

CHCS

Center for
Health Care Strategies, Inc.

Resource Paper

**Kansas City Children's Asthma
Management Program:
KC CAMP Family Health Partners**

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Abstract

KC CAMP is a pilot project to improve care for health plan members with asthma. It has demonstrated its effectiveness as a new model for delivering high-quality care. It affects members by changing systems of care at the health plan, provider and patient levels. Creation of a team approach allows all groups to focus their efforts on improving patient outcomes. Family Health Partner's asthma management program increased the use of asthma action plans and appropriate asthma medications. The program achieved a 40 percent reduction in asthma-related ER visits and a 50 percent reduction in hospitalizations. The cost of caring for members with asthma declined by about \$2 per member per month, which far exceeds the approximate cost of the program at \$.43 per member per month. The savings far outweigh program costs ensuring its sustainability and improving the likelihood that it will be adopted by additional health plans for management of asthma and other diseases.

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Executive Summary

The Institute of Medicine in its “Crossing the Quality Chasm” report identifies deficiencies in the way health care is delivered in the United States. The report called for major changes in health care delivery systems at all levels. The Children’s Mercy Hospital (CMH) in Kansas City, Missouri has a long history of providing excellent care to children in the region. Our asthma disease management program was created with the assistance of the Center for Health Care Strategies and financial support from The Robert Wood Johnson Foundation. Under the guidance of its current administration, and health professionals at CMH in partnership with Family Health Partners, we developed a unique new approach to health management that addresses many of the concerns outlined in the Chasm report.

A goal of Family Health Partners’ program is to develop a model of care delivery that coordinates health care

by placing patient goals first and setting the patient as the source of control at all levels of delivery, as shown in Table 1. Health management expands this patient-centeredness by helping providers deliver care that emphasizes prevention, evidence-based guidelines and patient empowerment. The goal is to improve the overall health of patients and their communities as measured by clinical, humanistic, and economic outcomes. The major goals of health management, outlined in the Chasm report, are for patient care to be safe, effective, timely, patient-centered, efficient, and equitable (Table 2).

The trend in medicine is away from sick care (episodic and reactive) and toward well care (preventive and proactive). It is estimated that 40 percent of the health care dollars spent in the United States are

wasted on system inefficiencies. Since the United States spends more on health per capita than any other country, it is unlikely that additional money will be available to create the huge changes called for in the Chasm report. Therefore shifts must occur in the way we use resources requiring investment at all levels. These changes will lead to reduced use of hospitals and emergency department services and increased use of health management services (Table 3). We have developed health management tools that can expand this new model of healthcare delivery to meet these new needs.

| <u>Level</u> | <u>Function</u> | <u>Example</u> |
|--------------------|--------------------------------|-------------------|
| People | Experience | Patients |
| Microsystems | Process | Provider offices |
| Organizations | Facilitate Process | Health Plans |
| <u>Environment</u> | <u>Facilitate Facilitators</u> | <u>Government</u> |

Levels of Experience in Healthcare Delivery and how they relate to each other.

Table 1

Patient care is:

- Safe
- Effective
- Timely
- Patient-centered
- Efficient
- Equitable

Goals of Health Mgmt

Decreased use of

- Hospitalizations
- Use of Emergency services

Increase use of

- Health mgmt services
- Data registries
- Evidence-based guidelines

Table 3

Investment in Healthcare at all Levels

Investment in People

Though patients account for the greatest health care costs, they also represent the greatest potential for investment. Investing in teaching self-management skills is the most effective way to encourage patients to manage their own care (Table 4). Such investment is best done by health care professionals who are trained to be health facilitators. A change in the way patient/provider relationships function is necessary to do this. Physicians become agents of change by encouraging their patients to care for themselves using proactive tools that support self management. Defragmentation can occur by making patients the repository for their health information.

Investment

- Self-management skills
- Community activation
- Defragmentation of care

Outcomes

- Reduced utilization
- Improved satisfaction
- Long-term resources

Table 4

Investment in Microsystems

Microsystems are groups of health care professionals that provide care directly to patients. Hospitals are groups of microsystems. Our approach is to help microsystems care for their patients rather than going directly to the patients as is typical of other disease management programs. Our innovative model for achieving this at the microsystem level has been to **place educators in provider offices** so they can catalyze behavior change. Behavior change is reinforced by activating a reimbursement system to reward providers for desired performance. The result of using this approach is better community microsystems resulting in a return on investment (Table 5).

Investment in Health Plans

Health plans most effectively promote good health when they help microsystems to care for their patients. They do this by providing resources that microsystems cannot provide for themselves. Our new approach is to provide tools for offices to use such as our patented Asthma Action Cards™, disease registry, and outcomes reporting. Case management is provided directly to patients by our program, but the case manager communicates frequently with providers to keep them involved. This creates a team approach that encourages coordination among various components of the healthcare system (Table 6).

Resources

- Asthma Action Cards
- Standardized curriculum
- Web-based disease registry
- Outcomes reporting
- Stratified interventions
- Case management

Outcomes

- Decreased costs
- Provider satisfaction

Table 6

Information Technologies

Coordination and defragmentation of care can be facilitated with new information systems (Table 7). We have developed a chronic disease registry that can track utilization of identified patients. This permits use of interventions to prevent further utilization proactively. Information can be imported from a variety of sources including health plan claims, hospital encounters, and pharmacy fills, as well as user-provided information. Performance monitors identify providers who need additional training in evidence-based care. Outcomes are used to reward and encourage providers as well as to inform them of patients who require more intervention, including case management and environmental assessment.

| Information Systems |
|-----------------------|
| • Web-based |
| • Data registry |
| • Diagnosis tool |
| • Performance monitor |
| • Outcomes tracking |
| • Quality Improvement |

Table 7

Conclusions

Health management is clearly an answer to the “Crossing the Quality Chasm” report. Huge changes in health care delivery can only be made by redirecting our resources from sick care to well care, and making the patient the center of control. The Kansas City Children’s Asthma Management Program (KC CAMP), the model for our new health management approach, is designed to do precisely that.

Introduction/Background

Asthma is a major health problem that has been increasing in frequency and severity for the last three decades. In the United States, asthma disproportionately affects minority groups, adding to the misery they already experience due to their increased rate of poverty. It now is clear that despite the widespread dissemination of the evidence-based 1997 National Heart, Lung, and Blood Institute (NHLBI) guidelines for diagnosis and treatment of asthma¹, most primary care providers fail to care adequately for their asthmatic patients²⁻⁵.

Our vision has been to build a new and better system of care that will dramatically improve the health and quality of life for as many children with asthma as possible. We have developed a specific approach to health management to achieve our vision. This approach contrasts sharply with current industry standards. We began developing that new approach three years ago. Our model places the knowledge and resources to manage asthma where they are needed most: with the primary care providers and the members themselves. We aim to create activated members who demand good health care, providers who can give that care, and the community resources needed to assure that the care gets to those who need it most. We based our program on the 1997 NHLBI guidelines and we measure its success relative to those guidelines along with validated measures of functional status.

Given the broad systemic changes in health care delivery involved in our vision, we have begun to implement our program in four phases, each contributing to the success of the next. During phase one, we piloted our idea of placing an asthma educator in a primary care clinic at The Children's Mercy Hospital (CMH), the region's largest children's hospital. That initial CMH program was able to achieve improved outcomes for children with asthma. This included improved quality of life, and fewer emergency room and hospital visits, as well as cost reduction by 37.5 percent in one year⁶.

Once we completed phase one and documented improved outcomes, we prepared for phase two by placing asthma educators in several community provider offices to further test and refine the model. This effort was funded, in part, by a grant from the Prime Health Foundation.

Phase three is the current project from which we are writing this report. This phase was performed in partnership with Family Health Partners (FHP), a health maintenance organization created in 1997 to manage patients covered by Missouri Medicaid. At the beginning of the project, Family Health Partners covered 37,560 members, of which 22,015 were children under 16 years of age. Of this number, 2,753, or 12.5 percent, had been diagnosed with asthma (ICD9 code 493.xx). These children were managed by a total of 357 providers in 78 offices located throughout the Kansas City metropolitan area. Most FHP members with asthma who visit a hospital or emergency department get their care at the Children's Mercy Hospital.

During the project we deployed our program throughout the system of providers for Family Health Partners. In addition, we initiated the inspection and remediation of 200 homes with a grant from the department of Housing and Urban Development. The outcomes from our program have proven its value to other health plans. We are in the process of contracting with other health plans for this same program. We see this as an indication that the momentum of our earlier success will carry the program far beyond the boundaries of our community and lead us toward our ultimate vision of improving the lives of all children with asthma.

Program Design

Program Goals

We identified four goals used to accomplish our aims. They ultimately served as the principal objectives of this project. They included:

- 1) Development of a central asthma registry to track patient encounter information provided by the health plan. This was critical for identification of patients with asthma and for tracking their outcomes. It was also essential for stratifying patients by disease severity to provide interventions in the most efficient manner.
- 2) Implementation of a standardized asthma curriculum by using certified asthma educators to teach providers and their staff how to educate patients in their offices. We did this by placing the asthma educators in private offices for a period of time sufficient for them to develop an on-site, self-sustaining education infrastructure.

- 3) Creation of a novel incentive for providers to teach their patients the standardized curriculum. This consisted of paying providers to deliver the asthma education using an appropriate CPT code that could be activated for each office when they completed the initial intervention.
- 4) Expansion of the program into the community to create sustainability after the grant is complete. Without this goal the program would become just another ad hoc demonstration without any long-term effect on asthma.

Measurable aims

Once these goals were identified, we developed a set of measurable aims using the Best Clinical Administrative Practices (BCAP) model with the help of the staff at the Center for Health Care Strategies (CHCS). These aims were divided into four domains:

- 1) Improved health, Quality of Life (QOL), and functional status, tracked by our asthma registry.
 - Aim one: Identify all members under age 17, with asthma and see that they receive a diagnosis.
 - Aim two: Improve QOL for case-managed members, under 17, and for their caregivers, by 0.5 units within one year of their enrollment in KC CAMP.
 - Aim three: Increase percent of members with asthma, under age 17 years, who have an asthma action plan.
 - Aim four: Improve provider satisfaction over baseline until it is stable.
- 2) Increase collaboration and coordination among providers facilitated by our community asthma educators.
 - Aim one: Provide standardized curriculum to providers and their staff in offices with member panels greater than 200, so that 88 percent of members will be influenced by the end of year three.
 - Aim two: Teach office staff and providers how to manage patients with asthma.
- 3) Improve utilization rate and patterns. Once the intervention was completed we needed an incentive to sustain behavior changes that would lead to reduced utilization.
 - Aim one: Increase percent of members with persistent asthma who receive a prescription for a controller medication to 80 percent. In addition, reduce the reliever-to-controller ratio to less than 1.5.
 - Aim two: Reduce the number per 1,000 and the percent of emergency department (ED) and hospital admissions percent for asthma by 50 percent by the end of 2004.
 - Aim three: Reduce the number of high utilizers by 30 percent.
 - Aim four: Provide controllers for green zone for patients with persistent asthma and add-on controller therapy for yellow zone (Green zone refers to the daily treatment plan, yellow zone refers to when the asthma flares up, and red zone indicates an asthma attack.)

- 4) Implement system-wide, sustainable changes. These changes were necessary if the program was to be sustained after the grant period.
 - Aim one: Increase the number of members identified with asthma who receive asthma education in certified offices per quarter to 80 percent by the end of 2004.
 - Aim two: Provide environmental education and assessment to members undergoing case management for asthma.
 - Aim three: The case manager will successfully contact 80 percent of members who have an indication for case management by the end of 2004.
 - Aim four: Reduce the incremental asthma direct and indirect costs by enough to offset the cost of KC CAMP, thus making the program economically sustainable.

Barriers

- 1) Family Health Partners became a fully owned subsidiary of Children's Mercy Hospital. Though this change of ownership delayed implementation of the administrative aspects of the project, it resulted in streamlining of the administrative process.
- 2) During the ownership change, the CEO of Family Health Partners left. The position was held by an interim CEO, Jo Stueve, MBA, MPH, and eventually Robert Finuf became CEO of Family Health Partners.
- 3) We determined that IRB approval was not required for this phase of the project since it exclusively involves patient care and quality improvement. We so informed our IRB.
- 4) A HIPAA-compliant authorization form had to be developed and approved by our legal council and by the State of Missouri.
- 5) A contract between the community asthma educators and Family Health Partners needed to be developed and approved.
- 6) Though most offices were eager to participate in KC CAMP, one of the largest provider offices declined.
- 7) Developing a process for cleaning claims data and combining information from various sources was extremely challenging. Over time we were able to overcome many of the difficulties.
- 8) In late 2003 we discovered that we were receiving an incomplete data set from FHP. We discussed this with the FHP staff and eventually changed our data transfer process to include additional ICD-9 codes.
- 9) Community doctors communicated to asthma educators that the CPT for education was being paid but the office visit codes were not. This information was passed on to FHP and the issue was resolved.
- 10) We had difficulty obtaining follow-up quality of life surveys. This was resolved by providing members a gift certificate for completed surveys.
- 11) As our database grew, we needed a larger server. We have subsequently purchased a Dell two-processor server with one terabyte of hard disk storage space.

Accomplishments/Findings

Expansion of our Central Asthma Registry:

At the beginning of the project our asthma registry consisted of a Microsoft Access database on a local server. We knew that redesign of this database would be necessary to accommodate information provided by Family Health Partners. Early on, a decision was made to create this redesign on a server running Microsoft SQL 2000, because it is faster and capable of managing larger amounts of data. We also wanted to create a web-based user front-end to simplify access to the information from various locations. This permitted disease managers and analysts to interact with the data and generate reports.

Early in the project we met with the information systems staff at Family Health Partners (FHP) to arrange for regular data dumps. During the initial meetings we had to foster a sense of trust with the FHP staff. They were very protective of their data and were not accustomed to sharing it with anyone. Numerous questions related to HIPAA, confidentiality and data security had to be overcome and communicated with the staff before we could receive the data. Even with open communication we found that after two years there was a communication gap that resulted in us not receiving important information that would have saved substantial programming effort on our part.

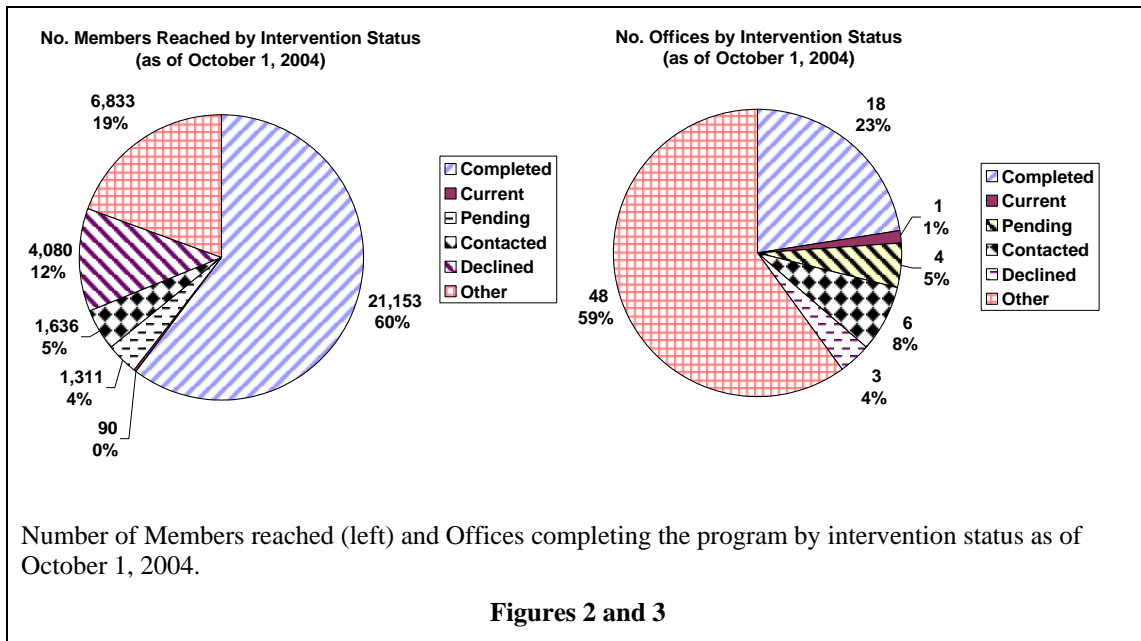
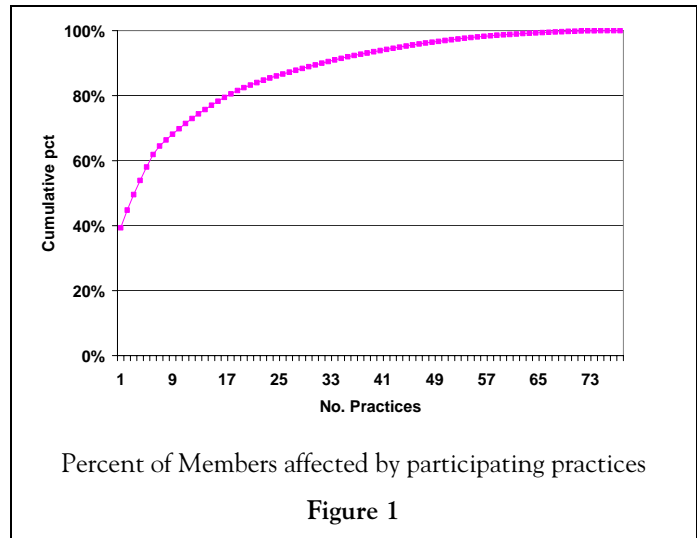
We provided FHP with a list of ICD9 codes to retrieve the data needed for our program. The FHP database was then scanned for members with any of these codes and a master member list was created. A second scan of the data was then performed to identify and download all claims for those members. This information was placed on an FTP server and transferred to our SQL server, where the data was imported into tables that had been prepared to receive it. We established this automatic data transfer process for ease and minimum effort during monthly downloads. We had information on more than two million claims in our database by the end of the first six months.

In our second year, the asthma registry had more than three million claims and we had to migrate it to a new SQL server with more space and processing power. The asthma action plans were entered directly into the asthma registry. We also imported information from a hospital source (Children's Mercy Hospital) in which asthma action plans had been entered since the year 2000. This was a valuable resource for establishing a baseline for our intervention. However, pharmacy data was another story. Initially we received it as Excel spreadsheets, making importation into the database very tedious. In year three we were notified that a direct data dump of the raw pharmacy data was possible, which simplified our work substantially. The information from claims was combined with pharmacy information and web-based outcomes became available for reporting by users. Additionally, we developed standardized reports that could be used each quarter to generate quarterly reports.

Implementation of Evidence-Based Guidelines and a Standard Asthma Curriculum:

Choosing the offices

We identified practices for the intervention by enumerating the number of FHP members in the panel of each practice and ranking them from highest to lowest. That permitted us to affect the largest number of FHP members while working with the least number of practices. This process was complicated by the fact that practices associated with a particular group of providers often have several offices with different addresses that generally are listed separately. This necessitated that we identify which locations correspond with each provider. Once practices were identified, we arranged for a preliminary visit to assess the degree of interest in our program by providers and staff.



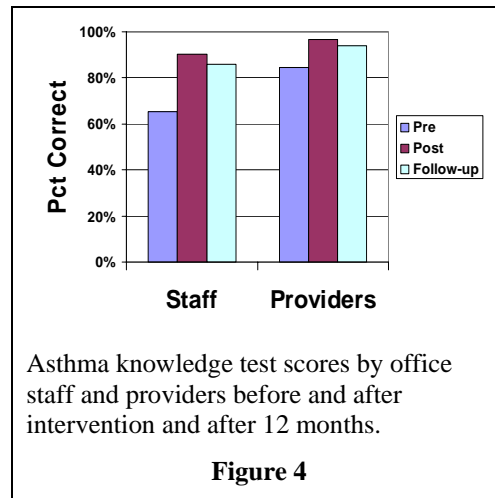
In general the reception of our program was favorable though there were a few practices that declined to participate in the program for a variety of reasons. One practice had undergone a substantial change in personnel and was not prepared for our intervention, while another had providers with a belief that they knew how to manage asthma and didn't need our help. One of the practices that initially declined later agreed to participate once they better understood what the program involved.

The advantage of our approach is that the intervention in a small number of offices (Figures 2 and 3) potentially can affect a large percentage of health plan members (21,153, or 60 percent). By the end of the project we had been in the practices with the largest number of FHP members. We felt that our efforts would be more effective by revisiting those practices and slowing the inclusion of additional ones.

| |
|---|
| <ul style="list-style-type: none"> ▪ Asthma 101 ▪ Patient Evaluation ▪ Spirometry ▪ Action Plans ▪ Case Management ▪ Devices ▪ Environment ▪ Outcomes |
| Teaching Topics |
| Table 8 |

Standardized Curriculum

The standardized curriculum we taught to providers is shown in Table 8. Topics we covered included: asthma 101, which is a basic overview of asthma; patient evaluation, which describes how to elicit and interpret a useful asthma history; the use of spirometry, as well as other devices such as inhalers and spacers; and promotion of self-management skills using asthma action plans. Health plan services such as case management and environmental assessment were also discussed and a module on measuring outcomes was provided. We have evidence that these learning sessions improved the knowledge of providers and office staff. We now know that this knowledge is retained after 12 months (Figure 4). Since office staff tends to turn over and new employees need to be trained, we have commissioned a professional service to develop a series of CDs based on our curriculum. These will be provided to the offices as they complete the intervention.



Asthma Educators to Change Behavior

A central component of our program is the use of asthma educators in primary care provider practices. Once the providers in a practice agree to participate in the program and the appropriate paperwork is completed, asthma educators visit their office eight times to teach the standardized educational curriculum. These modules have been designed to be interactive and to provide practical skills needed to manage asthma. The

educational sessions are held during lunch; however, the time may vary depending on the preference of the individual office.

Though learning sessions improve the knowledge of providers and office staff, we also know that information alone does not change behavior. For that reason, we developed a behavioral approach to asthma teaching. We defined the most important behaviors that needed to be fostered. The behaviors selected were: making an accurate diagnosis of asthma; providing asthma education; and providing patients with an asthma action plan. In addition to these behaviors, we had an unstated goal of encouraging culture change in the practices by encouraging allied health and providers to place the patients as the source of control. This is most clearly demonstrated by the way action plans are used. These plans provide patients with self-management tools; however, they must also develop skills to use them. It is the fostering and support of self-management skills by providers and office staff that leads to patients being the source of control. After all, if they are going to control their own treatment, they need to be asked how that control should work.

| <u>Desired Behavior</u> | <u>Change technique</u> | <u>Reinforcement</u> | <u>Outcome</u> |
|--------------------------|--|--|--|
| Diagnose asthma | <ul style="list-style-type: none"> • Provide clinically useful criteria for making the diagnosis | <ul style="list-style-type: none"> • Performance reports (Number of diagnosed patients vs. other providers) | <ul style="list-style-type: none"> • Number of patients diagnosed with asthma |
| Provide asthma education | <ul style="list-style-type: none"> • Role model • Provide curriculum (Action Cards) • Teach how to do it (Problem-based learning) | <ul style="list-style-type: none"> • Verbal encouragement • Payment for service (CPT code) | <ul style="list-style-type: none"> • Claims for the CPT code |
| Provide an action plan | <ul style="list-style-type: none"> • Supply tools (action cards, action plans) • Asthma fairs | <ul style="list-style-type: none"> • Comparison reports | <ul style="list-style-type: none"> • Number of action plans provided |

Table 9

Educators schedule half-days to work in the offices to initiate behavior change. Providers are encouraged to schedule asthma patients to be seen during those half days. While in an office the educators start by demonstrating the behaviors we hope to foster (Table 9). These include the proper way to take an asthma history and to identify patient goals. They also demonstrate how to categorize asthma severity and how to teach patients about asthma triggers, action plans, and devices such as spacers and peak flow meters. After several half-day sessions the staff is encouraged to do these activities under the guidance of the educators. Eventually they are encouraged to practice asthma management when asthma educators are not present with subsequent discussion of issues at their next visit. This process leads to successful transition from demonstration to independence and establishment of effective asthma management as habit. The educators work with providers, though their role in this instance is demonstration of effective ways to work with office staff.

Though the NHLBI defines asthma as a condition consisting of widespread narrowing of the airways associated with inflammatory changes, this is a pathophysiologic definition that is not useful for making a clinical diagnosis. We found that this led to underdiagnosis and misdiagnosis of a condition that really is a syndrome and not a disease. We therefore had to define and teach clinically useful criteria

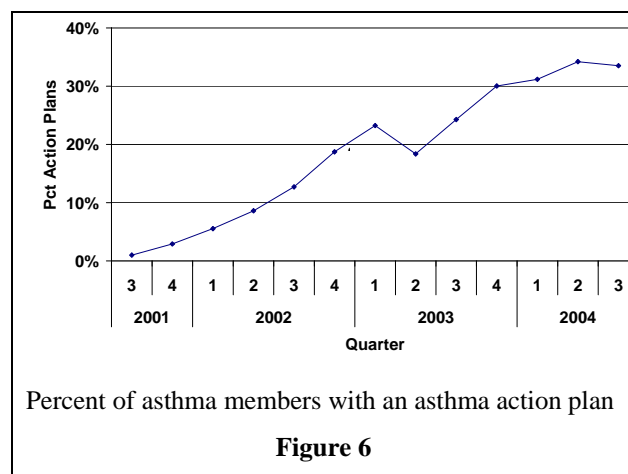
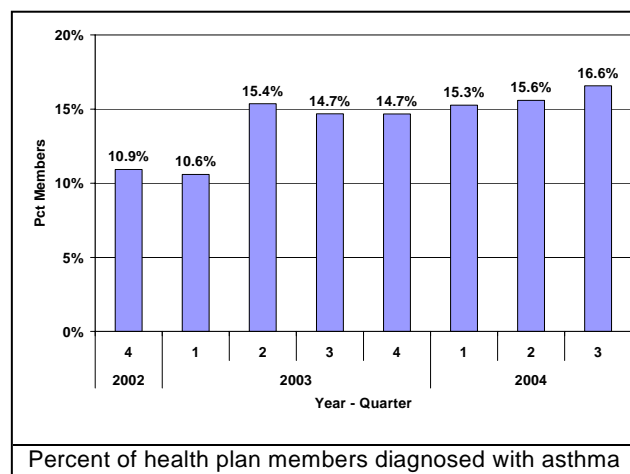


Figure 6

- Evidence of airways obstruction
 - Variability of the obstruction
 - Recurrence
 - Rule out plausible alternative diagnoses
- Clinically useful criteria for making a diagnosis of asthma

Table 10

for making a diagnosis. The criteria we chose to emphasize included evidence of airway obstruction, variability in the amount of obstruction, and recurrence of the obstruction. In addition, it is also necessary to rule out plausible alternative diagnoses such as cystic fibrosis and vocal cord dysfunction⁷ (Table 10).

Diagnosis of asthma in the health plan increased from fewer than 11 percent before the intervention to over 16 percent during the latest quarter for which data is available. The percent of members with asthma who are provided with an asthma action plan has increased to over 30 percent. While this is substantially less than our goal of 100 percent, it still represents a huge change in the behavior of a variety of private practice providers. In addition, satisfaction with asthma care has improved both for providers and staff⁸.

One would expect that provision of appropriate care would result in an increase in controller medications for members with persistent asthma as recommended by the NHLBI guidelines. As you can see in Figure 8, the number of prescription fills for asthma controller medications increased between 2000 and 2004, while the number of relievers declined. This appropriate treatment in 2003 was more apparent when we looked at prescriptions by asthma severity. The information in Figure 9 shows that most of the relievers are being prescribed to patients with intermittent asthma while those with persistent asthma get more controllers than relievers. This is contrary to most reports where relievers dominate because those reports generally do not describe prescription fills by asthma severity. Indeed, HEDIS measurements of controller medications for

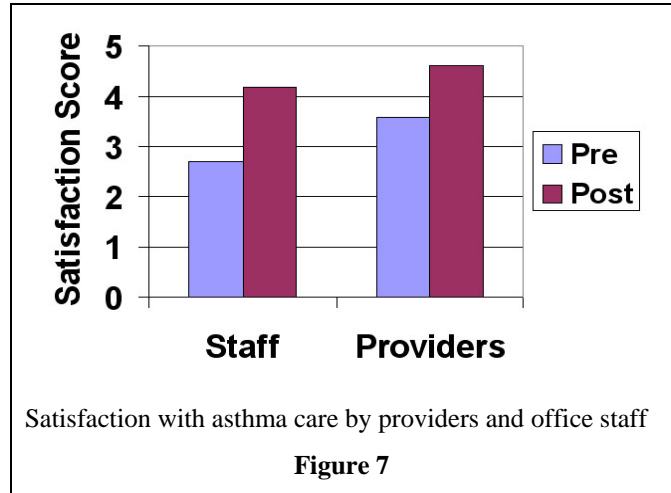
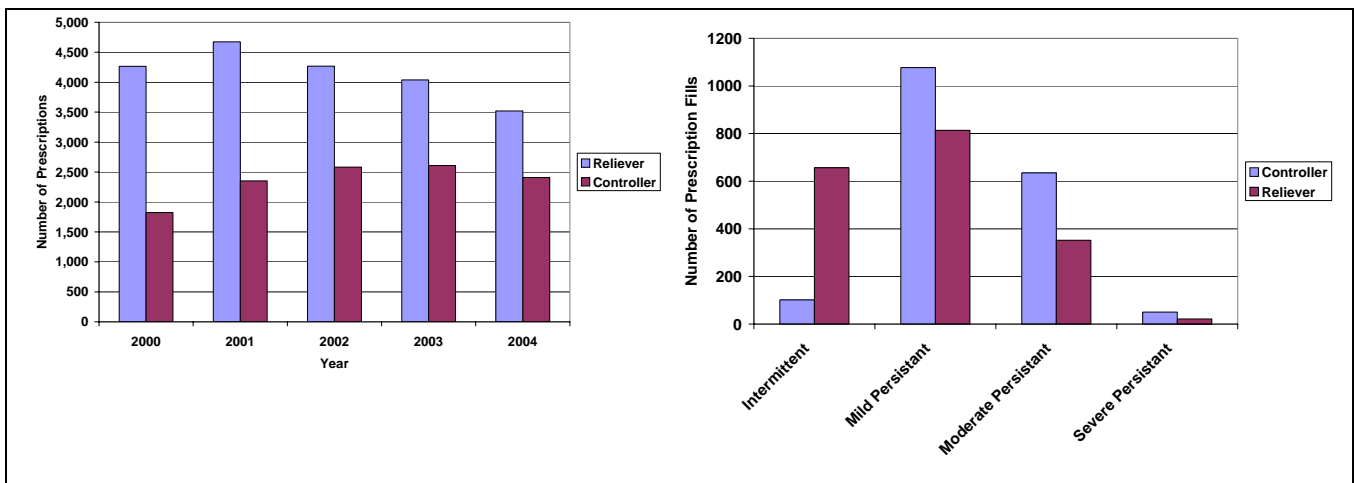


Figure 7



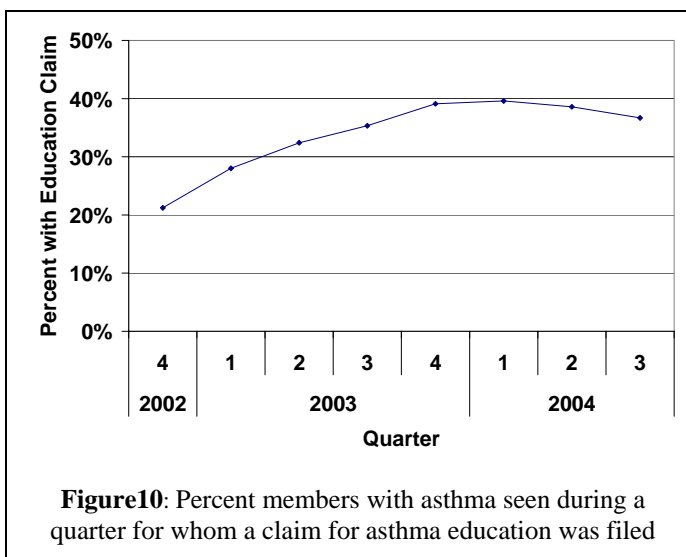
Figures 8 and 9: Number of prescription fills for controller and reliever medications (left) showing a desirable trend towards reduced relievers and increased controllers over time. This is confirmed by the number of prescribed controllers and relievers by asthma severity shown on the right. Most relievers are being prescribed for members with intermittent asthma, which is appropriate.

persistent asthma rely on utilization to define the condition rather than the clinical classification that was recommended by the NHLBI guidelines.

The CPT incentive:

CPT codes are being used in claims by providers we have educated to ensure reimbursement for asthma education. Though the AMA apparently has decided not to endorse CPT codes specific for asthma education, we have been able to use other codes that are approved for chronic disease counseling (99401 and 99402). These codes are activated for each practice once its members complete the intervention. The first time a patient receives asthma education, a claim is to be filed using 99402 for new education. Subsequent education sessions are billed using code 99401, which is for a follow-up education session. We decided to pay for as many follow-up sessions for which the provider wished to bill, rather than trying to limit them to a set number. To date, we have detected no instances of misuse of these codes.

The providers have assured us that the presence of these codes is essential for their ability to provide our members with the care they need. What is interesting is that although we are receiving action plans that demonstrate that education is being provided, we are not receiving claims for all of the education sessions that we know are taking place. As shown in Figure 10, claims for asthma education are being filed for approximately 40 percent of members with asthma seen during each quarter. In other words, the providers are providing the education but not billing for it via claims for the activated CPT. We have told the providers this but thus far they do not seem to be overly concerned about it.



Community Activation:

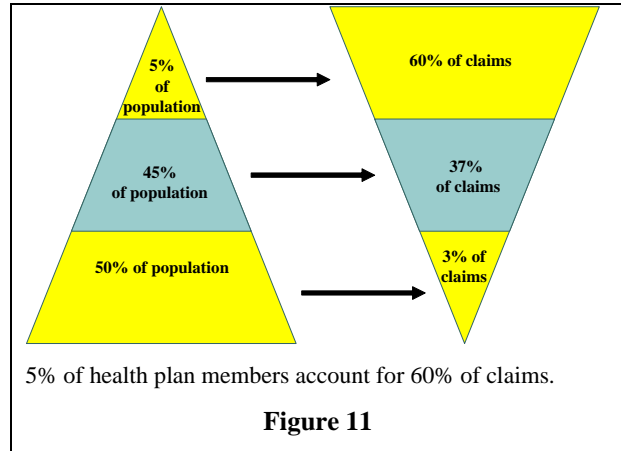
Community activation has taken several forms, including our Take Action Against Asthma Program (TAAAP), participation in asthma fairs in participating provider offices, outreach at health fairs, and speaking at community events. TAAAP was funded by a contract with the CDC and involved 60-80 patients with moderate or severe persistent asthma per year. These patients spent time with a master's-prepared Social Worker both in individual and group sessions. In a sense, this program provided more intense case management than would normally be available from a health plan.

Asthma fairs were held in provider offices. Members in the provider panels with asthma were notified of the fair and they were encouraged to attend. While there, they had their pulmonary function tested by the asthma educators and the providers wrote asthma

action plans for them. The result was that 20-30 action plans could be written in a single morning or afternoon.

Stratified Interventions

We know that approximately five percent of members account for 60 percent of claims (Figure 11). Therefore, the most effective way to allocate resources is with stratified interventions. Our stratification system includes five strata with specific interventions for each (Table 11).



Stratum one members are screened for a diagnosis of asthma. A unique feature of our program is that we screen for members filling asthma medication prescriptions and for members with diagnoses often associated with asthma such as bronchiolitis, bronchitis and recurrent pneumonia. Though our performance and outcomes data do not include members who have non-diagnosed asthma, this “hot list” allows us to identify potential members who either have asthma but no diagnosis, or who are likely to develop asthma. Focusing on these individuals has allowed us to get them diagnosed and treated earlier, hopefully preventing possible morbidity.

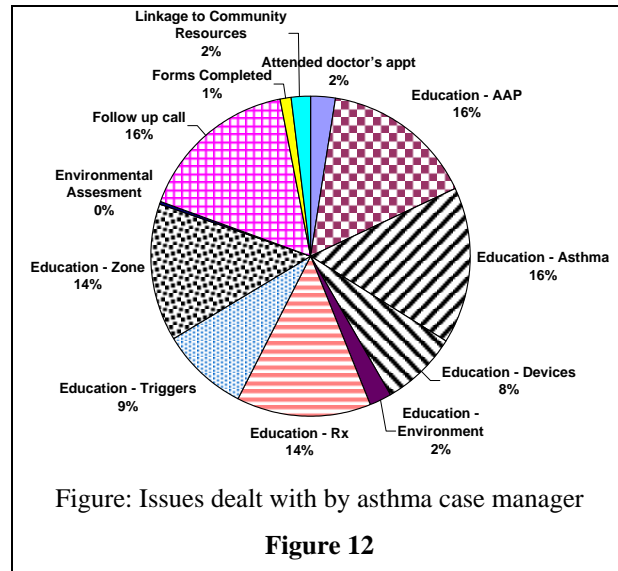
Stratum two members have a confirmed diagnosis of asthma. They receive education, and self-management skills in the form of an action plan. Their providers also receive payment for this service through the activated CPT code once they have completed the in-office intervention. Our program does not provide this service directly to health plan members. Instead, we facilitate its delivery through provider offices to their patients.

Stratum three members have persistent asthma. They receive controller medications and are offered an intensive one-on-one intervention with an asthma counselor (who is a master’s-prepared social worker). TAAAP was shown to be effective by the NICAS study.

| Stratum | Resources |
|--|---|
| Stratum 1: All members | <ul style="list-style-type: none"> ▪ Initial Screening Questionnaire ▪ Query database |
| Stratum 2: Members with asthma | <ul style="list-style-type: none"> ▪ Asthma Education by PCP ▪ Asthma Action Plan with Action Cards™ ▪ Payment for education |
| Stratum 3: Persistent asthma | <ul style="list-style-type: none"> ▪ Controller meds prescribed and filled ▪ TAAAP for moderate and severe persistent asthma |
| Stratum 4: Frequent Fliers (80 per case mgr) | <ul style="list-style-type: none"> ▪ Disease-specific case management |
| Stratum 5: Ultra freq fliers | <ul style="list-style-type: none"> ▪ Environment assessment as indicated |

Table 11: Stratified Interventions

Stratum four members are identified from our high utilizer list. These individuals receive direct intervention from an asthma case manager, making this the only group of health plan members to be directly affected by our program. We justify this by always including the primary care provider in the enrollment process and sending them progress reports. Our case manager has been able to manage up to 80 cases at a time. The types of issues that case managed patients generally have are shown in Figure 12.

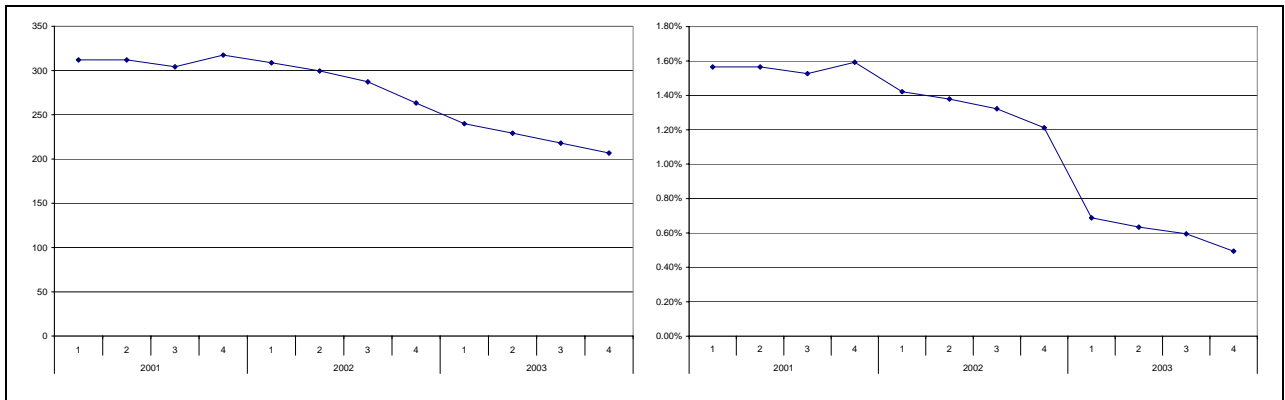


Case management is designed to reduce the number of high utilizers. These members are identified as described previously. Focusing on this group of members should make it possible to reduce the overall utilization by these members, allowing the reduction of overall utilization. The number of members who have participated in case management over time is shown in the Table 12.

| Status | 2003 | | | | | 2004 | | | Total |
|------------------|----------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Baseline | Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 | Qtr 1 | Qtr 2 | Qtr 3 | |
| No. Contacted | 507 | 177 | 49 | 225 | 150 | 121 | 212 | 147 | 1588 |
| No. Enrolled | 202 | 57 | 34 | 40 | 17 | 12 | 23 | 3 | 388 |
| No. not Enrolled | 305 | 120 | 15 | 185 | 133 | 109 | 189 | 144 | 1200 |
| Pct Enrolled | 40% | 32% | 69% | 18% | 11% | 10% | 11% | 2% | 24% |
| Case Managed | 101 | 56 | 62 | 101 | 81 | 66 | 69 | 61 | 74.6 |
| No. Contacts | 1341 | 574 | 302 | 886 | 572 | 702 | 636 | 293 | 663.3 |
| Contacts/Managed | 13.28 | 10.25 | 4.87 | 8.77 | 7.06 | 10.64 | 9.22 | 4.80 | 8.61 |

Table 12

The number of high utilizers and percent of health plan members with asthma who are high utilizers over time is shown in Figures 13 and 14. It is evident that once the program began, the number of high utilizers decreased from a little over 300 to 200 and the percent of health plan member high utilizers declined from 1.6 percent to 0.6 percent, which is a 60 percent reduction. This is independent of a phenomenon called “regression to the mean,” in which a cohort of outliers tend to become more like the mean over time. Since we are taking a quarterly “snapshot,” regression to the mean does not account for this decline. We believe that it is due to utilization report-directed case management.



Figures 13 and 14: The number (stratum 4) of asthma high utilizers (right) and percent of health plan members (left) who are high utilizers over time.

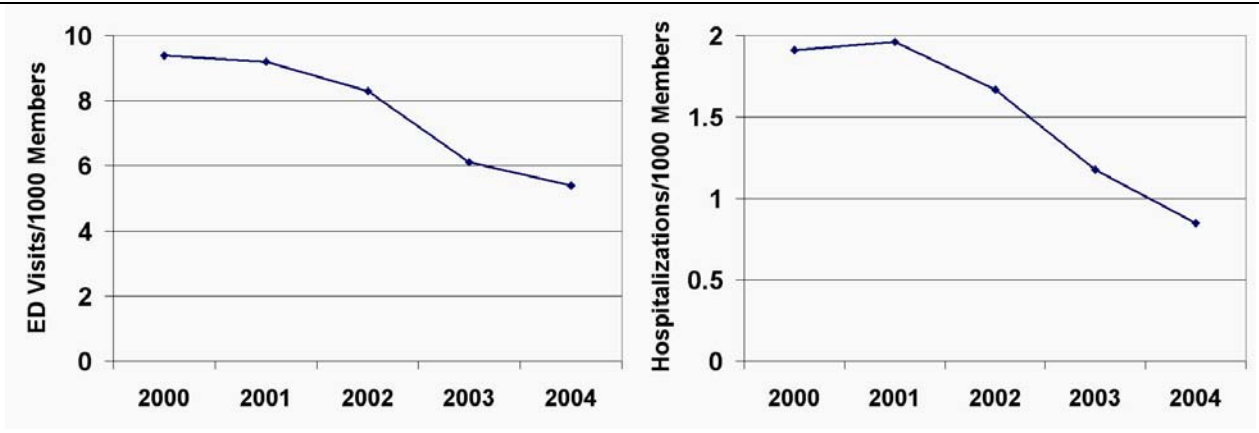
Stratum five members are in the upper 0.4 percent of the high utilizer list. Not only do they receive case management, but they also receive environmental counseling and a home inspection by an environmental health specialist if indicated. This information is shown in Table 13.

| Year | Quarter | Surveys Sent | Surveys Returned | Pct Surveys Returned | Education | Homes Visited | Pct Visited |
|--------------|---------|--------------|------------------|----------------------|-----------|---------------|--------------|
| 2002 | 4 | 121 | 53 | 43.80% | | 2 | 1.65% |
| 2003 | 1 | 81 | 24 | 29.63% | | 4 | 4.94% |
| 2003 | 2 | 34 | 9 | 26.47% | 14 | 6 | 17.65% |
| 2003 | 3 | 40 | 10 | 25.00% | 5 | 8 | 20.00% |
| 2003 | 4 | 14 | 9 | 64.29% | 3 | 0 | 0.00% |
| 2004 | 1 | 10 | 4 | 40.00% | 1 | 0 | 0.00% |
| 2004 | 2 | 21 | 10 | 47.62% | 1 | 2 | 9.52% |
| 2004 | 3 | 13 | 6 | 46.15% | 1 | 0 | 0.00% |
| Total | | 321 | 119 | 37.07% | 24 | 22 | 6.85% |

Table 13: Number of environmental encounters for asthma members by quarter.

Outcomes

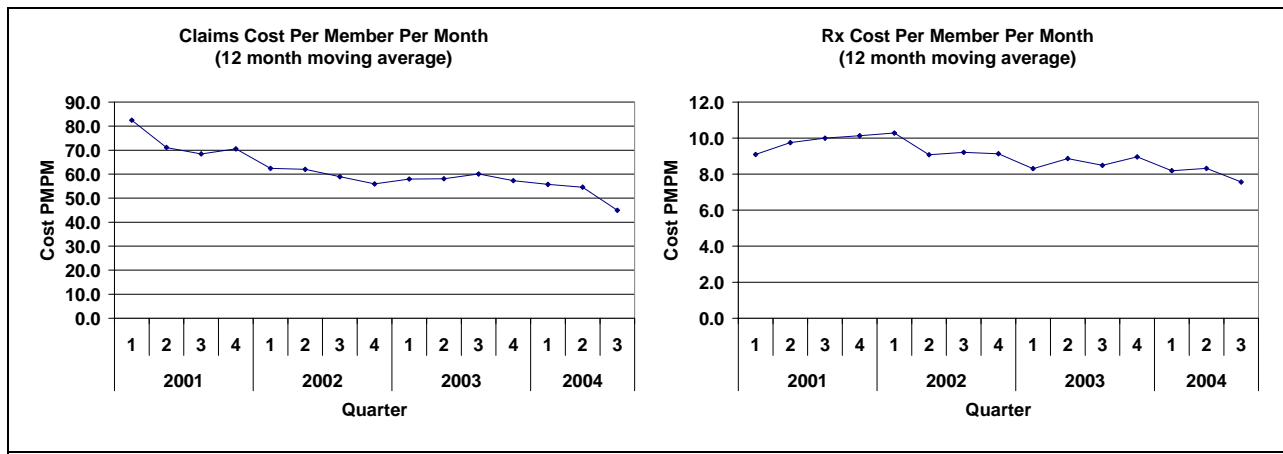
The most important outcomes for health plans regarding asthma are demonstrations that a disease management program can reduce utilization. Our program has demonstrated this both for emergency department visits and hospitalizations (Figures 15 and 16). The reduction in ED visits was from a little less than 10 per 1,000 members in 2000, (before the program began), to less than six per 1,000 members in 2004. This represents a 40 percent reduction in ED visits that we believe can be directly attributed to our asthma program. In addition, hospitalizations declined from two per 1,000 to a little less than one per 1,000 members representing over a 50 percent decline. Similar decreases in percent of asthmatic members going to the ED and being hospitalized were also found (not shown)⁸. We believe that the decline in visits per 1,000 members is the most accurate representation of the program's effect because it is not affected by the number of members diagnosed with asthma, which could artifactually reduce the percent utilization if a large number of newly diagnosed members with asthma are entered into the denominator.



Figures 14 and 15: Emergency department visits and hospitalizations per 1000 health plan members for asthma from 2000 to 2004.

The decline in overall utilization would be expected to lead to a reduction in asthma costs. Figures 16 and 17 show the cost per member per month for those with asthma both for claims and for prescription costs. These graphs demonstrate a slight decline in both costs; however, a number of factors must be considered when interpreting them. These include the fact that total health plan membership increased during this time, and the percent of members with asthma increased from 11 percent to 16 percent. It is likely that many of these represent lower-cost members with asthma since they have been diagnosed more recently.

One would expect, for example, that prescription costs would increase as the number of more expensive controller medication prescriptions increases. On the other hand, if members are diagnosed with milder types of asthma that require fewer medications, the mean cost per member would be expected to decline. When these types of factors are considered in combination it is very difficult to determine the actual effect of the program on asthma costs other than to note that they have declined.



Figures 16 and 17: Claims and prescription costs for asthma per member per month over time.

Inventions/forms

Our program used a number of tools for its implementation and others had to be invented during its course. The inventions and forms we used are shown in Table 14 and Figure 18.

We developed and piloted the use of Asthma Action Cards™ prior to the initiation of this program. These patented cards turned out to be one of our most important tools for teaching providers to foster self-management skills. The advantage lies in **their** ease of use even by providers and staff who are

not completely familiar with the process of writing asthma action plans. They assist providers to write action plans and educators to teach their patients how to follow them. Since they are colorful and user-friendly, patients tend to keep them and use them during asthma flares.

We also developed one-sheet action plans to accompany action cards. These were on NCR paper so that three copies were produced. The most critical aspect of the action cards and sheets is the detailed instructions on how to use a test dose of albuterol to determine what zone a patient is in during an asthma exacerbation. If the patient responds to a test dose of albuterol, he is in the yellow zone and should increase controller medications. If the patient does not respond to the test dose of albuterol, he is in the red zone and should take an oral corticosteroid and contact his asthma doctor. These instructions generally do not appear on publications such as the NHLBI guidelines yet without them the action plans are unlikely to be successful. These one-sheet action plans can also guide providers to write effective action plans and assist in their documentation.

Our satisfaction surveys and knowledge tests, while not formally validated, measure what the providers themselves are telling us. They now feel knowledgeable about asthma and that leads to greater satisfaction with the care they provide.

| Item | Purpose |
|---|---|
| Asthma Action Cards | Easy to use tool for teaching asthma and providing an action plan. |
| Asthma Action Plans (NCR paper) | A three-copy form used to define an asthma action plan for the patient. One copy goes to the patient, one to the provider's medical record, and one to our asthma educators for entry into the registry |
| Quality of Life forms (adapted from Juniper) ⁹ | Used to measure the effect of the program on the quality of life of patients and their caregivers |
| Provider/Staff satisfaction | Used to measure the satisfaction providers and staff have with asthma care they give |
| Asthma knowledge test | Measures knowledge of asthma by staff and providers |
| Asthma curriculum (soon on CD) | A series off 8 PowerPoint slide shows that contain the standardized curriculum that we teach. We currently are producing CDs of each for distribution to offices to train new staff. |
| Health Management Brochures | Used to promote our program to health plans, providers, patients and employers |

Table 14: Inventions, forms and tools used in KC CAMP



Asthma Action Cards™

Figure 18

Our educators made substantial efforts to develop a standardized curriculum. Though it exists in the form of PowerPoint presentations with didactic information and interactive case-based exercises, the real curriculum is in how they present the information. Since PowerPoint alone is incapable of capturing that, we have commissioned a media company to produce a series of CDs based on the curriculum with the educators themselves as the “stars.” Once completed, these will be given to providers for use in refreshing their information and training new staff that is hired after the initial intervention. This, along with regular revisits by the educators, should allow the behavior changes to continue unabated.

Provider Focus Group

We held a provider focus group in June 2004. What follows are some of the comments made by participants in this program. We believe that these comments speak for themselves.

Physician: Education for the staff was important. They are able to respond better to the patients and pick up clues about asthma better from the front desk to the nursing staff.

Triage Nurse: The program educated the physicians as well as the staff. The program put everyone on the same page. It facilitated team building.

Physician: The program had a huge impact on the nursing staff as well as the providers. It definitely impacted asthma management in their teaching practice.

Nurse Practitioner: I have always been a fan of spirometry but the program reinforced the importance of this test for diagnosis and treatment plans. The program also reinforces the team approach. If the patients hear the same information from everyone, it is more effective.

Physician: This program really helps us teach our families more about asthma. Our practice has seen results in the past two years. The parents are taking control of their child’s asthma instead of asthma controlling them.

Physician: Our support staff increased their knowledge level. Instead of only one RN able to perform spirometry and do teaching, all of our staff is able to do these skills. Definitely impacted our patient care with more staff able to help.

Physician: We are better as providers at making the diagnosis sooner. We would look at chronic cough and not treat as asthma but now treat sooner and make a diagnosis.

Physician: Staff awareness of asthma so much better. They think about asthma sooner.

Physician: Having written asthma action plans helps the families with outside sources: schools, local ERs, etc. If the families have the plan, know what to do, they can share information as well to others about their child’s asthma.

Physician: After the program, we found utilizing spirometry to help us make the diagnosis of asthma was very beneficial. Before we would send all patients to CMH, but now we can make the diagnosis and begin the treatment plan. Our nursing staff is better educated to ask questions of our patients.

Nurse Practitioner: The program provided a safe environment for all the staff to learn and ask questions. It was nice to here everyone saying the same thing-hearing the same thing. The miraculous thing about this program is it **changed behavior**. It definitely enhanced the skills of our triage staff.

Physician: Another great component of this program is the follow up-With the educators returning for follow-ups the education was reinforced and established relationships with the educators.

Physician: Action plans really helped our patients know what to do. We had one family that always went to the ER, but now has an action plan and hasn't gone to the ER once. The action plan helps the school nurse know what to do as well as the parent.

Physician: After education is done, we have a better acceptance from our parents. It has saved me time as a provider to have nursing staff help with education.

Physician: Before the program, asthma was very complicated-The provider had to diagnose, treat, educate, reinforce, etc. Now that the staff is involved, they can help with the education- every level at the office has improved- from scheduling follow-ups appropriately, setting aside more time for education, etc. We also made changes to our chart to put an asthma flow sheet. More available for everyone to notice and use.

Nurse Practitioner: Definitely moved from “**reactive care to proactive care.**”

Physician: We started controller meds quicker after the program.

Physician: This program **empowered** my nursing staff. Education gives power. The more they understood the better nursing care they gave.

Physician: Patients confidence increased with more asthma knowledge. Our job is to do education. If we get paid to do it great, but our job as doctors is still to take the time and teach our patients. IT will pay off in the long run. IT may take longer today to see them in the office but will be better the next time.

Physician: Health plan appreciates you- By paying something for education it validates that the HP does appreciate the provider.

Physician: Would like to see other chronic diseases. If we had other programs for other diseases we could decrease ER visits for them as well. It gives us a protocol to use to treat that disease.

Physician: Would like to see diabetes and obesity management program as “we.” The program has a partnership with us as providers. We have a name with a face and get results.

Physician: Acute diseases- would like to see a program set up to manage other acute diseases as well.

Physician: Population management - educate proper guidelines and treatment.

Physician: Key contact- Success of Program- Solution to the to problem- Personal touch-small setting

Sustainability

We believe some programs, although successful, while funded by external sources, should be structured so that they can continue to operate once that funding ends. Ad hoc programs that fail to meet this requirement may demonstrate impressive results, but they do little in the long run to improve the condition for which they are designed. We also believe that programs that are unable to be sustained on their own merits should not be continued.

For that reason, we designed this program to be sustainable from the outset. We knew that to persist it could not rely on external grants for ongoing operations, though such funding could be used for research and development of new aspects of the program such as new outcomes measures or extension to new diseases. To entice health plans, we had to show that the cost of the program would be offset by the reductions in the cost of member claims, at the same time maintaining high satisfaction and improved quality of life. The latter are essential if the health plan is to continue contracting with employers for covered lives.

By the end of year two we had enough information to determine whether our program would have the characteristics necessary for sustainability. In particular, we determined that the cost of care for members with asthma declined by about \$2.00 per member per month (PMPM) which was far more than the estimated \$0.43PMPM we estimated for the cost of the program. We were also able to demonstrate an increase in provider satisfaction and a corresponding increase in patient quality of life. In addition, reductions in utilization also were becoming apparent as well.

Given that information, we met with the medical directors from several health plans in the Kansas City area to determine the status of their current asthma disease management and their degree of interest in our program. We were encouraged by the response; one health plan was immediately interested in discussing a contract, while several others were interested in finding out more about our program. Family Health Partners was interested in continuing a contract past the dates of the grant and has recently signed a two-year extension. They have requested adult inclusion as well, therefore increasing our member pool to 50,000 members. Another health plan with 29,000 members also has negotiated a PMPM cost with us and is in the final stages of signing a contract for our program to begin early 2005.

- | |
|--|
| <ul style="list-style-type: none">▪ Cost effective- program savings outweigh program costs▪ Improved (or at least maintained) member satisfaction and quality of life▪ Improved provider satisfaction▪ Investment in local infrastructure that is sustained past the grant period▪ Incentives for behavior change/continuation |
|--|

Characteristics of a sustainable program

Table 15

These two health plans alone almost cover the cost of our overhead and of servicing the contracts. We need at least one additional contract to fully cover our costs and to pay for expansion. In the mean time, Children's Mercy Hospital has decided to create a new department of health management using this current program as a model. This new

department currently is developing similar programs for obesity and attention deficit hyperactivity disorder (ADHD). Both health plans that have contracted for our asthma program have expressed interest in purchasing those two additional diseases once they are ready for implementation.

Overall we have succeeded in packaging our program in such a way that it is attractive enough to health plans that they are willing to pay a sufficient amount to cover its costs. We believe that with this hurdle behind us we will be able to expand the program both to other health plans and to additional diseases. The model has been successful and should therefore be sustainable for the foreseeable future.

Conclusion

KC CAMP, our asthma management program, has demonstrated that our model of health care can effectively reduce acute hospital and ED stays related to asthma while at the same time improving the quality of life for patients and satisfaction with the care delivered by providers. Sustainable behavior changes can occur both at the patient and provider levels by creating an environment in which such behavior changes are encouraged and nurtured using appropriate incentives. This investment in local healthcare delivery infrastructure creates a unique partnership between health plans, providers and patients. This combination results in a synergy which we believe will ultimately lead to improved health for all of the citizens in our community.

Our health care delivery model has been structured in such a way that it can be generalized to work for other health plans and for other chronic diseases with a minimum of modification. It is this generality that will lead to its sustainability and that will ultimately allow us all as a nation to finally cross the Quality Chasm.

Consumer Vignette

Like most nine-year-old boys, Caleb Mahan loves to ride his bike. But just three short years ago, Caleb was rarely allowed outside to play, and bike-riding was out of the question. That's because when Caleb had his first asthma attack at age 6, it came without warning, landing him in intensive care at Children's Mercy Hospital.

"We had no idea that anything this serious was about to happen," says Caleb's mother, Sharon Blanton. "He had a little bit of a runny nose that day, but otherwise seemed fine when he went to school. By 10 o'clock that night Caleb couldn't breathe and we were in the emergency room at Saint Luke's Northland."

Because doctors couldn't stabilize Caleb's condition, they transferred him to the Children's Mercy Intensive Care Unit. He spent several hours there receiving albuterol (a drug that relaxes the airways to improve breathing) and breathing treatments before being moved to a regular floor.

After three days Caleb was released. "Caleb's first attack was very scary for us all," Sharon admits. "He was literally gasping for air. We didn't know what caused the attack, but we knew we didn't want it to happen again."

Unfortunately, over the next several months it did happen—again and again. In fact, Caleb visited the emergency room almost monthly, was hospitalized five times, and missed several days of school. "He was constantly battling his asthma. It seemed like we would just get over one attack, and he'd have another," Sharon says.

After Caleb's second hospitalization at Children's Mercy, he began seeing the doctors and nurses with the Kansas City Children's Asthma Management Program (KC Camp), an asthma management program offered through Family Health Partners, Caleb's health insurance plan.

At first, Caleb's condition was difficult to control, but then he met Colleen Pleiss, L.M.S.W., a case manager determined to help Caleb and his family learn how to manage his disease. "It took a lot of trial and error with different medications to find the best combination of therapies for Caleb," Sharon explains. Colleen taught Caleb and his family how unpredictable his disease can be, and how important it is to have an asthma action plan in place.

"The Asthma Action Cards™ and plan have been very helpful in controlling Caleb's asthma," Sharon says. "Now we are spending most of our time in the green zone where Caleb should be every day. And if he experiences any asthma warning signs, he knows to tell me how he's feeling so we can follow our plan to prevent an asthma attack."

Intensive case management has helped significantly reduce the number of trips Caleb has made to the hospital and emergency room. "When Caleb was first diagnosed, we were in the emergency room every month," Sharon says. "Since we began working with



KC Camp and Colleen, Caleb has only had three emergency room visits and two hospitalizations. And it's been almost a year since his last trip to the emergency room.”

According to Ma'ata Touslee, R.N., M.B.A., C.C.M., director of health services for Family Health Partners, the data shows that the KC Camp program is reducing the number of emergency room and hospital admissions for Family Health Partners members with asthma. “This is a much more innovative, hands-on approach than any other I have seen for managing asthma, and is a tremendous opportunity for us to partner with a provider who is well-respected in the community to actually impact patient care,” Touslee says.

Because Caleb's asthma is so severe, his treatment hasn't followed the typical path. But for many patients their primary care physicians are the first line of defense in preventing costly emergency room visits and hospitalizations. “Trained educators go to physicians' offices for six weeks to provide asthma education,” Touslee explains. “Their goal is to change the way physicians practice and manage the disease, and actually help the doctors and their staffs implement those changes. They don't just hand the doctor's office a list of guidelines. They help the provider implement those guidelines. They give the provider the tools to better manage this disease,” Touslee continues. “And for those members with difficult-to-manage asthma, like Caleb, intensive case management has made the difference between frequent hospital and emergency room visits, and staying healthy.”

Bob Finuf, chief executive officer of Family Health Partners, says the big difference between the Children's Mercy model and other health management programs lies with the provider involvement. “Making changes with the primary care office benefits the patient, and the program rewards these physicians for their participation. As the office delivers asthma education, they are able to use a specific billing code developed just for this program to receive reimbursement for that education,” Finuf says.

“We are giving the provider something tangible and real that they can use to improve patient care. It goes beyond the phone call or brochure that other disease management programs utilize,” Finuf adds. “The feedback is that the substance of this program is the quality of education the office staffs receive, and in turn the improved care they deliver to patients.”

For Warren Jackson, M.D., a pediatrician and Family Health Partners provider who has participated in the KC Camp Program, the results are well worth the time invested. “This is my 22nd year in private practice and the one thing I would say about asthma is that treating this disease has always been a stop-gap measure. Parents haven't understood the disease, and so we wouldn't see their kids until they were really sick. We were basically too busy putting out fires to take the time to educate patients and their families about asthma.”

Now Dr. Jackson believes the Children's Mercy program is a great teaching tool for staff, and ultimately patients. “This program has empowered our staff. They are much more comfortable identifying asthma, talking with patients and alerting the doctors to possible problems. As a result, knowledge about the disease among our patients and families has improved. This program gives the patient power and does so in a systematic way,” Dr.

Jackson notes. “To other providers, I would say you should participate in this program because it teaches your staff to identify and treat asthma. In the long run, you’re going to provide better healthcare for your patients.” Caleb Mahan’s mother agrees and says her son would spend more time hospitalized if it weren’t for their participation in the KC Camp program through Family Health Partners. “Thanks to the intensive case management we have received from Colleen, Caleb has been healthy for the past year,” Sharon says. “I have no doubt that without it we would still be in and out of the hospital.”

For Caleb, the result is clear. “Colleen got me some good medicine,” he says. That means he’s able to spend his time doing what most nine-year-old boys enjoy—attending school, playing with friends, and best of all, riding that bike.

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