

Cassano Health Center's Children's Asthma Screening Program Provided By Generous Grants From The Mathile & Iddings Family Foundations

Melissa Gargasz, DO; James Schoen, DO; Robert Cain, DO; Kelly Fackel, Osteopathic Foundation Grandview Hospital, Family Medicine Dept. Dayton, OH



Introduction

The purpose of the Children's Asthma Screening Program at the Cassano Health Center is to improve the health of the underserved children who suffer from asthma in the greater Dayton area. We estimate this total in Dayton alone to be 5,000 children, or more. The 2000 U.S. Census reports there were 48,488 children in the city of Dayton, specifically children ages 0 to 19 years old. Nationally, 5% to 13% of these children suffer asthma attacks, with the highest percentage being among the medically underserved population. There is a great need for this project. Children in poverty are much more likely to develop asthma and to suffer more serious attacks than other children. Asthma is exacerbated by smoking in the home, environmental factors such as poor heating systems, a lack of air conditioning and high levels of pollen, mold, dust mites and cockroaches in the home. Asthma is a serious and growing health concern, particularly among children. More Americans than ever before suffer from asthma and it is one of this country's most common and costly diseases. A recent issue of the *Dayton Daily News* reported that Dayton's per-capita rate of asthma is 11% higher than the U.S. rate; and the Asthma and Allergy Foundation of America ranks Dayton its 34th worst for asthma.

The Asthma and Allergy Foundation of America also reports that asthma is the most common chronic condition among children. Among children ages 5 to 17, asthma is the leading cause of school absences from a chronic illness. It accounts for an annual loss of more than 14 million school days per year (approximately 8 days for each student with asthma) and more hospitalizations than any other childhood disease. It is estimated that children with asthma spend nearly 8 million days per year restricted to bed. Nearly half (44%) of all asthma hospitalizations are for children. Asthma is the third ranking cause of hospitalization in children. Ethnic differences in the prevalence of asthma, morbidity and mortality are highly correlated with poverty, urban air quality, indoor allergens, lack of patient education and inadequate medical care. African Americans are three times more likely to be hospitalized from asthma and three times more likely to die from asthma. The annual cost of asthma is estimated to be nearly \$18 billion.

This grant is supporting a multi-prong approach to treating asthmatic children at the Cassano Health Center in Dayton, OH. The Children's Asthma Screening Program is allowing "at risk" children to be identified early, so that they may be given specialized treatment and education, support groups for their parents and other caregivers, smoking cessation classes for families, free or discounted medicines, and access to free or low-cost assistance to improve home HVAC systems. If this pilot program is effective and we can demonstrate positive outcomes, we will have identified a solution to one of the nation's top public health concerns.

Methods

The purposes of our screening studies are to increase awareness, diagnosis and treatment of asthma in our Cassano Clinic patients, and the surrounding underserved areas. To achieve these outcomes, we are employing three tactics: physician and staff training; education and outreach; and providing medicine and environmental tools (home visits and environmental assessments) to treat this chronic illness. The target patient population was pulled by diagnosis code (children and adults) for asthma and repetitive upper respiratory visits. The pool numbered over 800 patients, with 120 pediatric patients alone having the primary diagnosis of asthma.

To date, we have provided training to our residents and nursing staff on the use of spirometry in identifying asthma (this is a more accurate diagnostic tool than the peak flow meter, which is typically used in the clinic). We have also hosted a community health fair in the park next door to Cassano called "Better Breathing Day," where we offered free screenings, food, fun, flu shots and displays about the importance of breathing. Students and staff simply used peak flow meters and brochures inviting them to Better Breathing Day; additionally, all pediatric patients were notified by letter about the importance and availability of free flu vaccinations.

The bulk of our measurement, diagnosis, testing and educational programming is currently underway. We have partnered with a local elementary school to test children, grades 2, 3 and 4 in gym class (pre, post and 5 minutes after exercise, after obtaining parental/guardian consent), with fun activities, using preceptors, resident physicians, students and nursing staff, simply using peak flow meters, and recording height and weight. Children were considered to be at risk for asthma if they met one or more of the following criteria: pre-exercise % predicted below 80%, post or five minutes post exercise % change from baseline 20% or below, or symptoms per history or during exercise regardless of peak flow testing. Letters will be sent back to all parents informing them if their child was considered to have normal or abnormal screening results. Those children indicated with breathing problems or asthma will be invited back to the clinic for follow up testing and diagnosis (using the more accurate, yet time intensive spirometry to measure results). Parents of children referred to Cassano for follow up treatment will be invited to educational sessions for families to teach ways to manage this chronic illness. Home visits and environmental assessments will also be scheduled for families who desire that service.



Figure 1. Legend for figure 1.



Figure 2. Legend for figure 1.

Table 1

Cassano Health Center's Children's Asthma Screening Program
Feasibility Studies Over Four Years Health & Safety Program Evaluation

Method	Subgroup	Peak Flow Meter	Respirator	Respirator/Spinal	Asthma	Respirator/Spinal/Asthma	Asthma	Respirator/Spinal/Asthma	Asthma	Respirator/Spinal/Asthma	Respirator
1	100	100	100	100	100	100	100	100	100	100	100
2	100	100	100	100	100	100	100	100	100	100	100
3	100	100	100	100	100	100	100	100	100	100	100
4	100	100	100	100	100	100	100	100	100	100	100
5	100	100	100	100	100	100	100	100	100	100	100
6	100	100	100	100	100	100	100	100	100	100	100
7	100	100	100	100	100	100	100	100	100	100	100
8	100	100	100	100	100	100	100	100	100	100	100
9	100	100	100	100	100	100	100	100	100	100	100
10	100	100	100	100	100	100	100	100	100	100	100
11	100	100	100	100	100	100	100	100	100	100	100
12	100	100	100	100	100	100	100	100	100	100	100
13	100	100	100	100	100	100	100	100	100	100	100
14	100	100	100	100	100	100	100	100	100	100	100
15	100	100	100	100	100	100	100	100	100	100	100
16	100	100	100	100	100	100	100	100	100	100	100
17	100	100	100	100	100	100	100	100	100	100	100
18	100	100	100	100	100	100	100	100	100	100	100
19	100	100	100	100	100	100	100	100	100	100	100
20	100	100	100	100	100	100	100	100	100	100	100
21	100	100	100	100	100	100	100	100	100	100	100
22	100	100	100	100	100	100	100	100	100	100	100
23	100	100	100	100	100	100	100	100	100	100	100
24	100	100	100	100	100	100	100	100	100	100	100
25	100	100	100	100	100	100	100	100	100	100	100
26	100	100	100	100	100	100	100	100	100	100	100
27	100	100	100	100	100	100	100	100	100	100	100
28	100	100	100	100	100	100	100	100	100	100	100
29	100	100	100	100	100	100	100	100	100	100	100
30	100	100	100	100	100	100	100	100	100	100	100
31	100	100	100	100	100	100	100	100	100	100	100
32	100	100	100	100	100	100	100	100	100	100	100
33	100	100	100	100	100	100	100	100	100	100	100
34	100	100	100	100	100	100	100	100	100	100	100
35	100	100	100	100	100	100	100	100	100	100	100
36	100	100	100	100	100	100	100	100	100	100	100
37	100	100	100	100	100	100	100	100	100	100	100
38	100	100	100	100	100	100	100	100	100	100	100
39	100	100	100	100	100	100	100	100	100	100	100
40	100	100	100	100	100	100	100	100	100	100	100
41	100	100	100	100	100	100	100	100	100	100	100
42	100	100	100	100	100	100	100	100	100	100	100
43	100	100	100	100	100	100	100	100	100	100	100
44	100	100	100	100	100	100	100	100	100	100	100
45	100	100	100	100	100	100	100	100	100	100	100
46	100	100	100	100	100	100	100	100	100	100	100
47	100	100	100	100	100	100	100	100	100	100	100
48	100	100	100	100	100	100	100	100	100	100	100
49	100	100	100	100	100	100	100	100	100	100	100
50	100	100	100	100	100	100	100	100	100	100	100

Results

The Oak and Ivy Park next to the Cassano Health Center was transformed into a neighborhood fair, educating and testing Cassano patients and Wright Dunbar neighbors about asthma on Friday, Oct 12, 2007. Over 100 participants from ages 3 to 73 were in attendance to enjoy the music, free food and asthma screenings. Volunteer physicians, nurses and clinicians were on hand to discuss asthma and its challenges, as well as ways to control the disease. A number of questions were offered to participants to begin the conversation and educate them about asthma and its symptoms, including: Do you have trouble keeping up with your friends when running or playing? Do you always get a Spring or Fall cold or cough? Do you have allergies to grass, weeds, trees, pets or molds? Do you get short of breath easily, especially with exercise? Do you ever hear a whistling or wheezing sound in your chest? Does your chest ever feel tight? Do you ever have a cough that won't go away? Do you ever wake up at night coughing, short of breath or with a strange feeling in your chest? Do you have pets in your home? Are your children exposed to cigarette smoke? Do you have other children with asthma? Do either of your parents have asthma?

To date, we have screened 59 elementary school children (grades 2-4) for asthma utilizing height and peak flow meters to measure predicted peak flows, baseline peak flows pre exercise, peak flows immediately post exercise, peak flows 5 minutes post exercise (taking the best of 3 readings for each category, pre, post and 5 min. post, respectively). Other measurements obtained includes pre-exercise % predicted, post exercise % change from baseline, and 5 minutes post exercise % change from baseline. We also noted any comments or concerns during the screening process. This information can be seen on the table titled, Cassano Health Center's Children's Asthma Screening Program.

By classifying a child to be at risk for asthma according to our screening methods, a child must meet one of the following criteria: pre-exercise % predicted below 80%, post or five minutes post exercise % change from baseline -20% or below, or symptoms per history or during exercise regardless of peak flow testing. By analyzing the data on the Cassano Health Center's Children's Asthma Screening Program Table, we have found that 33 out of 59 children screened, were considered to be at risk for asthma.

Conclusions

Better Breathing Day provided the community outreach and awareness component of Cassano Health Center's Youth Asthma program. By providing this service to the community, we were able to better identify those with undiagnosed asthma, discuss adequate treatment and management of asthma through patient and physician education, and raise awareness of proper medication and improved environmental conditions in the home.

Although the asthma screenings in the elementary school setting are still ongoing, we have completed data analysis of 59 children. As this is only a screening tool, Peak Flow readings, as well as symptoms during exercise, have allowed us to successfully identify children who may have undiagnosed asthma. These screening results have raised awareness of those at risk and follow up letters are prompting parents to seek additional medical care for a more thorough evaluation.

Some study design limitations were identified while observing the screening environment and analyzing the data. Early in the screening process, our forms of exercise in gym class made it difficult for some children to comply with the duration of exercise, secondary to reasons of likely deconditioning or symptoms of poor exercise tolerance, such as coughing, wheezing and shortness of breath. However, our original choices for exercise may have not been sufficient for some of the more active students, as duration of exercise was somewhat sporadic and lacking in control of participation throughout the activities. We addressed these concerns by restructuring our activity to the form of hip-hop dancing. The change in exercise was well-received by students and staff, while allowing for better control of sustained activity to ensure more accurate post exercise and 5 minute post exercise peak flow measurements.

Other variables may have played a role in data collection, as well. Personnel varied on different screening days. This could account for inconsistencies in training on peak flow techniques, proper mouthpiece placement and postures of patients. Some children may have lacked the understanding of our requirements for screening. In consideration of all of the limitations and confounding variables, some children may have been improperly screened, thus missing an abnormal or at risk screening result.

To address this issue and possibility, we have sent letters to all parents of children screened, stating some common manifestations of asthma, and recommending follow up if they feel that their child has symptoms of asthma, even with a normal Peak Flow Screening Test.

We will measure results by monitoring the acute visit rate of pediatric asthmatic patients, prescription refill rates and emergency department visits. We will also conduct periodic surveys of the children's parents and caregivers to monitor their assessment of the support group therapy, education classes and their children's overall response to the treatment. We will share the results of our program with our patients and project partners, encouraging implementation of best practices we identify that can be made in the home and school.

Success will be defined initially by providing better care for our asthmatic patients, providing them with information and education to help them and their caregivers better manage their asthma, and to connect patients and families to resources in the community that may be able to make additional differences in their lives and health. Longer term success will be our ability to track and monitor our underserved patients for emergency department visits, to get a true picture of whether their health outcomes are improving because of our program.

References

A Proposal to the Mathile Family Foundation to fund the Cassano Health Center's Children's Asthma Program
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