

A Disease Management Program Utilizing “Life Coaches” for Children with Asthma

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An estimated 17 million Americans suffer from asthma, a costly disease accounting for 1.8 million emergency department visits and 10 million physician office visits annually [1]. Asthma is the most common chronic childhood disease, affecting more than 1 child in 20 and accounting for an annual loss of approximately 10 million school days per year [1]. Asthma-related hospitalization rates increased significantly during the past 2 decades even as overall hospitalization rates declined, particularly in children [2]. Further, asthma-related deaths increased 78% between 1980 and 1993 [1]. In 1998, the economic burden of asthma in the United States was estimated at \$11.3 billion [1].

A number of disease management programs have been directed toward patients with asthma to improve their health status and reduce costs. Asthma disease management is a comprehensive, coordinated system of care that emphasizes prevention of exacerbations and complications and patient self-management education [3]. This article describes and presents preliminary data regarding the efficacy of Sentara Health Management’s asthma disease management program.

Background

Sentara Health Management is the managed care division of Sentara Healthcare, a not-for-profit, fully integrated health care system providing a full range of services for more than 300,000 enrollees in the state of Virginia. Sentara Health Management has 2 health maintenance organization (HMO) licenses for the commercial and Medicaid products and a health insurance company license for the POS/PPO products. Generally, members join Sentara Health Management through employer-sponsored health plans or Medicaid-sponsored enrollment through state programs.

Health care resource use and associated costs increased sharply between 1996 and 1997 for children with asthma insured through the commercial and Medicaid HMOs, with the number of children with 1 or more hospital admissions or more than 4 emergency department visits tripling over a 12-month period. Traditional methods used to manage resource use for this population had experienced limited success. Prior to 1997, primary care providers and other health care professionals relied on patients to contact them when

asthma symptoms developed; consequently, the focus was on acute, episodic care instead of the promotion of a continuum-based approach to asthma management. To help children achieve and maintain control of asthma-related symptoms and to reduce resource use and associated costs, Sentara Health Management developed and implemented its own asthma disease management program.

The Asthma Program

Sentara’s asthma disease management program uses “life coaches” and home-based strategies to provide assessment, teaching, and monitoring to enable self-management by children and their caregivers. The focus of the program is to provide education and support that promotes optimal independent functioning, thus reducing the need for more intensive and higher-cost services. Life coaches assist children and their caregivers in making lifestyle and behavior changes to improve their health status. Life coaches are registered nurses who are certified in asthma disease management and knowledgeable about community and family resources.

Children are referred to the program by health plan case managers or primary care physicians based on clinical assessment. The asthma disease management program director also identifies eligible children using pharmacy and resource use data provided by the health plan’s clinical reporting team. Patients with a primary diagnosis of asthma with 1 or more hospital admissions or more than 2 emergency department visits in a 6-month period are referred to the program. Patients who frequently use β_2 -agonist “reliever” medications but little or no inhaled anti-inflammatory “controller” medications also are identified for potential enrollment.

Once the child is enrolled in the program, the life coach schedules a 2- to 3-hour home care visit. During this initial visit, the life coach reviews the child’s history, performs a physical and psychosocial assessment, evaluates past resource use, and assesses knowledge regarding asthma management. The life coach determines the severity of asthma by using a classification system based on the National Institutes

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of Health guidelines [4], ranking each child as mild, moderate, or severe. The clinical features that determine severity level range from intermittent, brief symptoms to frequent exacerbations that could prove life-threatening. Life coaches suggest a visit pattern, depending on severity level and family needs, and negotiate follow-up visits with the child and caregiver. The child is provided a peak flow meter and instructed in its use during the initial visit.

The life coach and the primary care provider initiate the Asthma Program Treatment Plan (Figure 1) based on the individual needs of the child and caregiver. Levels of the treatment plan are color-coded to enhance understanding and compliance. Both the child and caregiver are taught that the goal of optimal asthma management is to remain in the Green Zone and are instructed on what to do if they enter the Yellow Zone. Emphasis is placed on calling the life coach when symptoms intensify or current treatment is ineffective, minimizing risk of transition to the Red Zone. Life coaches are available 24 hours a day, 7 days a week, to intervene and assist the child. Frequently, the life coach is able to provide effective telephone intervention, preventing exacerbation of symptoms.

Life coaches use a comprehensive teaching model, combining pictures with understandable words to teach the child and caregiver about the treatment of asthma. The goal is to increase compliance with use of appropriate asthma medications and to encourage children and their caregivers to make comprehensive behavior and lifestyle changes. These changes may include assuring medication availability, smoking cessation, improving housekeeping habits, making home modifications, or finding alternative activities for children to minimize triggering asthma exacerbations.

After the initial visit, life coaches make routine telephone calls to monitor the children and to provide early intervention as needed to prevent complications. During the monthly follow-up calls, life coaches speak with both the child (those aged 6 years and older) and the caregiver to assess medication use, treatment plan results, number of days missed from school and work, and success at making home and lifestyle changes. Children are followed for 1 year or until self-management is achieved. Self-management is defined as successful use of the treatment plan, successful behavior and/or lifestyle changes, and decreased use of intensive, higher-cost services. During the follow-up phase of care, life coaches communicate the family's progress with the asthma disease management program director and primary care providers at least monthly. Communication occurs more frequently when the health and well-being of the child and/or caregiver warrants.

Impact of Program

Resource Use and Costs

To test the efficacy of the asthma disease management program, we used medical and pharmacy claims data to exam-

ine pre- and post-enrollment resource use and cost outcomes for children in the program. Children had to have been continuously enrolled in the asthma disease management program for 12 months and in the health plan for at least 24 months to be included in the analysis. Continuous enrollment was defined as no more than 1 break of up to 45 days [5]. In the absence of significant covariates, McNemar tests were used to explore differences between pre- and post-enrollment resource use. Dependent *t* tests were used to explore differences in health care cost associated with resource use. Alpha levels were set a priori at 0.10.

In June 2000, 294 children met inclusion criteria. Average age was 11.4 years (range, 3 to 19 years), with an approximately equal distribution of girls and boys. Almost 70% of the children were insured through the Medicaid product and resided in an urban environment. Figure 2 shows their resource use before and after enrollment in the asthma disease management program. Following enrollment, children were significantly less likely to be admitted to the hospital, with overall inpatient admissions declining 45% ($\chi^2 = 55.06$, $P < 0.001$). There was no change in average length of hospital stay (3.0 days vs. 3.1 days; $P = 0.467$). Emergency department visits dropped 17% following enrollment ($\chi^2 = 2.88$, $P = 0.09$) and primary care provider visits declined 19% ($\chi^2 = 9.474$, $P = 0.01$). No change was seen in visits to allergy or pulmonary specialists. The β_2 -agonist-to-anti-inflammatory medication ratio was used as an outcome measure because the goal of optimum drug therapy is to decrease reliance on quick-acting bronchodilators [6,7]. The ratio declined 20%.

Total health care costs were used to construct an average health care cost per child per month. Total health care costs included the costs of hospital admissions, emergency department use, primary care provider visits, specialist visits, home health visits, and asthma medications. Average health care cost per child per year declined 25% following enrollment in the asthma disease management program ($t = 3.567$, $P < 0.001$). As shown in Figure 3, per child per month inpatient costs declined 45% ($t = 5.621$, $P < 0.001$), emergency department costs declined 9% ($t = 0.055$, $P = 0.957$), and primary care provider costs declined 19% ($t = 3.256$, $P = 0.001$). Minimal (2%) cost savings were noted for specialist services ($t = 0.597$, $P = 0.551$). As expected, annual home care costs increased significantly ($t = 8.174$, $P < 0.001$).

Annual cost savings (the difference between pre-enrollment costs and post-enrollment costs annualized) totaled approximately \$490,000. Return on investment, defined as total health plan cost savings divided by total program costs, was calculated at \$4.40. Program costs included asthma disease management program personnel. Medical surgical supplies were not included in the program costs as these supplies were health plan benefits and not exclusive to the asthma disease management program.

ASTHMA PROGRAM TREATMENT PLAN

Patient Name: _____ Admit #: _____

Green Zone: All Clear

Peak flow between _____
(80%–100% of personal best)

No symptoms of an asthma episode.
You are able to do your usual activities
and sleep without having symptoms.

- Take these long-term medications every day

Medicine	Dose	How Often
_____	_____	_____
_____	_____	_____
_____	_____	_____

- Take _____ before exercise.
(medicine)
- When your peak flow meter falls, go to Yellow Zone.

Yellow Zone: Caution

Take action to get your asthma under control.

Peak flow between _____
(50%–80% of personal best)

You may be coughing, wheezing, feel short of breath, or feel like your chest is tight. These symptoms may keep you from being able to do your usual activities or keep you from sleeping.

- Take quick relief medicine if your peak flow has fallen to the Yellow Zone

Medicine	Dose	How Often
_____	_____	_____
_____	_____	_____

- After taking quick relief medication, repeat peak flow. If peak flow is above _____ (70% of personal best), return to Green Zone. If peak flow is below _____ (70% of personal best), repeat quick relief medication

- Take this quick relief medication:

Medicine	Dose	How Often
_____	_____	_____
_____	_____	_____

- Keep taking your Green Zone medicine(s).

- But, if you DO NOT feel better in 20–60 minutes or your peak flow is under _____, (70% of personal best) follow the Red Zone Plan below and call your Sentara Home Care Nurse—461-5649 (24-hour number).

Let the home care nurse know if you keep going into the Yellow Zone. Your Green Zone medicines may need to be changed to keep other episodes from starting. Gradually wean back to preventative medicines when symptoms are back to normal.

Red Zone: Medical Alert

This is an emergency! Get help.

Peak flow under _____
(50% of personal best)

You may be coughing, very short of breath, and/or the skin between your ribs and your neck may be pulled tight. You may have trouble walking or talking. You may not be wheezing because not enough air can move out of your airways.

- Repeat quick relief medication if peak flow is still under _____ (70% of personal best)

Medicine	Dose	How Often
_____	_____	_____
_____	_____	_____

See the doctor RIGHT AWAY or go to the hospital if any of these things are happening:

- Lips or fingernails are blue
- You/child are struggling to breathe
- You/child do not feel any better 20 to 30 minutes after taking the extra medicine and your peak flow is still under _____ (50% of personal best)

Figure 1. Sample asthma program treatment plan. Copyright 2001, Sentara Healthcare. (Adapted from National Heart, Lung, and Blood Institute, International Asthma Project. International Consensus Report on Diagnosis and Treatment of Asthma. Bethesda [MD]: U.S. Dept. of Health and Human Services, 1992. NIH Pub. No. 91-3091.)

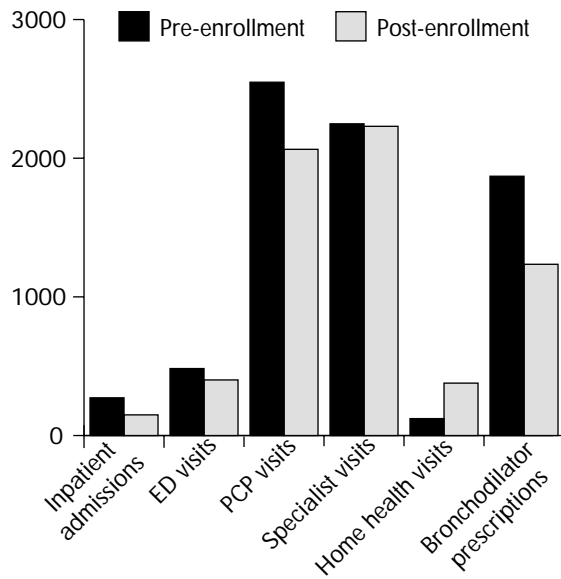


Figure 2. Annual resource use for 294 children in asthma program. ED = emergency department; PCP = primary care physician.

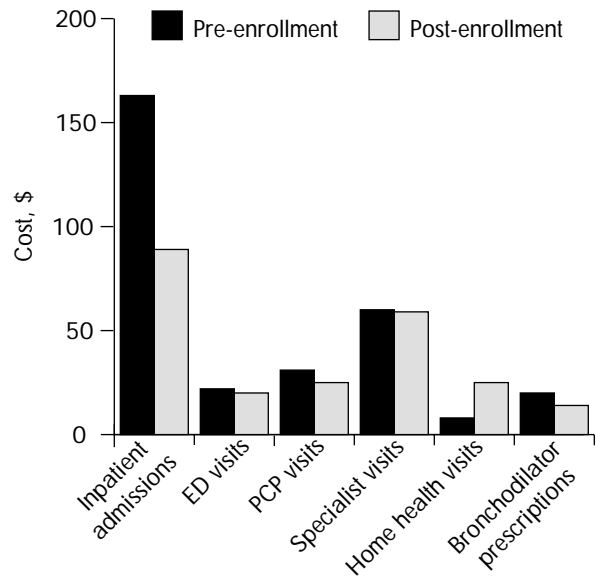


Figure 3. Average medical and pharmacy costs per child per month. ED = emergency department; PCP = primary care physician.

Knowledge and Satisfaction

As a part of routine telephone follow-up, life coaches assess child and caregiver knowledge about asthma management and satisfaction with the program. Both the child (those aged 6 years and older) and the caregiver are asked to describe the appropriate use of inhalers, spacers, and nebulizers and to explain, in their own words, the components of their treatment plan. Perception of health improvement is assessed using a 5-point Likert-type scale anchored with “no improvement” and “marked improvement.” A 5-point Likert-type scale also is used to assess overall satisfaction with the program.

Of the 294 study participants, approximately 60% were successfully interviewed at 2 months after the initial in-home visit. Of these, 100% (*n* = 177) were able to correctly describe the procedure for using a peak flow meter. Approximately 95% of participants could explain appropriate usage, side effects, and dosage of medications as reflected in their Asthma Plan. Approximately 99% of participants indicated they were likely to remain in the program and would recommend Sentara’s asthma disease management program to a friend with asthma.

Achieving Improvement

Communication

To help children and families maintain control of their asthma and prevent exacerbations, communication between the child and caregiver, life coach, asthma program director, health plan case managers, and physicians is essential. Life coaches stay in close contact with the primary care physician, with monthly

written communication and as-needed telephone calls to discuss changes to the treatment plan. Life coaches also maintain communication with the health plan, updating the program director on each child’s progress monthly.

Physician Support

The primary care physicians in the program have been instrumental in contributing to program success. They have been willing to accept the life coaches as primary liaisons for their patients and to work collaboratively with them on the treatment plan as needed. They have accepted new patient management strategies, such as empowering the asthma program director to enroll new patients without a formal physician referral. Anecdotally, the physicians have reported satisfaction with the program and feel that the program has been beneficial to their patients.

Data Management

Sentara Health Management was willing to make changes in patient databases in order to provide physicians and life coaches with actionable clinical information. New data elements along with formatting changes were added to existing reports. Monthly pharmacy reports were developed and are used to identify patients with a high β_2 -agonist-to-anti-inflammatory medication ratio for referral to the program. Patient management reports were refined to provide real-time data to monitor children’s progress within the program. Importantly, physicians are notified within 72 hours of patients accessing acute care services. Physicians are also provided with timely

feedback on their own performance along with comparisons to benchmarks and to their peers.

Conclusion

Sentara Health Management has successfully formed a partnership with its members and physicians to help children and their families manage 1 of the most common and costly illnesses in the United States. The 1-on-1 asthma education and regular follow-up provided by the life coaches play a large role in making the program successful. It is likely that patients feel greater accountability for making recommended behavior and lifestyle changes when the person calling to follow up is someone they know and who has been to their home. Sentara's asthma disease management program is a comprehensive program that can serve as a model for other disease management programs. The Department of Medical Assistance for the state of Virginia plans to use Sentara's asthma disease management program as a model for other managed care companies that insure Medicaid recipients. The program has not only met the cost saving goals for Sentara Healthcare but has made a major contribution to improving the quality of life of asthma patients in the Hampton Roads area of Virginia.

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