatives, Medi-Cal projects, CAASA, and/or the CAI could all submit data and begin to build the basis for a statewide database. Participation would be voluntary and would require some coordination of data definitions, rules, privacy protection, and so on. Perhaps school systems could be engaged in counties with high asthma rates to submit monthly school days missed due to asthma.

**Recommendation #6: Establish an advisory group to identify specific high-leverage areas for interventions.**

An advisory group, composed of individuals like those on the asthma strategic plan advisory group, could assist in developing appropriate types of interventions, which could either focus on one of the key elements of the delivery system or on the consumer perspective. For example, from the delivery system perspective, a goal for *prevention* could be to improve the environment of day-care centers for children less than five years of age in counties with high hospitalization rates, or some other indicator of high-need areas. A multidisciplinary approach would include representatives from the environmental services unit, housing, child-care licensing unit, and local provider organizations working together to assess the impact of improving the home and day-care environment on hospitalization rates or acute exacerbations of the disease.

**Emergency Care.** An example of this approach could be to identify emergency rooms across the state that see high numbers of children with asthma. There are specific recommendations for how to best treat children in emergency rooms within the guidelines of NHLBI, as well as regarding the impact of dose and administration of drugs in order to decrease hospitalizations.

**Hospital Care.** There are several organizations with “best practices” for identifying and managing children after a hospitalization. These best practices are not known across the state and could be identified and disseminated through a number of different strategies, including a Web-
based toolkit and a chronic-care quality improvement network (e.g., funded by CHCF and based at DHS, CPCA, or CHCF).

**Consumer Perspective.** CHCF could use the FACCT (Foundation for Accountability) model of consumer quality and focus on improving the consumer’s experience, such as “Staying Healthy,” “Getting Better,” and/or “Living with Illness.” CHCF could work with FACCT or the Children and Adolescent Health Measurement Initiative (CAHMI) to identify indicators for these consumer-focused measures, benchmarking, or comparing with other states’ activities in this area and identification of best improvement practices.

**Recommendation #7: Identify any one component of the NHLBI guidelines or Chronic Care Model to implement statewide.**

The selection criteria for the targeted component could include:

1. area of highest leverage as identified by advisory group or data;
2. interest of provider organizations;
3. opportunity to complement other asthma initiatives in the state;
4. ability to demonstrate measurable improvement within two-year time frame; and
5. support of Medi-Cal, Healthy Families, or other state-sponsored programs.
VIII. Conclusion

There is widespread recognition that pediatric asthma is a growing issue facing the California population. It is an epidemic with a disproportionate share of the burden being felt in the poor African American populations in the state.

Millions of dollars are being invested to identify and eradicate environmental triggers that exacerbate the disease. Schools and communities across the state are struggling on a daily basis to define their role in managing asthma. The major physician organizations and health plans are structurally ill equipped to manage the complexities of the care of the chronically ill. The hours of dedicated individuals, frustrated parents, teachers, and providers, millions of dollars and thousands of children struggling over their asthma management plan has historically not improved the overall quality of care of asthmatics or other chronically ill people. What is needed is an organized statewide effort directed at improving components of the care delivery process, providing data for benchmarking performance and creating a model of caring for the chronically ill.

There are clear guidelines on how to treat pediatric asthma and other chronic conditions like diabetes and congestive heart failure. We have examples of successful models for managing chronic diseases, even in the absence of an integrated delivery system like Kaiser or Group Health Cooperative of Puget Sound, an integrated medical delivery system based in Seattle. We also have the resources to impart this knowledge and build this capacity in the state.

The opportunity exists to make a significant impact on the lives of millions of children, parents, and providers in this state alone. We know what to do and possess the necessary knowledge and expertise to do it. There are no magic pills or miracle drugs; this effort will require a long-term commitment, clearly defined leadership, and substantial resources.
### Appendix A: Data Tables

#### Table A1. Medi-Cal Enrollees, Asthma Death Rates, and HRSA “Counties” in California

<table>
<thead>
<tr>
<th>County</th>
<th>Medi-Cal Enrollees</th>
<th>No. of Asthma Deaths (1990–1997)</th>
<th>Mortality Rate from Asthma: Total/African American</th>
<th>HRSA Program</th>
<th>Foundation Grants</th>
<th>Hospitalization Rates²</th>
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<td>Santa Clara</td>
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<td>166</td>
<td>13.5/---</td>
<td>Lowest</td>
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<td>Orange</td>
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<td>287</td>
<td>14.2/---</td>
<td>Family Health Network</td>
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<td>Lowest</td>
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<td>Riverside</td>
<td>High</td>
<td>203</td>
<td>17.1/58.4</td>
<td>CAASA: Riverside County Health Services and Riverside Dept. of County Health</td>
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<td>N/A</td>
<td>384</td>
<td>17.5/41.1</td>
<td>CAASA: Mid-City Agency</td>
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<tr>
<td>Los Angeles</td>
<td>Highest (30% of total)</td>
<td>1,284</td>
<td>17.6/40.6</td>
<td>Watts</td>
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<td>CAASA: Children’s Clinic</td>
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<td>High</td>
<td>248</td>
<td>26.6/72.4</td>
<td>Sacramento County Clinic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>San Joaquin</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td></td>
<td>Highest</td>
</tr>
<tr>
<td>Imperial</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
</tbody>
</table>

** Alameda and Fresno also reported the highest hospitalization rates for asthma in the state.82

Source: Constructed from information included in The Asthma County Mortality Chart Book, Trends in Public health Insurance Programs, by the Kaiser Family Foundation and California County Asthma Hospitalization Chart Book, by California Department of Health Services.

1 Mortality rate is age-adjusted and reported as deaths per million population.

Table A2. Most Frequently Prescribed Pediatric Asthma Drugs

<table>
<thead>
<tr>
<th>Drug</th>
<th>Manufacturer</th>
<th>Market Share/Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advair Diskus</strong></td>
<td>GlaxoSmithKline</td>
<td>Expects $1 billion sales in United States in 2001; reported $48 million in first full year of release in 1999 and £208 million in 2000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use for mild persistent asthma over the age of 12</td>
</tr>
<tr>
<td><strong>Flovent/Flixotide</strong></td>
<td>GlaxoSmithKline</td>
<td>£880 million in 2000; Glaxo’s number-one selling drug in 1999, sales of more than $1 billion</td>
</tr>
<tr>
<td><strong>Serevent</strong></td>
<td>GlaxoSmithKline</td>
<td>£622 million in 2000</td>
</tr>
<tr>
<td><strong>Pumicort</strong></td>
<td>AstraZeneca</td>
<td></td>
</tr>
<tr>
<td><strong>Atrovent</strong></td>
<td>Boehringer Ingelheim’s</td>
<td></td>
</tr>
<tr>
<td><strong>Symbicort</strong></td>
<td>AstraZeneca</td>
<td>Not yet approved in United States as of April 2001</td>
</tr>
<tr>
<td><strong>Singulair</strong></td>
<td>Merck &amp; Co.</td>
<td></td>
</tr>
<tr>
<td><strong>Pumicort Respules</strong></td>
<td>AstraZeneca</td>
<td>First drug approved by FDA for use with children and infants as young as one year and up to age eight; previously, the only inhaled corticosteroid was only for four years and above</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not for acute severe asthma attacks; only for mild-to-moderate persistent asthma</td>
</tr>
</tbody>
</table>

Appendix B: NHLBI Summary Guidelines for Pediatric Asthma

The specific recommendations for managing pediatric asthma in infants and young children (five years of age and younger) are:

- A diagnostic trial of inhaled bronchodilators and anti-inflammatory medications may be helpful.
- In general, infants and young children consistently requiring symptomatic treatment more than two times per week should be given daily anti-inflammatory therapy.
- When initiating daily anti-inflammatory therapy, a trial of cromolyn or nedocromil is often given due to the safety profile of these medications.
- Response to therapy should be carefully monitored. Once control of asthma symptoms is established and sustained, a careful step down in therapy should be attempted. If clear benefit is not observed, alternative therapies or diagnoses should be considered.

The key recommendations for managing asthma in school-aged children and adolescents are:

- Pulmonary function testing should use appropriate reference populations. Adolescents compare better to childhood- than to adult-predicted norms.
- When initiating daily anti-inflammatory therapy for mild-to-moderate persistent asthma, a trial of cromolyn or nedocromil is often given.
- Adolescents (and younger children as appropriate) should be directly involved in establishing goals for therapy and developing their asthma management plans.
- Active participation in physical activities, exercise, and sports should be promoted.
- A written asthma management plan should be prepared for the student’s school, including plans to ensure reliable, prompt access to medications.
Endnotes


5 DHS. California County Asthma Hospitalization. pp. 3.


13 DHS. California County Asthma Hospitalization.


16 CHCS. Asthma Care for Children.

17 Weiss R. “Statewide Asthma Management Program Targets School-Aged Children.”


HHS. Action Against Asthma.


CHCS. Asthma Care for Children.


American Academy of Allergy, Asthma, and Immunology (AAAAI). “Update on Pediatric Asthma: Promoting Best Practice.” Available at http://www.aaaai.org

CHCS. Asthma Care for Children.

NCHS. “New Asthma Estimates.”


CHCS. Asthma Care for Children.

DHS. California County Asthma Hospitalization.

DHS. California County Asthma Hospitalization.


For a detailed description of these diagnostic elements, see NHLBI. 1997. “Classification of Asthma Severity.” pp. 16.
Improving Quality of Care for Californians with Pediatric Asthma

43 NHLBI. “Classification of Asthma Severity.” pp. 22.
44 NHLBI. “Classification of Asthma Severity.” pp. 33.
45 AAAAI. “Update on Pediatric Asthma: Promoting Best Practice.”
46 NHLBI. “Classification of Asthma Severity.” pp. 41.
54 Allen DB. “Inhaled Corticosteroid Therapy for Asthma.”
56 NHLBI. “Classification of Asthma Severity.”
57 Presentation at the National Asthma Meeting. February 11, 2002, Atlanta, Georgia.
58 Presentation at the National Asthma Meeting. February 11, 2002, Atlanta, Georgia.
60 NCQA. Use of Appropriate Medications for People with Asthma.
61 Email correspondence with Sarah Shih of NCQA. February 12, 2002. Also see NCQA. Use of Appropriate Medications for People with Asthma. pp. 95-98.
63 AHRQ. Translating Research into Practice.
64 AHRQ. Translating Research into Practice.
65 For a complete list of programs, funding sites, and principal investigators, see “Children’s Health Highlights.” Available at http://www.ahrq.gov/child/highlts/chhigh1.htm
66 Interview with Sue Ellen Hanson, Asthma Coordinator, Blue Shield.
67 Interview with Tammy Fisher, Asthma Coordinator, Brown and Toland.
68 Fisher interview.
Interview with Pam Hightower, Senior Director of Health Improvement, Advance PCS. November 15, 2001; also written correspondence.

Interview with Leslie Braeburn, Community Asthma Coordinator, Marin IPA.


Weiss R. “Statewide Asthma Management Program Targets School-Aged Children.”

For an exhaustive report on community-based efforts, see “Fighting Community Asthma: How Communities Can Win,” prepared by Policy Link for the California Endowment.


Additional information is available from the University of Michigan Web site at http://www.asthma.umich.edu.


Interview with Megan Webb, Director, RAMP. November 2001.

Interview with Aryne Blumklotz, Communications Director, FACCT. May 2002.


DHS. *California County Asthma Hospitalization.*