

## Asthma-Related Interventions in a Pediatric Emergency Department Decrease Asthma-Related ED Revisits

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### *Study Purpose and Rationale*

Childhood asthma is a major public health issue in the Northern Manhattan community. The asthma rates within our community are approximately three times the national average [1]. Families of children with asthma face many challenges that are unique to our community. These challenges include low economic and educational statuses, cultural gaps in their understanding and care of asthma and poor access to care despite the proximity to large academic medical centers and community-based programs dedicated to improving asthma outcomes [2]. A particular problem in our community is how families are introduced to their medical home. Many of our families are introduced to the medical center through the pediatric emergency department (ED). In 2009, there were 52,534 ED visits; of which 2,142 visits were asthma-related visits. Approximately 254 of the 2,142 asthma-related visits were patients who were admitted and the rest were discharged from the emergency department. At the time of discharge, families were counseled to follow up with their pediatricians for further management of their asthma. Despite referral to outpatient physicians, many of these families returned to the emergency department for asthma exacerbations.

Asthma is defined as expiratory airflow obstruction in response to multiple environmental and medical triggers. These triggers lead to frequent asthma exacerbations in the setting of poorly controlled asthma [3]. It has been suggested that all children with asthma will suffer from an asthma exacerbation in their lifetime. Therefore, it is imperative to teach children and their families early signs and symptoms of an asthma exacerbation. These lessons will empower these families with the tools needed to treat these symptoms in order to decrease the frequency of hospitalizations, ED visits, and fatalities [4]. The best modality of improving asthma outcomes is highly debated. Some studies have showed the written asthma action plan can increase patient adherence to inhaled and oral corticosteroids, and improve asthma control after an acute care visit [5]. Encouraging families to participate in community-based programs that focus on changing environmental triggers can also improve asthma outcomes [6]. However, these community-based programs are not standardized and the quality of counseling may vary.

Most studies have approached the challenges of improving asthma outcomes with different modalities [7,8]. However, these modalities have not been validated in our pediatric emergency department. The demographic of our patient population is predominantly a Hispanic population. Most of our patients are enrolled in the Medicaid managed care plan. They typically follow up in our outpatient clinic if their medical home has been established. However, the emergency department is a critical element of their care. Our study aims to analyze three modalities and determine if they decrease the number of patients who have multiple asthma-related ED visits. The three modalities that we intend to implement are written asthma action plan, referral to a community-based asthma program, and initiating or stepping up controller medications if needed. We hypothesize that putting into practice these three modalities will decrease the number of asthma-related ED revisits.

### *Study Design and Statistical Procedures*

To evaluate our hypothesis, we will conduct a before and after study. Our goal is to provide guidance to the emergency department about ways to decrease asthma-related ED revisits. Our study will be conducted over a two-year period. During the one-year pre-measurement period, we will follow approximately 415 patients that present to our emergency department with an asthma exacerbation. Our current standard of care involves at discharge giving families prescriptions, and basic information about asthma. At the end of this period, we will determine how many of these patients returned to our emergency department for an asthma exacerbation. We will determine the average number of visits and hospitalizations, and if controller medications were initiated or stepped up for patients with poorly controlled asthma.

The intervention will involve training nurses and physicians about our three modalities of improving asthma outcomes. The first modality involves the written asthma action plan. At the time of discharge, physicians will complete a written asthma action plan as part of the discharge instructions. The nurses will be responsible for teaching families how to use a written asthma action plan effectively. They will be encouraged to use the teach-back method. The second modality entails referring families to WIN for asthma prior to discharge from the emergency department. The WIN for asthma coordinators will be available during business hours to meet with families in the emergency department. They will provide counseling about environmental triggers and ways to decrease asthma exacerbation by eliminating these triggers. Families will be offered home assessments if they are interested. Families evaluated after these coordinators are not available will be given appointments at a later date to meet with a WIN for asthma coordinator as an outpatient. The third modality involves encouraging physicians to initiate or step up controller medications if the clinical symptoms support this management. The nurses will be responsible for using the teach-back technique to teach families how to use their oral and inhaled medications. The electronic medical record will have hard stops to ensure that all of these steps are completed. The post-measurement period will also involve approximately 415 patients that present after the intervention has been made.

### *Statistical Analysis*

The 2009 data from our emergency department showed 4.1% of the total ED visits were asthma-related visits. The number of asthma-related ED visits does not vary significantly from year to year. It is estimated that 50% of these visits are families that return to the emergency department. Using the chi-square test for 80% power and 5% type 1 error rate, the number needed in our study is 415 patients in the pre-measurement and post-measurement groups in order to show a 10% decrease in asthma-related ED revisits. We will use a logistic regression analysis to control for confounding factors.

### *Study Procedures*

This study will review data obtained from the electronic medical records during the pre-measurement and post-measurement period. Data obtained will be used only for the purpose of this study.

### *Study Drugs or Devices*

N/A

### *Study Questionnaires*

N/A

### *Study Subjects*

All children 18 years of age and younger with asthma evaluated in the emergency department between 2011-2013 who were discharged. Patients who were admitted to the hospital will be excluded from the study.

### *Recruitment*

In terms of the patient population, this study is observational; no patients will be recruited for this study. However, our intervention involves teaching nurses and physicians in the emergency department our three modalities.

### *Informed Consent Process*

We will request a waiver for informed consent.

### *Confidentiality of Study Data*

Data will be managed on a password-protected computer. Each participant's identification number and other identifiers will be securely destroyed at the end of the study. All data and results that are published will be stripped of any identifiers.

### *Potential Conflict of Interest*

N/A

### *Location of the Study*

Children's Hospital of NY-Presbyterian

### *Potential Risks*

This study may increase the time it takes to discharge an asthma patient in the emergency department. Nurses are currently short-staffed and having them participate in a lengthy teaching program for asthmatics may decrease the time they spend on their other responsibilities.

### *Potential Benefits*

This study can decrease the frequency of emergency department visits. In addition, families are more empowered to manage their children asthma symptoms and decrease the frequency of asthma exacerbations.

### *Alternative Therapies*

N/A

### *Compensation to Subjects*

N/A

### *Minors as Research Subjects*

Research focuses on patients 18 years and younger. No assent or informed consent is needed.

*Radiation of Radioactive Substances*

N/A

References

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